

TOWN OF HINGHAM

PLANNING BOARD RULES AND REGULATIONS

ADOPTED UNDER THE SUBDIVISION CONTROL LAW

AS AMENDED THROUGH AUGUST 18, 2014

HINGHAM PLANNING BOARD RULES & REGULATIONS

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TOWN OF HINGHAM
RULES AND REGULATIONS
GOVERNING THE SUBDIVISION OF LAND

Adopted under the Subdivision Control Law of the Commonwealth of Massachusetts
General Laws, Chapter 41, Section 81-K et seq.

SECTION 1

AUTHORITY, PURPOSE, and DEFINITIONS

A. Authority

Pursuant to the authority granted by Section 81-Q of Chapter 41 of the General Laws and for the purpose specified in Paragraph B of this Section, the Planning Board of the Town of Hingham has adopted the following Rules and Regulations governing the subdivision of land in the Town of Hingham.

B. Purpose

These subdivision regulations have been enacted for the purpose of protecting the safety, convenience and welfare of the inhabitants of the Town 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 insuring 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 bylaws; for securing adequate provision compatible with town municipal services and natural features existing as of the date of submission of a subdivision plan for approval, for water distribution, sewerage, drainage, protection of natural water sources, flood control, wetland areas, underground utility services, fire, police, and other similar municipal equipment, and street lighting; and other requirements where necessary in a subdivision; and for protecting, promoting and enhancing the natural beauty and amenities of the Town and coordinating the ways in a subdivision with each other and with the public ways in the Town and with the ways in neighboring subdivisions. No subdivision shall be approved unless it complies with these Rules and Regulations and with the applicable provisions of zoning and other town bylaws and regulations and of the General Laws of the Commonwealth of

Massachusetts, nor unless, in the opinion of the Board, such subdivision meets the requirements of public safety, including reasonable precautions against possible natural disasters, of traffic safety and convenience, or adequate water supply, storm water drainage and sewage disposal and is designed with due regard to the rights, health and welfare of Hingham's inhabitants, including the residents of such subdivision. Proposed subdivisions shall conform to overall development plans adopted by the Planning Board and shall adhere to the principles of correct land use, sound planning and good engineering.

C. Limitation

No person shall make a subdivision of any tract, parcel, or lot of land into two or more lots in such a manner as to constitute a “subdivision” within the Town of Hingham, or proceed with the improvement or sale of lots in a subdivision, or the construction of ways, or the installation of municipal services therein, and until a definitive plan of such subdivision has been submitted to and approved by the Planning Board as hereinafter provided.

SECTION 2

GENERAL

A. Definitions

For the purpose of these Rules and Regulations, the following words and terms used herein are hereby defined as follows:

Abutter An owner or owners of property, which has (a) one or more boundaries or parts thereof, in common with the property being subdivided or, (b) has frontage in whole or in part directly opposite any portion of the property being subdivided or, (c) is deemed by the Planning Board to be affected by the proposed subdivision of land.

Applicant A person who applies for approval of a plan of a subdivision or who applies for a determination that approval is not required. The applicant (or applicants) shall be the owner (or owners) or the duly authorized agent or representative of the owner(s), or his or their assigns of all land included in the subject request for action before the Planning Board. If a plan for a subdivision of land is to be submitted by one representing to be the agent or assign of an owner, a notarized certificate shall be submitted, signed by the owner, authorizing the person filing the plan to act as agent or assign and the agent or assign shall also file sufficient documentation to explain the nature and extent of his own actual or potential interest in the land.

Board The Planning Board of the Town of Hingham.

Dead End Street A street, or network of streets, whether existing or proposed, which has only one public access from the remainder of the community street network. For the purpose of this definition, the length of the dead-end street shall be the sum of the lengths of all roadways beyond the limit of multiple access.(see also Sections 4,B.,(1),(d) and 4,B.,(4),(a).

Definitive Plan The plan of a subdivision as submitted (with appropriate application) to the Board for approval, in its entirety, to be recorded in the Registry of Deeds or filed with the Recorder of the Land Court when approved by the Board.

Department's Specifications The Standard Specifications for Highways and Bridges of the Massachusetts Highway Department, dated 1988 including all revisions thereto.

Department's Standards The Construction Standards of 1977 of the Massachusetts Highway Department, and all revisions thereto.

Developer Same as "Applicant".

Engineer A Registered Professional Engineer as defined in Chapter 112 of the General Laws, Section 81-D, as qualified in Chapter 112, Section 81-J and 81-M.

General Laws The General Laws of the Commonwealth of Massachusetts, with all additions thereto and amendments thereof. (Abbreviated G.L.)

Land Surveyor A Registered Professional Surveyor as defined in Chapter 112 of the General Laws, Section 81-D, as qualified in Chapter 112, Section 81-J and 81-M.

Lot An area of land in one ownership, with definite boundaries, used, or available for use, as the site of one or more buildings or for any other definite purpose.

Utility Services Sewers, surface and subsurface water drains, water pipes, fire hydrants, gas pipes, oil pipes, steam lines, electric lines or ducts, telephone lines or ducts, fire alarm cables and boxes, CATV, street lights, and their respective appurtenances, or other similar facilities.

Owner The person holding the ultimate fee simple title to a tract, parcel, or lot of land, as shown by the record in the Plymouth Registry of Deeds or Plymouth Registry of Probate. A certified copy of such record shall accompany any application.

Person An individual, two or more individuals, partnership, corporation, association, society, or any entity recognized by the General Laws, having common or undivided interests in a tract of land. Person shall also include, to the extent allowed by the General Laws, agents, administrators, executors, heirs, devisee, successors, and assigns.

Preliminary Plan A plan of a proposed subdivision or resubdivision of land drawn on tracing paper, or a print thereof, showing (a) the subdivision name, boundaries, north point, date, scale, legend and title "Preliminary Plan"; (b) the names of the record owner and the applicant and the name of the designer, engineer or surveyor; (c) the names of abutters, as determined from the most recent local tax list; (d) the existing and proposed lines of streets, ways, easements and any public areas within the subdivision in a general manner; (e) the proposed system of drainage, including adjacent existing natural waterways, in a general manner; (f) the approximate boundary lines of proposed lots, with approximate areas and dimensions; (g) the names, approximate location and widths of adjacent streets; (h) and the topography of the land in a general manner.

Print A reproduction of an original drawing - dark line on white background.

Roadway A portion of a way which is designed and prepared for vehicular traffic.

Site A portion of a lot, tract or parcel of land provided for the location of a building, with the necessary or convenient amount of land adjacent to such building used or to be used in connection with such building.

Street A public way, a way approved under Subdivision Control Law, or a way having in the opinion of the Planning Board, sufficient width, suitable grades and adequate construction to provide for the proposed use of the land abutting thereon or served thereby, (major, secondary, minor and limited residential streets are defined in Section 4,B. of these Regulations).

Subdivision The division of a tract of land into two or more lots and as further defined in Section 81-L, Chapter 41, G.L.

Subdivision Control Law Sections 81K to 81GG, inclusive of Chapter 41 of the General Laws and any acts in amendment thereof.

Way A way shall be the full strip of land designated as a way or street as distinguished from the roadway.

B. Administration

No plan shall be deemed to have been submitted to the Board until said plan, together with all application forms, fees and other items as required and executed as specified herein has been delivered in person to the Board at a meeting thereof, or by registered mail to the Planning Board by the owner of the land involved or his authorized agent. If so mailed, the date of receipt shall be the date of submission of the plan. (For matters not covered by these Rules and Regulations, reference is made to Sections 81-K to 81-GG, inclusive, Chapter 41, G.L.)

C. Certification of Plans

All definitive plans submitted to the Board shall include a certification as to their conformance in every respect, with these Rules and Regulations and as to the validity of their content executed by a person registered in the Commonwealth of Massachusetts as a land surveyor or professional engineer or both as required by the Board. If the Plan fails to comply in any respect with these Rules and Regulations, then the definitive plans must be accompanied by a list, certified by said land surveyor or engineer, setting forth each and every Regulation with which the Plan does not comply, the location and nature of the noncompliance, and the reason therefor. The Board suggests that the owner be represented at any meeting with the Board by the person responsible for the design of the subdivision and the preparation of the plans.

D. Format

All information submitted to the Planning Board shall be typewritten.

E. Waiver of Compliance

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. The application for approval of a definitive plan must be accompanied by a written request for waiver of strict compliance with these Rules, identifying with particularity the regulation sought to be waived, the nature and location of the waiver sought, and a demonstration certified by the applicant's surveyor or engineer that such waiver is consistent with each of the purposes set forth in Section 1,B. of these Rules and Regulations.

F. Fee Regulations

(1) Purpose

These regulations and fees schedules have been adopted to produce a more equitable schedule of fees which more accurately reflects the costs of technical and legal review of applications to the Planning Board; to take advantage of the procedures offered by G.L. c. 44, s. 53G; to establish a review procedure in the selection of consultants; and to promote more informed decision-making by the Planning Board.

(2) Fee Structures and Regulations

(a) General. The Planning Board shall impose reasonable fees for the review of applications that come before it. The Planning Board may impose Administrative Fees and Project Review Fees as may be applicable to the types of applications set forth below.

(b) Form of Payment. All Administrative and Project Review Fees shall be paid by bank or certified check.

(3) Administrative Fees

(a) Applicability. An Administrative Fee shall be assessed to offset the expense of processing and review with regard to all applications set forth in Section 3(c), below.

(b) Submittal. Administrative Fees shall be submitted at the time of the submittal of the application. Any application filed without this fee shall be deemed incomplete and no review work shall commence until the fee has been paid in full.

(c) Schedule of Administrative Fees. The following schedule applies to the types of applications to the Planning Board set forth below. This schedule

supersedes all previous schedules as they may have appeared in the Zoning By-Laws, the Rules and Regulations for the Subdivision of Land, and any listings which may have been compiled from time to time for the benefit of applicants.

APPLICATION FEE SCHEDULE AND SUBMISSION REQUIREMENTS			
PERMIT TYPE	PERMIT FILING FEE	NUMBER OF PLAN COPIES REQUIRED	PEER REVIEW FEES (for Approval Phase only)
APPROVAL NOT REQUIRED (ANR / FORM A)	\$250 plus \$250 per buildable lot	1 Mylar 5 Copies	\$0
PRELIMINARY SUBDIVISION	\$500	8 Sets	\$0
DEFINITIVE SUBDIVISION	\$2,000	14 Copies	As estimated by Peer Review Engineer and approved by Applicant per MGL 44, S. 53G
LOT RELEASE	\$250 per lot	NA	\$0
INSPECTION FEE	\$16 per linear foot	NA	Supplemental Fee as needed and determined by DPW, and Approved by Applicant
SUBDIVISION MODIFICATION	\$1,000	14 Copies	As estimated by Peer Review Engineer and approved by Applicant per MGL 44, S. 53G
SITE PLAN REVIEW in association with a Building Permit	\$500	7 Copies	As estimated by Peer Review Engineer and approved by Applicant per MGL 44, S. 53G.
SITE PLAN REVIEW in association with Special Permit A2	Included in ZBA Fee	Included in Submittal to ZBA	\$0
SPECIAL PERMIT A3	A3-Parking: \$500; A3 for FRD: \$2000	14 Copies	As estimated by Peer Review Engineer and approved by Applicant per MGL 44, S. 53G.

- (d) Fee Waivers. The Planning Board may waive or reduce any Administrative Fee, if, in the opinion of the Board, unusual circumstances exist regarding the subject property or the applicant.
- (e) Refund. Once the review process has been commenced, the Planning Board shall not refund Administrative Fees, including the case of withdrawal of the application by the applicant.

(4) Project Review Fees

- (a) Applicability. In addition to an Administrative Fee, the Planning Board shall impose a Project Review Fee on those applications which require, in the judgment of the Planning Board, review by outside consultants due to the size, scale, or complexity of a proposed project, the project's potential impacts, or because the Town lacks the necessary expertise to perform the review work related to the permit or approval. In hiring outside consultants, the Board may engage engineers, planners, lawyers, designers, or other appropriate professions able to assist the Board and to ensure compliance with all relevant laws, ordinances, by-laws and regulations. Such assistance may include, but shall not be limited to, analyzing an application, monitoring or inspecting a project or site for compliance with the Board's decisions or regulations, or inspecting a project during construction or implementation.

- (b) Submittal. Project Review Fees shall be submitted at the time of the submittal of the application for deposit in an account established pursuant to G.L. c. 44, s. 53G (53G Account). Any application filed without this fee shall be deemed incomplete and no review work shall commence until the fee has been paid in full.

- (c) Schedule of Project Review Fees. The following schedule applies to the types of applications to the Planning Board set forth below. This schedule supersedes all previous schedules as they may have appeared in the Zoning By-Laws, the Rules and Regulations for the Subdivision of Land, and any listings that may have been compiled from time to time for the benefit of the applicants. Where more than one type of application has been submitted for Planning Board action, only the largest of the applicable Project Review Fees shall be collected for deposit into the 53G Account, and not the sum of those fees.
 - (i) Preliminary Plan: \$.50 per each 1 foot of way within the subdivision

 - (ii) Definitive Plan: \$1000 plus \$3.00 for each foot of proposed or reconstructed roadway in excess of 400 feet.

 - (iii) Modification of a Preliminary Plan: To be determined by the Board

 - (iv) Modification of a Definitive Plan: To be determined by the Board

 - (v) Site Plan Review by Planning Board for Special Permit or Building Permit As needed, fee determined per Section I-I (2) of the Hingham Zoning By-Law

- (d) Replenishment. When the balance in an applicant's 53G Account falls below twenty-five percent (25%) of the initial Project Review Fee, as imposed above, the Planning Board shall consider whether to require a supplemental Project Review Fee to cover the cost of the remaining project review.
- (e) Inspection Phase. After granting of a Definitive Plan approval, the Planning Board will require a Supplemental Project Review Fee for the purpose of ensuring the availability of funds during the inspection phase of the review process, as follows: five dollars (\$5.00) times the number of linear feet of proposed or reconstructed ways within or without the subdivision.
- (f) Handling of Project Review Fees. The Project Review Fee is to be deposited into a special account as set forth in G.L. c. 44, s. 53G.
 - (i) Outside consultants retained by the Planning Board to assist in the review of an application shall be paid from this account.
 - (ii) Project Review Fees shall be turned over to the Town Accountant by the Planning Board for deposit into a 53G Account.
 - (iii) Confirmation of the establishment of the 53G Account shall be forwarded from the office of the Town Accountant to the Planning Board office as soon as it is received for timely and accurate accounting.
 - (iv) The Town Accountant shall prepare a report on activity in the 53G Account on an annual basis. This report shall be submitted to the Planning Board and Selectmen for their review. This report shall also be printed in the Annual Report for the Town.
 - (v) An accounting of an applicant's funds held in the 53G Account may be requested by the applicant at any time. The Planning Board shall respond to the request in a timely fashion.
 - (vi) An applicant may request an estimate of bills pending from consultants for work completed, or in progress, but not yet invoiced.
 - (vii) Excess fees in the 53G Account, shall be returned to the applicant or the applicant's successor in interest, at the conclusion of the review process, as defined below. For the purpose of this section, any person or entity claiming to be an applicant's successor in interest shall provide the Board with documentation establishing such succession in interest.

Conclusion of the Review Process

- (1) With the approval or disapproval of a Preliminary Subdivision Plan.

- (2) With the disapproval of a Definitive Subdivision Plan.
- (3) With the release of the performance bond at the end of construction of an approved Definitive Subdivision Plan.
- (4) With the final inspection or the approval or disapproval on all other types of applications under the Zoning By-Law, which ever comes later.

(6) Delinquent Accounts.

The following rules apply to fees owed to the Planning Board by applicants:

- (a) Consequences. Projects with accounts past due will be notified by the Planning Board. If no payment has been received after 30 days, the Board reserves the right to stop work on any project with past due accounts.
- (b) Costs of Collection. All costs of collection associated with past due accounts shall be borne by the applicant.
- (c) Current Delinquents. All applicants owing fees to the Planning Board at the time of any amendment to these provisions of the regulations shall be sent the following:
 - (i) A duplicate notice of the amount past due.
 - (ii) A copy of the applicable sections of these regulations with all amendments clearly indicated.
 - (iii) Notice of a 30-day grace period before the commencement of any changes in interest rate or charges.

(7) Revision of Fee Schedules and Regulations Governing Fees.

The Planning Board may review and revise its regulations and fee schedules, from time to time, as it sees fit.

- (a) Amendments shall be preceded by a public hearing.
- (b) Any new regulations or alterations to the fee schedule shall take effect upon filing a copy of the amendments with the Town Clerk.

G. Separability

If any section, paragraph, sentence, clause or provision of these Regulations shall be adjudged not valid, the adjudication shall apply only to the material so adjudged, and the remainder of these Regulations shall be deemed valid and effective.

H. Amendments

These Regulations or any portion thereof may be amended, supplemented or repealed from time to time by the Board after a public hearing on its own motion or by petition.

SECTION 3

SUBMISSION AND APPROVAL OF PLANS

A. Plans Believed not to Require Approval (ANR or Form A Plans)

1. Submittal Requirements

Any person wishing to cause to be recorded in the Registry of Deeds or filed with the Recorder of the Land Court a plan of land in the Town who believes that the plan does not require approval under the Subdivision Control Law, G.L. c.41, S81P, may submit such plan to the Board with six prints thereof, together with a properly executed application in the form shown as Form A in the Appendix hereto, which form may be changed from time to time by the Planning Board, and accompanied by the necessary evidence to show that the plan does not require approval, and also shall file (by delivery or registered mail, postage prepaid) with the Town Clerk a notice thereof stating the date of such submission and accompanied by a copy of the application. The applicant's attention is specifically called to the documentation requirements set forth in Section 2,A., Applicant and Owner, of these Rules.

2. Contents of Plan Believed Not to Require Approval

Such plan shall be at a scale of either 1" = 40' or 1" = 80' and shall include:

- (a) Date, scale, north point
- (b) Assessor's plan number for each parcel referenced
- (c) Name of the applicant, or person for whom the plan was prepared
- (d) Name, seal and signature of the engineer or surveyor preparing the plan
- (e) Zoning district classification, including all overlay districts
- (f) All land included in the Floodplain and Watershed Protection District and all other delineated wetlands and floodplain
- (g) Lot area, frontage and all other applicable zoning dimensions
- (h) Metes and bounds of all existing lots whose dimensions are altered by the Plan, of all proposed lots and of any contiguous lots in common beneficial ownership with any land that is the subject of the plan.
- (i) Locus plan at a scale of at least 1" = 800' containing sufficient information so that the land can be readily located, including streets bounding or near the property.
- (j) For a compiled plan, the identity of the plans from which it was compiled must be noted on the plan, including the title and date of the plan, the person who prepared the plan, date of preparation and approval by the Planning Board, and the recorded reference to the Plan in the Registry of Deeds or Land Court.

3. Approval Process

If the Board finds that the plan does not require approval, it shall, without a public hearing endorse thereon the words "Approval under the Subdivision Control Law Not Required." Such endorsement shall not be deemed to constitute any determination of compliance with requirements of the Zoning By-Law. If the Board determines that in its opinion the plan requires approval, it shall within 21 days notify the Town Clerk and the applicant of its determination to that effect.

4. Fees

For a plan believed not to require approval, there shall be an administrative fee as set forth in Section 2(F) of these Rules and Regulations for each Form A application submitted.

B. Preliminary Plan

1. General

In the case of a residential subdivision, a preliminary plan of a subdivision may be submitted to the Board and to the Board of Health by the applicant for discussion and consideration by the Boards prior to the submission of a definitive plan. In the case of a nonresidential subdivision, it is required that the applicant shall submit a preliminary plan. The submission of such a preliminary plan will enable the applicant, the Planning Board, the Board of Health and other municipal agencies to discuss and clarify the problems relating to such subdivision before a definitive plan is prepared. Therefore, it is strongly recommended that a preliminary plan be filed in every case.

2. Application Procedure

- a. An application for consideration of the Preliminary Plan shall be made accompanied by eight (8) sets of the Preliminary Plan, together with a properly executed application in the form shown as Form B in the Appendix hereto, which form may be changed from time to time by the Planning Board, and a Project Review Fee as set forth in Section 2(F) of these Rules and Regulations.
- b. The applicant shall also, by delivery or registered mail, give written notice to the Town Clerk stating the date of submission of the Preliminary Plan and accompanied by a copy of the completed application.
- c. Attention is directed to the Hingham Board of Health Supplementary Rules and Regulations for the Disposal of Sanitary Sewage, for percolation tests and other Board of Health requirements.

- d. The attention of the applicant is directed to the provisions of Massachusetts General Laws, Chapter 131, Sections 40 and 40A, and the town's local wetlands bylaw if any wetlands are included in the proposed subdivision.
- e. The attention of the applicant is directed to the requirement of the Massachusetts Highway Department that a permit be obtained before any work is performed within a State highway layout. Its permit will require a specific geometric design for street connections.

3. Contents of Preliminary Plan

The Preliminary Plan shall be drawn at a scale of 1"=40' or such other scale as the Board may accept. Said plan shall be identified as a Preliminary Plan and show clearly and adequately the information required to form a clear basis for a discussion of the problems and the preparation of the Definitive Plan. The Preliminary Plan should include as many of the following as practicable to insure sufficient discussion of relevant design issues:

- a. All information specified in items (a) through (e), (i), (j), (o) and (p) under the Contents of the Definitive Plan (Section 3,C.,(2)).

4. Board Actions

During the discussion of the Preliminary Plan the complete information required for the Definitive Plan, the filing fees and the municipal services will be discussed. The Board may give such Preliminary Plan its approval, with or without modification or disapprove said Plan, stating reasons for such disapproval. Approval, if given, does not constitute approval of a subdivision, but does facilitate the procedure in securing final approval of the Definitive Plan.

The Planning Board shall act on the Preliminary Plan within forty-five (45) days of the date of submission. Any plan submitted to the Board in advance of a Definitive Plan which does not conform to the minimum requirements pertaining to a Preliminary Plan specified in Chapter 41, Section 81-L shall not be so designated, nor shall such plan be given approval by the Board.

C. Definitive Plan

1. General

An applicant seeking approval of a Definitive Plan of a subdivision shall file with the Board the following:

- (a) The original drawings of the Definitive Plan and fourteen (14) prints thereof.
- (b) A properly executed application in the form shown as Form C in the Appendix hereto, which form may be changed from time to time by the Planning Board. The application shall be signed by the applicant. The application shall state all easements and restrictions, and mortgages to which the land is subject and all easements and restrictions appurtenant to such land over the land of others, and shall include reference to any recorded plan of the land in question. The applicant's attention is specifically called to the documentation requirements set forth in Section 2,A., Applicant and Owner, of these Rules.
- (c) The applicant shall, with the submission of a Definitive Plan, submit to the Planning Board a Project Review Fee as set forth in Section 2(F)(4)(c) of these Rules and Regulations. These Funds will be handed over to the Town Accountant for deposit into a special account (a 53G account) as set forth in G.L. c. 44, s. 53G and Section 2(F)(4) of these Rules and Regulations. The Applicant is directed to Section 2(F)(4) of these Rules and Regulations, which lays out all requirements and details relating to Project Review Fees, including fees for modification of definitive plans, replenishment of 53G accounts, and return of excess fees at the conclusion of the review process. The failure of the applicant to make the initial deposit and to maintain the account in accordance with Section 2(F) of these Rules and Regulations, shall be grounds for disapproval of the plan.
- (d) A sketch plan showing a possible or prospective street layout for any adjacent unsubdivided land, whether or not owned or controlled by the owner or subdivider of the subdivision, unless such a plan has already been filed with the Board. In the case where the applicant does not own or control any contiguous land, a statement to this effect shall appear in the application.
- (e) The applicant shall submit calculations for the determination of all waterway openings to justify culvert and drain sizes as required by Section (4,C.,3),(c). Such calculations shall be prepared by a Registered Professional Engineer, shall be based on the Rational Method and be accompanied by a watershed area plan justifying said calculations. Such plan shall clearly show the individual, delineated drainage areas used in the calculations.
- (f) The applicant shall submit calculations prepared by the Natural Resource Conservation Service method to determine peak outflow from the site under existing and proposed conditions.

2. Contents of the Definitive Plan

The Definitive Plan shall be clearly and legibly drawn on mylar or linen acceptable to the Registry of Deeds or Land Court at a scale of one inch equals forty feet or such other scale as the Board may accept to show details clearly and adequately. The sheet size shall be 24" x 36" with a minimum 2" border on the left hand side. If multiple sheets are used, the key map (see (e) below) shall show the extent of coverage of each sheet. The Definitive Plan shall include the following:

- (a) Subdivision name, north point, date, scale, bench mark and datum, date of original plan with provisions for dates and descriptions of any revisions. All elevations to refer to National Geodetic Vertical Datum of 1929.
- (b) Names and addresses of record owner, applicant and the applicant's engineer and surveyor, and the seal and signature of said engineer and surveyor together with proper certification as required in Section 2, paragraphs C. and E.
- (c) Boundary lines of the subdivision with the names of all abutters (including those separated from the subdivision by a way) and any other person required to receive notice of the Public Hearing in accordance with Section 3,C.,(6) of these Rules, and the area of the adjoining parcels as determined from the most recent tax list. The zoning classification of all included property and all abutting and affected property shall be noted on the plan.
- (d) Existing and proposed lines of roadways and their width; ways and their width; sidewalks, foot paths, bridle, and bicycle paths and their width; easements and their purpose, and any public or common areas within the subdivision. The proposed names of ways shall be shown.
- (e) Location and names of ways bounding, approaching or within the vicinity of the subdivision as well as the ways of the subdivision. This information shall be in the form of a key map or location plan at a scale not smaller than one (1) inch equals 800 feet.
- (f) Sufficient data to determine readily the location, direction and length of every way line, lot line and boundary line of the proposed subdivision, and to establish these lines on the ground.
- (g) Boundary lines, areas and dimensions of all proposed lots, including the area of Flood Plain and Watershed Protection District and Accord Pond Watershed and Hingham Aquifer Protection District included within each such lot, with all lots designated numerically and in sequence. Where the frontage dimension given in item (f) is less than that required, the width of the lot at the setback line also shall be given.

- (h) Location of all permanent monuments properly identified as to whether existing or proposed.
- (i) Location of natural waterways, swamps and water bodies, a soils map and Flood Plain and Watershed Protection District and Accord Pond Watershed and Hingham Aquifer Protection District boundaries within and adjacent to the subdivision.
- (j) The proposed system of drainage to include the size, location and material of all subsurface drains, storm drains and culverts and the location of all catch basins and manholes within and adjacent to the subdivision. Pipe invert elevations shall be given at all drainage structures and outfalls. The method of conducting the drainage to a natural waterway shall be described completely and conform to Sections 4 and 5 herein.

A complete description of the compatibility of the proposed system of drainage with town municipal services and waterways existing as of the date of submission of the Definitive Plan shall be provided. Runoff calculations shall be submitted to substantiate the adequacy of the proposed drainage system within and outside of the subdivision together with the existing town municipal services and waterways to be utilized for discharge from the subdivision.

A schematic drainage diagram shall be provided for each stormwater system, including the station and offset location of each structure with rim and invert elevations, high ground- water elevations, pipe grades, maximum and minimum flow rates and velocities, and outfall maximum and minimum flow rates with 10-year flood elevations. Where detention areas are utilized, outfall, 10-year flood and discharge structure invert and flow elevations shall be shown with velocity and discharge rates. High groundwater elevations shall be provided for all detention areas. An example of an appropriate diagram is shown in Figure 3.

Wherever a proposed outfall pipe, swale, channel or drainage ditch will discharge to a stream, brook, pond, marsh, or other wetland as may be identified by the Planning Board, said wetland being either perennial or seasonal, the ten year flood elevation shall be shown on the plan. If experience at a particular location indicates that the ten year flood elevation is exceeded at a frequency of greater than one in ten years, the Planning Board may require that a higher flood elevation be shown. The Board may seek advisory opinions and data from the Conservation Commission and others in establishing the flood elevation at the point of discharge.

Whenever it is proposed to discharge drainage across land not owned by the applicant, the applicant must demonstrate an easement or other legal right to do so.

Where open drainage systems are employed, the plan shall show the gradient of all cross slopes and swales or channels. Elevations shall be shown on the plan every 100 feet along the swale line and at all changes in gradient along that line.

- (k) All existing and proposed municipal services and their appurtenances shall be shown in such detail as necessary to coordinate all such services. An approved utility plan (or plans) accurately showing all electric street lighting, water, fire alarm, hydrants, sewer, storm drains, gas, oil lines, telephone, and other municipal services may be submitted with the Definitive Plan. Written approvals, if any, of the responsible officials (Section 3,C.,(4)) shall be endorsed on the utility plan (or plans). The Board shall review and approve, modify and approve or disapprove the plans for municipal services and utilities as part of its approval.
- (l) Location of existing street trees over 1 foot in diameter. Location, size (diameter, breast, height) and species of proposed street trees. Size, type and planting details must be approved by the Tree Warden.
- (m) Suitable space near the title block of each sheet for recording thereon the action of the Planning Board and the Board of Health with respect thereto.
- (n) A separate layout plan for each proposed way in the subdivision, at a horizontal scale of forty (40) feet to an inch, showing for each such way the proposed exterior lines and the centerline of way with the centerline stations, tangent bearings, angle points, points of intersection, points of curvature, points of tangency, radii of curves, length of curves, intersection angles and length of tangents. Information relative to the exterior lines, (lot lines) shall be repeated in all instances where it is different from that given for the centerline. The centerline and its descriptive information shall be in red; all other data shall be in black. The layout plan shall show the location of permanent monuments, together with all lot lines with frontages, buildings, walks and drives. The layout plan also shall show the size, location and elevation of all storm drains, open drainage systems, subsurface drains, and all other municipal services, together with their appurtenances, existing or proposed for each way. All municipal services shall be shown on the layout plan by the use of symbols the same as those used by the Massachusetts Department of Public Works for work performed under Chapter 90, G.L.

