

# Standard Design And Construction Specifications For Propane Systems

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## General Design Criteria

#### General Design Criteria

## 1.1. Introduction

The following design criteria shall be used for propane systems to be incorporated into the District's service areas and shall govern the design of all Kirkwood Meadows Public Utility District ("KMPUD" or "District") propane facilities. Exceptions and deviations from these specifications must be approved in writing by KMPUD.

## 1.2. Intent of Criteria

The intent of these criteria is to ensure that the propane system constructed will dependably deliver propane gas throughout the system at the least overall cost. Propane utilities shall be designed to meet or exceed the lifespan, or deprecation period, listed in the KMPUD Asset Life Schedule (KMPUD Policy Statement 370). KMPUD is committed to providing environmentally responsible services, therefore, all proposed installations shall be evaluated to ensure that the installation is environmentally sustainable and resource efficient throughout the life cycle of the system.

## 1.3. Current Standards

Applicable ordinances, rules, and regulations of all federal, state, and local agencies shall be complied with.

## 1.4. Propane System Design – Mains and Laterals

All installations are to be as shown in Kirkwood Meadows Public Utility District's Standard Drawings.

## 1.4.1. Design Conditions

- Depth of cover to be minimum thirty-six inches (36").
- Minimum trench width shall be one pipe outside diameter plus four inches (4") on either side of the pipe, and a maximum of one pipe outside diameter plus thirty-six inches (36") unless otherwise approved by KMPUD.
- Bedding tamped to twelve inches (12") above pipe, load factor 1.5.
- Soil density one hundred thirty-five pounds per cubic foot (135 lb/cf).
- Bedding angle ninety (90) degrees.
- Live load AASHTO H-20, sixteen thousand pound (16,000 lbs.) wheel load.
- Rigid pipe 1.5 factor of safety versus crushing.

## 1.4.2. Sizing

Pipeline sizing for propane lines shall be determined on the basis of the design flow rate. Propane mains and laterals shall have a minimum diameter of two inches (2").

#### 1.4.3. Material

#### 1.4.3.1. Mains and Laterals

Propane mains and laterals shall be PE 2708. Pipe shall be joined by means of electrofusion or butt fusion. Mechanical fittings are not permitted.

#### 1.4.4. Valves

Valves shall be manufactured from thermoplastic materials conforming to ASTM D2513. Valve size shall conform to pipe size, unless clearly stated and approved otherwise on the plans.

#### 1.5. Propane Service Line Design

#### 1.5.1. General

The propane service line is the line between the building served and the service connection. Pipe material and installation of the service line shall meet all the requirements of Sections 1.2 & 1.3.

#### 1.5.2. Line Sizing

Single family residence propane service lines shall be three-fourth inch (3/4") diameter. High density, commercial and industrial building service lines shall be sized based on flows, as calculated by a California Registered Professional Engineer, and shall be minimum one inch (1") pipe diameter.

#### 1.5.3. Material

Propane service lines shall be PE 2708. Pipe shall be joined by means of electrofusion or butt fusion. Mechanical fittings are not permitted.

#### 1.5.4. Cathodic Protection

All isolated steel pipe, risers, valves, and fittings within a PE pipe system must be cathodically protected. Prefabricated risers, metallic components on plastic valves, tapping tees, and metallic bolts on plastic fittings do require cathodic protection.

#### 1.5.5. Curb-Stop Shutoff Valves

All service lines shall require a curb-stop shutoff valve to be installed in a paved area from where snow is regularly removed. Curb-stop valves shall be located within two feet (2') of edge of pavement, either in the roadway or in a paved driveway. Curb-stop valves shall not be permitted in driveways constructed of pavers. Exceptions will require KMPUD approval.

See Standard Drawing KMG007.

#### 1.5.6. Service Riser

Applicants must not install any electrical devices or equipment including wires, cables, metering and telecommunication enclosures, bond wires, clamps, or ground rods within thirty-six inches (36") of the propane service riser. This

distance can be reduced to eighteen inches (18") for electrical devices or equipment certified for National Electric Code (NEC) Class I, Division 2 locations.

## 1.5.7. Service Piping, Valves and Automatic Shut-Off Devices

The applicant is responsible for installing and maintaining the service piping (houseline), valves, automatic shut-off devices (e.g., earthquake valves), or other piping components on any premises or in any building. These components must be installed downstream of the propane meter.

Reinforce the houseline so that it provides support for the meter-set piping. The pipe must be rigid, must be a minimum of three-fourth inch (3/4"), and must have tapered pipe threads.

## 1.5.8. Electrically Bonding and Grounding Gas Pipe

Applicant shall not install electrical devices or equipment, wires, cables, bonding or grounding wires, clamps, or ground rods around the gas meter. KMPUD service piping, gas risers or meter facilities shall not be used for electric bonding or grounding that allows the gas meter, piping, or other gas facilities to become current-carrying conductors.

#### 1.5.1. Applicant-Owned Protective Equipment

KMPUD's propane metering equipment can be affected adversely when an applicant's equipment causes pulsations in the gas flow, sudden changes in flow rate and/or a backflow condition.

Applicants must install, at their expense, any equipment necessary to mitigate or eliminate these detrimental effects. KMPUD must review and approve these installations before initiating propane service. Applicants must add any necessary protective equipment when their operations change and those changes could create any of the three adverse conditions described herein. KMPUD may terminate service and refuse to restore that service to any applicant who continues to operate without the proper protective equipment after receiving notification from KMPUD. Applicants are responsible for damages made to KMPUD equipment because they did not install the proper protective equipment.

