TracPipe® CounterStrike®

Installation Training

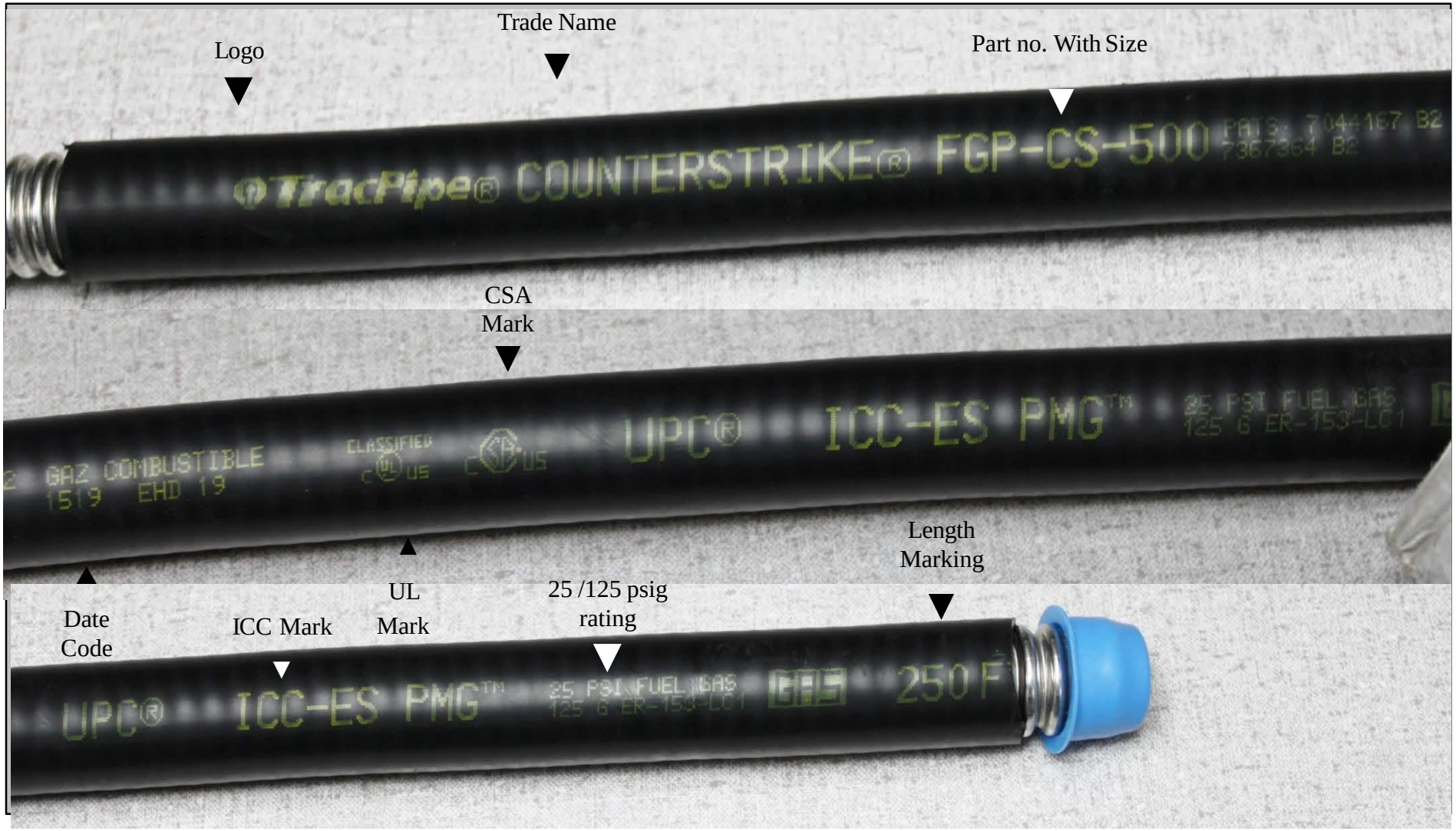
Current Standards and Code approvals

- TracPipe® CounterStrike® is manufactured and tested to ANSI LC 1
- TracPipe CounterStrike is approved for use by:
  - IFGC – International Fuel Gas Code
  - NFPA 54 – National Fuel Gas Code
  - IAPMO – Uniform Plumbing Code
  - Other State Codes

Description of System Components

- Tubing
- Fittings
- Accessories
- Pressure Regulators
- Protection Devices

Tube Markings



TracPipe® AutoFlare® Fitting

TracPipe® AutoSnap® Fitting

TracPipe® CounterStrike®

System Components

Meter Terminations

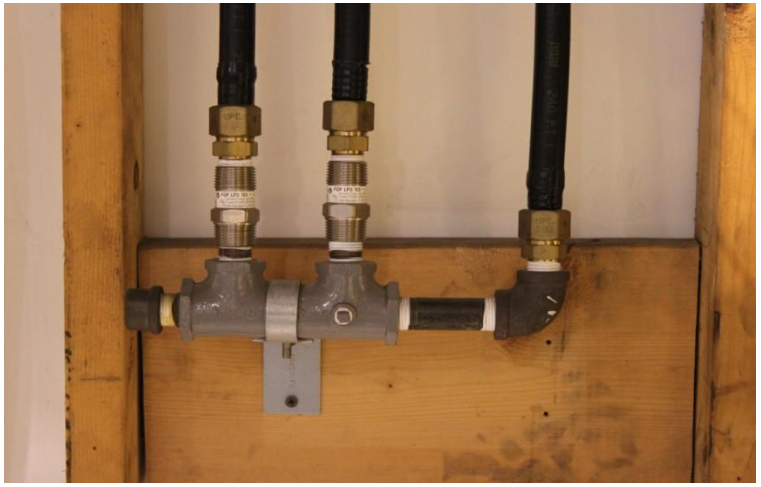
System Components

Appliance Termination Fittings

System Components

Accessories

Manifolds



Manifold Brackets

Mounting Brackets

Load Center

Pressure Regulators

Three Different Brands

System Configuration and Sizing

Allowable Pressure Drops

- Standard Pressure in North American is 6-7” W.C. (1/4 psig or 4 oz.) – Natural Gas, 11” W.C. - LP
- Basically set at the discretion of the system design engineer, provided:
  - Local gas utility can deliver the required pressure at the meter.
- Use TracPipe CounterStrike Sizing charts or the charts for CSST in applicable code books.
- Confirm the gas supply pressure with the utility or propane supplier.

Allowable Pressure Drops cont'd

2009 IFGC 402.5 ***Allowable pressure drop. The design pressure loss in any piping system under maximum probable flow conditions, from the point of delivery to the inlet connection of the appliance, shall be such that the supply pressure at the appliance is greater than or equal to the minimum pressure required by the appliance.***

- **The maximum allowable pressure drop is the difference between the supply pressure and the minimum allowable inlet pressure for the appliance being served**
  - **Use the sizing chart in the D&I Guide that is closest to but not greater than the desired allowable pressure drop**

Pressure and Pressure Drop
Natural Gas

Operating Pressure	Allowable Pressure Drop	Appliance Pressure
7 in. W.C.	0.5 in. W.C.	6.5 in. W.C.
8 in. W.C.	3.0 in. W.C.	5.0 in. W.C.
10 in. W.C.	5.0 in. W.C.	5.0 in. W.C.
2.0 psi 8.0 in. W.C.	1.0psi 3.0 in. W.C.	5.0 in. W.C.
5.0 psi 8 in. W.C.	3.5 psi 3.0 in. W.C.	 5.0 in. W.C.

Pressure and Pressure Drop
LP

Operating Pressure	Allowable Pressure Drop	Appliance Pressure
11 in. W.C.	0.5 in. W.C.	10.5 in. W.C.
11-12 in. W.C.	1.0 in. W.C.	10-11 in. W.C.
12-14 in. W.C.	2.0 in. W.C.	10-12 in. W.C.
2.0 psi 11.0 in. W.C.	1.0psi 0.5 in. W.C.	10.5 in. W.C.
5.0 psi 11 in. W.C.	3.5 psi 0.5 in. W.C.	 10.5 in. W.C.

Gas System Sizing

- **Three Requirements needed for sizing All Systems**
  - **Gas Pressure (Type of Gas)**
  - **Piping Lengths**
  - **Appliance Loads**

System Configuration and Sizing

Branch Length Method

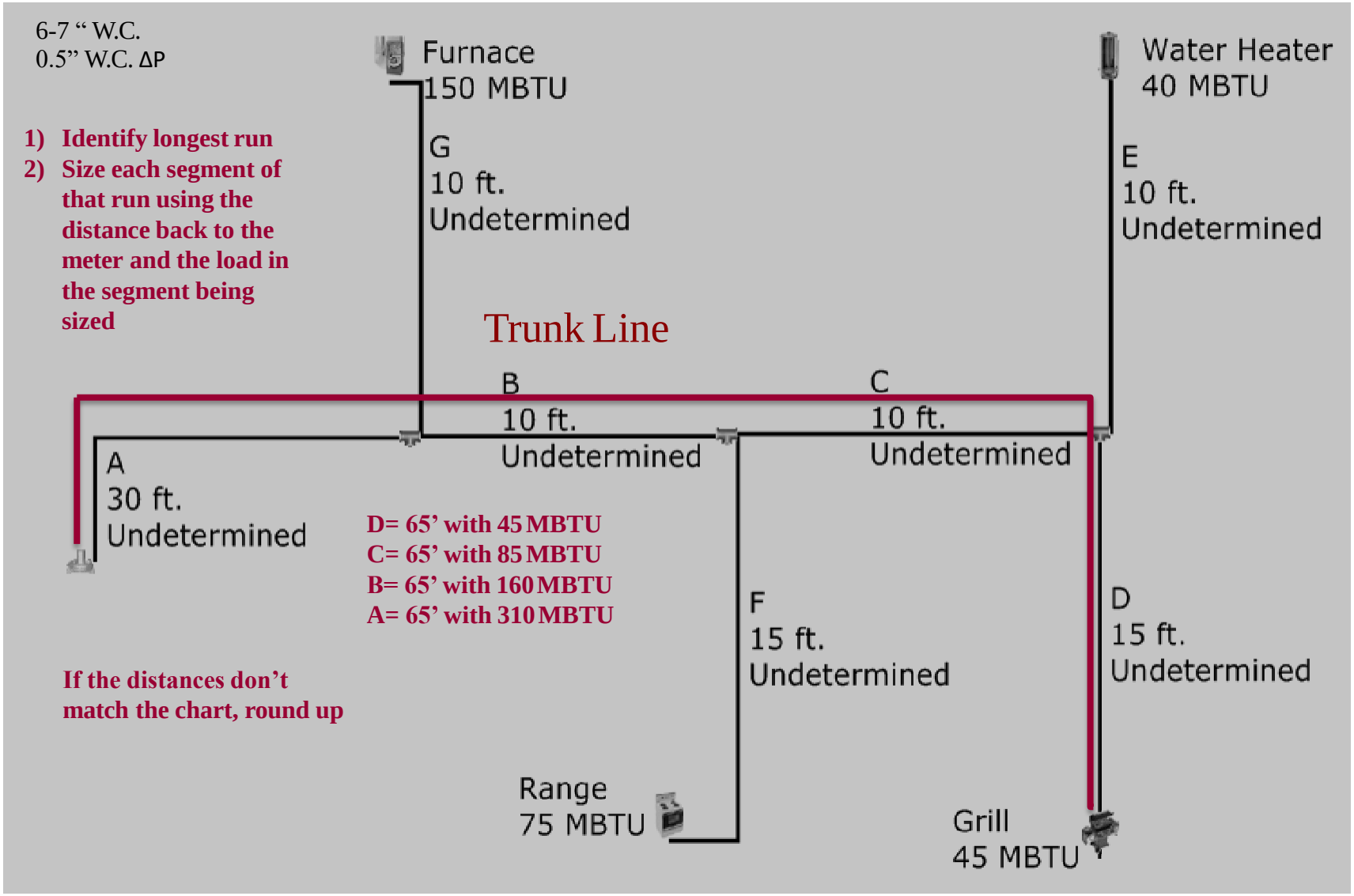
Series

- **Determine the gas appliance placement on floor plan.**
- **Determine the lengths of all the tubing runs.**
- **Determine the necessary flow (CFH) through each tubing section:**

$$\frac{\text{Appliance Btu/hr}}{1000\ \text{Btu}/\text{ft}^3} \cong \text{CFH}$$

