

## **SECTION XII CONSTRUCTION STANDARDS**

### **12.0 BASIC REQUIREMENTS**

- 12.01 The subdivider shall provide all of the improvements required herein and installed at his own expense. All work done under this section shall be done under the direction of the Board. The subdivider shall be responsible for providing a qualified engineer approved by the Board to oversee and certify the installation of all improvements as required in these rules and regulations.
- 12.02 No performance guarantee shall be fully released until:
- 12.021 all streets and all other improvements shall have been in place over at least one winter (December 1 through April 15) and/or one growing seasons for all planting material;
  - 12.022 full approval in writing, including a completed Form G, of all work done under this section is received from the Board's engineer(s) and any other consultants; and
  - 12.023 a cashier's check or money order, payable to "Town of West Springfield, Massachusetts," has been received to provide reimbursement for the full amount of the cost of engineer(s), Department of Public Works inspection services and other consultants where applicable.
- 12.03 No trees, stumps, brush, roots, and like material and no demolition material including but not restricted to concrete, asphalt and lumber shall be disposed of within the boundaries of the subdivision; said material shall be disposed of in accordance with Title V.

### **12.1 STREET AND ROADWAY CONSTRUCTION**

- 12.11 Clearing and Grubbing
- 12.111 No clearing or excavating shall be started on any part of the street until the Tree Warden has designated in writing those trees which are to remain in the tree belt. Such trees to be preserved shall be protected during construction as prescribed by the Tree Warden.

- 12.112 The entire area within the right-of-way of each street shall be cleared of all stumps, brush, roots, boulders and like material, except those trees that are intended for preservation.
- 12.113 No perishable matter such as stumps, trunks, or limbs of trees or brush shall be buried within the limits of the subdivision.
- 12.114 All loam, peat, mulch and other yielding material shall be removed from the roadway, side slopes, driveway aprons and sidewalks to a depth specified by the Department of Public Works and shall be replaced with an acceptable granular material.
- 12.115 Wherever soil borings indicate ground water within four (4) feet of the proposed roadway surface or wherever the soil particle size indicates the possibility of a capillary rise of water in the subgrade soil, subdrains shall be installed under both shoulders of the roadway. The design and depth of the sub-drain shall meet with the approval of the Department of Public Works.
- 12.116 Wherever rock is encountered it shall be excavated to a depth of four (4) feet below the subgrade of the roadway for the full width of the street layout. The excavated rock shall be replaced with a granular material satisfactory to the Department of Public Works.
- 12.117 Whenever it is necessary to install fill to bring a roadway to subgrade said fill shall be of a granular material satisfactory to the Department of Public Works. All fill shall be placed at a depth and compacted to a density so specified in the Mass. Highway Department Standard Specifications. The developer shall be responsible for the costs of all soil testing and analysis required by the Department of Public Works.
- 12.118 The subgrade of the roadway shall be compacted to a density and by a method approved by the Department of Public Works prior to the placing of the sub-base or base of the roadway.

## **12.2 GRAVEL FOUNDATIONS**

### 12.21 Subgrade

- 12.211 Within the roadway area including driveway aprons, sidewalks, and grass strips, all material shall be removed to subgrade and any unsuitable material, in the opinion of the Department of Public Works, below subgrade shall be removed and shall be replaced with proper bank-run gravel and brought to proper compaction. The depth of the subgrade will be governed by existing conditions and shall be as specified by the Department of Public Works.
- 12.212 The material used for a sub-base shall be of bank-run or crushed gravel and shall conform to AASHTO Soil Classification sub-groups A-1-a, A-2-4, A-1-b or A-2-5, shall have a group index of 0, a maximum plasticity index of 6 and a maximum liquid limit of 25. Furthermore, the gravel shall conform to the gradation requirements of M1.03.0 Type a or b of the Standard Specifications of the Mass. Highway Dept.
- 12.213 The maximum size aggregate for sub-base courses shall not exceed four (4) inches. The cost of any soil tests needed to determine the suitability of a material for use as a sub-base shall be borne by the Developer.
- 12.214 The gravel shall be spread and compacted in layers not exceeding six (6) inches in depth compacted measurement. The gravel shall be compacted to the density specified in Section 401 of the Standard Specifications of the Mass. Highway Dept.
- 12.215 The subgrade shall be shaped and finish graded at the required depth below and parallel to the proposed pavement surface, in conformance with the Typical Street Cross-Section.
- 12.216 Inspections, including density testing, shall be required after completion of the subgrade.
- 12.22 Gravel Base
- 12.221 The gravel base course for residential subdivisions shall consist of not less than twelve (12) inches of well compacted gravel placed upon the subgrade the entire width of the roadway. The depth of the gravel base for non-residential subdivisions shall be established through the review of the Preliminary Subdivision plan.