## 1.6. Propane Meter Set Requirements

#### 1.6.1. Access

Applicants must keep the area immediately behind gas meters, service facilities, and risers free and clear of all other facilities or equipment (i.e., pipes, building vents, or conduits).

Propane meter enclosures may not be used for temporary or permanent storage of any type.

KMPUD employees require access to meter sets to perform inspection and maintenance activities. When gas meters are installed in meter rooms, an

approved key lock box shall be installed near the meter room to hold a key to allow KMPUD access.

#### 1.6.2. Delivery Pressure

### 1.6.2.1. Standard Delivery Pressure

Gas will normally be delivered at KMPUD's standard delivery pressure of eleven inches of water column (11 iwc). This pressure shall not vary more than fifty percent above or below the standard delivery pressure. No variation in pressure from the standard pressure of three inches or more of water column (3 iwc) shall occur in a time less than fifteen minutes, excepting momentary fluctuations on individual services caused by the operations of customer's appliances or fluctuations caused by gas regulator buildups.

## 1.6.2.2. Increased Delivery Pressure

Upon request of the customer and at the option of KMPUD, gas may be delivered at a pressure higher than standard delivery pressure. KMPUD retains the right to decrease at any time the higher delivery pressure to a delivery pressure not less than the standard delivery pressure.

For all increased delivery pressure installations, KMPUD recommends that applicants hire a qualified person, such as plumber or contractor, to review all applicant-owned gas piping, venting, and appliance installations for the gas pressure service being requested. The qualified person can ensure that the installations comply with all local, state, and federal codes, standards, and regulations. Specifically, the qualified person helps to ensure that the Uniform Plumbing Code is enforced based on the installation requirements of the applicable county building department.

## 1.6.3. Pressure Test Port

A threaded three-fourth inch (3/4") plug will be required downstream of the regulator to allow the service pressure to be tested.

## 1.6.4. Back Pressure Protection

KMPUD may require the applicant to install a check valve after the propane meter set to prevent backflow. The need for a backflow prevention is determined on a case-by-case basis. If required, the applicant is required to maintain the backflow prevention.

## 1.6.5. Meter Set Locations

Typically, KMPUD provides only one meter set for each dwelling unit, installed in an outside location, and one service lateral for each building. Meter set locations must comply will all requirements in Section 2.2. Approved meter set locations are:

A. Meters for low density condominiums (2-3 dwelling units per building) shall be co-located in a single location per building.

- B. Meters for high density condominiums (more than 4 dwelling units per building) shall be co-located in one or more locations as approved by KMPUD.
- C. Meter set located outside in an enclosure or an alcove meeting the requirements of KMPUD Ordinance 21-01, or subsequent Ordinances as may be amended from time to time. See KMPUD standard drawing KMG008. The enclosure may require a custom design depending on the configuration. Outside locations are preferred.
- D. Meter set located inside a building in a propane meter room. Propane meter rooms will be approved by KMPUD on a case-by-case basis and must meet the requirements in Section 2.3.

#### 1.7. Propane System Layout Requirements

#### 1.7.1. Propane Line Locations and Clearances

Propane lines shall be placed in a roadways and public utility easements unless the District deems the alignment impractical, in which case a twenty foot (20') easement in favor of the District is required. Propane lines shall be installed in the center of the required twenty foot (20') easement. Back-lot line utilities are prohibited. Locate distribution mains ten feet (10') from the face or foundation of any building. Propane lines parallel to paved roads shall be installed with a minimum of five feet (5') horizontal separation from the edge of pavement.

Unless otherwise approved by the District, all propane locations shall not interfere with other existing utilities. All parallel and crossing utilities shall follow KMPUD Standards (KMW011 and KMW011A).

Propane service lines proposed to run under or through retaining structures or under or through structures, buildings, foundations or decks will require approval by the District. Written justification will be required. If approved, the propane service line under or through retaining structures, structures, buildings foundations of decks shall require installation in a casing.

Propane distribution lines shall be looped and connected wherever possible by development, even if outside the boundaries of the development and where required by KMPUD. In all cases, propane lines shall be extended to the property lines of the development along all access roads or routes, where looping is possible, and where potential future development or connections may exist. When an area outside the development, but in reasonably close proximity as determined by KMPUD staff, can be logically served by future extension of a proposed propane pipeline, the propane pipeline shall extend to the tract boundary or to the end of a paved street in a manner to facilitate the future extension and include any necessary diameter over sizing.

Private or non-District facilities, service lines or other appurtenances shall not be allowed within District trench sections, without written approval from KMPUD.

#### 1.7.2. Casing

KMPUD must approve all requests for gas service in a casing before installation. The casing shall be made of PE 2708 casing material, imprinted with "GAS SLEEVE". Casing shall be sized based on the following:

Propane Carrier Pipe (IPS) (inches)	Minimum Casing Size (inches)
2	4
3	6
4	8
6	12

Before paving, a minimum three inch (3") casing (i.e., sleeve) shall be placed around the gas service riser.

#### 1.7.3. Line Valves

The propane system shall be equipped with a sufficient number of line valves so that each street, neighborhood and commercial development can be isolated while maintaining service to the remaining distribution area. The maximum spacing between line valves shall not exceed one thousand feet (1000').

Valves shall preferably be located at street intersections. If it is necessary to install valves between street intersections, they shall be located on property lines. Valve size shall conform to pipe size, unless clearly stated and approved otherwise on the plans. Six inch (6") and smaller valves shall be full port ball-type, Polyvalve Poly-Gas valves or approved equivalent.

