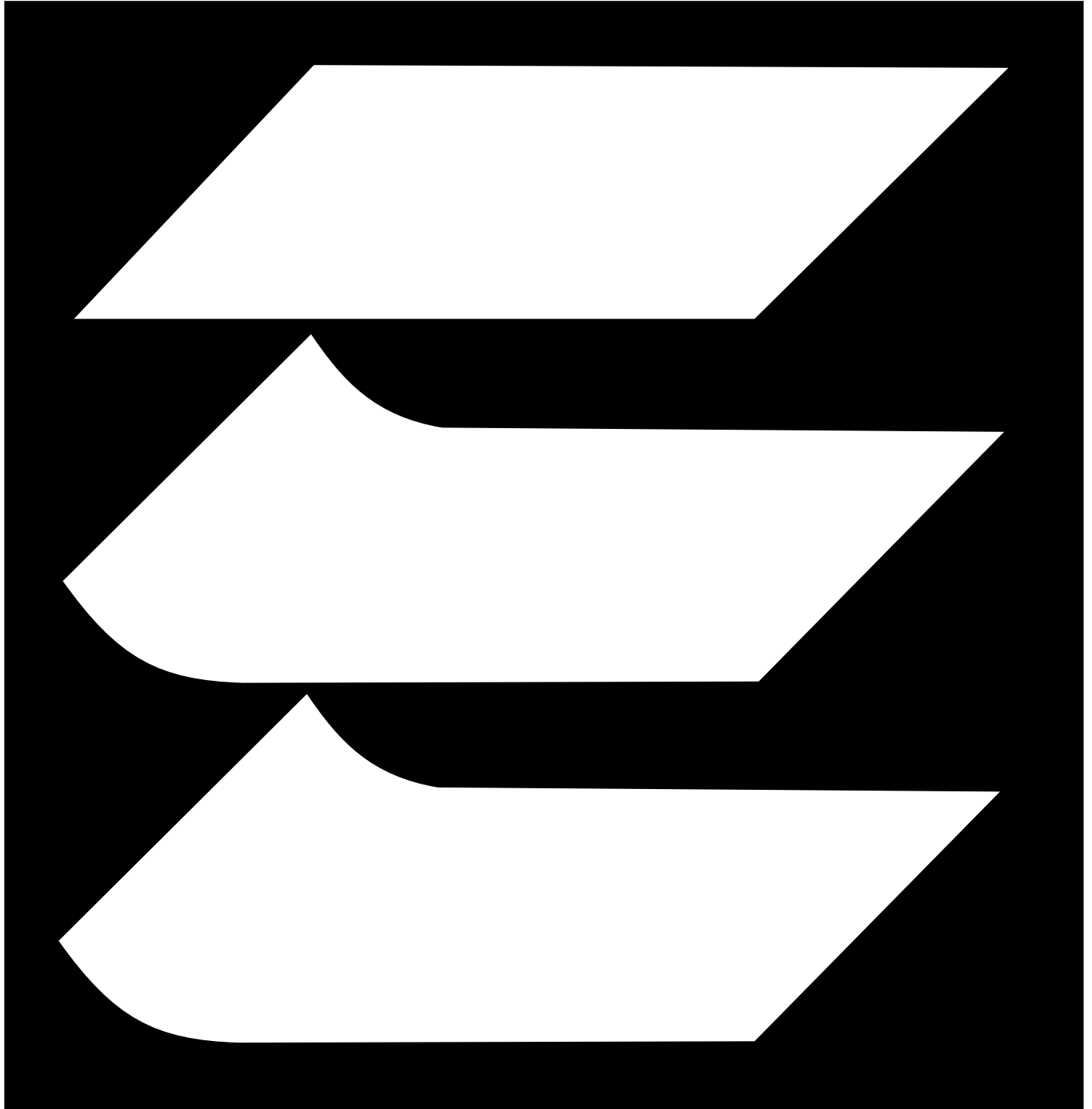




Exhaust & Underground
POLY COATED STEEL



SPIRAL PIPE & FITTINGS



Exhaust POLY COATED STEEL

EASTERN PCS ROUND DUCT AND FITTINGS CONSTRUCTION STANDARDS

Negative Pressure for Exhaust

Gauge selection for Eastern Poly Coated Steel (PCS).*

Fittings will be mechanically seamed and sealed.