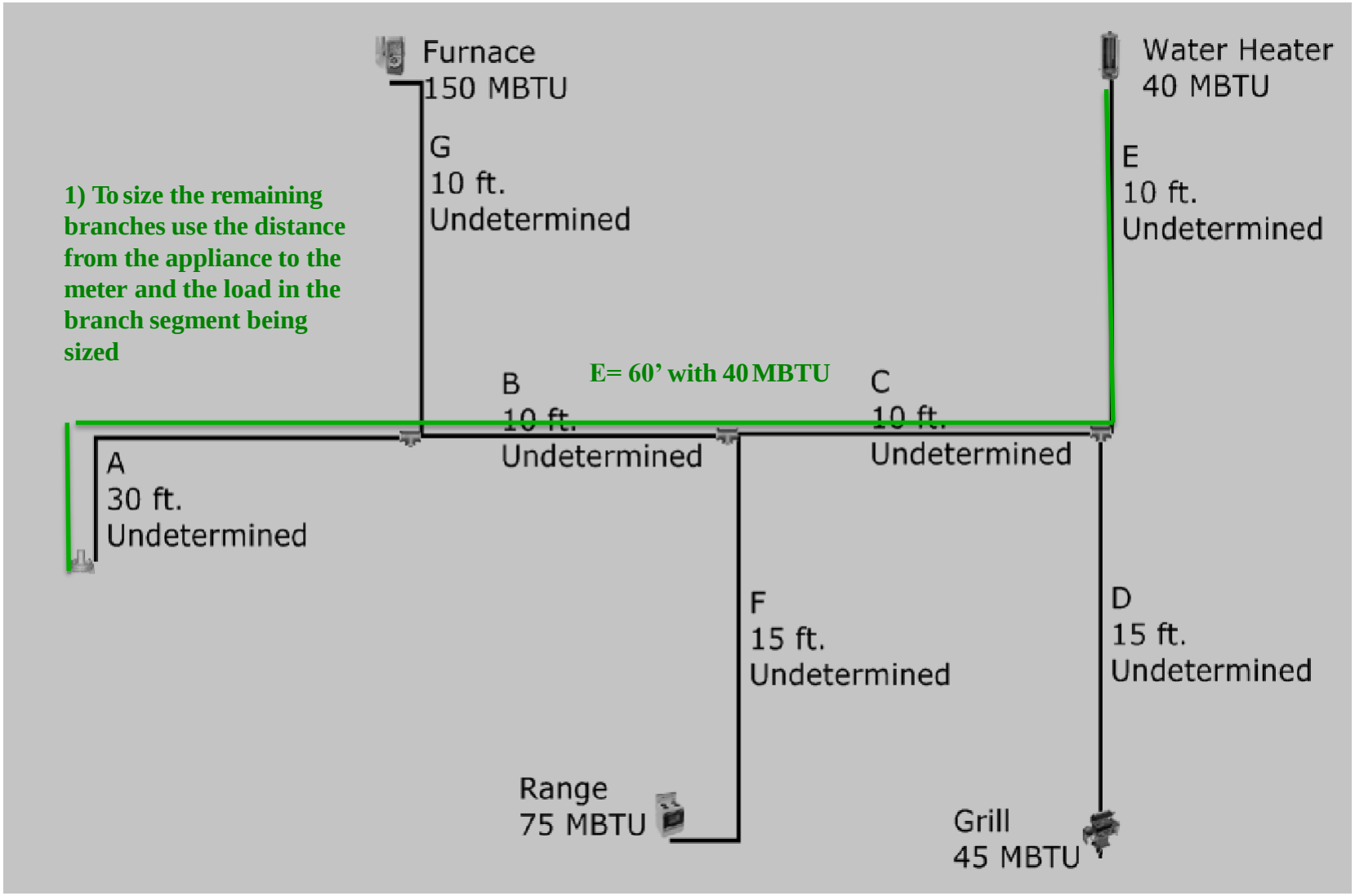
Series Arrangement

Branch Length Method



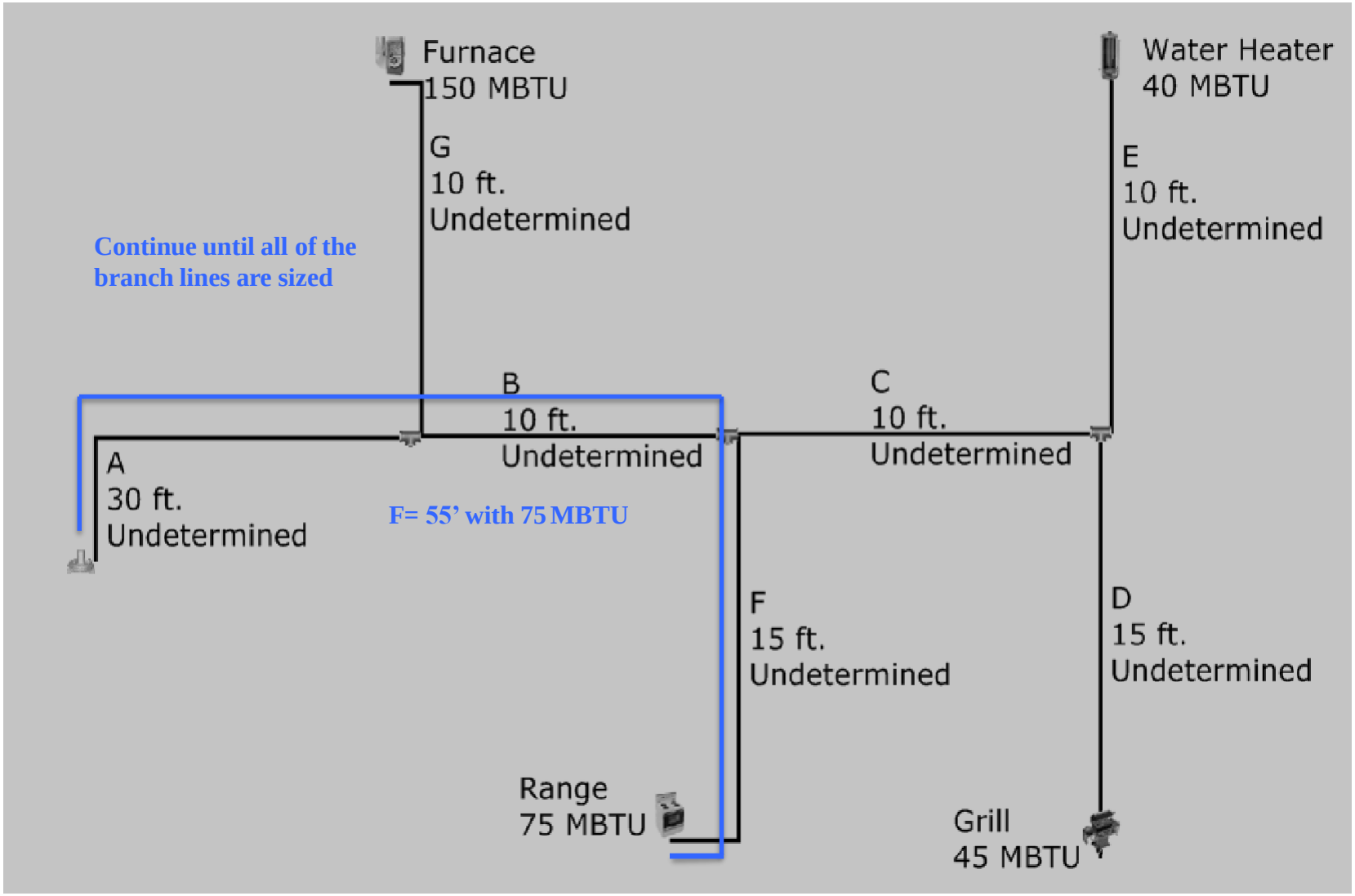
Series Arrangement

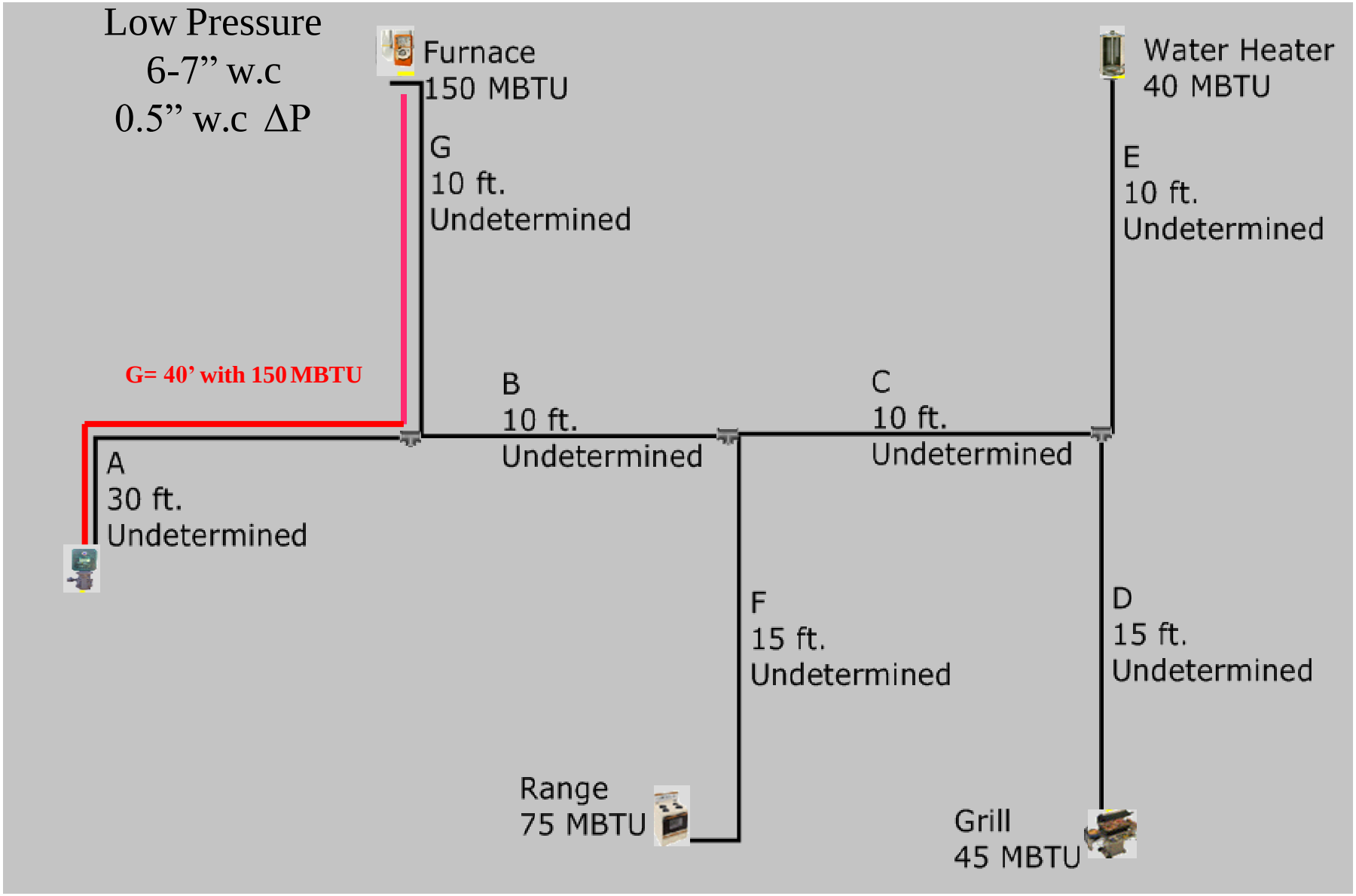
Branch Lines



Series Arrangement

Branch Lines




Low Pressure
6-7” w.c
0.5” w.c ΔP
Furnace
150 MBTU
G
10 ft.
Undetermined
Water Heater
40 MBTU
E
10 ft.
Undetermined
G= 40’ with 150 MBTU
B
10 ft.
Undetermined
C
10 ft.
Undetermined
A
30 ft.
Undetermined
F
15 ft.
Undetermined
D
15 ft.
Undetermined
Range
75 MBTU
Grill
45 MBTU

Series System Sizing

- **Information needed to size the system**
  - **Type of Gas**
    - **The System Pressure**
      - **Allowable Pressure Drop**
  - **Select the proper sizing chart**
  - **Pipe Lengths**
    - **Lengths of each segment**
  - **Appliance Loads**

Sizing Charts

Table N-1 Low Pressure (Standard)

Maximum Capacity of OmegaFlex TracPipe CSST in Cubic Feet per Hour (CFH) of Natural Gas (1000 BTU per cubic foot approx)

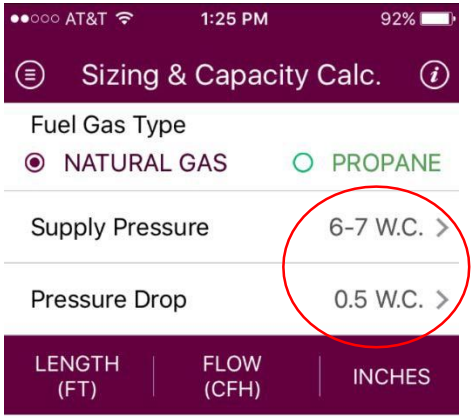
Min. Gas Pressure: 6-7 in w.c.
Pressure Drop: 0.5 in w.c.
(Based on a 0.60 Specific Gravity Gas)

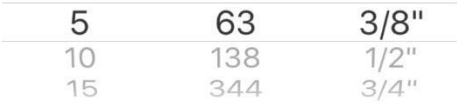
Size	EHD	Tubing Length (feet) 5	10	15	20	25	30	40	50	60	70	75	80	90	100	125	150	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
3/8"	15	63	45	37	33	29	27	23	21	19	18	17	17	16	15	14	12	11	10	9	8	7	6	6	5	5	5	5	4	4	4	4
1/2"	19	138	99	81	70	63	58	50	45	41	38	37	36	34	32	29	26	23	20	19	16	14	13	12	11	11	10	10	9	9	9	8
3/4"	25	344	245	201	175	157	143	125	112	102	95	92	89	84	80	71	65	57	51	46	40	36	33	31	29	27	26	24	23	22	22	21
1"	31	589	419	343	298	267	244	212	190	174	161	156	151	142	135	121	111	96	86	79	68	61	56	52	48	46	43	41	40	38	37	35
1 1/4"	39	1109	789	646	561	503	460	399	358	327	303	293	284	268	254	228	208	181	162	148	128	115	105	97	91	86	82	78	75	72	69	67
1 1/2"	46	1790	1261	1027	888	793	723	625	559	509	471	455	440	415	393	351	320	277	247	226	195	174	159	147	137	129	123	117	112	107	103	100
2"	62	4142	2934	2398	2078	1860	1698	1472	1317	1203	1114	1076	1042	983	933	835	762	661	591	540	468	419	382	354	331	312	296	283	271	260	251	242

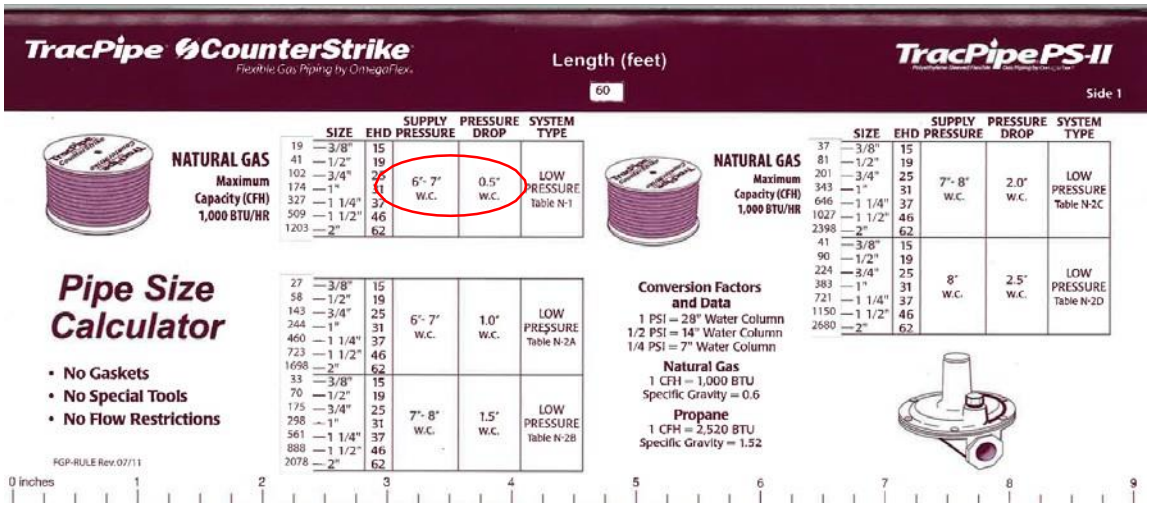
see notes below*

EHD (Equivalent Hydraulic Diameter) A theoretical size which reflects the hydraulic performance of the tubing. It is not a true physical measure. This number is used to compare individual sizes between different manufactures.
The higher the EHD number the greater the flow capacity of the piping.