## 1.7.4. Directional Changes

Changes in pipe direction must be made with elbows, or tee fittings at street intersections. Roping may be used for directional changes at other locations, if approved by KMPUD. Bends in roped PE pipe must be installed in the trench with a radius greater than the minimum recommended radius from the table below.

Nominal Pipe Size (In)	Minimum Bend Radius (In)
3/4 CTS	36
1 CTS	28
2 IPS	60
3 IPS	84
4 IPS	114
6 IPS	168

No fusion or mechanical joints shall be permitted within three feet (3') of any bend.

## 1.7.5. Branch Service Pipe

Branching may be used to provide service to no more than two single-family dwellings or commercial buildings, if approved by KMPUD. The meter installations must be located on adjacent sides of the two buildings being served.

A curb-stop valve in a location conforming to Section 1.5.5 will be required for each propane meter.

Condominiums, whether low density or high density, shall require a dedicated service line.

#### **Technical Standards**

#### **Construction Specifications**

#### 2.1. Propane Pipelines

#### 2.1.1. Pipe

Propane pipe, including mains, laterals and service lines shall be PE 2708 and comply with ASTM D2513.

Size <sup>1</sup> (IPS)	Material	SDR		OD (inches)	ID (inches)	Length (feet)	Wall Thickness (inches)
2	PE 2708	11	HDD (Stick) Direct Bury	2.375	1.917	20	0.216
2	PE 2708	11	HDD (Coil)	2.375	1.917	500	0.216
4	PE 2708	13.5	HDD (Stick) Direct Bury	4.500	3.830	40	0.333
4	PE 2708	13.5	HDD (Coil)	4.500	3.830	400	0.333
6	PE 2708	13.5	HDD (Stick) Direct Bury	6.625	5.643	40	0.491
6	PE 2708	13.5	HDD (Coil)	6.625	5.643	400	0.491

#### 2.1.1.1. Approved PE 2708

<sup>1</sup>Sizes and dimensions not referenced shall conform to ASTM D2513.

#### 2.1.2. Joints

Joints between propane pipe and fittings shall be slip-on type and shall be sealed by means electro-fusion or butt-fusion. All joints shall comply with ASTM D2513.

#### 2.1.3. Fittings

Fittings shall be slip-on type and shall be sealed by means electro-fusion or buttfusion. All joints shall comply with ASTM D2513.

Mechanical fittings may be allowed for field repairs on service lines only and will require the approval of KMPUD. Mechanical fittings are not allowed on molded butt fusion fittings such as 3-way tees, ninety degree (90°) elbows, forty-five degree

(45°) elbows, end caps, reducers, branch saddles, PE valves with molded ends, and tapping tees without pipe pups.

## 2.2. Valves and Appurtenances

## 2.2.1. Valves – Mains and Laterals

Valve installations shall be designed by a California registered Professional Engineer and reviewed for approval by KMPUD. District staff should be consulted in the early planning stages to assess the need for such installations and to develop the site-specific design criteria, which shall be determined solely by the District.

Valves for mains and laterals shall be manufactured from thermoplastic materials conforming to ASTM D2513. Valve size shall conform to pipe size, unless clearly stated and approved otherwise on the plans. Valves shall be full port ball-type and equipped with a two inch (2") operating nut, Polyvalve Poly-Gas valves, or approved equivalent.

## 2.2.2. Valves for Service Lines

All service lines shall require a curb-stop shutoff valve conforming to Section 1.5.5. Additional service line valves may be required due to site-specific design criteria. The need for such installations shall be determined solely by the District. Valves for service lines, three-quarter inch through one and a half inch (3/4-1.5") shall be manufactured from thermoplastic materials conforming to ASTM D2513. Valve size shall conform to pipe size, unless clearly stated and approved otherwise on the plans. Valves shall be full port ball-type and equipped with a two inch (2") operating nut, Polyvalve Poly-Gas valves, or approved equivalent.

## 2.2.3. Valve Boxes

Valve cans shall be provided for all underground valves and shall be pre-cast concrete. Christy G05 or equal. Lids shall be cast iron traffic type G5C and marked "GAS." If noted on the plans additional markings may be necessary. See drawing KMG007.

## 2.2.4. Locating Cable & Locator Tape

Direct burial yellow copper wire solid, Soft Drawn No. 10 insulated, shall be installed twelve inches (12") above the pipe. The wire shall be procured from the vendor complete with an approved splice and insulation kit and cable joints shall be spliced in accordance with the manufacturer's instruction to form a set of continuous electrical conductors throughout the pipe system. Where pipe branches occur, the wire shall be branched also so that wire is provided to each valve and to the locating wire of the branch if the existing branch has one.

All propane pipe shall be marked with a three inch (3") yellow metallic locator tape, located twelve inches (12") directly above the pipe and bedding material. The tape shall be marked with one and a half inch (1½") black "CAUTION – GAS LINE BURIED BELOW" lettering and be placed face up in the trench.

## 2.3. Meter Sets and Regulators

#### 2.3.1. Minimum Clearance Requirements – Single Meter

If applicants install a single meter in a standard enclosure, the enclosure must meet the specifications provided in Standard Drawing KMG008. If installed in a meter room, or in an alternative meter protection enclosure per Ordinance 21-01, a single propane meter must meet the specifications provided in Standard Drawing KMG003.

