

WESTBURY FIRE DEPARTMENT

PROBATIONARY DRILL



FIRE HOSE & APPLIANCES

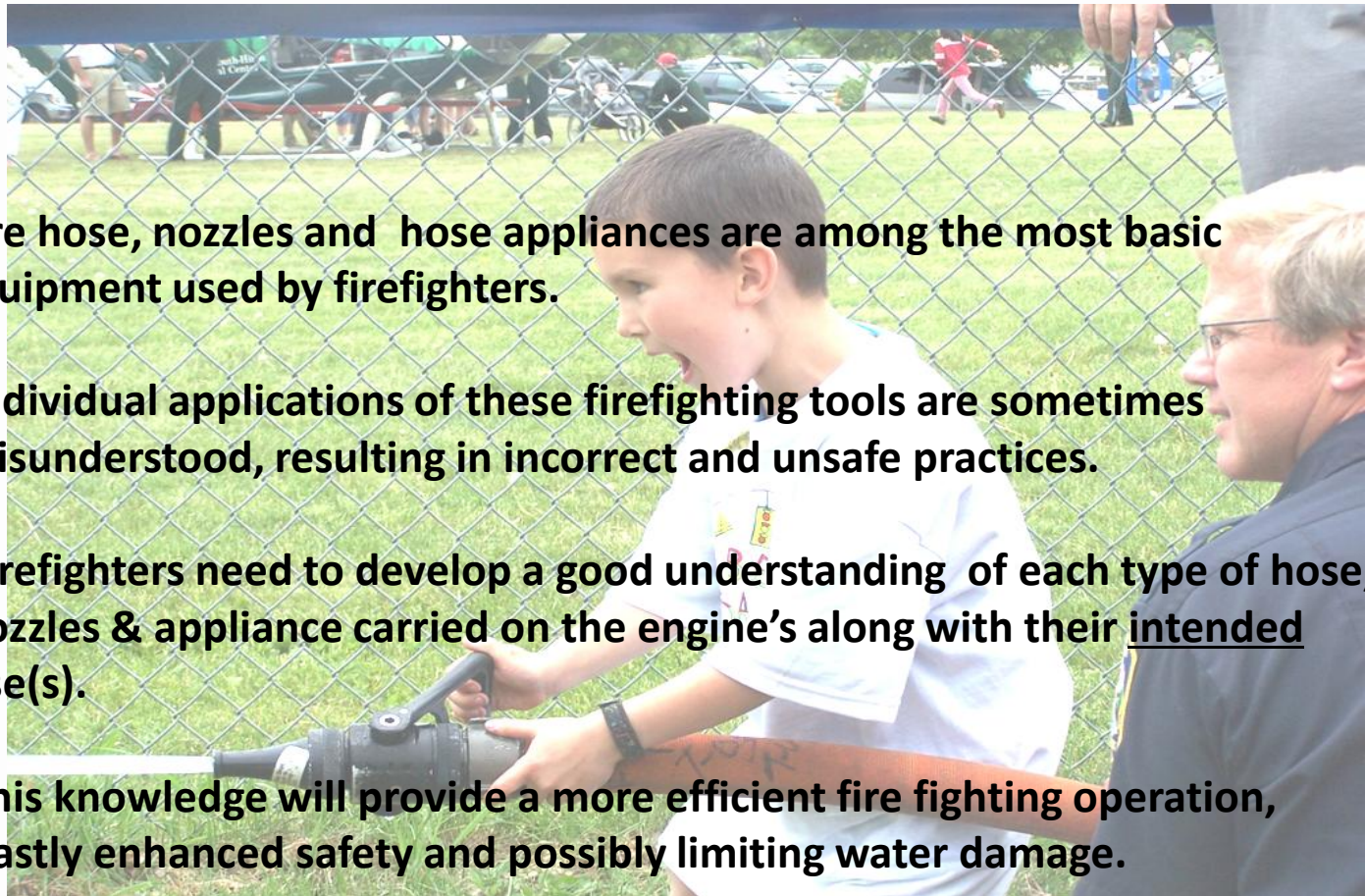
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FIRE HOSE & APPLIANCES

- Fire hose, nozzles and hose appliances are among the most basic equipment used by firefighters.
- Individual applications of these firefighting tools are sometimes misunderstood, resulting in incorrect and unsafe practices.
- Firefighters need to develop a good understanding of each type of hose, nozzles & appliance carried on the engine's along with their intended use(s).
- This knowledge will provide a more efficient fire fighting operation, vastly enhanced safety and possibly limiting water damage.



