Draft Work Permit and Traffic Stipulations

Phase I Environmental Site

Assessment Report

Phase II Environmental Site

Assessment Report

Geotechnical Engineering Report

Hydraulic System Report
prepared by Prysmian

Railroad Construction Company, Inc.
Contractors – Engineers
75-77 Grove Street • Paterson, NJ 07503
Est. 1926
Phone: 973-684-0362 • Fax: 973-684-1355

Prysmian NYC Transition Vault and Fluid Vault
Preliminary Pick Plan for Structures at 52nd Street

This preliminary picking plan will be as describe below for both structures located on 52nd street just east of 12th ave. We intend on using a NYC certified lifting and rigging contractor for all work which requires a crane for placement of structures.

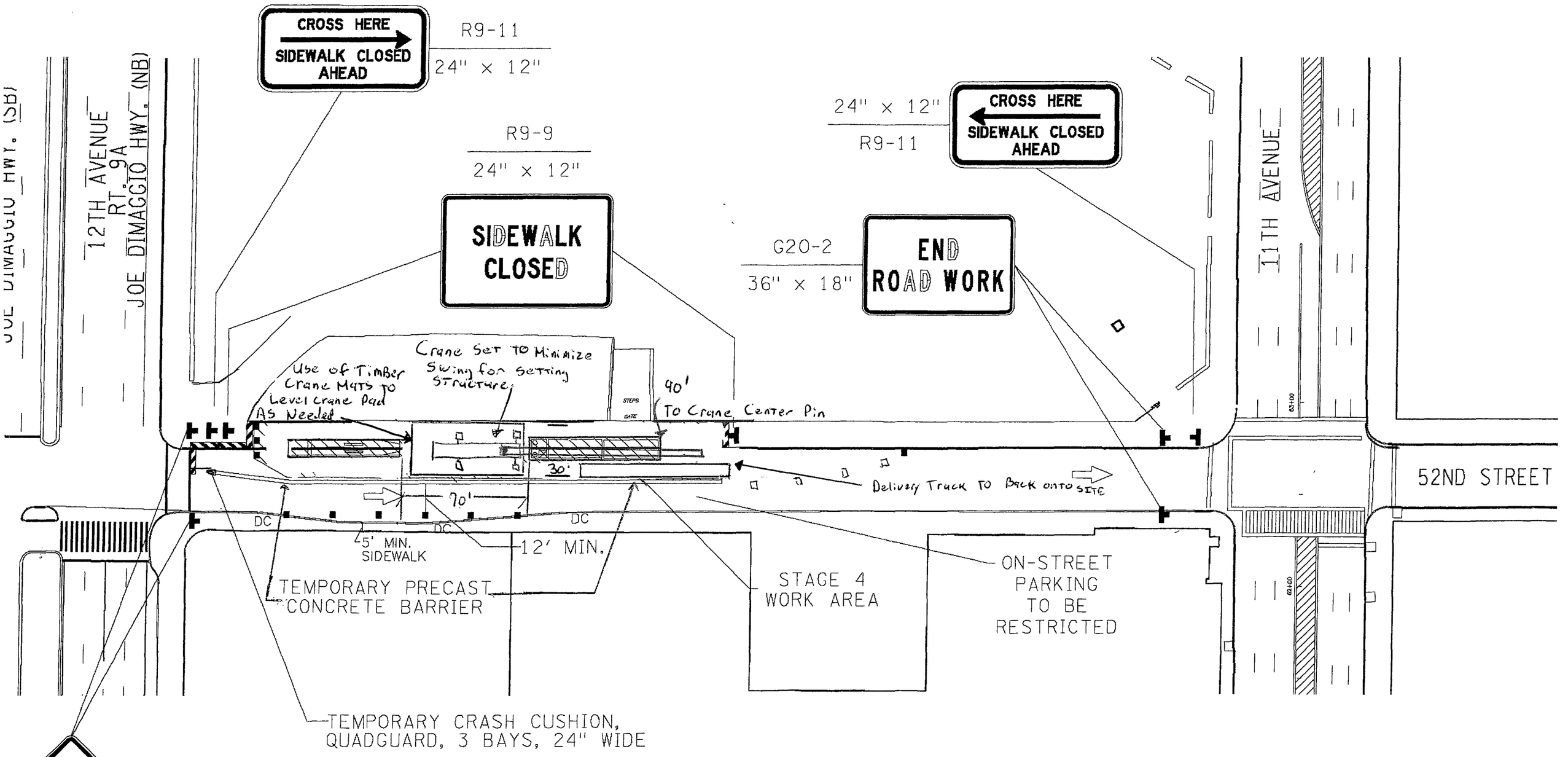
The largest pick of 25 tons is identified below. We intend on using a 110 ton Rough Terrain Hydraulic crane to set these structures or similar as advised by our lifting and rigging subcontractor. (See attached 110 ton Crane Specifications)

The heaviest pick we have identified will be the equipment enclosure on the Fluid Vault. This enclosure will come in 3 separate sections, which will consist of the base walls and slab (25 tons), Intermediate walls (17 tons) and the roof slab (7 tons). The rest of the structures will come in approximately 15 ton sections, which are to be assembled in place.

The center of the heaviest pick will be approx 40' off the center pin of the crane to its permanent location. The delivery trailer will be parked to have the center of the load with in 65' of the crane center pin. (See attached Sketch).

All Conduit and pipe to be installed in trenches and excavations will be placed using conventional excavators, earth moving equipment and/or by hand and manpower as the site allows for the access of equipment.

Please be advised the structures have not been designed and approved yet so the heaviest weights used for this pick plan are preliminary approximate weight. This pick plan will be revised as required to provide for the proper safety allowances for the weight and distances of the actual picks when these structures are designed and fabricated.

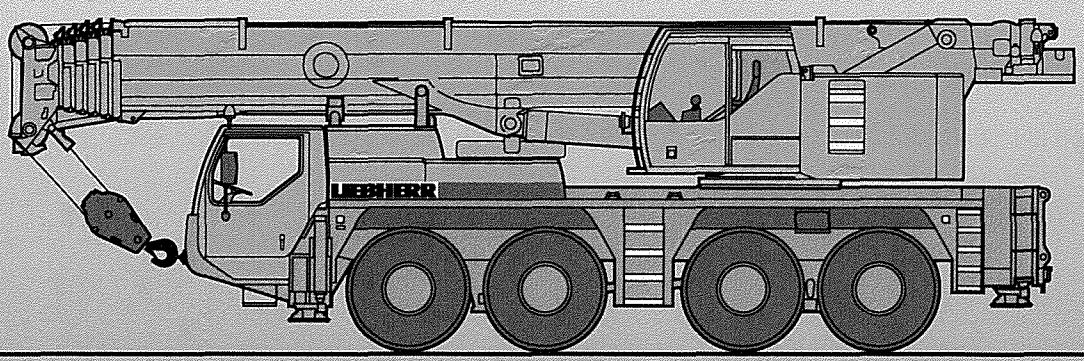


NOT TO SCALE

TYPICAL WORK ZONE TRAFFIC CONTROL LAYOUT - RIGHT SHIFT FOR WORK ON 52ND STREET

Grue mobile

Technical Data
Caractéristiques techniques



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↔ ft	36 ft *	36 ft	48 ft	60 ft	72 ft	83 ft	95 ft	107 ft	119 ft	130 ft	142 ft	154 ft	164 ft	↔ ft
9		150	140	140										9
10	212	150	140	139	118									10
12	146	145	137	131	118	96								12
14	134	132	126	121	115	96	82.5							14
16	124	120	117	112	108	96	81.5	61.5						16
18	116	110	109	105	101	94	79.5	61.5	54.6					18
20	108	101	102	98	94.5	91	77.5	61.5	54.5	42.9				20
23	96	88.5	90	89	85.5	82.5	74.5	61.5	53.6	42.9				23
26	83	77.5	79	79	78	75	71.5	58.5	51.5	42.4	34			26
29	63.5	63	70	70.5	68	66.5	63	54.7	48.8	41.2	33.5	25.1		29
32			62	62.5	60.5	59	55.9	50.9	45.9	39.5	32.7	25.1	21.8	32
35			55.5	55.7	54.8	52.7	50	47	43.2	37.6	31.5	25.1	21.8	35
38			50.2	50.8	49.6	47.5	45	43	40.7	35.8	30.3	24.8	21.5	38
44				42.1	41.3	39.5	37.4	36.4	34.5	32.4	27.8	23.4	20.6	44
50				34.8	34.8	33.4	31.8	31.6	29.8	28.5	25.6	21.9	19.4	50
56					29.5	28.7	28.2	27.5	26	24.6	23.6	20.5	18.1	56
62						24.8	25.3	24	22.7	21.7	21.3	19.1	16.9	62
68						21.4	22.1	21.1	20.4	19.6	18.7	17.8	15.8	68
74							19.3	18.7	18.7	17.6	16.6	16.5	14.8	74
80							17.1	16.8	16.6	15.7	15.2	15	13.9	80
86								15.2	14.7	14.5	14.1	13.4	13	86
92								13.9	13.1	12.9	12.7	11.8	11.7	92
98								12.5	12	11.6	11.2	10.5	10.4	98
104									11.1	10.4	10	9.2	9.2	104
110									10.1	9.4	8.9	8.3	8.2	110
116										8.5	8.1	7.4	7.3	116
122											7.3	6.6	6.5	122
128											6.7	5.9	5.8	128
134												5.3	5.2	134
140												4.7	4.7	140
146													4.2	146

* over rear / en arrière

TAB 150315 / 150301

↔ ft	36 ft	48 ft	60 ft	72 ft	83 ft	95 ft	107 ft	119 ft	130 ft	142 ft	154 ft	164 ft	↔ ft
9	150	140	140										9
10	150	140	139	118									10
12	145	137	131	118	96								12
14	131	126	121	115	96	82.5							14
16	119	117	112	108	96	81.5	61.5						16
18	109	109	105	101	94	79.5	61.5	54.6					18
20	99.5	101	98	94	91	77.5	61.5	54.5	42.9				20
23	85.5	87	87.5	83.5	80	74.5	61.5	53.6	42.9				23
26	75	76	74.5	71	69	65	58.5	51.5	42.4	34			26
29	62.5	67	64.5	63	60.5	57	53.6	48.8	41.2	33.5	25.1		29
32		58.7	57.6	55.8	53.2	50.3	48.2	45.4	39.5	32.7	25.1	21.8	32
35		52.1	51.5	49.7	47.4	44.9	43.4	41.1	37.6	31.5	25.1	21.8	35
38		46.2	46.2	44.6	42.6	40.5	39.6	37	35.6	30.3	24.8	21.5	38
44			37.8	37	35.4	34.4	33.5	31.5	30.2	27.8	23.4	20.6	44
50			31.2	31.1	29.8	29.7	28.5	26.9	26	24.9	21.9	19.4	50
56				26.3	25.5	25.8	24.4	23.7	22.8	21.7	20.5	18.1	56
62					22	22.4	21.4	21.2	20	19.2	18.7	16.9	62
68					19	19.5	19.3	18.6	17.8	17.5	16.6	15.7	68
74						16.9	17.3	16.3	16.1	15.6	14.6	14.3	74
80						14.9	15.2	14.5	14.3	13.8	12.8	12.6	80
86							13.3	13.2	12.5	12.1	11.3	11.1	86
92							11.9	11.7	11	10.6	9.7	9.6	92
98							10.7	10.4	9.7	9.3	8.6	8.5	98
104								9.3	8.7	8.3	7.6	7.5	104
110								8.5	7.8	7.4	6.7	6.6	110
116									7.1	6.6	5.9	5.9	116
122										5.9	5.3	5.2	122
128										5.3	4.6	4.6	128
134											4	4	134
140											3.4	3.5	140
146												2.9	146

TAB 150303

↔ ft	36 ft	48 ft	60 ft	72 ft	83 ft	95 ft	107 ft	119 ft	130 ft	142 ft	154 ft	164 ft	↔ ft
9	150	140	140										9
10	150	140	139	118									10
12	144	137	131	118	96								12
14	129	126	121	114	96	82.5							14
16	115	115	109	99.5	91	81.5	61.5						16
18	102	100	94.5	87	81.5	74.5	61.5	54.6					18
20	89	84	81	76.5	71.5	66.5	60.5	54.1	42.9				20
23	71	69	66.5	63	59.3	55.8	52.8	49.3	42.9				23
26	59.1	57.7	55.9	53.4	50.5	47.7	46.6	43.7	40.8	34			26
29	49.3	49.3	48.1	46.1	43.8	42.9	40.7	38	36.7	33.5	25.1		29
32		42.8	41.9	40.2	38.5	37.9	35.9	34.5	32.6	30.6	25.1	21.8	32
35		37.5	36.7	35.4	33.9	33.5	32	31	29.4	27.2	25.1	21.8	35
38		32.7	32.5	31.7	30	29.8	29.1	27.7	26.8	25.2	24	21.5	38
44			26.1	26.4	24.3	25	24.1	23.2	22.2	21.2	19.9	19.1	44
50			21.1	21.9	20.7	21	20.2	19.5	18.4	17.6	16.4	16.1	50
56				18.1	17.9	17.8	17.1	16.5	15.5	14.8	13.7	13.4	56
62					15	15	14.6	14	13.1	12.5	11.5	11.2	62
68					12.6	12.7	12.4	12	11.2	10.6	9.6	9.5	68
74						10.8	10.5	10.3	9.5	9	8.1	8	74
80						9.3	9	8.7	8.1	7.7	6.8	6.7	80
86							7.8	7.6	7	6.6	5.7	5.6	86
92							6.8	6.6	6	5.6	4.8	4.7	92
98							6	5.7	5.1	4.8	4	3.9	98
104								5	4.4	4	3.2	3.1	104
110								4.4	3.7	3.4	2.6	2.5	110
116									3.1	2.8			116
122										2.2			122