## 2.3.2. Minimum Clearance Requirements – Multi Meter Manifold

Multi-meter manifolds must meet the meter set requirements for single meters in Section 2.3.1. KMPUD limits gas meter manifold configurations to one-tier or two-tier meter manifolds not exceeding sixty inches (60") high, as measured from the final grade to the top of the manifold.

#### 2.3.3. Regulator Vent Locations

Regulator vents must terminate in a safe outside location, approved by KMPUD, that complies with Standard Drawing KMG006 and the following criteria:

- A. The regulator vent must not terminate near any sources of ignition or openings into the building. The regulator vent must be thirty-six inches (36") horizontally from sources of ignition and openings into the building, and this clearance area will extend ten feet (10') above and to grade below the regulator vent termination.
- B. The regulator vent must be a minimum lateral distance of eight feet (8') from a forced air intake. This includes the intake vents for a gas meter room.
- C. The regulator vent shall not be located in any location that is under display platforms or show windows in commercial buildings, including any permanent, elevated, display floors or platforms associated with the window.
- D. The regulator vent shall not be located under building overhangs, where the overhang is likely to direct venting gas into a building opening.

Regulator vent extensions must be separate lines, terminated so they are protected from the rain and provided with screened fittings to prevent insects and other debris from entering the vent.

## 2.3.4. Remote Read Meters

Most KMPUD propane meters are equipped with a remote read system that uses radio frequency (RF) technology to transmit meter reads automatically. To ensure that the remote read system can operate properly:

- A. Meters shall not be located in any room, cabinet, enclosure, or configuration that blocks or interferes with the RF signal transmissions.
- B. Meters shall not be located within six inches (6") to any metallic object that could block or interfere with the RF signal transmission.

C. Meters shall not be located within five feet (5') of building walls and/or ceilings if they are made from a significant amount of metal or metal reinforcements.

## 2.4. Meter Rooms

It is the responsibility of the applicant to design, construct, and furnish the gas meter room and related materials to meet the gas meter room requirements that are described in these Specifications, and in accordance with the California Building Code, including means of egress and those provisions to safeguard the health and safety of all personnel.

## 2.4.1. General Requirements

- A. Minimum clearance for the meter set must be maintained per Section 2.3.1.
- B. All electrical equipment in the room be classified as Class I, Division 1, Group D pursuant to NFPA-70, National Electric Code. All electrical wiring and conduit that pass through the gas meter room must meet the requirements of the National Electric Code Article 501. Electric devices or electrical connections for services such as cable television or telecommunications shall not be placed in the gas meter room.
- C. Lighting with a minimum thirty (30) foot-candle illumination shall be installed in the gas meter room.
- D. No foreign pipe (i.e., drain lines, domestic water, etc.) or ducts shall be installed in or routed through the gas meter room.
- E. The gas meter room shall be designed to prevent entrapment of gas. Mechanical ventilation to the outside atmosphere is required.
- F. A curb stop shutoff valve must be installed in accordance with Section 1.5.5.
- G. Service risers must not be installed inside buildings or meter rooms, except where special circumstances prevent outside installation. The installation of an inside riser may be approved at the discretion of KMPUD.

## 2.4.2. Meter Room Location Requirements

A meter room must have doors that open to the outside of the building and be accessible from the exterior of the building at all times, including during winter and associated snow/ice accumulation. The propane meter room shall be located at an above grade location designed and constructed with walls, ceiling, and floor that are vapor-tight to prevent the migration of gas to the building's interior.

## 2.4.3. Meter Room Design Requirements

- A. Fire rated walls must have a minimum two-hour fire rating, or as specified in the California Building Code for Group H, Division 1 occupancies.
- B. All doors must be rated commensurate with the rating of the wall. Doors that open to the inside of the building must be vapor-tight to prevent the migration of gas to the building's interior. Doors into gas meter rooms must be posted with approved signs stating that the room contains flammable gas.
- C. No floor drains shall be installed in the propane meter room.

- D. If the applicant's building is equipped with a fire sprinkler system pursuant to NFPA-13, the applicant must also install fire sprinklers inside the gas meter room.
- E. Only explosion-proof lighting fixtures are to be installed in the gas meter room and these must meet the requirements of the NFPA-70: National Electric Code for Class I, Division 1, Group D locations.
- F. It is preferred to mount the light switch outside the room next to the entry door. Explosion-proof light switches must be installed if located inside the meter room. These switches must meet the requirements of the NFPA-70: National Electric Code for Class I, Division 1, Group D locations.
- G. No electrical outlets are permitted in the gas meter room.
- H. The floor-to-ceiling height inside of the meter room must be a minimum of seven and a half feet (7.5') and a maximum of ten feet (10').
- Signs must be posted on at least two walls within the room stating "No Smoking – No Open Flames – No Sources of Ignition – This room is for the sole use of KMPUD propane meter equipment – No storage of any kind is allowed".
- J. The applicant is responsible for core-drilling, sealing, waterproofing, and maintaining a vapor tight seal on any wall, ceiling, or floor where penetrations are required.

## 2.4.4. Gas Meter Room Ventilation Requirements

Applicant must submit the designs and calculations, signed, and stamped by a California licensed Professional Mechanical Engineer, demonstrating that the ventilation for the gas meter room is provided in accordance with the Mechanical Code and satisfies one the following requirements:

A. Continuous ventilation introducing fresh air at six air exchanges per hour.

OR

B. A combustible gas detection system, interlocked with an automatic ventilation system that will provide fresh air at six air exchanges per hour upon activation of the detection system. The gas detectors must be set at 20% Lower Explosive Limit (LEL).

