During the development of the FGS program, the IAFF conducted beta tests with numerous prop designs and materials. The IAFF FGS Development Committee and the beta test participants were charged with designing props that are safe, well built, durable, provide for an accurate simulation of the actual survival skill and allow access for instruction and safety.

We found that the props utilized in this FGS training will undergo significant force and strain and must be made of the highest quality materials. Secondly, the props will be subjected to all types of weather conditions. Wood props made of common construction materials showed substantial damage after minimal training use and after exposure to various weather conditions. Lastly, this approach required personnel with the proper tools and skills necessary to build each prop. Our beta tests demonstrated that this approach can be costly when you factor in the materials, tools and personnel costs.

The final FGS props selected by the IAFF were designed and built using durable, high strength aluminum. These props are built by one manufacturer to IAFF specifications allowing for greater quality control. The IAFF FGS props are safe, well built, durable, provide for an accurate simulation of the actual survival skill and allow access for instruction and safety. Additionally, the design allows for quick assembly prior to training and easy disassembly for transportation and storage.

The IAFF FGS License is granted only upon the express conditions that the Licensee must use the IAFF FGS Program in whole and only for the purpose of survival training. These props and sign sets can be purchased by contacting the authorized vendor listed below.

To order props and signage, contact the IAFF.

- 1- IAFF FGS Disentanglement Prop
- 1-IAFF FGS Low/Reduced Profile Prop
- 1-IAFF FGS Upper-Floor Egress Prop
- All required IAFF FGS Signage
- All required Outdoor Sign Stands
- All hardware for assembly
- Prop and Signage crates
- Shipping
- FGS Trailers include 2 sets of props

For safety and durability reasons, FGS Licensees are strongly encouraged to procure IAFF FGS prefabricated props and signs through our authorized vendor. Licensees who prefer to build props in lieu of purchasing the prefabricated props may do so using the plans included in this appendix. However as a condition of maintaining an FGS license, FGS licensees are required to purchase one set of IAFF FGS signs and required sign holders for each set of props built. These signs must be used consistent with the instructions in the IAFF FGS Facilitators Manual. The signs are durable, weather resistant, and include an outdoor sign stand or are provided with predrilled holes for attachment to props. The fixed fees for both the IAFF FGS Train-the-Trainer Course and the IAFF FGS Direct Delivery Operations Course provide for one set of the IAFF FGS prefabricated props, signage and sign holders.

The IAFF will continue to audit and evaluate departments that choose to use the built props as well as the prefabricated props so as to continue our evaluation of the safest and most durable use of these training aids.

The plans to build the SCBA Low/Reduced Profile, Disentanglement, and Upper Floor Egress Props are included within this section. All props must be painted in black and gold (pantone 123), and have the IAFF FGS logos and signs attached as indicated in the pictures on the folowing pages.

The following list includes all materials required to build one set of the IAFF FGS props:

TOTAL QUANTITY	MATERIALS
75	2"x4"x8' std lumber
1	2"x8"x8' std lumber
14	1/2"x4'x8' cdx plywood
2	3/4"x4'x8' cdx plywood
4 lbs	8d coated nails per lb (for nail gun)
6 lbs	16 coated nails per lb (for nail gun)
2 lbs	3" No. 8 ext. deck screws (lbs)
6	1/2"x 4 1/2" hex bolt, coarse thread, galvanized
6	1/2" hex nuts, galvanized
6	1/2" washer, galvanized
1 (100 ft section)	20g 4 strand (or 6 strand) wire galvanized per 100'
20 feet	1/2" rope
2 (10 ft sections)	3/4" PVC Sch. 40 pipe per 10'

IMPORTANT SAFETY MESSAGE REGARDING PROP FABRICATION:

Props shall be constructed using the highest grade of attachment anchors. Each prop must be checked to ensure no nails, screws, staples, bolts, nuts, or wood splinters are exposed to create a hazard to fire fighters using the prop. Each prop must also be checked for proper structural stability to ensure it can withstand the demands of the skill. Props must be in the highest serviceable condition prior to use. Any prop not meeting the above requirements shall be removed from service.

IAFF FGS Low/Reduced Profile Prop -



IAFF FGS Disentanglement Prop



IAFF FGS Upper-Floor Egress Prop



IAFF FGS SCBA LOW/REDUCED PROFILE PROP DESIGN

The IAFF FGS SCBA low/reduced profile prop is designed to simulate a 16 inch on center stud wall. The prop is designed with portability in mind. When not in use the side braces and wall can be removed and stored flat with the base. The prop includes two typical spaces a fire fighter may use to move through a wall in order to find a more tenable atmosphere. The two spaces are duplicated to allow more fire fighters to use the prop simultaneously.

