



1 General

1.1 Preamble

- A. These Construction Standards are hereby established by the City of Framingham Department of Public Works (DPW). Their purpose is to provide a consistent policy under which the controlling requirements for construction of physical aspects of infrastructure system improvements within the City limits will be implemented. These aspects include streets, sidewalks, storm drains, water supply and sewer lines.
- B. These Design and Construction Standards and Construction Details are herein after referred to as the Standards. The Design and Construction Standards are provided as specifications in the materials and methods for performing work relative to the City of Framingham's infrastructure systems. The Construction Details are provided to graphically depict and to help illustrate key elements outlined within the written portion of these Standards.
- C. Most of the elements contained in this document are related to public improvements and City of Framingham contract projects; however, it is intended that they apply to both public and private work designated herein. For private work that does not fall within the regulatory jurisdiction of City By-Laws or regulations, DPW strongly recommends that these standards be used as a basis for construction. These Standards address the more typical infrastructure components. Accordingly, these Standards are intended to assist but not to substitute for competent work by design professionals by providing basic information. It is expected that engineers will bring to each project the best of skills from their respective disciplines, and design professionals shall contact the DPW for clarification and direction regarding designs not covered by these Standards.
- D. These Standards are also not intended to unreasonably limit any innovative or creative effort which could result in better quality, cost savings, or both. However, any proposed departure from the Standards will be judged on the likelihood that such variance will produce a long-term compensating or comparable result, in every way adequate for the user and City resident. Any variances from these Standards must be approved by the DPW. Further, these Standards are not intended to restrict the DPW in its effort to obtain the maximum benefits for the City in any construction project.
- E. These Standards are supplemented by regulations and fee structures. Reference to the pertinent regulations and fee structures is provided within each section of this document. In some cases, the regulations, fee structures, and forms are provided as Appendices to these Standards.

1.2 Regulatory Framework

- A. These Standards are provided to outline the DPW minimum criteria for construction of infrastructure within City limits. It is the responsibility of the property owner to verify and obtain all applicable permits.
- B. These standards are supplemental to the standards in the *City of Framingham Zoning By-Law* regulations for erosion and sediment control during and after construction and the *Rules and Regulations Governing Subdivision of Land in the City of Framingham*, which provides general design standards. Please refer to these documents for design requirements. All work shall conform to the current versions of the City of Framingham Water and Sewer regulations.
- C. All construction materials and methods shall conform to the requirements contained in the latest version of the Massachusetts Department of Transportation (MassDOT) Standard Specifications for Highways and Bridges as amended, unless otherwise specified herein or approved by the City of Framingham DPW.



1.2.1 Application/Plan Review

- A. Proposed construction must be approved by the DPW. The approval must be by the City Engineer, or designee. Proposed work shall be submitted as an Engineering Plan stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. The DPW will provide the Applicant with written correspondence indicating approval of the plan, or required changes. See Appendix A for Plan content requirements.
- B. In addition to plan review approval, it is the responsibility of the property owner to verify and obtain all written permits from appropriate agencies and pay all permit fees before construction begins.

1.2.2 Construction

- A. DPW Inspector of Construction and Utilities may approve field changes, or allowances, that differ from submitted plans or City standards. No changes are allowed without prior approval by the Inspector.

1.2.3 As-Built/Record Documents

- A. The Contractor shall be responsible for the preparation and submittal of record drawings to the DPW when construction is complete. Record drawings shall be a full set of drawings showing all details of the construction, along with any specifications or design reports. This plan shall include all drain lines and structures with rim and invert elevations; all water lines, gates and dwelling service shut offs; all sewer lines and structures with rim and invert elevations; all service wyes with distances to the nearest structures and all relevant easements. Record drawings and reports shall be certified (signed and stamped) true and correct by a Professional Engineer registered in the Commonwealth of Massachusetts and/or Professional Land Surveyor registered in the Commonwealth of Massachusetts, as applicable. Drawings shall be submitted in both electronic and hard copy formats. Contact the DPW to determine the current acceptable electronic format. See Appendix A for As-built Plan content requirements
- B. Certificates of Occupancy will not be signed until payments of the required fees are confirmed and a final site inspection is concluded to validate completeness and accuracy of the submitted as-built plan documents. The DPW requires a minimum of five business days following the delivery of as-built documents package (turnaround time subject to document package completeness) to provide Occupancy Certificate Sign-off.