TAB 150309

↔ ft	36 ft	48 ft	60 ft	72 ft	83 ft	95 ft	107 ft	119 ft	130 ft	142 ft	154 ft	164 ft	↔ ft
9	150	140	140										9
10	150	140	139	118									10
12	143	137	131	118	96								12
14	129	126	120	111	96	82.5							14
16	114	111	104	95.5	87.5	81	61.5						16
18	99	94.5	90	83.5	77	72.5	61	54.6					18
20	84	80	77	72.5	67.5	63	59.5	53.9	42.9				20
23	67	65	63	59.6	56.1	52.8	49.9	48	42.9				23
26	55.7	54.5	52.9	50.6	47.7	46.8	44	41.1	38.2	34			26
29	46.4	46.5	45.4	43.5	41.4	40.6	38.2	36.5	34.5	32.1	25.1		29
32		40	39.2	37.6	36	35.4	33.8	32.5	31	28.5	25.1	21.8	32
35		34.8	34.2	33.7	31.6	31.2	30.5	29	28	25.9	24.5	21.8	35
38		30.4	30.3	30.3	27.9	28.4	27.5	26.3	25.2	23.8	22.5	21.3	38
44			24.2	24.7	23.4	23.5	22.5	21.7	20.5	19.6	18.3	17.9	44
50			19.5	20.2	19.7	19.5	18.7	18	17	16.2	15	14.7	50
56				16.7	16.5	16.4	15.7	15.1	14.2	13.5	12.4	12.2	56
62					13.8	13.8	13.3	12.8	12	11.3	10.3	10.1	62
68					11.5	11.6	11.3	10.9	10.1	9.6	8.6	8.5	68
74						9.8	9.5	9.2	8.6	8.1	7.2	7	74
80						8.4	8.2	7.9	7.3	6.9	6	5.8	80
86							7	6.8	6.2	5.8	4.9	4.8	86
92							6.1	5.9	5.3	4.9	4	3.9	92
98							5.4	5.1	4.5	4.1	3.2	3.1	98
104								4.4	3.8	3.4	2.6	2.5	104
110								3.7	3.1	2.8			110
116									2.5				116

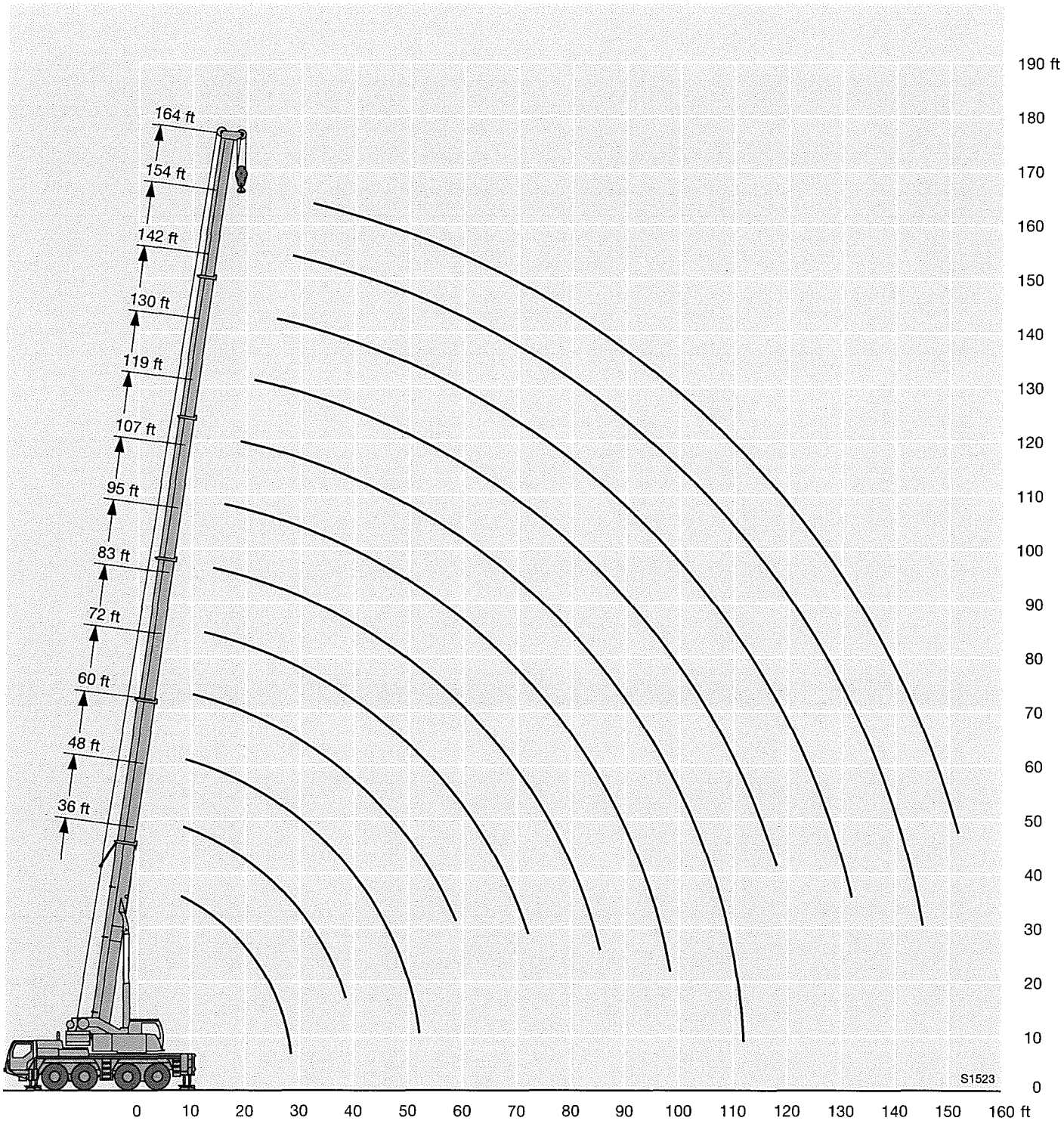
TAB 150310

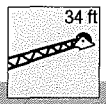
↔ ft	36 ft	48 ft	60 ft	↔ ft
9	51.9	53.2	54	9
10	51.4	52.7	53.5	10
12	45.2	46.6	47.4	12
14	40.1	41.5	42.4	14
16	35.8	37.2	38.1	16
18	32.2	33.8	34.6	18
20	29	30.5	31.4	20
23	25	26.6	27.5	23
26	21.7	23.4	24.3	26
29	19	20.7	21.6	29
32		18.4	19.3	32
35		16.4	17.3	35
38		14.4	15.6	38
44			12.3	44
50			9.6	50

0° = over rear / en arrière

TAB 150137

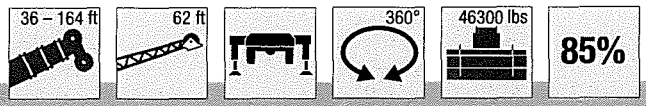
tyre size / dimensions de pneumatiques: 445/95 R 25 (16.00 R 25) / 525/80 R 25 (20.5 R 25)


164 ft
154 ft
142 ft
130 ft
119 ft
107 ft
95 ft
83 ft
72 ft
60 ft
48 ft
36 ft
190 ft
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
S1523
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 ft



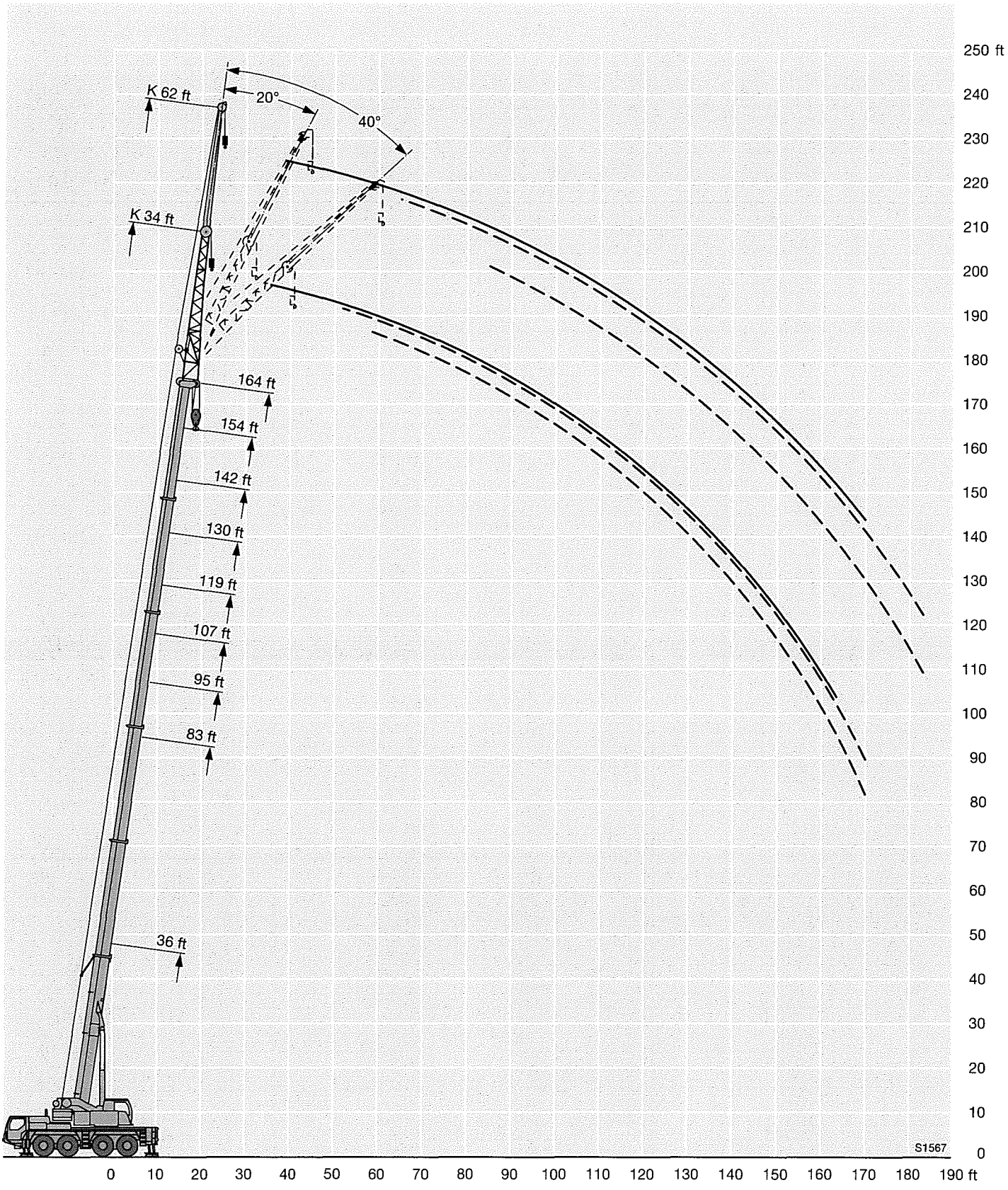

↔ ft	36 ft / 34 ft			83 ft / 34 ft			95 ft / 34 ft			107 ft / 34 ft			119 ft / 34 ft			130 ft / 34 ft			142 ft / 34 ft			154 ft / 34 ft			164 ft / 34 ft			↔ ft
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	
10	25.1																											10
12	25.1																											12
14	25.1	22.3																										14
16	25.1	22.3		25.1																								16
18	25.1	22.2		25.1			25.1																					18
20	25.1	21.9		25.1			25.1			25.1																		20
23	25.1	20.8	16.5	25.1			25.1			25.1																		23
26	23.9	19.7	16.4	25.1			25.1			25.1			23.8															26
29	22.3	18.8	15.9	25.1	22.3		25.1			25.1			23.8			20.4												29
32	20.6	17.9	15.4	25.1	21.8		25.1	21.6		25.1			23.8			20.4			17									32
35	19.1	17.2	15	25.1	21.1	16.5	25.1	21.2		25.1	20.7		23.6			20.4			17			12.6						35
38	17.7	16.4	14.7	25.1	20.4	16.2	25.1	20.6	16.1	25.1	20.3		23.3	19.4		20.3			17			12.6			10.7			38
44	15.4	14.9	14	24.7	19.2	15.7	24.8	19.5	15.7	24.2	19.4	15.5	22.4	18.8	15	19.9	17.5		16.9	16		12.6			10.7			44
50	13.4	13.4	13.1	23.2	18.2	15.2	23.6	18.5	15.2	23	18.5	15.2	21.5	18	14.9	19.4	17.1	14.3	16.5	15.6	12.6	12.6	11.9		10.7	10.4		50
56	11.8	12.3	12.1	21.2	17.3	14.8	22.1	17.7	14.8	21.8	17.7	14.8	20.7	17.3	14.6	18.6	16.6	14.2	15.8	14.7	12.6	12.3	11.6	10.7	10.5	10.2	9.5	56
62				19.3	16.5	14.4	20.5	16.9	14.5	20.6	17	14.5	19.7	16.7	14.3	17.6	16.1	14	14.9	13.8	12.5	11.8	11	10.4	10.2	9.8	9.4	62
68				17.6	15.6	14.1	19	16.1	14.2	19.1	16.3	14.2	18.2	16.2	14.1	16.5	15.4	13.8	14	13	12.2	11.2	10.5	9.9	9.8	9.4	9.1	68
74				16.1	14.7	13.6	17.5	15.4	14	17.2	15.6	13.9	16	15.6	13.8	15.3	14.7	13.5	13.1	12.3	11.6	10.6	10	9.5	9.3	8.9	8.8	74
80				14.8	13.8	13.1	16	14.6	13.6	15.3	14.9	13.7	14.2	14.8	13.6	13.8	13.8	13.2	12.3	11.6	11	10	9.5	9.1	8.8	8.5	8.4	80
86				13.7	13	12.6	14.5	13.8	13.1	13.6	14.1	13.3	13	13.3	13.2	12.2	12.9	12.7	11.6	10.9	10.4	9.4	9	8.8	8.4	8.2	8.1	86
92				12.7	12.4	12.2	13	13.1	12.6	12.2	12.8	12.8	11.8	11.9	12.4	10.8	11.6	12.1	10.8	10.4	9.9	8.9	8.6	8.5	8	7.8	7.8	92
98				11.8	11.9	11.9	11.4	11.9	12.1	10.8	11.4	11.7	10.6	11.1	11.1	10	10.3	10.8	9.6	9.8	9.5	8.5	8.2	8.2	7.7	7.5	7.5	98
104				10.9	11.2		10.2	10.6	10.8	9.6	10	10.3	9.4	9.9	10.2	9.3	9.2	9.6	8.6	9.1	9	8.1	7.9	7.9	7.4	7.2	7.2	104
110							9.2	9.5		8.6	8.9	9.2	8.4	8.8	9.1	8.4	8.6	8.7	7.7	8.2	8.5	7.7	7.6	7.6	7	6.9	6.9	110
116							8.3	8.5		7.7	8	8.1	7.5	7.9	8.1	7.6	7.9	8.1	7.3	7.3	7.7	7	7.3	7.3	6.7	6.6	6.6	116
122										6.9	7.2		6.7	7.1	7.2	6.8	7.1	7.3	6.9	6.9	7	6.2	6.7	6.9	6.1	6.3	6.4	122
128										6.2	6.3		6.1	6.3		6.3	6.5	6.6	6.3	6.5	6.6	5.5	6	6.3	5.4	5.8	6	128
134													5.8	5.9		5.9	6	6.1	5.6	6	6.1	4.9	5.3	5.5	4.8	5.2	5.4	134
140													5.6	5.7		5.5	5.6		5	5.3	5.4	4.4	4.7	4.9	4.2	4.6	4.8	140
146																4.9	5.1		4.5	4.7	4.8	3.8	4.1	4.3	3.7	4	4.2	146
152																4.4			4	4.2		3.3	3.6	3.7	3.2	3.5	3.7	152
158																			3.5	3.7		2.8	3.1		2.7	3	3.2	158
164																			3.1	3.1		2.3	2.6		2.3	2.5	2.6	164
170																						1.9	2.1		1.8	2.1		170
176																						1.6	1.7		1.4	1.6		176