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The Engine Companies Responsibility is to:

1. Get a **Water Supplied** to the Engine
2. Get **Water** from that Engine to the Fire



We Accomplish this through the use of Fire Hose & Appliances

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Fire hose - is identified and placed in four categories.

- a) Attack hose – Any hose that is used to directly control and extinguish fire. (your *Basic Fire Fighting hose*)
- b) Relay-supply hose – Designed to move large volumes of water at low pressure, < 100 psi. (*Our typical 5" hose*)
- c) Intake hose – Connects pumpers or a portable pump to a nearby water source. (*Hard Suction – used in drafting -“suction”*)
- d) Extinguisher hose – Used on large extinguisher units, that may be stationary, wheeled, or mounted on a vehicle. (*Booster Line*)



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The four classifications of hose is based on their method of construction.

- a) Woven jacket (everyday jacketed hose)
- b) Rubber covered (our 5" hose)
- c) Braided (booster hose)
- d) Wrapped (Hard Suction)



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The three basic types of *hose couplings*.

- a) Threaded couplings.
- b) Sexless couplings. (Storz type)
- c) Snap couplings



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The most commonly used Hose Appliance is the **Nozzle**

Types of nozzles:

- a) Solid stream.
- b) Fog stream.
- c) Broken stream.
- d) Master Stream.



Operating pressures 50 - 80 lbs – *Solid stream nozzles*
100 lbs – *Fog Stream nozzles*

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Major components of nozzles:

- Nozzle **control valves** : such as ball, slide, and rotary control valves.
- Tips** such as fog, smoothbore or special purpose.
- Play pipe** usually with double handles and tapered.
- Stream sharpeners** improve laminar flow to nozzle tip.
- Accessories** such as pistol grips and large double handles.
- Gallon adjustment** with some fog nozzles



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Components of nozzles:

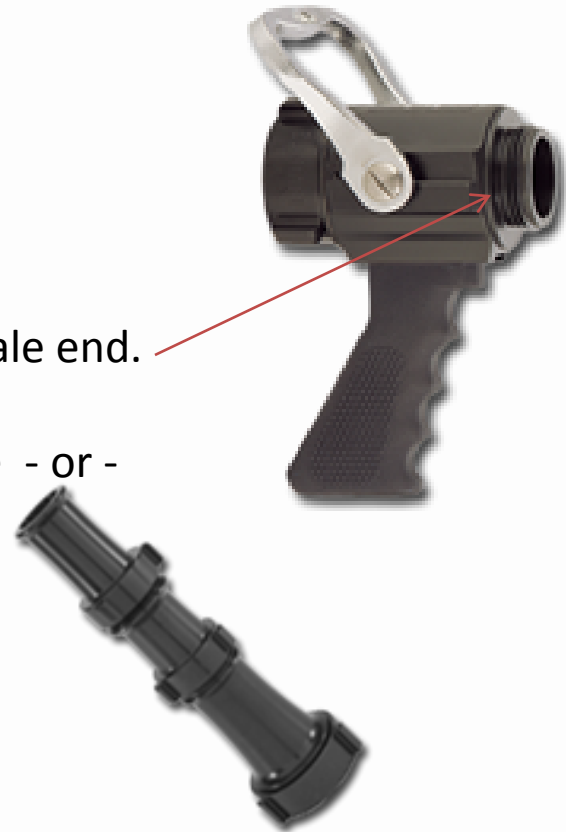
Note:

2.5" Nozzle when the tips are removed

– has 1.5" male end.

This can be used to reduce line to 1.75" line - or -
be a Gate to control water flow.