D & I Guide

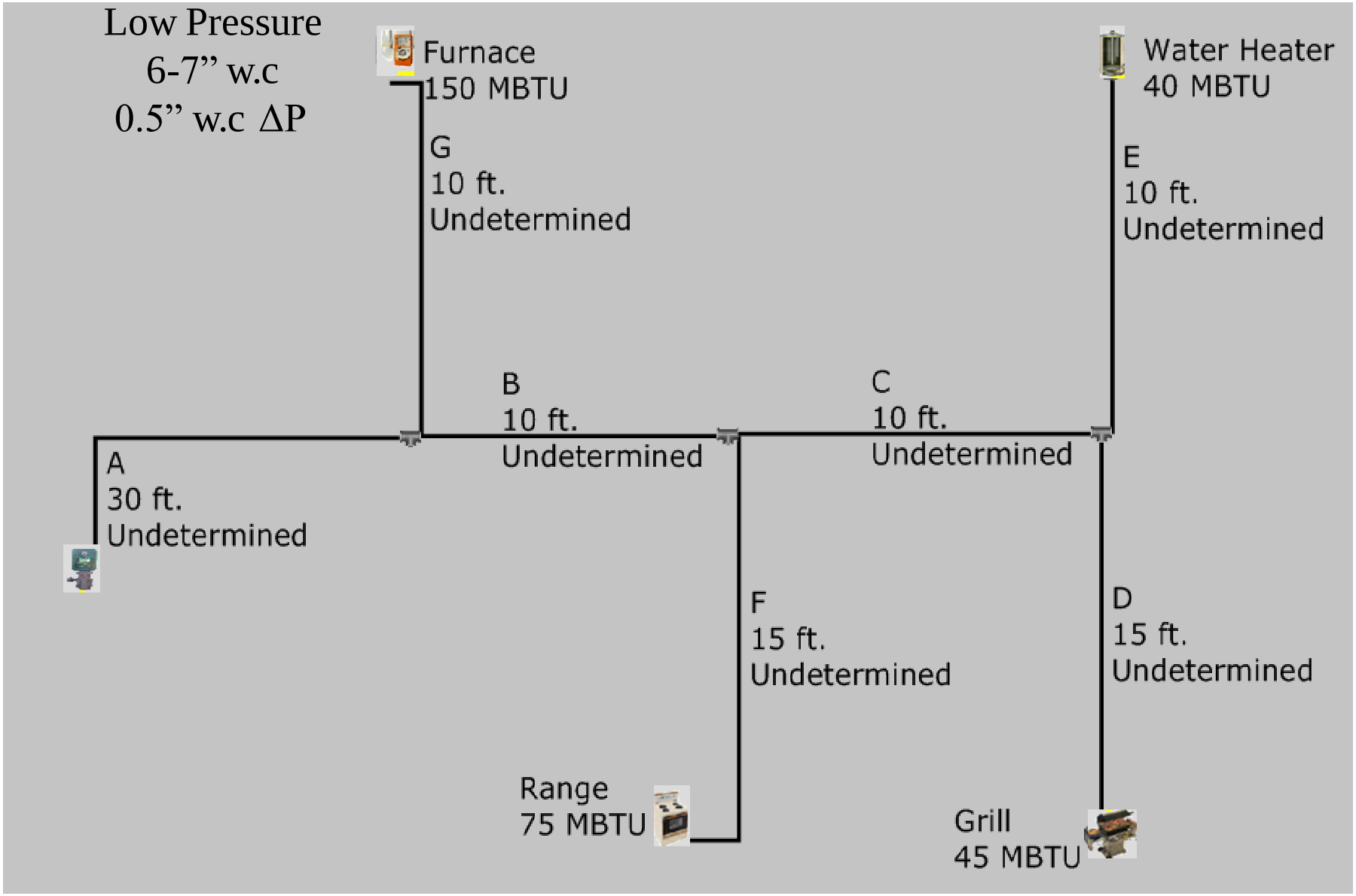






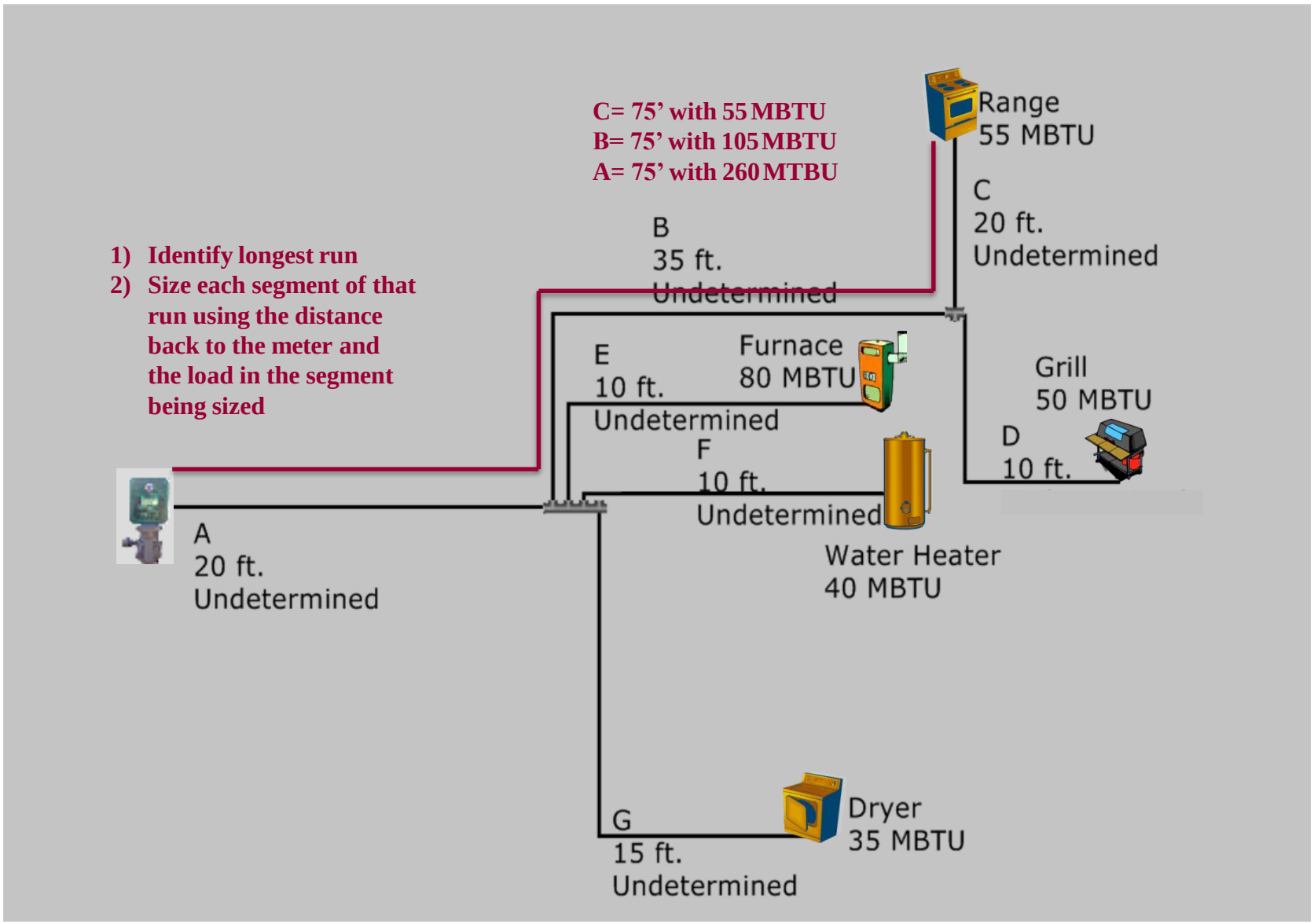
Slide Rule

TracPipe® CounterStrike®
Iphone
/
Android App

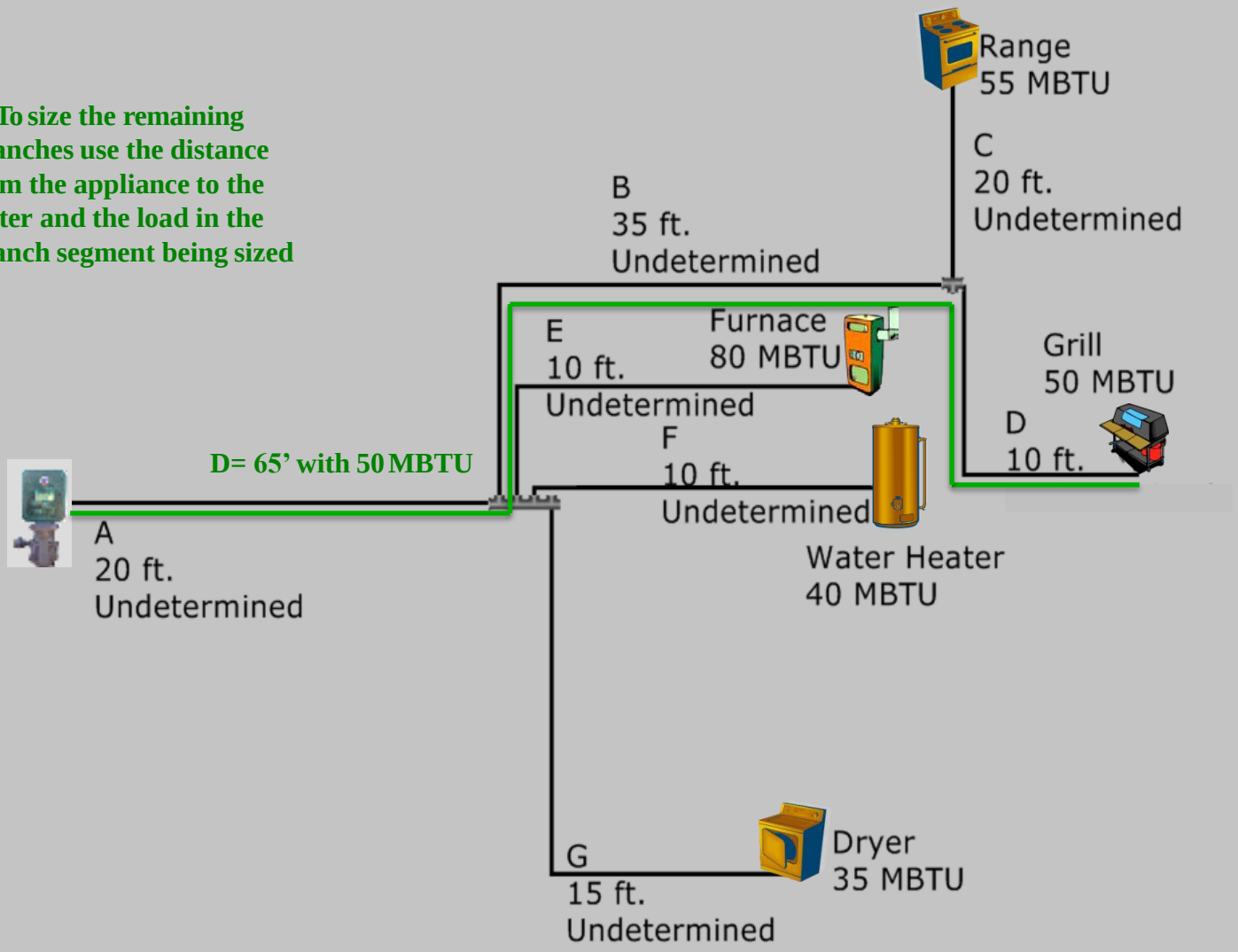

Low Pressure
6-7” w.c
0.5” w.c ΔP
Furnace
150 MBTU
G
10 ft.
Undetermined
Water Heater
40 MBTU
E
10 ft.
Undetermined
B
10 ft.
Undetermined
C
10 ft.
Undetermined
A
30 ft.
Undetermined
F
15 ft.
Undetermined
D
15 ft.
Undetermined
Range
75 MBTU
Grill
45 MBTU