TAB 150321 / 150331 / 150341

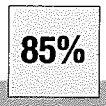


↔ ft	36 ft / 62 ft			95 ft / 62 ft			107 ft / 62 ft			119 ft / 62 ft			130 ft / 62 ft			142 ft / 62 ft			154 ft / 62 ft			164 ft / 62 ft			↔ ft
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	
10	9																								10
12	9																								12
14	9																								14
16	9																								16
18	9																								18
20	9																								20
23	9																								23
26	8.8			9																					26
29	8.6	7.3		9			8.5																		29
32	8.4	7.3		9			8.5																		32
35	8.1	7.3		9			8.5			8.3			8.3												35
38	7.9	7.2		9			8.5			8.3			8.3												38
44	7.5	6.9		8.9	7.3		8.5			8.3			8.3			7.8			6.8						44
50	7	6.5	5.8	8.6	7.3		8.4	7		8.2	7		8.3			7.8			6.8			6.1			50
56	6.4	6.2	5.7	8.3	7.2		8.1	7		8	6.9		8.2	7		7.8	6.8		6.8			6.1			56
62	5.9	5.9	5.6	8	6.9	5.8	7.9	6.9	5.8	7.8	6.8		8	6.9		7.7	6.8		6.8	6.3		6.1	5.8		62
68	5.4	5.6	5.4	7.7	6.7	5.8	7.6	6.7	5.8	7.6	6.6	5.6	7.8	6.8	5.6	7.6	6.7		6.8	6.3		6.1	5.8		68
74	5	5.2	5.3	7.5	6.5	5.7	7.4	6.5	5.7	7.4	6.5	5.6	7.5	6.6	5.6	7.4	6.5	5.6	6.8	6.2	5.3	6.1	5.8		74
80	4.6	4.8	5	7.2	6.3	5.6	7.2	6.3	5.6	7.2	6.3	5.6	7.3	6.4	5.6	7.2	6.3	5.6	6.7	6	5.3	6.1	5.8	5.1	80
86				6.9	6.1	5.5	6.9	6.1	5.5	6.9	6.1	5.5	7.2	6.2	5.6	7.1	6.2	5.5	6.6	5.9	5.3	6	5.7	5.1	86
92				6.5	6	5.5	6.6	6	5.4	6.7	6	5.4	7	6.1	5.5	6.9	6	5.4	6.5	5.8	5.3	5.9	5.6	5.1	92
98				6.2	5.8	5.4	6.3	5.8	5.4	6.5	5.9	5.4	6.8	6	5.4	6.7	5.9	5.3	6.4	5.7	5.2	5.8	5.5	5.1	98
104				5.8	5.6	5.4	6	5.7	5.3	6.2	5.7	5.3	6.6	5.8	5.3	6.6	5.8	5.3	6.2	5.6	5.2	5.8	5.4	5.1	104
110				5.5	5.4	5.3	5.7	5.5	5.3	5.9	5.6	5.3	6.4	5.7	5.3	6.4	5.7	5.3	6	5.5	5.1	5.6	5.3	5.1	110
116				5.2	5.1	5.1	5.4	5.3	5.2	5.6	5.4	5.3	6.3	5.6	5.3	6.2	5.6	5.2	5.8	5.4	5.1	5.4	5.2	5	116
122				5	4.9	4.9	5.1	5.1	5.1	5.4	5.2	5.2	6.1	5.5	5.2	6.1	5.5	5.2	5.7	5.3	5.1	5.2	5	4.9	122
128				4.8	4.7	4.8	4.8	4.8	4.9	5.1	5	5	5.9	5.4	5.2	5.8	5.4	5.2	5.5	5.2	5.1	5	4.9	4.8	128
134				4.5	4.5	4.6	4.5	4.6	4.7	4.9	4.8	4.9	5.7	5.4	5.2	5.3	5.3	5.2	5.2	5.1	5	4.8	4.7	4.7	134
140				4.4	4.4		4.3	4.4	4.5	4.6	4.6	4.7	5.3	5.3	5.2	5	5.2	5.2	4.7	4.9	4.9	4.5	4.5	4.6	140
146							4.1	4.2	4.3	4.4	4.5	4.5	4.8	5.2	5.2	4.7	4.8	5	4.2	4.7	4.8	4	4.4	4.4	146
152							3.9	4		4.2	4.3	4.4	4.4	4.8	5	4.4	4.6	4.7	3.7	4.3	4.6	3.5	4.2	4.3	152
158										4.1	4.1		4.2	4.3	4.5	4	4.4	4.5	3.3	3.8	4.2	3.1	3.7	4.1	158
164										3.9	3.9		4	4.1	4.3	3.5	3.9	4.2	2.9	3.4	3.7	2.7	3.2	3.6	164
170										3.8	3.9		3.6	3.8	3.9	3.1	3.5	3.7	2.5	3	3.2	2.3	2.8	3.1	170
176													3.2	3.4		2.7	3	3.1	2.1	2.5	2.7	1.9	2.4	2.7	176
182													2.8			2.3	2.6		1.7	2.1	2.2	1.5	2	2.2	182
188																2	2.2			1.7	1.7		1.6	1.8	188
194																1.7									194

TAB 150321 / 150331 / 150341

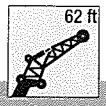

K 62 ft
20°
40°
K 34 ft
164 ft
154 ft
142 ft
130 ft
119 ft
107 ft
95 ft
83 ft
36 ft
S1567
250 ft
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 ft

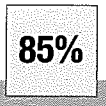
Tables de levage à la flèche pliable à variation hydraulique

↔ ft	36 ft / 34 ft			83 ft / 34 ft			95 ft / 34 ft			107 ft / 34 ft			119 ft / 34 ft			130 ft / 34 ft			142 ft / 34 ft			154 ft / 34 ft			164 ft / 34 ft			↔ ft
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	
12	25.1																											12
14	25.1	22.3		25.1																								14
17	25.1	22.3		25.1			25.1																					17
20	25.1	21.9		25.1			25.1			25.1																		20
23	25.1	20.8	16.5	25.1			25.1			25.1																		23
26	23.9	19.7	16.4	25.1			25.1			25.1			23.8															26
29	22.3	18.8	15.9	25.1	22.3		25.1			25.1			23.8			20.4												29
32	20.6	17.9	15.4	25.1	21.8		25.1	21.6		25.1			23.8			20.4			17									32
35	19.1	17.2	15	25.1	21.1	16.4	25.1	21.2		25.1	20.6		23.5			20.3			17									35
38	17.7	16.4	14.7	25.1	20.4	16.2	25.1	20.6	16.1	25.1	20.3		23.2	19.4		20.2			17			12.5			10.7			38
44	15.4	14.9	14	24.7	19.2	15.7	24.8	19.5	15.7	24.1	19.3	15.5	22.3	18.8	15	19.8	17.5		16.9	16		12.6			10.7			44
50	13.4	13.4	13.1	23.1	18.2	15.2	23.6	18.5	15.2	22.9	18.4	15.2	21.4	18	14.9	19.3	17.1	14.3	16.4	15.5	13.8	12.5	11.6		10.7	10.2		50
56	11.8	12.3	12.1	21	17.3	14.8	22	17.7	14.8	21.8	17.7	14.8	20.6	17.3	14.6	18.6	16.6	14.2	15.7	14.6	13.6	12.2	11.4	10.4	10.5	10	9.5	56
62				19.2	16.4	14.4	20.4	16.9	14.5	20.5	17	14.5	19.6	16.7	14.3	17.6	16.1	14	14.7	13.7	12.9	11.7	10.9	10.2	10.1	9.7	9.3	62
68				17.5	15.5	14	18.8	16.1	14.2	18.9	16.3	14.2	17.9	16.2	14.1	16.4	15.4	13.8	13.8	12.9	12.2	11	10.3	9.8	9.6	9.3	9	68
74				16.1	14.6	13.6	17.3	15.3	13.9	16.9	15.5	13.9	15.7	15.6	13.8	15.1	14.6	13.5	13	12.1	11.6	10.4	9.8	9.4	9.2	8.8	8.7	74
80				14.8	13.7	13	15.8	14.4	13.5	15	14.8	13.6	14	14.7	13.6	13.5	13.7	13.1	12.2	11.4	11	9.9	9.3	9	8.7	8.4	8.3	80
86				13.6	12.9	12.5	14.3	13.7	13	13.4	13.9	13.2	12.9	13	13.2	11.9	12.8	12.6	11.4	10.8	10.4	9.3	8.9	8.7	8.3	8	8	86
92				12.6	12.3	12.1	12.8	13	12.5	11.9	12.5	12.7	11.6	11.8	12.1	10.6	11.3	11.9	10.5	10.2	9.9	8.8	8.5	8.4	7.9	7.7	7.7	92
98				11.8	11.8	11.8	11.2	11.7	11.9	10.6	11.1	11.5	10.4	10.9	11	9.8	10	10.6	9.3	9.7	9.5	8.3	8.1	8.1	7.5	7.3	7.3	98
104				10.8	10.9		10	10.3	10.5	9.4	9.8	10.1	9.2	9.7	10	9.1	9	9.4	8.3	8.9	9	8	7.8	7.7	7.2	7.1	7	104
110							9	9.2		8.4	8.7	8.9	8.2	8.6	8.9	8.2	8.5	8.6	7.6	7.9	8.3	7.5	7.4	7.4	6.9	6.8	6.8	110
116							8.1	8.3		7.5	7.8	7.9	7.3	7.7	7.9	7.3	7.7	7.9	7.1	7.1	7.4	6.8	7.1	7.1	6.5	6.5	6.5	116
122										6.7	6.9		6.5	6.8	7	6.6	6.9	7.1	6.6	6.7	6.8	6	6.5	6.7	5.8	6.1	6.3	122
128										5.9	6.1		6	6.1		6.2	6.3	6.4	6	6.3	6.4	5.3	5.7	6	5.2	5.6	5.8	128
134													5.7	5.7		5.8	5.9	5.9	5.4	5.6	5.9	4.7	5	5.3	4.5	4.9	5.2	134
140													5.5	5.6		5.2	5.4		4.8	5	5.2	4.1	4.4	4.6	4	4.3	4.5	140
146																4.7	4.8		4.3	4.5	4.6	3.6	3.9	4	3.4	3.8	4	146
152																4.2			3.7	3.9		3	3.3	3.5	3	3.2	3.4	152
158																			3.2	3.4		2.5	2.8		2.5	2.7	2.9	158
164																			2.8	2.9		2.1	2.3		2	2.2	2.3	164
170																						1.7	1.8		1.6	1.8		170
176																							1.4					176