To ensure complete air exchange the fresh air intake and the exhaust air duct must be at opposite corners within the room. Exterior louvers must be located as far apart as practical and ensure no recirculation.

Mechanical fans and all other electric devices must be explosion proof and meet the requirements of the NFPA-70: National Electric Code for Class I, Division 1, Group D locations. Mechanical fans and detection equipment must be continuously monitored in case of failure. Alarms for trouble and failure must be installed in accordance with NFPA-72, National Fire Alarm Code.

## 2.4.5. Propane Regulators

Propane regulators and overpressure protection devices shall typically be installed outside of the meter room. If the applicant desires to locate the propane

regulator inside the meter room, KMPUD must approve the gas meter room design and interior regulator location in advance of any construction.

#### 2.4.6. Regulator Vent Lines

Regulators and any additional overpressure protection equipment installed indoors must be vented to the outdoors. The customer is required to provide penetrations through walls or ceilings for these vents.

Regulator vent lines must terminate in a safe location outside that complies with the requirements of Section 2.2.3.

## 2.5. Laying of Pipe

Pipe trenching and/or excavations shall not be permitted until the site has been brought to finish grade or the roadway has been brought to subgrade.

Pipe shall be laid and joined in accordance with the manufacturer's and/or KMPUD Inspector's directions, whichever is more stringent. Necessary facilities including slings shall be provided for lowering and properly placing pipe sections into the trench without damage.

Each section of pipe shall be thoroughly cleaned before it is lowered into the trench. If clean pipe sections and fittings cannot be placed in the trench without getting foreign material into open pipe, the KMPUD Inspector may require protection of the ends of the pipe or fitting until it has been lowered into position in the trench. After the pipe has been lowered into the trench, all foreign matter shall be completely removed from the pipe before assembly.

The pipe shall be cut to provide closure pieces of correct lengths to permit the proper location of the pipe sections, or to locate valves, fittings and appurtenant structures where specified on plans.

The pipe and fittings shall be laid to the lines and grades specified on the plans and centered in the trench. The alignment and elevation of the pipeline as shown on the drawings shall be designed to avoid conflict with new and existing underground utilities.

Trenches must be kept dry until pipe has been laid, joints closed and backfill completed to a depth of one foot (1') above top of pipe. Crushed rock for drainage and/or bedding shall be provided as necessary.

## 2.6. Connections to Existing Pipelines

All connections to existing pipelines shall be made as shown on the plans and in accordance with these Specifications.

Connection to the main will be made by hot tap or by cutting and inserting sections of pipe and fittings, as shown on the plans, or as directed by the KMPUD Inspector. For hot tap installations, the tapping saddle shall have a test plug and shall be air tested at twenty-five (25) psi for ten (10) minutes. All hot taps shall be performed by KMPUD at the Contractor's expense.

When deemed necessary by the KMPUD Inspector, shutdowns of existing in-service pipeline shall be made by the District as required to complete pipeline connections. A shutdown shall be for as short a period as necessary for shutdown and connection to existing mains, this varies with each job and must be planned accordingly. Unless dictated by propane system consideration, or emergencies, in no case will a shutdown and/or connection be scheduled with less than ten (10) days' notice. Interference with the operation of the District's distribution system shall be kept at a minimum. While an existing pipeline is shut down, the connection work shall be performed without interruption, continuing after regular working hours if necessary, until completed, unless otherwise directed by the KMPUD Inspector. In some cases, shutdowns must occur at times other than normal working hours and/or days. Shutdowns shall not be scheduled Fridays through Mondays. All costs for labor, equipment and meals shall be the responsibility of the Contractor.

In all cases, shutdowns shall be made under the direction of the KMPUD Inspector. The District shall close all valves in making a shutdown and shall open all valves to restore the existing main, as well as perform required hot tap connections and initiate service to the new installation.

The KMPUD Inspector shall be notified at least ten (10) working days prior to any connection so that advance preparation on the part of the District can be made and shall confirm such advance notice in writing. In no case shall any connection operations occur prior to passing pressure tests.

#### 2.7. Abandonment of Existing Facilities

Existing facilities shall be abandoned as indicated on the plans and specifications. Ends of pipelines four inches (4") and larger to be abandoned in place shall be plugged with concrete for a distance of not less than twelve inches (12"), unless otherwise shown on the plans. Valve cans to be abandoned shall be removed and the valve risers shall be filled with concrete.

#### 2.8. Pressure Testing

The KMPUD Inspector shall be notified forty-eight (48) hours prior to testing. All testing shall occur in the presence of a KMPUD Inspector or be subject to re-testing or rejection.

Propane mains, laterals and service lines shall be air tested for leakage. The internal pressure in the pipe shall be raised to twenty-five (25) psi for ten (10) minutes. During the test, connections shall be soaked with a leak detecting solution. Any pressure loss above an allowable thermal loss of three (3) psi over the ten (10) minute period constitutes a failed test.

All pipelines with failed tests shall be repaired at the Contractor's expense. All leaks shall be repaired, regardless of the amount of leakage, at the Contractor's expense. All leaks

shall be repaired in a manner approved by the KMPUD Inspector and retested before acceptance by KMPUD. The Contractor shall provide all labor, equipment and materials required for testing the pipelines.

