CITY OF GARDNER

DEPARTMENT OF PUBLIC WORKS
&
ENGINEERING DEPARTMENT

CITY SPECIFICATIONS

WATER – SEWER – DRAINAGE - HIGHWAY

EFFECTIVE JANUARY 2002

Revised August 2009

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Prior to Construction

Important Phone Numbers:

Department Of Public Works	Dane Arnold	978-632-7661
Engineering Department	Bob Hankinson	978-630-4010
Survey Department	Dick Lawrence	978-630-4010
United Water Office	W/S Inspections	978-630-8791
Planning Department	Rob Hubbard	978-630-4014
Building Department	Dick Reynolds	978-630-4007
Water & Sewer Dept. – Billing		978-630-4015

Prior to the beginning of any excavation in a City street, or connection to any existing utilities, including sewer, water, and drainage, a dig safe number and road opening permit must be obtained from the Department of Public Works. Road opening permits may be obtained by contacting the Director of Public Works at 978-632-7661. Proper insurance, security, and/or bond, must be obtained prior to issuance of a permit. Prior to connection of water and sewer services to an accepted public water and/or sewer main, all applicable connection fees must be paid. **Call dig safe…**

No person shall cut into, disturb the pavement or finish of, or make any excavation in any public way or portion thereof without first obtaining a permit to do so from the Director of the Department of Public Works or his designee.

Prior to any work, the contractor must obtain all necessary residential or commercial permits.

No person, corporation, or public utility shall commence any underground construction or repairs on or within the limits of public ways and sidewalks located in the City of Gardner without prior written approval of the Director of Public Works or his designee.

No unauthorized person, corporation, or public utility shall uncover, make any connections with or opening into, alter, or disturb any public sewer, water, or drain or appurtenance thereof without first obtaining written approval of the Director of Public Works or his designee.

Contractor is obligated to abide by the City of Gardner's ordinances, subdivision control laws, Department of Public Works specifications, and other applicable rules and regulations. All construction & repairs shall be made pursuant to the City of Gardner's specifications, ordinances, and regulations.

Unless specified herein, all construction will conform to Massachusetts Highway Standards. When conflict occurs, City of Gardner specifications shall prevail unless specified by the Director or his designee.

No excavation within public ways from **November 15 through April 15** unless deemed an emergency by the Director of Public Works or his designee.

The property owner will be responsible for all maintenance and repairs including plowing, sanding, roadway and sidewalk patching, etc., along with all maintenance and repairs of the sewer, water, and drainage system from proposed project to the existing mains until accepted by the City of Gardner. Contractor/property owner is to make aware to all potential customers that the developer is responsible for above mentioned maintenance and repairs until the proposed project is accepted by the City of Gardner.

All proposed connections to the sewer, water, or drainage system must be accompanied with four (4) copies **water/sewer connection plan** stamped by a Massachusetts registered professional civil engineer prior to any permit being issued. **Location plans will no longer be accepted.**

(See water/sewer plan requirements and example.)

Contractor to notify Director or his designee 24 hours prior to any inspections. All sewer, drainage, and water to be inspected by Director or his designee. Any **un-inspected work** will be excavated for inspection at cost of contractor.

The contractor must furnish, at his expense, the City of Gardner's Engineering Department a set of reproducible "as-built" drawings prepared by a professional engineer with any extension of the sewer or water main or drainage system prior to final sign off.

Sewer and water ties must be turned into the City of Gardner's Engineering Department prior to final sign off.

Insurance

Any contractor, public utility including, the gas, electric, cable, and phone company, will require a **$5,000 cash security** with the City of Gardner, Public Works Department. We will accept checks only made out to the City of Gardner. The contractor shall submit proof of such account to the Director prior to the issuance of a permit. The account shall remain in full amount and the City shall be able to access this account for two (2) years.

The $5,000 cash security is being taken by the City of Gardner for the purpose of ensuring completion of the permit work. Should the permittee default on the permit obligations, Department of Public Works will subcontract repair work to make the necessary repairs and assess the cost of the repairs against the cash security. The cash security will be held for two years after their last job which is the time the contractor is responsible for their trenches. The permittee shall give a written request after the two year period to release the cash security. So long as all permit obligations have been met, the security will be returned in its entirety with interest.

The Director is authorized to draw upon the security account to cover the costs of the City, including administrative costs, to perform work which permit applicant has not satisfactorily performed or maintained. If such action takes place, the contractor is responsible for replenishing cash security account to full amount. If contractor fails to replenish the account, Director can refuse future permits until account is at full amount.

$5000.00 amount may be increased for large scale projects or potentially high risk projects. Escrow account will cover one contractor for one calendar year.

Government entities may be exempt from such requirements that applicants provide an escrow account as is otherwise required by this section.

The Contractor will be responsible for trenches for 2 (two) years.

1. Before an excavation permit is issued, the applicant shall obtain insurance as required below and shall file with the Director an insurance certificate acceptable to said Director, containing the following:

The applicant shall obtain and maintain insurance from an insurance company licensed to write such insurance in the commonwealth of Massachusetts against the following risks and in the amounts not less than herein indicated:

A. Workers' compensation

1. Statutory minimums – Massachusetts
2. Coverage limit $100,000 each employee
3. Additional endorsement
    a) Voluntary compensation
    b) U.s. Longshoremen & harbor workers act endorsement

B. General liability

1. Limits of liability
    a) Bodily injury and property damage
    b) Combined single limit of $1,000,000

2. Arrangement of coverage
    a) Premises operation
    b) Products – completed operations
    c) Owners & contractors protective
    d) Explosion, collapse, underground
    e) Broad form comprehensive general liability endorsement equivalent (to include broad form contractual, personal injury, broad form property damage, incidental malpractice, etc.)
    f) Cross liability

C. Automotive liability

1. Limits of liability
   a) Bodily injury and property damage
   b) Combined single limit of $1,000,000

2. Arrangement of coverage
   a) Employer non-owned
   b) Hired car
   c) All owned or leased vehicles

D. Umbrella Liability

Limit of Liability: $1,000,000 (minimum) as excess over general liability, workers' compensation Coverage B

All policies shall provide the City of Gardner thirty (30) days' written notice of cancellation, non-renewal, or material change. Certificates of insurance are to evidence the duty to notify the City. Certificate wording to the effect that carriers will "endeavor to" provide notice and failure to provide notice "shall not impose liability or obligation" are not acceptable for the purposes of street excavation permits.

E. Occurrence Insurance

All insurance provided under this ordinance shall be occurrence based coverage, rather than claims based insurance coverage.

F. Certificate Holder

The City of Gardner shall be named as an additional insured for the project on all insurances policies. The certificate holder shall read exactly as follows:

Director, Department of Public Works
95 Pleasant Street
Gardner, MA 01440.

2. Exemptions to the filing insurance endorsement are only to other governmental agencies of state and federal level.

Revocation of Permits

The Director of Public Works or his designee may at any time cancel or suspend permits for cause. Alteration in coverage required by this ordinance, cancellation or expiration of insurance shall result in automatic cancellation of permit.

Start of Work

Work shall start as near to the starting date specified in the permit as possible unless otherwise expressly stated as a condition of the permit. A permit issued under this ordinance shall have a term of thirty (30) days. The Director, at his discretion, may grant a permit extension not to exceed sixty (60) days. In any case, a seventy-two hour notice to the Department of Public Works prior to the commencement of work is required.

Emergency Action

Nothing in this ordinance shall be construed to prevent the making of such excavations as may be necessary for the preservation of life or property or for the location of trouble in conduit, drain, culvert, or pipe, or for making repairs, provided that the person making such excavation shall apply to the Director for such a permit before 9:00 am on the first business day after such work is required.

The person engaged in the emergency action shall notify the Department of Public Works, Police Department, and the Fire Department at the start of the emergency work.

Routing Traffic

The permittee shall insure that normal traffic conditions are maintained in the area and during the time of excavation, to the extent practicable, so that the excavation work causes as little inconvenience as possible to the occupants of the property and general public.