DUCT DIAMETER	2005 SMACNA 2" WG		1995 SMACNA 2" WG		1995 SMACNA 10" WG	
	SPIRAL PIPE	FITTINGS	SPIRAL PIPE	FITTINGS	SPIRAL PIPE	FITTINGS
3"-4"	26	26	26	26	26	24
5"-6"	26	26	26	24	26	24
7"-8"	26	26	26	26	22	24
9"-10"	26	26	22	26	22	24
11"-12"	26	26	26	26	20	24
13"-14"	26	24	26	24	26	24
15"-16"	26	24	26	24	24	22
17"-18"	24	22	24	22	24	22
19"-20"	24	22	24	22	24	22
21"-22"	26R	22	24	20	24	22
23"-24"	26R	26R	22	20	24	22
25"-30"	26R	24R	22	18	22	20
31"-36"	26R	24R	20	18	22	20
37"-42"	26R	22R	20	16	20	18
43"-48"	24R	22R	18	18R	20	18
49"-54"	24R	22R	18	18R	18	16
55"-60"	24R	22R	18	18R	18	16
61"-66"	24R	20R	16	**	16	14
67"-72"	22R	20R	16	**	16	14
73"-78"	22R	20R	**	**	16	14
79"-84"	22R	20R	**	**	16	14

**Not addressed in this edition.

DUCT DIAMETER	2005 SMACNA 4" WG		1995 SMACNA 6" WG		1995 RIDC 2" WG	
	SPIRAL PIPE	FITTINGS	SPIRAL PIPE	FITTINGS	SPIRAL PIPE	FITTINGS
3"-4"	26	26	26	26	22	22
5"-6"	26	26	26	26	22	22
7"-8"	26	26	26	26	22	22
9"-10"	26	26	26	24	22	22
11"-12"	26	24	24	24	22	22
13"-14"	24	22	24	24R	22	22
15"-16"	24	22	26R	24R	22	22
17"-18"	26R	24R	26R	24R	22	22
19"-20"	26R	24R	26R	22R	22	22
21"-22"	26R	24R	24R	22R	20	20
23"-24"	26R	24R	24R	22R	20	20
25"-30"	24R	22R	24R	20R	18	18
31"-36"	24R	22R	22R	20R	16	16
37"-42"	22R	20R	22R	18R	16	16
43"-48"	22R	20R	20R	18R	22R	14
49"-54"	22R	18R	20R	18R	22R	14
55"-60"	22R	18R	20R	18R	20R	12
61"-66"	20R	18R	18R	16R	20R	12
67"-72"	20R	18R	18R	16R	20R	12
73"-78"	20R	18R	18R	16R	20R	10
79"-84"	20R	18R	18R	16R	18R	10

R = Reinforcement ring at 12' maximum spacing. Individual fittings may not have reinforcement.

* Because of the limitations of the construction methods we can use, Eastern PCS may require additional sealing in the field. Eastern will provide sealer as required for this, but will not be liable for labor for this sealing.

While the use of this type of material is widespread, ESM urges engineers always to consider the use of stainless steel whenever possible for systems.

Eastern PCS is not recommended for use in high visibility exposed applications because of the potential for damage to the PCS coating.



Exhaust DESIGN GUIDE

Eastern Poly Coated Systems (PCS) are frequently used for corrosive fume exhaust as an alternative to the use of stainless steel. Eastern PCS duct and fittings are made from G90 galvanized steel, which has been coated with a poly vinyl coating. This coating is provided in a 4x1 coating, 4 mils of poly vinyl coating on one side of the steel and an epoxy primer on the other; or a 4x4 coating, 4 mils of poly vinyl on both sides.

The temperature limits for Eastern PCS are sufficient for most commercial applications. The material is designed for exposure from -40°F to 250°F, with intermittent exposure of 400°F.

This list of the most frequently used industrial chemicals is coded to reflect the use of Eastern PCS as an acceptable material for corrosive fume exhaust. The following data is the result of laboratory testing conditions and should be used as a guideline in determining the ultimate use for the material. Actual service conditions may vary greatly.

Note: For all installations, exposed edges are to be covered with PCS sealant. Because of the limitations of the construction methods available, Eastern PCS may require additional sealing in the field. Eastern will provide sealer as required for this purpose, but will not be liable for the labor required to perform this additional sealing. This coating is also susceptible to damage and requires extra care during installation. Touch up of the coating may also be required. While use of this material is widespread, ESM urges engineers, because of the limitations mentioned above, to consider the use of stainless steel whenever budgets allow.

