

**Equipment for Consistent Hands-On Training**  
**NIEHS National Trainers' Exchange**  
**May 2023**

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### **Workshop Summary**

The terminal objective for this presentation is to show participants ideas for improvising and transporting training props to distant training locations that are consistent with fixed facilities or drill fields. All the props presented are constructed in-house using materials and equipment that are commercially available from local suppliers.

The attached specification sheets allow for consistency or repeatability in the event of damage or duplication as dictated by training schedule demands. The materials for the props presented are itemized in the specification sheets to aid in the purchase of the correct items and purpose in the training device. Each specification sheet has been assigned a QR code to allow for trainees to take back to their departments or facility.

This workshop showcases specific props and kits. It also provides inventories of most of WST's training equipment for HM Operations and Technician level training and Hazardous Waste Site Worker classes. Training props and inventories presented in this session include the items below.

- Full size decontamination shower to practice gross decontamination and/or final shower.
- Light weight decontamination shower for transport by ground or air to practice gross decontamination and/or final shower.
- Portable metal pipe stand and flange stand to practice containment techniques.
- Plastic pipe stand and flange stand shippable by ground or air transportation to practice containment skills.
- Equipment kit used to establish a full chemical reduction corridor when classes are too far away to trailer standard WST equipment.
- The use of QR codes to share information of complicated devices, kits, and load plans.

QR Codes for Training Props Presented and Other WST Equipment Inventories

Full Size Decontamination Shower



Light Weight (LT WT) Decontamination Shower



Metal Pipe Stand



Metal Flange Stand



LT WT PVC Pipe Stand



LT WT PVC Flange Stand



LT WT Chemical Reduction Corridor



WST Equipment Inventory List



## AFC/WST - Full Size HM Decon Shower and Manifold Spec Sheet

### Purchasing List

Grainger Part#	Qty	Description
6MV24	3	10' x 1.5" Schedule 80 PVC Pipe (unthreaded)
1DPL7	10	1.5" Female Cam and Groove Coupling (female NPT)
1DPL3	10	1.5" Male Cam and Groove Coupling (female NPT)
6NF97	11	1.5" x 1.5" x 1.5" Tee Schedule 80 PVC
6NG22	8	1.5" x 1.5" 90° Elbow Schedule 80 PVC
2PMJ9	10	1.5" x 1" Reducing Bushing Schedule 80 PVC
2PMJ6	10	1" x 0.5" Reducing Bushing Schedule 80 PVC
5P650	4	0.5" x close Black Iron Nipple
444K41	4	0.5" NPT Female Shower Head
6PEAO	6	0.5" NPT Male Quarter Turn Boiler Drain Valve
1P724	1	3/4" GHT x 3/4" GHT Double Female Hose Coupling
6APH8	1	1.5" x 1.5" Fire Hose Adapter NPSH x NH Swivel
3PDL5	Multiple	Thread Sealant Teflon Tape, 1/2"

- Vertical and Top Crossbar Pieces
  - 1 ea 33" cut 1.5" Schedule 80 PVC pipe
  - 1 ea 23.5" cut 1.5" Schedule 80 PVC pipe
  - 1 ea 20" cut 1.5" Schedule 80 PVC pipe
  - 1 ea 16.5" cut 1.5" Schedule 80 PVC pipe
  - 1 ea 14.5" cut 1.5" Schedule 80 PVC pipe
  - 2 ea 7" cut 1.5" Schedule 80 PVC pipe
  - 6 ea 5.75" cut 1.5" Schedule 80 PVC pipe
  - 4 ea 1.5" Female Cam and Groove Coupling (female NPT)
  - 6 ea 1.5" Male Cam and Groove Coupling (female NPT)
  - 6 ea 1.5" x 1.5" x 1.5" Tee Schedule 80 PVC
  - 2 ea 1.5" x 1.5" 90° Elbow Schedule 80 PVC
  - 6 ea 1.5" x 1" Reducing Bushing Schedule 80 PVC
  - 6 ea 1" x 0.5" Reducing Bushing Schedule 80 PVC
  - 4 ea 0.5" x close Black Iron Nipple
  - 4 ea 0.5" NPT Female Shower Head
  - 2 ea 0.5" NPT Male Quarter Turn Boiler Drain Valve
  - 1 ea 3/4" GHT x 3/4" GHT Double Female Hose Coupling
- Base Pieces
  - 2 ea 38" cut 1.5" Schedule 80 PVC pipe
  - 10 ea 4.5" cut 1.5" Schedule 80 PVC pipe
  - 6 ea 1.5" Female Cam and Groove Coupling (female NPT)
  - 4 ea Male Cam and Groove Coupling (female NPT)
  - 2 ea 1.5" x 1.5" x 1.5" Tee Schedule 80 PVC
  - 4 ea 1.5" x 1.5" 90° Elbow Schedule 80 PVC

