NATURAL GAS POLICY

INTRODUCTION

This policy has been adopted by the Board of Public Works (Board) as a guide to obtaining natural gas service and to set forth the services available, conditions for service, and standards for materials and construction in the customer's natural gas installation. The standards for materials and construction are necessary to safeguard all customers, to secure maximum utilization of the Macon Municipal Utilities' (MMU) service, and are the minimum standards for natural gas service. The primary purpose of this policy is for the protection of the public, property, and the adherence to the International Code Council (ICC), fire, and other city codes.

The following policies will be a part of every contract made to supply natural gas service. All persons receiving such service shall be bound by the provisions of this policy.

CHAPTER I - GENERAL

A. APPLICATION FOR NATURAL GAS SERVICE

100. An application for service along with associated fees (if applicable) shall be required from each customer in accordance with the General Rules and Regulations.

101. Before a gas service line is installed to a new structure, final grade work will be completed and allowed to settle so as to be able to keep the riser and meter from settling. MMU will supply gas service only after a customer's application for service has been approved and MMU finds it practicable to render service. MMU reserves the right to refuse or discontinue gas service when piping or equipment does not comply with rules contained herein, or with the codes of the City of Macon, or at any time the piping or equipment is found to be unsafe. When found to be unsafe, notice shall be attached to such appliances or piping. Such notice shall state that the service has been disconnected, reasons therefore, and such notice shall not be removed nor shall the appliance or gas piping be reconnected until the unsatisfactory condition has been corrected.

102. MMU reserves the right, at all times and without notice to customers, to shut off the gas for the purpose of making repairs or extensions, or for any other necessary purpose. It is the intention of MMU to notify its customers of the necessity of shutting off the main supply, but an emergency may not permit such notice.

103. Gas service to each customer shall be for the sole use of such customer at the premises described in the application for service, and resale of gas by such customer is prohibited. MMU will make only one service connection to a customer's premises, except where required by the customer's load being of such size and character and so located as to make it appropriate, in the opinion of MMU, to install more than one service connection.

104. Gas service furnished by MMU is subject to the requirements set forth in ordinances of the city and utility policies relating to gas installations, inspections, licensing, permits, general rules and regulations, and the most current ICC.

105. Whenever all improvements served by gas on a property are removed, the service connection shall be abandoned. This requirement to abandon may be waived if a building permit is obtained and the service connection is restored within a period of time not to exceed two years.

106. The breaking of seals, tampering with meters, wires, pipes or other property of MMU is prohibited. Plumbers are not allowed to turn gas off or on upstream of the meter, except to make repairs and test their work. All other parties are forbidden to turn the gas on or off. Plumbers shall notify MMU whenever it is necessary to break any meter seal attached to a gas meter, or service, nor shall such persons connect, disconnect, take apart, or in any manner change or cause to be changed, or interfere with the action, regulation, or registration of a gas meter. Any meter tampered with will be removed for testing and repaired at the expense of the customer. Gas shall not be turned on to any premises except by an employee of MMU.

107. MMU may inspect but shall have no other duty, obligation, or responsibility with respect to plumbing, fixtures, equipment or apparatus on the premises of any customer other than to provide a gas meter and a service connection from the distribution system of MMU to the point of delivery to the customer. The point of delivery shall be at the point designated by MMU.

108. The customer shall notify MMU immediately of any change in the connected gas load that might affect service. MMU shall have no duty, obligation, or responsibility for any adverse effects arising out of or resulting from the customer's failure to notify MMU of changes in connected load.

109. MMU shall not be liable for any injury, damage, or loss resulting from the use of gas on the customer's premises, or from the maintenance or use of any plumbing, fixtures, or equipment on the customer's premises.

110. Each customer shall notify MMU promptly of any defect of gas plumbing, equipment, or apparatus of MMU, or of any existing condition that might affect gas service to the customer or might be dangerous to persons or property.

111. MMU may, at its sole option and subject to its General Rules and Regulations, modify its facilities to suit the customer's desires, if practicable. The customer may be required to make a capital contribution for the cost of such modification.

B. METERING

112. The meter installation and entrance shall be located at the customer's structure at a suitable place as approved by MMU. MMU will size the meter installation to the customer's load. Access for MMU personnel must be maintained to allow proper maintenance of the service. The customer shall notify MMU before initiating any action that may adversely affect the accessibility of the meter. The customer shall, at the request of MMU and at the customer's expense, remove any obstruction that yields the meter inaccessible. All meters at a building shall be at a common location and properly marked to indicate the premises served.