Section I - Street Excavation

The Director may close the streets and walks to traffic for a period of time, as he deems necessary. If required by the Chief of Police, the permittee shall engage, at its own expense, a Police Officer(s) to direct traffic and maintain public safety. The presence of a Police detail does not reduce the duty of the permittee to insure safety in the work area, including the requirement of warning signs and other traffic control devices.

The permittee shall place warning signs an appropriate distance from the construction site to alert all traffic of the hazard, and shall place cones or other approved devices to channel traffic, all in accordance with the requirements of the Director or Chief of Police. All warning and safety measures shall be in accordance with the applicable requirements and practices of the Massachusetts Department of Public Works and as provided in the "manual on uniform traffic control devices for streets and highways", or as required by the Director or Chief of Police, whichever is more stringent.

Clearance of Vital Structures

The excavation work shall be performed and conducted so as not to interfere with access to fire hydrants, fire stations, fire escapes, water gates, underground vaults, catch basins, and all other vital equipment as designated by the Director.

Protection of Traffic

The permittee shall maintain safe crossings for two lanes of vehicle traffic at all road intersections where possible and safe crossings for pedestrians at intervals of not more than three hundred feet. If any excavation is made across a public way, it shall be made in sections to assure maximum safe crossing for vehicles and pedestrians. If the way is not wide enough to hold the excavated material for part time storage, the material shall be immediately removed from location.

Protection Measures

It shall be the duty of every person excavating in a street to place and maintain all required signs and traffic devices. All signs and devices shall be in accordance with the Massachusetts manual on uniform traffic control devices. The number and location of all signs and devices shall be as deemed necessary by the Director for the safe and efficient performance of the work and the safety of the traveling public.

Relocation and Protection of Utilities

The permittee shall not interfere with any existing utility without the written consent of the Director and the owner of the utility. If it becomes necessary to relocate an existing utility, the permittee shall comply with the owner's requirements in relocating such a utility, including bearing the cost of such work. The permittee shall inform itself as to the existence and location of all underground utilities and protect the same against damage.

The permittee shall adequately support and protect by timbers, or otherwise all pipes, conduits, poles, wires, or other apparatus which my be in any way affected by the excavation work, and do everything necessary to support, sustain and protect them under, over, along or across such work area. In the event any of said pipes, conduits, poles, wires or apparatus be damaged, and for this purpose pipe coating and other encasement or devices are to be considered as part of a substructure, such damage shall be repaired in compliance with the owner's requirements and the expense of such repairs borne by the permittee. The permittee shall be responsible for any damage done to any public or private property by reason of the breaking of any water pipes, sewer, storm drain, gas pipe, electric conduit or other utility.

Notification to Public Utility Companies

The permittee shall, in accordance with the General Laws of the Commonwealth of Massachusetts currently in effect, give notice to public utility companies before commencing excavation including but not limited to M.G.L. C. 82, § 40.

Under the General Laws of the Commonwealth of Massachusetts, Chapter 82, Section 40 as amended, no one may excavate in the Commonwealth of Massachusetts except in an emergency without giving seventy-two (72) hours notice, exclusive of Saturdays, Sundays, and legal holidays, to natural gas pipeline companies, public utility companies, cable television companies, and municipal utility departments that supply gas, electricity, telephone, or cable television service in or to the City where the excavation is to be made.

The permittee shall notify the City of Gardner Survey Department at least Seventy-Two (72) hours prior to commencing excavation and request the engineers identify the location of the existing utilities, except in the case of an emergency, which shall proceed in accordance with section h of this ordinance and applicable state law. Information from the Survey Department shall not alter or reduce the permittee's duties to safeguard the existing utilities as required by this ordinance and applicable law.

Protection of Adjoining Property

The permittee shall at all times and at his own expense preserve and protect from injury adjoining property by providing proper support, and by taking such other precautions as may be necessary for the purpose. The permittee shall, at his own expense, shore up and protect all buildings, walls, fences, foundations, pavement, landscaping or other property likely to be damaged during the progress of the excavation work and shall be responsible for all damage to public or private property or highways resulting from its failure to properly protect and carry out said work. The permittee shall not remove, even temporarily, any trees or shrubs which exist in planting strip areas without first obtaining the written consent of the Director of Municipal Grounds.

Repairs to Streets and Sidewalks

The five (5) inch bituminous concrete paving shall extend six (6) inches either side of the dimensions of the original excavation, and meet the existing pavement along a fresh, straight cut edge. This vertical edge of existing pavement shall be thoroughly covered with a tack coat of bituminous prior to placing the new bituminous concrete pavement. Upon completion of the patch, the joint between the new and old pavements shall be thoroughly sealed with a liquid bituminous seal coat or crack sealer. Mix shall conform to Massachusetts Department of Public Works standards. Where the trench is to one side of the street or perpendicular to the direction of traffic, the width of the one and a half (11/2) inch overlay shall be a minimum of twelve (12) feet (six feet either side of the center line of the trench where possible), unless approval to omit the overlay has been granted in writing by the City Engineer or Director of Public Works. In lieu of an overlay, infrared patching may be required by the Director of Public Works or his designee.

If more than 50% of a roadway disturbed by an excavation, the entire width of the roadway shall be paved gutter to gutter.

In no instance shall the thickness of the patch be less than the thickness of the surrounding roadway pavement. At those locations having a reinforced cement concrete slab underlying the bituminous concrete surface a six (6) inch cement slab shall be placed over the trench. This concrete slab shall consist of 4,000 psi early strength, air-entrained concrete, and shall extend a minimum of one (1) foot onto the original ground beyond either side of the trench. This slab shall have steel reinforcing for tensile strength placed in accordance with good engineering practice. The top of the concrete must remain at least four (4) inches below the grade of the existing pavement.

If utility manholes or castings have to be raised or otherwise adjusted in height or location, the existing pavement shall be removed for a minimum distance of two (2) feet from the edge of the casting. The thickness of bituminous concrete paving within this area shall be gradually transitioned from four (4) inches minimum thickness at the perimeter of the patch to the full depth of the casting. This area near the casting should be compacted with extra care to assure that good densification occurs around the manhole.

All excavating exceeding 100 feet in length, shall be repaired with machine laid dense mix and compacted utilizing a roller minimum five (5) ton in weight. The thickness shall not be less than the thickness of the surrounding roadway pavement.

Sidewalks, where disturbed, shall be replaced to the entire width with materials of the same composition as those removed. Concrete walks shall be repaired with 4,000 psi early strength air entrained concrete to the nearest score line or approved saw cut edge. Similarly, any curbs or berm disturbed shall be replaced in kind. Extreme care shall be exercised to protect existing property bounds and underground structures. Disturbed bounds shall be reset by a professional land surveyor at the expense of the permittee.

Driveways shall be repaired with materials of the type and thickness of those removed. All grass areas disturbed must be finished with a four (4) inch layer of screened loam and reseeded. Extreme care must be exercised to prevent damage to major root systems of trees.

Any temporary patching deemed necessary by the Director of Public Works or his designee shall be maintained in good repair at all times. The City of Gardner reserves the right to make any temporary repairs it deems necessary to maintain the street in a safe and usable condition, and to charge the permittee for all costs involved in such repair. **Contractors performing the excavation and repairs will keep such excavation in good repair for a period of two (2) years following completion of the project.**

All costs appurtenant to restoring the excavated area to its near original condition are to be borne by the permittee.

Effective October 14, 2004
Policy Regarding Excavation on Roadways Paved within 5 Years

Unless deemed an Emergency by the Director of Public Works, no excavation is allowed on roadways that have been paved within five (5) years. The City of Gardner has a 5 year moratorium on excavation in roadways that have been paved. Meaning, if a road is paved in 2005, it cannot be excavating in until 2010 unless deemed an emergency by the director.

On streets, which, have been resurfaced within the previous five (5) years, the entire width of the roadway shall be overlaid with a one and a half (1½) inch machine laid dense mix.

A fee of $5,000 is applied to newly paved roadways and will be granted ***only as deemed necessary by the Director of Public Works.*** The applicant shall present a Check to the City of Gardner at the Department of Public Works. The check must clear prior to excavation. Not every roadway will be granted this access depending on roadway and the scope of the project.