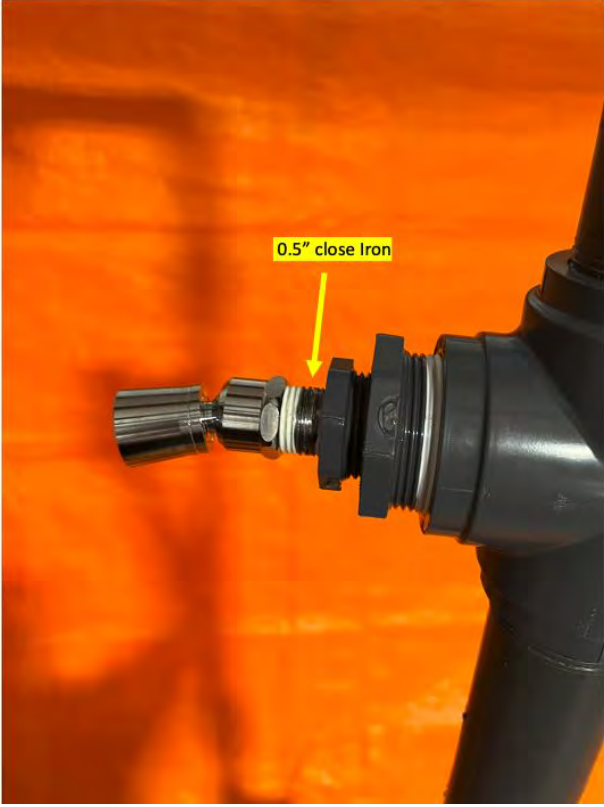
### Manifold Parts List

- 5 ea 5" cut 1.5" Schedule 80 PVC pipe
- 2 ea 1.5" x 1.5" 90° Elbow Schedule 80 PVC
- 3 ea 1.5" x 1.5" x 1.5" Tee Schedule 80 PVC
- 4 ea 1.5" x 1" Reducing Bushing Schedule 80 PVC
- 4 ea 1" x 0.5" Reducing Bushing Schedule 80 PVC
- 4 ea 0.5" NPT Male Quarter Turn Boiler Drain Valve
- 1 ea 1.5" x 1.5" Fire Hose Adapter FHT to NPT Swivel