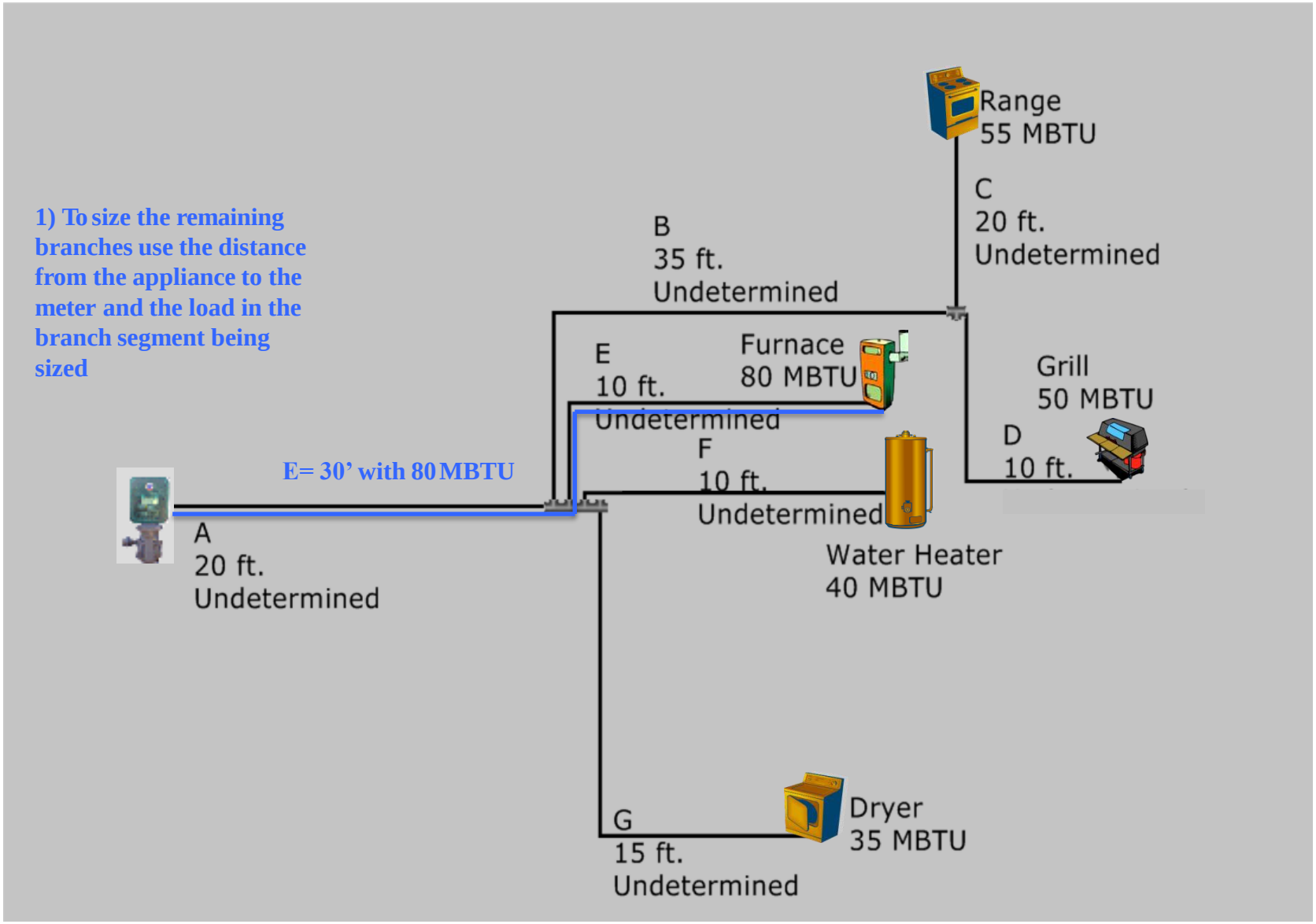
Sizing Parallel

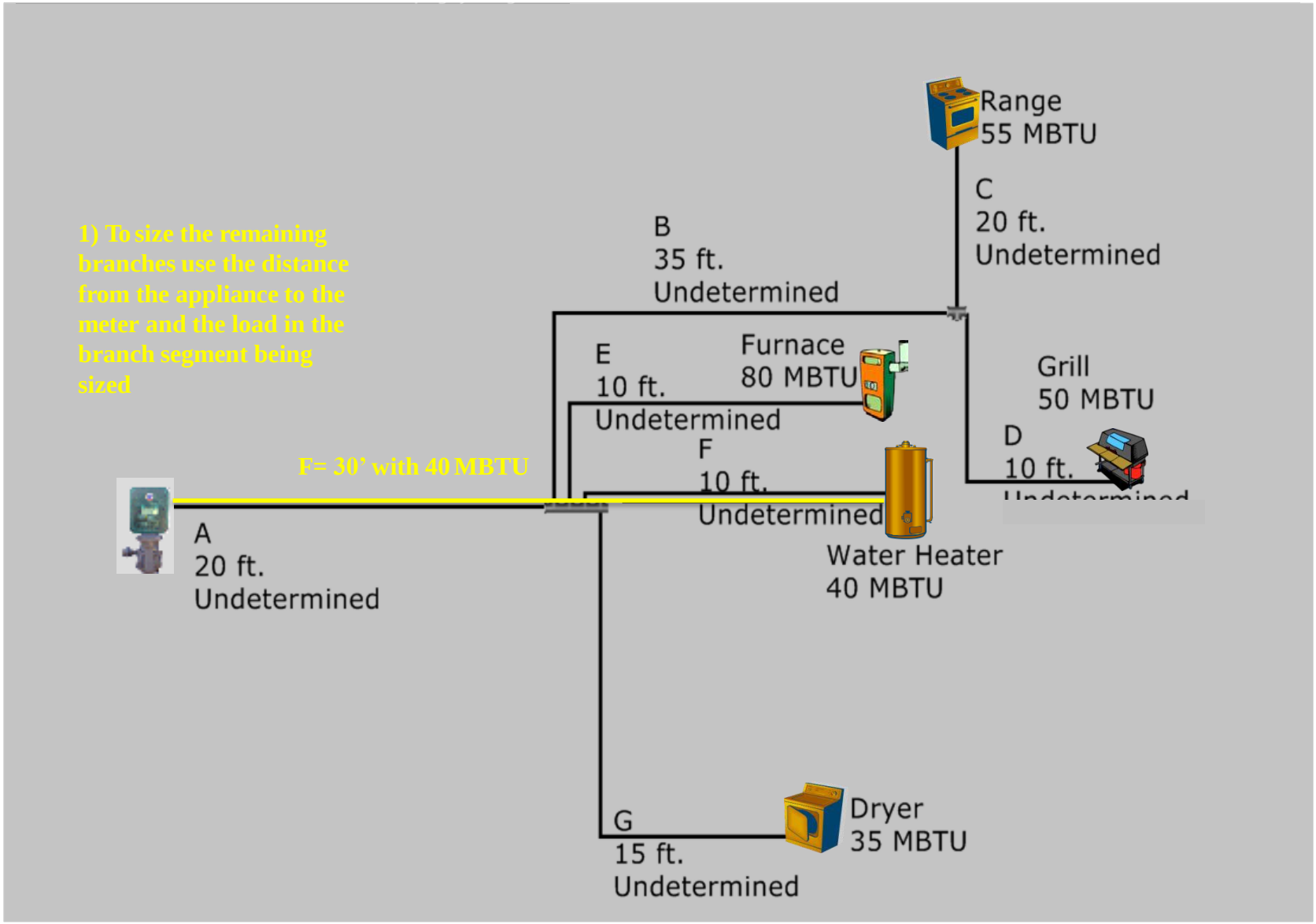
- Sized Similar to Series System
- Use appropriate Sizing Table for Supply Pressure.
- Each Tubing Run is Sized from the appliance back to the Meter.
- Main Trunk is sized from the furthest appliance to the meter with full load.


C= 75' with 55 MBTU
B= 75' with 105 MBTU
A= 75' with 260 MTBU
1) Identify longest run
2) Size each segment of that run using the distance back to the meter and the load in the segment being sized
Range
55 MBTU
C
20 ft.
Undetermined
B
35 ft.
Undetermined
E
10 ft.
Undetermined
Furnace
80 MBTU
Grill
50 MBTU
D
10 ft.
F
10 ft.
Undetermined
Water Heater
40 MBTU
A
20 ft.
Undetermined
G
15 ft.
Undetermined
Dryer
35 MBTU

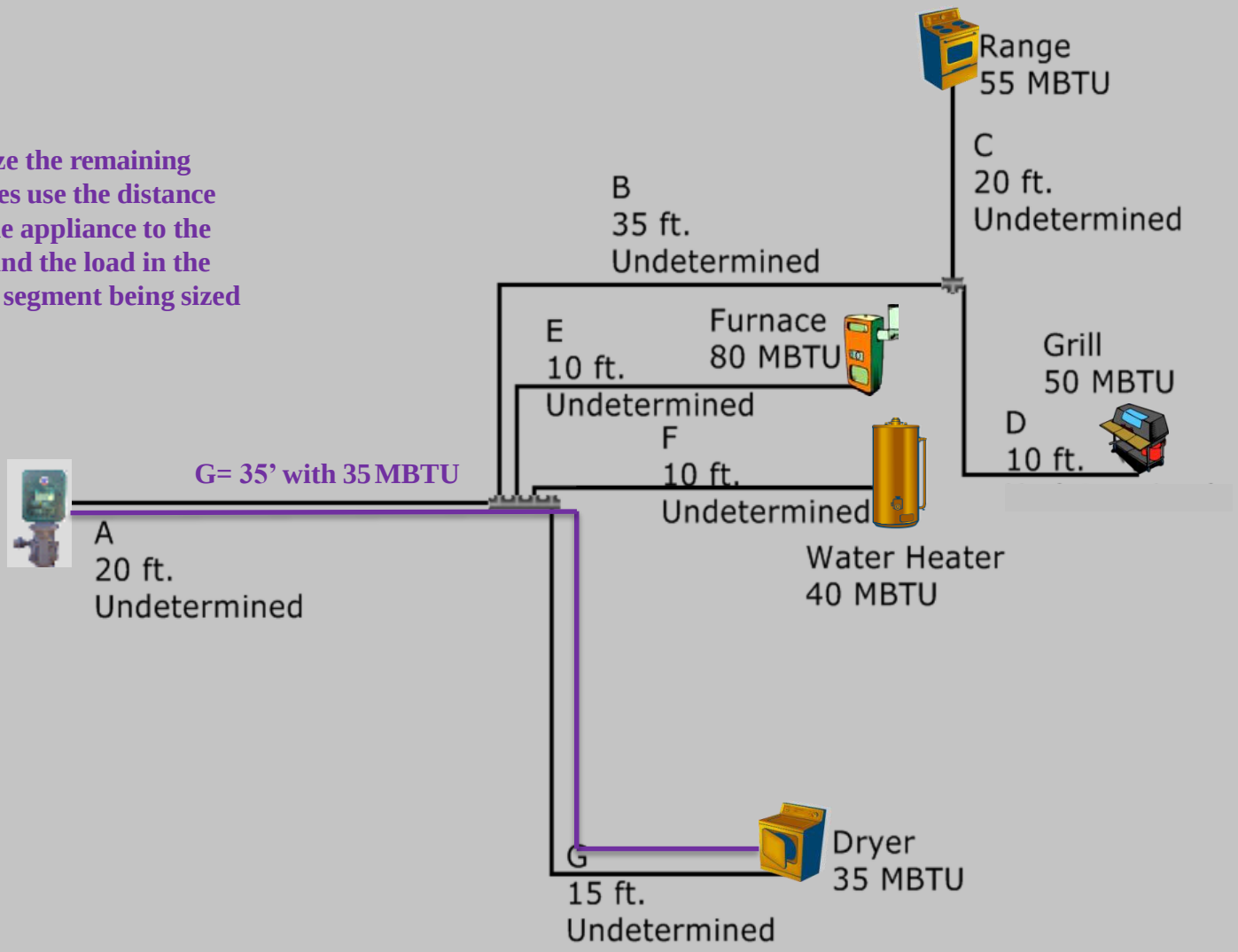
1) To size the remaining branches use the distance from the appliance to the meter and the load in the branch segment being sized




1) To size the remaining branches use the distance from the appliance to the meter and the load in the branch segment being sized
Range
55 MBTU
C
20 ft.
Undetermined
B
35 ft.
Undetermined
E
10 ft.
Undetermined
Furnace
80 MBTU
Grill
50 MBTU
D
10 ft.
F
10 ft.
Undetermined
E= 30' with 80 MBTU
A
20 ft.
Undetermined
Water Heater
40 MBTU
G
15 ft.
Undetermined
Dryer
35 MBTU


1) To size the remaining branches use the distance from the appliance to the meter and the load in the branch segment being sized
Range
55 MBTU
C
20 ft.
Undetermined
B
35 ft.
Undetermined
E
10 ft.
Undetermined
Furnace
80 MBTU
Grill
50 MBTU
D
10 ft.
F= 30' with 40 MBTU
F
10 ft.
Undetermined
A
20 ft.
Undetermined
Water Heater
40 MBTU
G
15 ft.
Undetermined
Dryer
35 MBTU

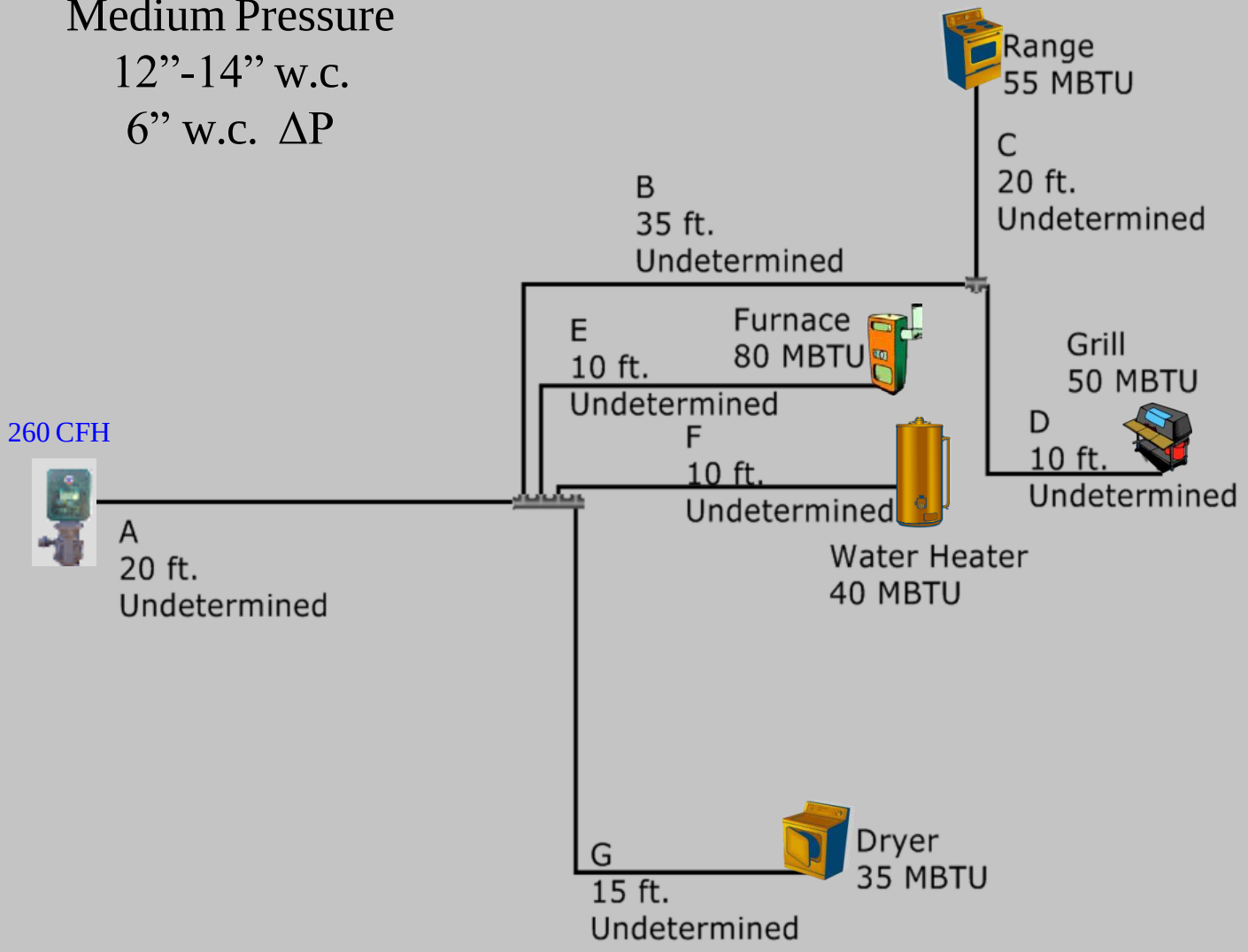
1) To size the remaining branches use the distance from the appliance to the meter and the load in the branch segment being sized



Sizing Parallel System

- **Select the sizing chart**
  - **System Pressure 12”W.C. – 14” W.C.**
    - **Pressure Drop 6” W.C.**