E=Excellent		G=Good		S=Satisfactory		U=Unsatisfactory	
CHEMICAL	PCS	CHEMICAL	PCS	CHEMICAL	PCS	CHEMICAL	PCS
Acetaldehyde	.U	Ammonia, Gas	.E	Barium Chloride	.E	Barium Chloride	.E
Acetamide	—	Ammonia, Liquid	.S	Barium Hydrate	—	Barium Hydroxide	.E
Acetate Solvents — Crude	.U	Ammonia, Aqua 10%	.E	Barium Sulfate	.E	Barium Sulfide	—
Acetate Solvents — Pure	.U	Ammonium Acetate	—	Beer	.E	Beet	.E
Acetic Acid 0-20%	.E	Ammonium Bifluoride	.E	Benzol	.U	Benzaldehyde	.U
Acetic Acid 20-30%	.E	Ammonium Bromide	—	Benzene Sulfonic Acid 10%	.E	Benzoic	.E
Acetic Acid 30-60%	.E	Ammonium Carbonate	.E	Bismuth Carbonate	.E	Black Liquor	.E
Acetic Acid 80%	.G	Ammonium Chloride	.E	Bleach	.E	Borax	.E
Acetic Acid — Glacial	.G	Ammonium Chloride 25%	.E	Boric Acid	.E	Boron Trifluoride	.E
Acetic Acid Vapors	.E	Ammonium Hydroxide 28%	.E	Bordeaux Mixture	—	Breeder Pellets	.E
Acetic Anhydride	.U	Ammonium Metaphosphate	.E	Brine	.E	Bromic Acid	.E
Acetone	.U	Ammonium Nitrate	.E	Bromine Liquid	.U	Bromine Water	.E
Acetyl Chloride	.E	Ammonium Monophosphate	—	Butadiene	.E	Butane	.E
Acetylene	.E	Ammonium Oxalate	—	Butanol Primary	.E	Butanol Secondary	.E
Adipic Acid	.E	Ammonium Persulfate	.E	Butyl Acetate	.G	Butyl Alcohol	.E
Alcohol, Allyl	.E	Ammonium Phosphate	.E	Butylene	.E	Butyl Phenol	.E
Alcohol, Amyl	.E	Ammonium Sulfate	.E	Butyne Diol	.E	Butyric Acid	.G
Alcohol, Butyl	.E	Ammonium Sulfide	.E	Cadmium	—		
Alcohol, Ethyl	.E	Ammonium Thiocyanate	.E				
Alcohol, Methyl	.E	Amyl Acetate	.U				
Alcohol, Propyl	.E	Amyl Alcohol	.E				
Alkaform Anesthesia	—	Amyl Chloride	.U				
Allyl Chloride	.U	Aniline	.U				
Alum	.E	Aniline Chlorohydrate	.U				
Alum, Chrome	.E	Aniline Hydrochloride	.U				
Alum, Potassium	.E	Anthraquinone	.E				
Aluminum Chloride	.E	Anthraquinonesulfonic Acid	.E				
Aluminum Fluoride	.E	Antimony Trichloride	.E				
Aluminum Hydroxide	.E	Aqua Regia	.E				
Aluminum Oxychloride	.E	Arsenic Acid	.E				
Aluminum — Molten	—	Arsenius	—				
Aluminum Nitrate	.E	Arylsulfonic Acid	.E				
Aluminum Sulfate	.E	Baking Oven Gases	—				
Aluminum Sulfuric Acid 40-70 95%	.U	Barium Carbonate	.E				