1.3 General Requirements

1.3.1 Brand Name or Equal

- A. If an item in these Standards is identified as “brand name or an approved equal,” the product will reflect the characteristics and level of quality that will satisfy the City’s needs. The City will evaluate “equal” products on the basis of information furnished by the Applicant or Contractor. All “or Equal” submissions must be approved during the Plan review process and will be judged consistent with MGL 30 §39M. All technical information submitted must be as provided by the manufacturer. The City is not responsible for locating or obtaining any information not identified.

1.3.2 FEMA Regulations

- A. The developer or owner is required to meet all Federal Emergency Management Agency (FEMA) regulations and the City’s Zoning By-Law, Section III (H) “Floodplain Districts.” When a submittal to FEMA is required to adjust the FEMA Flood Boundary and Floodway Maps, the



submittal must be submitted to and approved by the City Engineer prior to submitting to FEMA. Conditional Letter of Map Revisions (CLOMRs) and Letter of Map Revisions (LOMRs) are required for any modifications to a floodplain or floodway.

1.3.3 Easements

- A. Easements for Water, Sewer, or Drainage on or across lots or centered on rear lot lines or side lines shall be provided where necessary and shall be at least thirty feet (30 feet) wide. Major easements (i.e., over three hundred feet (300 feet) long) for sewer, water and drainage must be at least forty feet (40 feet) wide. Signed copies of easements and agreements affecting land not within a subdivision, but necessary for provision of utilities shall be submitted to the DPW before a plan can be approved. Where a subdivision is traversed by a water course, drainage way, channel, or stream, the DPW may require a storm water easement or drainage right of way be provided of adequate width to conform substantially to the lines of such water course, drainage way, channel, or stream and the necessary width for access. The DPW may further require the subdivider to provide construction of such improvements as they consider essential for public safety and for the adequate control of a one hundred (100) year storm.

1.3.4 Roadway Bounds and Monumentation

- A. All existing roadway monumentation shall be inventoried and protected. Any and all proposed impacts shall be brought to the attention of the Engineering Division immediately.
- B. The Engineering Division shall be notified immediately if any survey monuments are uncovered, exposed or damaged.
- C. Any damage to roadway or other survey monuments prior to acceptance by the City shall be repaired in a manner satisfactory to the DPW and the full cost of such repair shall be paid by the Contractor. Any material used which does not meet the standards of the DPW shall be replaced by the Contractor at no cost to the City.

1.3.5 Traffic Management Plans

- A. All traffic management plans shall be approved by the Engineering Division before construction may begin.
- B. Traffic management plans shall meet the requirements and guidance set forth in the MassDOT Work Zone Safety Guidelines, the ATSSA Guide to Temporary Traffic Control, and the MUTCD guidelines.
- B. Specific requirements are provided in Section 6 of these Construction Standards.

1.3.6 Construction Site Maintenance

- A. At the completion of each working day, all areas affected by work shall be brought to a reasonably clean, safe, and usable condition as determined by the City or its designee.

1.4 Erosion Control

1.4.1 Stormwater Management During Construction

- A. All construction shall comply with the City's Zoning By-Laws and Subdivision Regulations for land disturbance including clearing, erosion control, and stormwater management. In addition, construction shall comply with any applicable federal and state requirements, including but not



limited to National Pollutant Discharge Elimination System (NPDES) stormwater discharge requirements.