Demolition/Abandonment

Issues, such as abandonment or renewal of water or sewer services, the contractor demolishing the structure shall present a $5,000 Bond to the Department of Public Works. If renewing a water or sewer service, the service shall be renewed up to the pavement. A $5,000 bond shall be presented to the Department of Public Works for the purposes of renewing service under pavement when excavation moratorium has expired.

When demolishing a structure, the water and sewer main shall be capped at the main. The contractor demolishing the structure shall present a $5,000 Bond to the Department of Public Works for the purposes of capping the services under pavement when excavation moratorium has expired.

In all cases, the Insurance Bond shall be for the period until the 5 year excavation moratorium has expired. The Bond cannot be of renewing type. For example, if a road was paved 2 years ago, the Bond must be for 3 full years.

R. Restoration Guarantee

Any permittee making excavations in streets shall guarantee their permanent restoration work for a period of two (2) years from the date of acceptance of the permanent restoration by the Director. The permit holder may be required to completely re-excavate, refill, compact and repave any permanent restoration that fails within the two year guarantee period.

If, at any time, during or after the two year guarantee period, it is discovered that the permanent restoration was not made in accordance with City specifications, the permittee shall be responsible for making a proper restoration.

The Director may, in his discretion, require the permittee, as a condition of the permit, to maintain insurance and a bond for the guarantee period.

S. Testing of Work

The Director may, at his discretion, order tests on any street restoration in order to determine if the work has been completed in accordance with City Specifications.

If the test shows the street restoration to be unacceptable to the Director, the permit holder shall pay the cost of the testing in addition to making the proper restoration.

Street or Sidewalk Obstructions

Non excavation permits to place materials, equipment, or obstruction in a public way.

A. Permit Required

A. No person shall use any portion of a public way without first obtaining a permit to do so from the Director of Public Works or his designee.

B. No person shall use any portion of any street which the City is obliged to keep in repair for the purpose of placing building materials or rubbish or moving a building on either the sidewalk or roadway without a permit from the Director of Public Works or his designee.

C. No person to whom such a permit is issued shall fail to comply with the conditions thereof or with these regulations.

D. Application for such permit shall be made to the Director of Public Works or his designee. The Director of Public Works may grant such permit to be in force for a period that he may designate, not exceeding ninety (90) days, upon condition that during the whole of every night, from sunset until sunrise, warning lights shall be so placed as to warn travelers of the presence of the obstruction and upon such further conditions as the Director of Public Works may determine. The Director of Public Works may require that a cash security be furnished to secure the performance of the provisions of this section.

B. <u>Insurance</u>

A. Insurance requirements shall be as defined in previous section.

C. <u>Cash Security</u>

No person shall install/repair/renewals any utility or other private connection into any public utility including water, sewer, drainage, drilling, and all other types of excavation unless such person who's name will be on the permit deliver a cash security to the Director of Public Works, in the sum of not less than five thousand dollars ($5,000), for the faithful performance of such work as he may execute, and to make good any defects in material or workmanship which may appear in the utility trench on account of work done by said insured contractor, and to remunerate the City and any person connected to such work for loss or damage occurring in consequences of any act done under any permit granted such contractor.

As of January 1, 2002, in order to do any work within the public roadway, contractor will need to have deposited a $5,000 cash security with the City of Gardner, Public Works Department. We will accept checks made out to the City of Gardner. The contractor shall submit proof of such account to the Director prior to the issuance of a permit. The account shall remain in full amount and the City shall be able to access this account for two (2) years from the date of the last permit issued to said contractor.

The $5,000 cash security is being taken by the City of Gardner for the purpose of ensuring completion of the permit work. Should the permittee default on the permit obligations, Department of Public Works will subcontract repair work to make the necessary repairs and assess the cost of the repairs against the cash security. The cash security will be held for two years after their last job which is the time the contractor is responsible for their trenches. The permittee shall give a written request after the two year period to release the cash security. So long as all permit obligations have been met, the security will be returned in its entirety with interest.

The Director is authorized to draw upon the security account to cover the costs of the City, including administrative costs, to perform work which permit applicant has not satisfactorily performed or maintained. If such action takes place, the contractor is responsible for replenishing cash security account to full amount. If contractor fails to replenish the account, Director can refuse future permits until account is at full amount.

$5000.00 amount may be increased for large scale projects or potentially high risk projects. Escrow account will cover one contractor for one calendar year.

Government entities may be exempt from such requirements that applicants provide an escrow account as is otherwise required by this section.

City of Gardner

Department of Public Works

Insurance Certificate Guidelines

Check list

To be acceptable, certificates if insurance shall:

1. Be signed and dated by the issuing agent
2. Include the issuing agents name and address
3. Provide full description of each coverage including policy numbers, policy periods, and limits.
4. Include full name and address of the insured.
5. Include full name and address of the certificate holder.
6. Include name of companies affording coverage.
7. Indicate all required coverage's as outlined in insurance specifications, rules or regulations.
8. Indicate cancellation notice – not less than thirty (30) days.
9. Include full description of operations/work to be performed. Be specific in job description and location.
10. Indicate City of Gardner as additional insured.

Excavation

No person shall cut into, disturb the pavement or finish of, or make any excavation in any public way or portion thereof without first obtaining a permit to do so from the Director of the Department of Public Works or his designee.

Prior to any work, the contractor must obtain the necessary residential or commercial permits.

No person, corporation, or public utility shall commence any underground construction or repairs on or within the limits of public ways and sidewalks located in the City of Gardner without prior written approval of the Director of Public Works or his designee.

No unauthorized person, corporation, or public utility shall uncover, make any connections with or opening into, alter, or disturb any public sewer, water, or drain or appurtenance thereof without first obtaining written approval of the Director of Public Works or his designee.

Permits must be kept at the job site during the process of excavation and must be shown, upon request to any authorized City personnel.

Prior to the beginning of any excavation, the existing pavement shall be cut along a straight line to prevent over breaking.

Large stones, peat, wood debris, organic material, and other undesirable material shall be separated & removed from the site. Remaining material shall be stockpiled on-site and used for backfilling the trench, unless Director or his designee requests substitute backfill material.

All top soil shall be deposited along side the trench in an approved manner and shall not be mixed with other materials.

The contractor shall make excavations in an approved manner to the established line and grade, without damaging any existing structures. All existing gas pipes, water pipes, sewers, drains, catch basins or manholes shall be carefully supported and protected from injury. In case of any damage caused by his actions, the contractor must notify proper authorities and obtain approval of the method of repair. If it is necessary to change the locations of any structure, the structure will not be interfered with until the Director or his designee has given approval.

Sewer Specifications

City's policy as of August 16, 2004, regarding issuance of Sewer Extension Permits is as follows:

There are three categories:

1) Minimal Impact: up to 4 homes in a project
2) Moderate Impact: 5 to 12 homes in a project
3) Significant Impact: over 12 homes in a project

1) Applicants will be required to prove to the City there will be no effect to the existing sewer system with the proposed flow. Special conditions may apply depending on project's impact, scope, and location. A $2.00 per gallon charge will still apply at the time of applying for a Utility Permit.

2) Applicants will be required to remediate a 4:1 ratio of removal of Inflow and Infiltration from the sewer system prior to connection. Meaning, using Mass DEP Title V Regulations, for every bedroom (110 gallons of sewage generated), 440 gallons of I/I must be removed from the sewer system prior to issuance a Utility Connection Permit. The estimated cost of the project will be estimated and deducted from the $2.00 per gallon charge at the time of applying for a Utility Permit.

3) Applicants will be required to remediate at least a 4:1 ratio of removal of Inflow and Infiltration from the sewer system prior to connection. All sewer mains that will have additional flows introduced by the project must provide at least 25% capacity during peak/wet flows. Additional capacity in specified mains may be required by the director if deemed necessary to accommodate upstream flows with projected build-out. Increased capacity to the sewer system by increasing pipe size will be credited towards the 4:1 remediation. The estimated cost of the project will be estimated and deducted from the $2.00 per gallon charge at the time of applying for a Utility Permit.