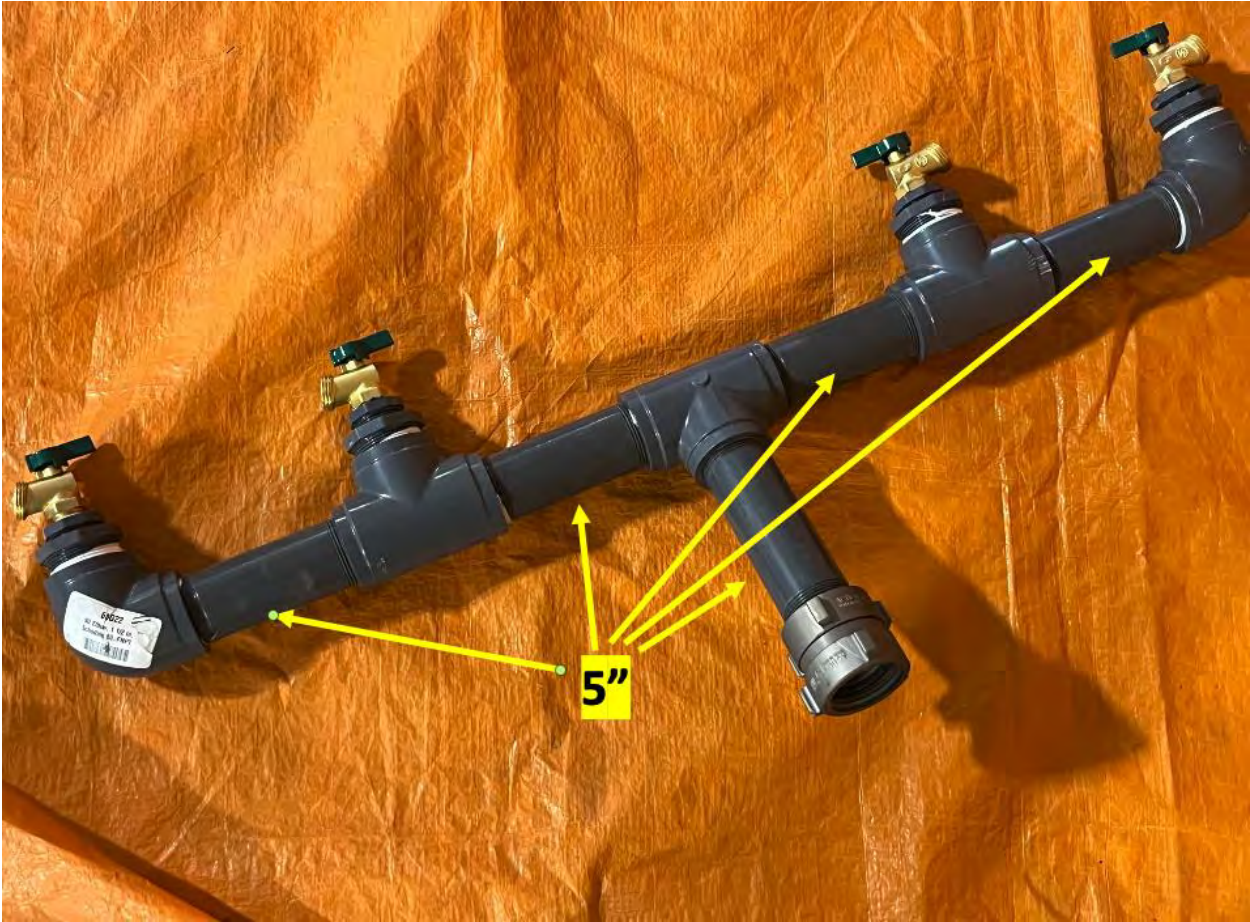


Shower Pics





Manifold Pics







## AFC/WST - Travel HM Decon Shower Spec Sheet

### Purchasing List

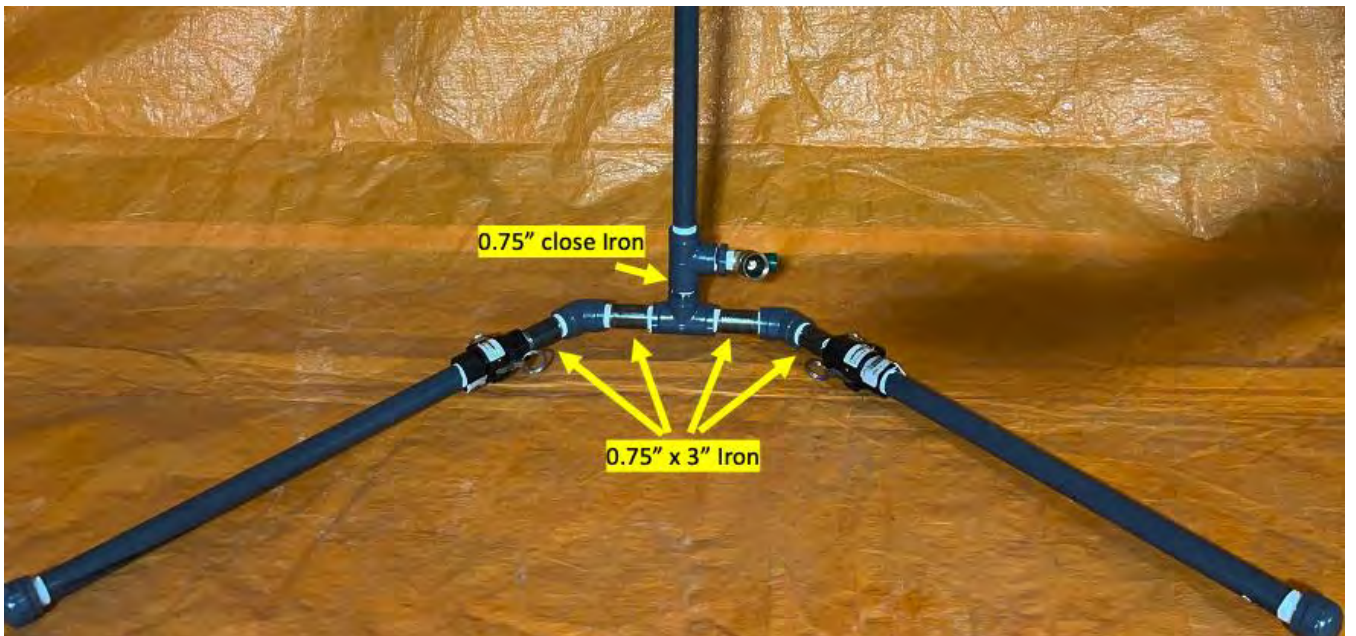
Grainger Part#	Qty	Description
6MV21	2	3/4" x 10' Pipe Schedule 80
1DPJ3	4	3/4" Female Cam and Groove Coupling (female NPT)
1MJV1	4	3/4" Male Cam and Groove Coupling (female NPT)
6NF94	3	3/4" x 3/4" x 3/4" Tee Schedule 80 PVC
6NG19	1	3/4" x 3/4" 90° Elbow Schedule 80 PVC
6NG43	4	3/4" x 3/4" 45° Elbow Schedule 80 PVC
2PMJ5	3	3/4" x 1/2" Reducing Bushing Schedule 80 PVC
6NVD25	2	3/4" Cap Schedule 80 PVC
5P667	3	3/4" x Close Black Iron Pipe Nipple
5P671	4	3/4" x 3" Black Iron Pipe Nipple
5P650	2	1/2" x Close Black Iron Pipe Nipple
444K41	2	1/2" NPT Female Shower Head
6PEA0	1	1/2" NPT Male Quarter Turn Boiler Drain Valve
1P724	1	3/4" GHT x 3/4" GHT Double Female Hose Coupling
3PDL5	Multiple	Thread Sealant Teflon Tape, 1/2"

- Vertical Pieces
  - 2 ea 26" cut 3/4" Schedule 80 PVC pipe
  - 1 ea 18" cut 3/4" Schedule 80 PVC pipe
  - 1 ea 9" cut 3/4" Schedule 80 PVC pipe
  - 4 ea 3/4" Female Cam and Groove Coupling (female NPT)
  - 2 ea 3/4" Male Cam and Groove Coupling (female NPT)
  - 3 ea 3/4" x Close Black Iron Pipe Nipple
  - 3 ea 3/4" x 3/4" x 3/4" Tee Schedule 80 PVC
  - 3 ea 3/4" x 1/2" Reducing Bushing Schedule 80 PVC
  - 1 ea 1/2" NPT Male Quarter Turn Boiler Drain Valve
  - 2 ea 1/2" x Close Black Iron Pipe Nipple
  - 2 ea 1/2" NPT Female Shower Head
  - 1 ea 3/4" GHT x 3/4" GHT Double Female Hose Coupling
  - 4 ea 3/4" x 3" Black Iron Pipe Nipple
  - 4 ea 3/4" x 3/4" 45° Elbow Schedule 80 PVC
- Leg Pieces
  - 2 ea 18" Cut 3/4" Schedule 80 PVC pipe
  - 2 ea 3/4" Male Cam and Groove Coupling (female NPT)
  - 2 ea 3/4" Cap Schedule 80 PVC