#### 2.9. Continuity Testing

The Contractor shall test for the continuity of the locating wire at time of final inspection. The Contractor shall provide all labor, equipment and materials required for testing the continuity of the locating wire. Continuity testing shall be performed in the presence of the District Inspector. Should continuity not be present and/or observed, the Contractor shall repair, replace and retest as necessary, entirely at Contractor's expense.

# GAS STANDARD DETAILS LIST OF FIGURES

KMG001 GAS GENERAL NOTES **KMG002** TRENCH BEDDING AND BACKFILL - GAS LATERALS GAS METER CLEARANCES IN A METER ROOM KMG003 **KMG004** TYPICAL RESIDENTIAL/SMALL COMMERCIAL METER **KMG005** TYPICAL GAS METER GAS METER SET CLEARANCES **KMG005** GAS REGULATOR SET CLEARANCES **KMG006** KMG007 PLASTIC VALVE INSTALLATIONS GAS METER ENCLOSURE KMG008



GAS STANDARD DETAILS

**KMG000** 

N.T.S. DRAWN BY: L.P.B.

## **GENERAL NOTES:**

- 1) THE TYPES, LOCATIONS, SIZES, AND DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE IMPROVEMENT PLANS WERE OBTAINED FROM SOURCES OF VARYING RELIABILITY AND ARE APPROXIMATE. A REASONABLE EFFORT HAS BEEN MADE TO LOCATE AND DELINEATE ALL KNOWN UNDERGROUND FACILITIES. HOWEVER, THE ENGINEER CAN ASSUME NO RESPONSIBILITY FOR THE COMPLETENESS OR ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND FACILITIES, NOR THE EXISTENCE OF OTHER BURIED OBJECTS OR FACILITIES WHICH MAY BE ENCOUNTERED BUT WHICH ARE NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE EXISTING UTILITIES, WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS AND TO FIELD VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL EXPOSE ALL UNDERGROUND FACILITIES THAT ARE TO BE CONNECTED TO OR THAT ARE IN THE PATH OF THE PROPOSED IMPROVEMENTS FOR VERIFICATION OF LOCATION AND ELEVATION PRIOR TO THE COMMENCING OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTING THE PROPANE LINE AND APPURTENANCES PER THE IMPROVEMENT PLANS DESPITE THE PRESENCE OF BURIED OBJECTS OR FACILITIES WHICH WERE NOT EXPECTED TO BE ENCOUNTERED, AND THE CONTRACTOR SHALL NOT BE REIMBURSED FOR ANY EXPENSES BROUGHT UPON BY SUCH BURIED OBJECTS OR UTILITIES. THE CONTRACTOR OR ANY SUBCONTRACTOR SHALL NOT BE REIMBURSED FOR ANY EXPENSES BROUGHT UPON BY SUCH BURIED OBJECTS OR UTILITIES. THE CONTRACTOR OR ANY SUBCONTRACTOR SHALL NOT FY UNDERGROUND SERVICES ALERT (USA) AT 811 IN ACCORDANCE WITH THE SPECIFICATIONS PRIOR TO ALL EXCAVATION.
- 2) THE CONTRACTOR SHALL CONTACT THE KIRKWOOD MEADOWS PUBLIC UTILITY DISTRICT ("KMPUD") AT (209)258-4444 48 HOURS OR TWO (2) BUSINESS DAYS, WHICHEVER IS GREATER, PRIOR TO COMMENCEMENT OF THE PRE-CONSTRUCTION MEETING AND INITIAL GAS LINE CONSTRUCTION, AND TWENTY-FOUR HOURS PRIOR TO EACH DAY WORK ON GAS LINE INSTALLATION OCCURS.
- 3) ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE MOST CURRENT KMPUD STANDARDS AND "STANDARD SPECIFICATIONS OF THE STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION". WHERE THERE IS ANY CONFLICT, KMPUD STANDARDS SHALL PREVAIL.
- 4) THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS THAT ARE TO REMAIN IN PLACE. ALL IMPROVEMENTS DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE EXPEDITIOUSLY REPAIRED OR RECONSTRUCTED AT THE CONTRACTOR'S EXPENSE AND INSPECTED BY THE AGENCY OR CONTROLLING AGENCY, WITHOUT ADDITIONAL COMPENSATION.
- 5) ALL PIPING SHALL HAVE 24" MINIMUM COVER EXCEPT WHERE SPECIFICALLY NOTED ON THE PROJECT PLANS. IF ELEVATIONS SHOWN ON PROFILE DRAWINGS RESULT IN LESS THAN 24" OF COVER, THEN 24" OF COVER SHALL PREVAIL.
- 6) PIPE BENDS AND TIE IN DETAILS INDICATED ON THE PLANS ARE APPROXIMATE HORIZONTAL ANGLES AND ARE INTENDED TO SHOW THE ESSENTIAL ELEMENTS REQUIRED OF THE CONNECTION. ACTUAL FIELD PIPING ANGLES MAY BE DIFFERENT. THE CONTRACTOR SHALL SUPPLY ALL LABOR, STANDARD OR FABRICATED FITTINGS, AND APPURTENANCES REQUIRED FOR THE BEND OR TIE-IN INSTALLATION, WITH NO ADDITIONAL REIMBURSEMENT. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL CUSTOM FABRICATED FITTINGS.
- 7) THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT OF THE LINE AND GRADE OF ALL PIPING WITHIN THE PROJECT SITE.
- 8) THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING RECORD DRAWINGS FOR ALL WORK THROUGHOUT THE COURSE OF CONSTRUCTION. SUCH DRAWINGS SHALL RECORD THE LOCATION AND GRADE OF ALL UNDERGROUND IMPROVEMENTS CONSTRUCTED AND SHALL BE DELIVERED TO KMPUD PRIOR TO, AND IN CONSIDERATION OF KMPUD'S ACCEPTANCE OF WORK.
- 9) THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL SURPLUS EXCAVATION MATERIAL AND DEBRIS PROMPTLY FROM THE SITE AND SHALL MAINTAIN THE SITE IN A NEAT AND ORDERLY CONDITION. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY FILL AND GRADING PERMITS.
- 10) THE CONTRACTOR SHALL ADJUST ALL VALVE BOXES TO FINISHED GRADE UNLESS OTHERWISE SHOWN ON DRAWINGS OR DIRECTED.
- 11) PIPE STATIONING IS BASED ON HORIZONTAL DISTANCE AND DOES NOT REPRESENT ACTUAL LENGTH OF PIPE.
- 12) CONTRACTOR SHALL AT ALL TIMES COMPLY WITH THE SAFETY RULES AND REGULATIONS ESTABLISHED BY CAL-OSHA AND OTHER AGENCIES HAVING JURISDICTION OVER THE WORK AND SHALL BE REQUIRED TO OBTAIN ALL PERMITS. CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY.
- 13) ALL EXISTING IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO LANDSCAPING, DRIVEWAYS, DRAINAGE DITCHES AND MONUMENTS, SHALL BE RESTORED TO THE CONDITION IN WHICH THEY WERE PRIOR TO CONSTRUCTION, OR BETTER.
- 14) A WRITTEN REQUEST TO REMOVE AND/OR TRIM ANY TREES SHALL BE SUBMITTED IN WRITING TO THE OWNER; NO REMOVAL AND/OR TRIMMING SHALL TAKE PLACE WITHOUT WRITTEN RESPONSE BY THE OWNER.
- 15) ALL TREES REQUIRING TRIMMING OR REMOVAL SHALL BE IDENTIFIED BY THE CONTRACTOR AND THE CONTRACTOR SHALL COMPLY WITH ALL KIRKWOOD TRI-TAC COMMITTEE REQUIREMENTS REGARDING TRIMMING OR REMOVAL WORK. WHERE APPROPRIATE, CONTRACTOR SHALL ALSO NOTIFY THE PROPERTY OWNER, HOMEOWNER ASSOCIATION AND KMPUD.
- 16) PLAN APPROVAL SHALL EXPIRE TWO YEARS FROM DATE OF KMPUD SIGNATURE OR CONDITIONAL WILL SERVE COMMITMENT, WHICHEVER COMES FIRST.