- 12.222 The material used for a base course shall be of processed gravel that meets with the approval of the Department of Public Works. This material shall conform to AASHTO Soil Classification subgroup A-1-a, or A-2-4, shall have a group index of 0, a maximum plasticity index of 3 and a maximum liquid limit of 25. The gravel shall conform to the gradation requirements of M1.03.0 Type b of the Standard Specifications of the Mass DPW and shall be bound with approved stone screenings. The cost of any soil tests needed to determine the suitability of a material for use as a base course shall be borne by the Developer.
- 12.223 The gravel shall be spread and compacted in accordance with Section 405 of the Standard Specifications of the Mass. Highway Dept.
- 12.224 The gravel base surface shall be shaped and finish graded at the required depth below and parallel to the proposed pavement surface, in conformance with the Typical Street Cross-Section.
- 12.225 Inspections shall be required before commencement and after completion of the gravel base.

### **12.3 ROADWAY SURFACING**

- 12.31 The roadway and driveway aprons shall be paved the entire width, including under the berms, and the surface treatment shall be compacted bituminous concrete placed in two (2) layers.
- 12.32 The first layer or binder course for residential subdivisions shall be Class I bituminous concrete pavement, Type I-1, binder course mix, laid at a thickness of two (2") inches in accordance with Section 460 of the Mass. Highway Dept. Standard Specifications for Highways and Bridges. The first layer or base course must be in place through one winter season after the completion of all underground work such as water and sewer mains, storm drains and other utilities and have the approval of the Department of Public Works before the second layer, or surface course, is applied. The thickness of the binder course for non-residential subdivisions shall be established through the review of the Preliminary Subdivision plan.
- 12.33 The second layer or surface course for residential subdivisions shall be Class I bituminous concrete

pavement, Type I-1, top course mix, laid at a thickness of one and one-half (1.5") inches in accordance with Section 460 of the Mass. Highway Dept. Standard Specifications for Highways and Bridges. The thickness of the surface course for non-residential subdivisions shall be established through the review of the Preliminary Subdivision plan.

- 12.34 No paving shall be conducted when the air temperature is 40 degrees Fahrenheit or less nor where the material on which the pavement is to be placed contains frost.
- 12.35 The final bituminous surface shall show no deviation greater than one-quarter (1/4) inch when tested with a sixteen (16) foot straight edge placed parallel to the centerline of the surface course.
- 12.36 Finished roadway and driveway apron surfaces less than the required thickness or containing any soft or imperfect places will not be approved.
- 12.37 All roadways shall be brought up to the finish grade as shown on the Definitive Plan, and all manhole covers, gate boxes, gas drips and other access to underground utilities shall be set flush with the surface of the road, grass strip or sidewalk.
- 12.38 The binder course shall be in place for at least one calendar year prior to the installation of the surface course.
- 12.39 Inspections shall be required upon completion of the Binder and Surface courses.

#### **12.4 INSTALLATION OF UTILITIES**

##### 12.41 General Standards

The installation of utilities and underground structures shall conform to the following general standards:

- 12.411 All public and private sewers, surface water drains, water and gas pipes, electric, telephone and cable T.V. lines, together with their appropriate underground structures, within the street right-of-way, shall be placed underground.
- 12.412 Underground utilities shall be installed after the street has been excavated to subgrade.

- 12.413 The location of the utilities shall conform to the Definitive Plan and the Typical Street Cross-Section, with the minimum cover as shown on the Typical Street Cross-Section in Appendix B.
- 12.414 Material used surrounding and supporting pipes and conduits in the utility trenches shall be of compacted, screened gravel placed at least six (6) inches in diameter around pipes, unless the trenches are in ledge, peat or heavy clay which requires twelve (12) inches of the compacted, screened gravel.
- 12.415 Material used in back-filling utility trenches around underground structures shall be placed in six (6) inch layers and thoroughly compacted by pneumatic or vibratory tamps.
- 12.416 Gravity sewer lines shall be true to line and grade with no horizontal or vertical curvature permitted.
- 12.417 No footing drains, roof drains or storm water drains shall be connected to the sanitary sewer system.
- 12.418 All lot connections shall be installed from the utility main structures in the street to the exterior right-of-way line for each lot regardless of whether there is a building thereon. In the case of a lot to be used for a park or playground or any other purpose for which the Planning Boards deems lot connections are not necessary, installation of such connections may be waived by the Board.
- 12.419 Private, on-site water supply wells shall be located a minimum of one hundred (100) feet from a leaching field; ten (10) feet from a sewer line; and fifty (50) feet from a septic tank in accordance with Title V.
- 12.420 All underground utilities shall be properly inspected, tested and approval given before the back-filling of trenches and placement of gravel base courses and pavement.
- 12.43 Water Mains
- 12.431 Materials
- 12.4311 All Ductile Iron Pipe furnished and installed shall be Class 52 centrifugally cast with

push-on type joints. Pipe shall be double cement-lined, tar coated, and in 18-20 foot lengths. Pipe shall be in full conformance with AWWA C151-76, AWWA C-111-79, and C104-80.