Shower Pics





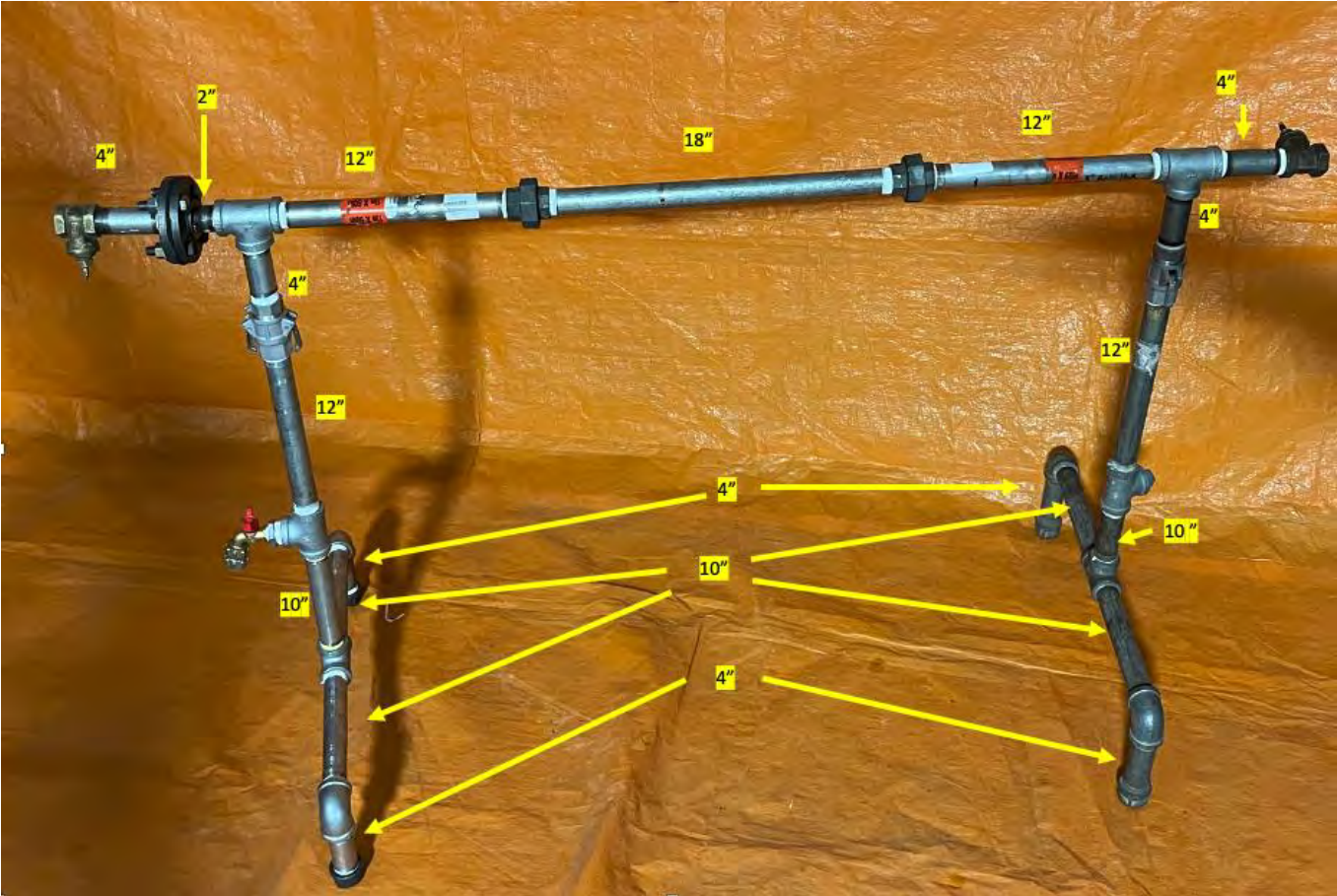
AFC/WST - Metal HM Pipe Stand Sheet

Purchasing List

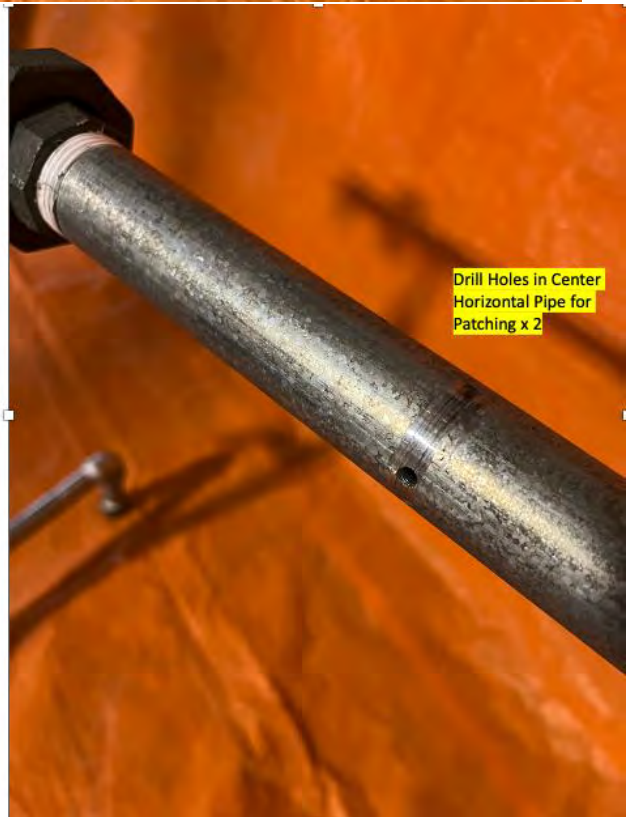
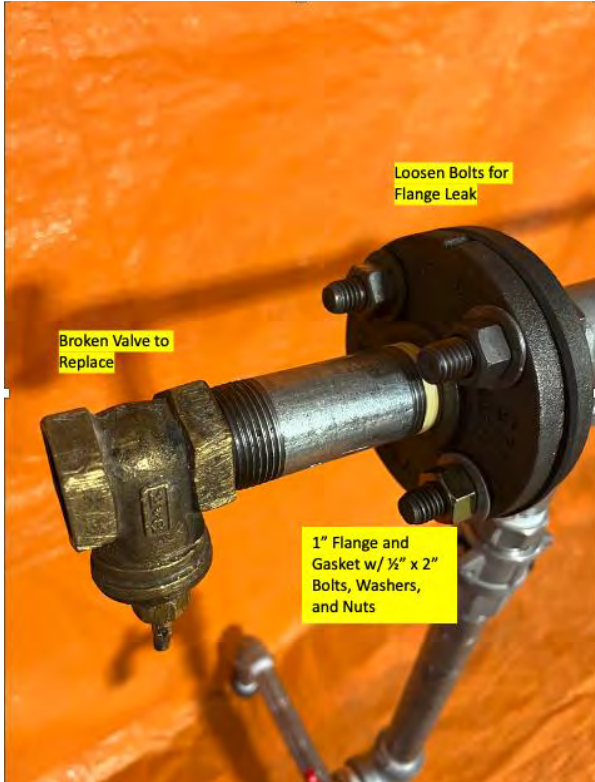
<b>Grainger Part#</b>	<b>Qty</b>	<b>Description</b>
6P826	8 ea	<u>Nipple: Galvanized Steel, 1 in Nominal Pipe Size, 4 in Overall Lg, Threaded on Both Ends, Welded</u>
6P836	4 ea	<u>Nipple: Galvanized Steel, 1 in Nominal Pipe Size, 12 in Overall Lg, Threaded on Both Ends, Welded</u>
6P900	1 ea	<u>Pipe: Galvanized Steel, 1 in Nominal Pipe Size, 18 in Overall Lg, Threaded on Both Ends, Schedule 40</u>
6P834	6 ea	<u>Nipple: Galvanized Steel, 1 in Nominal Pipe Size, 10 in Overall Lg, Threaded on Both Ends, Welded</u>
6P822	1 ea	<u>Nipple: Galvanized Steel, 1 in Nominal Pipe Size, 2 in Overall Lg, Threaded on Both Ends, Welded</u>
5P800	4 ea	<u>90° Elbow: Malleable Iron, 1 in x 1 in Fitting Pipe Size, NPT x NPT, Class 150</u>
4KWG4	2 ea	<u>Pipe Flange, Cast Iron, Faced and Drilled</u>
1TUR9	1 ea	<u>Flange Gasket: 1 in Pipe Size, 4 1/4 in Outside Dia., 1 5/16 in Inside Dia., Black</u>
23KZ75	1 pk	<u>Hex Head Cap Screw: Steel, Grade 5, Zinc Plated, 1/2"-13, Coarse, 2 in Lg, Globally Sourced, 10 PK</u>
22UH09	1 pk	<u>Flat Washer: For Screw Size 1/2 in, Steel, Grade 2, Zinc Plated, 0.531 in In Dia, Steel, 50 PK</u>