Exhaust DESIGN GUIDE

E=Excellent

G=Good

S=Satisfactory

U=Unsatisfactory

CHEMICAL

PCS

CHEMICAL

PCS

CHEMICAL

PCS

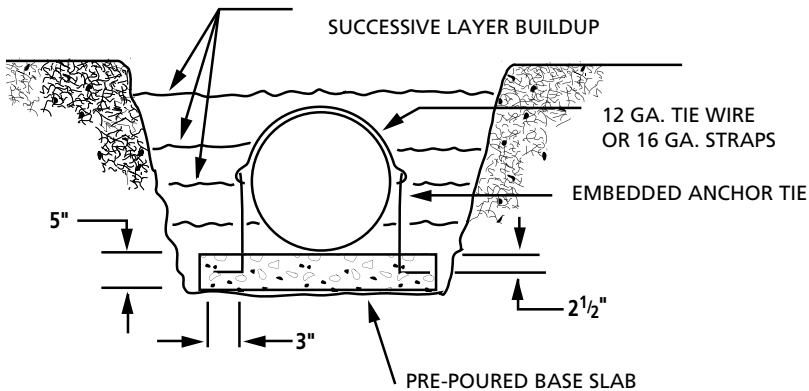
Calcium Bisulfite	E	Ethylene Chlorohydrin	U	Lemon Oil	—
Calcium Carbonate	E	Ethylene Dichloride	U	Linseed Oil	E
Calcium Chlorate	E	Ethylene Glycol	E	Linoleic Acid	E
Calcium Chloride	E	Fatty Acids	E	Liqueurs	E
Calcium Hydroxide	E	Ferric Chloride	E	Lubricating Oil	—
Calcium Hypochlorite	E	Ferric Nitrate	E	Lysol	—
Calcium Nitrate	E	Ferric Sulfate	E	Magnesium Carbonate	E
Calcium Sulfate	E	Ferrous Chloride	E	Magnesium Chloride	E
Carbonated Beverages	—	Ferrous Sulfate	E	Magnesium Hydroxide	E
Carbolic	—	Fluorine Gas	E	Magnesium Nitrate	E
Carbonic Acid	E	Fluoroboric Acid	E	Magnesium Sulfate	E
Carbon Bisulfide	U	Fluorosilicic Acid	E	Maleic Acid	E
Carbon Dioxide	E	Formaldehyde	E	Malic Acid	E
Carbon Monoxide	E	Formic Acid	E	Meats	—
Carbon Tetrachloride	S	Freon-12	E	Mercuric Chloride	E
Castor Oil	E	Fructose	E	Mercuric Cyanide	E
Caustic Potash	E	Furfural	U	Mercurous Nitrate	E
Caustic Soda	E	Gallic Acid	E	Mercury	E
Chloracetic Acid	E	Gas Coke Oven	E	Methane	E
Chloral Hydrate	E	Gas Natural	E	Methyl Alcohol	E
Chloric Acid 20%	E	Gas Manufactured	U	Methyl Chloride	U
Chlorine Gas	G	Gasoline	E	Methyl Sulfate	E
Chlorine Water	E	Glauber's Salt	—	Methyl Sulfuric Acid	E
Chlorobenzene	U	Gold Cyanide Electroplating	—	Methylene Chloride	U
Chloroform	U	Glucose	E	Milk	E
Chlorosulfonic Acid	E	Glycerine	E	Mineral Oil	E
Chrome Alum	E	Glycol	E	Mine Water	—
Chromic Acid 50%	E	Glycolic Acid	E	Mixed Acids	E
Cider	—	Green Liquor	E	Molasses	E
Citric	E	Heptaine	E	Molybdc	—
Copper Carbonate	—	Hexane	E	Monoethanolamine	—
Copper Chloride	E	Hexanol Tertiary	E	Naphtha	E
Copper Cyanide	E	Hydrobromic Acid 20%	E	Naphthalene	U
Copper Fluoride	E	Hydrochloric Acid 35%	E	Nickel Chloride	E
Copper Nitrate	E	Hydrochloric Acid 50%	E	Nickel Nitrate	E
Copper Sulfate	E	Hydrocyanic Acid 10%	E	Nickel Sulfate	E
Cottonseed Oil	E	Hydrofluoric Acid 50%	E	Nicotine	E
Cresol	U	Hydrogen	E	Nicotinic Acid	E
Creosote	—	Hydrogen Cyanide	E	Nitric Acid 10%	E
Cresylic Acid 50%	E	Hydrogen Peroxide 50%	E	Nitric Acid 70%	E
Croton Aldehyde	U	Hydrogen Phosphide	E	Nitric Acid 100%	U
Crude Oil	E	Hydrogen Sulfide Dry+	E	Nitrobenzene	U
Cyclohexanol	U	Hydrogen Sulfide Aq. Sol.	E	Nitrous Acid 10%	—
Cyclohexanon	U	Hydroquinone	E	Nitrous Oxide	E
Deminerlized Water	E	Hydroxylamine Sulfate	E	Ocenol	E
Dextrin	E	Hypochlorous Acid	E	Oil and Fats	E
Dextrose	E	Iodine	U	Oleic Acid	E
Diazo Salts	E	Jet Fuel JP-4	E	Oleum	U
Diglycolic Acid	E	Jet Fuel JP-5	E	Oxalic Acid	E
Dimethylamine	U	Kerosene	E	Oxygen	E
Diocylphthalate	U	Ketones	U	Ozone	G
Disodium Phosphate	E	Kraft Liquor	E	Palmitic Acid 10%	E
Ethers	U	Lactic Acid 25%	E	Palmitic Acid 70%	E
Ethyl Acetate	U	Lactic plus Salt	—	Peracetic Acid 40%	E
Ethyl Acrylate	U	Lard Oil	E	Perchloric Acid 10%	E
Ethyl Alcohol	E	Lauric Acid	E	Perchloric Acid 70%	U
Ethyl Chloride	U	Lauryl Chloride	E	Phenol	E
Ethyl Ether	U	Lead Molten	—	Phenylhydrazine	U
Ethylene Bromide	U	Lead Acetate	E	Phenylhydrazine Hydrochloride	E