Again, this is only if the sewer extension has to be completed; any connection that does not require an extension will fall under existing tie-in fees and a $2.00 per gallon I/I charge will still apply at the time of applying for a Utility Permit.

Applicant must meet with the Department of Public Works and its consultant to finalize area(s) to have I/I upgrade prior to the Director signing of Sewer Extension Permit. Improvements must be made to the system and proven to the City that their concerns have been met, including the ratio of 4:1 has been removed prior to issuance of Utility Permit.

Other requirements

Where the public sewer system is located within 1000' of a proposed subdivision (as the crow flies), the subdivider shall connect to the public sewer system at his expense, and in accordance with the overall sewer plan of the area.

If, in the opinion of the Director, there will be sewage within 1000' of the proposed subdivision within 5 years of the date of submission of the definitive plan, as indicated by an accepted City schedule of planned improvements, the subdivider shall, at no cost to the City, install in the street, sewer mains, and every lot, sewer laterals.

Water and sewer laterals shall be separated by not less than 10'. If this is not possible due to site restrictions, the sewer and water must be separated by not less than 3' horizontally **and** not less than 18" vertical separation with the sewer being lower than the water only with permission from the Director of Public Works or his designee.

Water mains must be not less than 18" above sewer main.

The following steps are required to connect to the city of Gardner's municipal sewer system:

1. Obtain a **Massachusetts registered civil engineer** to design a **sewer connection plan** (refer to city specifications for requirements of plan).
2. Submit **sewer connection plan with a sewer connection permit** to the department of public works for review proposed design. Pay appropriate fees at the sewer department city hall. Allow one week for review, comments or approval/disapproval.
3. Hire a city of Gardner insured contractor with a **cash security** to secure a permit. All **appropriate fees** must be paid prior to issuance of road opening permit. A list of currently insured contractors will be maintained at the department of public works.(refer to city ordinances and specifications for requirements of cash security).
4. Contractor to obtain a **road opening permit.** The contractor who is doing the work **must** be the one who obtains cash security and insured with the city.
5. The contractor will arrange an **inspection** with city inspector 24 hours prior to excavation. Contractor to perform in compliance with the city standards and specifications.
6. Sewer extensions must be **pressure tested** and **videotape** of line turned into city of Gardner's engineering department
7. The contractor will supply the city of Gardner's engineering department with an **as-built plan** which will be recorded and kept on file for future maintenance and upgrade purposes.

Existing building sewers constructed of transite (asbestos-cement) or Polyvinyl Chloride (PVC) may be used in the connection with new buildings **only** when they are found, after testing & examination by the Director or his designee. Services constructed of clay based material (vitrified clay) shall be removed from the main to the building & replaced with watertight **6" SDR 35 green PVC pipe.**

4" PVC will no longer be accepted for sewer services.

Location of sewer mains shall conform to typical street sections included herein.

Sewer mains shall be a minimum of **8" watertight SDR 35 green PVC pipe**.

The **minimum pipe slopes** shall be:
6" PVC 0.02 foot per foot for sewer laterals.
Pipe slopes shall not great enough to separate solids in pipe.

No more than 2 bends of not more than 45 degrees each shall be allowed for sewer services including bend at main connection. All bends must be exposed for inspection.

Only one sewer service is allowed per 6" lateral.

A minimum of 5' of cover is required for building sewers and 7' for mains, unless approved by the Director of Public Works or his designee. Every sewer main must be ended with an approved precast manhole.

The connection to the building sewer shall conform to requirements of all applicable building and plumbing codes or other applicable rules & regulations of the City of Gardner. A 24 hour notice must be given prior to installation of building sewer. This connection must be inspected by the Director or his designee.

All mains shall be aligned and graded using either a laser or transit. Manholes will be required at all changes in slopes or changes in alignments. Manhole separation will be no greater than 300 feet.

A minimum of 4 inches of crushed stone must be used under all sanitary sewer mains and under all pipes during excavation.

All pipes shall be jointed in strict accordance with the manufacturer's specifications. When connecting sanitary services to the main, saddles must be used. All connections for services shall use a "y" at the main. If a "y" cannot be used, the contractor must notify the City inspector to obtain approval for an alternate solution. Banana bends shall keep all sewer pipe and manholes watertight. In new main construction saddles are not allowed, only a "y" or "t" may be used.

Cleanouts will only be allowed if there is no other alternative. Approval must be given by the Director or his designee. Cleanouts for sewer services will be located in an accessible, but safe place so they can be easily worked on. Cleanouts shall not be located under stairs. Approved cleanouts shall be set to grade and a cast iron cover placed over top to protect it from being damaged.

Contractors shall be responsible for supplying the City with a video-audio tape of all new sewer mains, which will become the property of the City of Gardner Department of Public Works. **Air testing is required and passed before any flows are introduced into the sewer system** and shall be witnessed by City Official.

Force mains for single family dwellings shall be SDR 35, schedule 40, or equal. Force mains for multi dwelling units, apartments, condos, commercial or industrial units, force mains shall be Ductile Iron CL.52.

Trenches to be lined with 6" of crushed stone prior to laying sewer services and/or sewer mains.

Grease traps

1) Grease traps shall be provided for kitchen flows at restaurants, nursing homes, schools, hospitals, cafeterias, and other facilities which quantities of grease can be expected to be discharged into the sewer system. This will apply to all newly constructed establishments, major renovated establishments, existing establishments that are undergoing renovations that require a building permit with known sewer problems, or an establishment that has two (2) or more sewer backups.
2) Grease traps shall be installed on a separate building sewer serving kitchen flows into which the grease will be discharged. The discharge from the grease trap must flow to a building sewer prior to discharge into the sanitary sewer.
3) Grease traps shall:
    a. have a minimum liquid depth of 4'
    b. minimum capacity 1500 gallons or 200% of the design kitchen flow, whichever is greater
    c. have sufficient capacity to provide at least a 24 hour detention period for kitchen flow.
    d. Multi-compartments are preferred. The first compartment should be 2/3 the total volume.
    e. Kitchen flows shall be calculated in accordance with 310 CMR 15.203.
    f. If garbage grinders are used for disposal of waste, grease traps volume shall be increased by 25%.
    g. The invert elevation of the inlet of the grease trap shall be at least two inches above the invert elevation of the outlet. The inlet and outlet shall be located at the center line of the tank, and at least 12 inches above the maximum groundwater elevation.
    h. Inlet tee shall extend from approximately 3" below the top of the grease trap to a minimum of 24" below the surface of the liquid level or to the midpoint of the liquid level, whichever is lower.
    i. The outlet tee shall extend from approximately 3" below the top of grease trap to 12" above the bottom of the grease trap.
    j. Tees shall be cast-iron or Schedule 40 PVC and properly supported by a hanger, strap, or other device.
    k. Grease traps shall be provided with a minimum 20-inch diameter manhole frame and cover to grade over the inlet and outlet tees. Manholes shall be watertight and constructed of durable material.
    l. All piping shall be a minimum of Schedule 20 PVC in areas not subject to automobile or heavy equipment traffic. In areas where such traffic exists or is anticipated, Schedule 40 PVC or equal shall be used.