On the same sheet, there shall be drawn cross sections of the proposed way, properly located and identified by station number, at such intervals

along the way as will adequately indicate any variations in its section, supplemented, where necessary, by lines on the layout plan showing the width and location of proposed roadways, grass plots, gutters, sidewalks and similar physical features. Provided, however, that where all cross sections of the way will coincide with the appropriate cross section shown on the Board's Typical Cross Section Plan, such agreement may be indicated by proper notation on the layout plan, and the cross section drawings may be omitted therefrom with the prior approval of the Board.

Directly below the layout plan of each proposed way, a profile shall be drawn at a horizontal scale of forty (40) feet to an inch and a vertical scale of four (4) feet to an inch, showing for such street existing centerline grades in fine solid lines, existing exterior line grades in fine dash lines, and proposed finished centerline grades in heavy solid lines. Proposed grade elevations shall be shown by figures at fifty (50) foot stations, except on vertical curves where they shall be shown at twenty-five (25) foot stations and at PVC and PVT. Rates of gradient in percentage shall also be shown. Lines and figures for the proposed edge of roadway shall not be shown, except when the roadway is in other than a normal cross section. Lines and figures indicating proposed grades shall be in red; all other data shall be in black. All elevations shall be referenced to the datum of 0.00 equals mean sea level as established by the National Geodetic Vertical Datum of 1929. Profiles shall also indicate the location of any intersecting public or private ways, and the location of existing and proposed storm drains, including pipe invert elevations and gradients, subsurface drains, connecting swales or channels, and all existing and proposed municipal services and their appurtenances.

The layout plan shall have a space provided next to the title block for the date and brief description of any revisions made thereto subsequent to the approval of the subdivision by the Board. This space also shall include a space for the signature of the Chairman or other authorized member of the Board as evidence of the Board's approval of each revision made thereto.

Where only one way with a length of less than one thousand (1,000) feet is proposed, the information required by item (n) (layout plan, cross sections, and profile) may be shown either on the same sheet as items (a) through (m), or on a separate sheet, but where one way with a length greater than one thousand (1,000) feet or more than one way is proposed, the layout plan, cross sections and profile (item (n)) shall be shown together on a separate sheet for each way or portion thereof. All such sheets, together with those showing items (a) through (m) shall be deemed to constitute the Definitive Plan of the subdivision.

- (o) All natural and historical objects and major site features, such as natural waterways, water bodies, swamps, rock ridges and outcroppings, stone walls, fences, buildings, etc.

- (p) Existing and proposed topography of the land at a contour interval of two (2) feet except in cases where the Board directs that a smaller contour interval is necessary in order to adequately interpret the topography of the land, or agrees that the natural surface of the ground may be adequately represented by contours with larger intervals.

Items (o) and (p) shall be shown on a separate sheet or sheets at the same scale as the above plans and shall be drawn with pencil on tracing paper or ink on cloth with all boundaries, lot and way lines of the subdivision shown thereon.

Earthwork quantities shall be submitted with the Definitive Plan for all roadway and other grading. An Earthwork Summary shall be provided, indicating total surplus or borrow quantities. Disposal areas within the subdivision for surplus earth or rock excavation, unsuitable materials and tree stumps shall be noted on subdivision topographic plans. If materials are to be disposed of outside the subdivision boundaries, a plot plan of the site of disposal at a scale one inch equals eighty feet, including a locus plan and property ownership, shall be provided indicating the location of disposal areas outside the subdivision. Wetlands and floodplain lines shall be shown on all plans identifying disposal areas.

- (q) Such other information as may be required by the Board to evaluate the proposed subdivision.
- (r) The horizontal alignment of the centerline of each proposed way shall be staked upon the ground at the time of the filing of the Definitive Plan.
- (s) Stormwater Management Plan that complies with the most current version of the Massachusetts DEP Stormwater Management Policy and Standards and the Massachusetts Erosion and Sediment Control Guidelines.

3. Review by Board of Health as to Suitability of the Land

At the time of filing of the Definitive Plan, the subdivider shall also file with the Board of Health two prints of the Definitive Plan, and in unsewered areas, shall submit a topographic plan with two foot contour intervals and comply with other Board of Health requirements, including percolation tests and test excavations, as specified in "Supplemental Rules and Regulations for the Disposal of Sanitary Sewage".

The Board of Health shall within forty-five days after filing of the plan, report to the Planning Board in writing, approval or disapproval of said plan. If the Board of Health disapproves said plan, it shall make specific findings as to which, if any, of the lots shown on such plan cannot be used for building sites without injury to the public

health, and include such specific findings and the reasons therefor in such report. Every building lot so located that it cannot be served by a connection to the municipal sewer system shall be provided with a sewage disposal system approved by the Board of Health.

4. Review by Other Officials

Before the Definitive Plan is submitted, the Applicant is encouraged to consult with and may obtain written statements that the proposed improvements shown on a utility plan, (3,C.,(2),(k)), are laid out to the satisfaction of the official and for the facilities listed below:

- (a) Superintendent of the Department of Public Works as to the design of the street system, location of easements, design of the drainage system including appurtenances and compatibility with existing municipal services and waterways, effect on traffic congestion and safety in public ways adjacent to the subdivision and the location, size and species of street trees.
- (b) The Chief of the Fire Department as to the location of the hydrants, adequacy of water flow at the hydrant, and the layout of the fire alarm system, including location of boxes.
- (c) The Sewer Commissioners as to the requirements for provision for connections to and compatibility with the sewer system and, if required, the layout and design of the necessary connecting mains, laterals, manholes and stubs for such system. In such cases, review by the Sewer Commissioners will include the profiles of the streets.
- (d) The Manager of the local water company as to the location and size of water mains, including service to the fire hydrants.
- (e) The Hingham Municipal Light Board as to the requirements for electricity.
- (f) The Gas Company as to the location and size of gas mains.
- (g) The Telephone Company as to the location of the telephone lines.
- (h) The Postmaster of the Hingham Post Office, as to the type of delivery mail proposed.
- (i) The Conservation Commission as to requirements under the Wetlands Act (G.L. Chapter 131, Sec. 40 and 40A), the local wetlands bylaw and the Flood Plain and Watershed Protection District.

5. Performance Guarantee

Before endorsement of a Definitive Plan of a subdivision, the applicant shall agree to complete the required improvements as shown on the Definitive Plan and as specified in Section 5 for all lots in a subdivision, such construction and installation to be secured by one, or in part by one and in part by the other, of the following methods which may from time to time be varied by the applicant:

(a) Final Approval with Deposit or Irrevocable Letter of Credit

The applicant shall file a deposit of money or negotiable securities, or an irrevocable Letter of Credit, or whichever of the aforementioned is deemed by the Board to provide adequate security in an amount determined by the Board to be sufficient to cover the cost of all or any part of the improvements as shown on the Definitive Plan and as specified in Section 5 not covered by a covenant under (b) below. Such security, if filed or deposited, shall be approved as to form and manner of execution by the Town Counsel and as to sureties by the Town Accountant, and shall be contingent on the completion of such improvements within two years of the date of the irrevocable Letter of Credit or deposit of money. The form of the deposit may be as given by Form D or Form F in the Appendix, or as otherwise required by the Board and shall be contingent upon the completion of said improvements within two years of the date of the Agreement. At the discretion of the Board, a time extension may be granted for a period not to exceed one (1) year; provided that such an extension may be conditioned upon an increase in the amount of such security as determined by the Board.

(b) Final Approval with Covenant

The applicant shall file a covenant acceptable to the Board executed and duly recorded by the owner of record, running with the land, whereby such improvements as shown on the Definitive Plan and as specified in Section 5, not covered by a deposit under (a) above, shall be provided to serve any lot before such lot may be built upon or conveyed, other than by mortgage deed. A suggested, but not required, form of the covenant is given by Form E in the Appendix; hereto, which form may be changed from time to time by the Planning Board.

6. Public Hearing

Before approval of the Definitive Plan is given, a public hearing shall be held by the Board at the time and place designated by the Board. Notice of the time, place, and subject matter of such hearing will be given by the Board once in each of two successive weeks, the first publication being at least fourteen (14) days prior thereto, by advertisement in an official publication of, or in a newspaper of general circulation in the Town of Hingham. A copy of said notice will be mailed to the applicant and to

all owners of land abutting upon the subdivision and to anyone else entitled to receive notice of any hearings held in accordance with Chapter 40A Section 12 of the General Laws, as appearing in the most recent tax list.

7. Approval, Modification or Disapproval

In the case of a nonresidential subdivision or a residential subdivision where a preliminary plan has been filed and duly acted upon, or where 45 days has elapsed since the submission of the preliminary plan, and a definitive plan has been submitted, the Board shall take action within 90 days of submission, or such further time as may be agreed upon at the written request of the applicant.

In the case of a residential subdivision where no preliminary plan has been submitted, or where 45 days has not elapsed since the submission of a preliminary plan, the Board shall act within 135 days of submission, or such further time as may be agreed upon at the written request of the applicant.

8. Certificate of Approval

The action of the Board in respect to said Plan shall be by vote, copies of which shall be certified and filed with the Town Clerk and sent by certified mail to the applicant. Approval, if granted, shall be endorsed on the original drawing of the Definitive Plan 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 the action of the Board with the Town Clerk, and said Clerk has notified the Board that no appeal has been filed and not until any and all modifications or conditions set forth in the Certificate of Approval are incorporated in the Definitive Plan to the satisfaction of the Board. In any case, approval of the Definitive Plan shall not constitute the laying out or acceptance by the Town of any ways within a subdivision.

9. Inspection Fees

After granting of a site plan approval or Definitive Plan approval, the Planning Board will require a Supplemental Project Review Fee, as set forth in Section 2(F)(4)(e) of these Rules and Regulations for the purpose of insuring the availability of funds during the inspection phase of the review process. These funds will be handed over to the Town Accountant for deposit into a special account (a 53G account) as set forth in G.L. c. 44, s.53 G and Section 2(F)(4) of these Rules and Regulations. The Applicant is directed to Section 2(F)(4) of these Rules and Regulations, which lays out all requirements and details relating to 53G accounts.

The failure of the applicant to make the initial deposit and to maintain the account in accordance with Section 2(F) of these Rules and Regulations shall be grounds for rescission of the approval of the plan and for disapproval. The full cost of any special non-scheduled inspections deemed necessary by the failure of construction to proceed entirely in accordance with the approved plan, or as a result of any question

concerning the accuracy of any data provided by the applicant at any time, shall be borne by the applicant.

10. Recording of Plan

After the return to the applicant of the Definitive Plan as approved and endorsed, he shall cause to be recorded at the Plymouth Registry of Deeds and, in the case of registered land with the recorder of the Land Court, said plan, including all sheets thereof, with covenant if any, and shall pay all fees and costs related to the registry of the plan. After such plan, or modification thereof, is approved by the Board it shall be recorded within six (6) months or the applicant shall be required to apply to the Planning Board or Town Clerk for a certificate, dated within thirty days of the time of recording, that the approval has not been modified, amended, or rescinded, nor the plan changed. Furthermore, the applicant shall notify the Board of such recording, submitting evidence thereof, satisfactory to the Board, before the commencement of any work upon the subdivision. Upon receipt of notification of recording, the Board shall file one print of the Definitive Plan with the Building Commissioner. Where approval with covenant is noted thereon, he shall issue no permit for the construction of a building on any lot within the subdivision except upon receipt from the Board of a copy of the certificate of performance (Form G) releasing the lot in question.

11. Revision of Definitive Plan

If the applicant desires to make revisions due to field conditions or for any reason whatsoever, he shall submit a reproducible copy of the Definitive Plan or plans to be revised with a colored pencil representation of the changes he proposes to make together with a written request for modification, and a request for waiver of these Rules and Regulations with the information required by Section 2,E., if appropriate. The Board will consider such change in the same manner as consideration of the original plan and approve, disapprove or modify the requested change with or without a public hearing as the Board may determine. The change as approved shall then be incorporated on the original Definitive Plan or a mylar or linen reproduction thereof, and prints shall be filed as required of the original plan. Upon approval of the modification, the modification shall be recorded in accordance with (10) above.

(a) Work Inconsistent with the Approved Plan

No work may proceed that is inconsistent in any respect with the approved plan, even if such work is pursuant to an order, decision, ruling or regulation of any other municipal, state or federal agency or tribunal. It is the burden of the applicant to seek modification of the approved plan, to incorporate such order, decision, ruling or regulation, or to otherwise reconcile the inconsistencies.

12. Evidence of Satisfactory Performance

Before the Board will release the interest of the Town in an irrevocable Letter of Credit or deposit of cash or, in the case of approval with a covenant, issue a release of the covenant:

- (a) The applicant shall pay all fees as specified in Section 3,C.,(9) and Section 2(F)(4)(e) to cover the cost of inspections, and shall submit copies of receipts, releases, or other acceptable evidence that all due hydrant rentals, municipal light rentals, or other bills for municipal services have been paid to date.
- (b) The applicant shall be responsible for filing with the Planning Board as-built plans of the ways of the subdivision. The as-built plans shall be clearly identified as such, and shall include the profile plans and shall meet the requirements as to format and content as given in Section 3,C.,(16) for the Definitive Plans.

Where the ways, utilities and appurtenances of the subdivision have been installed according to the approved Definitive Plan (including approved subsequent amendments) the engineer may make certification in the form shown as Form R-2 in the Appendix hereto, which form may be changed from time to time by the Planning Board, to that effect which shall be submitted with the request for release of performance guarantee or the statement of performance to the Town Clerk. Evidence shall be submitted from each inspection report (Section 6) supporting such a certification. If the Planning Board concurs, the Definitive Plan or addenda to the Definitive Plan shall be sufficient to satisfy the requirement for as-built plans.

As-built plans may be mylar reproductions of the Definitive Plans. The as-built plans shall represent the as-built conditions of all work and appurtenances constructed as a requirement of the subdivision and shall show accurately all municipal services installed as part of the subdivision. As a condition precedent to the preparation of the as-built plans, the applicant shall engage the necessary engineering services to properly record the location of the municipal services installed, and the as-built plans shall contain a certification (see Section 2,C.) by such engineer that the municipal services were installed in the locations as shown on the plans. The as-built plans shall be submitted as a condition of the release of the bond or covenant, as required for the approval of the Definitive Plan, and a condition of approval by the Planning Board of acceptance of the ways by the Town Meeting.

- (c) The Board shall obtain from its engineer the complete inspection form (R-1) as given in Section 6 to the effect that all work required by these Rules and Regulations has been completed for each way in the subdivision (or way or ways serving the lots in question), and that he has approved the methods of construction and the materials used in the performance of such work.

- (d) The applicant shall obtain from the Chief of the Fire Department a statement, which shall be submitted to the Board, that he has approved the installation of the hydrant system for each way in question and that the installation of the fire alarm cable and boxes has been approved by the Fire Chief.
- (e) The applicant shall obtain from the Superintendent of the Department of Public Works a statement, which shall be submitted to the Board, that he has approved the location, size and species of street trees, the construction of the streets and the installation of the drainage system, including appurtenances.
- (f) The applicant shall obtain from the Sewer Commission a statement, which shall be submitted to the Board, that they have approved the installation of the sewer system as required by them.
- (g) The applicant shall obtain from the Municipal Light Board a statement, which shall be submitted to the Board, approving the installation of the street lights and electric power service.
- (h) The applicant shall obtain a statement from the Chairman of the Conservation Commission that appropriate guarantees have been received, measures have been taken, or orders of condition have been complied with to the satisfaction of the Conservation Commission, where applicable, with respect to the protection of wetlands under Chapter 131, Sections 40 and 40A of the General Laws and under the local wetlands bylaw, and with respect to the Flood Plain and Watershed Protection District Bylaw.
- (i) The Board may at its discretion require the applicant to obtain, at his own expense, additional professional engineering advice as to the satisfactory completion of the construction of each street or way in the subdivision, drainage systems within and outside of the subdivision, water mains and their appurtenances, and installation of all other services required according to the Definitive Plan.
- (j) The improvements of the subdivision shall endure twelve (12) months without substantial degradation. The twelve (12) months runs from the completion of all of (a) through (i) and the completion of the rest of any repairs or corrections required by the Board.

13. Release of Performance Guarantee

Upon the completion of the improvements as shown on the Plan, and as required herein, security for the performance of which was given by deposit, Letter of Credit or covenant, or upon the performance of any covenant with respect to any lot, the applicant may request and agree on terms of release with the Board, or he may send by registered mail to the Town Clerk a written statement, in duplicate, that the said

construction or installation in connection with such deposit, Letter of Credit or covenant has been completed in accordance with the requirements contained in these Rules & Regulations, such statement to contain the address of the applicant, and the Town Clerk shall forthwith furnish a copy of said statement to the Board.

If the Board determines that said improvements have been completed, it shall release the interest of the Town in such irrevocable Letter of Credit and return the deposit to the person who furnished the same, or release the covenant by appropriate instrument (Form G) duly acknowledged, with a copy to the Building Commissioner, except that the Board shall retain a deposit of 10% of the original security for a period of 12 months after completion of the subdivision to insure the integrity of the construction. If the Board determines that said improvements have not been completed, it shall within forty-five (45) days of the receipt of the applicant's statement by the Town Clerk, specify to the applicant in writing the details wherein said improvements fail to comply with its Rules & Regulations.

14. Reduction of Deposit or Letter of Credit

Upon written application of the applicant stating reasons therefore the amount of any deposit held hereunder, or Letter of Credit may from time to time be reduced at the discretion of the Board and the obligations of the parties thereto released by said Board in part in the form shown as Form F in the Appendix hereto, which form may be changed from time to time by the Planning Board. At no time shall the amount be reduced to less than 10% of the original amount.

15. Time of Completion of Ways and Installation of Municipal Services

Every applicant shall state in his application the time which he agrees to complete the proposed ways and to install the drainage system, water pipes, gas pipes and electric lines, and all other municipal services required by the Board. A condition of the approval of the Definitive Plan shall be conditioned upon the completion of the ways and the installation of municipal services within 24 months of the date of application, unless a longer period is expressly requested in the application with the justification therefore, and unless a longer period is expressly allowed in the certificate of approval.

In the event the work is not completed within the time set forth or as extended, the Board shall rescind its approval and require the reapplication and filing of a new Definitive Plan.

16. As-Built Plans

The developer shall supply as-built plans for each and every way of the subdivision, and the subdivision shall not be considered complete until the Board accepts the as-built plan. The as-built shall include the following:

Requirements for As-Built Plans

1. Legend on each page of the plan that the plan was prepared in compliance with the Rules & Regulations of the Registers of Deeds and must be signed and sealed by a registered land surveyor.
2. On each page of the plan a blank space, as required, to be reserved for use by the Registry of Deeds which is marked "FOR REGISTRY USE ONLY".
3. The metes and bounds for ways must be complete so as to permit a continuous metes and bounds description of the area of the way. This would include a line or lines, or an arc or arcs, identified as to metes and bounds locating the end of the area of a way which intersects with another way.
4. On each page of the plan signature lines:
 - a. For Planning Board Approval or endorsement that approval is not required, as applicable.
 - b. For the Board of Selectmen.
 - c. For the Town Clerk; date of filing; date of acceptance.
5. All easement areas:
 - a. Must be clearly indicated with metes and bounds shown.
 - b. If a drainage easement is shown on the Plan, then the Plan must show the body of water, stream, river or other terminus for drainage flow as well as all other drainage easement areas through which drainage must flow to reach its terminus.
6. Each parcel or lot of land shown on the plan (including all parcels abutting any way and all parcels crossed by or abutting a drainage easement) must be identified on the plan by a lot or parcel number (preferred method) or by the name(s) of current owners.
7. All registered land shown on the plan should be identified by Land Court plan number or Land Court case number or Land Court Certificate of Title number.
8. All abbreviations or codes used on the plan should be explained by the use of a legend inscribed on the plan.
9. A certification by the engineer that the municipal services were installed at the locations as shown on the plans.

SECTION 4

DESIGN STANDARDS

A. General

Plans for a subdivision will not be approved unless the subdivision and its ways are laid out in compliance with the requirements of these design standards. It should be noted that these design standards are considered as a minimum acceptable to the Board under its Rules and Regulations for subdivision control. Applicants are encouraged to design the subdivision at a level above these standards so as to create an attractive subdivision with the maximum livability, usefulness, and amenity.

It was not intended that these design standards would be applicable to all possible situations which may arise in the design of a particular subdivision. In situations not covered herein, and particularly in the case of subdivisions for business or industrial purposes, planned unit development, multifamily development, and similar large scale developments, the subdivision shall be designed to the satisfaction of the Board in accordance with such design standards as will satisfy the purpose of the Subdivision Control Law. In such cases, due consideration will be given to the prospective character of the subdivision, the anticipated amount of travel upon the ways therein, and/or to the relevant factors of the particular situation.

B. Streets (or Ways)

(1) Types of Streets

The following types of streets are hereby established for the purpose of developing design criteria in accordance with the expected use and type of traffic anticipated thereon.

- (a) Major Streets A street which, in the opinion of the Board is being used or will be used as a thoroughfare between different portions of the Town of Hingham, or which will be the principal access to a business or industrial subdivision.
- (b) Secondary Street A street intercepting several minor streets and which, in the opinion of the Board may carry traffic from such minor streets to a major street or community facility, including the principal access streets or principal circulation streets of residential subdivisions, and including all streets, except those designated as major streets, or a business or industrial subdivision.

- (c) Minor Street A street which, in the opinion of the Board is being used or will be used primarily to provide access to abutting lots, and which is not intended for use by through traffic.
- (d) Limited Residential Street A street, or network of streets, less than 400' in length ending in a turnaround and which intersects no other streets except at its origin, which may never serve more than 7 lots, which in the opinion of the Board is of such topography that its layout and design in accordance with the Minimum Design Standards for limited residential streets creates no risk to the public safety or convenience, and which the developer agrees will never be lengthened. The requirements of this section shall be guaranteed by a covenant running with the land of the subdivision and each lot thereof. The Board will not entertain any request for waiver of the length limitation or design requirements for such a street.
- (e) Private Local Roadway A roadway, no more than 300' in length, ending in a turnaround, to be in accordance with the International Fire Code (IFC), as shown on the following diagram (Appendix D), or a 50' circular roadway which intersects no other streets except at its origin, which may never serve more than 3 lots, which in the opinion of the Board is of such topography that its layout and design in accordance with the Minimum Design Standards for private local roadway creates no risk to the public safety or convenience, and which the developer agrees will never be lengthened. The requirements of this section shall be guaranteed by a covenant running with the land of the subdivision and each lot thereof. The road is to remain private in perpetuity. The Board will not entertain any request for waiver of the length limitation or design requirements for such a street.

APPENDIX D FIRE APPARATUS ACCESS ROADS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION D101 GENERAL

D101.1 Scope. Fire apparatus access roads shall be in accordance with this appendix and all other applicable requirements of the *International Fire Code*.

SECTION D102 REQUIRED ACCESS

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to fire department apparatus by way of an *approved* fire apparatus access road with an asphalt, concrete or other *approved* driving surface capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds (34 050 kg).

SECTION D103 MINIMUM SPECIFICATIONS

D103.1 Access road width with a hydrant. Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet (7925 mm), exclusive of shoulders (see Figure D103.1).

D103.2 Grade. Fire apparatus access roads shall not exceed 10 percent in grade.

Exception: Grades steeper than 10 percent as *approved* by the fire chief.

D103.3 Turning radius. The minimum turning radius shall be determined by the *fire code official*.

D103.4 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) shall be provided with width and turnaround provisions in accordance with Table D103.4.

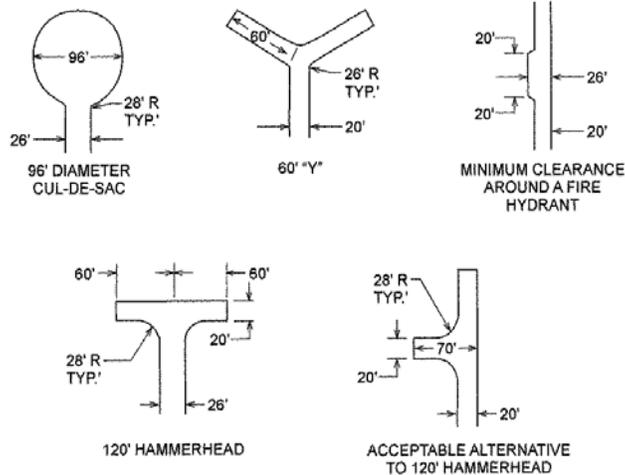
**TABLE D103.4
REQUIREMENTS FOR DEAD-END FIRE
APPARATUS ACCESS ROADS**

LENGTH (feet)	WIDTH (feet)	TURNAROUNDS REQUIRED
0-150	20	None required
151-500	20	120-foot Hammerhead, 60-foot "Y" or 96-foot-diameter cul-de-sac in accordance with Figure D103.1
501-750	26	120-foot Hammerhead, 60-foot "Y" or 96-foot-diameter cul-de-sac in accordance with Figure D103.1
Over 750		Special approval required

For SI: 1 foot = 304.8 mm.

D103.5 Fire apparatus access road gates. Gates securing the fire apparatus access roads shall comply with all of the following criteria:

1. The minimum gate width shall be 20 feet (6096 mm).
2. Gates shall be of the swinging or sliding type.



For SI: 1 foot = 304.8 mm.

**FIGURE D103.1
DEAD-END FIRE APPARATUS ACCESS ROAD TURNAROUND**

(2) Location of Streets

- (a) General The streets shall be designed and located so as, in the opinion of the Board, to be continuous and in alignment with existing streets; to provide adequate access to all lots in the subdivision, by streets that are safe and convenient for travel; to lessen congestion in such streets and adjacent public streets; to reduce danger from the operation of motor vehicles; to secure safety in case of fire, flood, panic and other emergency; to insure compliance with applicable Zoning By-laws; to secure adequate provision for proper drainage and water, sewers and other municipal services, compatible with existing town municipal services and waterways; and to coordinate the streets in the subdivision, with each other and with the existing street system of the Town, and the streets in neighboring subdivisions.
- (b) The proposed streets shall be designed and located so as to conform so far as practicable to the Master Plan if any, as adopted in whole or in part by the Board.
- (c) Provision, including grant of legal right, satisfactory to the Board shall be made for the proper projection of streets, or for access to adjoining property which is not yet subdivided. Where, in the opinion of the Board, access, safety and congestion considerations necessitate, a developer shall be required to construct or improve at his own expense, private ways outside the subdivision to connect adequately with public ways.
- (d) Due consideration will be given by the Board to the attractiveness of the layout and to the conformance of the ways to the topography.
- (e) 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.
- (f) In case access to a subdivision crosses land in another municipality, the Board may require certification, from appropriate authorities, that such access is in reasonable accord with the Master Plan and conforms to subdivision requirements of such municipality and that a legally adequate performance bond has been duly posted or that such access is adequately improved to handle prospective traffic.

- (g) The intersection of proposed streets of the subdivision with existing private or public ways must conform to all design standards of these Rules as if the intersection were entirely within the subdivision.

(3) Width, Alignment and Grades of Streets

- (a) The criteria contained in Table 1 shall be referenced to AASHTO chapters observed in the design of streets. The layout shall be designed to achieve the following minimum stopping sight distances with unobstructed visibility: for (a) limited residential streets, 150 feet; (b) minor through streets and secondary streets, 250 feet; and (c) major streets, 500 feet.

Table 1
Minimum Design Standards for Streets

Type of Street Way	Width of Right of Way	Width of Traveled	Edge Treatment	Sidewalk	Minimum Centerline Radii	Maximum Centerline Grade	Minimum Centerline Grade	Maximum Curb Radius at Street Intersection	Minimum Length of Tangent Between Reverse Curves	Depth of Pavement	Sub-base
Major	70'	40' *	24" CCB ES or VGC with 2" SS	5' ES	500'	5%	1%	50'	150'	3" Base 3" Top	24" - 6" Lifts
Secondary	55'	28' *	24" CCB ES or VGC with 2" SS	5' OS	300'	5%	1%	30'	100'	3" Base 1.5" Top	24" - 6" Lifts
Minor	46'	22' *	18" CCB ES	5' OS	200'	8%	1%	30'	0	3" Base 1.5" Top	24" - 6" Lifts
Limited Residential	40'	18' *	18" CCB ES	0	150'	8%	1%	30'	0	3" Base 1.5" Top	24" - 6" Lifts
Private Local	40'	14'	18" CCB with 4' SS ES	0	150'	5%	1%	30'	0	3" Base 1.5" Top	24" - 6" Lifts

LEGEND: CCB = CAPE COD BERM ES = EACH SIDE OS = ONE SIDE VGC = VERTICAL GRANITE CURB SS = STABILIZED SHOULDER

These design specifications represent minimum standards. More stringent design criteria shall be required by the Board when deemed necessary for present and future vehicular traffic.