2FE67	1 pk	<u>Hex Nut: 1/2"-13 Thread, 3/4 in Hex Wd, 7/16 in Hex Ht, Steel, Grade 2, Black Oxide, 50 PK</u>
5P846	6 ea	<u>Tee: Malleable Iron, 1 in x 1 in x 1 in Fitting Pipe Size, NPT x NPT x NPT</u>
5P960	2 ea	<u>Union: Malleable Iron, 1 in x 1 in Fitting Pipe Size, NPT x NPT, Class 150</u>
5P903	4 ea	<u>Round Cap: Malleable Iron, 1 in Fitting Pipe Size, Female NPT, Class 150</u>
5P884	1 ea	<u>Hex Bushing: Malleable Iron, 1 in x 1/2 in Fitting Pipe Size, NPT x NPT, Class 150</u>
5P912	1 ea	<u>Square Head Plug: Malleable Iron, 1 in Fitting Pipe Size, Male NPT, Class 150</u>
3LW92	2 ea	<u>Cam and Groove Adapter: 1 in Coupling Size, 1 in Hose Fitting Size, 1 in -11-1/2 Thread Size, FNPT</u>
3LW98	2 ea	<u>Cam and Groove Coupling: 1 in Coupling Size, 1 in Hose Fitting Size, 1 in -11-1/2 Thread Size, FNPT</u>
447P10	2 ea	<u>Repair Clamp: Redi-Clamp, Neoprene Gasket, 1 in Pipe Size, 1/2 in Tube Size</u>
6TWK0	1 or 2 ea	<u>Gate Valve: 1 in Pipe Size, 200 psi Max. Water Pressure - CWP</u>
48XH67	1 or 2 ea	<u>Ball Valve: 1 in Pipe Size, 1 in Tube Size, Full, 600 psi CWP Max. Pressure, -20° to 450°F</u>
20XP92	1 ea	<u>Garden Hose Adapter: 3/4 in x 3/4 in Fitting Size, Female x Female, Swivel, 1 in Overall Lg</u>
6PEA0	1 ea	<u>Quarter Turn Boiler Drain Valve: 1/2 in Pipe Size, Cup/MNPT x MGHT, Brass Body</u>