- B. Every person seeking to construct, repair, or modify a property's infrastructure that is either in the right of way or is subject to applicable City requirements (e.g., Planning Board or Conservation Commission) shall be required by the City to prepare and implement an Erosion and Sedimentation Control Plan to prevent the introduction of sediments into the City's drainage system. The person initiating such modification will be held accountable as the "Responsible Party" with the obligation to:
1. Secure the design of any facilities required pursuant to this section;
 2. Submit the design to DPW for review and approval;
 3. Be responsible for the full expense of installation and maintenance of such facilities; and
 4. Notify the DPW prior to the start of any work to arrange and coordinate City Inspection of the installation.
- C. Silt fencing shall be used as one of the primary erosion control measures. Silt fence shall consist of a sheet of synthetic fabric such as polypropylene, nylon, polyester, or polyethylene yarn. Silt fence shall be erected in a continuous fashion from a single roll of fabric. The bottom of the fabric fence shall be buried sufficiently below the ground surface to prevent gaps from forming, usually 4 to 6 inches below ground surface. The fabric shall be installed on the upstream side of the stakes. Stakes shall be strong enough and tall enough to securely anchor the fabric to the ground. Stake spacing shall be no more than 10 feet apart for extra-strength fabric and 6 feet apart for standard strength fabric. Maintenance of the fence is required during construction. Material shall be based on the synthetic fabric requirements as follows:
1. Filtering efficiency: 75% (minimum)
 2. Tensile strength: Standard strength: 30 lb./linear inch (minimum), Extra strength: 50 lb./linear inch (minimum)
 3. Elongation: 20% (maximum)
 4. Ultraviolet radiation: 90% (minimum)
 5. Slurry flow rate: 0.3 gal/ft²/min (minimum)
- D. Fiber rolls or an approved equal shall be used as another primary erosion control measures. Fiber rolls shall be used in conjunction with silt fences except when used for hillside erosion control, where they may be used alone.
1. Fiber rolls shall be trenched between 3 and 5 inches into the ground, depending on the size of the fiber roll.
 2. Fiber rolls shall be staked securely into the ground using wood stakes. A minimum of 3 inches of the stake shall stick out above the roll.
 3. Stakes shall be spaced 3 to 4 feet apart unless otherwise approved by the DPW.
 4. Fiber rolls placed around drain inlets shall be placed a minimum of one (1) foot back from the inlet.
 5. For slope stabilization, fiber rolls shall be placed perpendicular to the expected flow of stormwater runoff, with the following separation:
1:1 slopes = 10 feet apart
2:1 slopes = 20 feet apart



3:1 slopes = 30 feet apart

4:1 slopes = 40 feet apart

- E. Gravel aprons shall be installed at the entrance of construction sites where disturbance is over 4,000 square feet to prevent sediment from the construction site entering the roadway. Aprons shall be a minimum of 15 feet in length, and extend the width of the entrance.
- F. Silt sacks (or equivalent) shall be placed in down gradient catch basins to prevent sediment from entering the drainage system. Silt sacks shall be periodically cleaned while in use and must be cleaned prior to and after precipitation events. Applicants are advised they may be required to respond immediately for repair and maintenance at the request of the City within two hours of notification.
- G. All erosion and sediment controls shall remain in effective operating condition during construction activities. Inspect all erosion and sediment controls regularly and make the necessary repairs or modifications to ensure effectiveness or as directed by the City Inspector.
- H. Initiate soil stabilization measures immediately whenever earth-disturbing activities have permanently or temporarily ceased on any portion of the site. Complete soil stabilization measures as soon as practicable, but no later than 14 calendar days after the initiation of soil stabilization measures.
- I. All soil stockpiles to be in place for more than 14 days shall have erosion controls (e.g., fiber rolls) installed on the downgradient side to prevent migration of soils.

1.4.2 Stormwater Management Post Construction

- A. Every person shall be required to prepare and implement a stormwater management operations and maintenance plan as required by City review requirements (e.g., Planning Board or Conservation Commission).
- B. Such a plan shall include non-structural and structural measures to manage stormwater during and after construction of the new or expanded facility. The design of such facilities shall be subject to the approval of the DPW. The costs for the design, installation and maintenance of the aforementioned stormwater management systems shall be the responsibility of the facility owner. The DPW shall receive advance notice prior to the start of said work to coordinate Inspectional coverage of the installation.
- C. For subdivisions regulated by the City's Subdivision By-Laws, the DPW may require that major components of stormwater management systems be placed on the property rather than within the City right-of-way limits. In such cases, the owner or homeowners' association shall be responsible for the ongoing maintenance of said components, and the approved stormwater management plan shall include management of these components. This management plan shall be recorded with the deed at the Massachusetts Registry of Deeds.