Notes:

* The Board may require that the traveled way be separated by a raised median strip with a width to be determined by the Board. In this case, the traveled way shall consist of two roadways, each with a minimum width of 20 feet or such greater width as the Board may specify.

Major and secondary streets shall be superelevated in the cross section in the horizontal curve in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Policy on Design of Urban Highways and Arterial Streets 1973. The maximum superelevation shall be 0.06 ft. per foot (6 percent). Secondary streets shall be designed for a speed of not less than 30 mph and major streets for a speed of not less than 40 mph.

- (b) The Board may require delineation of adequate easements of slope on adjoining land in proper cases.
- (c) 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.
- (d) Streets intersecting another street shall be laid out opposite one another or shall be a minimum of two hundred (200) feet between centerlines measured along the centerline of the intersected street.
- (e) Where the angle of intersection between two streets varies more than ten (10) degrees from a right angle, the radius of the curve at the curb line at the obtuse angle shall be less and at the acute angle shall be correspondingly greater than the radius specified in Section 4,B.,(3),(a) above to the extent approved or required by the Board.
- (f) A leveling area shall be provided having not greater than three (3) percent grade for a distance of one hundred (100) feet, measured from the nearest right-of-way line of the intersecting street.
- (g) All changes in grade exceeding five tenths (0.5) of one percent shall be connected by vertical curves of sufficient length to afford the sight distances required in sub-paragraph (3),(a) above.
- (h) In the case of a subdivision in which connections to the Town sewer system are required, the sanitary sewer system within the subdivision shall be subject to the approval of the Sewer Commissioners.

(4) Dead-End Streets

- (a) Dead-end streets, excepting limited residential streets, shall not be longer than 800' in length. A dead-end street shall be measured from the nearest point of multiple access and then along the centerline or centerlines of the street or streets to the furthestmost limit or limits of the right-of-way of the required turnaround. For the purposes of this regulation, the point of multiple access shall be the intersection of the dead-end street's centerline with the right-of-way limit of the intersected way or ways.
- (b) Dead-end streets shall be provided at the closed end with a turnaround having an exterior line (way line) radius of at least sixty-five (65) feet, the roadway to have a radius of at least fifty-five (55) feet. An island of 30 feet in radius, suitably landscaped with grass, ground cover, trees, natural rock and/or elements blending with the surroundings shall be provided in the center of the turnaround. The island shall be enclosed with sloped granite curbing with 6" reveal from the roadway pavement. (See Figure 2

for Turnaround and Island Plan). An island shall not be required in a temporary turnaround; however, the turnaround shall be paved. When the dead-end street is extended, the turnaround easement shall terminate, and the applicant shall be required to remove, regrade, and restore the turnaround area to the satisfaction of the Planning Board.

C. Subsurface and Storm Drains

(1) Compatibility and General Design

All subsurface drains and storm drains and systems thereof shall be constructed in a manner which will ensure their complete compatibility with the existing town municipal services, wetland resource and flood plain areas and waterways. The drainage systems shall be designed to the satisfaction of the Planning Board with provision for such facilities and arrangement thereof as in the Board's opinion are reasonably necessary to provide adequate disposal of surface water from all streets and land within and adjacent to the subdivision.

Drainage systems shall be designed so as to avoid the flooding of downstream properties through the maintenance of existing rates of runoff. Where site or downstream flooding currently exist, the proposed drainage system shall be designed such that the existing volume of storm water passing from the proposed subdivision shall be maintained during the downstream flood period. These Regulations specifically prohibit retention or direct subsurface discharge of storm water.

(2) Groundwater Interception

Subdivision roads shall be designed in a manner which ensures that roadway storm drains and structures are placed above high groundwater. Evidence of high groundwater in low or cut areas shall be observed by the Planning Board's engineer and be provided to the Board as part of the definitive subdivision application. Subdrains shall be installed in all ledge cuts and shall extend at least fifty (50) feet beyond the limits of such cuts. The subdrain shall consist of a minimum of one longitudinal drain for each side of the paved roadway. In addition, laterals may be required as directed by the Board in areas in which an undue amount of water could accumulate in the subgrade. The system of subdrains shall be discharged into the storm drain system or be disposed of in a manner satisfactory to the Board.

(3) Storm Drains

A complete storm drain system shall be designed for each street of the subdivision to the satisfaction of the Board and shall be so laid out and of sufficient size to permit unimpeded flow of all portions of the street system so that water does not accumulate thereon, to intercept storm water runoff from the adjacent lots of the subdivision, and to eliminate undesirable or unnatural accumulation of water on any portion of the subdivision or surrounding property, and to be completely compatible with the

existing town municipal services and waterways. Those conditions which result from a ten (10) year storm shall be assumed as a basis for the design of the street drains. Twenty five (25) year conditions shall be the basis for design of stream culverts passing beneath roadways. Stormwater connections from abutting property into roadway drain systems is prohibited. The storm drain system shall include berms, gutters, catch basins, manholes, culverts, drain lines, concrete headwalls, detention areas and such other items as may be required to complete the system to the satisfaction of the Board.

- (a) Catch basins shall be used exclusively for the roadway drain system's intake of surface storm water and shall be located in pairs, one on each side of the roadway, at all low points or sag curves in the roadway, at intervals of not more than three hundred (300) feet on continuous grades of the roadway, not more than one hundred fifty (150) feet to either side of a low point, at or near the corners of the roadway at intersecting streets, and at the end of turnarounds pitched toward the dead end or at the neck if pitched toward the open end of road. Invert and rim elevations shall be shown on both plan and profile.
- (b) Manholes shall be located at all changes in direction of a drain line, either horizontally or vertically, or at the intersection of two (2) or more drain lines, or so located that no drain line greater than three hundred (300) feet in length would exist without a manhole. Manhole inlet and outlet inverts shall be at the same elevation. Manholes shall not be used to slow the flow of storm water. Invert and frame elevations shall be shown on both plan and profile.
- (c) Culverts shall be designed on the assumption that the entire drainage area is built up to that density and in the manner which the applicable section of the Zoning By-Law allows. All culverts shall have a standard concrete or masonry headwall at each end, and any culvert over thirty (30) inches in diameter shall have standard concrete wing walls. Culverts having inside diameters of eighteen (18) inches or greater shall be enclosed at each end with a secure metal grille.
- (d) All the drains shall be a minimum of twelve (12) inches in diameter and shall be laid on a slope of not less than one-half of one (0.5) percent. The designed maximum velocity shall not exceed twelve (12) feet per second, and the minimum velocity designed for shall not be less than two (2) feet per second. All outfalls shall extend to, and be compatible with, either a natural waterway or an existing drainage system. Where detention areas are used to control storm water runoff, the detention area shall be considered a part of the drainage system. Discharges into detention areas shall be above the area's 10 year flood elevation. The ground elevation of all outfall pipes, swales, channels or drainage ditches discharging to a stream, brook, pond, marsh or other wetland shall be at or above the 10

year flood elevation; or at higher elevations if required by the Planning Board because of special local situations based on consultation with the Conservation Commission and others (see 3,C.,2,(j)). Provision shall be made for the disposal of surface water intercepted or collected by the system in such manner that no flow is conducted over Town ways, or over the land of others unless a drainage easement is obtained. Where adjacent property is not subdivided, provision shall be made for extensions of the system by continuing appropriate drains to the boundary of the subdivision at such size and grade as will allow their proper projection.

- (e) A standard concrete or masonry headwall, with wing walls where required, shall be provided at the outfall end of all drains.
- (f) A tide gate shall be provided at the discharge end of all drainage outlets into tidal waters.
- (g) Proper connections shall be made with the existing public drainage system. Where adjacent property is not subdivided or developed, provision shall be made for extension of the system by continuing appropriate drains to the exterior boundaries of the subdivision at such size and grade as will allow for their proper projection. Where the Planning Board determines that the public interest and the best interest of the Town and the subdivision will be served by extension of the drainage system outside the boundaries of the subdivision, the Planning Board may require the Applicant, at his own expense, to continue the layout and construction of the drainage system to a point outside the boundaries of the subdivision where the drainage system may be connected to, and be compatible with, either a natural waterway or an existing public drainage system.

D. Open Drainage Systems

Open drainage systems of swales, ridges and slopes shall be designed to fit the natural contour of the land as much as possible. Disturbed land shall be landscaped to conform to the surrounding area and planted to eliminate the possibility of erosion and siltation. In no case shall side slopes in disturbed areas be greater than twenty-five (25) percent. Swales and drainage channels shall have a minimum grade of one-half (0.5) percent and a maximum grade of four (4.0) percent, although for small areas draining not more than one half acre, grades of up to ten (10) percent are permissible. The ground shall be sloped so that there is no stagnant water or artificial pools on the site attributable to the open drainage system. Drainage channels and swales shall be provided with easements which shall also permit access by the Town of Hingham for maintenance purposes. Easements shall conform to Section 4,E. of these Rules and Regulations.

Where the Planning Board determines that the public interest and the best interest of the Town and the subdivision will be served by extension of the drainage system outside the boundaries of the subdivision, the Planning Board may require the Applicant, at his own expense, to continue the layout and construction of the drainage system to a point outside the boundaries of the subdivision where the drainage system may be connected to, and be compatible with, either a natural waterway or an existing public drainage system.

E. Stormwater Management Structures

Storm water management structures for detention and/or retention of stormwater shall be located on a separate lot which shall, in the case of accepted roadways be conveyed to the Town and in the case of a private roadway be conveyed to a Homeowner's Association. Stormwater management structures for detention and/or retention of stormwater shall be open basins constructed of natural earth material with loam and seed surface treatment and shall be designed so as to blend into the existing topography. Side slopes shall not exceed twenty-five percent (25%) 4H:IV and shall be placed beyond the limit of wetland and flood plain resource areas and above high ground water elevations. Groundwater separation shall comply with Department of Environmental Protection requirements for infiltration systems and be a minimum of 12 inches for detention systems. The lot in which stormwater structures are located need not comply with zoning requirements for a buildable lot but shall have a minimum of 20 feet of frontage for access and shall include the access, slopes necessary to construct the basin and the outlet including erosion protection at the outlet and the path of flow to the property line.

F. Easements

(1) Easements for municipal services shall be provided as required and shall be at least twenty (20) feet wide (exclusive of underground services) and centered on the lot line where practical.

(2) Where a subdivision is traversed by a water course, drainage way, channel or stream, the Board may require that there be provided a storm water easement or drainage right-of-way of adequate width to conform substantially to the lines of such water courses, drainage way, channel or stream, to provide for construction, maintenance, or other necessary purposes.

G. Sidewalks

Sidewalks of adequate width (Figure 1) shall be constructed beside the roadway along each way in a subdivision as follows:

Major Streets - both sides

Secondary Streets - one side

Limited Residential Streets - no sidewalks

Minor Streets - one side

Private Local – no sidewalks

H. Lots

All lots within a subdivision shall comply with the Zoning By-Law of the Town of Hingham, or with the terms of any variance from such requirements which may have been specifically granted by the Board of Appeals. Percolation tests shall be required in accordance with the Supplementary Rules and Regulations for the Disposal of Sanitary Sewage of the Hingham Board of Health.

I. Open Space

Before approval of a plan the Board may also, in proper cases, require the plan to show a park or parks suitably located for playground or recreation purposes, or for providing light and air. The park or parks shall not be unreasonable in area in relation to the land being subdivided and to the prospective uses of such land. The Board may, by appropriate endorsement on the plan, require that no building be erected upon such park or parks for a period of not more than three years without its approval.

J. 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 or to the Town.

K. Cases In Which Ways Are Not Adequate

In any case in which the Board deems that ways either within or outside of the subdivision not adequate, it may approve the plan on conditions limiting the lots upon which buildings may be erected and the number of buildings that may be erected on particular lots without further consent by the Board to the access provided, and in each such case shall endorse such conditions on the plan to which they relate, or set them forth in a separate instrument attached thereto to which reference is made on the plan and may require the applicant to record a covenant running with the land of the subdivision and each lot thereof guaranteeing the limitations set as a condition of its approval as set forth in this section. The Board may deem said ways to be not adequate if such ways, either within or outside the subdivision, fail to meet the Design Standards set forth in these Rules.

L. Municipal Services

(1) The Board will require that the plan show municipal services of the kinds existing in the public ways nearest to the subdivision, or which in the opinion of the Board are likely to

be laid in such public ways within the reasonably near future, and which will be necessary

for the health, safety, or convenience of the prospective occupants of the subdivision.

- (2) The municipal services and sleeves for house connections shall be located as shown on the "Typical Road Cross Sections". The number and type of sleeves for house connections will be as directed by the Board.
- (3) The design of the sewer system, if required, shall be as directed and approved by the Sewer Commissioners.
- (4) The design of the water system and provision for hydrant service shall be as directed or approved by the Manager of the Massachusetts-American Water Company. Where adjacent property is not subdivided or developed, provision shall be made for proper projection of the sewer system, if required, by continuing appropriate mains to the exterior boundaries of the subdivision at such size and grade as will allow for the projection.
- (5) The location and type of hydrants, and size of pipe serving the hydrants, shall be as directed or approved by the Chief of the Fire Department. A minimum flow of 1,000 gallons of water per minute shall be required at the hydrant. Proper and compatible connections shall be made with the existing public water, and where required, sewer systems. Where in the opinion of the Planning Board the capacity of an existing public system is inadequate to accommodate the entire subdivision, the Planning Board may, at its option, either (i) approve only that portion of the subdivision which in its opinion can be adequately accommodated, or (ii) require the Applicant to make arrangements satisfactory to the Board for connecting the subdivision water pipes with a proper water supply.
- (6) The location and type of the fire alarm boxes and point of entry into the subdivision of the connecting fire alarm cable shall be as directed by the Fire Chief. The applicant shall furnish and install the necessary ducts, fire alarm boxes and electric cable.
- (7) The design and location of the electric power system shall be as directed by the Municipal Light Board, and the design and location of street lighting shall be as agreed upon by the Municipal Light Board and the Planning Board.
- (8) The applicant shall consult with the Telephone Company relative to the installation of telephone service.
- (9) All electrical, telephone and other utility wires shall be placed below ground in every subdivision unless the Board determines that such placement is not feasible or is not in the best interest of the Town.

M. Soil Surveys

Where appropriate, the Planning Board may require soil surveys to establish the suitability of the land for the proposed storm and sanitary drainage installations.

N. Foot Paths, Bridle and Bicycle Paths

The location and width of foot paths, bridle and bicycle paths will be designed to maximize the safety of the path users and to minimize interference with public and private ways.

SECTION 5

SPECIFICATIONS FOR CONSTRUCTION OF REQUIRED IMPROVEMENTS

A1. General

- (1) All improvements specified or implied on the Definitive Plan shall be constructed or installed by the applicant's contractor (The Contractor) in accordance with the provisions of this Section of the Rules and Regulations or as directed by the Hingham Planning Board (The Board). The applicant, at his own expense, shall furnish all necessary materials, labor and equipment which may be required to complete the work called for or implied on the Definitive Plan. Items not specifically mentioned herein shall be constructed in accordance with the most recent version of the Massachusetts Highway Department Standard Specifications (hereinafter referred to as MassDOT Standard Specifications) unless specifically directed otherwise by the Board.
- (2) All work performed by the applicant as a consequence of these Rules and Regulations will be subject to the review and acceptance or approval of the Board. Prior to the commencement of construction, including clearing of the site, the applicant shall meet with the Planning Board to discuss construction inspection procedures. The applicant shall present to the Board a construction schedule which may be modified by written notice providing a minimum seven calendar days to allow for proper inspections. Therefore, the Board will employ a Registered Professional Engineer for purposes of inspecting the work. In order that the Board's engineer may properly inspect the work as it progresses, the applicant will keep the Planning Board informed of the progress of the work on a timely basis and shall provide safe and convenient access to all parts of the work for inspection by members of the Board or its engineer or such persons as the Board may designate. No work will be approved which has been covered prior to inspection by subsequent work. Reference should be made to Section 6 for specific inspections required by the Board. The Board's Professional Engineer may also be referred to as the Project Inspector in this document.
- (3) Nothing in these specifications should be interpreted as placing the onus for safety and quality onto the Town of Hingham, its employees or its representatives. The Town will not be responsible for any cost implications associated with remedial action that may be required as a result of the inspections. The applicant/contractor is directly responsible for the overall safety in accordance with state and federal standards and quality of the project; and as such they shall indemnify the Town of Hingham, its employees or its representatives (quality is defined by final acceptance by the Board).

B1. Subdivision Layout

- (1) Prior to starting any land clearing activities, a registered land surveyor shall stake the limit of work. The work may proceed in phases, in which the initial clearing limits will be staked in a manner and frequency such that the Planning Board, a Registered Professional Engineer employed by the Board (The Project Inspector) or their representative can walk the clearing limits prior to the commencement of work. A plan shall be submitted to the Board that identifies the stake number and includes sufficient existing conditions information to be able to identify the location of the stake on the ground relative to other site features. All trees to be preserved shall be flagged. At times it may be feasible to adjust clearing limits slightly to preserve significant trees and other site features.
- (2) Prior to the start of other construction activities, a registered land surveyor shall set offset grade stakes along the roadway right-of-way, centerline, sidelines, and sidewalks at fifty-foot (50') intervals or at a frequency directed by the Project Inspector. These horizontal and vertical control stakes must be laid out to conform to the lines and grades shown on the approved Definitive Plan or any approved amendment thereto.
- (3) Further, permanent bounds as specified herein in Subsection 82 shall be placed so as to delineate the boundary lines between the property to be subdivided and adjacent Town property, including a Town right-of-way. All required Permanent Monuments are to be set where the property abuts Town property.
- (4) Any work, which in the opinion of the Project Inspector has not been properly laid out or does not conform to the Plans, may be checked by a Registered Land Surveyor employed by Town. If it is determined that such work does not conform to the Plan and that the Plan was based upon erroneous data or calculations provided by the applicant, or which was correctly laid out upon such erroneous data or calculations, the applicant shall pay all costs which the Town incurs as a consequence of checking the work. The Project Inspector or the Board may require the removal and correct replacement of any work which has been incorrectly laid out.

C1. Clearing, Grubbing and Excavation

- (1) Land shall be cleared and developed in increments of workable size which can be completed during a single construction season. Erosion and sediment control measures shall be coordinated with the sequence of grading, development, and construction operations. Control measures such as hydroseeding, berms, interceptor ditches, mulching, temporary sodding, terraces, and sediments traps shall be put into effect prior to the commencement of each increment of the development/construction.

- (2) The entire area of each way within its exterior lines shall be cleared of all trees not intended for preservation, stumps, brush, roots, rocks or boulders and all perishable or unsuitable material.
- (3) Trees intended to be preserved shall be protected from injury by suitable fencing at or beyond the drip line or by wells if in fill. The Project Inspector will make an inspection when this phase of the work is completed.
- (4) The contractor shall satisfactorily dispose of all trees, stumps, shrubs, roots, branches, dead wood and other litter in areas outside of the right-of-way or outside the subdivision and at approved disposal facilities when required. If requested by the Planning Board or the Board's Engineer, the disposal location shall be provided to the Board for approval. Reuse of processed vegetation on-site may be allowed subject to approval by the Planning Board or their Engineer.

D1. Excavation/Backfill

- (1) The entire area to be occupied by the roadway plus an additional four (4) feet or extending outward to the toe of slopes in fill areas, whichever is greater, shall be excavated a minimum of twenty-four (24) inches below finished grade, or as necessary to remove the topsoil and subsoil, or to such greater depth as may be required by the Project Inspector if soft or yielding material, clay, peat, silt, sand pockets, boulders or rocks, organic material, or other material detrimental to the subgrade is encountered. In cut sections excavation shall be to suitable depth to remove the topsoil and subsoil or to such greater depth as may be required by the Project Inspector if soft or yielding material, clay, peat, silt, sand pockets, boulders or rocks, organic material, or other material detrimental to the subgrade is encountered. Unless otherwise approved "detrimental subgrade" shall be defined as material with more than 10% passing the #200 sieve or material containing more than 1% organics. Materials encountered may be subject to in-situ sieve testing as directed by the Planning Board's Engineer.
- (2) All excavation will be to such width and depth as shown on the drawings, specified herein, or ordered by the Project Inspector. Such excavation may be for the laying of pipes or appurtenances, the removal of pipes or appurtenances, the capping or plugging of pipes to be abandoned, test pits to locate existing utilities, or any other purpose for which excavation may be needed.
- (3) Wherever a percentage of compaction for backfill is indicated or specified, it shall be the percent of maximum density at optimum moisture as determined by method D of ASTM Standard Methods of Test for Moisture - Density

Relations of Soils Using 10-lb. rammer and 18-inch Drop, Designation D 1557-78.

- (4) No backfilling of pipes, culverts or appurtenances shall be done until the installation has been inspected and approved by the Project Inspector. Backfilling shall be in layers not exceeding eight (8) inches, with each layer compacted by an appropriately sized plate vibrator, regardless of the method of final compaction at the sub-base or gravel base level. The minimum cover will be that specified on the plans and approved by the Project Inspector. The backfill fill material will be subject to compaction testing.
- (5) All excavations shall be sheathed or braced to the satisfaction of the Project Inspector for construction adequacy and not safety. All excavations shall be kept free of all water entering by dewatering. The Contractor shall submit the method for dewatering at the pre-construction meeting for approval by the Board and its Project Inspector. Flowable (CLSM) fill may be required for backfill if satisfactory compaction cannot be attained do to the limits of the work area.
- (6) The contractor shall conform to those requirements of the Department of Public Safety and OSHA. The contractor will be required to obtain a Trenching Permit under “Jackie’s Law” at the Hingham Department of Public Works prior to commencing work.
- (7) As excavation approaches known underground structures, the structure should be exposed by means of hand tools as a normal part of trench excavation.
- (8) All existing gas pipe, electric conduit, telephone conduit, cable TV conduit, water, sewer or drain lines and any other structures, which are uncovered by the excavation, shall be carefully supported and protected from injury by the Contractor. The Contractor shall restore any items damaged by him to as good a condition as they were found and or to the satisfaction of the Project Inspector or respective utility purveyor, and they shall be kept in repair during the life of this contract. The restoration of existing utility lines shall be done as promptly as practical and shall not be left until the end of the construction.
- (9) Where determination of the exact location or elevation of a pipe or other structure is necessary, the Contractor shall excavate test pits, as part of normal trench excavation, to determine such locations far enough ahead of the work so that the pipe alignment can be properly determined.
- (10) Excavating equipment shall be operated with care to prevent damage to trees, overhead branches and other structures. Wherever work will disturb existing trees in the public right-of-way, the Contractor will notify the DPW before cutting any roots or branches of existing trees. Branches and roots shall not be

cut except by permission of the Project Inspector. All cutting shall be done neatly without splitting or crushing.

- (11) Plantings and trees shall be adequately protected or removed and later re-established in their original position. Where injury is significant enough as to diminish their beauty or usefulness, they shall be replaced by items of the same kind and quality at least equal to the preexisting condition.

E1. Disposal of Surplus and Unsuitable Materials

- (1) All suitable surplus excavated materials not required for immediate re-use on the project shall remain on the property of the Owner and stockpiled by the Contractor on the site at such location or locations as directed by the Project Inspector or as specified by the SWPPP. Surplus material stockpiles shall be protected from erosion with appropriate sedimentation barriers.
- (2) All other unwanted materials not required or suitable for re-use shall be disposed of in accordance with local rules governing such disposals. Should unsatisfactory subgrade material be encountered, the Project Inspector may direct that excavation be carried to satisfactory material and be backfilled with gravel borrow or special borrow. The location of any off-site disposal shall be reported to the Planning Board.
- (3) The Contractor shall, periodically or as directed during the progress of the work, remove and legally dispose of all surplus excavated materials and debris, and keep the Project Area and public rights-of-way reasonably clean. Upon completion of the work, he shall remove all temporary construction facilities, debris and unused materials for the work, and re-establish the whole site of the work and public rights-of-way in a neat and clean condition.
- (4) The excavated topsoil shall be neatly stacked within the project limits at such location or locations as directed by the Project Inspector and/or as indicated on the SWPPP. Topsoil stockpiles shall be stabilized with a cover material as soon as practicable. If the conditions are not suitable for establishing a vegetative cover other means of stabilization will be required.
- (5) All excavated rock shall be removed and disposed of unless otherwise directed by the Project Inspector.

F1. Test Pits

- (1) Test pits for the purpose of determining subgrade geo-technical conditions and locating underground pipelines or structures in advance of construction shall be excavated and backfilled by the Contractor prior to start of construction at the locations of conflict shown on the Approved Plans or at the direction of the Project Inspector. Geo-technical investigations shall be excavated only in

the presence of the Project Inspector. Test pits shall be backfilled immediately after their purpose has been satisfied and maintained in a manner satisfactory to the Project Inspector and as outlined in this document.

- (2) Unsuitable foundation material in the opinion of the Project Inspector below the normal depth of construction shown on the drawings for pipes, structures or roadway sub-base shall be removed and disposed of at the Project Inspector's discretion.

G1. Excavation for Structures

- (1) The Contractor shall furnish all materials and equipment and perform all work required to install and maintain the dewatering and drainage systems he proposes for handling groundwater or surface water encountered.
- (2) If suitable material is encountered during excavation, estimated depths may not be realized. However, if unsuitable materials are encountered during excavation, depths may be greater than estimated. In all cases, excavation will be performed only to the depths authorized by the Project Inspector.
- (3) Any excavated or natural area below the subgrade shall be filled to the subgrade with suitable granular material, to be approved by the Project Inspector prior to its installation.

H1. Trench Excavation

- (1) Prior to excavation of all trenches in paved areas, the Contractor shall cut through the existing pavement and base course in neat straight lines with a minimum amount of vibration. Pavement including sidewalks shall be cut using a mechanical saw, or a machine mounted hydraulic or mechanical tool fitted with a rotary-type blade, and shall result in sound vertical edges, thus avoiding any damage to the pavement or base course to remain. Where the contract requires a permanent trench repair, pavement shall be cut twelve' (12) inches beyond the width of the trench along each side of the trench, or as allowed in writing by the Project Inspector. Should these edges crack or become damaged during excavation the contractor shall re-cut the edges to a uniform and undisturbed line just prior to paving.
- (2) Trench excavation shall be carried out to the lines and grades as specified herein and shown on the plans. Trenches may be excavated to their full depth by machinery if the material remaining at the bottom of the trench is no more than slightly disturbed.
- (3) The Contractor should anticipate that due to existing utility lines, hand excavation might be required.

- (4) Trench excavation shall result in a flat or shaped trench bottom, true to grade so that the pipe will have uniform and continuous bearing on a firm support. Trenches shall be made as narrow as practicable within the limits specified and required to lay all pipes and appurtenances as shown on the plans or ordered by the Project Inspector, and every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling and compaction are completed.
- (5) Normal depth of trench excavation shall be six inches (6") below the bottom of the pipe in earth.
- (6) Normal width of trench excavation in sheathed trenches up to 12' deep shall be measured between vertical planes which are a distance apart equals to the sum of the outside diameter of the pipe, the total width of the sheathing including walers and 2 feet. Such trench width shall not be less than 4 feet 2 inches or 5 feet if walers are used as part of the sheathing system.
- (7) Normal trench widths for trenches supported with approved trench boxes or hydraulic shoring systems shall be the sum of the outside diameter of the pipe, 1 foot on either side of the pipe, the width of the wall shield (no greater than 8 inches), and 1 foot of additional space to allow for Installation of the trench box.
- (8) Such trench width shall not be less than 3 feet except trenches for building services shall be a maximum of 2 feet 6 inches wide but always wide enough for compaction equipment. However, excavate-able flow-able fill will/may be used instead of compaction equipment, when the trench does not provide the necessary width, work area or when directed by the Project Inspector.
- (9) Trench widths for deeper excavations or special conditions may be specified in the contract drawings and will supersede limits outlined here as required to complete the work. The Contractor in all cases will include with his plans a copy of trench support and maximum trench width, for approval by the Project Inspector.

II. Miscellaneous Trench Excavation

- (1) This excavation shall be carried out in a similar manner to trench excavation, but to limits beyond the established limits for normal trench excavation including test pits ordered or approved by the Project Inspector.

J1. Below Grade Excavation

- (1) This excavation shall be carried out in a similar manner to trench excavation, but to depths below the established lower limit of trench excavation. All

unsuitable materials shall be removed from the job site and shall not be used for any backfill purposes.

K1. Rock Excavation

- (1) Rock in pipe trenches shall be excavated to be not less than 6 inches from the pipe. Before the pipe is laid, the trench below the pipe, where rock excavation has been made, shall be backfilled and compacted with suitable material specified for bedding the pipe.
- (2) The Contractor shall observe all state, federal and municipal laws, ordinances and regulations relating to the transportation, storage, handling and use of explosives. In the event that the regulations require a licensed blaster to perform or supervise the work, said licensed blaster shall have his license at the site and shall permit examination thereof by the Project Inspector.