Pipe Stand Set - Pipe Lengths



Pipe Stand Leaks





Pipe Stand Detail





Pipe Stand Patch and Valves



Required Patches  
and Valves, all 1"





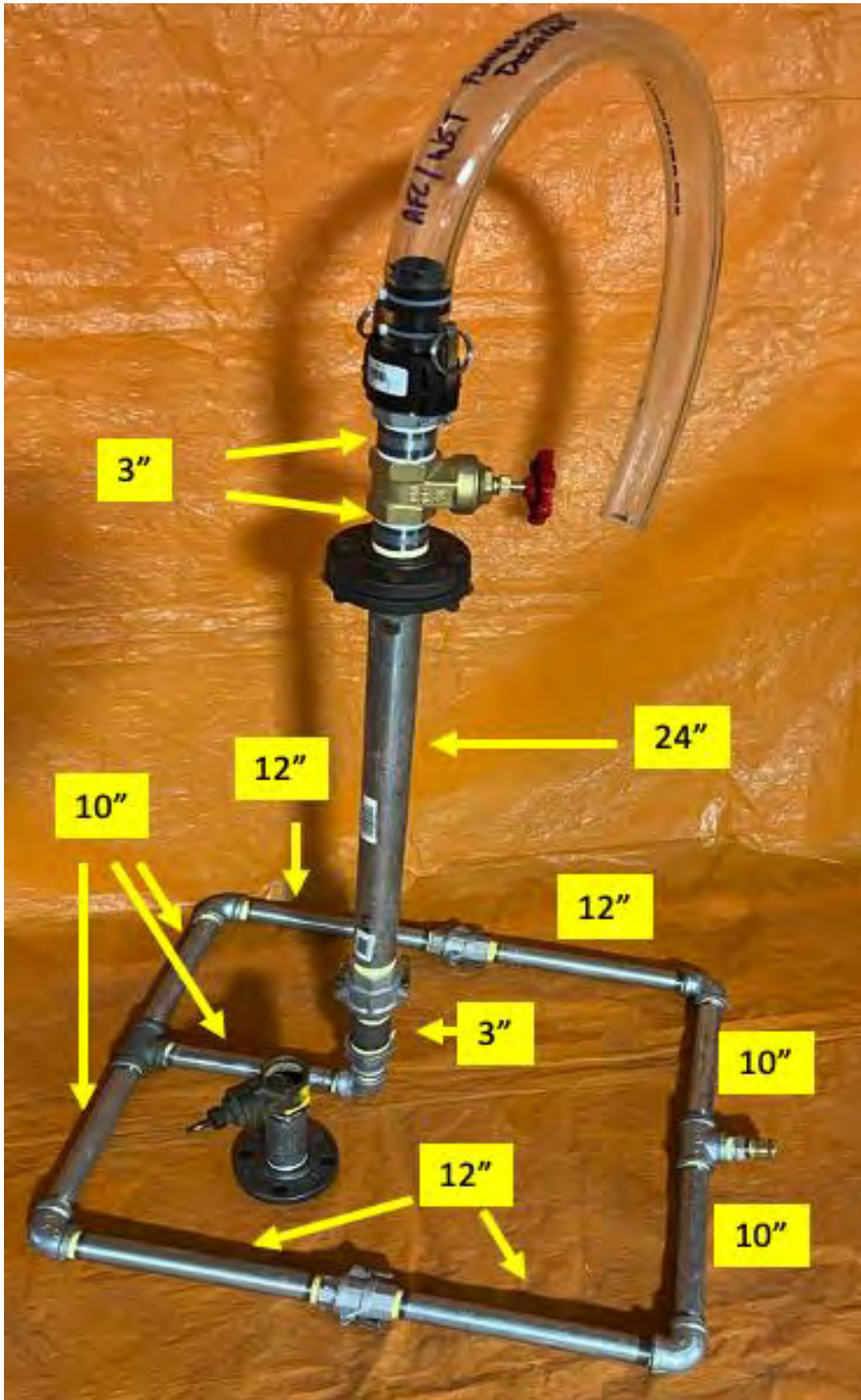
AFC/WST - Metal HM Flange Stand Sheet

Purchasing List

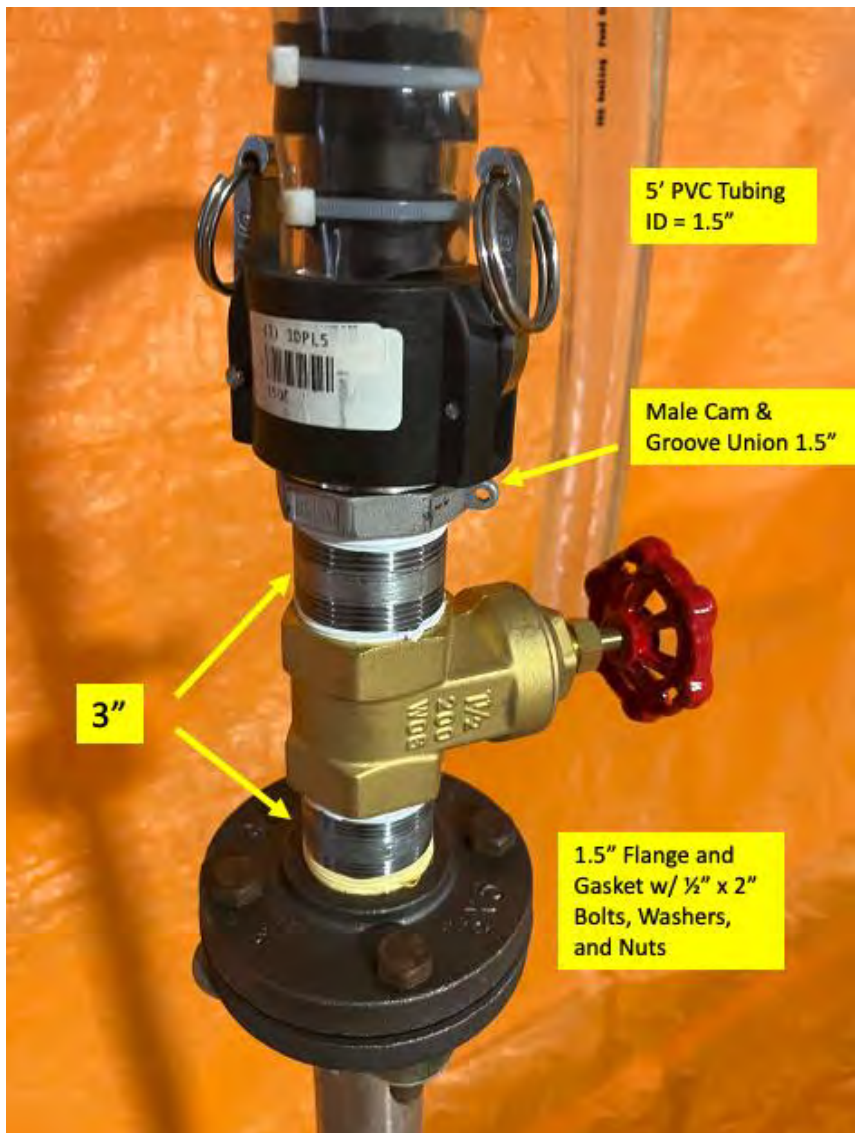
<b>Grainger Part#</b>	<b>Qty</b>	<b>Description</b>
6P836	4 ea	<u>Nipple: Galvanized Steel, 1 in Nominal Pipe Size, 12 in Overall Lg, Threaded on Both Ends, Welded</u>
6P834	5 ea	<u>Nipple: Galvanized Steel, 1 in Nominal Pipe Size, 10 in Overall Lg, Threaded on Both Ends, Welded</u>
6P822	1 ea	<u>Nipple: Galvanized Steel, 1 in Nominal Pipe Size, 2 in Overall Lg, Threaded on Both Ends, Welded</u>
5P800	5 ea	<u>90° Elbow: Malleable Iron, 1 in x 1 in Fitting Pipe Size, NPT x NPT, Class 150</u>
4KWG6	3 ea	<u>Pipe Flange, Cast Iron, Faced and Drilled</u>
1TUT1	1 ea	<u>Flange Gasket: 1 1/2 in Pipe Size, 5 in Outside Dia., 1 29/32 in Inside Dia.</u>
5P846	2 ea	<u>Tee: Malleable Iron, 1 in x 1 in x 1 in Fitting Pipe Size, NPT x NPT x NPT</u>
1MPN7	1 ea	<u>Hex Bushing: Forged Steel, 1 in x 3/4 in Fitting Pipe Size, NPT x NPT, Class 3000</u>
6P804	1 ea	<u>Nipple: Galvanized Steel, 3/4 in Nominal Pipe Size, 1 1/8 in Overall Lg, Fully Threaded, Schedule 40</u>
5P940	1 ea	<u>Reducing Coupling: Malleable Iron, 1 1/2 in x 1 in Fitting Pipe Size, NPT x NPT</u>
3LW92	2 ea	<u>Cam and Groove Adapter: 1 in Coupling Size, 1 in Hose Fitting Size, 1 in -11-1/2 Thread Size, FNPT</u>