Exhaust DESIGN GUIDE

E=Excellent		G=Good		S=Satisfactory		U=Unsatisfactory	
CHEMICAL	PCS	CHEMICAL	PCS	CHEMICAL	PCS	CHEMICAL	PCS
Phosgene Liquid	U	Salicylic Acid	E	Sulfur Dioxide Wet	G	Sulfur Oxychloride	—
Phosgene Gas	E	Salicylaldehyde	—	Sulfuric Acid 10%	E	Sulfuric Acid 30%	E
Phosphoric Acid 10%	E	Sea Water	E	Sulfuric Acid 60%	E	Sulfuric Acid 70%	E
Phosphoric Acid 25, 50%	E	Sauerkraut Brine	—	Sulfuric Acid 80%	E	Sulfuric Acid 90%	E
Phosphoric Acid 50, 85%	E	Selenic Acid	E	Sulfuric Acid 95%	E	Sulfuric Acid 103%	U
Phosphorus Yellow	E	Silicic Acid	E	Sulfurous Acid	E	Sulfur Trioxide	E
Phosphorus Pentoxide	E	Silver Bromide	—	Steam and Air	—	Steam and CO ₂ and Air	—
Phosphorous Trichloride	U	Silver Nitrate	E	Steam SO ₂ CO ₂ and Air	—	Syrup	—
Photographic Solutions	E	Silver Cyanide Electroplating Sol.	—	Tall Oil	E	Tannic Acid	E
Picric Acid	U	Soaps	E	Tanning Liquors	E	Tartaric Acid	E
Plating Solutions	E	Soap Solutions	E	Tetroethyl Lead	E	Tetrahydrofuran	U
Plating Solutions, Brass	—	Sodium Acetate	E	Thionyl Chloride	U	Thread Cutting Oils	—
Plating Solutions, Cadmium	—	Sodium Benzoate	E	Thread Cutting Oils	—	Titanium Tetrachloride	E
Plating Solutions, Chrome 25%	—	Sodium Bicarbonate	E	Toluene, Toluol	U	Toluene-Kerosene Mixture	—
Plating Solutions, Chrome 40%	—	Sodium Bichromate	—	Tomato Juice	—	Toxaphene-Xylene	—
Plating Solutions, Copper	—	Sodium Bisulfate	E	Tributyl Phosphate	U	Trichloroacetic Acid	—
Plating Solutions, Gold	—	Sodium Borate	—	Trichloroethylene	U	Triethanolamine	E
Plating Solutions, Iron	—	Sodium Bisulfite	E	Triethylamine	E	Triethylamine	E
Plating Solutions, Lead	—	Sodium Bromide	E	Trimethylpropane	E	Urea	E
Plating Solutions, Nickel	—	Sodium Carbonate	E	Uric Acid	E	Urine	E
Plating Solutions, Rhodium	—	Sodium Chlorate	E	Vegetable Oil	—	Vegetable Juices	—
Plating Solutions, Silver	E	Sodium Chloride	E	Vegetable Juices	—	Vinyl Acetate	U
Plating Solutions, Tin	—	Sodium Chlorite	—	Visco 202 Crude Oil Additive	—	Water	E
Plating Solutions, Zinc	—	Sodium Citrate	—	Water	E	Water Acid Mine	E
Potassium Aluminum Sulfate	—	Sodium Cyanide	E	Water Demineralized	E	Water Distilled	E
Potassium Bicarbonate	E	Sodium Dichromate	E	Water Salt	E	Water Sewage	E
Potassium Bichromate	E	Sodium Ferricyanide	E	Water Sewage	E	Whiskey	—
Potassium Borate	E	Sodium Ferrocyanide	E	White Liquor	E	Wines	E
Potassium Bromate	E	Sodium Fluoride	E	Xylene or Xylol	U	Zinc Chloride	E
Potassium Bromide	E	Sodium Hydroxide 15%	E	Zinc Chromate	E	Zinc Cyanide	E
Potassium Carbonate	E	Sodium Hydroxide 30%	E	Zinc Molten	—	Zinc Nitrate	E
Potassium Chlorate Aqueous	—	Sodium Hydroxide 70%	E	Zinc Sulfate	E	Zinc Sulfate	E
Potassium Chloride	E	Sodium Hypochlorite	E				
Potassium Chromate	—	Sodium Iodide	—				
Potassium Cyanide	E	Sodium Lactate	—				
Potassium Dichromate	E	Sodium Nitrate	E				
Potassium Ferricyanide	E	Sodium Nitrite	E				
Potassium Ferrocyanide	E	Sodium Peroxide	—				
Potassium Fluoride	E	Sodium Phosphate	—				
Potassium Hydrate	—	Sodium Phosphate	—				
Potassium Hydroxide	E	Sodium Sulfate	E				
Potassium Hypochlorite	—	Sodium Sulfide	E				
Potassium Iodide	—	Sodium Sulfite	E				
Potassium Nitrate	E	Sodium Thiosulfate 20% plus Acetic Acid 20%	—				
Potassium Oxalate	—	Sodium Thiosulfate plus 4% Potassium Meta Bisulfate	—				
Potassium Perborate	E	Soda Ash	—				
Potassium Perchlorate	E	Sour Crude Oil	E				
Potassium Permanganate 10%	E	Speculum Plating Solution	—				
Potassium Persulfate	E	Stannic Chloride	E				
Potassium Sulfate	E	Stannous Chloride	E				
Propane	E	Stearic Acid	E				
Propargyl Alcohol	E	Stoddard's Solvent	E				
Propyl Alcohol	E	Succinic Acid	—				
Propylene Dichloride	U	Sulfated Detergents	—				
Pyrogallic	—	Sulfur	E				
Pyroligneus	—	Sulfur Chloride	E				
Rayon Coagulating Bath	E	Sulfur Dioxide Dry	E				
Salenic Acid Aqueous	E						