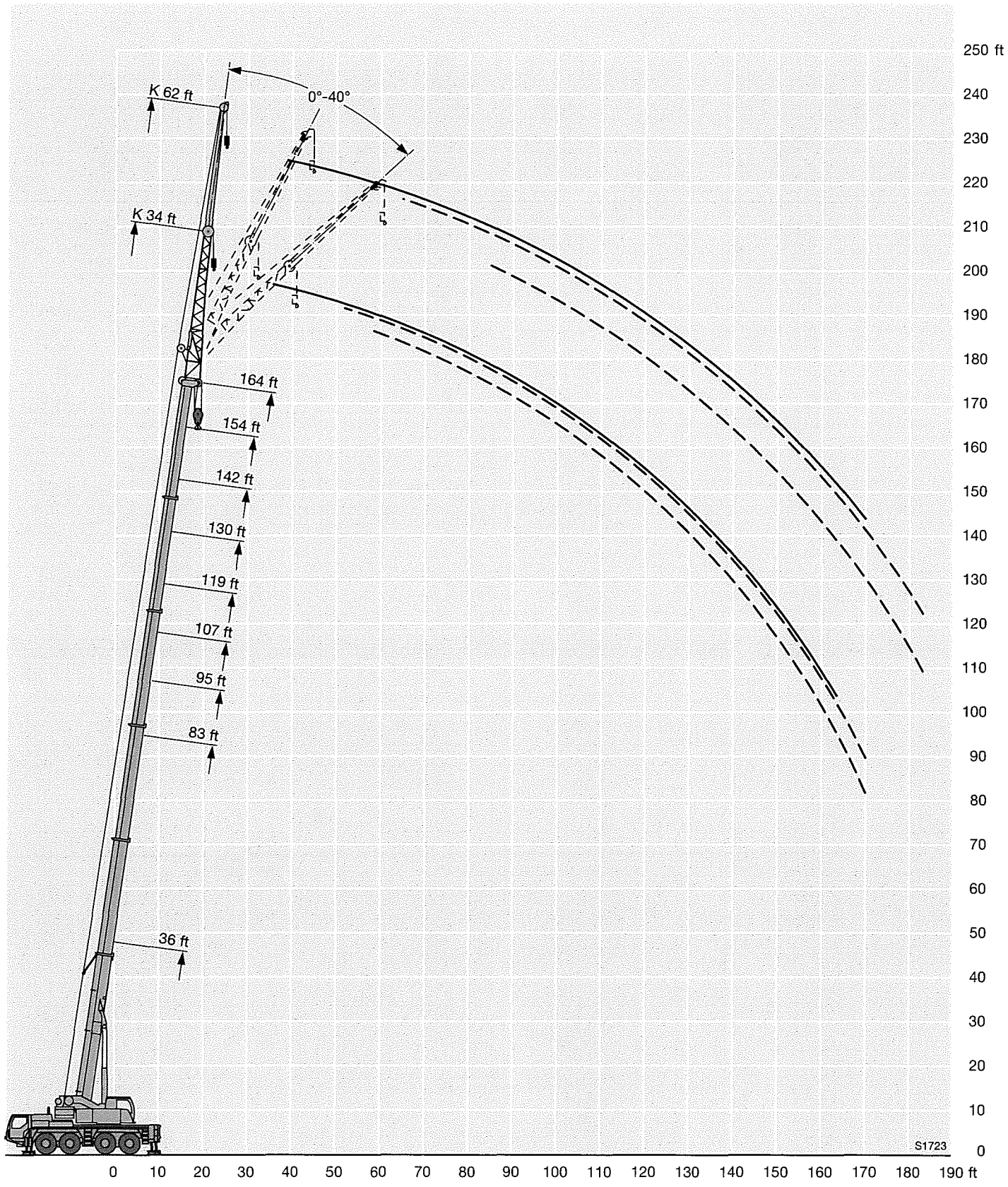
TAB 150351 / 150361 / 150371



↔ ft	36 ft / 62 ft			95 ft / 62 ft			107 ft / 62 ft			119 ft / 62 ft			130 ft / 62 ft			142 ft / 62 ft			154 ft / 62 ft			164 ft / 62 ft			↔ ft
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	
12	9																								12
14	9																								14
17	9																								17
20	9																								20
23	9																								23
26	8.8			9																					26
29	8.6	7.3		9			8.5																		29
32	8.4	7.3		9			8.5																		32
35	8.1	7.3		9			8.5			8.3															35
38	7.9	7.2		9			8.5			8.3			8.3												38
44	7.5	6.9		8.9	7.3		8.5			8.3			8.3			7.8									44
50	7	6.5	5.8	8.6	7.3		8.3	7		8.1	7		8.2			7.8			6.8			6.1			50
56	6.4	6.2	5.7	8.3	7.2		8.1	7		8	6.9		8.1	7		7.7	6.8		6.8			6.1			56
62	5.9	5.9	5.6	8	6.9	5.8	7.9	6.9	5.8	7.8	6.8		8	6.9		7.7	6.8		6.8	6.3		6.1	5.8		62
68	5.4	5.6	5.4	7.7	6.7	5.8	7.6	6.7	5.8	7.6	6.6	5.6	7.8	6.7	5.6	7.5	6.7		6.8	6.3		6.1	5.8		68
74	5	5.2	5.3	7.5	6.5	5.7	7.4	6.5	5.7	7.4	6.5	5.6	7.5	6.6	5.6	7.4	6.5	5.6	6.8	6.2	5.3	6.1	5.8		74
80	4.6	4.8	5	7.2	6.3	5.6	7.1	6.3	5.6	7.2	6.3	5.6	7.3	6.4	5.6	7.2	6.3	5.6	6.7	6	5.3	6.1	5.8	5.1	80
86				6.8	6.1	5.6	6.8	6.1	5.5	6.9	6.1	5.5	7.2	6.2	5.6	7	6.2	5.5	6.6	5.9	5.3	6	5.7	5.1	86
92				6.5	6	5.5	6.6	6	5.4	6.6	6	5.4	7	6.1	5.5	6.9	6	5.4	6.5	5.8	5.3	5.9	5.6	5.1	92
98				6.1	5.8	5.4	6.2	5.8	5.4	6.4	5.8	5.4	6.8	6	5.4	6.7	5.9	5.3	6.3	5.7	5.2	5.8	5.5	5.1	98
104				5.7	5.5	5.3	5.9	5.7	5.3	6.1	5.7	5.3	6.6	5.8	5.3	6.6	5.8	5.3	6.2	5.6	5.2	5.7	5.4	5.1	104
110				5.4	5.3	5.2	5.6	5.4	5.3	5.8	5.5	5.3	6.4	5.7	5.3	6.4	5.7	5.3	6	5.5	5.1	5.5	5.2	5.1	110
116				5.2	5	5	5.3	5.2	5.2	5.5	5.3	5.2	6.3	5.6	5.3	6.2	5.6	5.2	5.8	5.4	5.1	5.3	5.1	5	116
122				4.9	4.8	4.9	5	5	5	5.3	5.1	5.1	6.1	5.5	5.2	6.1	5.5	5.2	5.6	5.3	5.1	5.1	4.9	4.9	122
128				4.7	4.6	4.7	4.7	4.7	4.8	5	4.9	4.9	5.9	5.4	5.2	5.6	5.4	5.2	5.4	5.1	5	4.9	4.8	4.7	128
134				4.5	4.4	4.5	4.5	4.5	4.6	4.8	4.7	4.8	5.6	5.4	5.2	5.1	5.3	5.2	5	5	4.9	4.6	4.6	4.6	134
140				4.3	4.3		4.2	4.3	4.4	4.5	4.5	4.6	5.1	5.3	5.2	4.9	5.1	5.1	4.5	4.8	4.8	4.3	4.5	4.5	140
146							4	4.1	4.2	4.3	4.3	4.5	4.7	5.1	5.2	4.6	4.6	5	4	4.6	4.7	3.7	4.3	4.4	146
152							3.8	3.9		4.1	4.2	4.3	4.3	4.6	4.8	4.2	4.5	4.5	3.5	4.1	4.5	3.3	3.9	4.2	152
158										4	4		4.1	4.2	4.3	3.8	4.2	4.4	3.1	3.6	4	2.8	3.4	3.9	158
164										3.8	3.8		3.8	4	4.2	3.3	3.7	3.9	2.6	3.1	3.5	2.4	3	3.4	164
170										3.7	3.8		3.4	3.6	3.6	2.9	3.3	3.4	2.2	2.7	3	2	2.5	2.9	170
176													3	3.1		2.5	2.8	2.9	1.8	2.3	2.5	1.7	2.1	2.4	176
182													2.6			2.1	2.4		1.5	1.8	2		1.7	2	182
188																1.8	1.9			1.4	1.5			1.5	188
194																1.5									194

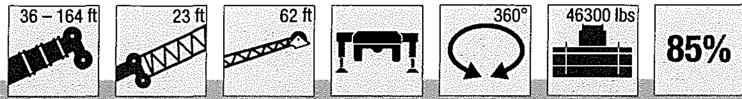
TAB 150351 / 150361 / 150371


K 62 ft
0°-40°
K 34 ft
164 ft
154 ft
142 ft
130 ft
119 ft
107 ft
95 ft
83 ft
36 ft
S1723
250 ft
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 ft

Portes de levage à la flèche pliante avec télescope rallonge

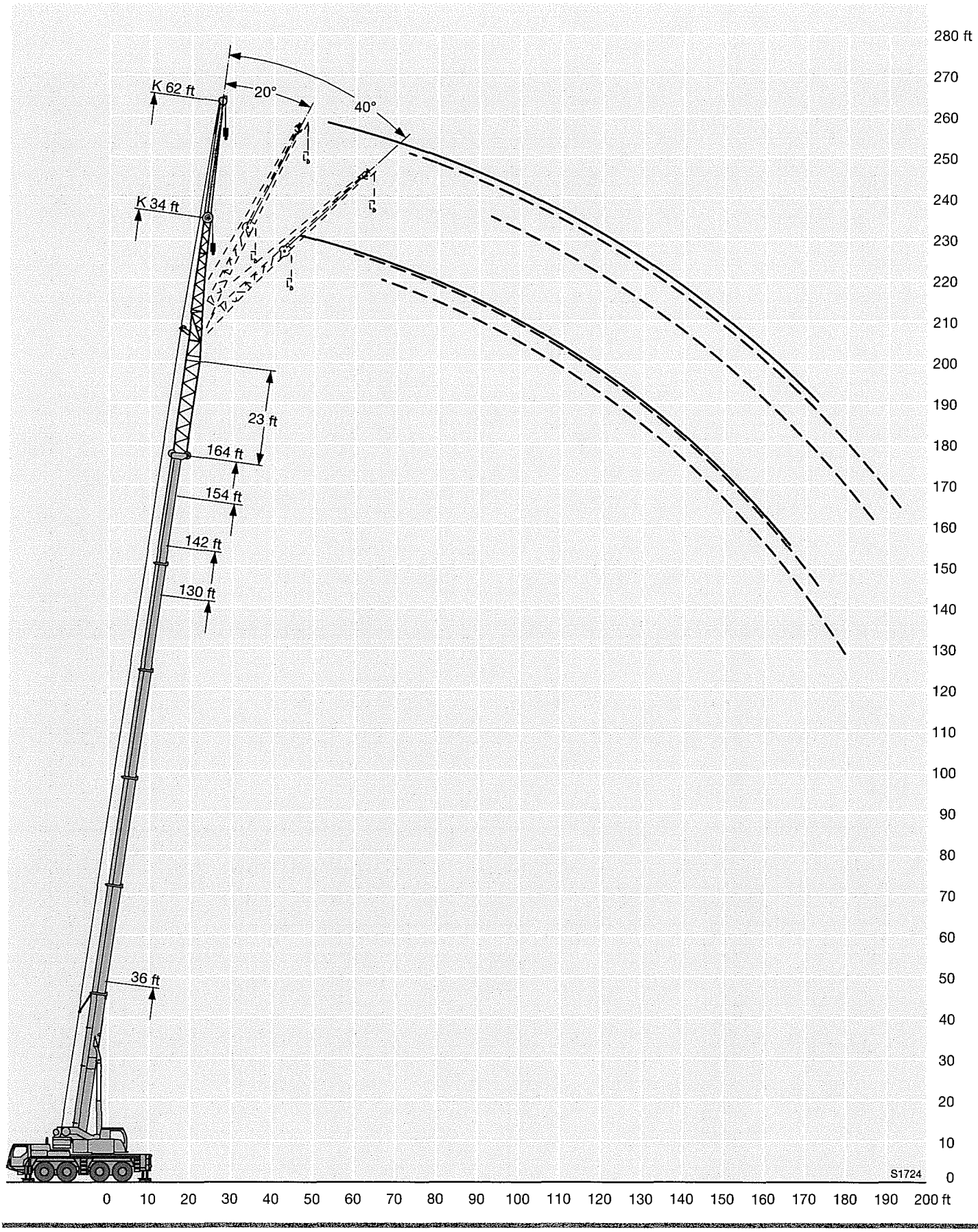
↔ ft	36 ft + 23 ft			130 ft + 23 ft			142 ft + 23 ft			154 ft + 23 ft			164 ft + 23 ft			↔ ft
	34 ft			34 ft			34 ft			34 ft			34 ft			
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	
10	9.2															10
12	9.2															12
14	9.2															14
16	9.2															16
18	9.2	8.7														18
20	9.2	8.7														20
23	9.2	8.7														23
26	8.9	8.7	8.3													26
29	8.6	8.7	8.3													29
32	8.1	8.4	8.3	9.2												32
35	7.7	8	8.1	9.2			8.5									35
38	7.3	7.6	7.9	9.2			8.5			8						38
44	6.6	6.8	7.1	9.2	8.7		8.5			8			7			44
50	6	6.2	6.4	9.2	8.7	8.3	8.5	8.5		8	8		7			50
56	5.4	5.6	5.8	9.1	8.7	8.3	8.5	8.4	8	8	8	7.5	7	7		56
62	4.9	5.1	5.3	8.8	8.4	8.1	8.4	8.2	7.9	8	7.8	7.5	7	7	6.8	62
68	4.4	4.7	4.8	8.4	8	7.8	8.2	7.9	7.7	7.8	7.6	7.4	7	6.9	6.7	68
74	4	4.2	4.4	8	7.6	7.4	7.9	7.6	7.4	7.7	7.3	7.2	6.8	6.7	6.6	74
80	3.7	3.8		7.5	7.2	7.1	7.5	7.2	7.1	7.4	7	7	6.7	6.5	6.4	80
86				7.1	6.9	6.8	7.2	6.9	6.7	7.1	6.8	6.7	6.5	6.2	6.1	86
92				6.8	6.5	6.5	6.8	6.6	6.5	6.8	6.5	6.4	6.2	6	5.9	92
98				6.5	6.2	6.2	6.5	6.3	6.2	6.5	6.3	6.2	5.9	5.8	5.7	98
104				6.1	6	5.9	6.2	6	5.9	6.2	6	5.9	5.7	5.6	5.5	104
110				5.8	5.7	5.7	5.9	5.8	5.7	6	5.8	5.7	5.4	5.3	5.3	110
116				5.6	5.5	5.4	5.7	5.6	5.5	5.7	5.6	5.5	5.2	5.1	5.1	116
122				5.3	5.2	5.2	5.4	5.3	5.3	5.5	5.4	5.3	5	4.9	4.9	122
128				5.1	5	5	5.2	5.1	5.1	5.2	5.2	5.2	4.8	4.7	4.8	128
134				4.8	4.8	4.8	5	4.9	4.9	4.7	4.9	5	4.4	4.6	4.6	134
140				4.6	4.6	4.6	4.7	4.7	4.8	4.1	4.5	4.7	3.9	4.3	4.4	140
146				4.4	4.4	4.5	4.3	4.5	4.6	3.6	4	4.2	3.4	3.8	4.1	146
152				4.2	4.2	4.3	3.8	4.1	4.2	3.1	3.5	3.7	2.9	3.3	3.5	152
158				3.8	4		3.4	3.6	3.8	2.7	3	3.2	2.5	2.8	3	158
164				3.4	3.6		2.9	3.2	3.2	2.3	2.6	2.7	2.1	2.4	2.5	164
170				3	3.1		2.5	2.7	2.7	1.8	2.1	2.2	1.7	2	2.1	170
176				2.6	2.6		2.1	2.3		1.4	1.7	1.7		1.6	1.7	176
182							1.7	1.9								182
188							1.4	1.5								188