12.4312 Fittings shall be ductile iron with mechanical joint connections on all ends. The inside of all fittings other than sleeves and plugs shall be cement lined and coated as specified for pipe. Sleeves and plugs shall be tar coated inside and out.

12.4313 Gate valves shall comply with AWWA C500 and C509 and shall be rated for 200 psi minimum working pressure and a minimum 300 psi test pressure.

Valves shall be of the iron body, bronze mounted, double disc, parallel seat or resilient seat, non-rising stem type, fitted with "O-ring" seals. Valves shall have mechanical joints equal to AWWA C111.

The operating nut shall be standard AWWA 2-inch square and shall be attached by a nut; pinning is not acceptable. Gate valves shall OPEN to the RIGHT or clockwise.

All ferrous parts of the valves, except finished or bearing surfaces, shall be given two coats of asphaltum varnish. After the valves are assembled and tested, a third coat shall be applied on the exterior. The body ring shall be free of any asphalt solution.

The design of the valve shall be such that the seal plate can be fitted with "O" rings while the valve is under pressure in the fully opened position.

12.4314 Hydrants: SIZE 4 ½" Compression Type Fire Hydrants with 2-2 ½' Hose Outlets National Standard Thread with 1-4 ½" Steamer Outlet National Standard Thread suitable for 5 ½" Trench, 6" M.J. Connections for Class 52 pipe, open left hand, 1 ½" operating nut with at least 1-1/8" height above top of any other projection on hydrant, outlet drip end with breakable section at ground line. Hydrant to be dry top construction with self contained Lubrication.

Approval of the Fire Hydrants must be obtained by the Department of Public Works.

12.4315 Street Gate Valve Boxes shall be 2 piece sliding type tops 26" long, bottoms 36" long, tar coated inside and out. They shall have a flange located at the top approximately 3" down. Boxes shall be Buffalo #5664-S or equal. Box covers shall be marked "WATER".

#### 12.432 Lining of Pipe and Fittings

12.4321 All ductile iron pipe and fittings shall be tar coated on the outside and cement-lined on the inside. The cement lining is to be sealed with a bituminous coating. The coating and lining shall meet the A.W.W.A. specifications.

12.4322 In handling and hauling of pipe and fittings, care should be taken to prevent any damage to the lining or coating. Should the lining be damaged to any extent, the Water Department reserves the right to reject the pipe or fittings. Should the coating be damaged, the Contractor will be directed to paint the damaged area with a suitable asphalt paint.

#### 12.433 Appurtenances and Installation

12.4331 The approximate location of pipe lines, valves, valve boxes, hydrant connections, taps, service pipes, etc. as shown on the plans shall be constructed as shown unless changed by the Department of Public Works. The Department of Public Works reserves the right to change the location of any or all such appurtenances shown on the plans. The Department of Public Works shall have the right to order the installation of extra valves, hydrants, fittings, or other appurtenances over and above those shown on the plans.

12.4332 Pipe and fittings, whether in the trench or on the bank, shall not be used at any time as a place for the temporary storage of tools, joint components, rubber boots, overalls, etc. Open ends of the pipe in the trench shall be plugged with ductile iron plug at all times.

12.4333 Thrust blocks must be placed at all fittings and hydrants as directed by the Department of Public

Works. Blocks may be of poured concrete or of suitable stone or masonry construction. Drip areas of crushed stone, gravel or other suitable material must be constructed around hydrants or blow-offs. No back-filling can be carried out around drips until they have been approved.

12.434 Pipeline Testing

12.4341 After the pipeline is laid it shall be tested with water pressure. The Contractor shall furnish all necessary plugs, meters, gages, and any other necessary equipment and labor required in testing. All calculations related to the pressure test shall be provided by the contractor in writing to the Department of Public Works a minimum of 72 hours prior to the pressure test being conducted.

12.4342 Pressure to be raised to 150 pounds and maintained for four (4) hours. Under this condition the leakage should not exceed 150 gallons per inch of diameter in 24 hours per mile of pipe to be considered satisfactory. Leakage in excess of above limit must be located, repaired, and retested. Any material or joints shown to be defective must be replaced or repaired.