4) Grease traps shall be watertight and constructed of materials with the following specifications:
    a. Grease traps shall be constructed of sound and durable watertight materials not subject to excessive corrosion, decay, frost damage, cracking, or buckling due to settlement or backfilling.
    b. Grease traps shall be constructed of:
        i. Poured-in-place concrete
        ii. Precast reinforced concrete
        iii. Fiberglass
        iv. Polyethylene
        v. Metal grease traps are prohibited.
    c. Grease trap construction materials shall meet the following minimum specifications:
5) Concrete
        i. Concrete strength f'c 4000 PSI @ 28 days. Density 140 PCF
        ii. Cement, Portland type I or III per ASTM C150-81
        iii. Admixtures per ASTM C233-82
        iv. Reinforcing per ASTM A615 for wire fabric. Grade 40/60 R'd or equivalent
        v. Design loading H-20
        vi. Minimum wall thickness: four inches, three with reinforcing
6) Synthetic
        i. Ultimate tensile strength – minimum 12,000 PSI when tested in accordance with ASTM D 638-89, Standard Method of Test for Tensile Properties of Plastics.
        ii. Flexural strength – minimum 19,000 PSI when tested in accordance with ASTM D 790-86, Standard Method of Test for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
        iii. Flexural modulus of elasticity – minimum 800,000 PSI when tested in accordance with ASTM D 790-86, Standard Method of Test for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating materials.
    b. Grease traps shall be water tight through manufacturer's specification and warranty; or
    c. Grease traps shall be made watertight by the manufacturer, equipment supplier, or installer using asphalt or synthetic polymer sealer specified by the concrete or synthetic material manufacturer.
    d. Grease traps shall be constructed or set level and true to grade on a level stable base which has been mechanically compacted. If the component is placed in fill, proper compaction is required to ensure stability and to prevent settling; native ground with a six inch base is otherwise adequate.
    e. All system components shall be constructed of corrosion resistant materials.

f. All pressurized pipes shall be designed and installed to meet the following requirements:
    i. To prevent freezing by being installed below the frost line, by being adequately insulated if installed above the frost line, or be self draining.
    ii. To specify appropriate class or schedule of pipe to withstand maximum pressure and/or anticipated vehicular loads; and
    iii. To specify appropriate thrust blocking at all angles, bends, branches, plugs, and wherever else necessary to prevent disruption of proper functioning of the line.

g. The top of the grease trap shall be installed not more than 36" below finished grade. Where site restrictions prevent compliance of this provision, written permission from Department of Public Works must be obtained prior to approval.

h. Where any portion of the grease trap is placed at or below the ground water table, grease trap shall be designed with counter weights, anchors, or ballast and a buoyancy calculation for the entire volume of grease trap, *when empty*, shall be performed and submitted to the Department of Public Works with plans and specifications of system.

7) Grease traps shall be installed on a level stable base that has been mechanically compacted and onto which 6 inches of crushed stone has been placed to minimize uneven settling.
8) Grease traps shall be accessible for inspection and maintenance. No structures shall be constructed directly upon or above the grease trap access locations.
9) Backfill around the grease trap shall be placed in such a manner as prevent damage to the tank.
10) Grease traps shall be maintained in accordance with the following:
    a. Grease traps shall be inspected monthly and shall be cleaned by a licensed septage hauler whenever the level of grease is 25% of the effective depth of the trap, or at least every three months, whichever is sooner.
    b. A log of inspection and maintenance shall be kept by owner for review by Sewer Department.
11) Grease removal by other devices located within the building as part of the internal plumbing are not within the jurisdiction of said ordinance and shall not be considered for compliance with ordinance except with prior written approval of the Department of Public Works.

12) If site restrictions exist, a written request for an alternative method(s) of treatment must be submitted to the Director of Public Works for review. No alternatives are acceptable without written approval from the Director of Public Works.

13) If applicant is aggrieved by the decision of Director of Public Works, a written request for a hearing must be presented to the Board of Health within 10 days. The Board will schedule a hearing for relief at the next available meeting.

Sewer Manholes

All manholes to be 4' in diameter and to have interlocking sections and be standard precast with either cast iron, aluminum or approved plastic steps spaced 12 inches apart. A watertight seal must be placed between precast manhole sections. Inverts must be built in sanitary manholes. Precast sewer manholes shall have rubber "O" ring gaskets.

All manhole covers used on City streets to be Type T&B LT106 or LB268-3 with a 26" diameter opening will be of heavy-duty construction with the frame and cover height of at least 8". Covers shall also have the words or "SEWER" integrally cast as appropriate. The cover to be of "Seal Tite" design as manufactured by Lebaron Foundry or approved equal.

All brick used in sanitary sewer manholes, including brick used for inverts and raising covers shall conform to A.S.T.M. Standard specifications for 4" x 8" x 2" **sewer brick**. Barrel block and cement brick are acceptable in drain manholes only. In the event the City inspector rejects any brick it shall be immediately removed and substituted with an acceptable brick.

Mortar used in manholes shall be composed of one part Portland cement, hydrated lime and two parts sand, in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. Lime and sand shall conform to A.S.T.M. Standards.

When installing manholes, the trench shall be excavated so that there is two feet clear on each side of the structure. Four to six inches of crushed stone shall be placed under the manhole or catch basin and gravel shall be compacted in six inch layers around the structure to secure it firmly.

In sensitive areas, such as Watersheds, walkways, playgrounds, easements, or any area in the opinion of the Director of Public Works deems necessary, a bolt-down manhole cover shall be used (Type Lebaron Foundry, LAB 268-000) 26" x 8" bolted and gasketed, heavy duty construction

Sewer ties must be turned into the City of Gardner's Engineering Department prior to final sign off.

The contractor must furnish, at his expense, the City of Gardner's Engineering Department a set of reproducible "as-built" drawings prepared by a professional engineer with any extension of the sewer main prior to final sign off.

Floor Drains

All floor drains must connect to the sanitary sewer. Floor drains in any garage must connect to a gas trap and separator before running into the sanitary sewer. Gas traps will conform to the latest state and local regulations.

Water Specifications

Where the public water system is located within 1000' of a proposed subdivision (as the crow flies), the subdivider shall connect to the public water system at his expense, and in accordance with the overall water plan of the area.

If, in the opinion of the Director, there will be City water within 1000' of the proposed subdivision within 5 years of the date of submission of the definitive plan, as indicated by an accepted City schedule of planned improvements, the subdivider shall, at no cost to the City, install in the street, water mains, and every lot, water services.

Water and sewer laterals shall be separated by not less than 10'. If this is not possible due to site restrictions, the sewer and water must be separated by not less than 3' horizontally **and** not less than 18" vertical separation with the sewer being lower than the water only with permission from the Director of Public Works or his designee.

All costs and expenses related to the installation or connection to the water system shall be borne by the owner of the property.

The following steps are required to connect to the city of Gardner's municipal water system:

1. Obtain a **Massachusetts registered civil engineer** to design a **water connection plan** (refer to city specifications for requirements of plan).
2. Submit **water connection plan with a water connection permit** to the department of public works for review proposed design. Pay appropriate fees at the sewer department city hall. Allow one week for review, comments or approval/disapproval.
3. Hire a city of Gardner insured contractor with a **cash security** to secure a permit. All appropriate fees must be paid prior to issuance of road opening permit. A list of currently insured contractors will be maintained at the department of public works. (Refer to city ordinances and specifications for requirements of cash security).
4. Contractor to obtain a **road opening permit.** The contractor who is doing the work must be the one who obtains cash security and insured with the city.
5. The contractor will arrange an **inspection** with city inspector 24 hours prior to excavation. Contractor to perform in compliance with the city standards and specifications.
6. Contractor to **chlorinate & test** water lines and submit results to city of Gardner's engineering department
7. The contractor will supply the city of Gardner's engineering department with an **as-built plan** which will be recorded and kept on file for future maintenance and upgrade purposes.

Water Mains

Water mains must be ductile iron class 52 push on joint and cement lined. The outside surface of the pipe shall be coated with a bituminous coating of either coal tar or asphalt base. The inside surface of the pipe shall receive a cement mortar lining and bituminous

seal coat in accordance with A.N.S. Standards for cement lining for cast-iron pipes and fittings for water.

Water mains must be a minimum of 8" in diameter.

A minimum of 5' of cover is required over water mains. Mains to be surrounded by a minimum of 6" of sand, 12" maximum.

Water mains must be not less than 18" above sewer main.

Where possible, water mains shall be looped. All proposed dead-end water mains must have hydrant at end of main. Hydrants shall be AVK Nostalgic, Mueller Centurion, and Clow Medallion. When installing a hydrant, the hydrant must be rodded to the gate valve. (See sketch)

Fittings must be ductile iron or cast iron. Cement lined and tar coated will be accepted 8" to 16". Megalug or grip ring joint restraints are to be used as needed.