TAB 150381 / 150391 / 150401



ft	36 ft + 23 ft			130 ft + 23 ft			142 ft + 23 ft			154 ft + 23 ft			164 ft + 23 ft			ft
	62 ft			62 ft			62 ft			62 ft			62 ft			
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	
16	5.8															16
18	5.8															18
20	5.8															20
23	5.8															23
26	5.8															26
29	5.8															29
32	5.8	5.3														32
35	5.8	5.3		5.8												35
38	5.6	5.3		5.8			5.3									38
44	5.3	5.3		5.8			5.3			5.1						44
50	5	5	4.6	5.8			5.3			5.1			4.2			50
56	4.7	4.7	4.6	5.8			5.3			5.1			4.2			56
62	4.4	4.4	4.5	5.8	5.3		5.3	5.1		5.1			4.1			62
68	4.1	4.2	4.3	5.8	5.3		5.3	5.1		5.1	4.9		4.1	4.1		68
74	3.8	3.9	4.1	5.6	5.2	4.6	5.3	5.1		5.1	4.8		4	4.1		74
80	3.5	3.7	3.8	5.5	5	4.6	5.3	4.9	4.4	5	4.8	4.4	3.9	4.1		80
86	3.2	3.4	3.6	5.3	4.9	4.6	5.1	4.8	4.4	4.9	4.6	4.4	3.9	4.1	4.1	86
92	3	3.2	3.4	5.1	4.7	4.5	5	4.6	4.4	4.8	4.5	4.3	3.8	4	4.1	92
98	2.8	3	3.1	4.9	4.6	4.4	4.8	4.5	4.3	4.7	4.4	4.2	3.7	4	4	98
104	2.6	2.7	2.7	4.7	4.4	4.2	4.7	4.4	4.2	4.5	4.2	4.1	3.7	3.9	3.9	104
110	2.4	2.5		4.6	4.3	4.1	4.5	4.2	4.1	4.4	4.1	4	3.7	3.9	3.9	110
116				4.4	4.2	4.1	4.4	4.1	4	4.3	4	3.9	3.6	3.8	3.8	116
122				4.2	4	3.9	4.2	4	3.9	4.2	3.9	3.9	3.6	3.7	3.7	122
128				4	3.9	3.8	4.1	3.9	3.8	4	3.8	3.8	3.5	3.6	3.6	128
134				3.9	3.8	3.7	3.9	3.8	3.7	3.9	3.7	3.7	3.4	3.5	3.5	134
140				3.7	3.6	3.6	3.8	3.6	3.6	3.8	3.6	3.6	3.4	3.4	3.4	140
146				3.5	3.5	3.5	3.6	3.5	3.5	3.6	3.5	3.5	3.3	3.3	3.3	146
152				3.4	3.4	3.4	3.5	3.4	3.4	3.3	3.4	3.4	3.1	3.2	3.2	152
158				3.3	3.2	3.3	3.3	3.3	3.3	2.9	3.3	3.3	2.7	3.1	3.1	158
164				3.1	3.1	3.2	3.2	3.2	3.2	2.5	3.1	3.2	2.3	2.9	3	164
170				3	3	3.1	2.9	3.1	3.1	2.1	2.7	3	1.9	2.5	2.9	170
176				2.9	2.9	3	2.5	2.9	3	1.8	2.3	2.6	1.5	2.1	2.5	176
182				2.6	2.8	2.9	2.1	2.5	2.7	1.5	1.9	2.2		1.7	2.1	182
188				2.2	2.5	2.6	1.8	2.1	2.3		1.6	1.8			1.7	188
194				1.9	2.1		1.4	1.8	1.9							194
200				1.6	1.8											200

TAB 150381 / 150391 / 150401


K 62 ft
20°
40°
K 34 ft
23 ft
164 ft
154 ft
142 ft
130 ft
36 ft
S1724
280 ft
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 ft

with boom extension
Forces de levage à la fléchette pliante à variation hydraulique avec télescope rallongé

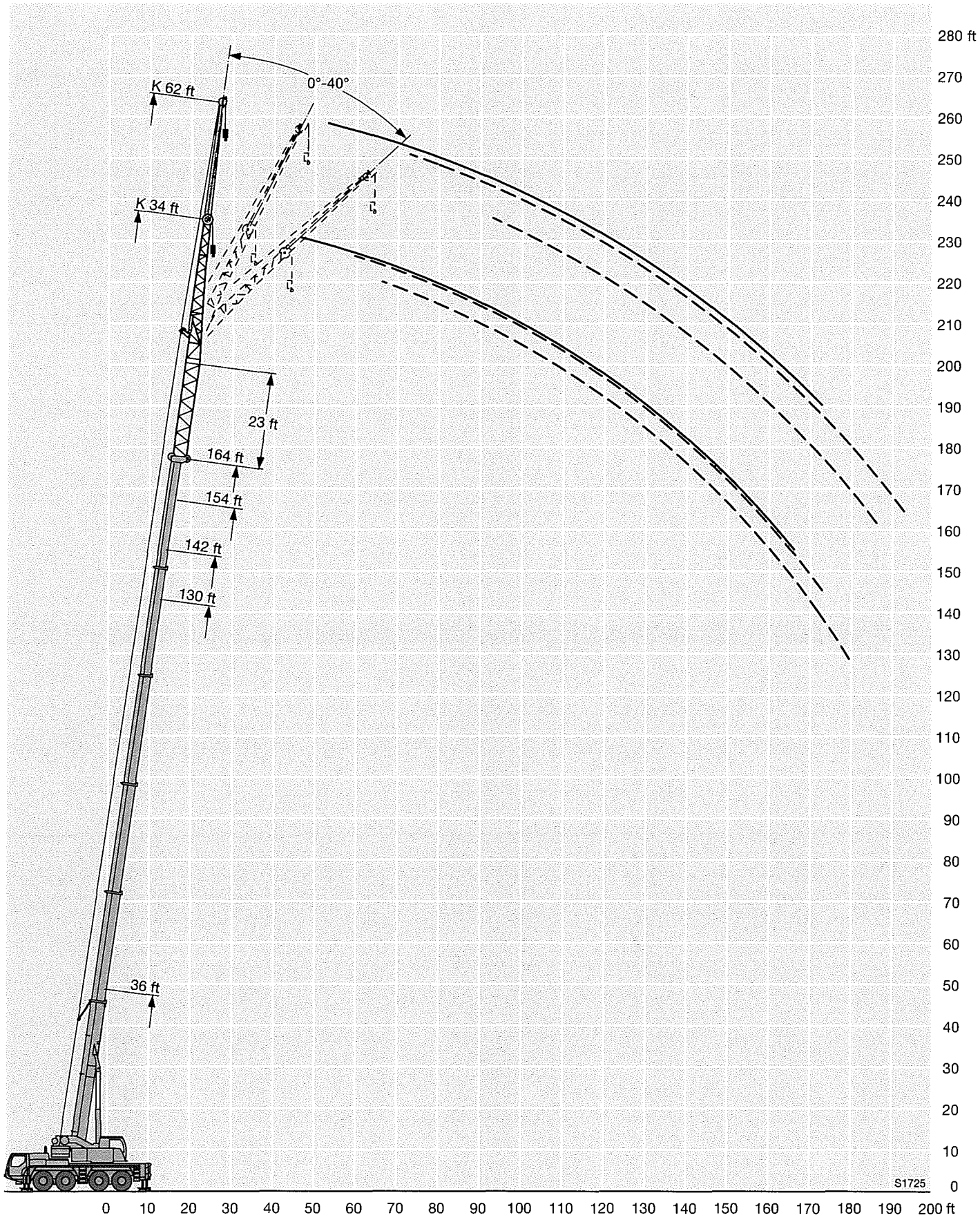
↔ ft	36 ft + 23 ft			130 ft + 23 ft			142 ft + 23 ft			154 ft + 23 ft			164 ft + 23 ft			↔ ft
	62 ft			62 ft			62 ft			62 ft			62 ft			
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	
16	5.8															16
18	5.8															18
20	5.8															20
23	5.8															23
26	5.8															26
29	5.8															29
32	5.8	5.3														32
35	5.8	5.3		5.8												35
38	5.6	5.3		5.8			5.3									38
44	5.3	5.3		5.8			5.3			4.9						44
50	5	5	4.6	5.8			5.3			4.9			3.9			50
56	4.7	4.7	4.6	5.8			5.3			4.9			3.9			56
62	4.4	4.4	4.5	5.8	5.3		5.3	5.1		4.9			3.9			62
68	4.1	4.2	4.3	5.7	5.3		5.3	5.1		4.9	4.9		3.9	3.9		68
74	3.8	3.9	4.1	5.5	5.1	4.6	5.3	5		4.9	4.8		3.8	3.9		74
80	3.5	3.7	3.8	5.3	5	4.6	5.2	4.8	4.4	4.9	4.7	4.4	3.8	3.9		80
86	3.2	3.4	3.6	5.2	4.8	4.6	5	4.7	4.4	4.8	4.5	4.4	3.7	3.9	3.9	86
92	3	3.2	3.4	5	4.6	4.4	4.9	4.5	4.4	4.7	4.4	4.3	3.6	3.9	3.9	92
98	2.8	3	3.1	4.8	4.5	4.3	4.7	4.4	4.2	4.6	4.3	4.1	3.6	3.8	3.9	98
104	2.6	2.7	2.7	4.6	4.3	4.2	4.6	4.3	4.1	4.4	4.2	4	3.5	3.8	3.8	104
110	2.4	2.5		4.4	4.2	4.1	4.4	4.1	4	4.3	4.1	3.9	3.5	3.7	3.8	110
116				4.2	4.1	4	4.3	4	3.9	4.2	3.9	3.8	3.4	3.6	3.7	116
122				4.1	3.9	3.9	4.1	3.9	3.8	4	3.8	3.8	3.4	3.6	3.6	122
128				3.9	3.8	3.7	3.9	3.8	3.7	3.9	3.7	3.7	3.3	3.5	3.5	128
134				3.7	3.6	3.6	3.8	3.7	3.6	3.8	3.6	3.6	3.3	3.4	3.4	134
140				3.6	3.5	3.5	3.6	3.5	3.5	3.6	3.5	3.5	3.2	3.3	3.3	140
146				3.4	3.3	3.4	3.5	3.4	3.4	3.5	3.4	3.4	3.1	3.2	3.2	146
152				3.2	3.2	3.2	3.3	3.3	3.3	3.1	3.3	3.3	2.9	3.1	3.1	152
158				3.1	3.1	3.1	3.2	3.1	3.2	2.7	3.2	3.2	2.5	2.9	3	158
164				3	2.9	3	3	3	3.1	2.3	2.9	3.1	2.1	2.7	2.9	164
170				2.8	2.9	2.9	2.6	2.9	3	1.9	2.5	2.9	1.7	2.3	2.7	170
176				2.7	2.7	2.8	2.3	2.7	2.9	1.6	2.1	2.4		1.9	2.3	176
182				2.4	2.6	2.7	1.9	2.3	2.5		1.7	2		1.5	1.9	182
188				2	2.3	2.4	1.5	1.9	2.1			1.6			1.5	188
194				1.7	1.9			1.6	1.7							194
200				1.4	1.6											200

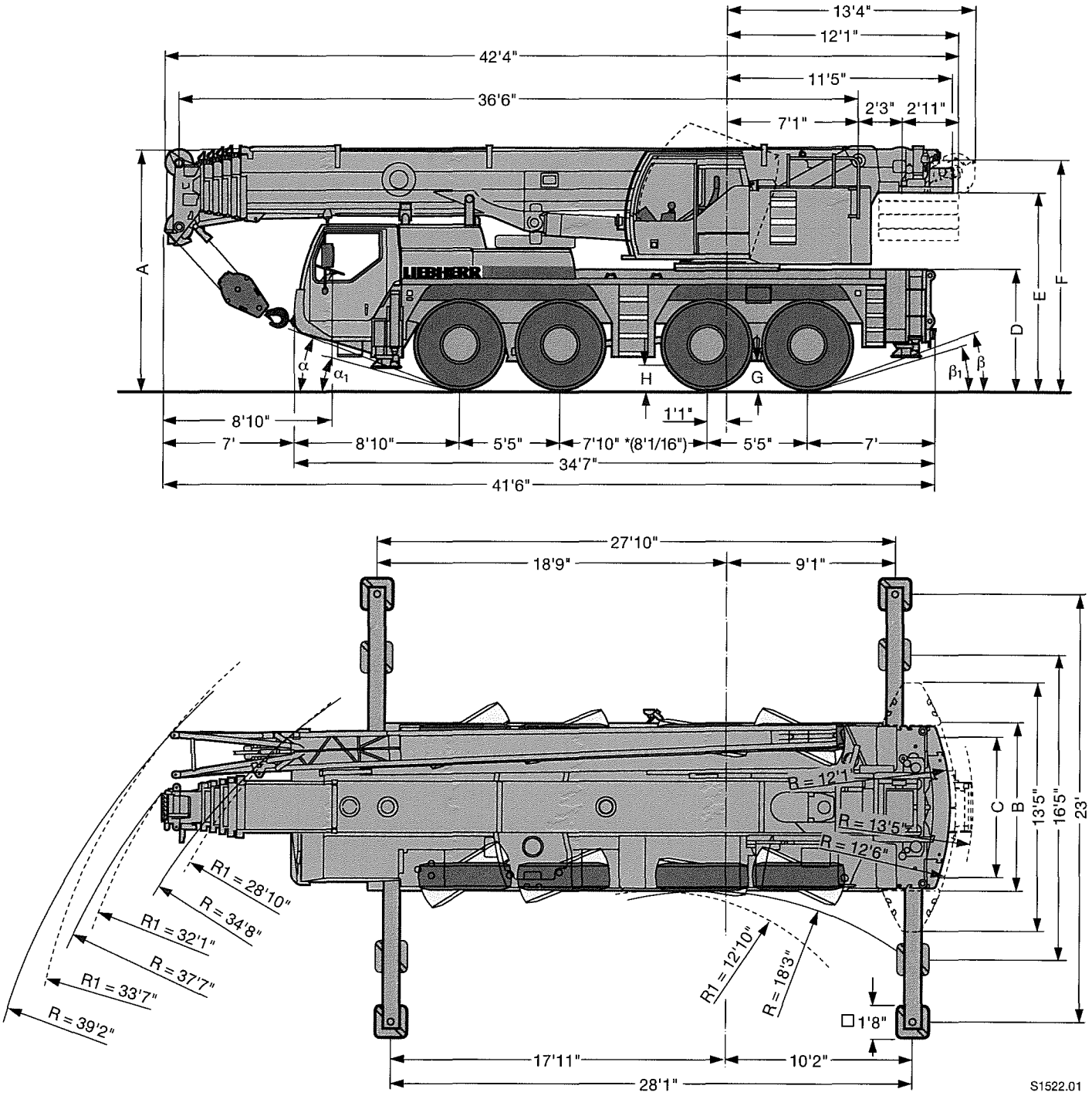
TAB 150411 / 150421 / 150431

with boom extension
Forces de levage à la fléchette pliante à variation hydraulique avec télescope rallongé