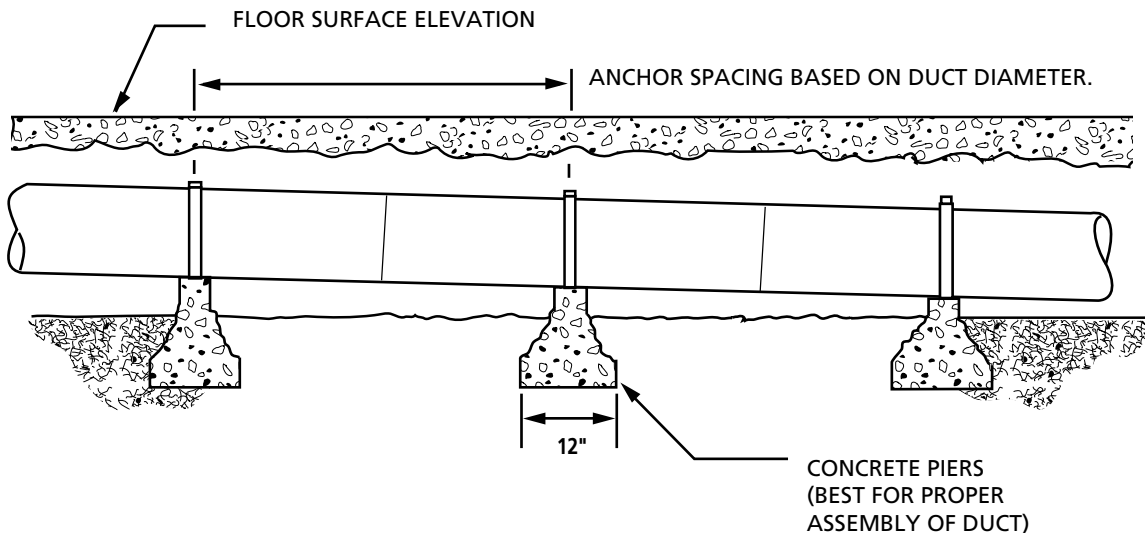
Underground INSTALLATION GUIDE



PRECAUTION!