Tapping sleeves and valves shall be two piece cast iron mechanical joint heavy patterns as manufactured by Clow or approved equal, 6" to 16".

Gate valves must be mechanical joint open left as manufactured by American AVK resilient wedge, Clow resilient wedge, Waterous series 500 resilient wedges, or approved equal. All exposed bolts to be 304 stainless steel. Must be stainless steel stems equal to AISI 420 A.S.T.M. a276. Epoxy coated interior and exterior to A.W.W.A. C550 thickness 10 mils.

Gate valve boxes must be two piece 48" bottom, 24" top, 5 ½" cover to be marked "WATER".

Where an extension is needed to extend a two piece gate box design, an EZ rise top extension marked "WATER" to be used, or a 12" EZ slide riser.

The property owner is responsible for the installation, maintenance and repair of the water service from the water main. If the water service is to be abandoned, property owner is responsible to pay for the water to be shut off.

Water mains and services to be inspected by the Director or his designee prior to backfilling. 24 hour notice is required.

The connection to the water system shall conform to requirements of all applicable building and plumbing codes or other applicable rules & regulations of the City of Gardner. A 24 hour notice must be given prior to installation of water main or service. This connection must be inspected by the Director or his designee.

Ductile-iron pipe shall have push on type joints except where the pipe is to be jointed with special fittings, or valves, in which case mechanical joints shall be used.

Any installation of DICL or C900 water main will have the capability of location by utilizing one of the following methods: wire tape or wedges, to be installed in conjunction with water main. Method to be approved by the Public Works Department prior to beginning work.

Any water main pressure testing will be performed by an independent A.W.W.A approved testing agency specification C600-64. All water lines shall be sterilized in accordance with A.W.W.A. Specification C601-54. This is for the testing of any newly installed water mains, hydrants and water services.

Hydrants

All hydrants to be AVK model 2780 as manufactured by American AVK, or Model 94 Metropolitan as manufactured by U.S. Pipe or Waterous Pacer as manufactured by American flow control and shall meet the following specifications:

Open left and a 5 ¼ inch main valve opening.

2-2 1/2 inch hose connection and special steamer

1-3 1/2 inch pumper nozzle national standard thread (NST – 3 ½)

Special operating nut #5-63

Shoe – 6" mechanical joint

Bury length – 5' – 6"

Traffic breakaway design

Color: yellow

Hydrant separation will be no greater than 500 feet and shall conform to the specifications of the Director of the Department of Public Works and Fire Chief.

Laying of Pipe

Water mains shall be laid and maintained to lines and grades established by the fittings, valves, tapped or brass outlets and hydrants at the required location unless otherwise approved by the Director of Public Works or his designee. Valve-operating stems shall be oriented in a manner to allow proper operations.

Valves twelve inches and smaller shall be resilient wedge gate valves and valves sixteen inches and larger will be butterfly valves. All valves will be Dresser, Mueller or equal and will open left. When installing new water mains at intersection, triple gating is required at a tee and four gates are required at a cross.

Water mains and services must be kept ten feet apart from any sewer pipe and in a separate trench. A minimum of five feet of cover is required for all mains and services.

Thrust blocks are required behind bends, hydrants, tees, and dead ends and at new mains tapped into existing mains. A minimum of five feet of cover is required for all mains. A minimum of 1/3 cubic yard of concrete must be used for thrust blocks.

Pressure and leakage tests to be done in the presence of the Director or his designee in accordance with A.W.W.A. C600-87 Section 4 Specifications or the latest revision thereof, to determine that the ductile iron pipe is structurally safe and free of excess leakage. Pipeline shall be subject to a hydrostatic test of a minimum pressure of 125 psi. Testing shall be done between valved off sections in approximately 1000' maximum section of the main. The pressure in the pipeline section shall be raised to a minimum of 125 psi and maintained, within 5 psi, for a minimum of 1 hour. During this time the line shall be checked for leaks by the Director or his designee. Allowable leakages, in accordance with A.W.W.A. Recommendations, shall be:

Pipe diameter	**125 psi**	**150 psi**	**175 psi**
12"	1.01 GPH	1.10 GPH	1.19 GPH
10"	0.84 GPH	0.92 GPH	0.99 GPH
8"	0.67 GPH	0.74 GPH	0.80 GPH
6"	0.50 GPH	0.55 GPH	0.59 GPH

If leakage is found to exceed this limit, the leak shall be located and repaired at the cost of the contractor. Further testing will be performed until the test standards are met. Only after a successful completion of the leakage test and a disinfection test, shall the main be put on line and services connected to it. 24 hour notice required for witnessing of leakage testing.

The disinfection of the water mains shall be done in a manner satisfactory to the City of Gardner Health Department, and shall be repeated until satisfactory results are obtained. The contact period for disinfection shall be at least 24 hours. Such tests are to be completed by a Massachusetts Department of Environmental Protection certified laboratory. Certified laboratory reports are to be provided to the City Engineer.

The water main shall be flushed out upon completion, disinfection, and testing; before the main is placed into operation.

Water ties on a 3" x 5" card must be turned into the City of Gardner's Engineering Department prior to final sign off.

The contractor must furnish, at his expense, the City of Gardner's Engineering Department a set of reproducible "as-built" drawings prepared by a professional engineer with any extension of the water system prior to final sign off.

Water Service Specifications

When installing or renewing water services, one inch Type K soft American made Copper Tubing shall be used. Taps into the main for services shall be made at a 45-degree angle using an approved method. Threads shall conform to the latest A.W.W.A standard. Contractor is responsible for a flared fitting and approved ball valve within the building. Buffalo Curb Boxes shall be 95-E Type.

Corporation shall be 438 & AG-CC thread on inlet, grip connection on outlet 438 & A-CF, or approved equal will be accepted. Manufactured by Red Hed Supply, or approved equal.

Curb stops shall be 415, grip fittings, copper to copper or flared, manufactured by Red Hed Supply, McDonald, or approved equal.

Where a 2 part union is required, it shall be type McDonald brass, or approved equal.

Type of valve inside building shall be a ford angle ball meter valve (ba23-444), or approved equal. For ¾" to 1" copper to a 5/8" meter. After the meter, there shall be a valve.

Service box shall be two pieces 95E Buffalo 2 ½" opening, 48" long bottom, 25" long top, cover to be marked "WATER". Centering adapter for service box 6' long. A 12" centering adaptor is required for **all** service boxes. Extensions to be supplied by contractor

When tapping any service, a tapping saddle must be used. A Dresser style design or comparable may be used with prior approval from the Director.

A minimum of five (5') feet of cover will be put over all services to protect from freezing.

All ledge shall be removed to a width of one (1') foot greater than the diameter of the pipe and six (6") inches below the underside of the water pipe. A bed of sand shall be placed in the trench prior to laying the pipe.

All new water mains shall be chlorinated and pressure tested prior to being accepted by the City.

In any new water main installation or renewal of water service, a Buffalo Service gate box is now required on the water main tap. And, as in the past a service box

will be installed in the tree lawn at the stop and waste valve. In new road construction the elevation of the service box will be at the base course of pavement.

All brass goods used will be McDonald, Ford, Mueller or equal. No thin walled fittings will be allowed.
A curb stop located on the owner's property is required for all water services. A block or flat stone must be placed under the curb stop to secure it in position. Underground copper tube ends shall be compression type fittings and curb stop shall have a drain.

Connection to the public water supply shall confirm to the requirements of the building and plumbing code or other applicable rules and regulations of the City. Any deviation from the prescribed procedures and materials must be approved in writing by the Director of Public Works before installation.

Water Meters

Unless specified by the Director, **the City will furnish one meter per building, up to an including 1". All other meters must be purchased by the property owner** and be of the make and style stipulated by the water Department.

Any second meter needed by the property owner for the purposes other than domestic use will be at the property owner's expense and the property owner must furnish the meter.

Water meters will be located in an accessible place so they can be easily worked on. Meters shall not be located under stairs, but if there is no other alternative, approval must be given by the City inspector.