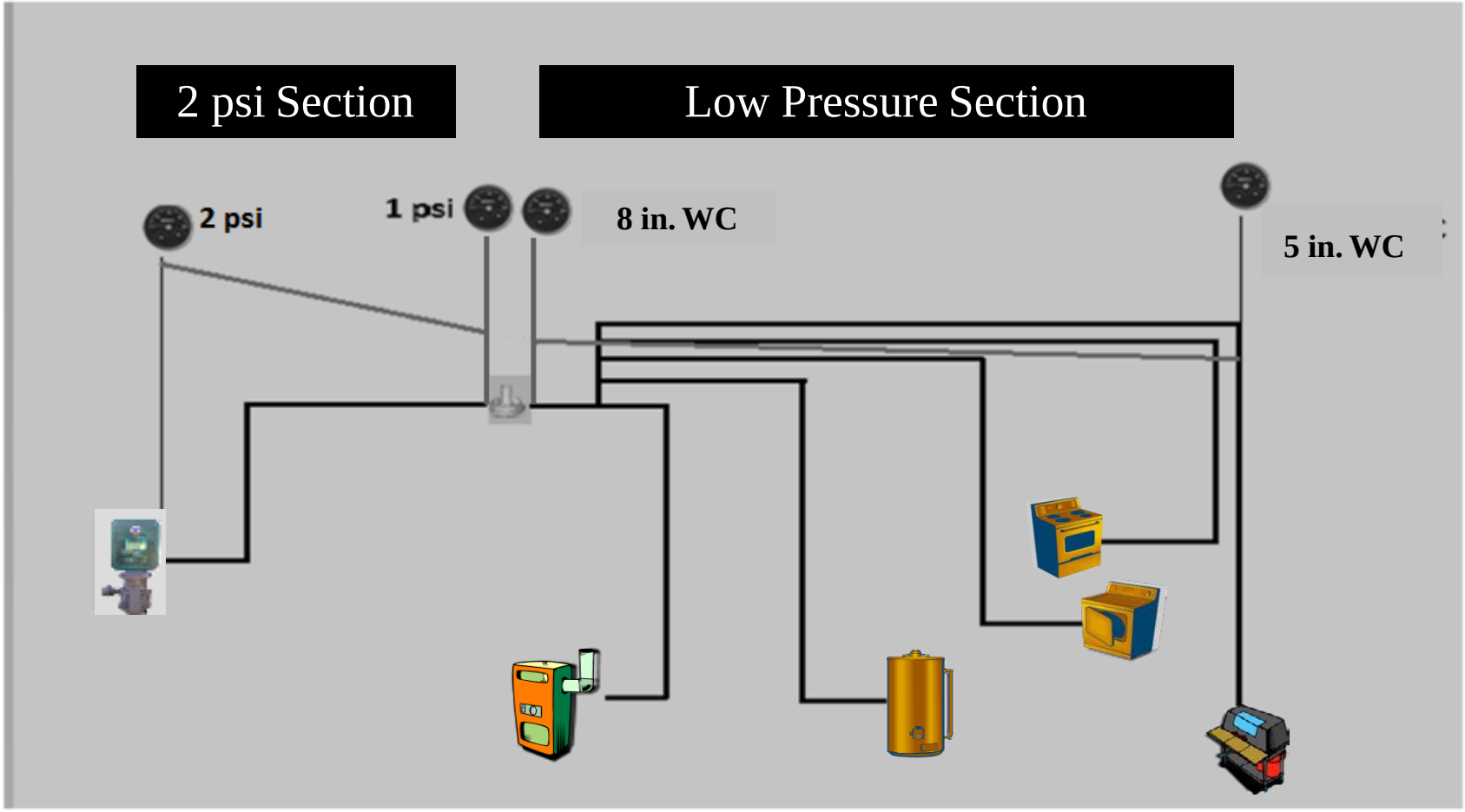
Medium Pressure
12”-14” w.c.
6” w.c. ΔP



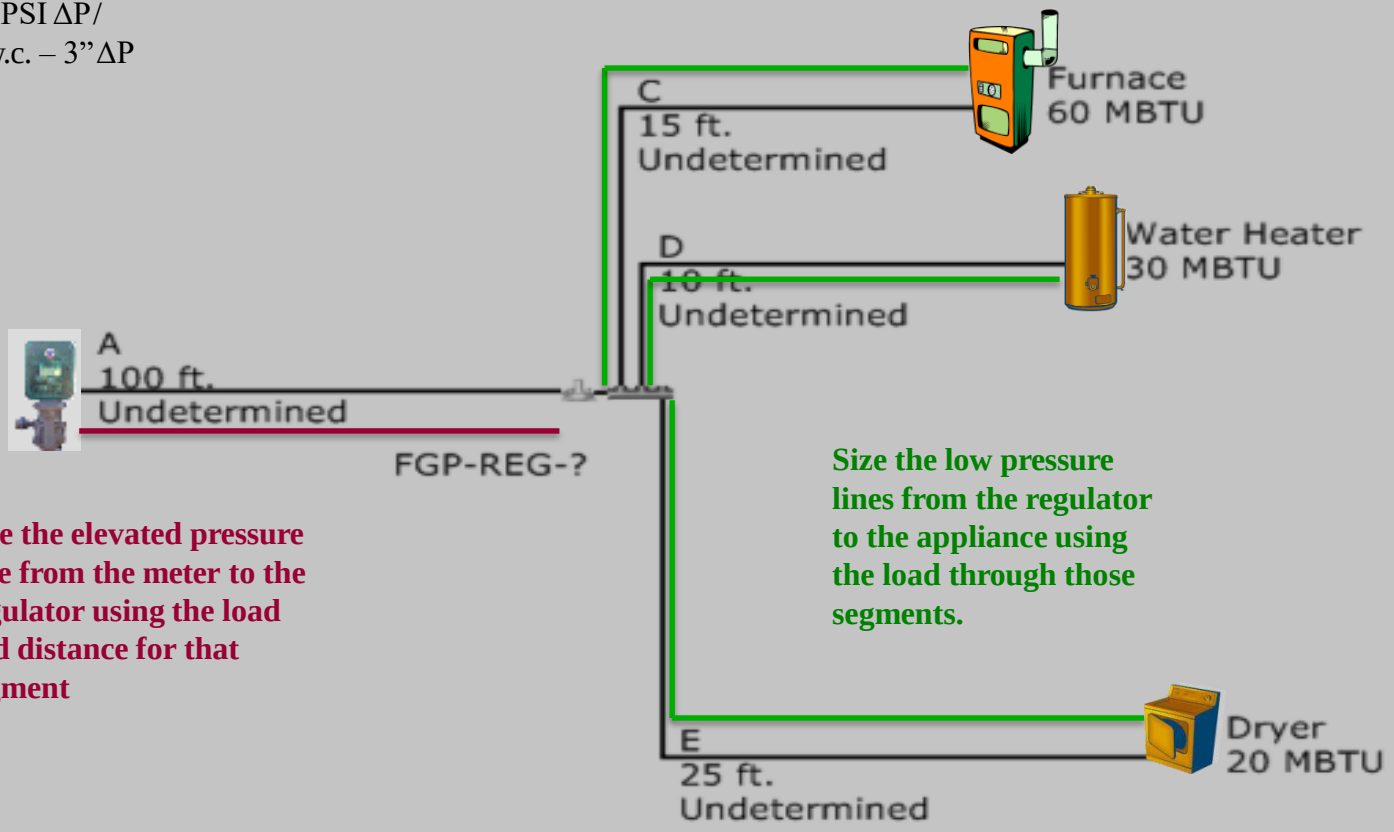
Dual Pressure System

Size 2-PSI zone separately from low pressure zone, using different tables and allowable pressure drops

Dual Pressure System
CSST



2 PSI
1 PSI ΔP/
8" w.c. – 3"ΔP



Size the elevated pressure side from the meter to the regulator using the load and distance for that segment

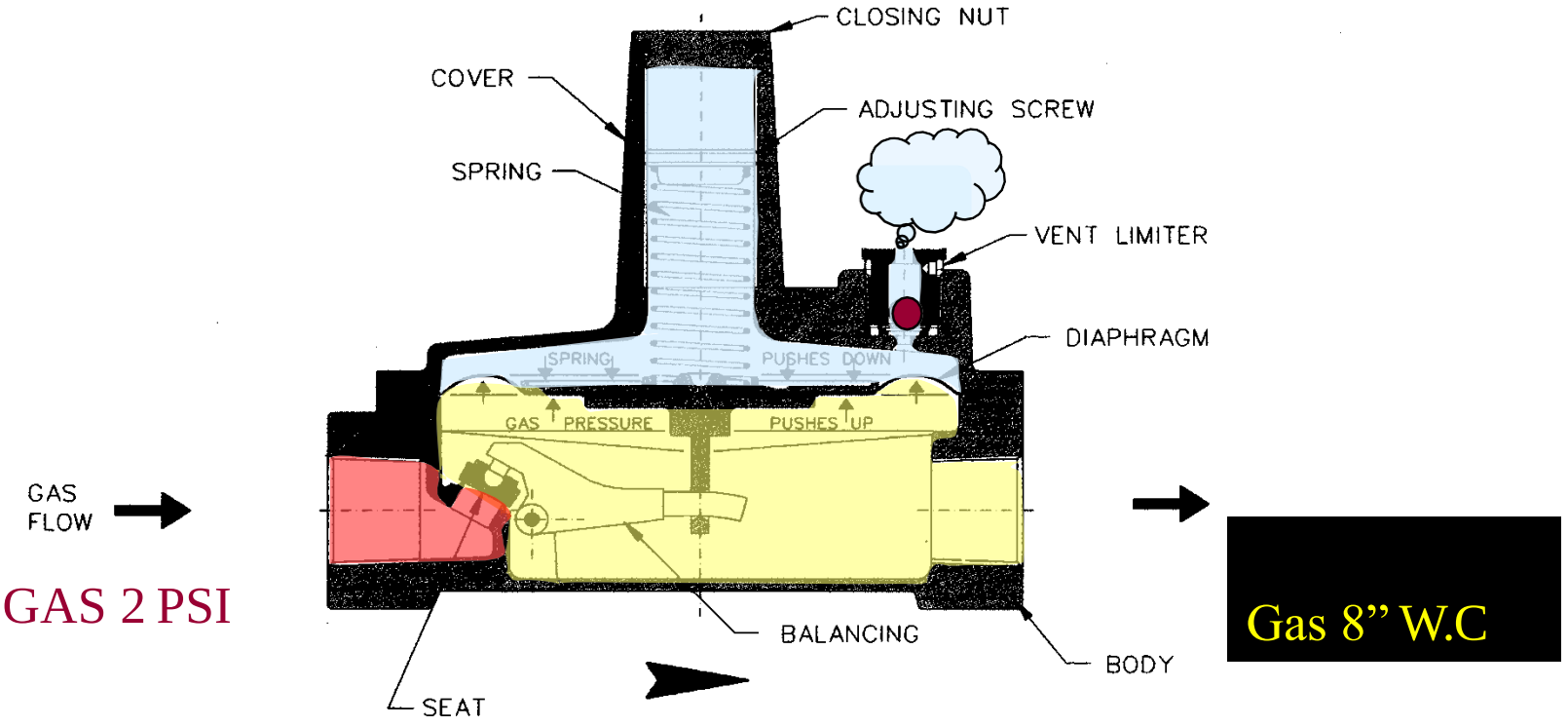
Size the low pressure lines from the regulator to the appliance using the load through those segments.

Installation Practices

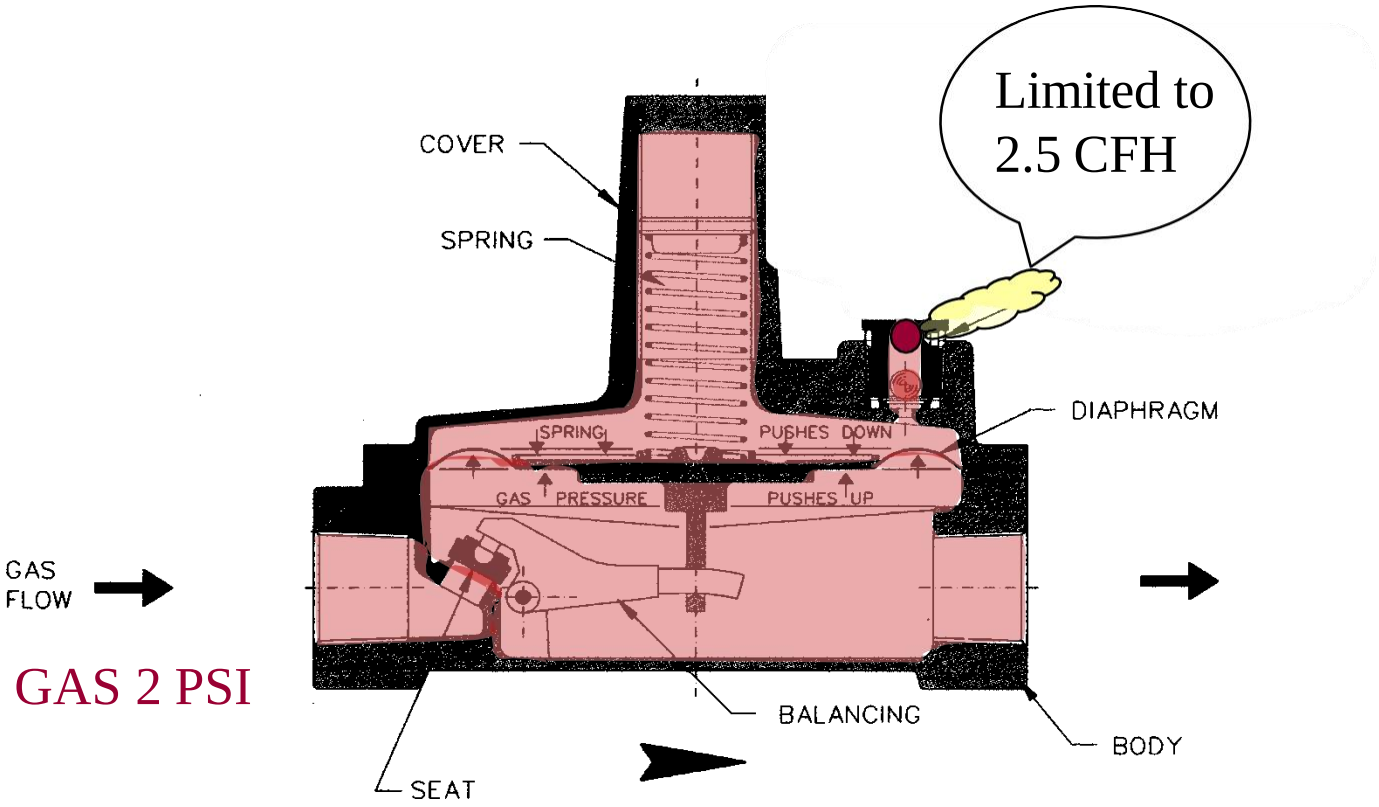
- **Pressure Regulators**
  - **Used on systems when the supply pressure exceeds ½ PSIG**
  - **Installation Requirements**
  - **Vent Limiter Option**
  - **Vent Line Sizing Requirements**
  - **Regulator Capacities and Pressure Drops**

Line Gas Pressure Regulators

Air at Atmospheric



Line Gas Pressure Regulators



Diaphragm Failure

Pietro Fiorentini LPR

Pressure Regulation

- Problem is becoming a bigger issue
  - Several design changes will fix the problem
    - Move the regulator further from the appliance
    - Install an oversized drip leg
      - Downstream of regulator
        - Acts as a reservoir
    - Pietro has a regulator design change in place

Regulators

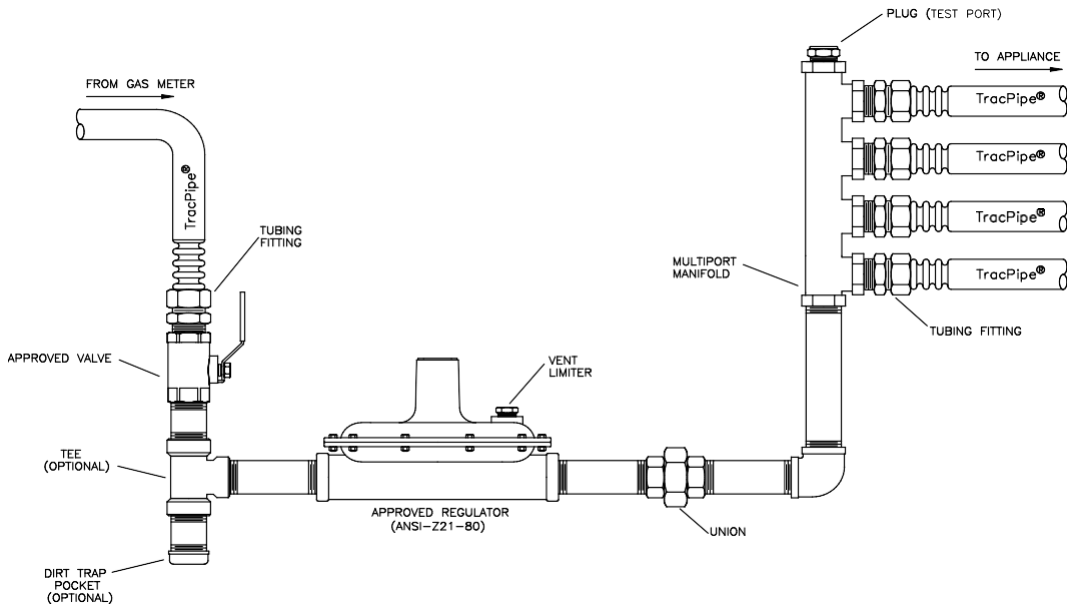
- Most frequent issue we currently deal with is not locking up
  - Start up - Open valve very slowly
    - Avoid overpressure downstream of the regulator (greater the 14”w.c.)
    - Misidentified as “regulator won’t regulate”
  - Regulator too close to the appliance
    - 10 pipe diameters is a rule of thumb
  - Exceeding single appliance load limit