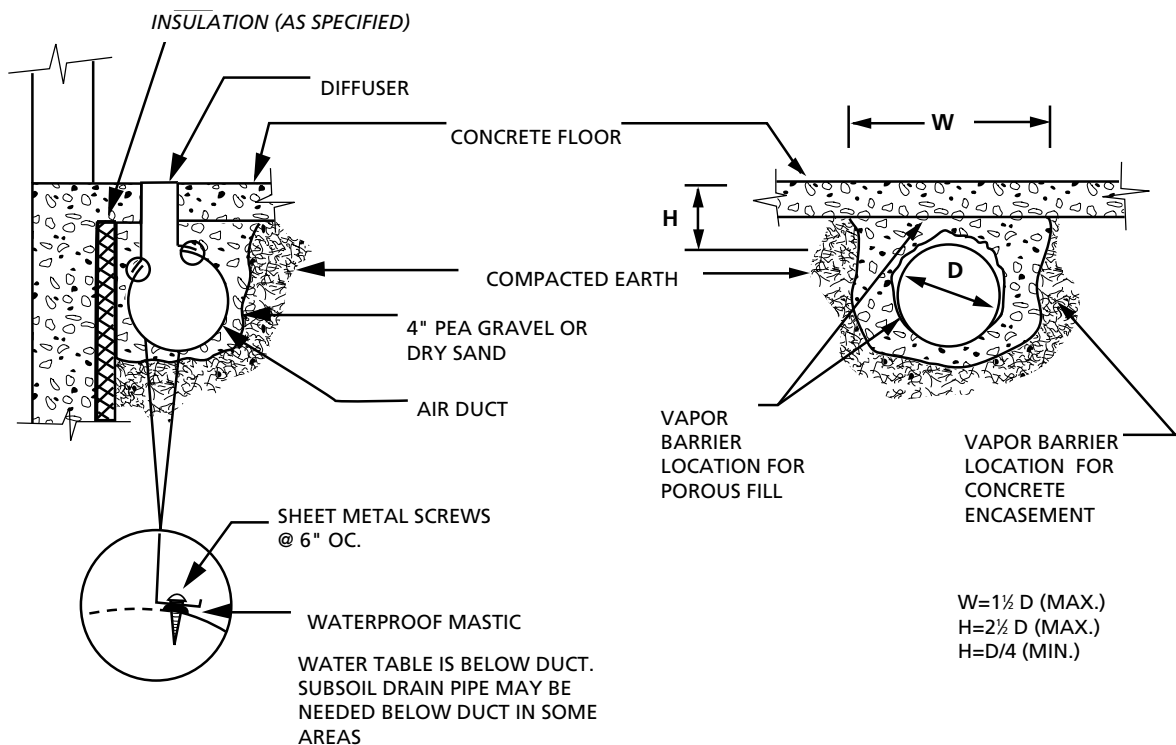
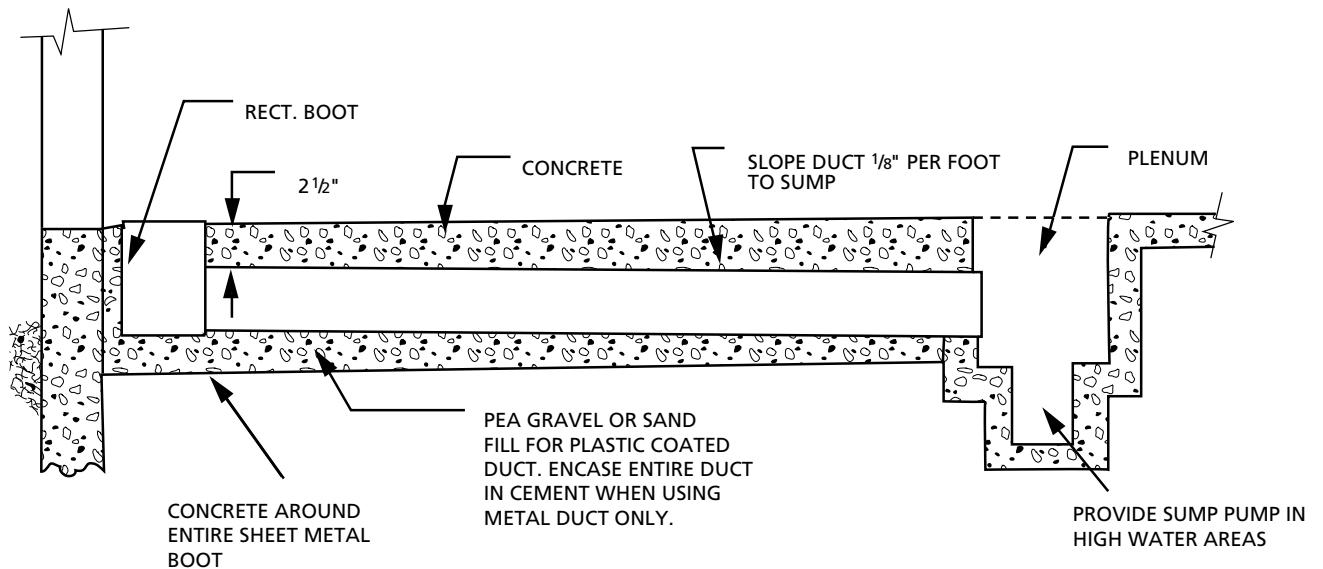
THREE STAGE PLACEMENT OF CONCRETE IS ADVISABLE TO AVOID DAMAGE AND REDUCE DANGER OF FLOTATION. CONCRETE SHOULD NEVER BE DUMPED ON THE DUCT; COVER SHOULD BE MOVED LATERALLY OVER THE DUCT.