Water meters greater than 1" will be supplied by the owner and approved by the City of Gardner, meter division. **The City installer must install this meter or water will not be supplied to the building.**

The size of the meter to be installed at the premises will be determined by the water Department.

No meters shall be installed if it does not meet City specifications.

The area surrounding the meter shall be kept free of any obstacles and shall be readily available for reading, repairs, and testing.

No property owner shall change, alter, or disconnect a meter.

Water meters damaged by freezing, hot water, or otherwise will be replaced by a new meter and charged to the property owner.

If the water Department finds evidence of tampering, the property owner shall receive a charge based on the registration for a corresponding period.

All water passing through a meter will be charged for whether used or not.

Any person removing or tampering with a water meter will be fined $500.00 per offense.

Water/Sewer Connection Plan

All water/sewer connection plans must include the following:

- Scale: 1" = 40' plan size: 8 ½ x 11 or 11 x 17 only.
- All invert and rim elevations of existing & proposed sewer & drainage connections.
- Pipe types, slopes, and lengths.
- Existing & proposed site grades showing labeled 2' contours (1' contours may be required for level sites).
- House sill & basement floor elevations.
- Plan view of site including water, sewer, drainage connections, property lines, proposed buildings, driveways, etc.
- Perimeter drains (not to discharge water onto street).
- All wetlands shown (if applicable). Written statement must be included on plan noting no wetlands exist within limits of proposed work.
- Zoning requirements including building setbacks.
- Locate building from property lines.
- Water pressure of building must be shown on plan.
- Estimated sewer flow based on title v.
- Stamped by a Massachusetts registered professional civil engineer.
- Dig safe note to contractor.

Drainage Specifications

Adequate facilities for the disposal of surface water shall be installed. Facilities shall be designed using a design storm of 10 years. Cross culverts, bridges, and detention ponds shall be designed using the 50 year storm, using the SCS TR-55 methodology.

Drainpipe shall be a minimum of 12" **Class III reinforced concrete, HDPE N-12 for 4"-36" smooth interior, HDPE N-12 HC for 42" & 48" smooth interior, or white SDR 35** or equal with a minimum cover of 4'.

Drain Manholes and Catch Basins

All manhole and catch basins are to have interlocking sections and be standard precast with either cast iron, aluminum or approved plastic steps spaced 12 inches apart. A watertight seal must be placed between precast manhole sections. Precast manholes shall have rubber "O" ring gaskets.

All manhole covers used on City streets will be of heavy-duty construction with the frame and cover height of at least 8". Covers shall also have the words "DRAIN" integrally cast as appropriate. Manholes shall have a minimum sump of 36". All castings shall confirm with A.S.T.M. specifications A-48. The drain manhole frames to be type LB 266 as manufactured by Lebaron Foundry, or approved equal. Approximate weight for frame and cover to be 420 pounds.

All drain lines shall be aligned and graded using either a laser or transit. Manholes will be required at all changes in slopes or changes in alignments. Manhole and catch basin separation will be no greater than 300 feet.

Catch basins will be required on both sides of the roadway on continuous grade at intervals of not more than 300'. Any catch basins and manholes used shall be 4' inside diameter, with a 36" or greater sump.

All brick used in manholes, including brick used for inverts and raising covers shall conform to A.S.T.M. Standard specifications for sewer brick. Barrel block and cement brick are acceptable in drain manholes only. In the event the City inspector rejects any brick it shall be immediately removed and substituted with an acceptable brick.

Catch basins shall tie directly into a manhole. Catch basin to catch basin connections will only be allowed if there is no other alternative and must be approved by the Director of Public Works or his designee.

Mortar used in manholes shall be composed of one part Portland Cement, hydrated lime and two parts sand, in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. Lime and sand shall conform to A.S.T.M. Standards.

When installing manholes and catch basins, the trench shall be excavated so that there is two feet clear on each side of the structure. Four to six inches of crushed stone shall be placed under the manhole or catch basin and gravel shall be compacted in six inch layers around the structure to secure it firmly. Catch basins will maintain a 36" minimum sump. Catch basins are to be 24" x 24" cast frames with cast cover grates as well. Frame of basin to be type lf 246 (4 flange) as manufactured by Lebaron Foundry, or approved equal, measuring 8" in depth, with approximate frame & cover weight of 420 pounds.

The contractor must furnish, at his expense, the City of Gardner's Engineering Department a set of reproducible "as-built" drawings prepared by a professional engineer with any extension or creation of a drainage system prior to final sign off.

Stone drywells will only be approved by the Director where foundation drains cannot reach "daylight" or drainage system. A test hole shall be excavated by the contractor and inspected by the Director or his designee prior to approval of drywell. Drywell shall not interfere with subsurface sewage systems (where applicable).

Headwalls

Headwalls shall be constructed of A.S.T.M. approved Portland Concrete. Headwalls will be built as directed to connect surface drains, culverts, and like structures and must be approved by the Director and board.

Trenches

Trench Excavation

No person shall cut into, disturb the pavement or finish of, or make any excavation in any public way or portion thereof without first obtaining a permit to do so from the Director of the Department of Public Works or his designee.

Prior to any work, the contractor must obtain the necessary residential or commercial permits.

No person, corporation, or public utility shall commence any underground construction or repairs on or within the limits of public ways and sidewalks located in the City of Gardner without prior written approval of the Director of Public Works or his designee.

No unauthorized person, corporation, or public utility shall uncover, make any connections with or opening into, alter, or disturb any public sewer, water, or drain or appurtenance thereof without first obtaining written approval of the Director of Public Works or his designee.

Permits must be kept at the job site during the process of excavation and must be shown, upon request to any authorized City personnel.

When excavations are to be made in paved or concrete surfaces, the pavement shall be cut ahead of the excavation by means of pneumatic or other suitable tools to provide a clean uniform edge with a minimum disturbance of remaining pavements. The width of the pavement removed shall not exceed the distance as measured between vertical planes two (2) feet outside the outside limits of the pipe unless otherwise approved by the Director.

Large stones, peat, wood debris, organic material, and other undesirable material shall be separated & removed from the site. Remaining material shall be stockpiled on-site and used for backfilling the trench, unless Director or his designee requests substitute back fill material.

All top soil shall be deposited along side the trench in an approved manner and shall not be mixed with other materials.

The contractor shall make excavations in an approved manner to the established line and grade, without damaging any existing structures. All existing gas pipes, water pipes, sewers, drains, catch basins or manholes shall be carefully supported and protected from injury. In case of any damage caused by his actions, the contractor must notify proper authorities and obtain approval of the method of repair. If it is necessary to change the locations of any structure, the structure will not be interfered with until the Director or his designee has given approval.

When making excavations in rock, a minimum of twelve inches of screened gravel must be placed in the trench prior to the laying of any pipe. Pipe laid on unexcavated rock is not acceptable.

The most suitable excavated materials shall be used for backfilling pipe trenches. Large stones that have rolled near or lodged under the pipe shall be removed.

The material shall be deposited in the trench in approved manner and shall be thoroughly consolidated by tamping. Backfilling from the bottom of the trench to one foot above the pipe, shall be done by hand in layers not to exceed 4 inches in thickness with thorough tamping between each layer. Backfill material in this area shall contain no stones larger than 3 inches at their greatest dimension.

As soon as practicable after the pipes and masonry have been placed and the concrete has acquired an adequate degree of strength, special leakage tests, if required, shall be made after which backfilling shall begin. The best of the excavated materials shall be utilized in backfilling within 2 feet of structures and unequal soil pressure shall be sufficiently compacted to prevent settlement and shall be deposited in suitable layers.

The contractor shall replace all surfaces material, and shall restore pavement, shrubbery, sod and other surfaces or structures disturbed to a condition equal to that before the work began.