L1. Drainage and Stormwater Management

- (1) The Definitive Plan shall provide adequate drainage facilities within the subdivision for collecting, conveying and disposing of storm water in a manner, which will ensure proper protection of the roadway and the areas adjacent thereto. The Definitive Plan shall provide for recharging groundwater with pre-treated (if applicable) storm water in an amount equal to or exceeding pre-development conditions.
- (2) No catch-basin-to-catch-basin connections will be allowed, without the written approval from the DPW and the Planning Board.
- (3) The construction of the drainage system, including methods of construction and quality of materials, shall conform to the applicable sections of the Massachusetts Highway Department's Specifications except as modified hereafter or as approved by the Planning Board as a waiver of its Rules and Regulations.
- (4) All storm drains shall be laid with a minimum of two and one-half (2 1/2) feet of cover. All joints shall be sealed by caulking and cement mortar, or by use of approved rubber gaskets. Shop drawings for materials shall be supplied to the Board for approval prior to any materials being delivered or installed on-site.
- (5) All catch basins shall be constructed of precast concrete and shall have a standard twenty-four (24) inch square frame and crossed grate cover appropriate for the passage of bicycles. A MassDOT vaned grate may be used on slopes over 3%. A granite gutter mouth curb shall be furnished and set where vertical or sloped granite curbing is utilized. Where Cape Cod Berms are used, the catch basin and cover shall be laid so as to be slightly below the

roadway pavement, which shall be suitably tapered toward the cover, and direct surface water flow to the catch basin. Even with cape cod berm a gutter mouth stone shall be used with two transitional sections of curb, from gutter mouth to face of berm. When approved the omission of gutter mouth stone shall be substituted by placement of catch basin frame and grate in relationship to roadway gutter-lines six (6) inches into a Cape Cod berm.

- (6) No pipe shall extend into a catch basin more than three (3) inches beyond the inside face of the wall. Gas traps shall be utilized over outlet pipes within a catch basin. All catch basins shall have an inside diameter of at least four (4) feet, shall be constructed with a minimum depth of four (4) feet below the invert of the outflow pipe, and as otherwise shown in accordance with the Construction Standards of the Massachusetts Highway Department.
- (7) All manholes shall be constructed of the same materials as permitted herein for catch basins except that a standard heavy (LeBaron, Neenah or approved equal) twenty-six (26) inch diameter cover and frame shall be furnished and set, and all other details shall be as shown in the MHD Standards for manholes.
- (8) If required due to groundwater conditions, or as directed by the Board' Engineer, a subdrain or system of subdrains for collection and removal of groundwater from the roadway shall be installed. Such system, as shown on the approved Definitive Plan, or as ordered by the Board during construction, shall be constructed of not less than 6-inch diameter perforated Schedule 80 PVC pipe with all joints firmly clamped, perforations turned up, and laid to line and grade. All subdrains shall be a minimum of four feet deep to the top of the pipe and be installed in $\frac{3}{4}$ to 1 $\frac{1}{2}$ inch crushed stone wrapped in filter fabric. Note that a minimum of six (6) inches of topsoil is required for seeded areas. (Details as per MHD Construction Standards 209.1.0)
- (9) All drainage pipes shall end in a concrete or masonry headwall having dimensions as specified in the Department's Standards and constructed in accordance with the Department's Specifications. The concrete shall have a minimum compressive strength of 3000 pounds per square inch after twenty-eight days curing. Headwalls for pipes over 18" in diameter shall be fitted with a stainless steel or aluminum grate. Shop drawing approval of grates is required.
- (10) All tide gates shall be of standard manufacture, of the same size as the outfall pipe, cast-iron frame and flap each fitted with bronze seat and subject to the approval of the Project Inspector.
- (11) The Project Inspector will inspect the completed drainage system or sections thereof prior to placing any backfill.

- (12) All trench backfill for the storm and subsurface drains and other backfill within the limits of the way shall conform to the base course requirements and shall be deposited to required subgrade in not more than six (6) inch layers and compacted to 95% of the maximum dry density as determined by modified Proctor Test, in accordance with ASTM D-1557-70, Method "D".

M1. Culvert Piping

- (1) The drainage pipe shall be reinforced concrete or approved equal, with bell and spigot gasket joints. The pipe shall be Class III in accordance with ASTM C-76. The gaskets shall be O-ring type in accordance with ASTM C-443. The minimum diameter shall be twelve (12) inches. The pipe shall be laid in undisturbed trenches below the grade of pipes, starting with the downstream end on firm bedding. All bells shall be facing upstream. Reference benchmarks shall be clearly marked to enable the Project Inspector to check the grade and invert elevations. The joints of all concrete pipes shall include a pre-molded neoprene continuous O-ring flexible compression gasket. No backfilling of pipes or culverts shall be done until the installation has been inspected and approved by the Project Inspector or a Planning Board Representative. Backfilling shall be in layers not exceeding eight (8) inches, with each layer compacted by an appropriately sized plate vibrator, regardless of the method of final compaction at the subbase or gravel base level. The minimum cover is forty-two (42) inches above the top of the pipe.² If required by the Project Inspector, side under drains shall be installed on both sides of all streets, except in Fill sections, and connected to the surface drainage system. In circumstances where the groundwater table is not within four (4) feet of the finished grade and each linear foot of under drain would serve a surface drainage area of not more than twenty (20) square feet, or in other circumstances which would render such under drains superfluous, the Project Inspector may waive such requirement. The side drains shall be shown in cross-section detail.
- (2) At each outfall of a drain line, a winged headwall of reinforced concrete shall be constructed according to the details shown in the plans.

N1. Stormwater Management Structures

- (1) Stormwater Management structures used for treatment of runoff shall be approved by the DPW. Structures shall be located in an accessible location and be compatible with available maintenance equipment if the system is to be accepted by the Town for maintenance.
- (2) Shop drawings for all special stormwater structures, including outlet structures for stormwater basins, etc. shall be provided to the Board for approval prior to ordering the structures.

O1. Fine Grading and Compacting Subgrade Area

- (1) The contractor will be required to establish grade markers to the elevations specified on the plans. Using the machinery designated for this type of work and necessary to complete the task, such as a (Rubber Tired Excavator) Gradall or a Road Grader, the contractor will create the required roadway profiles for features specified such as drainage. The Contractor will be required to compact these areas to 95% of Maximum Dry Density as determined by ASTM D-1 557.
- (2) Street grades shall be designed in relation to existing grades such that the volume of cuts and fills made within the right-of-way approximately balances, except to offset peat, boulders or other unusable materials to be removed.
- (3) Final grading shall be inspected by pulling a string line from “finish grade” grade stake to grade stake and measuring from the transverse line to the prepared road-base. Grading shall be within plus or minus ½” of desired overall pavement thickness. The contractor shall provide the necessary labor to perform the aforementioned. The Project Inspector shall be present to witness the measurements.

P1. Lot Grading/Drainage

- (1) Lots shall be prepared and graded in such a manner that development of one shall not cause detrimental drainage on another. If provision is necessary to carry drainage to or across a lot, an easement or drainage right-of-way of a minimum width of twenty (20) feet and proper side slope of at least three to one (3:1) shall be provided. Storm drainage shall be designed in accordance with these specifications. Where required by the Planning Board, the applicant shall furnish evidence as to any lot or lots for which adequate provision has been made for the proper drainage of surface and underground waters from such lot or lots. Unless specifically approved private drainage shall not be allowed to connect to the existing Town drainage structures. Unless specifically approved, private drainage will not be allowed in the Town R.O.W.

Q1. Catch Basin And Drain Manholes

- (1) No more than four (4) pipe openings shall be allowed in any one (1) manhole. Four-foot-diameter manholes will be used for drains up to thirty- (30") inches in diameter. Five-foot-diameter manholes are necessary for pipe diameters between thirty-six (36) and forty-eight (48) inches. All flows into a manhole shall be in the same direction (no reverse flows or sumps allowed), with a maximum angle between the main and any connecting line of ninety degrees (90°). All connecting lines shall have bricked inverts rounded into the direction of flow.

- (2) Manhole casting shall be set flush with the designed finish grade of the pavement. Catch basin grates shall be set half (1/2) inch below the finished gutter grade and shall be of the egg box variety (square openings). Manhole castings and catch basin grates shall be raised at the earliest thirty days prior to final paving. If paving does not occur within said thirty days, they shall be lowered immediately. Ramping is prohibited.
- (3) Pre-cast catch basin and manhole bases, risers, eccentric cones, and slab tops shall conform to the latest requirements of ASTM Designation C 478. Where the shallow grade will not allow for standard manhole and catch basin installations, the construction including flat top slabs shall conform to the detail drawings for shallow catch basins and manholes.

R1. Pre-Cast Manhole and Catch Basin Materials

- (1) New manholes, catch basins and other structures shall be pre-cast concrete unless approved as a change by the Planning Board and the DPW.
- (2) Catch basins shall have a minimum sump of forty-eight (48) inches.
- (3) Pre-cast concrete manholes and catch basins shall conform to the ASTM Standard Specifications for pre-cast reinforced concrete manhole sections, Designation C478-77 or latest version, except as modified herein.
- (4) Type II cement shall be used unless specifically authorized in writing.
- (5) Joints between pre-cast sections shall be sealed with a preformed flexible joint sealant conforming to the requirements of ASTM Designation C990-92. The manufacturer of the pre-cast units shall supply the joint sealant. The joint sealant shall be produced from blends of butyl rubber, refined hydrocarbon, resins; and. plasticizing compounds reinforced with inert mineral filler that are solvent free. The sealant shall have an approximate cross section of 3/8-inch by 3-1/2 inch' for single strip application or 3/8-inch-by-3/8-inch square or 3/8-inch diameter cord for multiple cord usage application. Use six (6) cords minimum for multiple cord applications.
- (6) Manholes shall be four (4) feet in diameter (inside) unless otherwise noted on the plans or in the Special Conditions. Catch basins shall be 5 feet in diameter (inside) and 8 feet 6 inches deep as shown on the standard drawings. The manhole base shall be pre-cast concrete and shaped to receive the pipe sections and manhole sections.
- (7) Catch basins shall have a pre-cast slot and opening suitable for mounting the hood and discharge pipe.

- (8) Manhole sections shall contain manhole steps accurately positioned and imbedded in the concrete when the section is cast.
- (9) No more than two lift holes will be cast or drilled in each section.
- (10) The date of manufacturer and the name or trademark of the manufacturer shall be clearly marked on the inside of the barrel.
- (11) Brick shall be sound, hard and uniformly burned, regular and uniform in shape and size, of compact texture, and satisfactory to the Project Inspector. Brick shall comply with the ASTM Standard Specification for Sewer and Manhole Brick (made from clay or shale), Designation C32-73. Grade SS brick shall be used for paved inverts and shelves, and grade MS shall be used for walls. Concrete brick will not be allowed.
- (12) Concrete masonry block shall be machine-made, solid, pre-cast concrete masonry units. Block shall comply with the ASTM Standard Specification for Concrete Masonry, Units for Construction of Catch Basins and Manholes, Designation C139-73, except as modified herein.
- (13) The width of the units shall be six (6) inches. The inside and outside surfaces of the units shall be curved to the necessary radius (5 foot inside diameter) and so designed that the interior surfaces shall be cylindrical, except the top batter courses shall be designed to reduce uniformly the inside section of the structure to the required size and shape at the top.
- (14) Blocks shall be designed so that only full-sized units are required to lay any one course.
- (15) Type II cement shall be used unless otherwise authorized in writing.
- (16) Sand shall be well graded and with no grain larger than will pass a No. 8 sieve.
- (17) Hydrated lime shall form type M mortar (2500 psi) conforming to the ASTM Standard Specification for Hydrated Lime for Masonry Purposes, Designation C207-79.
- (18) The mortar shall be composed of Portland cement, hydrated lime, sand and water in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. In general, mortar for Grade SS brick shall be mixed in the proportions of 1:1/2:4 1/2 (Cement: Lime: Sand).
- (19) Drain manholes shall have rung manhole steps fifteen (15) inches on center built into the vertical side.

- (20) Steps for manholes shall be non-skid raised edge-front steel reinforced polypropylene plastic type, with at least a 14-inch wide stepping surface, and grade-60 steel. Placement into pre-cast walls shall be by a method recommended by the 'supplier of the pre-cast manhole sections. Steps shall protrude no less than 6-inches from the wall and are to be installed per the manufacturer's specifications. Details of the steps and methods of placement shall be submitted for approval.
- (21) Steps shall not be mortared into place after the concrete has set.
- (22) All new catch basins shall be constructed with a new section of granite curb with a gutter mouth as shown on the standard details.
- (23) Any concrete block or brick used shall be skim coated with Type M mortar.

S1. Catch Basins (Built)

- (1) Details of standard manhole, catch basin, frame and grate and curb inlet should be shown in the plans.
- (2) Unless specifically noted otherwise, or approved by the Project Inspector, all catch basins shall be as shown on the standard drawings. Basins that cannot be built due to conflicts with existing structures shall be reevaluated by the project Inspector and approved by the Board.
- (3) Concrete-block-masonry may be used in lieu of pre-cast catch basins and manholes structures only when approved by the Project Inspector, catch basins may be constructed with brick or concrete masonry blocks, and reinforced concrete base, as an alternative to pre-cast concrete units.
- (4) Catch basins and drain manholes shall be constructed of concrete-block masonry eight (8) inches in thickness with an inside diameter of four (4) feet or more. They shall be built with horizontal and vertical mortared joints. The arch or cone section shall be twenty-four (24) inches in height consisting of a first row, second row, third row and a ring row (either round or square as appropriate). The cone section shall be mortared on the exterior and interior. The faces of all pipes shall be flush with or extend not more than three (3) inches into the basin or manhole. Flat-topped structures are not allowed, unless approved by the Project Inspector.
- (5) Drain manholes shall have a four-inch-thick concrete base. At least one (1) row of blocks shall be set on the base to allow the construction of a brick table within the manhole. Arched invert of one-half (1/2) the pipe diameter shall be sloped upward to the sides of the manhole. The elevations of the main drain lines entering and leaving a manhole shall be matched.

T1. Manhole Construction Methods

- (1) Barrel sections (walls) shall be set to be vertical, with steps in alignment.
- (2) For Sewer Manholes the invert channel within the structure shall be an inverted arch with bricks laid as stretchers and on edge and constructed as to conform in shape to the lower half of the pipe. In addition, in these structures an arch shall be constructed over inlet and outlet pipes with bricks laid as headers and on edge. The shelf in manholes shall consist of bricks laid flat and the top of the shelf shall be at the elevation of the top of the pipe, as indicated on the drawings, and shall be sloped to drain toward the channel.
- (3) An approved grade ring shall be placed between the cone section and the cast iron frame for purposes of setting the frame to match the roadway grade. More than one ring may be necessary to match the required grade but in no case shall the rings exceed 16" in height.
- (4) Special manholes for 36 inch pipe and larger shall have reinforced concrete bases and pre-cast concrete or brick chimneys as detailed on the drawings.
- (5) Manhole stubs, where indicated on the drawings, shall be short pieces (maximum length 3.5 feet) cut from the bell ends (retaining bell end) of the appropriate size and class of pipe. PVC stubs shall be plugged with a PVC stopper and RCP stubs shall be plugged with brick masonry or approved plug.
- (6) Inverts shall conform accurately to size of the adjoining pipe. Side inverts and main inverts where the direction changes shall be laid out in smooth curves of 'the longest possible radius which is tangent, within the manhole, to the centerline of the adjoining pipelines.
- (7) Preformed flexible joint sealant shall be placed over the entire horizontal-mating surface of adjoining pre-cast section, and installed in accordance with the manufacturer's recommendations.
- (8) All holes in sections used for their handling shall be thoroughly plugged with rubber plugs made specifically for this purpose or hydraulic grout.
- (9) For Sewer manholes, the exterior surfaces of pre-cast manholes shall be given two heavy coats of bituminous waterproofing material. The waterproofing material shall be applied by brush or spray and in accordance with the instructions of the manufacturer. Time shall be allowed between coats to permit sufficient drying so that the application of the second coat has no effect 'on the first coat.

- (10) All connections between pipe and manholes shall be made with a positive seal connector manufactured for this purpose. The type of connector proposed shall be subject to review and approval by the Project Inspector.
- (11) Openings for pipe and materials to be embedded in the walls of the manhole for those joints shall be cast in the barrel sections or base at the required locations during the manufacturing process. Only with approval from the DPW will any modifications to the structure be allowed, and if so, only by coring. Chipping an opening into the structure will not be allowed.
- (12) All materials, accessories, and construction methods used in making the joints shall be supplied or approved by the manufacturer of the pre-molded elastomeric-sealed joint.

U1. Drop Inlets

- (1) Drop Inlets shall be pre-cast or where approved, constructed with brick or concrete masonry block walls and poured concrete bases as detailed on the standard drawings.
- (2) When concrete masonry units are used 1) each block shall be dry and laid in a full bed of mortar; 2) vertical keyways shall be completely filled with mortar; 3) catch basins shall be fitted with a standard hood and a 12-inch outlet pipe; 4) the connection between the pipe and catch basin or drop inlet shall be made with an approved positive seal flexible connector.

V1. Dry Wells /Leaching

- (1) Drywells shall be pre-cast concrete with dimensions and details as shown on the Contract plans; Drywells shall be constructed using 5,000 psi concrete and ASTM GR.60 steel reinforcement and shall be manufactured to support AASHTO HS20-44 live load.
- (2) The installation of a dry well will require the Contractor to excavate a square hole, which will be four (4) feet wider than the outside dimension of the dry well and two (2) feet deeper than the proposed bottom of the Dry Well. The excavation shall be lined with geo textile fabric and a two (2) foot layer of crushed stone shall be placed as bedding surface. An adequate length of 12" RCP pipe shall connect the proposed catch basin to the dry well. The space between the dry well and the sides of the excavation shall be backfilled with the crushed stone placed and compacted in 6" lifts. The crushed stone shall be placed flush with the top of the structure and the filter fabric shall be folded over to the center of the structure. A standard frame and cover shall be placed over the structure to the proposed roadway grade and profile. (See adjusting structures and frames)

- (3) All holes shall be cored and connections shall be made in accordance with the specifications for manholes. Frames and covers shall be the specified standard and set in accordance with the plans and these specifications.

W1. Raising Casting Construction

- (1) The contractor shall locate with a metal detector each buried casting. After receiving permission to excavate, the contractor will expose the casting to determine whether the existing casting is useable. If not, the contractor must install a new frame and cover.
- (2) The Contractor will adjust to grade any service box, gate box, or meter box, as shown on plans, or where directed by the Project Inspector. Any service box, gate box, meter box, and/or covers damaged due to the Contractor's operations will be replaced by the Contractor at his own expense.

X1. Construction Method for Frame and Cover Construction

- (1) Catch basins and drain manholes shall be constructed with cast-iron frames and covers or grates. Frames must be set in a full bed of cement mortar. Bricks shall be used between the frame and top course for grade adjustment. They shall be laid in a radial fashion with full bearing on the ring row. A maximum of four (4) and a minimum of two (2) brick courses will be allowed. Frames shall be at least two hundred sixty-five (265) pounds and shall be of North American manufacture. Covers or grates shall be no less than two hundred ten (210) pounds, in accordance with the Standard Specifications and shall be of North American manufacture. The word "drain" shall be cast into the solid cover in letters at least three (3) inches in height.
- (2) The frame and grate shall first be set to binder grade using a bituminous concrete collar as soon as possible after the roadway binder course has been placed. No sooner than one week prior to final paving, the frame and grate shall be reset to proposed finished grade using a concrete collar flush to the binder grade.
- (3) All mortar used shall be mixed only in such quantity as required for immediate use and shall be used before the initial set has taken place. Mortar shall not be retained for more than one and one-half hours and shall be constantly worked over with a shovel until used. Anti-freeze mixtures will not be allowed. No masonry shall be laid when the outside temperature is below 40°F unless special provisions are made and accepted by the Project Inspector.
- (4) All mortar used shall be mixed only in such quantity as required for immediate use and shall be used before the initial set has taken place. Mortar shall not be retained for more than one and one-half hours and shall be

constantly worked over with a shovel until used. Anti-freeze mixtures will not be allowed. No masonry shall be laid when the outside temperature is below 40°F unless special provisions are made and accepted by the Project Inspector.

- (5) Each frame and cover shall be Le-Baron Foundry Model No. LK1 10, or equal and shall have a clear opening of 24-inches and the word, “SEWER” or “DRAIN” cast in 3-inch letters on the surface. Double grate catch basins shall be cascade-type grates, LeBaron Foundry Model LK 120-A, or equal.
- (6) Bricks for building up and leveling manhole and catch basin frames shall conform to ASTM C32, Grade MS.
- (7) Mortar used in the brickwork shall be composed of one part Type II Portland Cement conforming to ASTM C150 to two parts sand to which a small amount of Hydrated Lime conforming to ASTM C207, mortar proportions will be mix so as to produce type M (2500 psi mortar).
- (8) Sand used shall be washed, cleaned, screened, sharp and well graded with no grain larger than will pass a No. 4 sieve. It shall be free of all foreign matter as to render it unsatisfactory.

Y1. Concrete Materials for Adjusting Sewer or Drain Castings Collars

- (1) Cement shall be American made Portland Cement conforming to ASTM Standard Specification for Portland Cement, Designation C 150. Where concrete is used for sewerage works, Type II cement shall be used.
- (2) Aggregates for concrete shall conform to ASTM Standard Specifications for Concrete Aggregates, Designation C33 and the additional requirements specified herein.
- (3) Fine aggregate shall be clean screened sand with not less than 15 percent nor more than 30 percent, by weight, passing the No. 50 sieve and shall not contain more than 2 percent silt with an F.M. of 2.5 to 3.0.
- (4) Coarse aggregate shall be washed screened gravel or crushed stone having not more than 5 percent, by weight of deleterious and soft substances, well graded for nominal size 1 inch to No. 4 aggregate and shall not contain more than 1 percent of silt.
- (5) Concrete shall have a minimum 28-day compressive strength of 4000 psi shall be used unless otherwise specified or indicated on the drawings.

- (6) Materials for concrete shall be proportioned to produce a workable mixture resulting in a dense watertight concrete. Slumps shall generally not exceed 4 inches, and air contents of 4-7 percent. Mixtures must be from a MHD approved production facility and an approved MHD mix design.

Z1. Construction Methods for Concrete Placement

- (1) Small Quantity batcher mixed concrete shall be mixed in a suitable batch mixer except for small quantities that, by permission, may be hand mixed. The minimum mixing time shall be (1 ½) one and a half minutes for mixers of 1 cubic yard or less and the time shall be increased by 30 seconds for each additional half cubic yard. The entire batch shall be discharged before the mixer is recharged.
- (2) If the concrete is mixed by hand, it shall be done on a flat nonporous surface, the cement and aggregate being mixed dry until an even and uniform color has been attained. The proper quantity of clean water shall then be added and the entire mass turned until it has become intimately mixed.
- (3) When using larger quantity ready-mixed, at the time of delivery of each load of concrete, the Project Inspector shall be given a slip stating the actual quantity of each ingredient of that load and the design strength. The work shall be planned such that the concrete is discharged at the site within 1 ½ hours after water was first added to the mix and shall be mixed at least 5 minutes after all water has been added. Each batch shall be air entrained with a minimum air content of 5 to 7 percent when used where there are exposed surfaces to prevent spalling. (Concrete may be subject to testing as outlined in this document)
- (4) No concrete shall be placed on frozen subgrade or in water. Concrete shall be deposited in layers, one quickly following another, until placement is complete, while avoiding cold joints. While being installed, the concrete shall be thoroughly compacted by rodding, spading or by mechanical vibration. The concrete will be placed within the target slump +/- 1" and air +/- 1.5 %. Loads not within these limits will be rejected at the owner's expense. It will be the owner's responsibility to determine how much water will be added on site to achieve the required workability without exceeding the slump and air tolerances.
- (5) Water shall not be permitted to rise on concrete within 24 hours after it is placed, nor shall running water be allowed to flow over it within 24 hours. All concrete shall be protected for at least 7 days such that the temperature at the surface does not fall below 40 Degrees F.

- (6) Manhole tables and all surfaces shaped without forms and over which liquids will flow, shall be smoothly finished by means of a steel trowel without additional water or cement.

A2. Reinforced Concrete Pipe

- (1) Reinforced concrete pipe shall be manufactured in a plant adapted to meet the design requirements of the pipe.
- (2) Each unit of pipe shall have an interior surface, which is free from roughness, projections, indentations, offsets, or irregularities of any kind. The pipe units shall be Class III unless otherwise indicated on the drawings and shall conform to ASTM Standard Specifications for Reinforced Concrete Culvert, Storm Drain, Designation C76-12 or the latest revision with the following exceptions and additions
- (3) Pipe units shall have a minimum laying length of 8 feet, except as otherwise indicated or permitted by the Project Inspector.
- (4) The date of manufacture, class of pipe unit, size of pipe unit, and trademark of the manufacturer shall be clearly and permanently marked on the outside at one end of each pipe unit.

B2. Joints on RCP

- (1) Pipe joints for all reinforced concrete pipes shall be of the rubber gasket type in which the gaskets are in compression and which will permit both longitudinal and angular movement. Each unit of pipe shall be provided with proper ends made of concrete formed true to size and formed on machined rings to ensure accurate joint surfaces. Joints and gaskets for pipe 36 inches or less in diameter shall be the O-ring gasket type and shall conform to the requirements of ASTM Standard Specifications for Reinforced Concrete Low-Head Pressure Pipe, Designation C 361-11 and the additional requirements specified. Joints and gaskets for pipe larger than 36 inches in diameter shall be O-ring or ribbed gasket type and shall conform to the requirements of ASTM Standard Specifications for joints for Circular Concrete and Culvert Pipe, Using Rubber Gaskets, Designation C 443-11 and the additional requirements specified. The DPW will consider other types of gaskets that conform to ASTM C 443-11.
- (2) Joints shall be of such design that when tested under an average internal hydrostatic pressure of 10 p.s.i. (ASTM C 76 & C 361) no visible leakage will result. The diameters of the joint surfaces which compress the gasket shall not vary from the true diameters by more than 1/16 inch or the amount permitted by the appropriate above-mentioned ASTM Standard Specifications, whichever is less.

- (3) Gaskets shall be of a composition and texture which is resistant to common ingredients of sewage, industrial wastes, and groundwater, and which will endure permanently under the conditions likely to be imposed by this service. Gaskets shall be the product of a manufacturer regularly engaged in the manufacture of rubber gaskets for pipe joints.
- (4) The interior joints of all reinforced concrete storm drains in sizes 24 inches and over shall be filled with an approved non-shrinking grout and smooth finished after partial backfilling. The grout shall be a specially prepared, pre-mixed, ready for use formulation, which eliminates settlement shrinkage, and driving shrinkage and when mixed with water forms a grout of plastic consistency to develop a good bond to the concrete. Joints to be filled shall be dry, clean and completely free of all foreign matter. After the pipe joints have been made and the interior surface properly prepared, the joints and adjacent areas and any damaged portion of the previously applied protective coating shall be brought to a continuous surface of coating by means of at least two brush coats of epoxy compound. The thickness of brush coats shall be equivalent to those previously applied by spray. In 24-inch pipe, the Contractor may, if he so elects, incorporate the epoxy compound with the non-shrinking grout prior to filling the pipe joint with the grout rather than epoxy coating the joint after the joint has been grouted. Exterior joints are not to be filled or treated unless directed by the Project Inspector.

C2. Pipe Manufacture Inspection and Acceptance

- (1) When deemed applicable by the Project Inspector, acceptance will be based on material tests on cement, reinforcement and aggregates, absorption tests, crushing tests on pipe and its material.
- (2) Tests and certified copies in triplicate of test results will be required for the materials as described herein. If less than 100 units of a given size and class of pipe are required, the Contractor may submit certified copies of tests made on identical pipe units made by the same manufacturer within the past year. The Project Inspector reserves the right to have any or all pipe units inspected or tested, or both, by an independent testing laboratory at either the manufacturer's plant or elsewhere. Such additional inspection and/or tests shall be the test results of record. All tests shall be made in accordance with the above-mentioned applicable ASTM specifications, and acceptance or rejection shall be based on the test results.
- (3) Where required for more than 100 units, concrete cylinder compression tests shall be made on standard concrete cylinders for the first or test pipe unit and then for every 100 cubic yard of concrete used in pipe manufacture, or for each additional 200 units of pipe, whichever represents the lesser amount of concrete. Four cylinders shall be made for each test, and they shall be broken

at 7,14 and 28 days with one cylinder as a spare to be used in the event of an unsatisfactory break. The reports shall be submitted within three days after each of the compression tests.