NOTES				
DATE: 3/30/22	APPROVED BY: B.B.			
SCALE: N.T.S.	DRAWN BY: L.P.B.	KMG001		

GAS GENERAL





------ BUILDING WALL



## NOTES:

- 1. METER SETS SHOULD BE LOCATED AT THE BUILDING AND AS NEAR AS PRACTICAL TO THE POINT WHERE THE GAS SERVICE PIPE ENTERS THE PROPERTY. THE METER SET LOCATION TYPICALLY SHOULD BE NEAR THE SIDE OF THE BUILDING FROM WHICH THE CUSTOMER WILL BE SERVED. THE ORDER OF PREFERENCE FOR LOCATING THE METER SET IS:
  - 1) OUTSIDE IN AN ENCLOSURE OR ALCOVE MEETING KMPUD REQUIREMENTS
  - 2) IN A PROPANE METER ROOM. PROPANE METER ROOMS WILL BE APPROVED BY KMPUD ON A CASE BY CASE BASIS AND MUST MEET ALL CALIFORNIA BUILDING CODE AND KMPUD REQUIREMENTS.
- 2. IF A METER SET IS INSTALLED IN A METER ROOM, AN APPROVED KEY LOCK BOX SHALL BE INSTALLED NEAR THE METER ROOM TO HOLD A KEY TO ALLOW KMPUD ACCESS.



## TYPICAL RESIDENTIAL/SMALL COMMERCIAL METER

-		
DATE:	APPROVED BY:	DRAWING NUMBER:
4/28/22		
SCALE:	DRAWN BY:	I KMG004
N.T.S.	L.P.B.	



## NOTES:

- 1. DO NOT PLACE ANY GAS REGULATOR VENTS UNDER DISPLAY PLATFORMS OR SHOW WINDOWS IN COMMERCIAL BUILDINGS. THIS INCLUDES ANY PERMANENT, ELEVATED DISPLAY FLOORS OR PLATFORMS ASSOCIATED WITH THE WINDOW, WHERE THE PURPOSE OF THE WINDOW IS TO PRESENT A DISPLAY TO THE PUBLIC.
- 2. DO NOT PLACE ANY GAS REGULATOR VENTS UNDER BUILDING OVERHANGS WHERE THE OVERHANG IS LIKELY TO DIRECT VENTED GAS TO A BUILDING OPENING.
- 3. THE BUILDING VENT OPENINGS, SOURCES OF IGNITION AND ABOVE GROUND WATER SOURCES MUST BE A MINIMUM OF 36 INCHES AWAY FROM THE RISER.
- 4. NOTHING MAY BE INSTALLED WITHIN 36 INCHES OF THE GAS FACILITIES.
- 5. FOR A LARGE METER OR MULTI-METER MANIFOLD, THE MINIMUM SEPARATION REQUIREMENT FOR SOURCES OF IGNITON, OPENING TO BUILDINGS OR SOURCES OF ABOVE-GROUND WATER ,EXTEND 12 INCHES BEYOND THE FARTHEST CONNECTION TO THE APPLICANT HOUSELINE, AND 10 FEET ABOVE THE HIGHEST REGULATOR VENT.