1.5 Tree Planting and Protection

- A. All tree work shall be completed in accordance with the requirements of the Tree Warden and/or planning board as appropriate.
- B. When specifying trees to be planted on or near the roadways in Town, specifications shall identify species and cultivar. The more disease resistant cultivars shall be recommended.



- C. Trees shall be tagged with identification as to location of origin, species, and cultivar. Notification shall be provided to the Tree Warden to provide time for inspection and verification of tree species and cultivar.
- D. When planted, an area around the trees shall be mulched for a minimum of 3 feet from the tree or twice the size of the root ball, whichever is greater. The area immediately around the tree trunk (within 2 inches of the trunk) shall remain un-mulched.
1. The planting hole shall be at least 2 times the width of the rootball, up to 5 times the rootball.
 2. Burlap, twine, and wire baskets shall be entirely removed after planting.
 3. Place the tree in the hole at both the appropriate upright angle and depth.
 4. Replace the soil so that there is no excessive coverage to roots or contact above the root flare at the stem.
 5. Add a two- to three-inch layer of mulch, not contacting the bark of the tree.
 6. Immediately water the tree, with a plan for regular follow-up watering.
 7. Provide a final quality-control check, where depth of the structural roots is verified, with the use of a chaining pin or other measuring implement.
- E. Tree protection shall include the following.
1. Notification shall be provided to Tree Warden during the planning and specification development of projects where tree protection may be required. The Tree Warden may require that a City-approved certified arborist oversee construction activities related to tree protection.
 2. A pre-construction meeting with the Tree Warden shall be conducted at least two weeks prior to construction to review tree protection procedures.
 3. Tree protection shall be provided for each tree within the work area.
 4. The tree protection zone shall extend out from the center of the trunk to a radius of 1.5 feet per inch of DBH (DBH = diameter of trunk at 4.5 feet above ground).
 5. Primary tree protection shall include 2" x 4" boards in 8-foot lengths vertically strapped around the trunk, at a maximum of 8 inches apart, on center. No penetration of the tree trunk shall be allowed except as approved by a certified arborist or the Tree Warden.
 6. Secondary tree protection shall include fencing around the tree protection zone.
 7. No storage of any materials or equipment shall be allowed within the tree protection zone.
 8. No parking shall be allowed within the tree protection zone.
 9. No roots greater than 2 inches shall be cut during construction activities.
 10. Any pruning of tree limbs shall be done under the direction of a certified arborist.
 11. During excavation, major roots as determined by the Tree Warden shall be exposed using an air spade and flagged for protection.
 12. Vertical mulching shall be required if soil compaction levels exceeds 75% or more than 3 passes by heavy equipment are expected.
 13. If travel is required within the tree protection area, a layer of at least 6 inches of wood chips, mulch, or other matting as approved by the Tree Warden shall be laid down to protect the



roots. The matting shall be removed and the area restored to pre-construction conditions upon completion of the work.

14. For construction where trees roots may be damaged, only root pruning methods may be used for removal. The Tree Warden shall be notified and a plan submitted to the Tree Warden for approval.
 15. Curb cuts should not be closer than five (5) feet from the trunk of any adjacent tree.
- F. Trees that, in the judgment of the Engineer or the Tree Warden, have been irreparably damaged by the Contractor shall be replaced in kind and in size, or with a quantity of 2-inch caliper replacement trees (the quantity of which shall be determined by the Engineer) such that the cumulative caliper of the replacement trees will be up to the equivalent diameter of the lost tree at breast height. Cost of removal of a destroyed tree, including roots and stumps, as well as the cost of replacement trees, shall be paid for by the Contractor.
- G. A written guarantee shall be provided to the Town that trees planted in Town as per the contract will thrive for a minimum of two (2) years. The guarantee shall include replacement of trees that the Tree Warden has determined are not thriving. Replacements shall be required to have the same guarantees as the original trees.

1.6 Waste Management

Disposal of removed pavement, concrete, soil, or other construction materials shall comply with the DPW's Waste Management and Soil Management specifications. The disposal location and management plan shall be pre-approved by the DPW, prior to the start of any work.