SCBA LOW/REDUCED PROP MATERIALS LIST:

- 20 2" x 4" x 8'
- ¼ lb (20) 3" No.8 ext. deck screws
- 4 ½" x 4' x 8' plywood
- 6' ½" rope
- 1 lb (150) 8d coated sinkers (nails)
- 1 lb (70) 16d coated sinkers (nails)



IAFF FGS SCBA LOW/REDUCED PROFILE WALL FRAME CONSTRUCTION

All dimensions of the wall are measured from the middle of the 2" x 4" (on center measurement). Secure using 16d nails.

- 12 2" x 4" x 8'
- 50 16d coated sinkers (nails)



IAFF FGS SCBA LOW/REDUCED PROFILE WALL COVERING CONSTRUCTION

Cover the frame on both sides using ½" x 4' x 8' plywood. Use frame to trace "open" areas onto plywood. Once plywood is cut, secure plywood to each side of frame using 8d nails. See following pictures.

- 2 ½" x 4' x 8' plywood
- 120 8d coated sinkers (nails)



IAFF FGS SCBA LOW/REDUCED PROFILE WALL COVERING CONSTRUCTION CONTINUED

Picture of ½" x 4' x 8' plywood with open areas cut out. Cut two - one for each side.



IAFF FGS SCBA LOW/REDUCED PROFILE WALL COVERING CONSTRUCTION CONTINUED

Picture of ½" x 4' x 8' plywood attached to each side of wood wall frame.



IAFF FGS SCBA LOW/REDUCED PROFILE WALL SIDE BRACING FRAME CONSTRUCTION

Build 2 side bracing frames using 2" x 4"s and 16d nails.

- 4 2" x 4" x 8'
- 20 16d coated sinkers (nails)



IAFF FGS SCBA LOW/REDUCED PROFILE WALL SIDE BRACING FRAME CONSTRUCTION CONTINUED

Cover both side bracing frames with $\frac{1}{2}$ " plywood using 8d nails. Attach plywood so it is flush against vertical 2" x 4" positioned in the middle of the triangle. (See picture on following page)

- 1 ½" x 4' x 8' plywood
- 20 8d coated sinkers (nails)



IAFF FGS SCBA LOW/REDUCED PROFILE WALL ATTACHMENT OF WALL AND SIDE BRACES TO BASE

First reinforce base ends by attaching a 2" x 4" at each end of $\frac{1}{2}$ " x 4' x 8' plywood base. Attach using 8d nails. Place completed wall on base inside base 2" x 4"s. Secure triangular braces at each end on top of 2" x 4"s using 3" drywall screws. The screws are preferred over nails due to the ease of removing the screws so the prop can be taken apart and stored flat.

- 1 2" x 4" x 8'
- 1 ½" x 4' x 8'
- 10 8d coated sinkers (nails)
- 20 3" No. 8 ext. deck screws



IAFF FGS SCBA LOW/REDUCED PROFILE WALL CARRYING HANDLES FOR EACH SIDE

 $\frac{1}{2}$ " rope is used to create two carrying handles on each side of the prop. The handles allows for four persons to move the prop easily. Cut $\frac{1}{2}$ " holes in triangular side braces and secure $\frac{1}{2}$ " rope using an overhand knot.

MATERIALS REQUIRED:

 \mathbf{I} 6' – ½" rope (use two 3' sections for each side)



IAFF FGS DISENTANGLEMENT PROP DESIGN

The IAFF disentanglement prop is designed to be stored in pieces. When not in use the wires can be easily removed by pulling the PVC pipes free from the prop, and the walls removed by removing the attachment screws and $2^{\circ} \times 4^{\circ}$ top braces.

DISENTANGLEMENT PROP MATERIALS LIST:

- 21 2" x 4" x 8'
- ½ lb (40) 3" No. 8 ext. deck screws
- 2 ½" x 4' x 8' plywood
- 15' ½" rope
- 1 ¾" x 4' x 8' plywood
- 1 lb (160) 8d coated sinkers (nails)
- 2 ¾" x 10' PVC pipe sch. 40
- 1.5 lbs (90) 16d coated sinkers (nails)
- 100' 20 gauge 4 strand multipurpose utility wire galvanized



IAFF FGS DISENTANGLEMENT BASE FRAME CONSTRUCTION

The base is made using two 2" x 4" x 8's and seven 2" x 4" x 45". 45" boards are spaced at 16" on center. Secure using 16d nails.

- 6 2" x 4" x 8'
- 28 16d coated sinkers (nails)



IAFF FGS DISENTANGLEMENT BASE CONSTRUCTION

Cover the disentanglement frame with a sheet of ¾" x 4' x 8' plywood. Nail using 8d nails.