↔ ft	36 ft + 23 ft			130 ft + 23 ft			142 ft + 23 ft			154 ft + 23 ft			164 ft + 23 ft			↔ ft
	34 ft			34 ft			34 ft			34 ft			34 ft			
	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	0°	20°	40°	
10	9.2															10
12	9.2															12
14	9.2															14
16	9.2															16
18	9.2	8.7														18
20	9.2	8.7														20
23	9.2	8.7														23
26	8.9	8.7	8.3													26
29	8.6	8.7	8.3													29
32	8.1	8.4	8.3	9.2												32
35	7.7	8	8.1	9.2			8.5									35
38	7.3	7.6	7.9	9.2			8.5									38
44	6.6	6.8	7.1	9.2	8.7		8.5			8						44
50	6	6.2	6.4	9.1	8.7	8.3	8.5	8.3		7.9	7.8		7			50
56	5.4	5.6	5.8	8.9	8.6	8.2	8.4	8.2	7.8	7.9	7.8	7.5	7	7		56
62	4.9	5.1	5.3	8.6	8.3	8	8.3	8	7.7	7.8	7.7	7.4	6.9	7	6.8	62
68	4.4	4.7	4.8	8.2	7.8	7.6	8.1	7.7	7.5	7.7	7.4	7.2	6.8	6.8	6.7	68
74	4	4.2	4.4	7.8	7.4	7.3	7.7	7.4	7.2	7.5	7.2	7	6.7	6.6	6.5	74
80	3.7	3.8		7.3	7.1	6.9	7.4	7	6.9	7.2	6.9	6.8	6.5	6.3	6.2	80
86				6.9	6.7	6.6	7	6.7	6.6	6.9	6.6	6.5	6.3	6.1	6	86
92				6.6	6.3	6.3	6.6	6.4	6.3	6.6	6.3	6.2	6	5.8	5.8	92
98				6.3	6.1	6	6.3	6.1	6	6.3	6.1	6	5.8	5.6	5.5	98
104				5.9	5.8	5.7	6	5.8	5.8	6	5.8	5.8	5.5	5.4	5.3	104
110				5.7	5.5	5.5	5.7	5.6	5.6	5.8	5.6	5.6	5.2	5.2	5.1	110
116				5.4	5.3	5.2	5.5	5.4	5.3	5.6	5.4	5.3	5	4.9	4.9	116
122				5.1	5	5	5.2	5.1	5.1	5.3	5.2	5.2	4.8	4.7	4.8	122
128				4.9	4.8	4.8	5	4.9	4.9	5	5	5	4.6	4.6	4.6	128
134				4.6	4.6	4.6	4.8	4.7	4.7	4.5	4.7	4.8	4.2	4.4	4.4	134
140				4.4	4.4	4.5	4.5	4.5	4.6	3.9	4.3	4.5	3.7	4.1	4.2	140
146				4.2	4.2	4.2	4.1	4.3	4.4	3.4	3.7	4	3.1	3.5	3.8	146
152				4	4	4.1	3.6	3.9	4	2.9	3.2	3.4	2.7	3	3.3	152
158				3.6	3.8		3.1	3.4	3.5	2.4	2.7	2.9	2.2	2.6	2.8	158
164				3.1	3.3		2.7	2.9	3	2	2.3	2.5	1.8	2.1	2.3	164
170				2.7	2.9		2.3	2.5	2.5	1.6	1.9	2		1.7	1.9	170
176				2.3	2.4		1.8	2				1.5				176
182							1.5	1.6								182

TAB 150411 / 150421 / 150431


K 62 ft
0°-40°
K 34 ft
23 ft
164 ft
154 ft
142 ft
130 ft
36 ft
S1725
280 ft
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 ft



R_1 = All-wheel steering / Direction toutes roues * optional · en option

	Dimensions / Encombrement												
	A	A 0'4" *	B	C	D	E	F	G	H	α	α_1	β	β_1
445/95 R 25 (16.00 R 25)	13'	12'6"	9'9"	7'7"	6'4"	10'6"	12'2"	1'5"	1'6"	20°	15°	20°	17°
525/80 R 25 (20.5 R 25)	13'	12'6"	9'9"	8'	6'4"	10'6"	12'2"	1'5"	1'6"	20°	15°	20°	17°

* lowered / abaissé

Axle Essieu	1	2	3	4	Total weight (lbs) Poids total lbs
lbs	26400	26400	26400	26400	105600[1]

[1] with 14800 lbs counterweight / avec contrepoids 14800 lbs

Load (kips) Forces de levage kips	No. of sheaves Poulies	No. of lines Brins	Weight lbs Poids lbs
176.3	7	14	1100
128.7	5	10	1100
84.4	3	7	992
35.3	1	3	606
12.5	–	1	309

Working speeds
Vitesses

		1	2	3	4	5	6	7	8	9	10	11	12	R 1	R 2	
445/95 R 25 (16.00 R 25)	mph	3.5	4.5	5.8	7.5	9.5	12.2	16	20.6	26.5	34	43.2	50	3.8	4.9	53.1 %
525/80 R 25 (20.5 R 25)		1.6	2.1	2.6	3.4	4.3	5.5	7.2	9.3	11.9	15.4	19.5	25	1.7	2.2	61.7 %

Drive Mécanismes	infinitely variable en continu	Rope diameter / Rope length Diamètre du câble / Longueur du câble	Max. single line pull Effort au brin maxi.
1	0 – 410 ft/min single line ft/min au brin simple	0'7" / 853 ft	12800 lbs
2	0 – 410 ft/min single line ft/min au brin simple	0'7" / 853 ft	12800 lbs
360°	0 – 1.7 rpm		
	approx. 50 seconds to reach 83° boom angle env. 50 s jusqu'à 83°		
	approx. 330 seconds for boom extension from 36 ft – 164 ft env. 330 s pour passer de 36 ft – 164 ft		

Crane carrier

Frame	Self-manufactured, weight-optimized and torsion resistant box-type design of high-tensile structural steel.
Outriggers	4-point supporting system, hydraulically telescopable into horizontal and vertical direction. Automatic levelling of crane. Electronic inclination indicator.
Engine	6-cylinder Diesel, make Liebherr, type D846 A7, watercooled, output 350 kW (476 h.p.) at 1900 rpm, max. torque 1637 lbs-ft at 1200 rpm – 1500 rpm. Exhaust emissions acc. to 97/68/EG stage 3 and EPA/CARB Tier 3. Fuel reservoir: 106 gallons.
Transmission	ZF 12-speed gear box with automatic control system AS-TRONIC. ZF-intarder fitted directly to the gear. Two-stage transfer case with lockable transfer differential.
Axles	Welded design, made of high-tensile fine grained steel. All Axles steerable. Axles 2, 3 and 4 are planetary axles with differential locks.
Suspension	All axles are mounted on hydropneumatic suspension and are lockable hydraulically.
Tyres	8 tyres, size: 445/95 R 25 (16.00 R 25).
Steering	ZF-servocom power steering, dual circuit system, with hydraulic servo system and auxiliary pump circuit. At road travel, the 4th axle is steered electrohydraulically, and fixed for straight travel from 18.6 mph onwards. Steering acc. to EG directive 70/311/EWG.
Brakes	Service brake: Dual circuit, all-wheel servo-air brake. Parking brake: Spring brake actuator, acting on the wheels of the 1st, 2nd and 3rd axle. Sustained-action brakes: Engine brake as exhaust retarder with Liebherr additional brake system ZBS. Intarder on gear. ABV in conjunction with ASR. Brakes acc. to EG directives 71/320 EWG.
Driver's cab	Spacious, steel made, corrosion resistant cab, cataphoretic dip-primed, on resilient suspension with hydraulic shock absorbers, sound and heat absorbing internal panelling acc. to EG directive, safety glazing, operating and control instruments, comfortably equipped.
Electrical system	Modern data bus technique, 24 Volt DC, 2 batteries of 170 Ah each.

Crane superstructure

Frame	Self-manufactured, cataphoretic dip-primed weight-optimized and torsion resistant welded design of high-tensile structural steel; linked by a triple-row roller slewing ring to the carrier for continuous rotation.
Crane engine	4-cylinder Diesel, make Liebherr, type D934S A6, watercooled, output 145 kW (197 h.p.) at 1800 rpm, max. torque 678 lbs-ft at 1100 rpm – 1500 rpm. Exhaust emissions acc. to 97/68/EG stage 3 and EPA/CARB Tier 3. Fuel reservoir: 74 gallons.
Crane drive	Diesel-hydraulic, with 1 axial piston variable displacement pump, with servo-control and capacity control, 1 double gear pump, open controlled oil circuits. Compact hydraulic drive flanged to the Diesel engine. Drive assembly completely enclosed for noise abatment.
Control	Electric "Load Sensing" control, simultaneous operation of 4 working motions, 2 self-centering hand control levers (joy-stick type).
Hoist gear	Axial piston fixed displacement motor, Liebherr hoist drum with integrated planetary gear and spring-loaded static brake. Hoist gear is driven through a controlled open oil circuit.
Luffing gear	1 differential ram with safety check valves.
Slewing gear	Axial piston fixed displacement motor, planetary gear, spring-loaded static brake. Slewing gear invertible from released to locked as a standard feature.
Crane cab	All-steel construction, entirely galvanized, powder coated, with safety glazing, operating and control instruments, comfortably equipped, cab tiltable backwards.
Safety devices	LICCON safe load indicator, test system hoist limit switch, safety valves to prevent pipe and hose ruptures.
Telescopic boom	Buckling and torsion resistant design of high-tensile structural steel, oviform boom profile, 1 base section and 5 telescopic sections. All telescopic sections hydraulically extendable independent of one another. Rapid-cycle telescoping system "Telematik". Boom length: 36 ft – 164 ft.
Counterweight	14800 lbs basic counterweight.
Electrical system	Modern data bus technique, 24 Volt DC, 2 batteries of 170 Ah each.

Additional equipment

Swing-away jib	34 ft – 62 ft long, mountable to the telescopic boom at 0°, 20° or 40°. Hydraulic ram for operating the swing-away jib from 0° – 40° (option).
Telescopic boom extension	23 ft long lattice section, thus 23 ft higher pining point for swing-away jib.
2nd hoist gear	For two-hook operation or for operation with swing-away jib if the hoist rope shall remain reeved.
Additional counterweight	31500 lbs for a total counterweight of 46300 lbs.
Tyres	8 tyres, size 525/80 R 25 (20.5 R 25).
Drive 8 x 8	Additional drive of the 1st axle.

Other items of equipment available on request.

Châssis porteur

Cadre	Construction en caisse résistante à la torsion et optimisée en poids réalisée par Liebherr en acier de construction à grain fin très rigide.
Calage	Dispositif de calage horizontal et vertical en 4 points, entièrement déployable hydrauliquement. Nivellement automatique du calage. Indicateurs électroniques d'inclinaison.
Moteur	Moteur diesel, 6 cylindres, fabriqué par Liebherr, de type D846 A7, à refroidissement par eau, de 350 kW (476 ch) à 1900 rpm, couple max. 1637 lbs-ft à 1200 – 1500 rpm. Emissions des gaz d'échappement conformes aux directives 97/68/EG partie 3 et EPA/CARB Tier 3. Capacité du réservoir à carburant: 106 gallons.
Boîte de vitesse	Boîte de vitesses ZF à 12 rapports, mécanisme automatisé à commande AS-TRONIC. Ralentisseur hydrodynamique ZF directement accouplé à la boîte. Boîte de transfert à 2 étages avec blocage de différentiel.
Essieux	Construction soudée en acier à haute résistance fins grains. Tous les essieux directeurs. Essieux 2, 3 et 4 planétaires avec blocage différentiel.
Suspension	Suspension hydropneumatique sur tous les essieux. Chaque essieu peut être bloqué hydrauliquement.
Pneumatiques	8 pneus de taille: 445/95 R 25 (16.00 R 25).
Direction	Direction hydraulique ZF-servocom, à deux circuits, assistée hydrauliquement, avec pompe auxiliaire entraînée par essieu. Lors de déplacement routier, le 4ème essieu est dirigé électrohydrauliquement, et fixé en marche directe à partir de 18,6 mph. Direction conforme aux directives européennes 70/311/CE.
Freins	Freins de service: servofrein à air comprimé, à 2 circuits. Frein à main: ressort accumulé agissant sur les roues des essieux 1, 2 et 3. Freins continus: frein moteur par clapet sur échappement avec système de ralentissement Liebherr ZBS. Ralentisseur hydrodynamique accouplé à la boîte de vitesses. ABV avec contrôle ASR. Freins conformes aux directives européennes 71/320 CE.
Cabine du conducteur	Cabine spacieuse en tôle d'acier, traitement anticorrosion par bain de cataphorèse, avec suspension élastique et amortisseurs hydrauliques, revêtement intérieur avec isolation phonique et thermique selon les directives européennes, glaces de sécurité, appareils de commande et de contrôle, équipement confortable.
Installation électrique	Technique moderne de transmission de données par BUS de données, courant continu 24 Volts, 2 batteries de 170 Ah chacune.