# GAS METER SET CLEARANCES

DATE: 4/28/22 APPROVED BY: DRAWING NUMBER: SCALE: DRAWN BY: L.P.B.

KMG005



GAS REGULATOR SET CLEARANCE REQUIREMENT FROM SOURCES OF IGNITION

#### NOTES:

- 1. IF THE PROPANE METER IS PROTECTED BY AN ENCLOSURE, NO VENTS OR SOURCES OF IGNITION SHALL BE WITHIN ENCLOSURE.
- 2. CLEARANCE MAY BE REDUCED TO 18 INCHES UPON KMPUD APPROVAL FOR ELECTRICAL DEVICES OR EQUIPMENT CERTIFIED FOR NATIONAL ELECTRIC CODE (NEC) CLASS 1, DIVISION 2 LOCATIONS.



KIRKWOOD MEADOWS

GAS REGULATOR SET
CLEARANCES

DATE: 4/11/22 APPROVED BY: DRAWING NUMBER: SCALE: DRAWN BY: L.P.B.

KMG006



#### NOTES:

- 1. LOUVER TO BE HORIZONTAL FIXED BLADE, 2" MINIMUM WIDTH, 24"x24" MINIMUM, CONSTRUCTED OF ALUMINUM OR GALVANIZED STEEL AND RESISTANT TO WIND DRIVEN RAIN. ACCEPTABLE MANUFACTURERS INCLUDE GREENHECK EHH201 & RUSKIN EME220DD. ALTERNATES SHALL BE SUBMITTED TO KMPUD FOR APPROVAL.
- 2. CONCRETE SHALL BE 2,500 PSI MINIMUM.
- 3. 12" WIDE STRIP FOUNDATION WITH SAME CLEARANCES AND 2X SILL MAY BE SUBSTITUTED FOR CIRCULAR FOUNDATIONS. NO FOUNDATIONS TO BE CONSTRUCTED OVER UNDERGROUND GAS LINE.
- 4. 4 POSTS WITH REAR HEADER MAY BE UTILIZED IF HOMEOWNER DOES NOT WISH STRUCTURE TO BE ATTACHED. ROOF AND WALLS SHALL BE SEALED TO HOUSE WITH FLASHING OR CAULKING TO PREVENT SNOW INTRUSION.
- 5. HOMEOWNER MAY SUBSTITUTE PRE-FABRICATED GALVANIZED STEEL ENCLOSURE IF SUBMITTAL IS PROVIDED TO KMPUD DETAILING STRUCTURE AND 300 PSF SNOW LOAD CAPACITY, CERTIFIED BY A CALIFORNIA REGISTERED PROFESSIONAL CIVIL OR STRUCTURAL ENGINEER.
- 6. PROVIDE HINGED DOOR ON FRONT OF STRUCTURE, 36" MIN. WIDTH, FULL HEIGHT.
- 7. STRUCTURE MAY BE PAINTED, STAINED OR COVERED TO MATCH HOUSE COLOR OR STYLE.
- 8.  $\frac{5}{8}$ " MIN. EXTERIOR PLYWOOD ON SIDES OF STRUCTURE. NAIL 8d GALV. BOX 6" O.C.
- 9. PROVIDE METAL OR COMPOSITE ROOFING MATERIAL OVER ENCLOSURE ROOF PLYWOOD.
- 10. ANY WOOD IN CONTACT WITH CONCRETE SHALL BE PRESSURE TREATED.
- 11.FRAME SIDES WITH HORIZONTAL OR VERTICAL 2X4 DF AT 24" O.C. MAX.
- 12. FASTENER QUANTITY ACCEPTABLE FOR 2,500 PSI CONCRETE AND GROUTED 1,500 PSI MASONRY. LESSER VALUES WILL REQUIRE ENGINEERING.
- 13. SPACE CONCRETE AND MASONRY FASTENERS EVENLY ACROSS LEDGER AND STAGGER. PROVIDE 8" MINIMUM BETWEEN FASTENERS.
- 14. EMBEDMENT IS INTO CONCRETE OR MASONRY OR FRAMING MEMBER OF EXTERIOR WALL.
- 15.EPOXY ANCHORS OR OTHER MANUFACTURERS ANCHORS MAY BE UTILIZED IF THEY EQUAL OR BETTER DESIGN VALUES OF ANCHOR SHOWN OR ARE SUBMITTED TO KMPUD.
- 16. MASONRY MUST BE FULLY GROUTED.
- 17.INSTALL ALL ANCHORS IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS.

FASTENER/ANCHOR	MINIMUM EMBEDMENT	# PER HORIZ. LEDGER (MIN.)	# PER VERT. LEDGER (MIN.)
TIMBERLOK, LEDGERLOK OR SIMPSON SDS	2-1/2"	12	4
3"+ STRONGBOLT2 OR TITEN HD - CONCRETE	3"	3	2
<sup>1</sup> / <sub>2</sub> " STRONGBOLT2 OR TITEN HD - MASONRY	3-1/2"	4	2
ਭੇ"+ WEDGE-ALL - CONCRETE	3"	3	2
<sup>1</sup> / <sub>2</sub> " WEDGE-ALL - MASONRY	3-1/2"	8	2



KIRKWOOD MEADOWS

N.T.S.

L.P.B.