D2. Polyvinyl Chloride Pipe for Drain

- (1) Polyvinyl chloride pipe and composite polyvinyl chloride pipe and fittings shall conform to ASTM Standard Specification for Type PSM polyvinyl chloride (PVC) pipe and fittings, Designation D3034-08. The pipe shall have a pipe diameter to wall thickness ratio (SDR) of a maximum of 35.
- (2) Branches shall conform to the specifications referenced above for pipe material. Saddle branches are prohibited.
- (3) Pipe and fittings shall have bell and spigot (push-on) joints using electrometric ring gaskets. Gaskets shall be made of a composition and texture which is resistant to common ingredients and industrial wastes, including oils and ground water, and which will endure permanently under the conditions of its proposed use.
- (4) Joints shall conform to ASTM Standard Specifications of Joints for Drain Plastic Pipe using Flexible Electrometric Seals.
- (5) All pipe and fittings delivered to the job site shall be accompanied by test reports certifying that the pipe and fittings conform to the above-mentioned ASTM specifications.
- (6) The Contractor shall furnish all labor necessary to assist the Project Inspector inspecting the pipe and fittings. The pipe and fittings shall be inspected upon delivery and any which does not conform to the above specifications shall be rejected and immediately removed from the site by the Contractor.

E2. Construction Methods for Polyvinyl Chloride Pipe

- (1) The Contractor's attention is called to the fact that the pipe and fittings are slightly brittle. Care shall be taken in handling and laying to avoid damaging the pipe and fittings. Extra care will be necessary during cold weather construction.
- (2) Any fitting showing a crack, and any fitting or pipe which has received a blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work.
- (3) All pipe ends must be square after cutting.

- (4) While stored, all pipes shall be adequately supported from below, in at least 3-foot intervals, to prevent deformation prior to installation. Pipe shall be stacked to a height not exceeding six feet. Pipe shall be stored in a manner, which will keep the pipe at ambient outdoor temperature. Temporary shading as required to meet this requirement shall be provided. Simple covering of the pipe that allows temperature buildup, when exposed to direct sunlight will not be permitted.
- (5) Pipe and fittings shall be installed in accordance with the latest instructions of the manufacturer, ASTM 2321, as specified herein and as directed.
- (6) When moveable trench bracing such as trench boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and surrounding backfill. Trench boxes, moveable sheeting, shoring or plates shall not be allowed to extend below mid-diameter of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, material shall be placed to fill any voids created and the material shall be re-compacted to provide uniform side support for the pipe.
- (7) All concrete for encasements, cradles and saddles shall conform to the detail drawings and as directed.
- (8) All pipes where concrete is required shall be securely braced both vertically and horizontally to restrain it against flotation while pouring concrete. Holes left in the concrete by cross braces during the pouring shall be completely filled with concrete in a manner approved by the Project Inspector.

F2. Construction Methods for Handling and Placing Reinforced Concrete Pipe

- (1) Each pipe unit shall be handled into its position in the trench only in such manner, and, by such means as acceptable to the Project Inspector. Care shall be taken to avoid damaging the pipe and fittings.
- (2) Drainpipe shall be laid at the lines and grades as shown on the plans and specified herein. Whenever encountered within the trench, existing sewer/drain lines shall be removed unless otherwise noted. All existing sewer/drain lines, which are to be abandoned in place, shall be plugged at all open ends.
- (3) Each pipe and/or fitting to be installed shall be subjected to a careful inspection just prior to installation. Each straight length of pipe shall be generally straight. Centerline deviation of more than 1/16 inch per foot of length shall be deemed unacceptable and such pipe shall immediately be removed from the site.

- (4) Pipe shall be supported by compacted-screened gravel. No pipe or fitting units shall be supported on saddles, blocking or stones. Suitable bell holes shall be provided so that after installation only the barrel of the pipe receives bearing pressure from the supporting material.
- (5) All pipe and fittings shall be cleaned of all debris, dirt or other foreign substances prior to being installed and shall be kept clean until accepted.
- (6) Before any joint is made, the previously installed unit shall be checked to insure that a closed joint with the adjoining unit has been maintained and that the inverts are matched and conform to the required grade. Pipe shall not be driven down to the required grade by striking with an unyielding object.
- (7) Immediately before joining the pipe, all joint surfaces shall be cleaned and the bell or groove shall be lubricated in accordance with the manufacturer's recommendations. Each pipe unit shall be pushed into place without damage to the pipe or gasket.
- (8) All open ends of pipe and branches shall be closed with stopper's secured in place in an acceptable manner.
- (9) After each pipe has been properly bedded, enough screened gravel shall be placed between the pipe and the sides of the trench, and, thoroughly compacted, to hold the pipe in 'correct alignment. Bell holes shall be filled with screened gravel and compacted, and then screened gravel shall be placed and compacted to complete the pipe bedding' as indicated on the drawings.
- (10) At all times pipe installation is not in progress, the open ends of 'the pipe shall be closed with temporary watertight plugs, or by other acceptable means.
- (11) If water is in the trench when work is to be resumed, the plug shall not be removed until suitable provisions have been made to prevent water, earth, or other substances from entering the pipe.
- (12) Pipelines shall not be used as conductors for trench drainage during construction.
- (13) All manhole connections shall be as shown on the drawings except that concrete and mortared connections shall be equipped within integral O-ring or other sealant such that a positive watertight seal is established.

G2. Ductile Iron Pipe

- (1) Ductile iron pipe shall be designed in accordance with general specifications (Ductile iron pipe shall be at least thickness Class 52). It must be installed in

accordance with the Local Water Company requirements, and the Planning Board Rules and Regulations for backfilling pipe.

- (2) Push-on joints shall be made up by first inserting the, gasket into the groove of the bell and applying a thin film of non-toxic gasket lubricant uniformly over the inner surface. The chamfered end of the plain pipe shall be inserted into the gasket and forced past it until it seats against the bottom of the socket.

H2. 4" Corrugated High Density Polyethylene Pipe (Slotted)

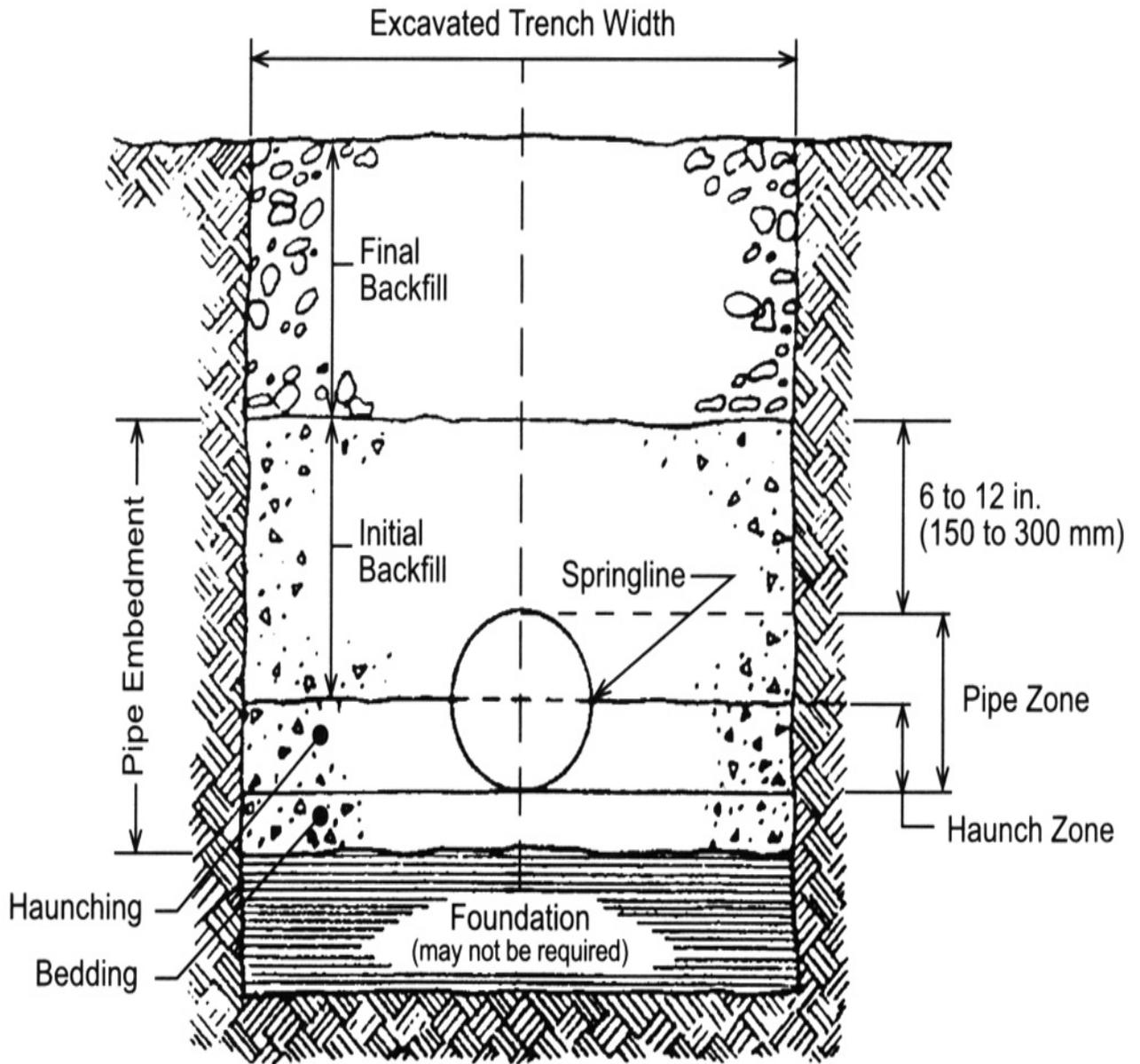
- (1) This consists of furnishing and placing 4" Corrugated High Density Polyethylene Pipe for a drainage application.

I2. Corrugated Hdpe Materials

- (1) High Density Polyethylene (HDPE) Corrugated and Smooth-Lined Pipe and / or materials for constructing of culverts, side road pipes, storm sewers, stubs, and all related connections and fittings, all of shall conform to ASTM F 2306, latest edition. The pipes shall be of the sizes, types, and dimensions shown on the plans, and contained in this specification. In addition, it shall include a - 67 -ll connections and joints to new or existing pipes, storm sewer manholes, inlets, headwalls, and other appurtenances as may be required to complete the work.
- (2) High Density Polyethylene (HDPE) Corrugated and Smooth Lined Pipe & Fittings shall be manufactured in accordance with requirements of ASTM F 2306, latest edition. Type S: This pipe shall have a full circular cross section, with an outer corrugated pipe wall and a smooth inner wall.
- (3) High Density Polyethylene (HDPE) Corrugated and Smooth Lined Pipe shall be manufactured from virgin PE compounds which conform to the requirements of cell class 435400C as defined and described in ASTM D 3350.
- (4) Minimum Pipe Stiffness (PS) at five percent deflection shall be as described in ASTM F 2306, Section 6.3 when tested in accordance with ASTM D 2412.
- (5) All HDPE Corrugated and Smooth Lined Pipe shall be certified through the AASHTO National Transportation Product Evaluation Program (NTPEP) 3rd Party Certification program.
- (6) Installation shall be in accordance with ASTM D 2321, "Standard Practice for Underground Installation of Pipe and Other Gravity Flow Applications".

- (7) The pipe shall be unloaded and handled with reasonable care. Pipe shall be placed in the bed starting at the downstream end. Trenches shall be excavated in such a manner as to insure that the trench sidewalls will be stable under all working conditions. Trenches with pipe in place shall be backfilled as soon as practicable, but no later than the end of each working day. Trench details, including foundation, bedding, haunching, initial backfill, final backfill, pipe zone, and trench width are shown in Figure 1.

Figure 1



- (8) Trench width shall be in accordance with ASTM D2321 and shall be sufficient to ensure working room to properly and safely place and compact haunching and other backfill materials. Minimum trench width shall not be less than 1.25 times the pipe outside diameter plus 12 inches, (1.25 x O.D. + 12"). On multiple pipe barrel runs the clear distance between pipes shall be 0.50 times the pipe diameter, ($\frac{1}{2}$ x Diameter).
- (9) Bedding material shall meet the requirements of ASTM D2321 material. A minimum of 6" of bedding shall be provided prior to placement and shall be loosely compacted. Bedding material size shall be 1½" maximum granular material. Initial backfill material shall meet the same requirements as the bedding material and shall extend to 8 inches above the top of the pipe. Final backfill material shall meet the requirements in these specifications. All initial and final backfill material shall be placed in 8 inch lifts and compacted to a minimum 95% Proctor Density Method "D" of the ASTM D-1557-70,. The contractor shall provide density reports and a Proctor on materials as requested by the project inspector.
- (10) The minimum cover is 18 inches below the bottom of stabilized subgrade for HS-25 Live Loads (from 18" to 42" Pipe Diameters) and 24 inches below the bottom of stabilized subgrade for larger diameter structures (from 48" to 60" Pipe Diameters). It is recommended that all pipes shall be placed a minimum of 24 inches below the bottom of stabilized Subgrade in order to reduce the potential for conflicts with other utility systems. Variances from the minimum cover requirement must be submitted in writing to the Board and approved by the Projects Engineer prior to commencing construction. Extreme care should be taken when heavy construction equipment loads cross the pipe trench during construction. If the passage of construction equipment over an installed pipeline is necessary during construction, compacted fill in the form of a ramp shall be constructed to a minimum elevation of three (3.0') feet over the top of the pipe. Any damaged pipe shall be replaced.
- (11) At the Boards discretion, all pipe exceeding 7.5% deflection (as per AASHTO Section 30) may require replacement or re-compaction at the contractor's expense when measured or inspected not less than 30 days following completion of installation. Deflection is defined per ASTM D 2321. The Contractor shall provide Video Camera (CCTV) inspection on 100% of the pipelines installed. The test shall be conducted at least 30 days after the installation of the pipeline. Mandreling of the pipe may be accepted as a suitable alternative for pipeline inspection and deflection testing, in lieu of CCTV inspection.
- (12) Joints shall be installed such that the connection of pipe sections will form a continuous line free from irregularities in the flow line. All installations shall require watertight joints that meet a 74kPa (10.8 psi) laboratory test per

ASTM D3212 and utilize a bell and spigot design with a gasket meeting ASTM F477.

- (13) In installations where high groundwater is encountered, a soil filter fabric shall be installed, as per manufacturer's recommendations, around the initial backfill material unless sufficient fill cover can be provided over the pipe. In flowable fill or high groundwater installations, pipe shall be restrained as per manufacturer's recommendations to prevent floating of pipe.

J2. Fill

- (1) All fill material which may be required within the exterior lines of the roadway foundation shall be of clean gravel material or other suitable material as approved by the Project Inspector and compacted to 95% of the maximum dry density as determined by modified Proctor Test, in accordance with ASTM D-1557-70, Method "D".
- (2) All municipal services including but not limited to storm drains, sub-drains and drainage structures and sewers if required within the way lines shall be installed after sufficient lifts of fill have been placed and compacted to provide support for trench excavations to install utilities. Utilities are to be installed in trench excavations at least one pipe diameter over the top of the pipe. This shall include the installation of each service pipe, sleeve or conduit to the front lot line of each lot in the subdivision.
- (3) Upon the completion of the fill and the backfill of all service trenches, the work will be inspected by the Board's Project Inspector. Subsequent work shall not be commenced until the Project Inspector has approved the fill as acceptable for the application of the roadway foundation material.

K2. Filter Fabric

- (1) Filter fabric shall be installed where indicated on the trench details and shall be polyester, polyvinyl chloride or polyamide fibers, either woven or non-woven. Filter fabric shall meet the following minimum requirements:
 - a) Weight - 4 ounces per square, yard
 - b) Thickness - 15 mils.
 - c) Puncture strength - 70 pounds
 - d) Bursting strength - 210 psi. Elongation - 50 percent
 - e) Permeability - 300 gallons per minute per square foot at four inches of head
 - f) Equivalent opening size shall be no greater than No. 70 U.S standard sieve
- (2) The drainage filter fabric shall be placed in the manner and at the locations shown in the Contract Drawings. Sharp objects shall be removed from the

area before placing fabric to avoid fabric punctures. The fabric shall not be laid in a stretched condition, but laid loosely. The panels shall be overlapped by a length of three feet. Filter fabric damaged or displaced before or during placement of overlying layers shall be replaced or repaired at no additional expense to the Planning Board.

L2. Gravel Material for Backfill or Road Base

- (1) Gravel material shall be placed, spread and compacted as set forth in this document.
- (2) The entire roadway width then shall be rolled with a roller having an effective force of twelve (12) tons, forming the subgrade with a one-quarter-inch-per-foot crown, or as required on the cross-section plan.
- (3) The gravel base of the roadway and sidewalks shall consist of unfrozen, hard, durable stone and coarse sand, free from loam and clay, uniformly graded to the specified tolerances listed in the Massachusetts Highway Department Standard Specifications for each respective gravel type.
- (4) Gradation tests (sieve analysis) shall be performed by an independent testing laboratory on the material to be utilized as gravel backfill and roadway foundation and shall be submitted to the Department of Public Works and Planning Board for review. This analysis, to be done at the expense of the Developer in advance of applying or grading the material, shall certify that it falls within the allowable limits for gravel borrow in accordance with the Standard Specifications. The Project Inspector or DPW Director may, at any time during the roadway construction, require additional in-situ tests including a sieve analyses after each layer of roadway foundation is placed. Test may also be required of backfill material at the discretion of the DPW or Project Inspector.
- (5) The Developer must demonstrate to the Project Inspector that he has sufficient suitable material on site, or he shall have to haul in gravel conforming to the Standard Specifications. His intent shall be made clear to the Director.
- (6) Before the roadway foundation gravel is spread, the roadbed shall be sloped to a true surface, conforming to the proposed cross section of the road, and no gravel is to be spread until this sub-grade is approved by the Department of Public Works Director.
- (7) Gravel for base shall be spread in eight (3) layers of equal thickness, each thoroughly rolled true to lines and grades with a roller having an effective force of at least twelve (12) tons so as to yield a total depth of twenty four (24) inches after thorough compaction. Any depression or soft spots that appear during or after rolling shall be filled with crushed processed gravel and be re-rolled until the surface is true and even. Gradation and compaction tests shall performed and submitted to the Department of Public Works for review. Testing results should be satisfactory to the Department of Public Works prior

to placement of base course of pavement.

- (8) All sidewalk areas shall be provided with a gravel base foundation consistent with that required for roadways, except that the compacted depth shall be twelve (12) inches. The slope of the base shall be to the maximum allowable by ADA requirements (see sidewalks and crosswalks requirements contained in this document) sloping from the back of the sidewalk towards the curb, unless otherwise requested by the Project Inspector. Gradation and compaction tests shall be performed and submitted to the Department of Public Works for review at the expense of the developer. Each layer shall be compacted to not less than ninety-five percent (95%) of the maximum dry density of the material, as provided in the Standard Specifications.
- (9) Before pavement is placed, the rolled gravel base and sidewalk base shall be surveyed by a registered professional land surveyor. As-built plans with an accuracy of one-tenth foot vertical at every 50-foot station along the centerline, sidelines and sidewalks shall be submitted to the Department of Public Works for review. However, depending on the topography of the work area the Planning Board and its Project Inspector may request an as built frequency at every 25-foot station. They shall also include water, sewer, and storm drainage systems, invert, services and service stubs. In addition, the topography of drainage facilities shall be provided at one-foot accuracy. All shall be approved by the Department of Public Works Director prior to paving. Weight slips may be requested by the Project Inspector to verify the source of the Gravel. Such slips shall bear the name of the supplier, date purchased and the weight of the gravel.

M2. Processed Gravel

- (1) Processed Gravel shall be used as refill material in all trench excavations, rock excavations, miscellaneous trench excavations and any other location where specified herein, shown on the plans or ordered by the Project Inspector. It shall conform to Section M1.03.1 of the Massachusetts Highway Department Standard Specifications for Highways and Bridges and be free of pavement, trash, loam, ice, snow, tree stumps, roots and other deleterious or organic matter.
- (2) Processed Gravel shall consist of inert material that is hard (L.A of not more than 50), durable stone and coarse sand free from loam and clay surface coatings, be well graded and contain no stone having any dimension greater than three (3) inches. Gravel shall conform to the following requirements:
 1. Passing 3 inch sieve 100%
 2. Passing 1 ½ inch sieve 70-100%
 3. Passing ¾ inch sieve 50-85%
 4. Passing No. 4 sieve 30-60%
 5. Passing No. 200 sieve 0-10%

- (3) New bank run is acceptable but must meet the above requirements. All processed gravel shall come from an approved stockpile. The equipment producing the processed gravel shall be of adequate size and with sufficient adjustments to produce the desired materials. The processed material shall be stockpiled in such a manner to minimize segregation of particle sizes.

N2. Screened Gravel Construction Methods

- (1) Screened Gravel shall be placed, spread and compacted as set forth in Excavation and Backfill, except that Screened Gravel shall be spread in uniform layers of not more than eight (8) inches.

O2. Screened Gravel

- (1) Screened Gravel shall be used as backfill material in all locations and depths as called for in the appropriate pipe specification, as shown on the plans or as ordered by the Project Inspector.
- (2) Screened Gravel shall be uniformly graded with the maximum size of a particle between 3/8 inch and 3/4 inch or such other size as may be approved by the Project Inspector. Screened Gravel shall consist of clean, hard and durable particles free from an excess of soft, thin and disintegrated pieces. Crushed rock of suitable size and grading maybe used in place of Screened Gravel at the option of the Project Inspector.

P2. Special Borrow

- (1) Special borrow for subgrade stabilization or in other locations when, in the opinion of the Project Inspector, special borrow is necessary for completion of the work, shall conform to Section M1.02.0 of the Massachusetts Highway Department Standard Specifications for Highways and Bridges and be free of pavement, trash, loam, ice, snow, tree stumps, roots and other deleterious or organic matter.

Q2. Gravel Borrow

- (1) Gravel Borrow for roadway sub-base pavement installation and repair shall conform to Section M1.0.3.0, Type B of the Massachusetts Highway Department Standard Specifications for Highways and Bridges and be free of pavement, trash, loam, ice, snow, tree stumps, roots and other deleterious or organic matter.
- (2) Gravel Borrow for reinforced concrete pipe bedding shall conform to Section MI .03.0, Type C of the Massachusetts Highway Department Standard Specifications for Highways and Bridges and be free of pavement, trash, loam, ice, snow, tree stumps, roots and other deleterious or organic matter.

R2. Sand Borrow

- (1) Sand Borrow shall conform to Section M.1.04.0 Type A of the 1998 Massachusetts Highway Department Standard Specifications for Highways and Bridges.
- (2) Sand Borrow shall be used for backfilling around water mains or other utilities as shown on the plans and as directed.

S2. Crushed Stone

- (1) Crushed stone shall conform to Section M2.01.5 of the Massachusetts Highway Department Standard Specifications for Highways and Bridges. Stone shall be washed and free from water, ice and snow, stone, dust, sand, clay, loam or other deleterious or organic matter.
- (2) Crushed stone shall be furnished, installed and compacted in areas where the Project Inspector has determined its use necessary for completion of the work.

T2. Concrete Sand General

- (1) The Contractor shall furnish Concrete Sand to be used as backfill material for all locations shown on the plans, specified herein or ordered by the Project Inspector.
- (2) Concrete Sand shall conform to ASTM Designation C33, Standard Specification for Concrete Aggregates. The gradation shall conform to ASTM C33 for Fine Aggregates, which is as follows:

Sieve Size Percent Finer by Weight	
3/8"	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-30
No. 50	10-30
No. 200	2-10

Concrete Sand shall be free of deleterious, including organic impurities.

U2. Concrete Sand Construction Methods

- (1) Concrete Sand shall be placed in layers not exceeding twelve (12) inches and adequately compacted.

V2. Backfilling and Compacting

- (1) Wherever a percentage of compaction for is indicated or specified, it shall be the percentage of the Maximum Density at Optimum moisture as determined by ASTM 1557-78 Method D of the Standard Methods of Test and Moisture –Density Relations of Soils using a 10 – Ib. rammer and an 18 inch drop.
- (2) All excavations will be kept free of all water entering by dewatering, the developer shall submit for approval by the Board the method for dewatering.
- (3) As soon as practical the after installing the utility the contractor shall backfill the trench with the specified material to a density of 95% of the proctor value for the specific material used.
- (4) If the material is found to be too wet the contractor shall bring in dry material, however compaction cannot be performed on wet material behaving plastic regardless of compaction test value.
- (5) Backfill shall not be placed on frozen material.
- (6) The trench one foot above level over the top of the pipe shall be backfilled and compacted by mechanical tamping or rolling (maximum weight of roller 1 ton within 3 feet of pipe) in accordance with the nature of the material and as approved by the Project Inspector. Compaction areas that are unattainable by conventional compaction equipment do to the restrictions of a confined space, excavate able Flow-able Fill (CLSM) will be used as back fill in its place.
- (7) Backfilling of the entire trench before the pipeline has successfully passed any specified tests required shall be at the Contractor's option and risk. The Contractor shall be responsible for removing and later replacing such backfill, at his own expense, should be ordered to do so in order to locate and repair or replace leakage or defective joints or pipe.
- (8) The material shall be deposited in layers of not more than 8 inches in depth before compaction. Each layer shall be tampered or rolled as required to obtain a thoroughly compacted mass. Care shall be taken that the material shall first be wet by sprinkling as directed or approved to achieve approximate optimum moisture. However, no compaction shall be done when the material is too wet, where too wet is described as the material behaving spongy deflecting and rebounding under the weight of the compaction equipment, regardless of compaction test results. If this condition develops, compaction will cease and the wet material will be allowed to dry otherwise removed so that dry material will be installed in its place prior to re-restarting compaction.

- (9) Common fill shown on the drawings shall be selected from excavated materials. Material for backfill in trench shall be as shown on drawings or as directed.
- (10) Puddling or Water Jetting of trench material will not be allowed. Hand tamping or compaction by mechanical means must be used. Any areas not attainable do to working area restraints, excavate able Flow-able fill (CLSM) will be used.
- (11) If the compaction requirements are not met, the Contractor shall excavate and re-compact the material at his expense.

W2. Subgrade

- (1) When establishing the roadway subgrade, all existing material shall be removed to the subgrade plane as defined by the typical cross-section for the entire width of the finished roadway. If, however, the soil is soft and spongy or contains undesirable material such as clay, sand pockets, tree stumps, stones over six (6) inches in diameter or any other material detrimental to the subgrade, a deeper excavation below the subgrade shall be made as required by the Project Inspector.
- (2) All utilities, including drainage, water, sanitary sewer and gas (where applicable), shall be installed and brought to the property line in accordance with these regulations while sub base is exposed, prior to the installation of road base.
- (3) Excavation shall be carried out to the lines and grades as set forth above as shown on the plans as ordered by the Project Inspector. Furnishing, placing and compacting suitable backfill material for such over-excavation as directed by the Project Inspector shall be at the Contractors/Developers expense.

X2. Utilities/Municipal Services

- (1) The applicant shall provide and install all necessary materials, appurtenances and equipment to complete the municipal services as may be required by the Definitive Plan in a manner acceptable to the Planning Board and the officials or agency having jurisdiction of each service as previously mentioned herein. All costs incurred by the applicant as a consequence of installing and maintaining such municipal services as the Board requires shall be paid by the applicant, including all costs which may be incurred for any reasons whatsoever until such time as the Town assumes the responsibility for such service. The Board will not take any action to have the applicant reimbursed for any costs so incurred.

- (2) All underground utilities shall be installed prior to application of the gravel base.
- (3) All underground utilities shall be installed in a parallel fashion. The sewer line shall be in the center of the road and drainage and water on either side, with at least ten (10) feet separating the water and sewer lines or as deemed by the Planning Board.
- (4) All work in connection with the municipal services shall be left uncovered until such time as the Project Inspector the backfill to be placed. The applicant shall notify all utility companies, with municipal services installed or to be installed within the ways, as to the date and time he intends to place the gravel base course and the paving so that such utility company may properly record the location of pertinent features of the system so that they will not be covered or lost as a result of the paving operation.
- (5) All trench backfill material for the municipal services within the way limits shall conform to the base course requirements and shall be deposited to required subgrade in not more than 6 inch layers and compacted to 95% of the dry density as determined by modified Proctor Test, in accordance with ASTM D-1557-70, Method "D".

Y2. Water Systems

- (1) All water systems work shall be performed in accordance with the applicable provisions of supplemented and amended to conform with the DPW and Water Company Specifications latest edition and all amendments thereto. In the event of any discrepancy between the aforementioned specifications and the Contract Documents, the Water Company specifications shall govern, unless ordered otherwise by the Water Company Division Superintendent.
- (2) The Contractors attention is directed to the following conditions, which apply to all projects, related water systems work.
- (3) Prior to beginning the water systems work, the Contractor shall notify the Water Company
- (4) The size and location of all water mains, valves, hydrants, services and appurtenances are subject to final approval by the Water Company and the Planning Board.
- (5) At the completion of construction and prior to final acceptance, the Contractor shall submit to the Water Company and the Hingham Planning Board a set of as-built record drawings showing the location of all water mains, valves, hydrants, and services.

Z2. Maintaining Water Service During Construction

- (1) The Contractor is advised that there may exist active water system mains that are located within the limits of the project construction site. This water supply system must be maintained at all times during the project construction, and provisions for the maintenance of this service should be incorporated into the scope of any proposed water system work. Should water service be disrupted through the fault of the Contractor at any time during work on this project, the Contractor will be required to work around the clock as necessary to restore service at no cost. All water system work shall be subject to the approval of the Water Company and the HDPW in addition to the Project Inspector.