Partie tournante

Cadre	Construction soudée résistante à la torsion et optimisée en poids réalisée par Liebherr en acier de construction à grain fin très rigide. Couronne d'orientation à rouleaux à 3 rangées permettant une rotation illimitée sert de pièce de liaison avec le châssis de la grue.
Moteur	Moteur diesel Liebherr, 4 cylindres, de type D934S A6, à refroidissement par eau, de 145 kW (197 ch) à 1800 rpm, couple max. 678 lbs-ft à 1100 rpm – 1500 rpm. Emissions des gaz d'échappement conformes aux directives 97/68/EG partie 3 et EPA/CARB Tier 3. Capacité du réservoir à carburant: 74 gallons.
Entraînement de la grue	Diesel hydraulique avec 1 pompes à débit variable à piston axiaux, servocommande et régulation de la puissance, 1 double pompe à engrenages, circuits hydrauliques ouverts et régulés. Entraînement hydraulique compact, accouplé directement au moteur Diesel, mécanisme d'entraînement total fermé pour une bonne insonorisation.
Direction	Direction électrique «Load Sensing», 4 mouvements de travail dirigeable simultanément, deux leviers de commande à 4 positions et à autocentrage.
Mécanisme de levage	Moteur à cylindrée constante et à pistons axiaux. Treuil de marque Liebherr équipé d'un engrenage planétaire et d'un frein d'arrêt commandé par ressort. L'entraînement du treuil de levage s'effectue en circuit régulé et fermé.
Mécanisme de relevage	1 vérin différentiel avec soupapes de retenu.
Dispositif de rotation	Moteur à cylindrée constante à pistons axiaux, engrenage planétaire, frein d'arrêt commandé par ressort. Orientation de série commutable en circuit hydraulique ouvert ou fermé (freinage automatique ou au pied).
Cabine du grutier	Construction en tôle d'acier entièrement zinguée avec peinture par poudrage et cuisson au four, avec glaces de sécurité, appareils de commande et de contrôle, équipement confortable, cabine inclinable vers l'arrière.
Dispositif de sécurité	Contrôleur de charge «LICCON», système test limitation de la course pour le levage, soupape de sûreté contre la rupture de tubes et de tuyaux.
Flèche télescopique	Flèche télescopique en acier à haute résistance à grains fins, à profil ovale, 1 élément de base et 5 éléments télescopiques. Tous les éléments télescopables indépendamment les uns des autres. Système de télescopage séquentiel rapide «Telematik». Longueur de flèche: 36 ft – 164 ft.
Contrepoids	Contrepoids principal de 14800 lbs.
Installation électrique	Technique moderne de transmission de données par BUS de données. Courant continu 24 Volts, 2 batteries de 170 Ah chacune.

Equipement supplémentaire

Fléchette pliante	Longueur: 34 ft – 62 ft, montable sous un angle de 0°, 20° ou 40°. Vérin hydraulique pour le relevage de la fléchette pliante de 0° à 40° (en option).
Rallonge flèche télescopique	Elément en treillis de 23 ft, de cette manière point d'articulation plus haute de 23 ft pour la flèche pliante.
2ème mécanisme de levage	Pour l'utilisation du deuxième crochet, ou bien pour une utilisation avec fléchette pliante lorsque le câble de levage principal rest moufflé.
Contrepoids supplémentaire	37500 lbs pour un contrepoids total de 46300 lbs.
Pneumatiques	8 pneus. Taille: 525/80 R 25 (20.5 R 25).
Entraînement 8 x 8	Essieu 1 est entraîné additionnellement.

Autres équipements supplémentaires sur demande.

The crane's structural steelwork is in accordance with EN 13000 and ASME B 30.5.

2. For the calculation of the load charts at least a wind speed of 23 ft/s (7 m/s, 15.7 mph) and regarding the load a sail area of 1 m² per ton load and a wind resistance coefficient of 1.2 on the load have been taken into account. For lifting of loads with large sail areas and/or high wind resistance coefficients the maximum wind speed as stated in the load charts has to be reduced.
3. Lifting capacities are given in kips.
4. The weight of the hook blocks and hooks must be deducted from the lifting capacities.
5. Working radii are measured from the slewing centreline.
6. The lifting capacities given for the telescopic boom only apply if the folding jib is taken off.
7. Lifting capacities above 139 kips / 176.3 kips only with additional pulley block/special equipment.
8. The data of this brochure serves only for general information. All information is provided without warranty. Instructions for the correct commissioning of the crane please take from the operation manual and the load chart book.

Remarques relatives aux tableaux des charges

1. La capacité de charge ne doit pas dépasser 85 % de la charge de basculement conformément à ASME B 30.5.
   La structure métallique de la grue est conforme à EN 13000 et ASME B 30.5.
2. Une vitesse de vent de 23 ft/s (7 m/s, 15.7 mph) minimum, une surface de prise au vent de 1 m² par tonne ainsi qu'un coefficient de résistance au vent de la charge 1,2 sont pris en compte pour le calcul des tableaux de charge. Lorsque des charges ayant une surface de prise au vent et/ou un coefficient de résistance au vent plus élevé(e)(s) sont levées, la vitesse de vent maximale indiquée dans les tableaux de charge doit être réduite.
3. Les forces de levage sont données en kips.
4. Les poids des moufles et crochets doit être soustrait des charges indiquées.
5. Les portées sont calculées à partir de l'axe de rotation.
6. Les forces indiquées pour la flèche télescopique s'entendent fléchette dépliable déposée.
7. Forces de levage plus de 139 kips / 176.3 kips seulement avec moufle additionnel/équipement supplémentaire.
8. Les données de cette brochure sont données à titre informatif. Ces renseignements sont sans garantie. Les consignes relatives à la bonne mise en service de la grue sont disponibles dans le manuel d'utilisation et le manuel de tableaux de charge.

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Blast Plan March 22, 2011
Prysmain Transmission Project

INTRODUCTION:

The most effective method for breaking rock for removal is through controlled blasting. Controlled blasting is safe, expedient, more energy efficient and creates less nuisance due to the shorter duration compared to other mechanical methods. The Prysmain Transmission Project will require limited blasting to achieve depths into rock suitable for the installation of Transition and Fluid Vaults. L. P. Drilling Inc of Fairfield NJ will do blasting for the Prysmain Transmission Project under the direction of and as a subcontractor to Railroad Construction Co., Inc. of Patterson, NJ.

DRILLING AND BLASTING PROGRAM

Permits

L. P Drilling Inc. will obtain all necessary site-specific blasting permits from the local regulatory bodies. L. P Drilling holds all federal permits for the purchase and use of explosives (ATF). Blasting permits will be coordinated with FDNY.

Safety

All crews shall be trained in the use and application of explosives. They shall possess proper license in New York City to handle explosives. Safety meetings shall be made a part of the daily routine.

Warning Signs & Guarding (according to NYC FDNY)

Warning Signs will be erected in locations around the blast area and will be legible from a distance of at least 200 feet if possible, Signs will be mounted on fences surrounding the project and all access points.

Blaster-in-charge will designate guarding positions. All guards will have a direct method of communication to the Blaster-in-Charge and clear visibility of their area of concern. These positions will include project level and street level positions as needed as well as the PATH Passenger Terminal.

After the blast, the Blaster-in-Charge will inspect and signal the all clear,

Blast Warning Signals

Blast day- Inform crews that blasting will occur; Horn or Siren will be used to sound:
1 long whistle - Preparing to Blast (up to 3 minutes)
2 short whistles – Ready to Blast.
3 short whistles – All Clear

Radio Communications

All relevant personnel will be in radio or other form of direct communication with the Blaster-in-Charge. All blasting initiation will be accomplished using non-electric systems, which will eliminate the need to limit radio transmissions near the site.

Site Control

The actual blasting area will be under the control of L.P. Drilling Inc. personnel at all times. THE BLASTER-IN-CHARGE HAS TOTAL AUTHORITY OVER THE SITE AND CAN PROHIBIT ANYONE FROM ENTERING.

Explosive Transportation and Storage:

ExploPowder will provide daily delivery of explosives. Onsite, type 3 magazines or "dayboxes" will be used per FDNY code.

ExploPowder will remove all leftover explosives products from the day's activities at the end of shift.

Pre-blast Surveys

Preblast Surveys will be performed at the direction of the FDNY.

Post Blast Surveys

Post Blast Surveys will be conducted as directed and necessary if damage is suspected. Post blast surveys will be limited to those structures that had a pre-blast survey so that it may be compared for the incidence of damage.

Seismic and Acoustic Monitoring

Seismic instrumentation will be located as directed and in an arrangement which provides the greatest protection for nearby structures and that provides the best data for ongoing refinement of subsequent blast designs.

Records

NYC required records would be used.

Blasting Control

Test blasting and production blasting will be performed to FDNY regulation and any required variances for changes of products and blast pattern geometry will be applied for during the test blast program and initial production-blasting schedule. Also, variances may continue to be applied for throughout the project if different explosives technology or technique is better suited to complete the project.

Blasting Mats or the equivalent will be used to cover all blasts to ameliorate flyrock possibilities.

Line Drilling will be utilized for perimeter/wall control. Line Drilling will consist of utilizing up to a 3-inch diameter borehole on 9 inch spacing.

Blast Pattern

Production blast patterns will vary as conditions dictate from 2ft X 3ft to 3ft X 3 ft.

Blast Plan Summary Means and Methods

The blasting program will start utilizing the standard blasting practices by FDNY regulations.

Test blasts

The test blast program will be conducted before any production blasting occurs. Initial test blasts will be located in the least sensitive area of the project.. Test blasts will be performed as necessary until sufficient data is obtained to confidently design blasts.

Blastholes will be drilled under the direction of a New York City licensed blasters. Top hammer hydraulic rock drills will be used. After holes are drilled, they will be loaded with cartridged explosives and non-electric detonators. Holes will then be stemmed or filled in with gravel to confine explosives. A licensed blaster will then connect the blastholes and then rubber mats or other suitable cover will be used to cover the blast.

EXPLOSIVES PRODUCTS

Explosives and initiation products will be those manufactured and supplied by Austin Powder Company. ExploPowder is the distributor of these products in the New York City five boroughs. The products include the following:
Emulex® 520 & 927, Red-D-lite®, and the Shockstar® Series Nonelectric Shocktube Detonators.
See "Explosives Products" Section for technical data and MSDS information.

Blasthole Drilling and Loading Sequence

1. Blaster-in-Charge will "layout" area to be drilled by marking with paint or other means the locations of the blastholes.
2. Blastholes will be inspected and measured by the blaster-in-charge.
3. Blastholes will be charge with explosives and stemmed to the proper load and depth.
4. Blastholes will be connected of "tied-in" by the blaster-in-charge after deciding on the timing to be used. Timing will be based on field conditions.
5. Blastholes will be covered with blasting mats or equivalent material.
6. Blast area will be cleared to a distance of blasters and FDNY discretion.
7. Blast will be initiated.
8. After blast is initiated, blaster-in-charge will inspect area for misfires or other dangers.
9. Blaster will signal all clear.

Seismology

Seismographs can give erroneous data if they are affected by other energy sources besides the blast. Also, geophone decoupling and/or the operational limits of the seismographs being exceeded can cause erroneous data. This can be determined by examining the seismograph for atypical waveforms and also by looking at the USBM graph for a chaotic array of vibration points.
The waveforms can be examined to determine if they are valid readings for the data they measure: peak particle velocity, frequency, acceleration, and ground strain (displacement). Acceleration and ground strain can also be approximated and/or estimated using various techniques once the peak particle velocity and frequency are known.
Utilizing data from other seismographs, peak particle can be checked for accuracy. Also, by using a continuing regression analysis, data can be reviewed for accuracy.

Vibration Monitoring

Seismic recordings will be collected immediately after each test blast. A vibration regression

analysis will be developed during the test blast program and updated on a daily basis throughout the project to insure the vibrations stay below project and state limits.

During the production blasting, seismograph monitoring locations will be used as directed.

Ongoing regression analysis insures that regardless of the pattern being utilized, proper explosives weights can be used to stay under the vibration limits. Using packaged explosive cartridges, it will be much easier to adjust explosive weight per delay.

ROLES AND RESPONSIBILITIES:
FDNY

The NY City Fire Department has ultimate and total control of blasting within the city limits. The Department issues blasting permits.

MATERIAL SAFETY DATA SHEET

EMULEX SERIES

DATE MARCH 2011 MSDS NO. E-3

SECTION I **Issued by the Safety and Compliance Dept.**

Austin Powder Company
25800 Science Park Drive
Cleveland, Ohio 44122

CHEMTREC (24HR Emergency Telephone), call 1-800-424-9300- United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory).
International callers, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00).
U.S. Maritime callers dial- 1-703-527-3887.

For non-emergency assistance, call 216-464-2400

TRADE NAME AND SYNONYMS

Seismex MH	Red-D Prime
Emulex 500, 700 & 900 Series	Enviroseis Emulsions
AXE 100 to 499	Emuline and Emuline 33
Primegel	Red-D Lite-E

Coalmex (Permissible Emulsion)
Emuline and Emuline 33 are Emulex Products that incorporate a continuous length of Detonating Cord. See MSDS. Primegel contains a Cast Booster. See MSDS. Enviroseis products are packaged in threaded plastic tubes.