*Usually done when reducing the 2.5"
attack line to a 1.75" line to do overhaul.*



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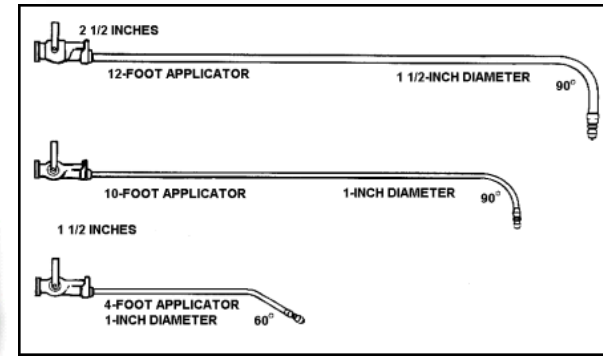
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Special Purpose Nozzles:

- a) Cellar nozzles.
- b) Water curtain nozzles.
- c) Piercing nozzles.
- d) Chimney nozzles.
- e) Low velocity Fog nozzles.
- f) High-pressure Fog nozzles.



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Nozzle Streams:

Broken

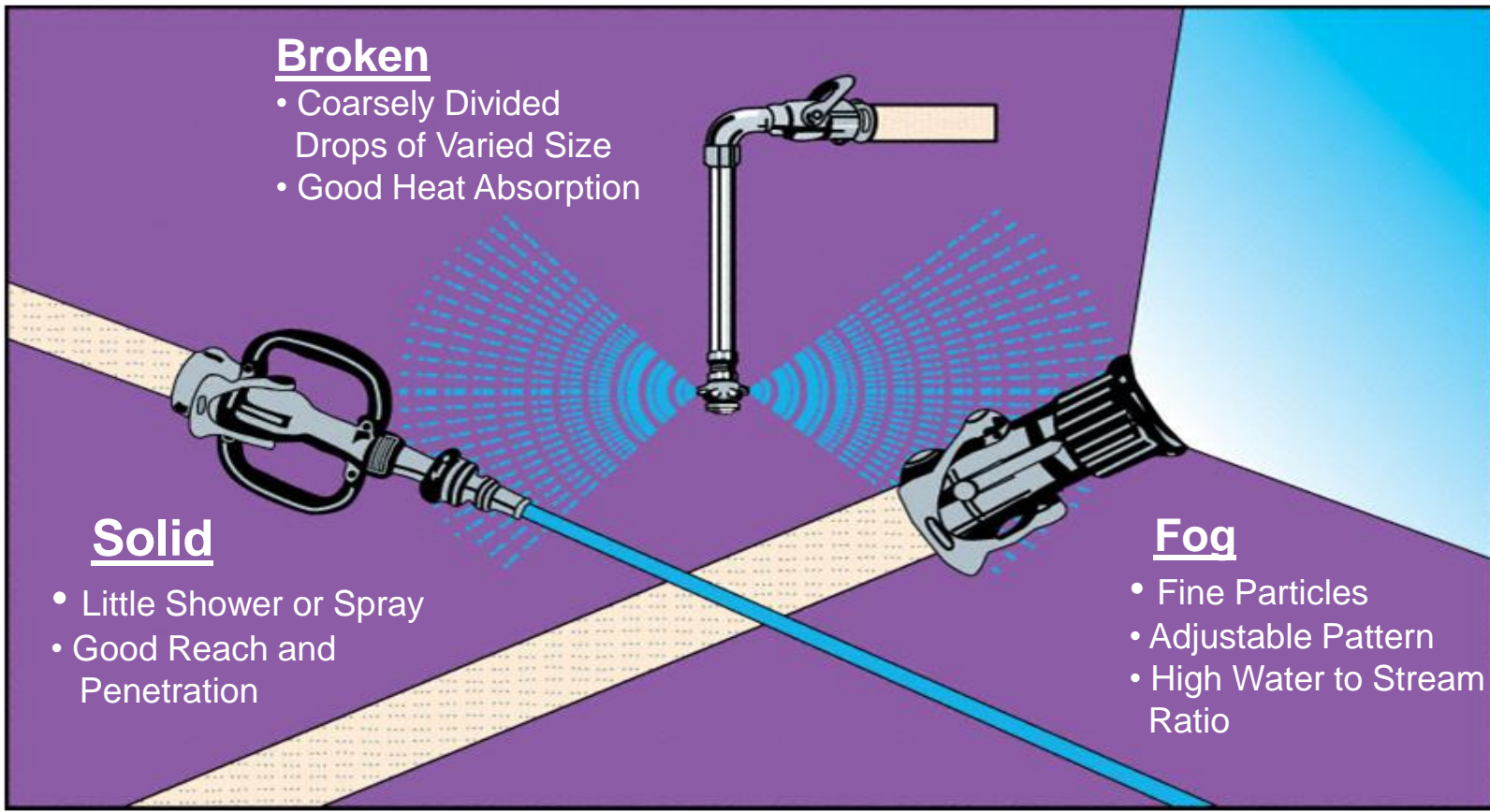
- Coarsely Divided Drops of Varied Size
- Good Heat Absorption