12.435 Cleaning and Sterilizing

12.4351 Each pipe and special casting before being laid in trench, and each valve before being set, shall be carefully cleaned throughout; and the bell and spigot ends cleaned to obtain good joints.

12.4352 The Contractor shall use one do the following chlorination methods utilizing the standards in the following table:

**TABLE 12-1  
CHLORINATION METHODS FOR DININFECTING WATER MAINS**

Chlorination Method Used	Maximum Chlorine Dose (note a)	Minimum Contact Time	Minimum Chlorine Residual
Continuous	50 mg/L	24 hours	25 mg/L
Slug	500 mg/L	3 hours	300 mg/L
Tablet (note b)	50 mg/L	24 hours	25 mg/L

Note a: AWWA Standard C651-92 recommends the following doses: Continuous - 25 mg/L; Slug - 100 mg/L; Tablet - 25 mg/L. The minimum chlorine dose depends on whether you are disinfecting an existing main (high dose of 500 mg/L and short contact time of 15 minutes), or a new main (continuous minimum residual of 25 mg/L for 24 hours). The developer shall utilize the minimum dose strength and length of contact time to produce negative coliform test results.

Note b: Tablets must be placed at the inside top of pipe when the pipe is being laid. In addition, two tablets must be placed at all joints on both sides of the pipe at the half/full location. Place one ounce (28g) of HTH powder per inch (25mm) of pipe diameter in the first length of pipe and again after each 500 feet (150m) of pipe. This ensures that the first water entering the spaces at joints will have high chlorine residual. Fill the pipe with water velocities of less than 1 ft/sec.

The developer shall be responsible for providing and paying for the costs of all water tests.

#### 12.4353 Flushing After Disinfection

Flush lines after disinfection under all alternative procedures until residual chlorine is less than 1 mg/L. Velocity of flushing is not critical if the preventive and preliminary procedures detailed above were adequately performed. All flush water must be dechlorinated prior to disposal into the sanitary or storm water system.

#### 12.4354 Testing After Disinfection

After disinfection and prior to placing a line in service, bacteriological test (24-hour membrane filter) are required as follows:

1. In a chlorinated water system, test at least one sample for each section disinfected.

2. Test at least two samples for each section disinfected in an unchlorinated water system.
3. For long lines, test samples along the entire line as directed by the Department of Public Works. Water lines greater than 2,500 lineal feet (750 meters) are considered long lines.

If bacteriological tests are unsatisfactory, disinfection must be repeated. Repeat of tablet is not possible and an alternative procedure must be utilized. It is suggested that the main be flushed and additional samples be taken at water taps other than fire hydrants and blow-off valves.

If the bacteriological tests remain unsatisfactory, the main must be dewatered utilizing compressed air. Refill the empty main with water containing a chlorine residual between 50 and 100 mg/L. Allow the water to remain in the main for a minimum of 48 hours. Flush the main and resample. It is suggested that the water entering the main be tested to rule out cross-contamination.

The developer shall be responsible for providing and paying for the costs of all bacteriological water tests prior to the approval of the water main being placed in service.

#### 12.436 Trenching and Back-filling

Trench is to be dug, unless otherwise directed, so as to give the pipe five foot (5') of cover to the proposed finished grade. The bottom of the trench is to be leveled by hand and any excess excavation hand back-filled and tamped. Pipe, fittings, and valves are to be set on hardwood blocks if needed. Pipe is to be back-filled by hand until at least six inches (6") of cover is over pipe and this is to be tamped around pipe and over it as back-filling progresses. All rock encountered in trench must be removed for distance of one foot (1') from pipe before laying and no rock shall be placed around pipe in back-filling.

#### 12.44 Sanitary Sewer Main

- 12.441 Sanitary sewers, mains and laterals shall be of PVC SDR 35 or greater as required by the Department of

Public Works. The minimum size for a sewer main shall be eight (8) inches while the minimum size of sewer laterals shall be four (4) inches.