A3. Water Installation Methods

- (1) Excavation for pipes and underground structures shall be done in accordance with Sections in this document and the Massachusetts Highway Department Standard Specifications or as directed by the Project Inspector.
- (2) The bedding for ductile iron pipe shall be shaped to conform reasonably close to the lower 10 percent of the pipe. All pipes shall be laid true to the specified line and grade, with a firm bearing throughout each length.

B3. Construction of Water Supply

- (1) Connection to existing water mains shall be the developer's responsibility but shall be made only under the direction of a Department of Public Works Director and the Water Company. A road opening and water permit must be obtained from the respective entities prior to tapping any main.
- (2) Water mains shall be laid in a dry trench on a twelve-inch bed of sand or approved material. Construction pipe shall be manually tamped with sand the full length of the pipe up to one-half (1/2) the diameter of the pipe to eliminate any voids under the pipe.
- (3) Water mains shall be laid to provide a minimum cover of five (5) feet below the finished grade and a maximum of seven (7) feet.
- (4) The installation of water pipes or related equipment shall not be backfilled until inspected by the Department of Public Works and The Water Company. Backfilling and compaction techniques are the same as those for drainage (See Backfilling).

C3. Installation of Valve Box Construction Methods

- (1) Valves, valve boxes and appurtenances shall be set in general as indicated by the Drawings. The exact location, however, will be determined in the

field by the Project Inspector and the respective Utility.

- (2) Valve boxes shall be set plumb and aligned vertically centered on the operating nut. Valve boxes shall support adequately during backfilling to prevent lateral movement, care will be implemented not to allow soil to fall into the box. The bases will rest on cushions of well-compacted earth placed around the valve or valve gearing and shall not rest upon any part of the valve or pipe.

D3. Raise Water/Gas Castings

- (1) The buried casting will be located, excavating down to the casting and raising the casting to grade.
- (2) Covers or sleeves found to be cracked or defective will be replaced by the contractor at his own expense and supplied by the respective Utility.
- (3) Concrete for setting castings shall not be leaner than 1- part cement, 2- parts sand and 4-1/2 parts stone and shall have a minimum compressive strength of 3000 psi.
- (4) Finish grade of casting elevations shall be determined by utilizing an 8' straight edge extended over the existing road profile both longitudinally and horizontally, and then measuring down from the edge to establish grade.

E3. Gas

- (1) Where natural gas service is available, a gas main may be installed in the grass plot, two (2) feet inside the traveled way or at the location approved by the DPW. The depth of the gas main is to be determined by the utility owning the service installed.

F3. Fire Service

- (1) The fire alarm system connection will be made by the Hingham Fire Department using materials which shall be furnished by the applicant as specified by the Fire Chief.
- (2) The type of hydrants and type and size of pipe serving the hydrants shall be as directed or approved by the Fire Chief.

G3. Sewers

- (1) All materials and work in connection with the sewer system shall be as directed and approved by the Hingham Sewer Commissioners or authorized agents.

H3. Electrical Service

- (1) All materials and work in connection with the street lights and electric power service shall be as directed and approved by the Hingham Municipal Light Board.

I3. Other Utilities

- (1) Wiring, Electrical, telephone and television community cable conduits shall be placed underground. Size, depth, materials and lateral spacing between conduits shall meet the requirements of the respective utility company and the DPW. The final locations of the utilities shall be approved by the Planning board and the DPW. Poles and any associated overhead structures, of a design approved by the Planning Board, shall be provided for use for police and fire alarm boxes and any similar municipal equipment and for use for street lighting.
- (2) Pull Boxes and Conduit (Hand Holes) will be installed when and where deemed necessary by the Planning Board for future work.

J3. Roadway Foundation

- (1) A minimum of twenty-four (24) inches of clean gravel, as approved by the Project Inspector, shall be deposited in not more than eight (8) inch layers for the full width of the way so as to form a roadway foundation which shall be at all points parallel to the finished grade of the roadway surface. Each layer of gravel shall be compacted to 95% of the maximum dry density as determined by the modified Proctor Test, in accordance with ASTM D-1557-70, Method "D". The gravel shall conform to the following gradation:

Sieve Size	% of Passing By Weight
3"	100
2	95-100
1	60-100
3/4	55-95
1/2	48-85
3/8	44-80
#4	33-68
10	23-55
20	15-43
40	8-34
80	2-22
200	0-10
.02 mm	0-3

The Planning Board's Engineer will inspect the roadway foundation after the completion of each eight (8) inch layer.

K3. Pavement Material

- (1) All Hot Mix Asphalt must meet the MassDOT requirements for each mix, as submitted and approved.
- (2) The Developer/Contractor will submit to the DPW and the Planning Board for approval, the intended Job Mix formula from the proposed production facility. The Job Mix formula and the Plant must be currently (annually) approved by the MHD.

L3. Pavement

- (1) A two-course bituminous concrete surface shall be applied to residential streets. A three-course bituminous concrete shall be applied to commercial and industrial streets. The first course for residential streets shall be a binder course as defined by the Standard Specifications, which, after compaction is two and one half (2 ½) inches thick. The first course for commercial and industrial streets shall be a base course as defined by the Massachusetts Highway Department Standard Specifications, which, after compaction, is four (4) inches thick. The second course for commercial and industrial streets shall be a binder course as defined by MHD Standard Specifications, which, after compaction is two and one half (2 ½) inches thick. For all roadways that are to remain in binder course over a winter season Massachusetts Dense Binder is required. Gradation (sieve analysis) and asphalt content tests shall be performed on the material utilized as base course and/or binder course after it has been placed, and submitted to the Department of Public Works for review. All pavements shall be machine placed and rolled with a tandem roller having an effective force of not less than twelve (12) tons. An additional finish roller of less weight will be utilized during the installation of the Top Course (wearing surface) to remove all roller marks produced by the intermediate roller and the break down roller.
- (2) If requested by the Department of Public Works Director, compaction and plane of finished surface tests shall be performed on the Base, Binder and/or Top course during installation or once in place. All requested testing should be performed by an independent testing laboratory at the expense of the Developer.
- (3) Prior to the finished course of pavement being applied, the binder course shall be approved by the Department of Public Works Director. Paving will not be allowed if it is raining or the roadway is wet, if frost is present, or when the air temperature is below forty degrees Fahrenheit (40° F.) and falling. The temperature of the bituminous concrete mixture shall be a minimum of 280° F

and a maximum of 320 ° F prior to being placed and a minimum of 170° after intermediate rolling, all in accordance with standard Specifications.

- (4) All frames, grates, manhole covers and water gates shall be adjusted to the proper finished grade by setting in a concrete bed. Only with the approval of the DPW and the Project Inspector, any depressions or irregularities in the binder pavement are to be saw cut out to a depth of twenty-four (24) inches and replaced with compacted Processed Gravel and hot binder at least one (1) week before final paving.
- (5) The base binder course pavement must be swept clean by a Street Sweeper of all loose material prior to being paved. Any areas not accessible by the Street Sweeper will be swept by hand.
- (6) A tack coat of emulsified asphalt shall be applied with a pressure distributor at a rate of five-hundredths (0.05) of a gallon per square yard, immediately preceding the binder and top course paving. All longitudinal and Transverse joints will also be tack coated; inaccessible areas to pressure distributors shall be applied by hand held brushes. An environmentally safe synthetic mat specifically designed for the purpose may be substituted for the tack coat of emulsified asphalt.
- (7) The finished course of Massachusetts Highway Department bituminous concrete top course shall be applied to a one and one half (1-1/2) inch thickness after compaction on residential, commercial and industrial streets, with a roller having an effective force of not less than twelve (12) tons.
- (8) The developer shall make and maintain all subdivision roadways so that all occupied dwelling units within the subdivision are easily accessible to all municipal and emergency services to the satisfaction of the Hingham DPW, Hingham Fire Department and the Hingham Police Dept.
- (9) All roadways shall be prepared in such a manner that all manholes catch basins, valve gates or other structures in the roadway are installed with bituminous paving around the perimeter of each such structure such that a smooth transition is maintained between the top of each structure and the road surface. The elevation of these structures shall be established by running a eight (8') foot straight edge over the top of structure both longitudinally and transversely to the roadway to a finished height along the straight edge equal to that of the compacted pavement thickness.
- (10) At the discretion of the Project Inspector, temporary installation of catch basin gates may be required at levels lower than the base coat elevation to make them functional prior to application on the finish coat.
- (11) If requested by the Department of Public Works Director, compaction and plane of finished surface tests shall be performed on the top course paving

once in place. All requested testing should be performed by an independent testing laboratory at the expense of the Developer. The Director of Public Works may request remedial repairs or replacement of any portion of the pavement system if it fails to meet these and/or the Massachusetts Highway Department Standard Specifications Latest Edition and the requirements listed in this document.

- (12) Handwork will be kept at an absolute minimum. The paver will pinch the longitudinal joint as tightly as possible to avoid excessive luting, and segregation.
- (13) Care will be taken to avoid end of load segregation by not closing the wings on the hopper excessively and not running out each truck into the paver until empty.

M3. Pavement Compaction & Testing

- (1) The Developer will provide at their expense an Independent Pavement Inspector that will be responsible for testing compaction, temperature, thickness and overall placement techniques.
- (2) If a plant inspection has not taken place during the installation, then the paving inspector will obtain a field sample at a minimum frequency of one sample per 750 tons. At the Developer's expense, the sample obtained will be set aside, and subject to testing at the Project Inspectors discretion.
- (3) The placement contractor will be responsible for proper installation equipment, which will include pavers that are in good operating order, compaction equipment of suitable size and type, and a sufficient number of trucks so as not to cause major delays between loads that will result in cold joints.
- (4) Roadway will be compacted to 92-97% of the Maximum Theoretical Density. Prior to paving the independent pavement installation inspector will be provided with the Maximum Theoretical Density by the production facility, the pavement surfaced will be tested using a density gauge (nuclear gauge). During the installation, the paving inspector will check to assure the proper thickness and temperature is being provided, he or she will notify the paving contractor and the developers representative of any deficiencies during the installation. He or she will also notify the Town Project Inspector of any problematic issues.
- (5) At the Developer's expense the town may request that the pavement be cored and the Mix be analyzed for verification of compaction and mix composition which would include the following tests:

- Extraction
- Bulk Density of the Core
- Maximum Theoretical Density of the Core
- Density of the core
- Core Thickness

N3. Driveway Installations (Pavement)

- (1) Driveway cuts shall not be allowed within sixty- (60) feet of the intersection of the centerline of intersecting streets. In no instances shall catch basins be located along a driveway curb opening. Driveway openings shall be shown on the definitive plan.
- (2) Driveways shall be paved from the curb to the property line. That portion of all driveways within the street right-of-way limits shall be constructed to the same specifications as the roadway: twelve-inch gravel base binder at two and one half (2 ½) inches after compaction and top coat at one and one half (1 ½) inches after compaction. Sidewalk grades shall be continuous across driveway openings. Transition in grade of no more than two inches will be allowed.
- (3) Driveways shall be at least ten (10) feet wide and shall have an opening of at least sixteen (16) feet in the curb at the gutter line.
- (4) At all driveways, the grade at the back of the sidewalk shall be at least six (6) inches higher than the grade at the gutter line.
- (5) The junction of sidewalks, driveways and roadways shall be constructed in such a manner as to prevent recessed areas where puddling may form.

Driveways serving the premises shall provide access through the required frontage of the serviced lot, except in the case of a common driveway.

O3. Sidewalks

In residential areas, sidewalks shall be five (5) feet wide. In commercial and industrial areas, sidewalks shall be six (6) feet wide. A minimum of five-foot-wide traveled way shall be maintained at all times. In all areas, all materials shall be removed or filled to a depth of twenty-seven (27) inches below the finished design grade. Any soft spots of undesirable materials shall be removed and replaced with gravel. The sidewalk area shall be filled with gravel and rolled or compacted with a vibratory plate of a suitable size to a compacted depth of eight (8) inches at a time with a slope of 1.5% (maximum of 2%) per the most recent MHD American Disability Act specifications pitched toward the street whenever possible. In areas of high groundwater as previously determined by soil borings or test pits, the compacted depth of gravel shall be increased to twelve (12) inches.

Sidewalks shall extend to the paved roadway at intersections to provide convenient

walk-off for crossings and shall be ramped for the handicap accessibility to the gutter with no curb at threshold unless otherwise noted. Handicap ramps shall be shown on the plan and shall be constructed in accordance with the latest revision of the MHD American Disability Act specifications and architectural access codes.

- (1) Sidewalk materials shall be subject to testing as listed in Pavement Compaction & Testing, Backfill, and Compaction for Gravel.

P3. Paved Sidewalks

- (1) Sidewalks shall have a finished grade in relation to the roadway as shown on the "Typical Road Cross Sections" and shall be constructed of Bituminous Concrete in accordance with the Department's Specifications subject to the approval of the Project Inspector.
- (2) The gravel foundation shall be a minimum of twenty-four (24) inches in compacted thickness and shall otherwise conform to the requirements of the roadway foundation. Sidewalk paving to consist of 2" binder course and 1 1/2" finish course, for a total of 3 1/2".

Q3. Concrete Sidewalks

- (1) A five-inch-thick Class A [four thousand (4,000) pounds per square inch (psi)] concrete shall be applied to the prepared gravel base. A slump test shall be performed by an independent testing lab for every other truck. The slump shall vary between two and four inches. Department of Public Works personnel shall observe and accept or reject the concrete delivery based on test results.
- (2) Sidewalk grade shall be continuous across driveways openings. Transition in grade will not be allowed. Four-by-four-inch welded wire mesh or equal shall be installed at all driveway aprons. The welded wire mesh or equal shall be supported in place such that a minimum two-inch concrete coverage is maintained in all locations. The concrete shall be a plant mix, placed, floated, trowled and then finished with a broom. Curing and sealing compound shall be applied. Preformed expansion joints shall be installed fifteen (15) feet on center for five-foot-wide sidewalks and eighteen (18) feet on center for six-foot-wide sidewalks.
- (3) Finished sidewalks shall be sloped as specified in this document. Trowled joints shall be installed five (5) feet on center in residential areas and six (6) feet on center in commercial and industrial areas. Plant mix design data and delivery slips shall be submitted to the Planning Board and Department of Public Works for review. All construction and concrete repair (if necessary) shall be in accordance with MassDOT Standards. Finished concrete sidewalks

shall be inspected by the Project Inspector and will not be accepted until the surface is uniform and contains no defects.

R3. Crosswalks

- (1) The Planning Board shall approve layout of crosswalks prior to the installation.
- (2) All twelve-inch (12”) thermo-plastic lines or reflective paint shall be applied in one (1) application; no combination of lines (i.e. two 6” lines) will be accepted.
- (3) All crosswalks shall conform to latest revisions of the Massachusetts Highway Department “Standard Specifications for Highway and Bridges” for reflectorized lines (thermo plastic/paint) and material M7.01.20.
- (4) Any installation of Reflectorized Paint or Thermo Plastic will be contingent upon allowable weather conditions, which will facilitate proper bond.

S3. Pedestrian Wheel Chair Ramps & Crosswalks

- (1) Pedestrian (wheelchair) ramps shown on plans will conform to Massachusetts Highway Department “Wheel Chair Ramp Standards” revised October 8, 1997 (or latest revision).
- (2) Wheelchair ramps shall be concrete.
- (3) Wheelchair ramps shall contain a detectable tactile “warning strip” installed in the concrete wheelchair ramp. Detectable warnings shall consist of a surface of truncated domes aligned in a square or radial grid pattern and shall comply with R304.
- (4) Manufacturer should be Massachusetts approved. Domes should be set flush with the finish grade of the concrete. Ramp should be constructed so as not to hold water. Utilizing an edger the concrete should be scored allowing water to drain the ramp.
- (5) Detectable tactiles shall be red in color, unless otherwise approved.
- (6) The contractor shall exercise extreme care to construct the ramps with proper sidewalk cross slopes, wheelchair ramp slope, and clearances.
- (7) The Project Inspector must approve any modification to the proposed ramp designs.

T3. Curbing

- (1) Except as otherwise required in this section, bituminous concrete curbing

(Cape Cod berms), vertical granite, sloped granite, or granite curbing shall be provided along both sides of the roadway.

- (2) Where vertical granite curbing meets bituminous Cape Cod berms, suitable granite transitions shall be constructed.
- (3) Care will be taken when moving curb so as not to damage the curb, any chipped or broken curbing will not be used.
- (4) Concrete shall have a minimum strength of 3000 psi for setting curb.
- (5) Curbing or any other material shall not be left in the roadway(s) without the approval from the DPW.
- (6) Gutter mouth curb will be used at all drainage inlets.
- (7) 1/2" curb joints will be provided
- (8) Type M mortar will be used at all curb joints once the curb has been set in concrete.
- (9) Curb will be set so the concrete flows under the middle of each section of curbing by 3", so that curb does not shift after construction or during plowing.
- (10) The back of the curb will be backfilled with gravel and compacted as described in "Sidewalks" once the concrete used for setting the curb has been allowed to set for 24 hours.
- (11) Radius curb will be ordered and installed to the length of radius and size of radius specified in the drawings at the specific location, any substitutions that may be considered will be made only with the approval of the Project Inspector.

U3. Vertical Curbing

- (1) Vertical Curbing shall be VB (Massachusetts Highway Department and Department of Public Works Specifications M9 & Section 500) vertical granite where high-frequency parking is anticipated, such as where multifamily units are to be near the street or at drop-off points in nonresidential development or such curbing is necessary to control surface run-off, or prevent serious erosion, or for safety or other similar purposes.
- (2) Where vertical granite curbing is installed, all curb inlets for catch basins shall be granite mouth curbing.
- (3) Vertical granite curbing shall be upright four-foot-minimum lengths, finished side facing the traveled way, with a finished reveal of seven (7) inches plus or

minus $\frac{3}{4}$ ". It shall be installed in accordance with the specifications of the Massachusetts Highway Department Standard Specification.

- (4) Curb will be installed so that the face of the curb tilts very slightly ($\frac{1}{8}$ of an inch from top to bottom) backward toward the sidewalk minimizing damage to tires and damage to curb edge from plows.

V3. Sloped (Slant) Granite

- (1) Sloped granite curb, Type SB, is to be used on all grades of approximately seven percent (7%) or greater.
- (2) Slant granite curbing shall be of lengths determined by the Department of Public Works to be adequate to serve the situation (Massachusetts Department of Public Works Specification M9 & Section 500). It shall be set on compacted gravel at some angle not less than forty five degrees (45o) and not greater than sixty degrees (60o). In addition, it shall have a reveal of seven (7) inches plus or minus three quarters inches ($\frac{3}{4}$ ") measured from the top of the granite level to the finished grade. It shall be supported in place by blocks or undisturbed earth. The granite shall be set in a concrete base approximately six (6) inches square, which shall abut against the binder course. The concrete shall be placed in front and under the granite during an initial pour up to $\frac{1}{2}$ " below the binder grade. The concrete shall be placed in back and under the granite during a second pour, half way up the back of the curb. The top course of paving will cover the concrete and key the granite in place. Joints on the face and top of the granite curb shall be mortared. The angle, alignment and reveal shall be uniformly maintained.
- (3) The back of the curb will be backfilled with gravel and compacted as described in "Sidewalks" once the concrete used for setting the curb has been allowed to set for 24 hours.

W3. Curb at Driveways

- (1) Two foot vertical granite radius corner pieces may be required at all driveway openings along vertical granite curbing.
- (2) Transition pieces may be required at all driveway openings along slant granite curbing and vertical curbing. The transition shall be a piece of granite curbing (minimum length seven feet) that starts with proper reveal and transitions downward to be just higher than flush (finish grade elevation plus $\frac{1}{2}$ ") with finish grade at the driveway opening to avoid puddling at driveway opening. All other requirements listed in Curbing apply during the installation.

X3. Street Lighting

- (1) It is the responsibility of the developer of any subdivision within the Town of Hingham to provide for the installation of sodium vapor street lighting within that subdivision in accordance with Hingham Lighting standard specifications with The Planning Board approval.
- (2) The developer may be required to install all roadway lighting in those designated locations along the roadway that would be considered the normal path of ingress and egress to that dwelling.
- (3) When required, street lighting shall be installed as follows: within a subdivision each intersection, intersecting way, cul-de-sac, curve with a radius of sixty degrees (60°) or greater over a linear distance of two hundred (200) feet or other road hazard shall be illuminated by a lighting fixture(s) which is to be installed on a structure(s) (pole, post, etc.) nearest the road hazard identified.
- (4) The quantity, type and location of lights within a proposed subdivision shall be subject to Planning Board approval and shown on the definitive plan. The lighting fixture and structure specification is as follows:
 - (5) Fixture lumen rating: four thousand (4,000).
 - (6) Nominal structure mounting height above street grade: twenty-five (25) feet.

Y3. Unaccepted Street Lighting

- (1) Where the town has not agreed or is likely not to accept future payment for street lighting, the developer, contractor or association of customers shall: Provide, install and retain ownership of all street lighting equipment, including underground conductors, conduits, foundations, poles and luminaries; and Contract directly with the Hingham Municipal Light Company to provide electricity for light operation and to service and maintain all equipment on a long-term basis.

Z3. Accepted Street Lighting

- (1) Where the town has accepted a roadway or is likely to accept street lighting, or itself owns a parking lot or other way, or has otherwise agreed to supply streetlight service to a private way, the developer, contractor or association of customers, or the town in the case of a municipal facility, shall provide and install all street lighting including underground conductors, conduit and foundations on which poles and luminaries are set. In case of accepted street lighting, the town shall contract with the Hingham Municipal Light Company

to provide electricity for light operation and to service and maintain all equipment.

A4. Landscaping (Grass Plot, Side Slopes, Street Trees)

- (1) Planting areas and shoulders shall pitch toward the traveled way not less than one-fourth (1/4) inch nor greater than two (2) inches to the foot.
- (2) Grass seed shall be spread during the growing season at the rate of four (4) pounds per one thousand (1,000) square feet. It shall be a mixture of creeping red fescue and perennial rye grass. It shall be properly fertilized, limed and watered. A guaranty period of one (1) year from full growth and final bond release shall be honored by the Developer.
- (3) All disturbed unpaved areas within the street right-of-way shall be loamed to a minimum of six-inch thickness and seeded.
- (4) A grass plot shall be provided on each side of all roadways between the edge of the roadway and the sidewalk. The finished grade of the grass plot in relation to the finished grade of the roadway shall be as shown on the "Typical Road Cross Sections".
- (5) The area between the sidewalk and traveled way shall have six (6) inches of loam which, when rolled, shall match with the top course of the sidewalk and the top of the front face of the curb.

X3. Side Slopes

- (1) As part of design, the area behind the sidewalk or shoulder shall be sloped at not more than the ratio of three (3) feet horizontal to one (1) foot vertical to a point where it precisely coincides with the surrounding ground or abutter's lawn. Side slopes shall be loamed and seeded or retained in existing vegetation the same as grass strips.
- (2) Terracing and/or sloping of grades to the roadway will be required when the normal runoff from a lot onto another has been made greater by new construction or by man-made land changes.
- (3) Terracing shall be done with earthen embankments, and each terrace shall have no more than a three-foot vertical drop. Natural slopes or terraces will be no greater than one (1) foot horizontal to one (1) foot vertical, although no slopes greater than three (3) feet horizontal to one (1) foot vertical shall be allowed within ten (10) feet of the lot line. "Terrace" shall mean a raised flat mound of earth with sloping sides.

- (4) The areas of cut or fill outside the traveled way shall be sloped as follows until it intersects the finished grade of the abutting lots, except as may be required for sidewalks and except where, in the opinion of the Board, slopes in excess of the following are warranted to mitigate impact upon wetlands or other natural features:

Depth/height of cut/fill slope	Maximum permissible rate of
Less than 4 feet	6 to 1
feet to 10 feet	4 to 1
More than 10 feet	2 to 1

- (5) Where fill slopes equal or are greater than 3 to 1, a guardrail shall be placed at a distance no less than four (4) feet from the edge of traveled way. The detail should include rail, posts and cable. The guardrail section shall include a 16' approach to begin 16' prior to the 3 to 1 slope. An example of an appropriate guardrail is shown in Figure 4.

B4. Street Trees

- (1) Street trees, not less than twelve (12) feet in height and of a species approved by the Superintendent of Public Works, shall be planted on each side of every street in the subdivision wherever, in the opinion of the Planning Board, existing woodlands or individual trees are not retained. Trees shall be located on private property and planted a minimum of (10) feet outside the right of way. Spacing shall be 50' on-center. Upon acceptance, these trees shall be considered privately owned trees by the respective property owner.

C4. Bounds/Monuments

- (1) Granite monuments with the letters HHB (Hingham Highway Bound) engraved into the top shall be set 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.
- (2) Bounds shall be installed at all street intersections, at all points of change in direction or curvature of street side lines, arcs on curves at intervals of 300 feet, all easement boundaries, and at other points where, in the opinion of the Planning Board, permanent bounds are necessary. Such bounds shall be pre-cast reinforced concrete not less than thirty-six (36) inches in length and six (6) inches square. Other than bounds that exist, bounds shall be installed at all turning points for parcels designated as open space.

- (3) Each lot shall have at least one (1) sideline marked by a bound.
- (4) Bounds shall be set to the finish grade. A registered land surveyor shall certify to the Planning Board that the location of such bounds has been verified by him, following all earthwork and paving and shown on as-built plans.
- (5) Monuments shall be at least four (4) by four (4) inches and shall extend a minimum of three and one-half (3 1/2) feet below finished grade to not more than six (6) inches above finished grade, except that bounds located in lawns shall be of materials approved by the Planning Board, and shall be set with the top flush or slightly below finished grade and except that bounds set in driveways, sidewalks or other paved areas shall be constructed of a 2" brass rod extending 3' into the ground and shall be set flush to finished grade.

D4. Street Signs

- (1) Street signs of the type commonly used on public ways of the Town and bearing the names of the intersecting streets as indicated on the Definitive Plan shall be erected at all intersections of streets in the subdivision. Such signs shall be subject to the approval of the Board.
- (2) Street signposts shall be ten (10) feet in length, three (3) feet of which shall be buried in the ground. An anchor shall be installed with the underground portion to prevent turning or removal.
- (3) The Developer shall furnish and install double-faced extruded-aluminum street signs, mounted on two-inch-diameter posts equal to those in use by the Hingham Department of Public Works.

E4. Transformers, Fire Alarm Boxes, Mailboxes

- (1) Transformers and junction boxes for underground wiring and telephone shall be located outside of the right of way in easements permitting access for maintenance purposes.
- (2) Fire alarm boxes and hydrants shall be located according to the specifications of the Hingham Fire Department either in the grass strip or in easements outside of the right of way.
- (3) Personal mailboxes shall not be located in the Town right of way.

F4. Cleaning Up

- (1) The entire area of the subdivision shall be cleaned up so as to leave, in the opinion of the Board, a neat and orderly appearance free from debris and other objectionable materials. All catch basins and manholes shall be cleaned out.
- (2) The Developer shall remove from the street and adjoining property all temporary structures, debris, tree stumps, loose rocks and surplus materials which may have accumulated during the prosecution of the work, leaving the subdivision in a neat and orderly condition. Prior to completion of work, the applicant shall clean the entire stormwater management system, both on-site and off-site to its point of discharge.

SECTION 6

INSPECTION

A. General

- (1) All work performed as a consequence of these Rules and Regulations shall be subject to the review of the Board which shall approve and accept or disapprove and reject each phase or portion of such work and at completion shall recommend the acceptance of all work or disapproval of the work with reasons therefore. The Board will employ a Registered Professional Engineer in the inspection of the work to insure compliance with these Rules and Regulations and to report to the Board his recommendations as to approval or disapproval of the work. Such engineer will make certain inspections as prescribed herein in order to check the adequacy of the work at various stages prior to such work being covered by subsequent work. However, the Board, its engineer, and such other persons as the Board may designate shall have the right to inspect the work any time. Therefore, the applicant shall at any time provide safe and convenient access to all parts of the work for inspection by the Board or its engineer.

Inspection by the Board's engineer does not in any way limit the right of the Board to require or direct the applicant to rectify, correct or alter any portion of the work, deemed in the opinion of the Board, upon receipt of evidence or facts leading the Board to conclude as such, that further work is necessary to satisfactorily complete and satisfy the plan as approved by the Board.

- (2) All work which has been disapproved or is not acceptable to the Board shall be removed and replaced or otherwise corrected to the point of complying with the requirements of the Board for acceptance. Any work which has been covered by subsequent work prior to acceptance, or is otherwise not available or obscured to the point of rendering inspection of the work difficult, shall be considered to be not acceptable to the Board. Such subsequent work shall be removed as directed by the Planning Board to insure availability of the work to be inspected as required herein. The release of the performance guarantee shall depend upon the acceptance of all work prescribed herein and on the Definitive Plan and as directed by the Board.
- (3) At points indicated in Section 5 and as further described hereinafter, the construction of the required improvements shall be inspected by the Board's engineer, and unless approval of the work completed, including approval of materials used, to each such point has been given in writing, no further work shall be commenced. Such inspections may include the taking of certain samples for laboratory analysis or testing, in such cases, the applicant shall insure that the engineer is in no way hindered or obstructed in the course of obtaining such

samples. Where such samples are removed from the completed work, the applicant shall replace and restore such work, to the satisfaction of the engineer, to its condition prior to the taking of the sample.