Solid

- Little Shower or Spray
- Good Reach and Penetration

Fog

- Fine Particles
- Adjustable Pattern
- High Water to Stream Ratio



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Fog Nozzle Streams:



Straight Stream



Narrow Fog



Wide Fog

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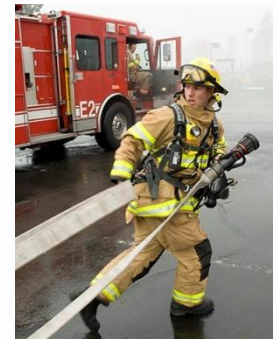


FIRE HOSE & APPLIANCES



The four basic components of an effective fire line:

- a) Reliable water supply.
- b) Fire apparatus equipped with adequate pumping capacity.
- c) Appropriate fire equipment such as hose & nozzles.
- d) Most importantly - **Properly Trained Personnel** to put all together and into operation, efficiently.



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Common problems occurred with an ineffective Fire Line:

- Broken or inadequate hydrant or water source
- Kinks in hose lines, reducing flow (supply or attack)
or - over pumping lines to compensate for them making them difficult to operate or control.
- Water Hammers (damage line or pump)
- Inadequate size line or nozzle for the job
- Over heated pump – *not moving water*
- Inadequate training



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When establishing lines – there may be a need for additional hose appliances such as:



Wye – (1 into 2) 1 female intake making 2 outputs

Either can be found with or without gates

Siamese (2 into 1) 2 females intakes making 1 output



Remember
“Female in – Male out”



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When establishing lines – there may be a need for the use of an additional hose appliance such as:



Manifolds (1 making 3-5)
1 females intakes making
Multiple (3 / +) outputs



Water Thief's - Output(s) tapped off a Large Gate
(Used to maximize a water supplies)

Think of it as a Gated Hydrant w/ a 4.5" and (2)gated 2.5" spuds

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When establishing lines – there may be a need for the use of an additional hose appliance such as:

Gate: “a Shut off”



Wheel Type
Found on standpipes



1/4 Turn ball valve
aka Hydrant gate



Crank Type
Still out there - positive is it Prevents
Water Hammers



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When establishing lines – there may be a need for the use of an additional hose appliance such as:

Adaptors: “adapts” one style hose or thread into another



Storz to Steamer “Hydrant”



Storz to 2.5” Male
aka reducer



Female to Male
aka Double Male



2.5” Male – Male 1.5”
aka reducer



Male to Female
aka Double Female

- **Just a few** -
Many find **any** combination

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When establishing lines – there may be a need for the use of an additional hose appliance such as:

Adaptors: *also adapt one style thread into another*

When we see **female to male adaptors**



Can also convert one **style thread** into another.

DEPT'S THREAD

A lot of the time the thread **NOT** being used by the dept. will be painted a **different color.** (to make to stand out)
It will also be stamped the thread type.



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When establishing lines – there may be a need for the use of an additional hose appliance such as:

Stream Shapener:



improves laminar flow
to a nozzle

In- line Pressure Gauge:



Displays the pressure being supplied to
a line, at the point of attachment.
Used in our stand pipe connections
Water need to me flowing for accurate readings

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When establishing lines – there may be a need for the use of an additional hose appliance such as:

30 , 45 & 90 degree elbows: used to either soften the water as it enters a line or used to directed a line in a different direction, preventing kinks.