3LW98	2 ea	<u>Cam and Groove Coupling: 1 in Coupling Size, 1 in Hose Fitting Size, 1 in -11-1/2 Thread Size, FNPT</u>
6P917	1 ea	<u>Pipe: Galvanized Steel, 1 1/2 in Nominal Pipe Size, 2 ft Overall Lg, Threaded on Both Ends, Welded</u>
6P856	3 ea	<u>Nipple: Galvanized Steel, 1 1/2 in Nominal Pipe Size, 3 in Overall Lg, Threaded on Both Ends, Welded</u>
6P862	1 ea	<u>Nipple: Galvanized Steel, 1 1/2 in Nominal Pipe Size, 6 in Overall Lg, Threaded on Both Ends, Welded</u>
20XP90	1 ea	<u>Garden Hose Adapter: 3/4 in x 3/4 in Fitting Size, Female x Female, Swivel, 1 1/8 in Overall Lg</u>
3LX09	2 ea	<u>Cam and Groove Adapter: 1 1/2 in Coupling Size, 1 1/2 in Hose Fitting Size, 2 7/64 in Overall Lg</u>
3LX15	1 ea	<u>Cam and Groove Coupling: 1 1/2 in Coupling Size, 1 1/2 in Hose Fitting Size, 2 13/16 in Overall Lg</u>
1DPL5	1 ea	<u>Cam and Groove Coupling: 1 1/2 in Coupling Size, 1 1/2 in Hose Fitting Size, 4 3/4 in Overall Lg</u>
6TWK2	1 or 2 ea	<u>Gate Valve: 1 1/2 in Pipe Size, 200 psi Max. Water Pressure - CWP</u>
55YK45	5 ft	<u>Tubing: PVC, 1 1/2 in Inside Dia, 2 in Outside Dia, 5 ft Lg. Clear, Not Reinforced, Laboratory</u>
23KZ75	1 pk	<u>Hex Head Cap Screw: Steel, Grade 5, Zinc Plated, 1/2"-13, Coarse, 2 in Lg, Globally Sourced, 10 PK</u>
22UH09	1 pk	<u>Flat Washer: For Screw Size 1/2 in, Steel, Grade 2, Zinc Plated, 0.531 in In Dia, Steel, 50 PK</u>
2FE67	1 pk	<u>Hex Nut: 1/2"-13 Thread, 3/4 in Hex Wd, 7/16 in Hex Ht, Steel, Grade 2, Black Oxide, 50 PK</u>