113. MMU will own, install, and maintain the meters and metering devices.

114. The following govern the location of meters:

a. All meter locations shall be approved by the inspector.

b. Metering equipment is to be located outside and not within any locked area.

c. Meters may not be installed within 36 inches of windows or doors.

When meters are to be located in a passageway or narrow space, the clear space in front of the meter shall not be less than two feet.

115. The gas meter and piping near the meter shall not be used to tie up dogs, animals, nor shall anything but gas apparatus be connected in any way to the meter or piping.

C. TESTING AND REPLACEMENT OF METERS

116. If a customer requests a gas meter be replaced or tested and:

a. If the meter has been in service over 60 months, the meter may be replaced at no charge. The meter may be tested and the customer billed, unless the meter is found to be more than two percent fast, in which case there will be no charge.

b. If the meter has been in service 60 months or less, there will be a charge to test or replace the meter, unless the meter is found to be more than two percent fast, in which case there will be no charge.

D. PILOT LIGHTING

117. During normal working hours, no charge will be made to light a pilot light. After normal working hours from November 1 through March 31, no charge will be made to light a furnace pilot light. An overtime service charge will be made to light a furnace pilot light form April 1 through October 31. An overtime service charge will also be made to light any other appliance during all seasons. No charge will be made at any time to check a possible gas leak.

CHAPTER II – FUEL LINES, SERVICE LINES, AND PERMITS

A. FUEL LINES

200. The customer's fuel line starts at the outlet side of the gas meter. The fuel line must be of proper height and location to permit proper installation of the meter. The fuel line must be constructed of proper materials. The fuel line shall be constructed above ground except as may be approved on a case-by-case basis. If constructed underground, the fuel line shall be polyethylene with anodeless risers and trace wire, to be purchased from MMU and installed at a minimum depth of 18 inches. The fuel line shall not be used as a ground or conductor for any electrical device, including telephone systems. The customer assumes all responsibility for the customer's fuel line which begins at the outlet of the gas meter.

201. MMU may refuse to supply gas service, or may suspend service, to a customer, without notice, if the customer's installation is unsafe or dangerous.

B. SERVICE LINES

202. MMU will install underground services and will refill the trench. Leveling of the soil and grass replacement will be the customer's responsibility. Service lines shall be maintained by MMU.

C. PERMITS

203. No gas work, unless otherwise excepted herein, shall be undertaken prior to the issuance of a permit.

204. No person shall construct, install, extend, alter, or repair any gas piping or gas appliance on consumer's premises without **first** obtaining a permit to do such work. In case of an emergency arising where an immediate repair may be necessary, repairs may be made under the express condition that a permit shall be secured before noon of the next business day.

205. A gas permit may be issued to any person to do gas work in a single-family dwelling used exclusively for living purposes, including accessory buildings and quarters in connection with such building, provided the person is the owner of such building, and the dwelling will be occupied by said owner, that said owner shall personally purchase all material, and perform all labor in connection with the issued permit.

206. All work on a commercial building and/or rental property must be done by licensed contractors. Residential work may be done by the home owner, if the owner lives in said home and is approved by the inspector as qualified to do the work. Otherwise will require licensed contractor.

D. NOTICE FOR INSPECTION

207. It shall be the duty of the holder of a permit to give at least twenty-four (24) hour notice to MMU when work is ready for inspection.

E. RIGHT OF ENTRY

208. MMU shall have the authority to enter any building, structure, or premises at any reasonable hour for the purpose of making inspections. In the case of emergency, MMU shall have the right of entry at any time, provided such entry is necessary and in the interest of public safety.

CHAPTER III – NATUREAL GAS MAIN EXTENSIONS

A. POLICY STATEMENT

300. It is the policy of MMU that, to the extent the natural gas supply and our ability to maintain adequate gas pressure to satisfy the requirements of additional customers, natural gas

mains and services may be extended to serve additional customers according to the terms and conditions set forth below.

B. GENERAL

301. If an extension of the gas distribution system is needed to serve a customer or group of customers, the Board may, after execution of a Reimbursement Agreement, authorize the extension necessary to provide gas service. The Reimbursement Agreement shall provide that the entire cost of construction of the gas main be paid by the party desiring the extension. Such Reimbursement Agreement shall also provide for a partial reimbursement as each customer is initially provided service from such main. The amount of each partial reimbursement shall be a specified below. Such reimbursements shall be made over a period of time not exceeding five (5) years following construction. In no event shall the total amount reimbursed exceed the original cost of construction nor shall interest be paid or allowed. Although it is recognized that the total original construction cost may not be fully refunded within five years following construction, there shall be no additional reimbursement. Reimbursements shall be made only upon written request.