30 degree



45 degree



90 degree

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When establishing lines – there may be a need for the use of an additional hose appliance such as:

End Caps:



Cap for a Male coupling



Cap for a Female coupling



Cap for a Storz coupling

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When establishing lines – there may be a need for the use of an additional hose appliance such as:

Wrenches: To Tighten/Loosen these appliances – we use:



Spanner Wrench
1.5" & 2.5" Hose



Stortz Wrench
Sexless Stortz



Combo Stortz Wrench
All : stortz – 2.5" & 1.5"



Hydrant Wrench



Rubber Mallet
Steamer couplings



Pipe Wrench



Combo Hydrant/Spanner Wrench



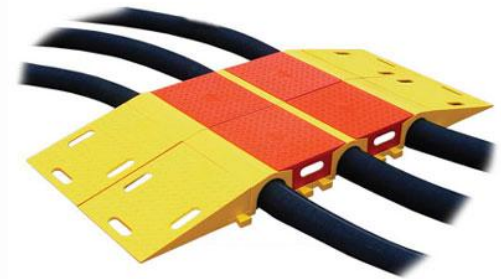
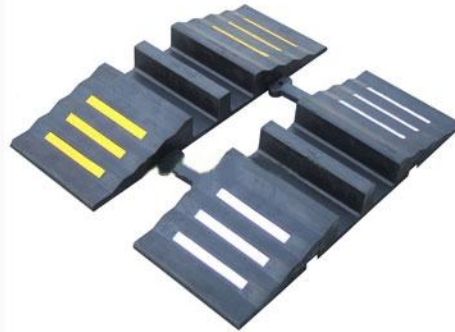
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When establishing lines – there may be a need for the use of an additional hose appliance such as:

Hose Bridges/Rams:



For extended operations – Bridges/Rams may be used to keep the needed apparatus and resources flowing to scene if the roads are blocked by hose.

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When establishing lines – there may be a need for the use of an additional hose appliance such as:

Hose Straps:



Hydrant Strap



Hose Strap



These straps are used to help hose movement or securing hose to an object such as a hydrant or ladder

A “hose strap” isn’t the strap that hold a high rise pack together!

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Other appliances:

Hose Roller:



Used to drain water from the hose (mainly 5"), before we load back on the rig.



Hose Clamp:

Used to stop water flow in a line, as a gate would, when ability to do so is lost

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(Have Class - Name components & their use)

Hydrant Bag:



A bag that carries all appliance needed to secure a hydrant.



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Stand Pipe Bag: (Have Class - Name components & their use)

A bag that carries all appliance needed to secure a stand pipe.



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High-rise packs:



50' of hose – packed so it can be carried easily to a location of stand pipe.