Line Gas Pressure Regulator

Capacities and Pressure Drop

Regulator Capacities - CFH 0.64 Sp. Gr. Gas						
Part Number	NPT SIZE	Maximum Single Appliance Load	Outlet Pressure Set Point	Operating Inlet Pressure		
				1/2 psi (34 mbar)	3/4 psi (52 mbar)	1 psi (69 mbar)
FGP-REG-3	1/2"	140 (4.0)	8" w.c.	145	200	250
FGP-REG-5A	3/4"	300 (8.5)	8" w.c.	335	475	550
FGP-REG-7L	1-1/4"	900 (25.5)	8" w.c.	690	970	1000

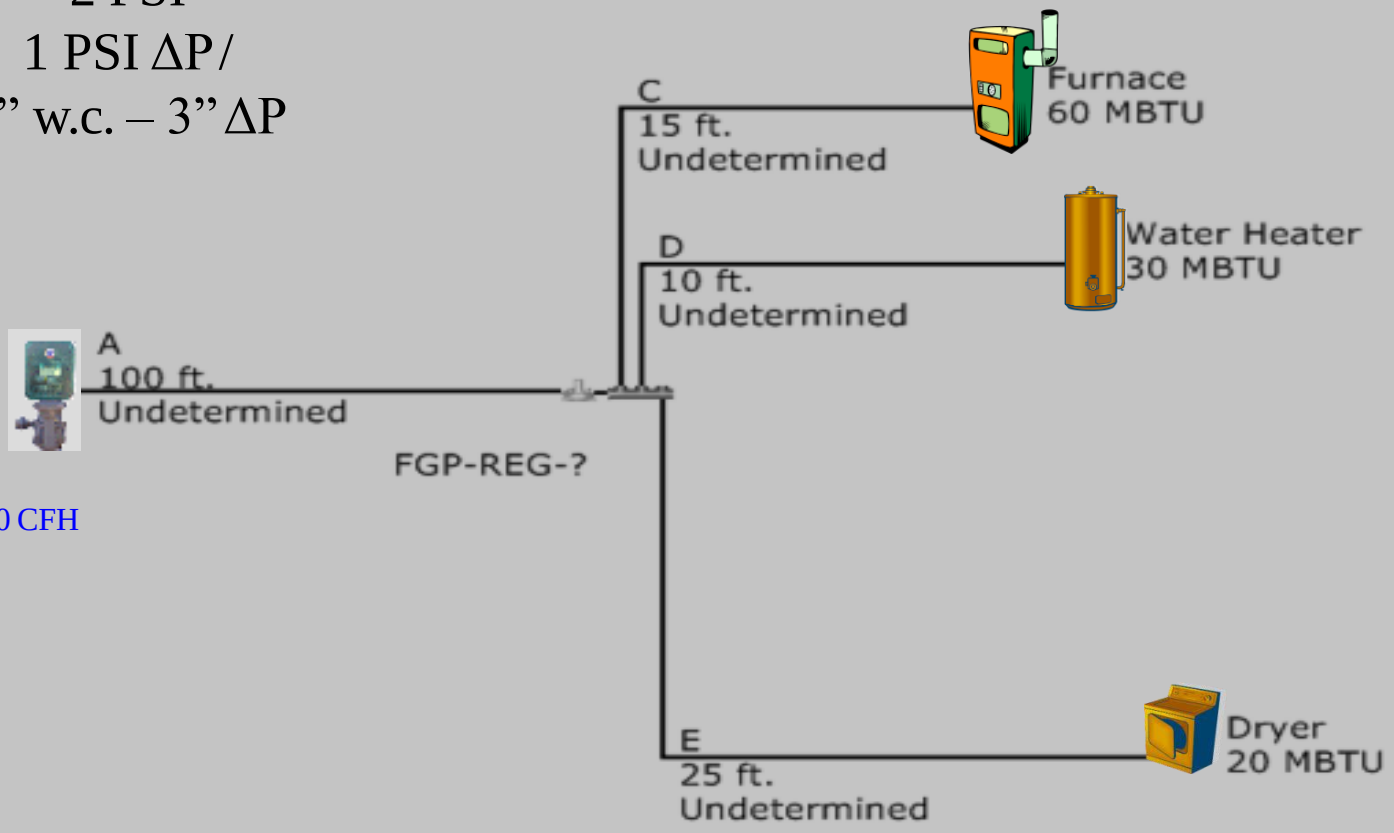
Typical Regulator/Manifold Configuration When Using a Vent Limiter Device



Sizing Dual Pressure Systems

- With two pressures two chart are needed
  - 2 PSI
    - 2 PSI with a 1 PSI Pressure Drop
  - Low Pressure
    - 8” W.C. with a 3” W.C. Pressure Drop

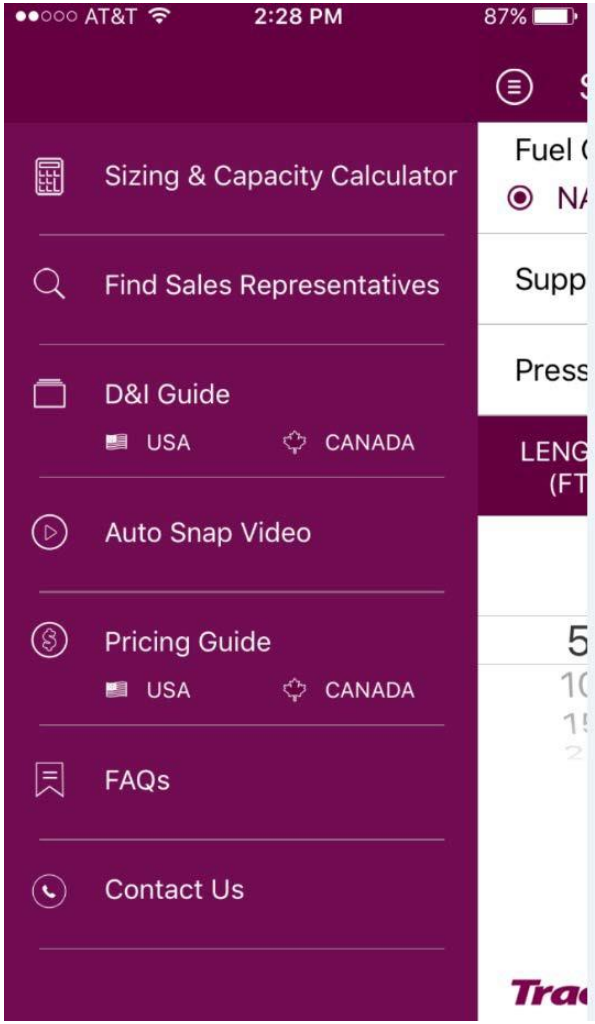
2 PSI
1 PSI ΔP /
8” w.c. – 3” ΔP



110 CFH

Sizing App

IPhone



Android

Sum of Pressure Loss (SOPL) – Method

- The SOPL method is used to determine the absolute smallest piping that may be used and still meet the requirements of the appliance(s) being served
- The system designer calculates the ACTUAL friction loss (pressure drop) in each section of pipe based on the type and diameter of pipe chosen and the gas load passing through that section

Sum of Pressure Loss (SOPL) – Method

- The individual section pressure drops are then added together from the point of delivery to each appliance to assure the total pressure drop in any path does not exceed the allowable pressure drop

Sizing Summary

"There is nothing sacred about operating gas systems at 7 in. WC.

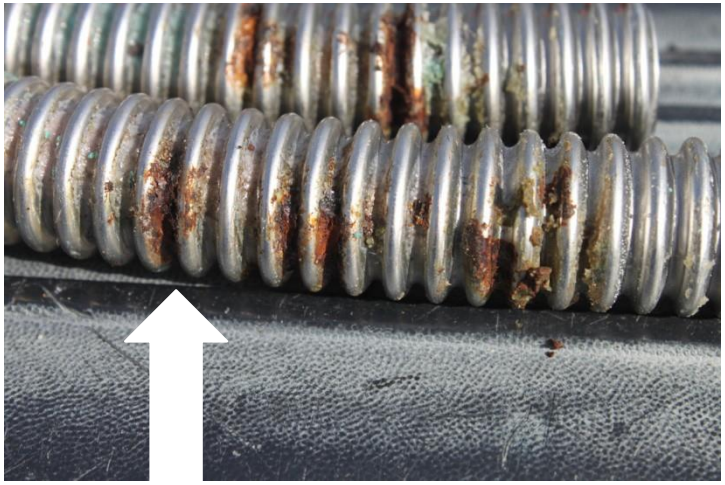
There is no redeeming value in limiting the pressure drop to 1/2 in. WC."

"We need to start using pressure drop as a tool and stop using pressure drop as a restriction."

General Installation Practices

- Operating Pressures up to 25 psi
  - Special approvals
    - 3/8” thru 1-1/4” up to 125 psi
    - 1-1/2” and 2” up to 25 psi maximum
- Only use Omegaflex parts
  - Do not mix brands of tubing and fittings
    - Differing brands of CSST systems and BIP may be combined using standard malleable couplings or tees

Avoid contact with Chlorides



❖Leak test solutions containing chlorides corrode stainless steel as well as black iron

- ♦Most common are solutions made from dish soap
- ♦Wrap tubing in corrosive environments, i.e. swimming pool mechanical rooms, with self bonding silicone tape

General Installation Practices - Cont'd

- **Support**
  - **Vertical - Every 10'**
  - **Horizontal – Every 4' , 6' , or 8' depending on the diameter of the tubing**
- **Tubing is considered to be supported wherever it goes through or over a structural member**

Tubing Support

❖**TracPipe CounterStrike shall be mounted using the same metal hangars as rigid pipe or supported by the buildings structural components**

HORIZONTAL OR INCLINED RUNS

Table: 4-2

PIPING SIZE	SPACING OF SUPPORTS
3/8 inch	4 FEET
1/2 inch	6 FEET
3/4 inch	8 FEET
1 inch	8 FEET
1-1/4 inch	8 FEET
1-1/2 inch	8 FEET
2 inch	8 FEET

Jacket Strip Length

- **The TracPipe CounterStrike Jacket strip length for AutoFlare® attachment must be limited to Table 4-3 in Section 4.2 of the D&I Guide**

Maximum Strip Length

Table 4-3

Tubing Size	Part No. FGP -	FST Fittings	Termination Type and PS-II Fittings
3/8"	375	1-1/8"	1-1/2”
1/2"	500	1-3/16"	1-1/2”
3/4"	750	1-1/4"	1-3/4"
1"	1000	1-3/8"	2”
1-1/4"	1250	1-5/8"	2-1/4"
1-1/2"	1500	1-5/8"	2-1/2"
2"	2000	2"	2-3/4”

- **AutoSnap® strip length is 3 corrugations regardless of size**

Jacket Strip Length

AutoFlare® Strip Length

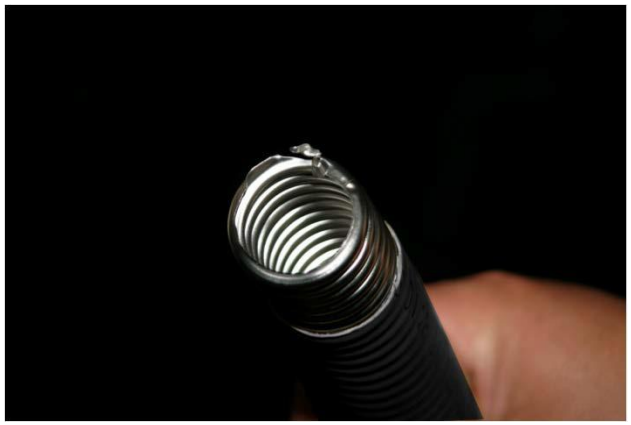
AutoSnap® Strip Length

AutoFlare® Assembly

- **Cutting the Tubing**
  - **Most critical part of making a leak tight seal**
- **Standard Tubing cutter – Sharp Wheel.**
  - **AutoFlare® Split Rings go in the valley of the first corrugation**

DO NOT USE THREAD SEALANTS ON FLARE THREADS

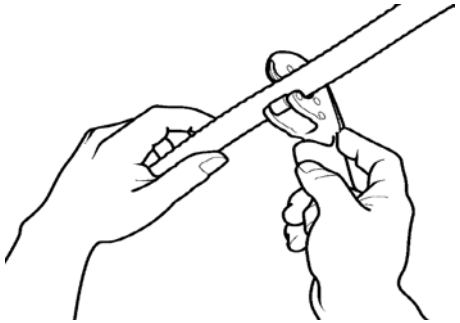
Bad Cuts = Bad Flares



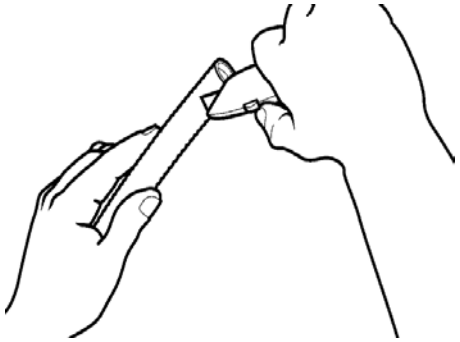
Good Cuts = Good Flare

AutoFlare® Assembly

- Cut to Length

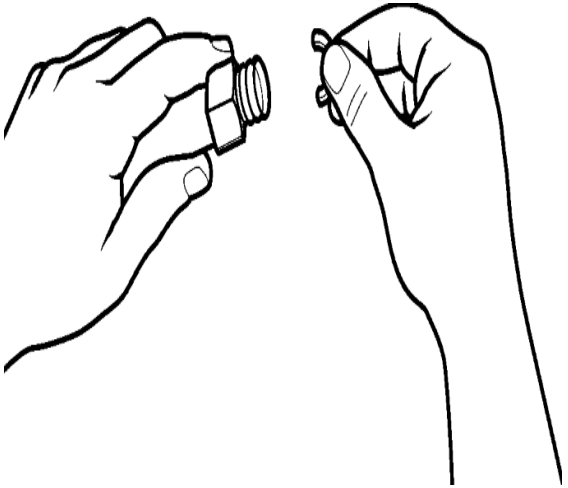


- Strip the Jacket to Specified Length
  - Do not over strip the jacket



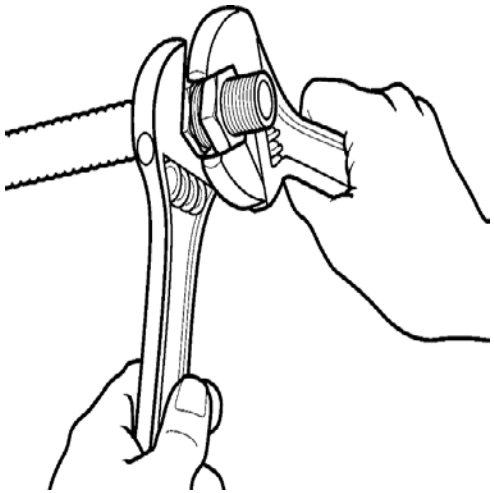
AutoFlare® Assembly

- Slide Nut Over the Tubing
- Install the Split Rings in the Valley of the First Corrugation



AutoFlare® Assembly

- Place the Adapter into the Nut
  - Engage Threads
  - The Fitting Insert (pilot) will self center
- Using Appropriate Wrenches
  - Avoid using Channel Lock Pliers
- Tighten Nut



AutoFlare® Assembly

- **Final Torque**
  - **Tighten nut and adapter as though you are making up a flared tubing joint**
  - **Note relation between the two hex flats and tighten two additional hex flats.**

- Strip the Jacket THREE Corrugations
  - Straight Fittings
- Strip the Jacket FIVE Corrugations
  - Termination Fittings
- Remove Fitting from box and loosen nut 1 to 1-1/2 turns.
  - Do Not remove nut from Body

- Hold the tubing straight and insert it into the back of the fitting.
- Push the tubing to firmly seat it into the fitting. (Snap)
- <u>While holding the tubing straight</u> begin hand tightening the nut
  - ***<u>A gradual resistance to tightening should be felt.</u>***
    - If a full stop is felt DO NOT CONTINUE TO TIGHTEN
      - Loosen the nut ¼ turn, move the tubing around and continue to hand tighten.