C. AMOUNT OF REIMBURSEMENT

302. The Board will make reimbursement for each permanent customer that connects to the main and is using gas during the first five (5) years from the date the gas main is complete and ready for consumer use. The reimbursement will be based on the actual cost of construction. The construction cost shall include the cost of labor, materials, overhead, permits, right-of-way, pavement repair, and all other costs incident to the installation of the main. The amount of reimbursement for each permanent customer shall be computed by using a formula developed by the Board.

D. IMMEDIATE CUSTOMERS

303. The requirement that the party desiring the main extension pay for construction of the main with subsequent reimbursement may be waived to the extent that potential customers have made application for gas service to existing structures and have made necessary deposits.

E. REIMBURSEMENT TO APPLICANT ONLY

304. The right to reimbursement under any Reimbursement Agreement shall not be transferable. Requests for reimbursement may only be made by a party to a Reimbursement Agreement.

F. SERVICE LINES

305. MMU will install a gas service line from a gas main to the meter at a cost to be established by the Board, when an owner of the property or some other responsible party, makes an application for service.

G. RIGHT-OF-WAY REQUIRED

306. The MMU will install gas mains and services in permanently established public streets, roads, and highways as determined by the Board. Extensions of mains and services into or across private property may be made by the Board, provided that the right-of-way agreement is satisfactory to the Board.

H. AUTHORITY TO EXTEND LINES

307. Main and service line extensions are to be made as authorized by the Board. The Board reserves the right to deny any main or service extension.

I. OWNERSHIP AND CONTROL

308. Upon satisfactory completion, MMU accepts ownership of the main extension. However, in the event of any irregularity in construction or legal title, MMU has the option of postponing or refusing acceptance of the main. The cost of operation and maintenance of mains and services shall at all times be at the expense of MMU.

J. BOARD DETERMINATION FINAL

309. MMU shall determine the size of the mains and services. MMU reserves the right to eliminate dead end mains and make other improvements to the gas system. The Board's determination on any matter relating to this policy shall be final.

CHAPTER IV – GAS PIPING

A. MATERIAL FOR GAS PIPING

400. All pipe used for the installation, extension, alteration, or repair of any gas piping shall be standard weight black iron or brass of iron pipe size. Copper and galvanized iron shall not be used.

401. All such pipe shall be new, and shall be free from internal obstructions and the ends thereof properly reamed.

402. Piping shall be cleaned and inspected.

403. All fittings used in connection with the piping shall be of black iron or brass.

404. All joints in the piping system, unless welded, shall be screwed joints, having standard pipe threads. Such screwed joints shall be made up with a thread compound applied to the male threads only.

405. If an inspection shows that defective materials have been used or defective workmanship has been performed in the installation, alteration, repair, or extension of any gas pipe, fixture, or appliance in or on any customer's premises, such defective materials or work shall be replaced by the permit holder within a period of time not to exceed seven days after notification and the inspection repeated.

B. INSTALLATION OF NATURAL GAS PIPING

406. All gas piping shall be supported at intervals of not more than six (6) feet by straps or hooks capable of withstanding four times the weight of the pipe being supported.

407. All joints concealed in any walls, floors, or ceilings shall be accessible.

408. Bushings, right and left couplings shall not be used. Piping may be jointed by threaded fittings, valves, couplings, or ground joint unions or by welding.

409. All outlets shall be properly connected to appliances, capped, or plugged with screw joint fittings.

410. Pipes shall not be bent except for minor offsets. Fittings shall be installed to prevent any air or oxygen from entering the gas piping.

411. A shutoff valve, union, and drip leg shall be installed adjacent to every gas appliance. The union shall be between the valve and appliance and accessible for use in emergency situations.

412. Piping laid under concrete, tile, or composition floors shall be protected against corrosion. Piping laid in concrete, cement, masonry, etc. shall be laid in a conduit or a tunnel left in the solid work. Gas piping shall not run through hot air furnace pipes, cold air ducts, or elevator shafts.