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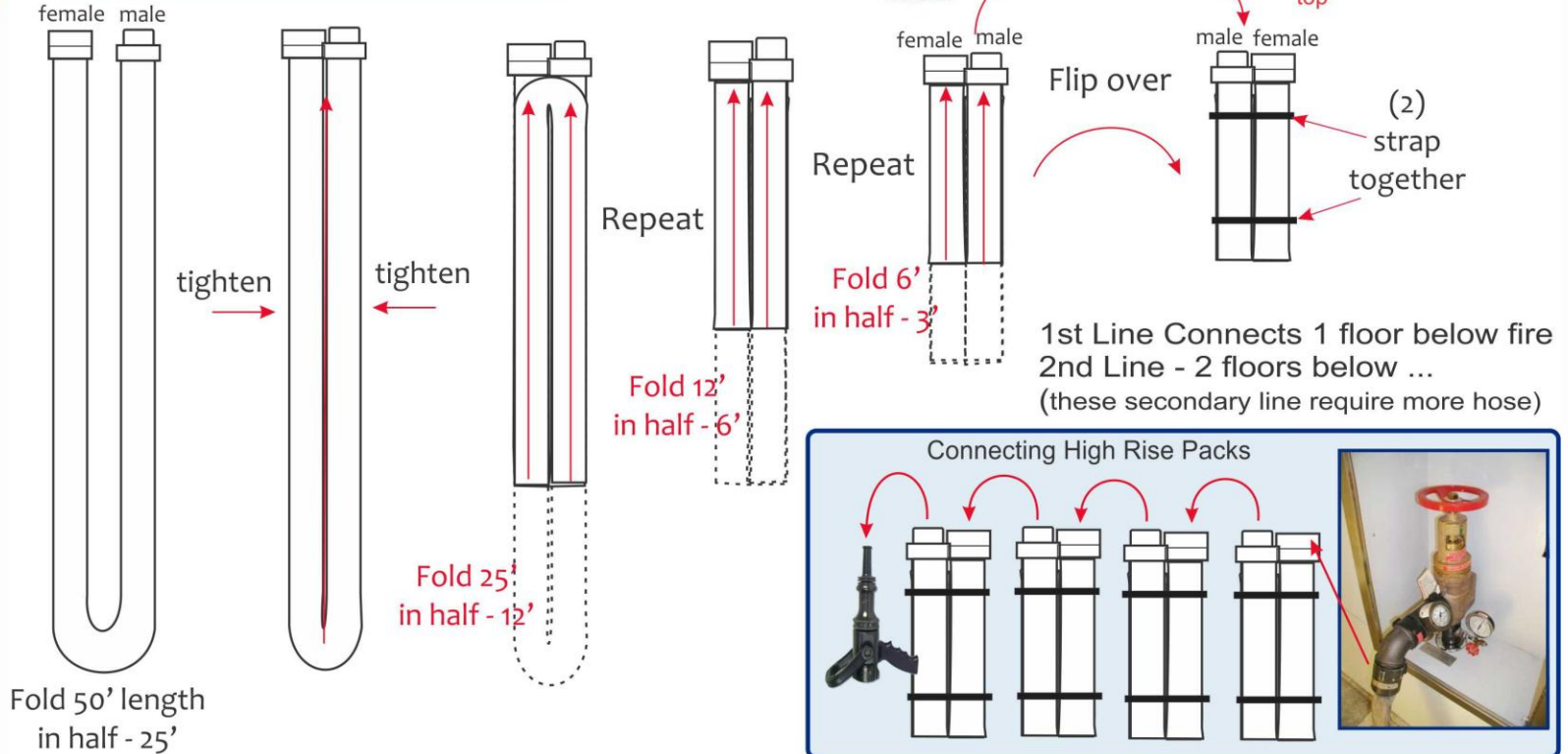
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High Rise Pack:

References - Diagrams are NOT to Scale



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25' length(s) - 5' hose:



Since a length of 5" hose is 100' long, when we lay a line to/from a hydrant we may only need 20 -40' to finish the connection.

Instead of pulling another 100' and trying to disburse that addition 60', we'll use either 1 or 2 of the 25' length, on side of rig, to make up the shortage.

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Putting Attack Line in Operation:

Once we've done an adequate size up and determined :

What size attack line is needed for Incident – (Big fire – Big water)

Rule of thumb – Commercial - 2.5"
Residential - 1.75"
Inside – Solid Nozzle
Outside – Fog Nozzle

Pull the appropriate line from the rigs -

Pre-connects - 200' of 1.75" or 200' of 2.5" = already connected to rig's discharge.

- Or -

The appropriate amount line from the dead bed. ** **With the Appropriate Nozzle** **

Pre-connect



Dead Bed



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Putting Attack Line in Operation:

Three functional positions of an attack line:

a) Nozzle

b) Back-up

c) Control (s)

“If Available” a 4th position
“Door” may be utilized



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Putting Attack Line in Operation:

Three functional positions of an attack line:

a) Nozzleman:

- leader of the attack line crew, in the absence of a line officer,
- determines the method of attack,
- operates the nozzle,
- controls speed of advancement and retreat,
- communicates directions to crew members.

When adjusting the pattern of a Fog nozzle - (right is tight)
the same goes for tightening hose & adaptors

Test line, bleeding off air before getting to fire room or even in the building.

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Putting Attack Line in Operation:

Three functional positions of an attack line:

b) Back-up man:

- assists in locating hazards,
- directly supports nozzleman in the control of hose and nozzle,
*wants to be doing opposite nozzle – (nozzle right – back up left , nozzle up – back up down)
- communicates information between nozzleman and control position.