In restoring pavement surfaces, new pavement surface is required. Temporary patch must be left in place and remain for a minimum of 30 days. When repairing with permanent patch, the contractor shall first cut back the trench, one foot on each side, keeping the sides as square as possible. The permanent patch will consist of a rolled 2 inches of bituminous concrete Type-I-1 base and one inch of bituminous concrete Type I Top. Paving of new roads will only be permitted when the temperature is above 40 degrees F°. Under fair conditions. **The contractor will be responsible for trenches for 2 (two) years.**

The City may require at its discretion, the need to use flow able fill or infra red treatment for the repairing of trench work in any City street. These methods of repair will be required in any recently overlaid road.

Trench backfilling

The Director of Public Works or his designated-City inspector must inspect all construction, and approval given prior to any backfilling of trenches. If the Director or his designated City inspector deems any work unacceptable, the contractor shall immediately correct the problem at his own expense. If the contractor backfills a trench that has not been inspected, the City inspector reserves the right to make the contractor uncover the work at his own expense. If a contractor is notified to maintain his trench

and fails to do so within 2 weeks, the Escrow Account will be utilized to make the repairs by a contractor hired by the City.

Backfill shall be placed in uniform layers, not exceeding twelve (12") inches in depth, and each layer shall be mechanically tamped to assure adequate compaction (95%). The top twenty (20") inches of trench backfill shall consist of the following:

- Fifteen (15") inches of approved select gravel (placed and compacted 95% in two (2) uniform layers).
- Five (5") inches of bituminous concrete Type I pavement (placed and compacted in two (2) equal layers).

The backfilling of a trench shall follow immediately after construction of the pipeline and appurtenances. The backfilling of the trench shall be made with approved materials free from all organic matter and shall contain no boulders or rock fragments weighing over 50 pounds.

Pipelines shall be installed as shown on the attached City of Gardner "Typical Trench Detail". Single sanitary pipelines shall be installed in an envelope of stone from six (6) inches below the pipeline to six (6) inches above the top of the pipe. Single surface pipelines shall be installed in an envelope of stone from six (6) inches below the pipeline to the spring line of the pipe. In the typical trenches containing two (2) pipelines, the limits of the stone shall be six (6) inches below the lowest pipeline, to the center elevation of the higher pipeline. Select backfill material shall be placed and thoroughly compacted by means of mechanical tamping up to a level of one (1) foot above the top of the pipe.

The remainder of the trench shall be backfilled with suitable material, as approved by the Department of Public Works. The backfill shall be compacted in layers by mechanical or vibratory compactors, sufficiently to prevent subsequent settling of the trench.

The backfill material shall be placed in suitable layers necessary to accomplish a minimum of 95% compaction and shall be thoroughly compacted by mechanical or vibratory compaction equipment.

Where impractical to compact by other methods, the backfilling material shall be thoroughly compacted by pneumatic ramming with tools weighing not less than 20 pounds. There shall be at least one man ramming for each man shoveling material into the trench. Material shall be evenly spread in layers not exceeding 6 inches in thickness. If required, material shall be wet by sprinkling before rolling or ramming.

Whichever method of compaction is utilized, care shall be taken that stones and lumps do not create voids in the backfilled trench.

No boulders or rock fragments weighing over fifty (50) pounds shall be backfilled into the trench, nor shall large masses of backfilling material be dropped into the trench in such a manner as to damage the installed pipe.

Any voids left by the removal of sheeting shall be completely backfilled with suitable material and thoroughly compacted.

Pieces of bituminous concrete shall be excluded from the backfill unless expressly permitted by the Director or his designee, in which case they shall be broken up into a suitable size as directed.

In streets, the top of the compacted backfill shall be left one foot below the bottom of the existing pavement surface and the remainder of the trench filled with compacted gravel borrow. The gravel borrow shall consist of hard durable stone and course sand practically free from loam, clay, & silt, uniformly graded and containing no stone having any dimension greater than six (6) inches. When spread on the street and rolled, it shall form a suitable foundation.

The gravel shall conform to the following requirements:

Passing ½" sieve	70% maximum
Passing no. 4 sieve	50% maximum
Passing no. 200 sieve	5% maximum

Roadway Construction

Roadway gravel will meet the Massachusetts highway Department standard specifications for highway and bridges mi .03.0 gravel borrow Type B. This gravel will be tested for grain size-gradation-prior to placement to assure it meets this criteria.

3" - 100 % passing
½" - 50-85 % passing
#4 - 40-75 % passing
#50 - 8-28 % passing
#200 - 0-10 % passing

If the gravel satisfies this specification, then a proctor determination will be performed to obtain the maximum dry density of this material. Field Density Tests will be performed prior to placement of H.M.A.-Hot Mix Asphalt-to assure that a minimum of 95% of this maximum dry density has been obtained.

Core samples for the intermediate course-binder-will be performed at intervals of 200 feet, however, not less than 4 cores taken on any roadway. The thickness of these cores will be recorded for acceptance. If 1 in 4 cores fail to meet the required thickness, two additional cores will be performed at 25 feet in both directions of the roadway as a retest. If these two samples meet the required thickness, this will be acceptable.

In most cases, the top or wearing course of H.M.A. Is not tested but will be up to the discretion of the Director. If tests are required, the same criteria will be used as in the intermediate course.

Subgrades will be compacted with a minimum of 6 passes with a 10-ton vibratory roller.

Gravel base will be compacted to a minimum of 95% of the maximum dry density as determined by A.S.T.M. specification D-1557C.

Trench Resurfacing

Using appropriate methods, prior to commencement of any work, the contractor shall adequately clean the area to be repaired.

The contractor shall heat the entire section to be repaired in conjunction with the adjacent area by carefully positioning a pre-approved infrared heater, not to exceed 15,000 BTU's per square foot, per hour, to achieve a consistent plasticized surface condition. Excessive heating of the pavement shall be avoided. The contractor shall remove all unsuitable oxidized material and replace with "virgin" bituminous concrete.

A suitable proven recycling agent additive of a sufficient amount as approved will be introduced to the softened area. Scarification will then be performed to produce a workable mix condition uniformly incorporating the recycling agent.

Specified bituminous concrete mixes must be obtained from an on-site infrared heated storage unit capable of maintaining stored asphalt materials at a near constant temperature throughout the working day. **Under no circumstances shall any asphalt mix be used that registers a temperature of less than 250° f.**

After the proper consistence of the paving material and recycling agent has been properly attained, the combined mixture shall be raked to the desired grade & compacted. Compaction shall be accomplished by use of a designated static and/or vibratory steel wheeled roller of adequate weight to establish a uniform density comparable to that of the adjacent surface within the work area. The repaired section shall be smooth and even with the surrounding pavement.

The entire perimeter of the work area shall be trimmed to a neat straight line and painted by hand with a penetrating asphalt emulsion. This work of treating the pavement edges shall be the responsibility of the contractor.

Specifications for Resurfacing Trenches
Temporary and/or Permanent

The bituminous concrete (HMA) shall be laid and thoroughly rolled in two courses consisting of a binder course mix and a top course mix to the thickness as indicated below:

	Binder course	***top course***
Roadway up to 12% grade	2-1/2”	2”
Roadway 12 to 16% grade	3”	2”
Roadway 16% and over	3-1/2”	2”

Any sub-base disturbed by the contractor without the contracting officer’s approval shall become the contractor’s responsibility to replace with approved gravel (graded and compacted).

Placement of the temporary patch must commence as soon as reasonably possible upon completion of said backfill and compaction by owner. **No more than five (5) consecutive days shall pass without the contractor addressing said temporary patch.** This temporary patch will remain as the wearing course and be maintained as such until the permanent patch is installed.

The permanent patch shall be placed according to City of Gardner standards as shown on attached detail and not before sufficient time has passed to allow for typical settlement. Preferably allowing a freeze – thaw cycle to occur prior to placement of said permanent patch.

All abutting surfaces of bituminous pavements shall be trimmed to a neat straight line and painted with an asphalt cement or approved emulsion. This work of treating the pavement edges shall be the responsibility of the contractor.

Please Sign and Leave at DPW

I have read and understand the City of Gardner's Department of Public Works specifications along with related City ordinances, rules, and regulations.

Name:_____

Address:_____

Company:_____

Phone:_____

Date:_____

Fees

Water-Sewer-Drainage-Highway

Details