- 1 ¾" x 4' x 8' plywood
- 36 8d coated sinkers (nails)



IAFF FGS DISENTANGLEMENT LEFT WALL CONSTRUCTION

Build frame using 2"x 4"s and 16d nails. Drill $\frac{3}{4}$ " holes through 2"x 4"s to accept $\frac{3}{4}$ " PVC pipe used to attach the wires creating the entanglement hazard. Left wall is constructed with the smooth surface of 1/2" plywood facing to the inside of the box. Secure wall to base using 3" screws. The PVC pipe is used to easily free an entangled fire fighter who is injured or experiencing difficulty. As the PVC is pulled away from the prop the wires creating the entanglement are released and the fire fighter can be easily accessed.

- 5 2" x 4" x 8'
- 1 ½" x 4' x 8' plywood
- 28 16d coated sinkers (nails)
- 36 8d coated sinkers (nails)
- 1 ¾" x 10' PVC pipe sch. 40
- 10 3" No. 8 ext. deck screws



IAFF FGS DISENTANGLEMENT WIRE ENTANGLEMENT

Drill 15 to 20 equally spaced 1 ¼" holes in plywood where PVC pipe is located. Create 1" diameter loop on wire end. Pass wire loop through holes in plywood. Insert PVC pipe into 1 ¼" holes in 2" x 4"uprights on outside of prop. Ensure PVC pipe runs through loops on each wire. Be sure the looped end of wire does not snag plywood when PVC pipe is removed to free entanglement. PVC pipe should be able to be pulled out from holes in 2" x 4" uprights to allow wire to easily pass through holes in plywood so fire fighter can be removed from the prop.



IAFF FGS DISENTANGLEMENT RIGHT WALL CONSTRUCTION AND TOP SUPPORTS

Build right wall frame same as left wall. Drill 1 ¼" holes for PVC pipe 6" from the bottom on this wall. This creates a diagonal with the wires originating from the top of one wall and terminating near the bottom of the other. Attach the ½" plywood to the outside of wall. This creates an open stud wall surface on the interior of the prop simulating what may be experienced in unfinished garages and basements. Attach 20 gauge 4 strand wires from one PVC pipe to the other by wrapping the wire around the PVC pipe, creating a loop on the end of the wire. Attach four 2" x 4" across top for wall support using 3" screws.

- 7 2" x 4" x 8'
- 1 ½" x 4' x 8' plywood
- 28 16d coated sinkers (nails)
- 1 ¾" x 10' PVC pipe sch. 40
- 36 8d coated sinkers (nails)
- 30 3" No. 8 ext. deck screws
- 100' 20 gauge 4 strand multipurpose utility wire galvanized



IAFF FGS DISENTANGLEMENT CARRYING HANDLES FOR RIGHT WALL

 $\frac{1}{2}$ " rope is used to create two carrying handles on each side of the prop. The handles allow for four persons to move the prop easily.

MATERIALS REQUIRED:

■ 15' – ½" rope



IAFF FGS DISENTANGLEMENT CARRYING HANDLES FOR RIGHT WALL CONTINUED

Attach 2" x 4" blocks to interior of the right wall for backing. Drill 1" hole though plywood; block and secure rope with square knot.



IAFF FGS DISENTANGLEMENT CARRYING HANDLES FOR LEFT WALL

Drill $\frac{1}{2}$ " holes through studs at each end of the prop. Use $\frac{1}{2}$ " rope to create handle so prop can be picked up using a slight bend of the knees. Prop should only by lifted 4" to 6" off the ground. Secure rope at ends.



IAFF FGS UPPER FLOOR EGRESS WINDOW PROP DESIGN

The IAFF FGS upper floor egress window prop is designed to simulate an upper floor window measuring $3' \ge 3'$ square. The prop is designed with portability in mind. When not in use the side braces and wall can be removed and stored flat or upright with the base.

UPPER FLOOR EGRESS WINDOW PROP MATERIALS LIST:

- 28 2" x 4" x 8'
- 1 2" x 8" x 8'
- 50 3" No. 8 ext. deck screws
- 16 1 ½" No. 8 ext. deck screws
- 6 1/2" x 4' x 8' plywood
- 150 16d coated sinkers (nails)
- 1 ¾" x 4' x 8' plywood
- 215 8d coated sinkers (nails)
- 6 1/2" x 4 1/2" hex bolt, coarse thread, galvanized w/ washer & nuts





IAFF FGS UPPER FLOOR EGRESS WINDOW BASE FRAME CONSTRUCTION

The base is made using two 2" x 4" x 8's and seven 2" x 4" x 45". 45" boards are spaced at 16" on center. Secure using 16d nails.

- 6 2" x 4" x 8'
- 28 16d coated sinkers (nails)



IAFF FGS UPPER FLOOR EGRESS WINDOW BASE CONSTRUCTION

Cover the base frame with a sheet of ³/₄" x 4' x 8' plywood. Nail using 8d nails.