- 12.442 All sanitary sewers, sewer force mains and sewer laterals shall be installed in "first class" bedding and in accordance with the Department of Public Works specifications. Sewers shall be installed to the line and grade indicated on the plans.
  - 12.443 Only precast concrete manholes of a design approved by the Department of Public Works shall be installed on a sanitary sewer main. Sanitary sewer manholes shall be installed no further than three (300) hundred feet apart and the sewer shall be laid in a straight line between manholes.
  - 12.444 Before any sanitary sewer will be accepted by the Board it must pass an infiltration or exfiltration test made in accordance with the Department of Public Works specifications. Said test will be made at the Developer's expense and shall be made under the direction of the Department of Public Works.
  - 12.445 Where rock is encountered it shall be removed to a depth of one foot below the flowline of the sewer and the pipe laid in a properly compacted granular material approved by the Department of Public Works.
  - 12.446 Only granular material approved by the Department of Public Works shall be used as backfill in any trench excavation.
- 12.45 Storm Water Drains
- 12.451 Storm drains shall be installed using ADS N-12 Pro Link Ultra or equal. The minimum allowable size is a twelve (12) inch diameter pipe including catch basin leaders.
  - 12.452 All storm drains including catch basin leaders and culverts shall be installed in "first class" bedding. All work and materials shall be in accordance with the Department of Public Works specifications.
  - 12.453 Precast concrete or concrete block manholes of a design approved by the Department of Public Works shall be used on storm drains. The distance between manholes shall not be greater than three (300) hundred feet.

12.454 Precast concrete or concrete block catch basins shall be installed at intervals of three (300) hundred feet on both sides of a roadway and at intersections as necessary. The basins shall have a three flange frame and grates and a granite curb inlet, and shall be of a design approved by the Department of Public Works.

12.455 Where rock is encountered it shall be removed to a depth of one foot below the flowline of the drain and the pipe laid in a properly compacted granular material approved by the Department of Public Works.

12.456 Only granular material approved by the Department of Public Works shall be used as back-fill in any trench excavation.

#### 12.46 General Utilities

12.461 Street lights shall be installed by the Subdivider at his expense and he shall be responsible for the cost of lighting until the street is accepted by the Town. The lighting shall be installed on a street prior to occupancy of any house on that street.

12.462 All underground utilities such as gas mains, cable, electric and telephone lines, including service connections shall be installed prior to the construction of the roadway surface, base or sub-base. All methods used to install these utilities shall be subject to the approval of the Department of Public Works. Only granular material approved by the Department of Public Works shall be used as back-fill in any utility trench.

### 12.5 BERMS AND CURBING

12.51 Bituminous concrete curbs of the type and dimensions as shown on the Typical Street Cross-Section, (see Appendix B), shall be required along both sides of the roadway, except at curb inlets or where, in the opinion of the Planning Board, such curbs are not necessary.

12.52 The berms shall be constructed of Type I-1, Class I bituminous concrete, and laid with a berm forming machine.

12.53 All berms shall have a minimum reveal as shown on the berm details in Appendix B.

- 12.54 Along the inside pavement radius of cul-de-sacs and at the intersection of any two streets, granite curbing shall be installed along the arc of the curves. The granite curbing shall have a reveal equal to or greater than the bituminous curb and a width at the top of six (6) inches.
- 12.55 Bituminous curbs shall butt against all granite curb inlets, and constructed so as to be true to line and grade after compaction. Any mixture which becomes defective in any way shall be replaced with a fresh mixture.
- 12.56 Under special conditions, specially constructed berms or gutters may be required by the Planning Board, particularly in areas of heavy slope.
- 12.57 Bituminous concrete berms shall be applied onto the base course of roadway paving and the top course of pavement laid against the face of the berm.
- 12.58 At all curb cuts, all berms shall be installed so as to return to the sidewalk or the property line.

## **12.6 SIDEWALKS AND BICYCLE PATHS**

- 12.61 In residential subdivisions, sidewalks of not less than five (5) feet in width shall be constructed on both sides of the street within the street right-of-way, abutting the property line and in conformity with specifications of the West Springfield Planning Board.
- 12.62 The sidewalk grade shall be parallel to the center line and not more than twelve (12) inches above the roadway center line grade. Sidewalks shall be sloped to the roadway at all street intersections for a distance of not less than thirty (30) inches from the roadway edge.
- 12.63 Sidewalks shall be constructed of concrete using wood frames of not less than four (4) inches in depth, placed five (5) feet wide and consist of the following:
  - 12.631 A gravel base upon the subgrade, wetted and compacted to a depth of eight (8) inches with a self-propelled roller of not less than five (5) tons. Stones larger than one and one-half (1.5) inches shall not be used;

- 12.632 Portland cement of a 1-2-3-mixture (4000 psi) shall be poured, monolithic, to a thickness of four (4) inches;
- 12.633 A dummy joint shall be scored every five (5) feet with a three-eighths (3/8) inch bituminous fiber expansion joint provided every twenty (20) feet;
- 12.634 At all driveways, the concrete shall be of minimum depth of six (6) inches and reinforced with four (4) inch square welded wire fabric of at least 0.12 square inches of steel in longitudinal and transverse direction.