Flange Stand Set - Pipe Lengths



# Flange Stand Leaks and Repair





Pipe Stand Detail





1' to 3/4" Reducing  
Bushing & 3/4"  
Close Nipple" with  
Double Female  
NPT to GHT Swivel  
Adapter



AFC/WST - Travel Decon Set

Purchasing List

Vendor Part#	Qty	Description
Grainger 49EN70	1 ea	<u>Pail: 5 gal, Open Head, Plastic, 12 3/8 in, 14 3/4 in Overall Ht, Round, Yellow</u>
Grainger 49EN60	1 ea	<u>Pail: 5 gal, Open Head, Plastic, 12 3/8 in, 14 3/4 in Overall Ht, Round, Green</u>
Grainger 49EN64	1 ea	<u>Pail: 5 gal, Open Head, Plastic, 12 3/8 in, 14 3/4 in Overall Ht, Round, Red</u>
Grainger 8DY47	2 ea	<u>Scrub Brush: Medium, Plastic, 11 in Brush Lg, 8 1/4 in Handle Lg, 7/8 in Head Wd, Red</u>
Grainger 22JC26	4 ea	<u>Tarp: Std Duty, 8 x 10 ft Cut Size, 7 ft 4 in x 9 ft 6 in Finished Size, Blue</u>
Grainger 313G69	4 ea	<u>Water Hose: Kink Resistant, 5/8 in Hose Inside Dia., Varies, 15 ft Hose Lg</u>
Grainger 10D421	3 ea	<u>Spill Tray: 30 in L x 30 in W, 9 gal Spill Capacity, gal., PVC, Yellow</u>
Grainger 6AKD7	1 ea	<u>Fire Hose Adapter: NST x GHT, Female x Male, 1-1/2 in x 3/4 in Fitting Size, Brass x Brass, Rigid</u>
Grainger 35ZD37	1 ea	Garden Hose Manifold
Grainger 15X957	2 ea	Water Hose Nozzle
Grainger 39R408	3 ea	<u>Car Wash Brush: 10 in Overall Lg, Polypropylene, Yellow</u>
Grainger 48WX16	3 ea	<u>Handle: Threaded, Std, Wood, 72 in Lg, 1 1/8 in Dia, Wood, Fixed Handle (cut handle to 30")</u>
Academy Sports 50002309	1 ea	Manual Bilge Pump (Kayak Hand Pump w/ Hose)
Grainger 22FJ73	4 ea	<u>90° Elbow: 1 1/4 in x 1 1/4 in Fitting Pipe Size, Schedule 40, Female Socket x Female Socket, White</u>
Grainger 22FK95	14 ea	<u>Tee: 1 1/4 in x 1 1/4 in x 1 1/4 in Fitting Pipe Size, Schedule 40, 370 psi, White</u>
Grainger 5AFJ5	7 ea	<u>Pipe: PVC, ChlorFIT, 1 1/4 in Nominal Pipe Size, 10 ft Overall Lg, Unthreaded</u> (Need to cut into 20 sections - 30" each)
Custom Built	1 ea	WST LTWT Decon Shower
Custom Built w/ Grainger 6APH0 6PEA0 426G23	1 ea	WST Hydrant Adapter (2.5" fire hydrant cap, 0.5" NPT Male Quarter Turn Boiler Drain Valve, Garden Hose Wye w/ Shutoff)