- 1 ¾" x 4' x 8' plywood
- 36 8d coated sinkers (nails)



IAFF FGS UPPER FLOOR EGRESS WINDOW BASE TO WALL ATTACHMENT CONSTRUCTION

The wall is attached to the base using $\frac{1}{2}$ " hex bolts that pass through 2" x 4" blocks fastened underneath the base. The 2" x 4" blocks are nailed in place using 16d nails. NOTE: Do not drill $\frac{1}{2}$ " hole for bolt until wall is positioned on top of the base. See following page for larger view picture.

- 1 2" x 4" x 8'
- 12 16d coated sinkers (nails)
- 6 1/2° x 4 1/2° hex bolt, coarse thread, galvanized with washer and nuts



IAFF FGS UPPER FLOOR EGRESS WINDOW WALL FRAME CONSTRUCTION

The wall is constructed using 2" x 4" x 8' uprights spaced equally at 16" on center. The window is a 3' x 3' square, with the windowsill 5 feet from the bottom of the wall. The 3' x 3' opening represents the minimum size window for a bedroom.

- 10 2" x 4" x 8'
- 34 16d coated sinkers (nails)



IAFF FGS UPPER FLOOR EGRESS WINDOW INSIDE SHEETING OF WALL FRAME

The inside of the wall is covered $\frac{1}{2}$ " x 4' x 8' plywood. Bottom 2' is left open for access to $\frac{1}{2}$ " bolts used to attach wall to base. Use entire $\frac{1}{2}$ " x 4' x 8' plywood to cover middle of wall with top at windowsill. Cut $\frac{1}{2}$ " x 4' x 8' to fit around window.

- 2 ½" x 4' x 8' plywood
- 60 8d coated sinkers (nails)



IAFF FGS UPPER FLOOR EGRESS WINDOW OUTSIDE SHEETING OF WALL FRAME

The outside of the wall is covered with 2 pieces of ½" x 4' x 8' plywood. First install the middle piece so the top edge is flush with the windowsill. Cut the second piece of plywood around the window to fit tightly against the top edge of the first piece of plywood installed. Use the plywood cut from the top piece to cover the bot-

- 2 ½" x 4' x 8' plywood
- 72 8d coated sinkers (nails)



IAFF FGS UPPER FLOOR EGRESS WINDOW STEP FOR WINDOW ACCESS

The top of the step used by the fire fighter to access the window is $24^{\circ} \times 45^{\circ}$. The step is secured to a frame that elevates it to the appropriate height to simulate an actual floor. All measurements are on center.

- 3 2" x 4" x 8'
- 40 16d coated sinkers (nails)



IAFF FGS UPPER FLOOR EGRESS WINDOW STEP FOR WINDOW ACCESS CONTINUED

The top of the step used by the fire fighter to access the window is 24" x 45". The step is secured to a frame that elevates it to the appropriate height to simulate an actual floor. All measurements are on center. Secure $\frac{1}{2}$ " plywood to top.

- 2 2" x 4" x 8'
- 1 ½" x 45" x 24" plywood
- 20 16d coated sinkers (nails)
- 18 8d coated sinkers (nails)



IAFF FGS UPPER FLOOR EGRESS WINDOWSIDE BRACES

Construct 2 triangular side braces to stabilize the wall when it is attached to the base. Allow the $\frac{1}{2}$ " plywood to overlap 5 $\frac{1}{4}$ " so the plywood can be attached to the side of the wall and base. Attach to wall and base using 3" screws through 2" x 4". Add stability by securing overlapping plywood to wall and base using 1 $\frac{1}{2}$ " screws. Materials required: (makes 2)

- 4 2" x 4" x 8'
- 1 ½" x 4' x 8' plywood
- 12 16d coated sinkers (nails)
- 28 8d coated sinkers (nails)



IAFF FGS UPPER FLOOR EGRESS WINDOW PUTTING THE PIECES TOGETHER

Position wall onto base. Identify areas where 2" x 4" blocks are secured to underside of base. Drill holes to accept six, equally spaced $\frac{1}{2}$ " bolts. Secure triangular braces to each side using 3" screws through 2" x 4"s. For added stability use 1 1/2" No. 8 screws to secure the plywood of the triangular brace to the base and wall.

- 2 2" x 4" x 8'
- 6 1/2" x 4 1/2" hex bolt, coarse thread, galvanized w/ washers & nuts
- 40 3" No. 8 ext. deck screws
- 16 1 ½" No. 8 ext. deck screws



IAFF FGS UPPER FLOOR EGRESS WINDOW INSTALLATION OF WINDOWSILL

Cut a 2" x 8" x 8' to 40 inches. Cut 40" board according to specification below (see picture). Secure to bottom of window using 3" screws.

- 1 2" x 8" x 8'
- 5 3" No. 8 ext. deck screws