#### 12.64 Bicycle Paths

- 12.641 Bicycle paths shall be provided for as required by the Planning Board under Section 11.5 of these regulations.
- 12.642 Easements or rights-of-way shall be given to the Town for all paths which do not lie within the roadway right-of-way.
- 12.643 Bicycle paths shall be constructed of Type I-1, Class I Bituminous Concrete Surface, at a width approved by the Board, and shall consist of the following:
  - 12.6431 A six (6) inch gravel base having a maximum size aggregate not exceeding four (4) inches compacted with a power roller weighing not less than five (5) tons.
  - 12.6432 A bituminous concrete surface compacted with a roller weighing not less than one and one-half (1.5) tons having a thickness of not less than two (2) inches.
  - 12.6433 Where the path intersects roadway rights-of-way, a barrier approved by the Board shall be constructed so as to allow bicycles while prohibiting automobiles.

### 12.7 GROUNDWATER DRAINAGE

As construction progresses, unforeseen groundwater conditions may be encountered which require additional subdrains or curtain drains. These conditions include potential problems if construction is in progress at a

time of low water table or other dry conditions. The Board reserves the right to require appropriate systems to accommodate this problem.

## **12.8 RETAINING WALLS**

Upon approval of the Planning Board and the Department of Public Works, retaining walls shall be installed where deemed necessary and they shall be designed by a Professional Engineer registered in the Commonwealth of Massachusetts.

## **12.9 BOUNDS AND LOT CORNERS**

12.91 Bounds shall be set on both sides of each proposed street at all angle points, at the beginning and end of all curves thereof, and at all intersections of streets and ways with each other or with Plan boundary lines. The bounds shall be of granite or reinforced concrete, shall be not less than four (4) feet in length and not less than six (6) inches in width and breadth and shall have a drill hole in the center. All bounds shall be set flush with the surface of the adjoining ground. Wrought iron rods may be used where the points fall on exposed ledge. The placement and accurate location of these bounds shall be certified to by the Registered Land Surveyor of the developer by a letter which shall be submitted with the As-Built Plan. Entrances to subdivisions shall not be marked by elaborate monuments.

12.92 Lot corners in the subdivision shall be set in a manner similar to the setting of the bounds. These corners or points of deflection will be marked with iron ins (or equal) as permanent markers. The same certification is required as in the case of the bounds.

## **13.0 TREES AND PLANTINGS**

### **13.01 Treebelt**

13.011 All areas of the treebelt not reserved for sidewalks, bicycle paths and other impervious structures shall be finished with eight (8) inches of loam and planted with seed mixture, sod or plantings approved by the Tree Warden and the Board.

- 13.012 Areas of the treebelt, which have been planted as in 13.011 above, shall be watered and maintained by the developer to ensure the viability of the vegetation.

### 13.02 Existing Trees

Trees on the site, especially those over eight (8) inch DBH in size should be preserved. The Tree Warden shall inspect and approve all trees over eight (8) inch DBH for preservation/removal. Following is a list of recommended measures for the protection of trees:

- 13.021 There should be no operation of heavy equipment or storage of any materials under said tree within its natural drip line.
- 13.022 Wherever possible no grading or filling should be done within the drip line.
- 13.023 Supplemental irrigation should be provided to all trees as needed during the summer months to insure healthy maintenance.
- 13.024 No black top paving or vehicle parking should be located under evergreen trees. No more than twenty (20) percent of the area under any deciduous tree's natural drip line may be so paved.
- 13.025 All drainage from paved areas should be directed away from root zones.

### 13.03 Street Trees

- 13.031 The subdivider is required to plant suitable broad-leaved deciduous shade or ornamental trees along roads, or ways, unless specifically exempted by the Board. All trees shall be the equivalent of well-rooted nursery-grown stock free of injury, harmful insects, and diseases. They shall meet minimal standards of ANSI Z60.1-1990, American Standard For Nursery Stock, as amended.
- 13.032 Acceptable types of street trees, which include large-growing, medium-growing, and small-growing deciduous shade and ornamental trees indigenous to the area, shall be planted to enhance the visual and aesthetic uniqueness of the site and shall be subject to approval of the Tree Warden.
- 13.033 Large growing trees shall be spaced at intervals of 45 to 55 feet, medium-growing trees at intervals of

30 to 40 feet, and small-growing trees at intervals of 20 to 30 feet or as recommended by the Tree Warden and approved by the Board. Trees on one side of the street may be set either opposite or diagonally to trees on the opposite side.

- 13.034 Minimum acceptable sizes of trees to be planted shall be as follows:

Large-growing--2 ½" trunk diameter, caliper at 1' above ground;

Medium-growing--2 ½" trunk diameter, caliper at 1' above ground;

Small-growing--9' crown height, 5' spread; or as recommended by the Tree Warden and approved by the Board.