413. Drip legs shall not be less than six (6) inches in length, unless approved by the inspector.

414. Track piping and associated fittings are allowed in some cases if approved by a MMU inspector.

C. REQUIRED GAS SUPPLY

415. Piping shall be of a size and so installed as to provide capacity sufficient to meet the maximum demand without undue loss of pressure between the meter and the appliance or appliance.

416. The hourly volume of gas required at each outlet shall not be less than the maximum hourly rating, as specified by the manufacturer of the appliance or appliances.

417. Where the manufacturer's rating of an appliance is given in B.T.U. per hour, this rating shall be divided by 1000 to obtain the corresponding gas demand in cubic feet per hour.

418. In no case shall a supply pipe to any gas appliance be installed having a diameter smaller than the inlet connection of that appliance.

D. LOCATION OF SHUT-OFF

419. Service shut-offs shall be installed at the meter on all new and replacement services.

E. CLOSURE OF PIPING OUTLETS

420. It shall be unlawful to remove or disconnect any gas appliance without capping or plugging, with a screwed joint fitting, the outlet from which the gas appliance was connected.

F. INSPECTION OF PIPING

421. Before any gas piping is put in service or returned to service following repair or modification, it shall be tested and inspected. Where any part of the system is to be enclosed or concealed, this test shall precede the work of closing in. New gas piping systems must stand a pressure of at least ten (10) inches of mercury (i.e. five psig) for a period of not less than 15 minutes without showing any drop in pressure. For this test, the piping may be filled with air or inert gas, but not with any other gas or liquid. **In no case shall oxygen ever be used.** This test must be witnessed by the Inspector. For repairs and modifications, the inspection may require a pressure test as described above or may test using a soap solution on all joints. Maximum test pressure will be 25 psig for inside piping. Existing piping that is opened for repairs or modification will be required to be brought up to MMU specifications.

G. ENCLOSING A BURNER, BY-PASSING OF METERS

422. No person shall install or use any device intended as an adjunct or addition to a gas appliance or to be suspended above or wholly or partially to enclose any burner of a gas appliance in such a manner as to reduce the effectiveness of the ignition of the gas issuing from the burner or impair the combustion of the burner. No person shall cause the gas supplied to by-pass the meter.

CHAPTER V – GAS APPLIANCES, GENERAL

A. CONSTRUCTION AND PERFORMANCE

500. The construction and performance of all gas burning appliances shall be safe to persons and property.

501. The presence of a valid seal of approval of a nationally recognized testing laboratory showing conformity of the construction and performance of gas burning appliances with applicable requirements that have been approved by the American Standards Association or the

American Gas Association shall be prima facie evidence that such construction and performance are safe to persons and property.

B. APPLIANCE INSTALLATION

502. Appliances shall be installed so that their continued operation will not create a hazard to persons or property. The gas supply to any appliance shall not be set, adjusted, or regulated so that the hourly flow of gas is in excess of the BTU rating as determined by the manufacturer.

503. No filter or other obstruction shall be placed on a flue passage of any appliance. This shall not preclude baffles and other standard parts built into an appliance by the manufacturer.

504. No appliances shall be installed in a room or space in which the facilities for ventilating do not permit the proper combustion of gas under normal conditions of use. All air ducts or permanent openings supplying air for combustion shall be acceptable to the inspector.

505. All appliances shall be connected with rigid piping, provided, however, that those appliances that are necessarily portable or require a vibration joint may be connected with flexible tubing. On such applications the shut-off shall be in a solid connection on the piping and not on the appliance. Only approved tubing shall be used, and it shall be securely attached at each end. Flush-to-wall models of domestic gas ranges may be connected with metal tubing connectors approved by the American Gas Association Testing Laboratory or the inspector.

506. Every appliance shall be located so that it will be readily accessible for operation and servicing.

507. Gas appliances shall not be installed in any location where flammable vapors are likely to be present, unless the design, operation, and installation eliminate the possible ignition of the vapors.

508. Gas appliance pressure regulators requiring access to the atmosphere for successful operation shall be equipped with a vent pipe leading to the outer air or into the combustion chamber adjacent to a constantly burning pilot.