The Planning Board or its engineer may require certified copies of delivery receipts or bills of lading or other certification as to the description of materials used or incorporated in the work. The Planning Board or its engineer may also require a sample of any materials or supplies, which may be incorporated in the work; such samples shall be furnished at the expense of the applicant, and the applicant shall be liable for all costs and fees incurred by the Board as a result of testing such materials.

B. Preconstruction Requirements

At least seven days prior to the proposed construction start date and before the pre-construction meeting takes place, an Applicant shall provide the Planning Board, the Planning Board's Engineer with the following information:

- (1) An affidavit certifying that the Applicant is the owner of record of all of the property shown on the endorsed definitive plan or documentation signed by the owner(s) of record that the Applicant has authorization to act on all matters pertaining to the construction of the development.
- (2) An affidavit certifying that the Applicant has reviewed all of the conditions of subdivision approval and has taken all of the required steps to satisfy the conditions.
- (3) An affidavit certifying that all required federal, state and local permits have been obtained and providing a list, with the dates of issuance of each permit and the permit identification number.
- (4) A letter identifying the persons or entities responsible for completion of any portion of the project including the name, address, telephone number and e-mail address of each such person or entity.
- (5) A letter that identifies (name, business address, telephone and facsimile numbers and e-mail) for the following:
 - *The official representative of the Applicant and owners.
 - *The engineering and surveying firm to be used during construction.
 - *The general contractor.
 - *The soils testing firm to be used during construction.
- (6) Shop drawings and/or catalog cuts of all structures/materials to be used to construct the approved definitive subdivision. All catalog cuts shall be highlighted as to product submitted for approval.

- (7) Certification by a Land Surveyor that the site control data including benchmarks, limits of work and horizontal control has been properly staked.
- (8) The location of the disposal site for all solid waste and surplus material must be supplied and approved.
- (9) Any changes to previously submitted information contained above must receive approval of the Planning Board.
- (10) **Preconstruction Meeting.** At least 48 hours prior to the beginning of construction, the Applicant shall arrange and participate in a pre-construction meeting with the Planning Board's Engineer to review all construction requirements. (See Appendix -Preconstruction checklist)

C. Notification to the Engineer

- (1) After approval of the Definitive Plan and subsequent to the receipt by the Board of the fee required under these Regulations, the Board will notify the applicant of the name and address of the engineer designated to perform the inspections as required herein. The applicant shall keep the Planning Board and a representative of the Hingham Department of Public Works fully informed as to the status and progress of the work and shall notify the engineer, through the Planning Administrator, (by mail or in-person telephone) at least two (2) business days in advance, that the work has progressed to a stage that an inspection is required, unless other arrangements acceptable to the parties concerned have been made.
- (2) In the event that the engineer is unavailable to provide inspection services within two business days of the applicant's request, the Planning Board may designate a substitute engineer.
- (3) In the event the engineer makes an inspection of the work at the time designated and finds that such work is not at the proper stage of completion or that the work has been covered or otherwise obscured, the engineer shall notify the applicant and the Board as to the additional steps the applicant shall take to complete the work to the point required or to the extent the work shall be uncovered or exposed to full view. The applicant shall notify the Board again when the work is ready as prescribed in Section 6,B.,(1).
- (4) The applicant shall be responsible for maintaining sufficient escrow balance to pay for all costs and fees incurred by the Board as a result of requests by the applicant for any inspection of the work.

D. Lines and Grades

- (1) Prior to the inspection of any phase of the work, it shall be the applicant's responsibility to provide sufficient line stakes and grade stakes to insure that a proper inspection may be made. These horizontal and vertical control stakes must be laid out to conform to the lines and grades shown on the approved Definitive Plan or any approved amendment thereto. A licensed land surveyor, retained by the Applicant, shall establish control for all stakeout on the property including the limit of work, project boundaries and both vertical and horizontal benchmarks. If requested by the Board a copy of the control plan in both paper and digital formats shall be provided for reference.
- (2) The engineer will advise the Board at any time during the construction if, in his opinion, he believes that the work has not been laid out to the lines and grades as shown on the Definitive Plan. In such cases, the Board will proceed as described as described elsewhere in these Regulations.
- (3) Any costs which, in the opinion of the Board, is the responsibility of the applicant as noted in these Regulations shall be in addition to the fees required elsewhere herein.

E. Inspection of Required Improvements

It is typical practice for construction to be a fluid process with one phase leading to another in a continuous manner. The Board and their representative will work to maintain the proposed construction schedule subject to proper notification and quality of work. The following inspections of the required improvements will be made by the Board's engineer. These inspections are the minimum required. In addition, random site visits to observe site conditions and inspections after rain or other weather events will be performed. The Board may also request, or require other inspections at their discretion. Although the order of the inspections follows general construction practice, certain inspections may be required at

- (1) The first inspection will be made to observe site control staking, clearing limits and erosion controls. The surveyor shall provide the Board with a certification statement that all control has been installed and complies with the requirements of the Board. For multi-phase projects, there may be limits to initial staking, erosion controls etc. The control staking and certification is required for each phase as applicable.

No clearing or cutting shall commence for any phase of the project until the inspection above has been performed to the satisfaction of the Board or their representative. An inspection will be made of the work upon completion of all clearing, grubbing and excavation of unsuitable soils including top and subsoil within the roadway and other areas to be cleared for the project, with exception

to individual house lots as applicable as may be required or implied by these Regulations. No fill shall have been placed at the time of this inspection.

- (2) An inspection will be made of the compacted fill consistent with the requirements for various fill materials in these Regulations and as may be required to bring the roadways to their proposed grades. The applicant shall notify the engineer as to his source of gravel for fill as soon as such information is known, so that samples may be taken and analyzed by the engineer. The applicant shall not proceed with the filling operation until such time as the engineer notifies the applicant that the gravel proposed for the fill is acceptable. The applicant shall not use a gravel source other than the one designated without prior notice to the engineer. The Planning Board's representative will require in-situ testing of the gravel material to assure consistency from the source. Test locations and frequency are at the discretion of the Town's representative.
- (3) An inspection will be made of the drainage outfall(s), which shall be laid as the first part of the drainage system, and which shall be placed at the elevations required under the Definitive Subdivision Plans as approved by the Board. The engineer shall be satisfied that the placement of the outfall is consistent with the requirements of these Regulations, the Definitive Plan and the existing conditions of the site. Upon approval, the engineer shall require that the outfall be permanently set to the line and grade approved and shall require that the applicant submit certification of the final invert elevation at the outfall.
- (4) The drainage system shall not be covered until such time as the Planning Board's representative has inspected the installed drainage system. It is anticipated that drainage system installation would occur on a continuous basis with inspection of the portion completed prior to backfill. No components are to be covered without inspection.

At the same time, or such other time as the work may be available, inspections will be made of the completed municipal services (without back fill) as required on the Definitive Plan. The inspection of the required municipal services will be made by the agency responsible for the particular service. Each agency so involved will notify the Board's engineer of the approval of such work. The Board's representative may also inspect portions of the installation of other municipal services and or private utilities to ensure that materials and installation is consistent with the plans.

- (5) An inspection will be made of each six (6) inch layer of compacted roadway foundation as specified the Construction Specifications. In-situ gravel sample or samples will be taken at random locations at the direction of the Planning Board's representative,

- (6) An inspection will be made of the final six (6) inch layer of compacted roadway foundation. Where precast concrete or granite curb is to be used, it shall be installed prior to this inspection.

After this inspection the Applicant shall set roadway and easement bounds and prepare an interim as-built plan, indicating the location of all improvements, utilities, easements, right-of-way lines, drainage inverts, etc. The interim as-built shall be prepared at the same scale as the Definitive Plan and be provided in both paper and digital form for review and approval prior to any lot release.

- (7) An inspection shall be made of the bituminous concrete base course as it is installed. The Applicant shall provide at least 48 hours notice for the Town to procure the services of a certified testing company to inspect the pavement. This includes the services of a Certified testing lab for certification of the mix at the plant prior to delivery to the site, and for testing of temperature, compaction, etc. on site. The Applicant is responsible for the costs of the testing lab and inspector. The coordination of the testing will be performed by the Town's representative.
- (8) Permanent monuments for the roadway, easements, etc. shall be set and protected from damage prior to paving.
- (9) An inspection will be made of the completed Class I Bituminous Concrete Pavement Type I-1 for the roadway surface as it is installed. The Applicant shall provide at least 48 hours notice for the Town to procure the services of a certified testing company to inspect the pavement. This includes the services of a Certified testing lab for certification of the mix at the plant prior to delivery to the site, and for testing of temperature, compaction, etc. on site. The Applicant is responsible for the costs of the testing lab and inspector. The coordination of the testing will be performed by the Town's representative.
- (10) An inspection will be made of all work as required on sidewalks, grass plots, side slopes, street signs, plantings, etc. The timing of these inspections is dependent on the installation of said improvements.
- (11) A Final inspection will be made of all subsequent work as required herein or on the Definitive Plan to include the final clean-up.
- (12) Annual Inspection November/December An annual inspection, if required, prior to project closeout for winter shall be performed. The Board's representative will inspect the site with the project superintendent to determine work to be done to stabilize and protect the site during the winter.
- (13) Annual Inspection April An annual inspection, if required, prior to project restart in the spring shall be performed. The Board's representative will inspect

the site with the project superintendent to determine work to be done to repair winter damage and to stabilize and protect the site relative to proposed work scheduled to be performed.

F. Engineer's Report

- (1) The engineer will submit weekly reports as necessary during the progress of the work. If no work or inspections occur during specific weeks a report will not be prepared. A sample weekly report is attached in the Appendix.
- (2) At the completion of the work and in association with any surety reduction request(s), the engineer will report to the Board that in his or her opinion the work has been performed in accordance with these Rules and Regulations and the Definitive Plan, or the engineer will advise the Board that the work is not acceptable with the reasons therefore. Notwithstanding such an opinion by the engineer, the Planning Board is the final authority as to the sufficiency of the work done.
- (3) At any time during the progress of the work, the engineer will advise the Board, immediately, of any factors which may adversely affect the progress of the work.
- (4) The engineer's inspection report will be submitted to the Board as shown on Form R1 (See Appendix).

HINGHAM PLANNING BOARD

Preconstruction Checklist

Subdivision Name: _____

Applicant: _____ Phone: _____

Road Contractor: _____

Name of Street: _____ From Station: _____ To Station: _____

_____ (1) An affidavit certifying that the Applicant is the owner of record of all of the property shown on the endorsed definitive plan or documentation signed by the owner(s) of record that the Applicant has authorization to act on all matters pertaining to the construction of the development.

_____ (2) An affidavit certifying that the Applicant has reviewed all of the conditions of subdivision approval and has taken all of the required steps to satisfy the conditions.

_____ (3) An affidavit certifying that all required federal, state and local permits have been obtained and providing a list, with the dates of issuance of each permit and the permit identification number.

_____ (4) A letter identifying the persons or entities responsible for completion of any portion of the project including the name, address, telephone number and e-mail address of each such person or entity.

_____ (5) A letter that identifies (name, business address, telephone and facsimile numbers and e-mail) for the following:
*The official representative of the Applicant and owners.
*The engineering and surveying firm to be used during construction.
*The general contractor.
*The soils testing firm to be used during construction.

_____ (6) Shop drawings and/or catalog cuts of all structures/materials to be used to construct the approved definitive subdivision. All catalog cuts shall be hi-lighted as to product submitted for approval.

_____ (7) Certification by a Land Surveyor that the site control data including benchmarks, limits of work and horizontal control has been properly staked.

_____ (8) The location of the disposal site for all solid waste and surplus material must be supplied and approved.

_____ (9) Any changes to previously submitted information contained above must receive approval of the Planning Board.

_____ (10) Preconstruction Meeting. At least 48 hours prior to the beginning of construction, the Applicant shall arrange and participate in a pre-construction meeting with the Planning Board's Engineer to review all construction requirements.

HINGHAM PLANNING BOARD

R1 - Report of Inspection for Construction of Required Improvements

Subdivision Name: _____

Applicant: _____ Phone: _____

Road Contractor: _____

Name of Street: _____ From Station: _____ To Station: _____

Engineer's signature on each line is a certification of compliance with the Definitive Plan and Subdivision Rules and Regulations.

#	Date	Inspection	Engineer's Signature
1		Clearing, Grubbing and Excavation	
2		Drainage Outfall Permanently Set	
3		Total Drainage System and Municipal Services	
4		Compacted Fill	
5		First Foundation Layer	
6		Second Foundation Layer	
7		Bituminous Concrete Base Course	
8		Bituminous Concrete Base Class I Surface Course	
9		Sidewalks, Curbing, Monuments, Grass, Etc.	
10		Final Inspection, Clean-up, Etc.	

The Following Tests were Performed (Report Attached Hereto):

Date of Test Type of Test Signature Certifying Acceptance of Results

HINGHAM PLANNING BOARD

R2 - Certificate of Construction and Performance

Subdivision Name: _____

Applicant: _____ Phone: _____

Engineer: _____ Phone: _____

Name of Street: _____

(The engineer responsible for inspecting the work will make one of the two alternative certifications below, with appropriate entries and deletions, upon completion of all required inspections and re-inspections):

I, _____, certify that the Subdivision described above has (has not) been constructed in conformance with the Definitive Plan and all amendments, and the Rules and Regulations of the Planning Board (and that the ways, utilities, drainage and municipal services have been installed to line and grade as shown in the Definitive Plan so that a waiver of "as-built" plans is recommended).

Professional Engineer's Stamp Date _____ Signature _____

I, _____, certify that with the exception of minor changes shown on the attached plans, the line and grade of ways, utilities, drainage and municipal services is as shown on the Definitive Plan, so that, with the attached drawings, a complete record is available and "as-built" drawings may be waived.

Professional Engineer's Stamp Date _____ Signature _____

FORM A

**APPLICATION FOR ENDORSEMENT
OF PLAN BELIEVED NOT TO REQUIRE APPROVAL**

Hingham, MA, _____, 20__

To the **Hingham Planning Board**:

The undersigned, believing that the accompanying plan of his property in the Town of Hingham does not constitute a subdivision within the meaning of the Subdivision Control Law, herewith submits said plan for a determination and endorsement that Planning Board approval under the Subdivision Control Law is not required. For the following reasons:

1. Name of Applicant: _____

Address: _____

Telephone#: _____ Work#: _____

2. Name of Engineer or Surveyor: _____

Address: _____

3. Deed of Property recorded in _____ Registry of Deed Book _____ Page _____
(county)

4. Location and Description of Property: _____

5. Date of Filing of this Application with the Town Clerk: _____

Signature of record owner(s): _____

Print name of record owner(s): _____

Address: _____ Telephone#: _____

Note: The Applicant must submit with this application all of the data and documentation required by Section 3A of the Rules and Regulations of the Planning Board. The application needs to be stamped by the Town Clerk before submitting to the Planning Board.

CHECKLIST FOR FORM A APPLICATIONS

The following checklist shall be completed in its entirety and be submitted with the Form A as a part of an Approval Not Required Subdivision Application:

PERMIT TYPE	PERMIT FILING FEE	NUMBER OF PLAN COPIES REQUIRED
APPROVAL NOT REQUIRED (ANR / FORM A)	\$250 plus \$250 per buildable lot	1 Mylar 5 Copies

- _____ Application fee and submittal requirements (See table above)
- _____ Scale: 1" = 40'
- _____ Date of plan
- _____ North point
- _____ Reference to Assessor's plan number
- _____ Reference to recently recorded plans for the parcel
- _____ Name of the person for whom the plan is prepared or name of the applicant
- _____ Name of engineer or surveyor preparing the plan:
 - _____ Seal
 - _____ Signature
- _____ Flood Plain and Watershed Protection District
- _____ Area of flood plain included within each lot
- _____ All other wetlands and flood plain
- _____ Lots: area, frontage and dimensions of all whose dimensions are altered by the plan
- _____ Area, frontage dimensions and bearings of all proposed lots
- _____ Contiguous lots in common beneficial ownership with land that is the subject of the plan
- _____ Locus plan at a scale of at least 1" = 800'
- _____ Streets bounding or near the property
- _____ For a compiled plan:
 - _____ Identity of plans from which compiled
 - _____ Identity of each plan referenced or relied upon by the plan
 - _____ title
 - _____ date
 - _____ person who prepared the plan
 - _____ date of preparation
 - _____ approval by Planning Board
 - _____ recorded reference to the plan in the Registry of Deeds or Land Court
- _____ Circle for frontage
- _____ Upland area for all lots
- _____ Setbacks for all existing structures
- _____ Zoning District

The plan should include the following note: **ENDORSEMENT OF THIS PLAN DOES NOT CONSTITUTE AN INTERPRETATION OF ZONING.**

If applicable the plan should also include the following language:
 THE WETLANDS DELINEATION LINE AS DEFINED BY THE WETLANDS PROTECTION ACT, CHAPTER 131, SECTION 40, AND THE TOWN OF HINGHAM CONSERVATION COMMISSION BY-LAWS HAS NOT BEEN VERIFIED BY THE HINGHAM CONSERVATION COMMISSION OR APPROVED BY THIS ENDORSEMENT.

FORM B

APPLICATION FOR APPROVAL OF PRELIMINARY PLAN

Hingham, MA, _____, 20__

To the Hingham Planning Board:

The undersigned herewith submits the accompanying Preliminary Plan of property located in the Town of Hingham for consideration as a subdivision under the requirements of the Subdivision Control Law and the Rules and Regulations Governing the Subdivision of Land of the Planning Board in the Town of Hingham.

1. Name of Subdivider: _____

Address: _____ Telephone#: _____

2. Name of Engineer or Surveyor: _____

Address: _____ Telephone#: _____

3. Deed of Property recorded in _____ Registry of Deed Book _____ Page _____
(county)

4. Location and Description of Property: _____

5. Date of Filing of this Application with the Town Clerk: _____

Signature of record owner(s): _____

Print name of record owner(s): _____

Address: _____ Telephone#: _____

Note: File one completed form with the Planning Board and one copy with the Town Clerk.

FORM C

APPLICATION FOR APPROVAL OF DEFINITIVE PLAN

To the Planning Board of the **Town of Hingham**:

The undersigned applicant(s) being the owner(s) of all land included within the proposed subdivision shown on the accompanying plan desire(s) to subdivide such land, and submit(s) such plan as a definitive plan for approval as a subdivision under the requirements of the Subdivision Control Law and the Rules and Regulations governing the subdivision of land of the Planning Board of the Town of Hingham.

(a) Name of Subdivider: _____

Address: _____ Telephone#: _____

(b) Name of Engineer or Surveyor: _____

Address: _____ Telephone#: _____

(c) Deed of Property recorded in _____ Registry of Deed Book _____ Page _____
(county)

(d) Said land is described as follows: _____

(e) The following are all the mortgages, liens, easements, restrictions and other encumbrances on the whole or any part of said land: _____

(f) The following are the easements and restrictions appurtenant to said land over the land of others: _____

(g) The applicant(s) covenant(s) and agree(s) for himself (themselves) (itself) and his (their) (its) heirs, executors, administrators, successors and assigns:

- (1) To construct and complete the proposed ways and all improvements shown on said plan as approved by the Board and to install the drainage system, water pipes, gas pipes and electric lines, and all other municipal services therein required by the Board, within _____ months from the date of this application.
- (2) To construct and complete said ways and improvements and to install said municipal services, in accordance with the Rules and Regulations of the Board in force at the date of this agreement and in accordance with the specifications set forth in Section 5 of these Rules and Regulations.
- (3) That before the approval of the plan to which this application relates becomes effective he (they) (it) will cause to be filed with the Board a duly executed bond or deposit or Letter of Credit in a form satisfactory to the Board, to secure performance of and compliance with all agreements, conditions and requirements contained in his (their) (its) application, or imposed by the Board, in accordance with law and the Rules and Regulations of the Board, in a sum equal to the full cost of constructing said ways and all improvements and installing said services, as estimated by a person satisfactory to the Board, and secured by an irrevocable Letter of Credit drawn upon a Massachusetts lending institution in an amount sufficient in the opinion of the Board to secure performance.

- OR THIS -

- (4) The applicant(s) request(s) that the Board approve the plan to which this application relates without requiring a bond, on condition that no lot in the subdivision shall be sold and no building shall be erected or placed on any lot therein until said ways and all improvements are completed and said municipal services are installed, in accordance with the specifications laid down by the Board, so as adequately to serve such lot, and he (they) (it) agree(s) that in the event of such approval, he (they) (it) will obey and comply with such condition until performance with the requirements thereof is evidenced by a certificate of the Board.
- (5) That if this application is approved, he (they) (it) will cause the plan to which it relates to be recorded in the Registry of Deeds of Plymouth County or filed with the Recorder of the Land Court within thirty (30) days after such approval and that he (they) (it) will not sell or offer to sell any of the lots within the subdivision until such plan is so recorded or filed.

(h) This application is accompanied by an original drawing of the definitive plan and all other data, plans, and maps required, and fourteen print copies of each, all on the forms or in the manner prescribed by the Board and a fee of _____(as per Section 2(c)).

Witness the signature(s) and seal(s) of the undersigned this _____ day of _____, 20____.

Assented to:

Mortgagees

FORM C-1

**APPLICATION FOR MODIFICATION, RESCISSION OR AMENDMENT OF
DEFINITIVE SUBDIVISION PLAN**

Subdivision: _____

Date: _____

To the Planning Board of the **Town of Hingham:**

The undersigned authorized applicant(s) or owner(s) of all the land shown on the accompanying approved Definitive Subdivision plan located and described as follows:

Plan Title: _____

Plan Date: _____ Revised Through: _____

Drawn By: _____ Number of Pages: _____

Date of Planning Board Approval: _____ Endorsed: _____

Assessor's Map and Lot Numbers(s): _____

Zoning: _____ Total Acreage: _____ Number of Lots: _____

hereby submits this Application for a Modification _____ Rescission _____ or Amendment _____ of an Approved Definitive Subdivision Plan.

The Modification is described as follows: _____

All prior conditions of approval shall remain in full force and effect until such time as they are met. Pursuant to Massachusetts General Laws, Chapter 41, Section 81-W, this Modification/Rescission/Amendment shall take effect when: (1) the plan as originally approved or a copy thereof, and a certified copy of the vote of the planning board making such Modification/Rescission/Amendment or change, and any additional plan referred to in such vote, have been recorded, (2) an endorsement has been made on the plan originally approved as such vote is indexed in the grantor index under the names of the owners of record of the land affected.

If a proposed Modification will result in changes to the Definitive Plan, the plan submission requirements for a Definitive Plan shall be followed.

List all mortgage holders of the land: _____

Permission of the owners affected by any change to the subdivision plan and of the mortgage holders must be obtained.

*Attach a list of lot owners and their addresses.

To the best of my knowledge the information submitted herewith is complete and accurate.

Signature of Owner Address Telephone

Signature of Authorized Applicant Address Telephone

The cost of recording shall be at the expense of the applicant in the case of Amendment or Modification.

The Amendment/Modification/Rescission of the approval of this plan shall not affect the lots in the subdivision which have been sold or mortgaged in good faith and for valuable consideration or any rights appurtenant thereto, without the consent of the owner of such lots, and of the holder of the mortgage or mortgages, if any, thereon. Written consent from said owners and mortgages, if any, is attached hereto.

Hingham Planning Board Chairman

Submittal requirements:

1. Completed application
2. Application Fee
3. Twelve copies of proposed plan (one - full set and eleven - 11"x 17" sets)

FORM D

PERFORMANCE BOND - SECURED BY DEPOSIT

Know all men by these presents that _____
_____ of _____, _____

hereby binds and obligates himself/itself and his/its executors, administrators, devisees, heirs, successors and assigns to the Town of Hingham, a Massachusetts municipal corporation, in the sum of _____ dollars, and has secured this obligation by the deposit with the Treasurer of said Town of Hingham of said sum in money or negotiable securities.

The condition of this obligation is that if the undersigned or his/its executors, administrators, devisees, heirs, successors and assigns shall fully and satisfactorily observe and perform in the manner and in the time therein specified, all of the covenants, conditions, agreements, terms and provisions contained in the application signed by the undersigned and dated _____, 20____, under which approval of a definitive plan of a certain subdivision, entitled _____ and dated _____, 20____, has been or is hereafter granted by the Hingham Planning Board, then this obligation shall be void; otherwise, it shall remain in full force and effect and the aforesaid security for said sum shall become and be the sole property of said Town of Hingham as liquidated damage.

IN WITNESS WHEREOF the undersigned has hereunto set his hand and seal this _____ day of _____, 20____.

FORM E

COVENANT

THE
UNDERSIGNED _____

of _____, County, Massachusetts, hereinafter called the

"Covenantor", having submitted to the Hingham Planning Board a Definitive Plan of a subdivision, entitled _____

dated _____ made by _____ does

hereby, in consideration of the approval of said plan by said Planning Board and the successors in office of said Board, pursuant to G.L. (Ter. Ed.) C., 41, Sec. 81U, as amended, that:

1. The covenantor is the owner of record of the premises included in the subdivision shown on said plan, and there are no mortgages of record or otherwise on said premises except such as are described below and are subordinated to this covenant.
2. This covenant shall run with the land included in said subdivision and be binding upon the executors, administrators, heirs and assigns of the covenantor, and their successors in title to the premises shown on said plan;
3. The construction of ways and the installation of municipal services shall be provided to serve any lot in accordance with said plan as approved by said Board and the applicable Rules and Regulations of said Board 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 the mortgaged premises or part thereof may sell any such lot, subject only to that portion of this Covenant which provides that no lot so sold shall be built upon until such ways and services have been provided to serve such lot;
4. Nothing herein shall be deemed to prohibit a conveyance subject to this covenant by a single deed of the entire parcel of land shown on the subdivision plan or of all lots not previously released by the Planning Board without first providing such ways and services;
5. This covenant shall take effect upon the approval of said plan;

6. Reference to this covenant shall be entered upon said plan and this covenant shall be recorded when said plan is recorded.

7. It is understood that lots within said subdivision shall, respectively, be released from the foregoing conditions upon recording of a Certificate of Performance signed by a majority of said Planning Board and enumerating the specific lots released.

The undersigned _____ wife, husband, of the covenantor hereby agree that such interest as I, we, may have in said premises shall be subject to the provisions of this covenant and insofar as is necessary release all rights of tenancy by the courtesy, dower, homestead and other interest therein.

EXECUTED as a sealed instrument this _____ day of _____, 20__.

Description of Mortgages: _____

Each of the undersigned hereby agrees that the mortgages held by it (him) on said premises shall be subordinate to the above covenant.

COMMONWEALTH OF MASSACHUSETTS

_____, ss. _____ 20__.

Then personally appeared _____ and acknowledged the foregoing instrument to be _____ free act and deed, before him.

 Notary Public

My Commission expires: _____

FORM F

AGREEMENT

This agreement made this _____ day of _____, 20____,
By and between the Planning Board of the Town of Hingham, Plymouth County,
Massachusetts, hereinafter called the Board: _____ of
_____, hereinafter called the Applicant; and _____
_____, having its usual place of business in
_____, _____ County, Massachusetts,
hereinafter called the Lender.

WHEREAS by a covenant between the Board and the Applicant, dated _____
duly recorded by the Applicant, in Plymouth County Registry of Deeds, Book _____
Page _____, running with the land, Lot Nos. _____, as shown on a plan,
approved by the Board on _____, 20____, entitled “ _____
_____,” dated _____,
and being filed as Plan Nos. _____ in Plan Book _____, in the Plymouth County
Registry of Deeds, cannot be built upon or conveyed, other than by mortgage deed, until
completion of the construction of ways and the installation of municipal services serving
such lots, in accordance with said plan and the Rules and Regulations of the Board.

WHEREAS the Applicant, as security for monetary advances to be made to the Applicant
by the Lender, has given a first mortgage dated _____, recorded in
the Plymouth County Registry of Deeds, Book _____, Page _____, to the Lender
covering (all of the premises or Lots Nos. _____) as
shown on said plan.

NOW, THEREFORE, the parties hereby agree, in accordance with the provisions of
Chapter 41, section 81U of the General Laws of the Commonwealth of Massachusetts, as
follows:

1. The Board agrees with the Applicant to release, by a separate document to be recorded, Lots _____, as shown on said plan, from the operation of said covenant.
2. The lender agrees with the Board that it tenders an Irrevocable Letter of Credit Number _____ in the sum of _____.
3. The lender further agrees, that in the event all of said work is not completed within 24 months from and after the date thereof, all of the said sum shall be applied for completion of said work (to the full extent required for such completion) in such manner as the Board shall direct.
4. The Applicant agrees that the construction of said ways and the installation of said municipal services shall be done in accordance with the Rules and Regulations of the Board and with the requirements of said plan as approved by the Board.

FORM G

CERTIFICATE OF PERFORMANCE

(Covenant Approval Release) Hingham, Massachusetts, _____, 20__

The undersigned, being a majority of the Planning Board of the Town of Hingham, Massachusetts, hereby certify that the requirements for work on the ground called for by the Covenant dated _____, 20 ____, and recorded in Plymouth District Deeds, Book _____, Page _____, (or registered in Plymouth Land Registry District as Document No. _____, and noted on Certificate of Title No. _____, in Registration Book _____, Page _____) have been completed to the satisfaction of the Planning Board as to the following enumerated lots shown on Plan entitled- _____, recorded with said Deeds, Plan Book _____, Plan _____, (or registered in said Land Registry District, Plan Book _____, Plan _____) and said lots are hereby released from the restrictions as to sale and building specified thereon.