- 13.035 Planting operations shall be conducted as specified in the Tree and Shrub Transplanting Manual printed by the International Society of Arboriculture or as approved by the Tree Warden.
- 13.036 Requirements for support stakes, guy wire and cable, ground anchors, hose, and wrapping material shall be those contained in the Tree and Shrub Transplanting Manual or as approved by the Tree Warden.
- 13.037 The subdivider shall be responsible for maintenance of planted trees and replacement of those which have died or become diseased from the time of planting through two full growing season.
- 13.038 Existing trees over eight (8) inch DBH in the proposed right-of-way shall be preserved unless removal has been approved by the Tree Warden. Trees which are to be preserved shall be pruned and shaped as required by the Tree Warden.

#### 13.04 Bank Plantings

- 13.041 All cut or fill bankings that tend to wash or erode shall be planted with suitable, well-rooted, and low-growing plantings. All plants shall be the equivalent of nursery grown stock in good health, free from injury, harmful insects, and diseases meeting all standards of ANSI Z60.1-1990, American Standard For Nursery Stock, as amended.

- 13.042 Acceptable planting types which include very low-growing (4" to 12"), low growing (12" to 30"), and herbaceous plantings shall be approved by the Tree Warden. Perennial grass turf installed as sod is an acceptable alternative for the planting of banks.
- 13.043 If bank plantings are of a type which are properly spaced at close intervals, 8" to 12" of loam shall be spread over the entire bank. If the plantings are to be widely spaced they may be planted in loam pits.
- 13.044 Mulch (wood chips or equal) shall be spread evenly among plantings for weed and erosion control to a depth of not more than four (4) inches.
- 13.045 The subdivider shall be responsible for maintenance of bank plantings and replacement of those which have died or become diseased from the time of planting through two full growing season.

13.05 Corner Plantings

Requirements for plantings adjacent to street intersections shall be the same as those for Bank Plantings with the following exceptions:

- 13.051 Turf may be provided by seeding as well as by planting sod.
- 13.052 Bushy shrubs and herbaceous plantings which are over three and one-half (3.5) feet in height or that would tend to obscure visibility are not permitted within twenty-five (25) feet of the intersection of the curbs adjacent to the corner lot. The requirements of the Zoning Ordinance and Chapter 162, Section 8 of the Town Ordinance shall be adhered to.

13.06 Cul-de-Sac Plantings

- 13.061 The central portion of a permanent dead-end street shall be landscaped with low-maintenance plantings. The following options are permitted:
  - 13.0611 Planting ornamental shrubs and trees of a type acceptable to the Board.

13.0612 Retaining existing vegetation, with the approval of the Board.

13.062 The standards and specifications for existing and proposed trees as outlined in this section shall be adhered to.

### 13.07 Utility Structures

All above ground structures associated with underground utilities (i.e. transformers, switchboxes, etc.) shall be screened with suitable evergreen vegetation approved by the Board and Tree Warden.

## 13.1 GUARD RAILS

Guard rails shall be installed as required by the Board and the Department of Public Works or its engineering consultant, based on State Construction Standards.

## 13.2 EXCAVATION WITHIN EXISTING STREETS

### 13.21 Street Openings

Before starting work, the developer shall obtain all necessary permits for excavating and/or storing material on a public or private way, and any other permits or bonds required. Special provisions will apply to streets openings to any street that has been resurfaced within the prior five (5) calendar years.

### 13.22 Provisions for Traffic

13.221 Conduct all operations so that interference with the flow of traffic will be held to a minimum. Construct temporary bridging across trenches when necessary for traffic and pedestrians.

13.222 Take all necessary precautions to prevent injury to the public due to open trenches. Erect protective fences and barricades and provide adequate warning lights at all trenches, excavated material, equipment, or any other obstacle which may in any way be a source of potential danger to the public.

13.223 Provide and pay all costs for police protection in connection with maintaining traffic while work is in progress.

13.224 The contractor shall remain fully responsible for the protection of persons and property at all times.

### 13.23 Construction Procedures

All construction procedures shall conform to specifications in the West Springfield "Manual for Occupancy of Public Way" unless otherwise directed by the Department of Public Works.

## 13.3 INSPECTIONS OF IMPROVEMENTS

13.31 Subject to approval by the Department of Public Works, it shall be the responsibility of the applicant to engage a Professional Engineer registered in the Commonwealth of Massachusetts to provide engineering supervision during construction to ensure proper installation of improvements in accordance with the approved plan. Said Engineer shall be approved by the Planning Board and Department of Public Works. In accordance with these rules and regulations, the supervising Engineer(s) shall certify that all work has been conducted and completed strictly in accordance with Mass. Highway Department standards, the approved plans and these Rules and Regulations. The developer shall be responsible for all expenses incurred for the inspection of all improvements related to the subdivision.