509. Gas fired water heaters shall not be installed in bathrooms or bedrooms except as a replacement in a bathroom, where they are properly vented and are supplied with adequate combustion air specifically authorized by the inspector. Gas fired water heaters shall not be installed closer to combustible materials than six (6) inches, provided that underfired, insulated automatic storage heaters may have a clearance not less than two (2) inches and units with one or more flat sides and listed for installation flush to the wall may be installed without the specified clearances. A temperature and pressure relief valve shall be installed on all water heater installations or replacements. The temperature and pressure relief valve shall meet the specification requirements of the American Gas Association or the American Standards Association. The valve shall be installed either directly in the tank in a tapping provided for this purpose, or not over six (6) inches down from the top of the tank as possible. Pressure relief

discharge shall be set at 125 psi and shall be rated to limit the pressure rise, by thermal expansion for any given heat input, to ten (10) percent of the pressure at which the valve is set to open.

However, the setting must not be in excess of the rated working pressure of the tank. Temperature relief discharge shall be set to open at 210 degrees and shall have a BTU temperature relieving capacity rating at least equal to the gross heat input of all connected heaters to prevent any further rise in temperature. A length of PVC or copper tubing approximately four feet in length shall be fitted to the pressure relief valve in a downward position to control discharge flow. The outlet of a temperature and pressure relief valve shall not be connected to the drainage system of the building as a direct waste.

510. Before natural gas supply is furnished to a consumer who has been previously using Liquefied Petroleum Gases (LPG), the appliances shall be properly converted to ensure safe operation of burners and proper combustion of the gas.

511. All heating appliances that are converted to a gas shall be cleaned and installed in accordance with accepted engineering practices for the installation of domestic gas conversion burners.

CHAPTER VI – VENTING OF GAS APPLIANCES

A. VENT CONNECTION REQUIRED

600. Every fuel-burning appliance shall discharge its products of combustion to a vent, factory-built chimney, masonry chimney, or metal chimney, except that appliances that have been tested for use with a special vent system shall be vented in accordance with the manufacturer's installation instructions. The chimney or vent shall be designed for the type of appliance being vented. A chimney or vent shall not be required for appliances that are tested for unvented use. Unvented appliances shall be used and installed in accordance with the manufacturer's installation instructions. All appliances must be vented when installed in bathrooms, unventilated rooms, or rooms used for sleeping. Unvented appliances may not be used as a sole source of heat.

B. SIZE OF VENTS AND VENT CONNECTIONS

601. The vent connection shall not be less in diameter than the vent outlet of the gas appliance that it serves. Unless the appliance manufacturer's installation instructions indicate otherwise, every vent connection shall have a rise of not less than one-half (1/2) inch per foot of length. The horizontal run of the connector shall be as short as possible, and the appliance shall be located as near the flue or vent as practicable. The maximum length of horizontal run shall not exceed 75 percent of the height of the flue or vent.

602. A rectangular or oval vent may be used, provided its internal cross-sectional area is not less than that of the vent outlet of the appliance that it serves, and provided that the ratio of its width to depth in cross-sectional area is not less than that of the vent outlet of the appliance it serves,

and provided that the ratio of its width to depth in cross-section does not exceed 3 to 1. In no case shall any vent or portion thereof have a cross-sectional area of less than twelve (12) square inches of a minimum internal diameter of less than two (2) inches.

603. Every vent, thimble, and inlet shall have a clear and unobstructed cross-sectional area at least equal to the area of the outlet on the gas appliance that it serves.

604. Except as otherwise provided, the area of any vent serving more than one appliance shall be not less than the area of the largest vent connection plus fifty (50) percent of the areas of all other additional vent connections.

605. Each metal vent joints shall be secured by a minimum of three screws.

C. GAS VENTS – GENERAL REQUIREMENTS

606. Vents shall, as a minimum, conform to the recommendations of the manufacturer of the appliance being vented.

607. Type "B" gas vents shall not be used with gas appliances that produce flue gas temperature in excess of 550 degrees. They shall not be used for venting:

a. Incinerators, or
b. Appliances that are or may be converted to the use of solid or liquid fuel, or
c. Boilers and high heat producing furnaces.

608. Type "BW" gas vents shall be used only with approved recessed or wall gas heaters listed for use with such vents.

609. Type "C" gas vents shall be used only for runs directly from the space in which the appliance is located. Such vents shall not pass through any attic or concealed space nor through any roof or floor and shall not be used to vent a gas appliance directly to the outside atmosphere.

D. PROTECTION OF COMBUSTIBLE MATERIALS

610. Combustible material within twelve (12) inches vertically and six (6) inches horizontally of any vent connection shall be protected by approved fire-resistive material. These distances shall be measured at right angles to the vent connection.