1.7 Asbestos Cement Pipe Encountered during Construction

- A. If either asbestos cement (AC) pipe or asbestos cement material in soil is encountered, notification shall be immediately provided to the DPW Engineering and Transportation Division.
- B. Handling of any AC Pipe or AC material shall be according to federal and state regulations, specifically but not limited to EPA's *National Emission Standards for Hazardous Air Pollutants* (NESHAP) Title 40, Part 61; EPA's *Guide to Respiratory Protection for the Asbestos Abatement Industry* OSHA 29 CFR part 1926.1101; OSHA 29 CFR 1010.1001; USDOT 49 CFR 100-185; Massachusetts Division of Labor Standards 453 CMR 6; MassDEP 310 CMR 7.00, 7.09, 7.15; and MassDEP *Asbestos Cement Pipe Guidance Document* (June 2011).
- C. Handling, management, storage and disposal of any AC pipe or AC contaminated material shall comply with Framingham's Standard Operating procedures for asbestos containing materials.

1.8 Conditions for Street Acceptance

- A. The following shall be required as applicable as conditions for acceptance of streets. Any listed reports shall be signed and stamped by a registered professional engineer or land surveyor with applicable qualifications.
 1. Conditions & confirmation conditions achieved
 2. Order letter of conditions
 3. Identified condition exceptions
 4. Homeowner association document
 5. As-built subdivision or plot plan
 6. Roadway layout plan



7. Copies of deeded easements
8. Inspection reports of plantings and other items in the right of way
9. Street light inspection report
10. Fire pull box inspection report
11. Highway sign and/or striping inspection report
12. Layout /bound/ easement inspection report
13. Roadway/sidewalk/curbing base & finish inspection report
14. Utilities inspection (water, sewer, drainage) reports, including water quality testing for all water systems
15. CCTV drain/ sewer systems reports
16. Hydrant inspection reports including test data
17. Drainage/retention pond inspection report
18. Easement or proof of ownership and Operations and Maintenance plans for drainage detention/retention basins.

1.9 Items Not Covered in This Document

- A. Items not covered in this document include the following:
1. Complex and specialty items such as bridges, culverts, siphons, pump stations, and backflow prevention. Plans for these items are to be provided for individual review by the DPW.
 2. Drainage that is completely operating within the boundaries of private property, with no discharge to waterways or the City's drainage system.
 3. Street Opening Permit (SOP) requirements for any facility installation that may occur within the Town Right of Way limits. For SOP policy details please refer to Town of Framingham Web site link as follows: http://www.framinghamma.gov/public_works/sop/default.htm.
 4. Trench Opening Permit requirements for any excavation that meets the definition of a trench as per MGL Chapter 82A Unattended Open Trenches Safety Hazards Rules, Regulations and Fines, and regulated under 520 CMR 14.00 Excavation and Trench Safety Regulations.

1.10 References

<u>Standards</u>	<u>Title/Subject</u>
ATSSA	Guide to Temporary Traffic Control in Work Zones
Mass DLS	453 CMR 6. Current Asbestos Regulations
MassDEP	310 CMR 7.00. Air Pollution Control Regulations. Includes Section 7.09 <i>Dust Odor, Construction and Demolitions</i> and 7.15: <i>Asbestos</i>
MassDEP	Asbestos Cement Pipe Guidance Document (June 2011).
MassDOT	Work Zone Safety Guidelines for Massachusetts Municipalities and Contractors
US DOT	Manual on Uniform Traffic Control Devices
OSHA	29 CFR part 1926.1101. Safety and Health Regulations for Construction, Sub Part Z, Toxic and Hazardous Substances: Asbestos



OSHA	29 CFR 1010.1001. Occupational Safety and Health Standards, Subpart Z, Toxic and Hazardous Substances: Asbestos
US DOT	49 CFR 100-185. Hazardous Materials Transportation
US EPA	National Emission Standards for Hazardous Air Pollutants (NESHAPS) Title 40, Part 61
US EPA	Guide to Respiratory Protection for the Asbestos Abatement Industry