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Putting Attack Line in Operation:

Three functional positions of an attack line:

c) Control:

- insures that adequate hose is available for advancement;
- Prevents kinks at doorways, stairways, landings and obstacles;
- controls the retreat of hose line;
- watches for the development of hazards behind the hose crew.
- “Controls” all the hose line between – Back up or Door (if One),
al the way back to the Engine.

In situation with: large stretches, multiple doors/rooms, or turns – multiple control positions should utilizes – 1 at each turn.

When there are multiple Control position, each would be responsible for all the hose in front and behind them, to the next position or the engine.

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Putting Attack Line in Operation:

Fourth functional positions of an attack line: *If resources allow – Rarely!*

d. Door:

- insures that adequate hose is available for advancement,
- Prevents kinks, feeding hose into the fire area
- Stages loops in hose for future advancement ;
- watches for the development of hazards behind the hose crew.
- Controls all the hose line between – Back up person to the Door of area the hose line is operating in.

Multiple controls positions are more commonly utilizing then a Door position. This give more flexibility and more area that is covered. In these case a control person should be monitoring all the hose inside the fire room along with the other hose in their responsibility.

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Putting Attack Line in Operation:

When Pulling Line from Rig (Pre-connect or Dead bed) :

Nozzleman – should take a couple of folds* , step off rig **and stop**

***(approx 50' or 1 length of hose)**

Backup – should then take a few folds of hose * , step off rig **and together with Nozzleman , they** should walk to front door .

Control – will then take the remainder of the pre-connect & flake out between back up and the Rig.



* If pulling Dead bed, **control** will make sure **proper amount of hose** came off the Rig (50' per length) – Break at coupling and hand to pump operator. Control will then flake hose out between back up and the Rig.

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Putting Attack Line in Operation:

Out of all the members on the Line, (although probably the least glorious), the **Control**, will “Control” the success or failure of the hose team.

Having the responsibility to :

- Assure no kinks of line – (directly effect the water supply)
- Flakes line out in a way it can be easily advanced (effects how fast water will get on the fire)
- Line is not bound up at doorways and turns (effects how fast water will get on the fire)
- Monitors conditions around & behind the nozzle (effects the hose team safety)

With multiple turns and stairways the use of a 2nd & 3rd control persons is recommended when manpower permits, to allow for rapid advancement of line.



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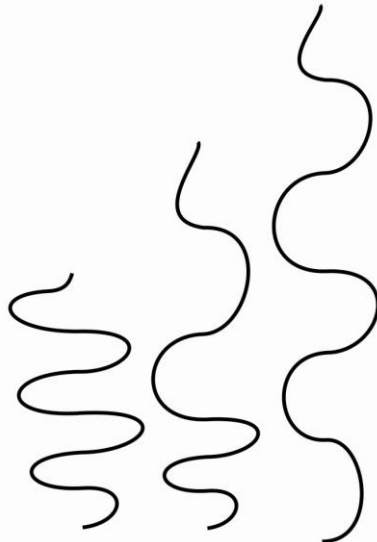


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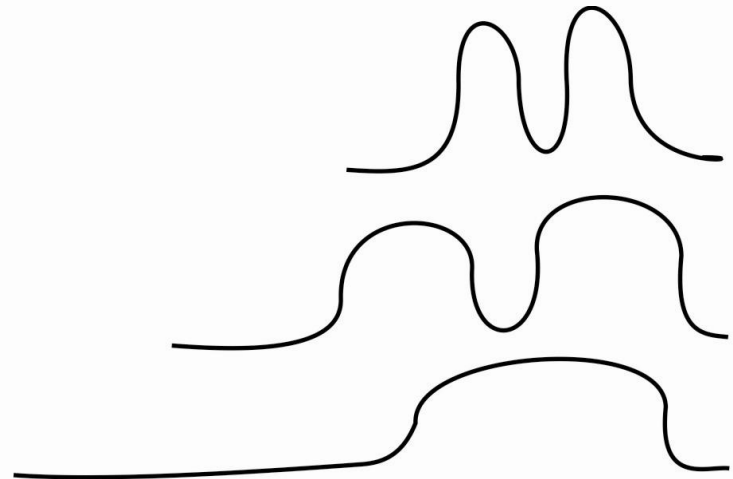
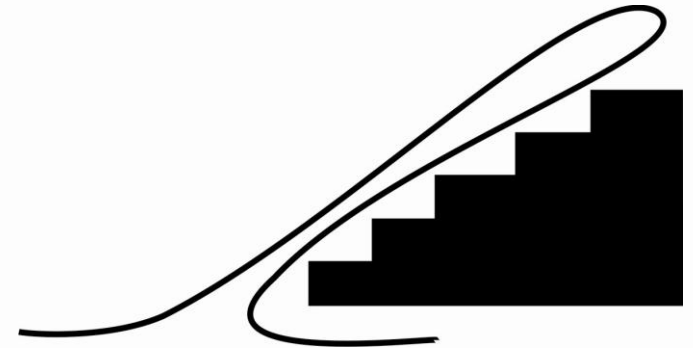
Putting Attack Line in Operation:

When flaking Hose:

Use Gravity & Physics to your advantage -



Charged hose - (Naturally wants to be straight)
by having loops, that want to be straight,
that energy will make hose advancement easier.



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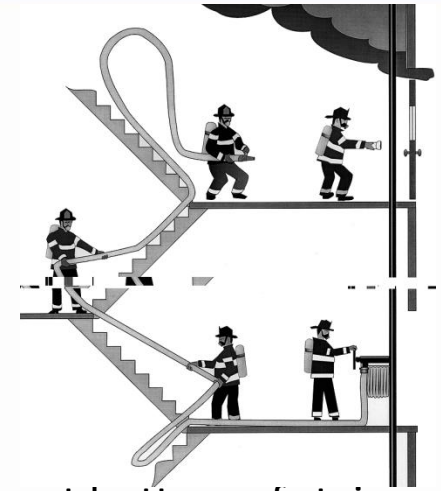
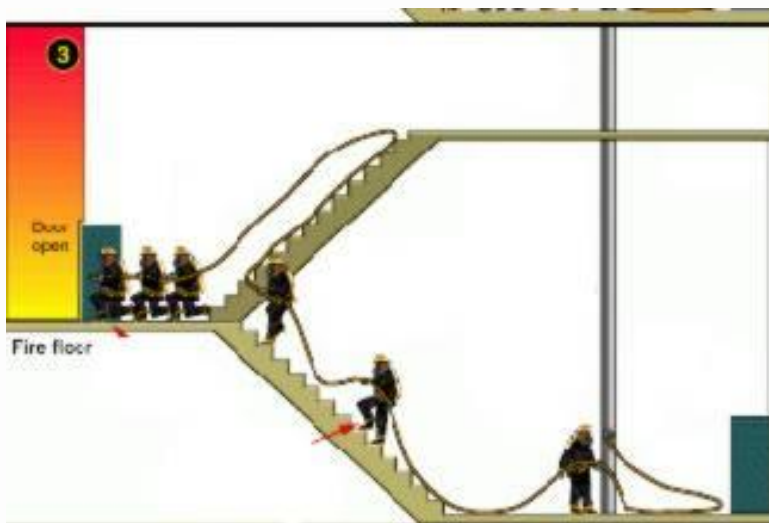


FIRE HOSE & APPLIANCES

Putting Attack Line in Operation:

When flaking Hose:

Use Gravity & Physics to your advantage -



Here we see:

- 1 member at turn at bottom of stairs
- 1 member at Middle of stairs
- Control has put hose up stairs so gravity can help feed hose into room
- control's in position can see ahead and also down stairs
- control doesn't need to move position until all hose on above stair is in door

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End of Lecture

Practical Applications:

1. Pull 2.5" pre-connect with solid nozzle – Stage at front door & flake remaining hose.
2. Connect 25' of 5" to engine and add Manifold to opposite end.
3. To manifold add 50' of 2.5" – reduced to 50' of 1.75" with fog nozzle.
1. Replace the 2.5" section of hose.
(reversed with female end towards fire) - Utilizing adaptors.
5. Convert 2.5" nozzle of the pulled pre- connect to a gate and add 50' of 1.75" hose with a fog nozzle.
6. Advance 2.5" line up 2 stories of stairs.
7. Advance 2.5" line up a ladder and in 2 stories window securing the hose to ladder with hose strap.
8. Set up portable master stream devise.