611. Every vent, thimble, and inlet extending into or through any wall, partition, floor, ceiling, or roof of any building shall have a perforated and ventilated sleeve extending the full length of such space between the ceiling and floor above, or through any partition or wall. Such sleeve shall provide at least a three quarter (3/4) inch air space at every point around the vent. Such sleeves or air spaces may be omitted in noncombustible construction.

E. HEIGHT OF VENT ABOVE ROOF

612. The flue or vent shall extend high enough above the building or other neighboring obstruction so that wind from any direction will not strike the flue or vent from an angle above horizontal. Flues or vents must extend at least two (2) feet above roofs or two (2) feet above the highest part of wall parapets and peaked roofs within twenty (20) feet horizontally, except that gas vents need not comply with the provision when equipped with an approved device that eliminates down drafts.

F. INLET CONNECTIONS TO VENTS

613. Where two or more inlets are provided in any vent or chimney, such inlets shall be offset in such a manner that no section of any inlet shall be opposite to other inlets in such vent and shall be at different levels.

614. Vent inlets not in use shall be tightly closed by means of an approved cap.

G. DRAFT HOODS

615. Every flue-connected appliance, except an incinerator (unless its construction serves the same purpose) shall be equipped with an effective draft hood that either (1) has been approved as part of the appliance, or (2) complies with nationally recognized standards for draft hoods.

616. The draft hood shall be attached to the flue collar of the appliance or as near to the appliance as conditions permit and in a position for which it is designed with reference to horizontal and vertical planes. The draft hood shall be so located that the relief opening is not obstructed by any part of the appliance or adjacent construction.

H. VENT CAP OR TOP INSTALLATIONS PERMITTED

617. The installation of an approved vent cap or top that will prevent precipitation from entering the vent may be installed. An approved vent cap or top shall be so constructed that it cannot slip down and block the vent opening. A vent cap or top installed on the vent at its terminus shall have a free open area equal to the cross-sectional area of the vent pipe on which it is installed.

CHAPTER VII – CHIMNEYS, FLUES, AND VENTS

A. CHIMNEY – GENREAL REQUIREMENTS

700. Any chimney that has a clean-out at the bottom, is of solid nonporous construction, and the interior of which has a straight line opening from top to bottom, need not be lined for use as a gas vent provided it is properly cleaned.

701. All other chimneys including block flue pipe shall be provided with a fire clay flue liner or other approved corrosion-resistant liner.

702. No person shall vent any gas appliance into a vent or chimney that serves a solid fuel appliance.

B. LABORATORY TESTED, FACTORY BUILT CHIMNEYS

703. Factory built chimneys that are approved as a result of test and listing by a nationally recognized testing laboratory shall be installed in accordance with the conditions of the approval.

CHAPTER VIII – UNLAWFUL APPROVAL

The issuance or granting of a permit shall not be deemed or construed to be a permit for or approval of any violation of the provisions of these rules or the ICC. No permit purporting to give authority to violate or cancel these provisions shall be valid.

CHAPTER IX – NATIONAL RECOGNIZED CODES

Regulations pertaining to installation, use, maintenance, alteration, repair, or removal of any gas piping or appliance within the City of Macon not covered herein will be regulated by the ICC.

CHAPTER X – MISCELLANEOUS

A. CAPACITY OF PIPE OF DIFFERENT DIAMETERS AND LENGTHS IN CU.FT. PER HR.

Lgth. of Pipe (Ft.)	IRON PIPE SIZE (IPS) INCHES									
	1/2	3/4	1	1 1/4	1 1/2	2	3	4	6	8
15	76	172	345	750	1220	2480	6500	13880	38700	79000
30	52	120	241	535	850	1780	4700	9700	27370	55850
45	43	99	199	435	700	1475	3900	7900	23350	45600
60	38	86	173	380	610	1290	3450	6800	19300	39500
75		77	155	345	545	1120	3000	6000	17310	35300
90		70	141	310	490	1000	2700	5500	15800	32250
105		65	131	285	450	920	2450	5100	14620	29850
120			120	270	420	860	2300	4800	13680	27920
150			109	242	380	780	2090	4350	12240	25000
180			100	225	350	720	1950	4000	11160	22800
210			92	205	320	660	1780	3700	10330	21100
240				190	300	620	1680	3490	9600	19740
270				178	285	580	1580	3250	9000	18610
300				170	270	545	1490	3000	8500	17660
450				140	226	450	1230	2500	7000	14420
600				119	192	390	1030	2130	6000	12480