- Do not dump directly on top of ducts. Hand shoveling is recommended until the duct is buried at least 12".
- Fill must be tamped under and around the duct. Care must be taken not to damage duct.
- This duct is not for use in areas of vehicular traffic of any kind both during and after construction.
- Underground duct is not watertight.
- Duct that appears to be damaged must not be installed.
- Temporary reinforcement may be required during back filling. Reinforcement is not provided by ESM.
- Failure to follow the instructions above will void warranty.

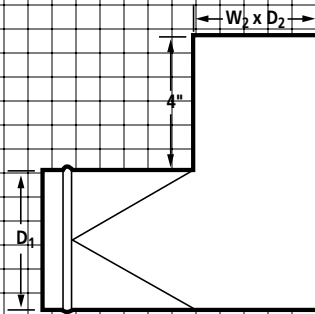


TYPICAL ANCHORAGE OF DUCTS TO BE ENCASED IN CONCRETE

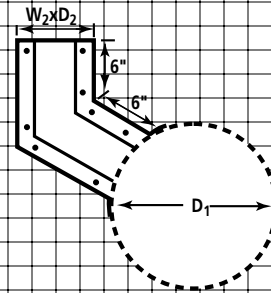
Underground INSTALLATION GUIDE



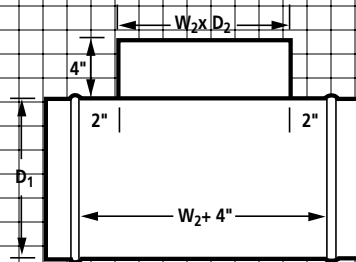
ELBOW ROOT

EB

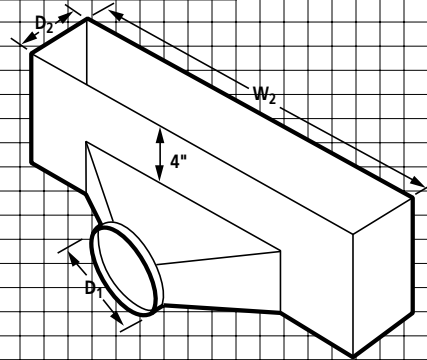
45° RECTANGLE ON ROUND

45RR

RECTANGLE ON ROUND

RR

SPECIAL ELBOW BOOT

SEB**UNDERGROUND**

Gauge selection for Eastern Poly Coated Steel (PCS).*
Fittings will be mechanically seamed and sealed.

DUCT DIAMETER	1995 SMACNA 2" WG: POSITIVE SPIRAL PIPE	
	PIPE	FITTINGS
3"-8"	26	26
9"-16"	24	24
17"-24"	22	22
25"-32"	20	20
33"-48"	18	18
49"-60"	16	16

* Because of the limitations of the construction methods we can use, Eastern PCS may require additional sealing in the field. Eastern will provide sealer as required for this, but will not be liable for labor for this sealing.