Lots designated on said Plan as follows:

Majority of the Hingham Planning Board: _____

COMMONWEALTH OF MASSACHUSETTS

_____, ss. _____, 20__

Then personally appeared _____, one of the above named members of the Planning Board of the Town of Hingham, Massachusetts and acknowledged the foregoing instrument to be the free act and deed of said Planning Board, before me.

Notary Public
My Commission expires: _____

FORM D4

PERFORMANCE SECURED BY FUNDS RETAINED BY LENDER
MORTGAGE PROCEEDS

This is a sample form. The form submitted to the Planning Board shall be prepared as an original document. The Developer should not attempt to "fill in the blanks" on this copy.

_____, 20__
_____, Massachusetts

AGREEMENT made this date between the Planning Board of the Town of Lexington, hereinafter referred to as "the Board"; _____ hereinafter referred to as "the applicant" of (name of applicant)

_____ and _____
(address of applicant)

_____, hereinafter referred to as "the lender" of _____ (name of bank that has first mortgage)

_____, to secure construction of ways and _____ (address of lender) installation of municipal services in the subdivision of land shown on a plan entitled

by: _____ dated: _____, 20__
and showing ___ proposed lots, hereinafter referred to as the "definitive plan."

WHEREAS, the applicant and the Board have executed a covenant, dated _____, 20__, recorded in the Middlesex County Registry of Deeds, Book _____, Page _____; and

WHEREAS, the applicant has recorded a first mortgage with the lender dated _____, 20__, recorded in the Middlesex County Registry Deeds, Book _____, Page _____, covering _____ as shown on the above-referenced plan as security for the payment of a certain note in the principal sum of _____ dollars; and

WHEREAS, there is now due and available to the applicant on account of said loan a sum not less than _____ dollars; and

WHEREAS, the Board is in receipt of a recommendation of the Town Engineer, dated _____ 20__, and has determined the amount of surety needed for the construction of ways and installation of utilities;

NOW, THEREFORE, in consideration of the mutual covenants herein contained, the parties hereto agree as follows:

1. The applicant and the lender warrant and represent that they are the only parties having any interest in lots numbered ___ through ___ inclusive shown on the definitive plan and that they are duly authorized and empowered to enter into this agreement upon the terms and conditions herein set forth.
2. The lender hereby acknowledges that it has retained and set aside from said loan the sum of _____ dollars (\$ _____) to secure performance of the work, which sum shall not be released except in accordance with the provisions of this agreement.
3. The applicant and lender hereby bind and obligate themselves, their executors, administrators, devisees, heirs, successors and assigns, jointly and severally to the Board, in the sum of

dollars, and have secured this obligation by the lender retaining said sum of money of said principal sum otherwise due the applicant to insure the performance by the applicant of all covenants, conditions, agreements, terms and provisions contained in the following:

- a. Conditions included in the Certificate of Action issued by the Planning Board and dated _____
(date of vote to approve);
 - b. The definitive plan as qualified by the Certificate of Action; and
 - c. The subdivision control law and the Planning Board's Rules and Regulations governing this subdivision and dated _____;
(date of Rules and Regulations which govern plan)
 - d. A covenant, dated _____, 20___, recorded in the Middlesex Registry of Deeds, Book ___, Page _____; and
 - e. Other document(s) specifying construction or installation to be completed, namely: specify other documents, if any, and list lots secured if only a part of the subdivision is secured by a lender's agreement _____.
4. The applicant that it shall expeditiously undertake to perform the work and that in all events the work shall be performed no later than _____, unless such date is extended by written agreement of the parties hereto. The Board shall be under no obligation to extend such date and may condition any such extension upon reasonable further conditions, including a condition that additional sums be held pursuant to this agreement on account of increased costs.
5. The parties agree that the work is of such a nature that provision may be made for a release in stages of the sum held pursuant to this agreement. Accordingly, such sum be released from time to time by the lender to the applicant upon receipt by the lender of a certificate from the Board that a specified amount of the work has been performed to the satisfaction of the Board and that the Board has voted to release a specified sum, and in accordance with the following schedule:
- | SUM TO BE
RETAINED
BY LENDER | STAGE OF CONSTRUCTION
AND OR INSTALLATION TO BE
COMPLETED | DATE WHEN CONSTRUCTION
INSTALLATION IS TO BE
COMPLETED |
|------------------------------------|---|--|
|------------------------------------|---|--|

- 1. \$ Installation of all utilities
- 2. \$ Installation of "binder" course of street
- 3. \$ Installation of surface course of street, final grading, loaming and seeding

If the Board shall not provide a final certificate prior to the Completion Date because of the failure of the applicant to perform its obligations hereunder, then, upon notice from the Board to the lender of such fact, such (or such portion thereof as the Board may determine to be appropriate in the circumstances) shall be made available to the Town of Lexington (without, however, intending hereby to require Town Meeting action on account thereof) to enable it to cause the applicant's obligations hereunder to be performed. The

lender shall have no obligation to inquire into the validity of any such notice and shall be fully protected in relying upon the terms set forth therein.

The applicant hereby expressly assents to release of sums hereunder in accordance with the foregoing procedures and agrees that any such release shall be considered as properly made in accordance with the terms hereof except for actions taken by the lender or the Board in bad faith. Any unused portion of such funds will be released by the Planning Board and may be disbursed by the lender to the applicant upon completion of the work by said Town.

6. In consideration of the foregoing, the Board hereby releases lots numbered ___ through inclusive as shown on the definitive plan from the provisions of the covenant and the conditions therein imposed. Except to the extent herein expressly set forth, the Board does not waive any rights it may have on account of the definitive plan or the covenant or under the Massachusetts Subdivision Control Law and the Board's Rules and Regulations adopted there under. The lender hereby assents to any and all changes and modifications which may be made by the Board and the applicant with respect to the definitive plan, said certificate of action, this agreement and other relevant documents.

7. This agreement shall be binding upon the parties hereto and their respective successors and assigns.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands and seals as of the day and year first above written.

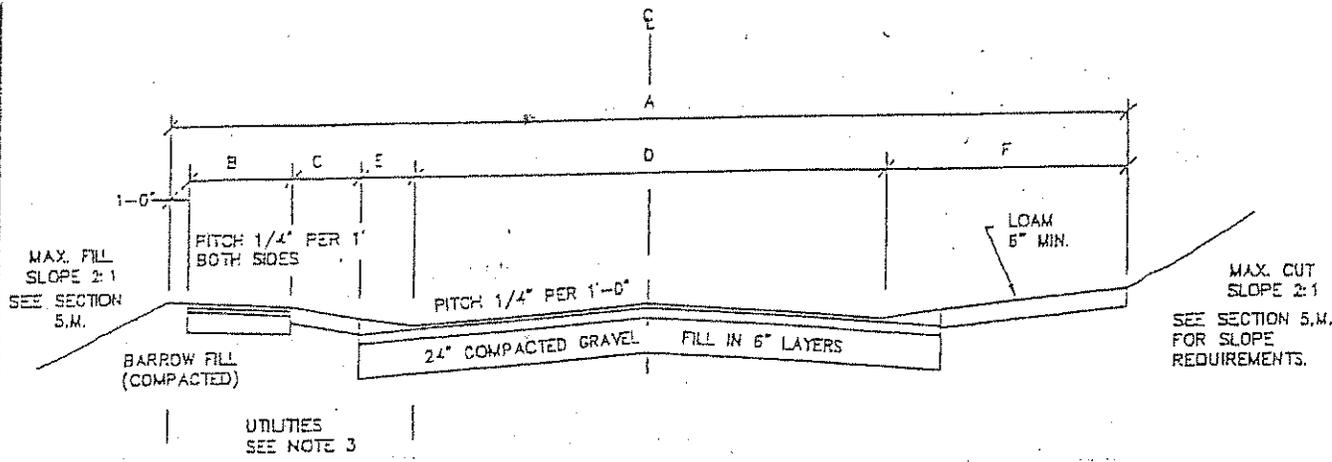
Signature of Applicant
Applicant's Name Typed _____

Address _____

Signature of Authorized Representative of the Lender
Name of Authorized Representative Typed _____

Signatures of a Majority of the Lexington Planning Board

FIGURE 1
TYPICAL ROAD CROSS SECTION



TYPE OF STREET	RIGHT OF WAY A	SIDEWALK B	GRASS STRIP C	ROADWAY PAVEMENT D	BERM. E	F
MAJOR	70'	5' EACH SIDE	7'	40'	24"	15'
SECONDARY	55'	5' ONE SIDE	5.5'	28'	24"	13.5'
MINOR	46'	5' ONE SIDE	4.5'	22'	18"	12'
LIMITED RESIDENTIAL	40'	NOT REQUIRED	8.5'	18"	18"	11'

NOTES:

1. ALL LEDGE AND BOULDERS ABOVE SUBGRADE TO BE REMOVED.
2. SLEEVE FOR HOUSE UTILITY CONNECTIONS SHALL BE LOCATED AS DIRECTED BY BOARD.
3. ALL UTILITIES EXCEPT SEWERS SHALL BE PLACED OUTSIDE THE ROADWAY PAVEMENT WHERE, IN THE OPINION OF THE BOARD, IT IS POSSIBLE TO DO SO.
4. UTILITY POLES AND HYDRANTS TO BE LOCATED IN GRASS STRIPS.
5. ELECTRIC HANDHOLES TO BE LOCATED IN MIDDLE OF SIDEWALK (WHERE APPLICABLE). TRANSFORMERS AND JUNCTION BOXES TO BE LOCATED OUTSIDE THE RIGHT OF WAY IN EASEMENTS. FIRE ALARM BOXES TO BE LOCATED IN GRASS STRIPS OR IN EASEMENTS OUTSIDE THE RIGHT OF WAY.
6. SEE SECTION 4.B.(3)(a) FOR REQUIREMENTS FOR SUPERELEVATION.
7. SEE SECTION 5.H. AND I. FOR PAVEMENT SURFACE REQUIREMENT.
8. SEE FIGURE 4 FOR GUARDRAIL DETAIL.

FIGURE 2
TURNAROUND AND ISLAND PLAN
(MINIMUM REQUIREMENTS)

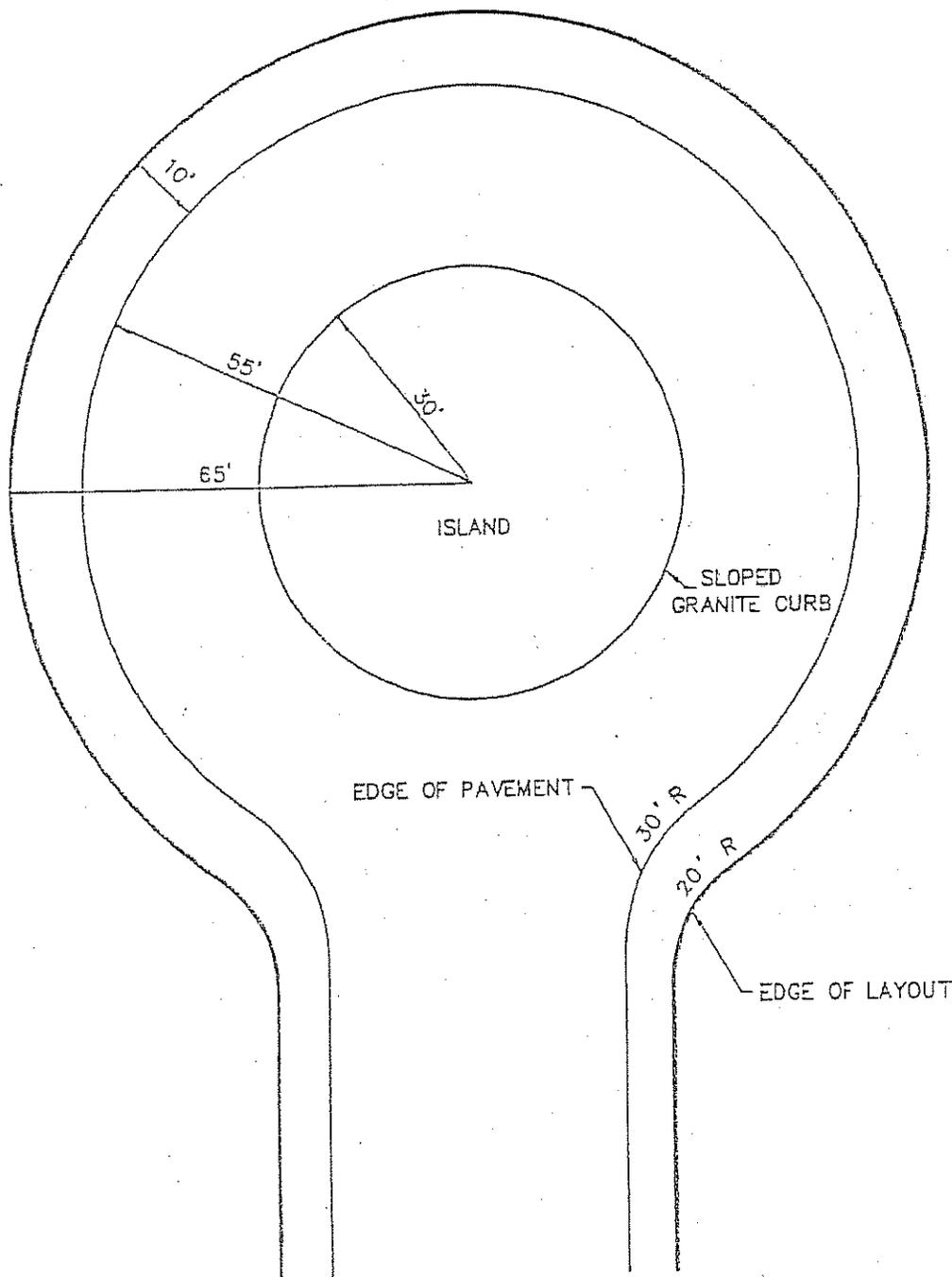


FIGURE 3
EXAMPLE STORMWATER FLOW CHART
 NOT TO SCALE

LEGEND

Q_{10} : Flow for 10-yr storm event
 T_c : Time of concentration
 V_{10} : Velocity in pipe for 10-yr storm event
 GW: Groundwater
 l_{10} : Head loss in pipe due to friction for a 10-yr storm event
CAPACITY₁₀: Storage volume in pond for a 10-yr storm event
 BWV: Bordering vegetated wellands

PIPE DATA

MATERIAL =
 CLASS =
 SIZE =
 LENGTH =
 SLOPE =
 V_{10} =
 l_{10} =
 H_{10} =
 MIN. COVER =
 V_{25} =
 Q_{25} =
 H_{25} =
 * REQUIRED FOR CULVERTS

OUTLET STRUCTURE

INV. ELEV. =
 V_{10} OUT =
 Q_{10} OUT =
 WIER ELEV. =

NATURAL WATERCOURSE

FLOOD ELEV.₁₀ =
 MAX. GW ELEV. =
 FLOOD PLAIN ELEV.₁₀ =
 BWV ELEV. =

HEADWALL DATA

STATION =
 OFFSET =
 INV. ELEV. =
 Q_{10} OUT =
 10-YEAR FLOOD ELEV. =

DETENTION POND DATA

CAPACITY₁₀ =
 FLOOD ELEV.₁₀ =
 MAX. GW ELEV. =
 BOTTOM ELEV. =

DRAIN MANHOLE DATA

STATION =
 OFFSET =
 RIM ELEV. =
 INV. IN =
 INV. OUT =
 Q_{10} IN =
 Q_{10} OUT =
 MAX. GW ELEV. =

PIPE DATA

MATERIAL =
 CLASS =
 SIZE =
 LENGTH =
 SLOPE =
 V_{10} =
 l_{10} =
 H_{10} =
 MIN. COVER =

DRAIN MANHOLE DATA

STATION =
 OFFSET =
 RIM ELEV. =
 INV. IN =
 INV. OUT =
 Q_{10} IN =
 Q_{10} OUT =
 MAX. GW ELEV. =

PIPE DATA

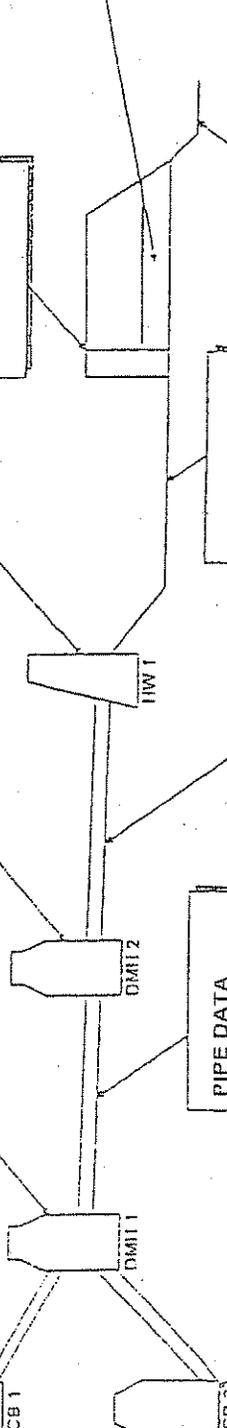
MATERIAL =
 CLASS =
 SIZE =
 LENGTH =
 SLOPE =
 V_{10} =
 l_{10} =
 H_{10} =
 MIN. COVER =

CATCH BASIN DATA

STATION =
 OFFSET =
 RIM ELEV. =
 Q_{10} IN =
 Q_{10} OUT =
 T_c =
 WATERSHED AREA =
 MAX. GW ELEV. =

CATCH BASIN DATA

STATION =
 OFFSET =
 RIM ELEV. =
 Q_{10} IN =
 Q_{10} OUT =
 T_c =
 WATERSHED AREA =
 MAX. GW ELEV. =



APPENDIX D

FIRE APPARATUS ACCESS ROADS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION D101 GENERAL

D101.1 Scope. Fire apparatus access roads shall be in accordance with this appendix and all other applicable requirements of the *International Fire Code*.

SECTION D102 REQUIRED ACCESS

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to fire department apparatus by way of an *approved* fire apparatus access road with an asphalt, concrete or other *approved* driving surface capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds (34 050 kg).

SECTION D103 MINIMUM SPECIFICATIONS

D103.1 Access road width with a hydrant. Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet (7925 mm), exclusive of shoulders (see Figure D103.1).

D103.2 Grade. Fire apparatus access roads shall not exceed 10 percent in grade.

Exception: Grades steeper than 10 percent as *approved* by the fire chief.

D103.3 Turning radius. The minimum turning radius shall be determined by the *fire code official*.

D103.4 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) shall be provided with width and turnaround provisions in accordance with Table D103.4.

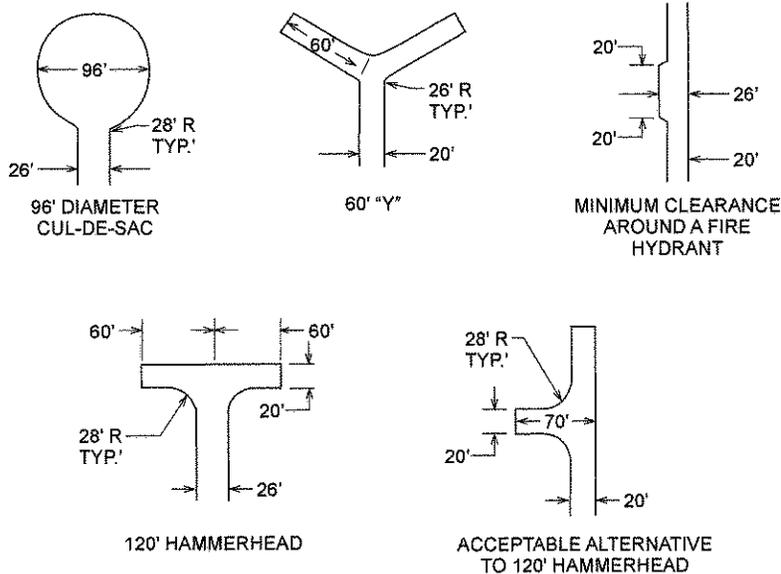
**TABLE D103.4
REQUIREMENTS FOR DEAD-END FIRE
APPARATUS ACCESS ROADS**

LENGTH (feet)	WIDTH (feet)	TURNAROUNDS REQUIRED
0-150	20	None required
151-500	20	120-foot Hammerhead, 60-foot "Y" or 96-foot-diameter cul-de-sac in accordance with Figure D103.1
501-750	26	120-foot Hammerhead, 60-foot "Y" or 96-foot-diameter cul-de-sac in accordance with Figure D103.1
Over 750	Special approval required	

For SI: 1 foot = 304.8 mm.

D103.5 Fire apparatus access road gates. Gates securing the fire apparatus access roads shall comply with all of the following criteria:

1. The minimum gate width shall be 20 feet (6096 mm).
2. Gates shall be of the swinging or sliding type.

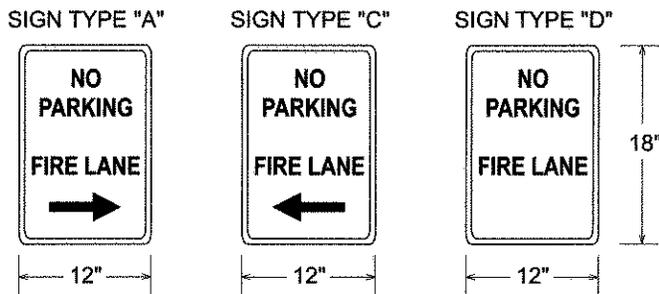


**FIGURE D103.1
DEAD-END FIRE APPARATUS ACCESS ROAD TURNAROUND**

For SI: 1 foot = 304.8 mm.

3. Construction of gates shall be of materials that allow manual operation by one *person*.
4. Gate components shall be maintained in an operative condition at all times and replaced or repaired when defective.
5. Electric gates shall be equipped with a means of opening the gate by fire department personnel for emergency access. Emergency opening devices shall be *approved* by the *fire code official*.
6. Manual opening gates shall not be locked with a padlock or chain and padlock unless they are capable of being opened by means of forcible entry tools or when a key box containing the key(s) to the lock is installed at the gate location.
7. Locking device specifications shall be submitted for approval by the *fire code official*.
8. Electric gate operators, where provided, shall be *listed* in accordance with UL 325.
9. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.

D103.6 Signs. Where required by the *fire code official*, fire apparatus access roads shall be marked with permanent NO PARKING—FIRE LANE signs complying with Figure D103.6. Signs shall have a minimum dimension of 12 inches (305 mm) wide by 18 inches (457 mm) high and have red letters on a white reflective background. Signs shall be posted on one or both sides of the fire apparatus road as required by Section D103.6.1 or D103.6.2.



**FIGURE D103.6
FIRE LANE SIGNS**

D103.6.1 Roads 20 to 26 feet in width. Fire apparatus access roads 20 to 26 feet wide (6096 to 7925 mm) shall be posted on both sides as a *fire lane*.

D103.6.2 Roads more than 26 feet in width. Fire apparatus access roads more than 26 feet wide (7925 mm) to 32 feet wide (9754 mm) shall be posted on one side of the road as a *fire lane*.

SECTION D104

COMMERCIAL AND INDUSTRIAL DEVELOPMENTS

D104.1 Buildings exceeding three stories or 30 feet in height. Buildings or facilities exceeding 30 feet (9144 mm) or

three stories in height shall have at least two means of fire apparatus access for each structure.

D104.2 Buildings exceeding 62,000 square feet in area. Buildings or facilities having a gross *building area* of more than 62,000 square feet (5760 m²) shall be provided with two separate and *approved* fire apparatus access roads.

Exception: Projects having a gross *building area* of up to 124,000 square feet (11 520 m²) that have a single *approved* fire apparatus access road when all buildings are equipped throughout with *approved automatic sprinkler systems*.

D104.3 Remoteness. Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.

SECTION D105

AERIAL FIRE APPARATUS ACCESS ROADS

D105.1 Where required. Buildings or portions of buildings or facilities exceeding 30 feet (9144 mm) in height above the lowest level of fire department vehicle access shall be provided with *approved* fire apparatus access roads capable of accommodating fire department aerial apparatus. Overhead utility and power lines shall not be located within the aerial fire apparatus access roadway.

D105.2 Width. Aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet (7925 mm), exclusive of shoulders, in the immediate vicinity of any building or portion of building more than 30 feet (9144 mm) in height.

D105.3 Proximity to building. At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet (4572 mm) and a maximum of 30 feet (9144 mm) from the building, and shall be positioned parallel to one entire side of the building.

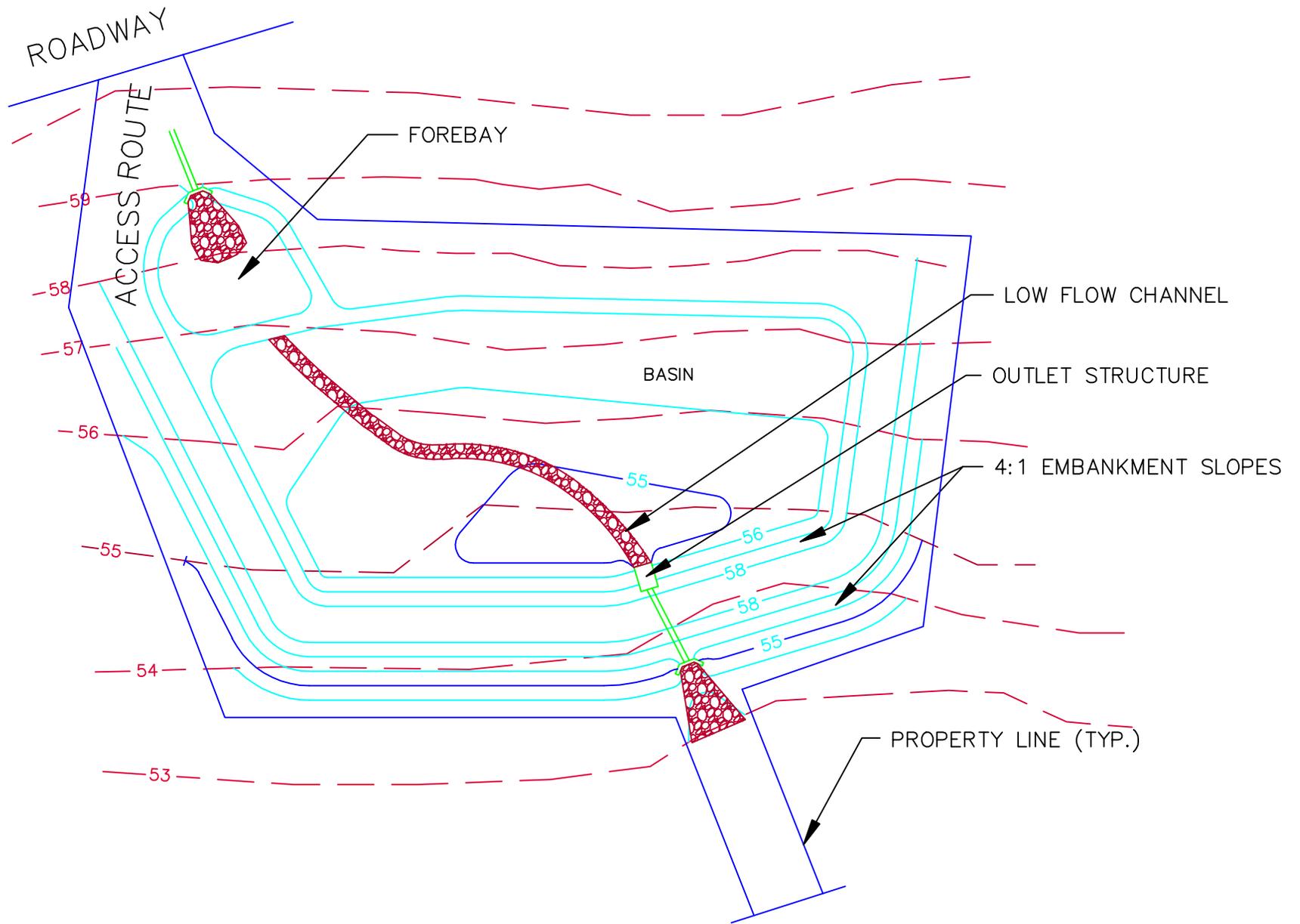
SECTION D106

MULTIPLE-FAMILY RESIDENTIAL DEVELOPMENTS

D106.1 Projects having more than 100 dwelling units. Multiple-family residential projects having more than 100 *dwelling units* shall be equipped throughout with two separate and *approved* fire apparatus access roads.

Exception: Projects having up to 200 *dwelling units* may have a single *approved* fire apparatus access road when all buildings, including nonresidential occupancies, are equipped throughout with *approved automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

D106.2 Projects having more than 200 dwelling units. Multiple-family residential projects having more than 200 *dwelling units* shall be provided with two separate and *approved* fire apparatus access roads regardless of whether they are equipped with an *approved automatic sprinkler system*.



TYPICAL BASIN DETAIL