13.32 During the active construction phase of a development, bi-weekly reports shall be submitted to the Planning Board and Department of Public Works by the developer's Engineer outlining work completed and condition of site.

13.33 At various specified stages of construction of streets and ways, utilities, and other improvements, inspections shall be mandatory and shall be made and approved in writing by a Registered Professional Engineer approved or appointed by the Board, or a representative of the appropriate agency involved. Certification of the completeness of the improvements shall be noted in Form G of these regulations and shall be submitted to the Board.

13.34 Construction of streets and installation of utilities may be phased provided that each section shall not be less than five hundred (500) feet.

13.341 The water system and appurtenant facilities shall be inspected by the Department of Public Works.

- 13.342 Upon the request of the Department of Public Works, the applicant shall have an inspection of installed drainage lines and sewer mains performed by means of a television camera after the filling and compacting of the utility trenches. This inspection shall be conducted at the applicant's expense, and the results forwarded to the Department of Public Works.
- 13.343 At the completion of all the improvements in the subdivision including loaming and seeding, curbs, monuments, plantings and signs, the Department of Public Works and Tree Warden shall make an inspection before final release of the performance guarantee.
- 13.35 Each specified construction stage shall be completed to the satisfaction of the inspecting Professional Engineer and given in writing, before further work shall be done. Any development which progresses beyond an inspection stage without written approval shall be required to return the construction to the status necessary to perform the required inspection.
- 13.36 In lieu of the applicant securing the services of a Professional Engineer, the Planning Board may hire an outside consultant to oversee and inspect all improvements related to the development of the subdivision. All fees for the consultant shall be paid by the developer and administered in accordance with M.G.L. Chapter 44, Section 53G.

#### **13.4 AS-BUILT PLAN**

- 13.41 After construction of all improvements is completed, and before final release of the Performance Guarantee, the subdivider shall prepare and submit to the Board three copies of the Definitive Plan, revised in an As-Built Record Plan at a scale of one inch equals forty feet (1" = 40'), which shall indicate the location of the following as built:
- 13.411 Street lines, showing centerline elevations at fifty (50) foot intervals;
- 13.412 Edge of traveled way, locations of paths and sidewalks;
- 13.413 All permanent monuments and all bounds;

- 13.414 Location and inverts of drainage systems and any utilities required to be installed by the developer including all laterals from the mains to the street edge of the right-of-way. Where houses or cellars exist, additional measurements to such structures shall be shown as more convenient information;
- 13.415 Location of all other underground utilities (such as electricity, telephone, cable, gas, etc.) including all laterals (as d. above); and
- 13.416 All other improvements required by these Regulations or agreed upon as a condition to plan approval.
- 13.42 The accuracy of such record plan shall be certified by a professional land surveyor registered in the Commonwealth of Massachusetts.
- 13.43 As part of the As-Built Plan, the developer shall submit to the Board a certification, by a registered engineer, in which said engineer certifies that all construction was executed strictly in accordance with these Regulations and with all requirements agreed upon as a condition to plan approval.

### **13.5 FINAL CLEANING**

Upon completion of the work, the subdivider shall remove from the right-of-way and adjoining property all temporary structures, surplus material, and rubbish which may have accumulated during the execution of the work, and shall leave the subdivision area in a neat and orderly condition. Burning or burying of the rubbish and waste material is prohibited.

### **13.6 STREET ACCEPTANCE PLANS**

After construction of all improvements is completed, and before final release of the Performance Guarantee, the subdivider shall prepare and submit to the Board three copies of Street Acceptance Plan. The plan shall be at a scale of one-inch equals forty feet (1" = 40'), unless otherwise specified by the Planning Board. The sheet size shall not exceed an outside dimension of twenty-four by thirty-six (24" X 36") inches. The Street Acceptance Plan shall indicate the following information:

- 13.61 The subdivision name, true North arrow, date, scale, locus map, legend and title "Street Acceptance Plan - proposed street name";
- 13.62 Legend denoting all signs and symbols used on the plan and not otherwise explained;
- 13.63 The location in metes and bounds description of all lines of streets, ways and rights-of-way proposed for acceptance as a public way;
- 13.64 Location of all permanent monuments, pins and benchmarker;

The above reference plan and a separate legal description of the roadway shall be prepared by a Civil Engineer and/or Land Surveyor registered in the Commonwealth of Massachusetts.