- **Finish by tightening the nut with an Adjustable End Wrench**
  - **When fully tightened 1 to 1-1/2 threads will be visible**

AutoSnap®

Snap-on Fitting for TracPipe® CounterStrike®

General Installation Practices- cont'd.

- **Trouble Shooting the fittings**
  - **The tubing cut is the most critical step. Take a little time.**
  - **If the flare appears to be good, and the fitting leaks – replace the split rings, or the entire fitting.**

Routing Tubing

Beneath Floor Joists

Over Ceiling Joists/

Through Floor Joists

Along Side of Floor Joists

Routing Tubing

Striker Plates and Floppy Installed

Inside Hollow Wall Cavities

Through approved conduit underground or under-slab

PS II

Concealed Fittings

- **AutoFlare® and AutoSnap® fittings are ALL listed for concealed locations**
  - **Do not conceal fitting at manifolds with a regulator**
  - **TracPipe CounterStrike can be used in conjunction with black iron pipe and components**

Outdoor Installation Issues

- Jacket must remain intact.
- Wrap Tubing and fitting in corrosive environments i.e. Swimming pool mechanical rooms
- Along the side of a structure and under 6’ – Protect the tubing
- Do not direct bury TracPipe. – Use TracPipe PS-II
  - If you sleeve it yourself use non-metallic, water tight conduit
- Crawl Spaces and Under Mobile Homes are considered to be outdoors
  - Tubing must not be in direct contact with the ground
- Wrap exposed Stainless Steel and fittings with self bonding silicone tape

Protection from Puncture Threat

❖**PROTECTION IS REQUIRED WHENEVER THE TUBING IS CONCEALED, RESTRAINED, AND WITHIN 3 INCHES OF A POTENTIAL THREAT**

- **Eliminate one of the above restrictions and protection is no longer required**

❖**Only approved CSA protection methods may be used**

- **Approved Hardened Striker Plates**
- **Black Iron Pipe Sleeve**

Protection cont'd

❖**Some examples of areas requiring protection when tubing is concealed:**

- **Penetrations of top and bottom plates (2x4 framing)**
  - **Top plates - use ¾ Striker Plate**
  - **Bottom plates - use ½ Striker Plate**

Protection cont'd

- **Where tubing runs horizontally through the studs**
  - **Use ¼ Striker plate at each stud and encase the entire horizontal run in floppy conduit**

Protection cont'd

- **Multiple tubing runs may be protected by a single plate**

- **Where the tubing is restrained by a termination fitting**
  - **Use floppy conduit**

Protection cont'd

- Tubing runs may be installed in insulated exterior walls. For bat type insulation the tubing may be placed within or in front of the insulation facing sheet. Tubing restrained by rigid foam type insulation shall be protected along the entire concealed and restrained run using floppy conduit provided the tubing is also within 3 inches of a potential threat

  - Alternatively rigid piping may be used for the portion of the run located within the wall cavity

Protection cont'd

- The best protection is to install the tubing in areas that do not require it to be protected

Protection cont'd

- Conversions from CounterStrike to other piping materials can be made using standard NPT fittings

Special Considerations

- TracPipe CounterStrike meets ASTM E84 Flame Spread and Smoke rate standards
  - Black Pre-Sleeved TracPipe PS-II for underground does not meet ASTM E84
- All TracPipe is UV resistant
- For through penetrations refer to UL Classifications in the D & I Guide Appendix

Meter Connections

- TracPipe CounterStrike may not be used connected directly to the meter unless an independent meter bracket is used
- A PVC sleeve is required for masonry wall penetrations and recommended for wood frame wall penetrations
- Use the TracPipe Meter Termination fitting

Installation Practices

- **Appliance Connections**
  - **Moveable Appliances**
    - **Use Flange Mounts or Termination fittings**
  - **Fixed Appliances**
    - **Can be connected directly to the piping system**

Installation Practices

- Pad mounted equipment shall be connected using a listed appliance connector or rigid piping.
  - Some generators include specified connectors
- Direct connection of TracPipe CounterStrike to pad mounted equipment is permitted when the CSST is securely supported and located where it will be protected from physical damage.
  - Exposed Stainless Steel shall be wrapped with self bonding silicone tape sealing the fitting connection

Installation Practices
Roof Top

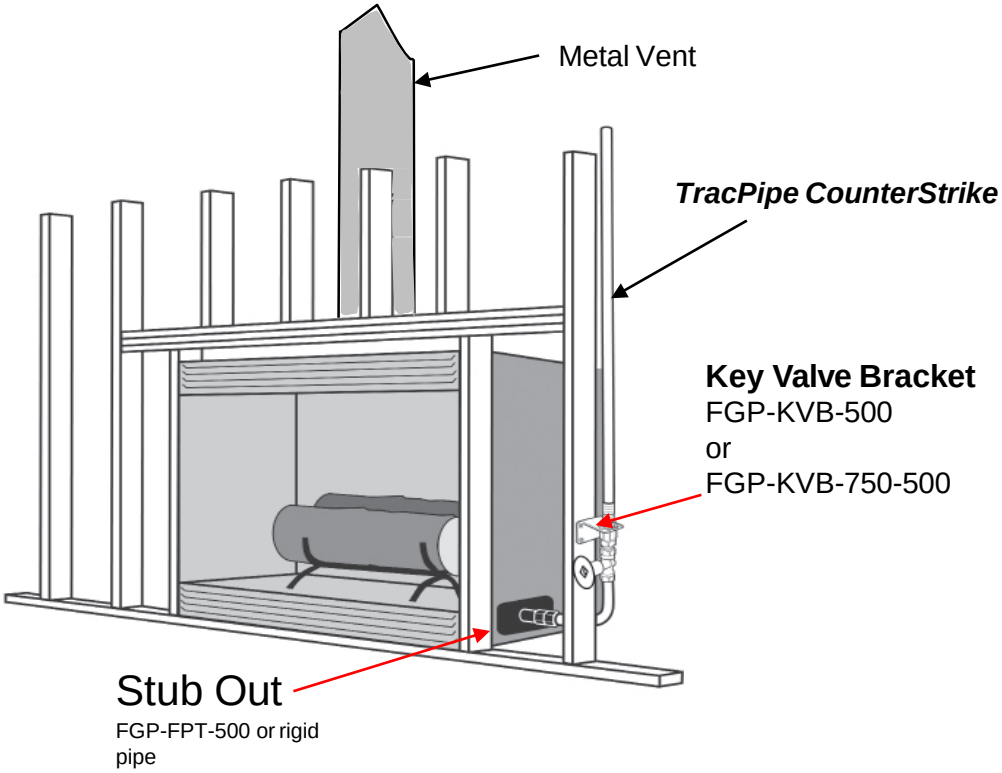
- No special requirements for roof top equipment
  - Tubing may be run completely on the roof if desired
- Long runs of tubing shall be supported with non-metallic blocks at the appropriate support intervals
- TracPipe CounterStrike may be supported with strut/channel from block to block
  - Support may be reduced to 8 ft. intervals
  - Black cable ties at intermediate points facilitate rolling out the CSST

Outdoor Appliances

- **Exposed Stainless Steel shall be wrapped with self bonding silicone tape sealing the fitting connection**

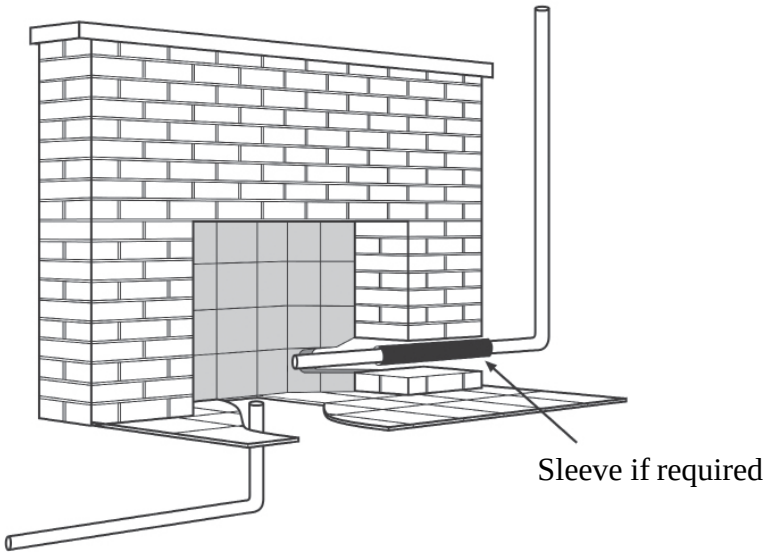
Fireplaces

- ***TracPipe® CounterStrike®* shall not be directly routed into a metallic gas appliance enclosure utilizing a metallic vent which penetrates a roofline**



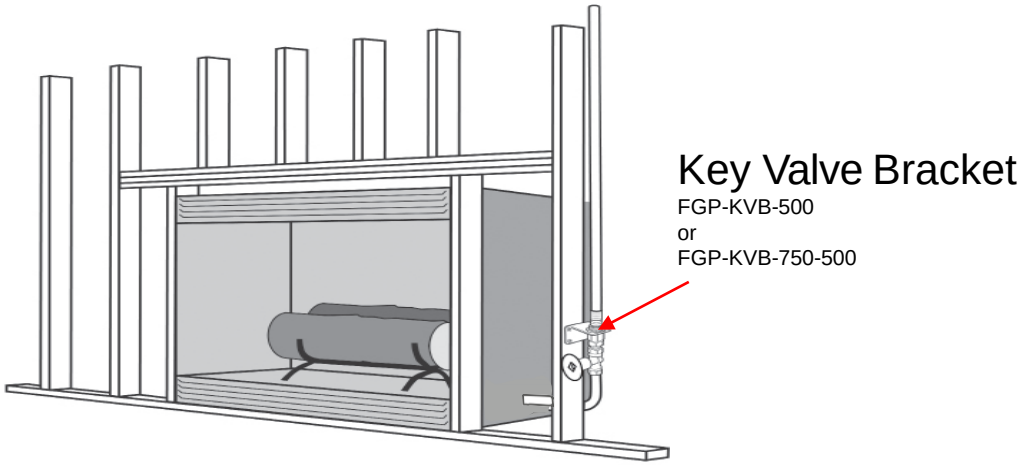
Fireplaces Cont'd

- ***TracPipe® CounterStrike®*** **may be used to deliver gas directly to the gas logs used in masonry fireplaces and prefabricated fireplace inserts with non-metallic venting. Remove the jacket from tubing that is installed within the firebox.**



Fireplaces cont'd

- ***TracPipe® CounterStrike®* connections to approved unvented appliances and sidewall vented fireplaces may be made to the shutoff valve located in the control area beneath the burner unit without removal of the polyethylene jacket.**



Manifolds and Regulator Stations

- Manifolds are used for parallel arrangements
- Nipples and Tees may be used as a manifold
  - Size system for additional pressure drop
- The manifold station must be accessible if a regulator is being used at the location
  - Optional shut-off valves may be used on individual appliance runs
    - Full port valves

Regulators and Elevated Pressure Systems

- Regulators are required on systems over ½ psi
- The regulator must be equipped with a vent limiter or be vented outside
  - The vent line cannot exceed 30' *
- Mount regulator upright if vent limiter is used
- The regulator must be fully accessible
- Systems over 2 psi require over-pressure protection

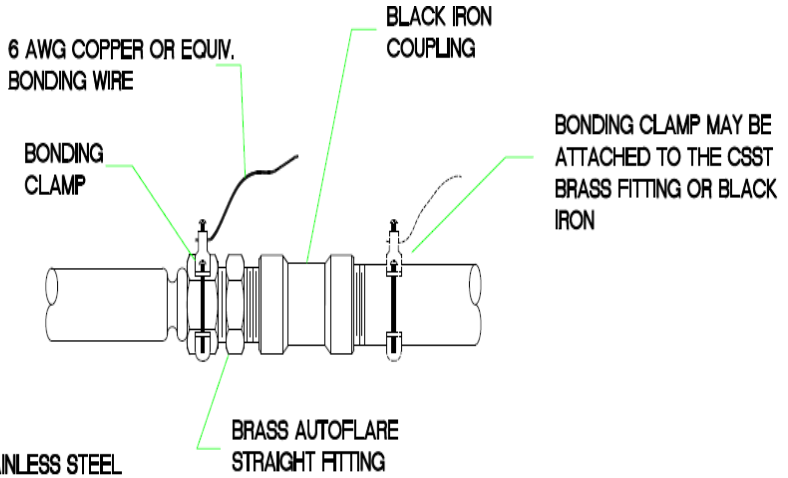
* For vents over 30' contact TracPipe Engineering

TracPipe CounterStrike
Electrical Bonding / Grounding

- The piping system is not a grounding conductor
- Bonding is required by NEC
  - NEC recognizes third wire bond as adequate
- TracPipe Counterstrike Bonding requirements are per NEC/NFPA 70. Third wire equipment bond is acceptable if approved by the local code authority
- More Restrictive Local Requirements May Apply

TracPipe® or Other CSST Electrical Bonding / Grounding

- Not a grounding conductor
- Bonding clamp attachment
  - NEC ANSI/NFPA-70
- Additional bonding is required
  - Size of bonding wire 6 AWG min. and/or per NEC 250.66
- More restrictive local requirements may apply
- Bonding may be required to be done by a licensed electrician
- Provide additional bonding on any system that uses standard CSST
- TracPipe <u>STRONGLY</u> recommends *Equipotential Bonding of all conductive systems*



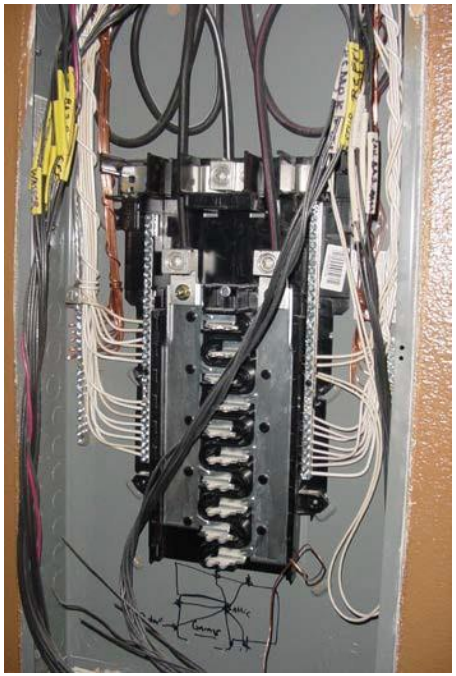
NOTE: THE CORRUGATED STAINLESS STEEL PORTION OF THE GAS PIPING SYSTEM SHALL NOT BE USED AS THE BONDING ATTACHMENT POINT UNDER ANY CIRCUMSTANCES.

TracPipe® or Other CSST Electrical Bonding / Grounding

- **Install the listed bonding clamp to the gas piping system**
  - **2015 Codes allow for the bonding attachment point to be located at any location on the gas piping system**

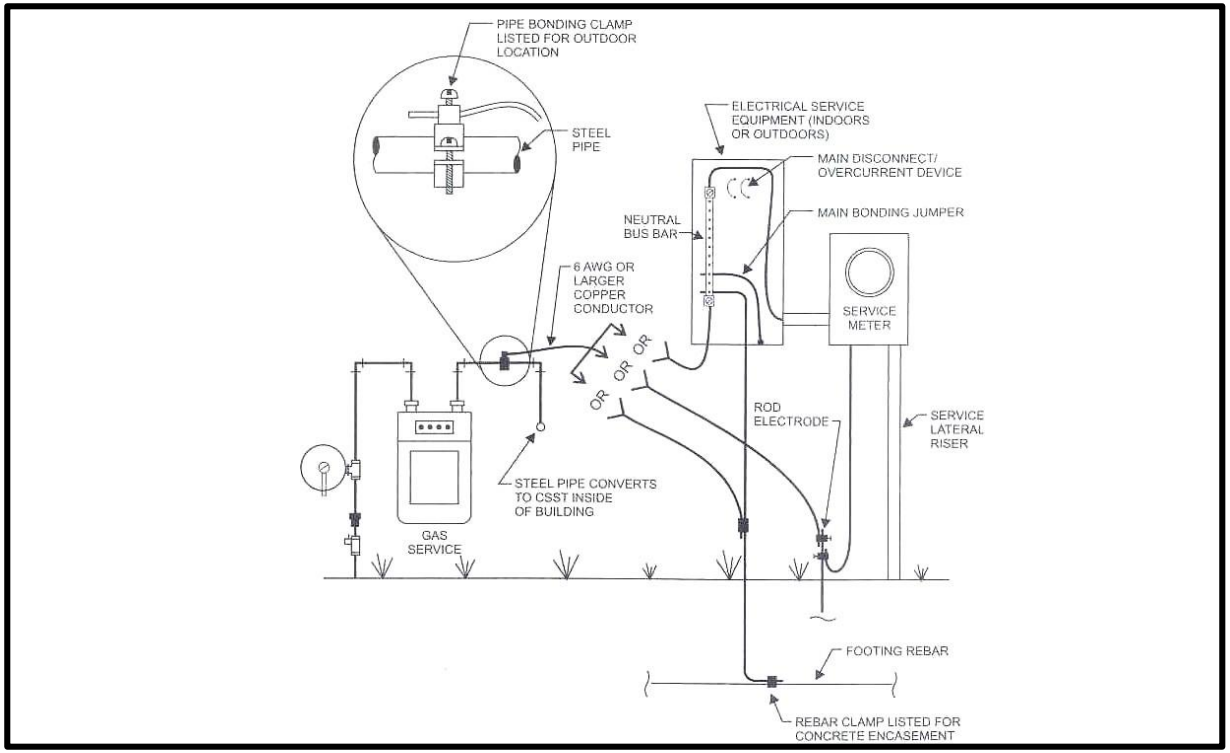
TracPipe® or Other CSST Electrical Bonding / Grounding

❖**Route a 6AWG copper wire attached to the bonding clamp to an area in close proximity to the electrical service panel or other approved bonding location**



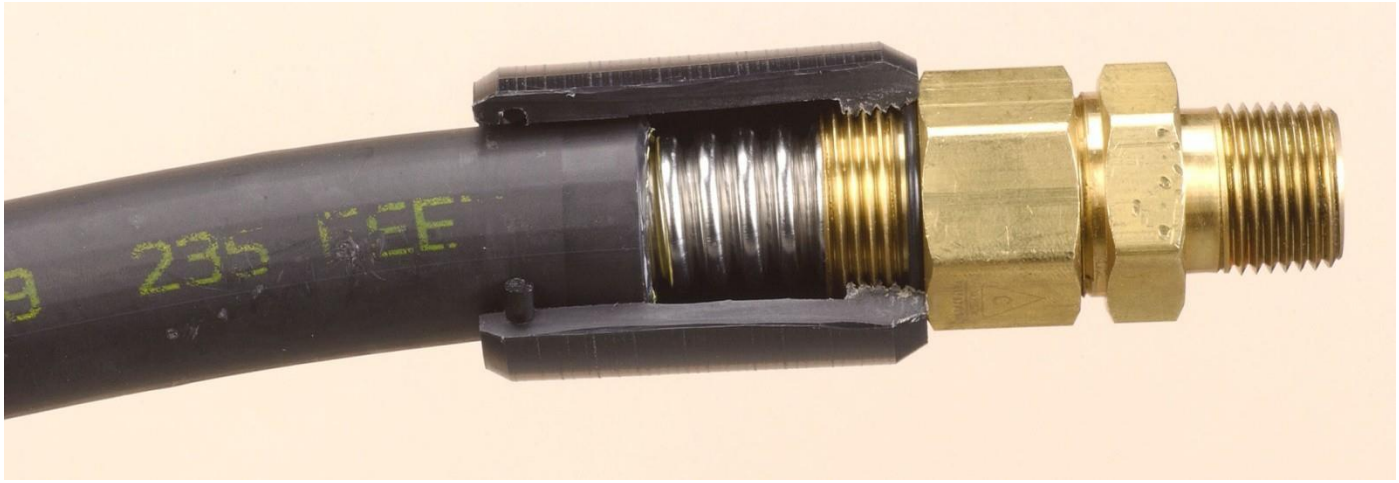
TracPipe® or Other CSST Electrical Bonding / Grounding

- Make the final connection to the grounding electrode system at an approved location



Underground Installations

- **General Code Requirements:**
  - **When gas piping is installed in contact with the earth it must be protected from possible corrosion**
- **Piping Through Foundation Wall**
  - **Shall be encased in a protective sleeve**
    - **TracPipe PS-II meets the requirement**

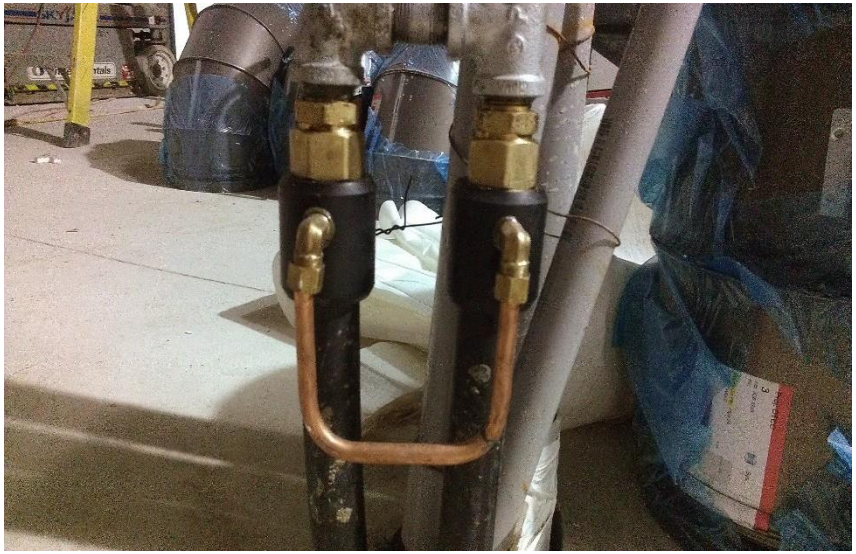


Underground Installations

- **Conduit with <u>One End</u> Terminating Outdoors**
  - **Interior end of piping shall extend into accessible portion of the building**
  - **Shall extend min. 4” outside of the building and be vented above finished ground level**

- **Conduit with <u>Both Ends</u> Terminating Indoors**
  - **Conduit shall Terminate in accessible Locations**
  - **Neither End Shall be Sealed**
    - **Leave <u>Both</u> Vent Plugs out of TracPipe PS-II**

Vent per local Code Requirements



Underground Installations

- TracPipe PS-II meets underground requirements
  - IAPMO Listing
  - ICC PMG Listing
- Burial depth, cover requirements and superimposed loading for TracPipe PS-II are covered
- Burial depth, cover requirements and superimposed loads for other systems are covered in the national codes

Inspection

- **Minimum inspection requirements**
  - **Located in Section 5.1 of the D&I Guide**
- **Repair/Replacement of damaged tubing**
  - **Required where the tubing is significantly damaged**
  - **Crushed or dented more than 1/3rd of its original diameter**

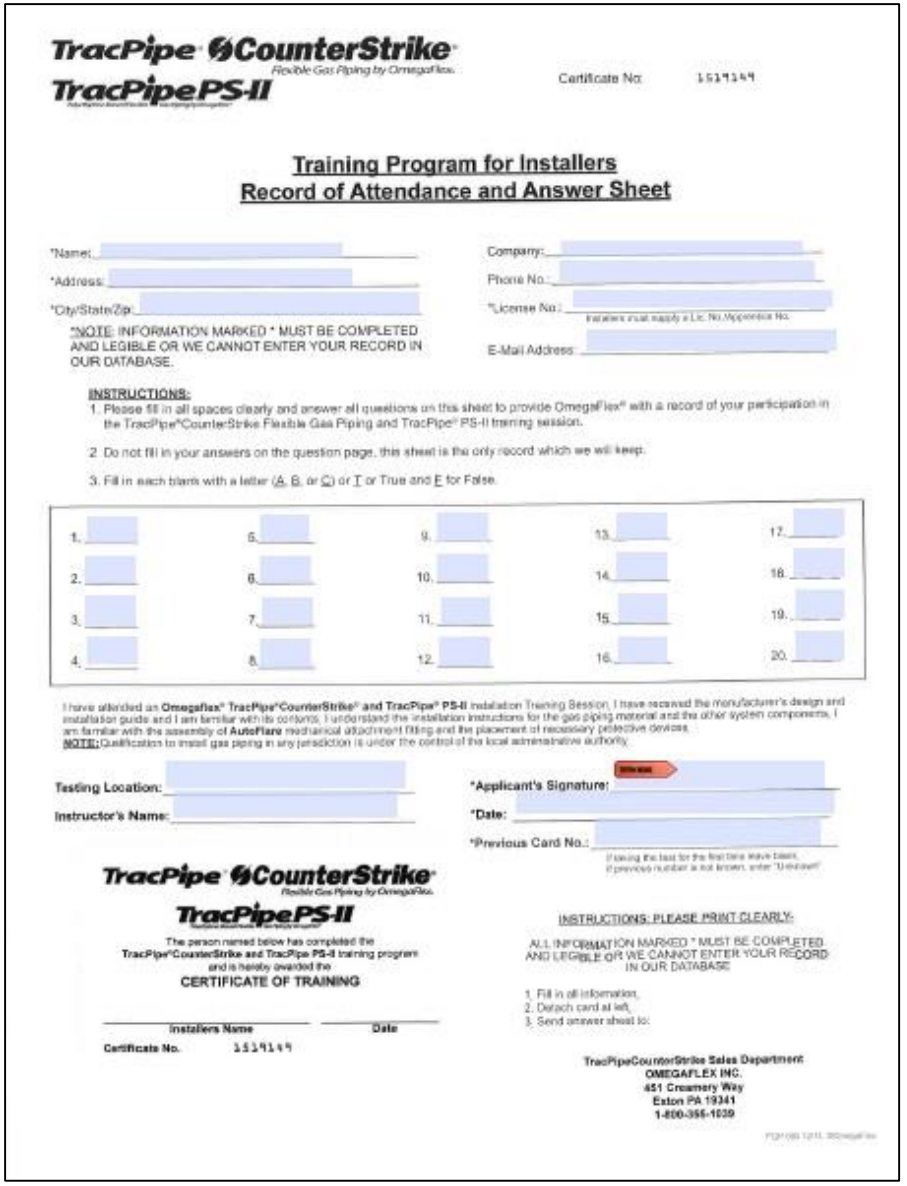
Inspection

- **Pressure/Leakage testing**
  - **Performed during rough construction**
  - **Pressure test procedures with and without regulators**
    - **Isolate the regulator from the test pressure**
    - **Remove the regulator and test through a jumper**
  - **Local code authority determines pressure test requirement**
  - **Do not use leak test solutions which contain chlorides - Only use solutions labeled non-corrosive**
    - **Leak testing is only required to locate a leak if the pressure test indicates a leak is present**
    - **Thoroughly rinse and dry any areas exposed to a leak test solution**

Mark your answer sheet as an original or retest

Provide original Cert. No.

Fill in all highlighted areas <u>LEGIBLY</u>



TracPipe® CounterStrike®
Flexible Gas Piping by OmegaFlex®
TracPipe PS-II

Certificate No: 1519149

Training Program for Installers
Record of Attendance and Answer Sheet

*Name:
*Address:
*City/State/Zip:
*NOTE: INFORMATION MARKED * MUST BE COMPLETED AND LEGIBLE OR WE CANNOT ENTER YOUR RECORD IN OUR DATABASE.

Company:
Phone No.:
*License No.:
Installers must supply a Lic. No./Apprentice No.
E-Mail Address:

INSTRUCTIONS:
1. Please fill in all spaces clearly and answer all questions on this sheet to provide OmegaFlex® with a record of your participation in the TracPipe® CounterStrike Flexible Gas Piping and TracPipe® PS-II training session.
2. Do not fill in your answers on the question page, this sheet is the only record which we will keep.
3. Fill in each blank with a letter (A, B, or C) or T or True and F for False.

1.	5.	9.	13.	17.
2.	6.	10.	14.	18.
3.	7.	11.	15.	19.
4.	8.	12.	16.	20.

I have attended an **Omegaflex® TracPipe® CounterStrike® and TracPipe® PS-II** installation Training Session, I have received the manufacturer's design and installation guide and I am familiar with its contents. I understand the installation instructions for the gas piping material and the other system components. I am familiar with the assembly of **AutoFlare** mechanical attachment fitting and the placement of necessary protective devices.
NOTE: Qualification to install gas piping in any jurisdiction is under the control of the local administrative authority.

Testing Location:
Instructor's Name:
*Applicant's Signature:
*Date:
*Previous Card No.:
If having the test for the first time leave blank. If previous number is not known, enter "Unknown"

TracPipe® CounterStrike®
Flexible Gas Piping by OmegaFlex®
TracPipe PS-II

The person named below has completed the TracPipe® CounterStrike and TracPipe PS-II training program and is hereby awarded the
CERTIFICATE OF TRAINING

Installers Name _____ Date _____
Certificate No. 1519149

INSTRUCTIONS: PLEASE PRINT CLEARLY:

ALL INFORMATION MARKED * MUST BE COMPLETED AND LEGIBLE OR WE CANNOT ENTER YOUR RECORD IN OUR DATABASE

1. Fill in all information.
2. Detach card at left.
3. Send answer sheet to:

TracPipeCounterStrike Sales Department
OMEGAFLEX INC.
451 Creamery Way
Exton PA 19341
1-800-355-1039

❖Q & A