SECTION II HAZARDOUS INGREDIENTS

Ammonium Nitrate: NH_4NO_3, CAS No. 6484-52-2, (60 - 90%)
Sodium Nitrate, $NaNO_3$, CAS No. 7631-99-4, (0 - 17%)
Petroleum Hydrocarbons, CAS No. 68476-30-2 (3 to 9%)
Aluminum, Al, CAS No. 7429-90-5, (0 to 10%)
An emulsified water in oil mixture of ammonium nitrate, mineral oil, and emulsifiers.

SECTION III PHYSICAL DATA

BOILING POINT N/A
SPECIFIC GRAVITY (H_2O = 1) 1.14 to 1.35
PERCENT VOLATILE BY VOL. (%) N/A
VAPOR PRESSURE (mm Hg) N/A
VAPOR DENSITY (Air=1) N/A
EVAPORATION RATE: N/A
SOLUBILITY IN WATER: Although in excess of 80% of the materials are readily soluble in water, the products have excellent water resistance.
APPEARANCE AND ODOR: Viscous emulsion. If aluminum is present, gray metal particles will be visible. Slight odor of oil.

SECTION IV FIRE AND EXPLOSION DATA

FLASH POINT:	Oil 114^{0}C (PMCC)
FLAMMABLE LIMITS:	Not available
EXTINGUISHING MEDIA:	See below.
SPECIAL FIRE FIGHTING PROCEDURES:	Do not fight fires. Withdraw personnel immediately. Allow fire to burn itself out.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	May explode when subjected to fire or shock, especially when confined and in large quantities.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: ACGIH: Oil Mist, mineral, 5 MG/M^3, Aluminum metal dust, 10 MG/M^3
OSHA: Oil Mist, mineral, 5 MG/M^3, Aluminum metal dust, 15 MG/M^3
EFFECTS OF OVEREXPOSURE: Acute: Ingestion of large amounts may cause cyanosis, nausea, collapse, vomiting, abdominal pain, rapid heartbeat and breathing, coma, convulsions, and death may occur.
EMERGENCY AND FIRST AID PROCEDURES:
Eyes: Slight irritant. Flush with large amounts of water for at least 15 minutes and consult a physician.
Skin: Slight irritant. Wash with mild soap and water.

MATERIAL SAFETY DATA SHEET

EMULEX SERIES

SECTION VI REACTIVITY DATA **Issued by the Safety and Compliance Dept.**

STABILITY: Stable under normal conditions. May explode when subjected to fire or shock, especially when confined and in large quantities. Avoid temperatures above 212^0F, (100^0C).

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid all contamination, especially peroxides and chlorates. Alkaline contamination may liberate ammonia fumes.

HAZARDOUS DECOMPOSITION PRODUCTS: Gaseous nitrogen oxides and carbon oxides: Toxic decomposition products including carbon monoxide (CO) may migrate to off blast-site areas.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Pick up and dispose of all spilled material immediately. Do not permit smoking or open flames near spill site.

WASTE DISPOSAL METHOD: Uncontaminated material may be placed in large diameter boreholes and detonated so that the explosive energy is utilized as originally intended. Dispose of under direct supervision of a qualified person according to local, state and federal regulations. Call Austin Powder for recommendations and assistance.

TRANSPORTATION EMERGENCIES involving spills, leaks, fires or exposures in the United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory): **CALL CHEMTREC** for emergencies only**:** 1-800-424-9300.
International callers, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00).
U.S. Maritime callers dial- 1-703-527-3887. All calls are recorded.

SECTION VIII SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION:	Not required under normal conditions.
VENTILATION:	Not required under normal conditions.
PROTECTIVE GLOVES:	Slight skin irritant.
EYE PROTECTION:	Slight eye irritant.

SECTION IX SPECIAL PRECAUTIONS

COMPLY WITH THE SAFETY LIBRARY PUBLICATION NO. 4 "WARNINGS AND INSTRUCTIONS" AS ADOPTED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES.
TRANSPORTATION, STORAGE AND USE MUST COMPLY WITH OSHA SAFETY AND HEALTH STANDARDS 29CFR1910.109, APPLICABLE MSHA REGULATIONS, THE DOT AND HAZARDOUS MATERIALS REGULATIONS, BATF REQUIREMENTS AND STATE AND LOCAL TRANSPORTATION, STORAGE AND USE REGULATIONS AND ORDINANCES.

DOT or IMDG proper shipping description: Explosives, Blasting, Type E, 1.1D, UN0241, PG II.

Coalmex is approved for use as a Permissible Explosive by the USDL and MSHA when used in conformance with the requirements of 30 CFR 15.

This material may become a hazardous waste under certain conditions and must be collected, labeled and disposed of per state and federal hazardous waste regulations.

None of the components are listed in the 1987 IARC Monographs, Group 1, 2A or 2B as known, probable, or possible carcinogens, nor are they listed in the NTP annual report on carcinogens.

MATERIAL SAFETY DATA SHEET

SHOCK *STAR
NON-ELECTRIC DETONATORS

DATE APRIL 2010 **MSDS NO. ED-5**

SECTION I

Issued by the Safety and Compliance Dept.

AUSTIN STAR DETONATOR COMPANY
901 CANTU ROAD
BROWNSVILLE, TX 78520

CHEMTREC (24HR EMERGENCY TELEPHONE), CALL 1-800-424-9300- United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory).
International callers, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00).
U.S. Maritime callers dial- 1-703-527-3887.

For non-emergency assistance, call
956-831-7751

TRADE NAME AND SYNONYMS

Shock*Star: Twin* Star Detonators, In-Hole Delays, Detonators, Surface Delay Connectors, Quick-Relay Connectors, Dual-Delays, Shorty, Long Period, STD (Shock Tube with Detonators), Quick*Start and MS Connector.

Non-Electric Blasting Caps

SECTION II HAZARDOUS INGREDIENTS

Explosive components are PETN or RDX and lead compounds sealed in a metal shell.

PETN, Pentaerythritol tetranitrate, $C_5H_8N_4O_{12}$	CAS No. 78-11-5
RDX, Cyclotrimethylene Trinitramine, $C_3H_6N_6O_6$	CAS No. 121-82-4
Lead Azide, Pb $(N_3)_2$	CAS No. 13424-46-9
Lead Styphnate, Lead Trinitroresorcinate, $C_6H_3N_3O_9Pb$	CAS No. 15245-44-0

SECTION III PHYSICAL DATA

BOILING POINT	N/A	VAPOR PRESSURE (mm Hg)	N/A
SPECIFIC GRAVITY (H_2O = 1)	N/A	VAPOR DENSITY (Air = 1)	N/A
PERCENT VOLATILE BY VOL. (%)	N/A	EVAPORATION RATE:	N/A
SOLUBILITY IN WATER:	Insoluble		

APPEARANCE AND ODOR: Aluminum or copper shells with Shock Tube attached. See the Shock Tube MSDS. No odor.

SECTION IV FIRE AND EXPLOSION DATA

FLASH POINT:	N/A
FLAMMABLE LIMITS:	N/A
EXTINGUISHING MEDIA:	See below
SPECIAL FIREFIGHTING PROCEDURES:	Do not fight fire. Withdraw personnel immediately. Allow fire to burn itself out.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	May explode when subjected to flame, heat, impact or friction. Safe from extraneous electric currents except for high energy discharges such as lightening. Do not exceed 150°F (66°C). Avoid toxic fumes from fire.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: ACGIH: 0.05 mg/M³ TWA, lead, elemental, and inorganic compounds, as Pb.
RDX-Skin 1.5 mg/M³
OSHA : 50 µg/M³ PEL as Pb. For additional information, see 29 CFR 1910.1025

EFFECTS OF OVEREXPOSURE: None likely when safe blasting practices are employed.

EMERGENCY AND FIRST AID PROCEDURES: Improper handling or misuse may cause detonation resulting in injuries from shrapnel. Lead and lead compounds are listed in the 1987 IARC Monographs as possible human carcinogens (Group 2B). Lead is not listed in the NTP annual report on carcinogens.

MATERIAL SAFETY DATA SHEET

SHOCK*STAR
NON ELECTRIC DETONATORS

Austin Star Detonator Company
901 Cantu Road
Brownsville, TX 78520

SECTION VI REACTIVITY DATA

Issued by the Safety and Compliance Dept.

STABILITY: May explode when subjected to flame, heat, impact or friction. Shock*Star and non-electric detonators are safe from extraneous electric currents except for high energy discharges such lightening.

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid contact with acids or alkalies.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide and lead fumes.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Pick up containers or units by hand. Avoid conditions affecting stability. DO NOT use damaged detonators.

WASTE DISPOSAL METHOD: Dispose of under direct supervision of a qualified person according to local, state and federal regulations. Call Austin Powder for recommendations and assistance. This material may become a hazardous waste under certain conditions and must be collected, labeled and disposed of per state and federal hazardous waste regulations.

TRANSPORTATION EMERGENCIES involving spills, leaks, fires or exposures in the United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory): **CALL CHEMTREC** for emergencies only**:** 1-800-424-9300.
International callers, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00).
U.S. Maritime callers dial- 1-703-527-3887. All calls are recorded.

SECTION VIII SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION:	Avoid breathing fumes from detonation.
VENTILATION:	Not required.
PROTECTIVE GLOVES:	Not required.
EYE PROTECTION:	Not required.

SECTION IX SPECIAL PRECAUTIONS

COMPLY WITH THE SAFETY LIBRARY PUBLICATION NO. 4 "WARNINGS AND INSTRUCTIONS" AS ADOPTED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES.
TRANSPORTATION, STORAGE AND USE MUST COMPLY WITH OSHA SAFETY AND HEALTH STANDARDS 29CFR1910.109, APPLICABLE MSHA REGULATIONS, THE DOT AND HAZARDOUS MATERIALS REGULATIONS, BATF REQUIREMENTS AND STATE AND LOCAL TRANSPORTATION, STORAGE AND USE REGULATIONS AND ORDINANCES.
THESE DETONATORS MAY BE SHIPPED UNDER ONE OF THE FOLLOWING DOT CLASSIFICATIONS:
DOT or IMDG proper shipping description:
Detonator Assemblies, Non-Electric, 1.1B, UN0360, PGII Detonator Assemblies, Non-Electric,1.4B, UN0361, PGII
Consult IME Safety Library Publication No. 22, RECOMMENDATIONS FOR THE SAFE TRANSPORTATION OF DETONATORS IN A VEHICLE WITH CERTAIN OTHER EXPLOSIVE MATERIALS AND THE GUIDE FOR THE USE OF THE IME 22 CONTAINER.

MATERIAL SAFETY DATA SHEET

SHOCK★STAR™ SHOCK TUBING

DATE JUNE 2008 **MSDS NO. C-3** **PAGE 1 OF 2**

SECTION I

Issued by the Safety and Compliance Dept.

Austin Star Detonator Company
901 Cantu Road
Brownsville, TX 78520

CHEMTREC (24HR Emergency Telephone), call
1-800-424-9300- United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory).
International callers, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00).
U.S. Maritime callers dial- 1-703-527-3887.

For non-emergency assistance, call
956-831-7751

Trade Name And Synonyms

Signal Transmission Tubing
Shock Tube
Lead-In-Line (L-I-L)

SECTION II HAZARDOUS INGREDIENTS

The explosive components of this device (HMX and Aluminum Powder) are less than 0.4 percent by weight of the shock tube and are totally enclosed in the tubing.

SECTION III PHYSICAL DATA

Boiling Point : N/A
Specific Gravity (H_2O = 1): N/A
Percent Volatile By Volume: None
Solubility In Water: Negligible
Vapor Pressure (mm Hg): N/A
Vapor Density (Air = 1): N/A
Evaporation Rate: N/A

Appearance And Odor: Flexible ionomer resin plastic tubing with a minute amount of an extremely fine, silver colored explosive composition on the interior walls of the tube. No odor.

SECTION IV FIRE AND EXPLOSION DATA

Flash Point:	N/A
Flammable Limits:	N/A
Extinguishing Media:	Water, CO_2 , foam, dry chemical fire extinguisher.
Special Firefighting Procedures:	Not determined.
Unusual Fire And Explosion Hazards:	Avoid toxic fumes from fire.

SECTION V HEALTH HAZARD DATA

Threshold Limit Value: Not Determined.
Effects Of Overexposure: Not Determined.

Emergency And First Aid Procedures:
Fumes: Remove To Fresh Air.

MATERIAL SAFETY DATA SHEET

Austin Star Detonator Company
901 Cantu Road
Brownsville, TX 78520

SHOCK★STAR™ SHOCK TUBING

SECTION VI REACTIVITY DATA **Issued by the Safety and Compliance Dept.**

Stability: Stable.

Incompatibility (Materials To Avoid): None known.

Hazardous Decomposition Products: Gaseous nitrogen oxides and carbon oxides: Toxic decomposition products including carbon monoxide (co) may migrate to off blast-site areas.

Hazardous Polymerization Will Not Occur.

SECTION VII SPILL OR LEAK PROCEDURES

Steps To Be Taken In Case Material Is Released Or Spilled: Pick up containers or units by hand.

Waste Disposal Method: Dispose of under direct supervision of a qualified person according to local, state and federal regulations. Call Austin Powder for recommendations and assistance.

Transportation Emergencies involving spills, leaks, fires or exposures in the United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory): **CALL CHEMTREC** for emergencies only**:** 1-800-424-9300.
International callers, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00).
U.S. Maritime callers dial- 1-703-527-3887. All calls are recorded.

SECTION VIII SPECIAL PROTECTION INFORMATION:

Respiratory protection:	Avoid breathing fumes from detonation.
Ventilation:	Not required under normal conditions.
Protective gloves:	Not required.
Eye protection:	Not required.

SECTION IX SPECIAL PRECAUTIONS

Comply With The Safety Library Publication No. 4 " Warnings And Instructions" As Adopted By The Institute Of Makers Of Explosives.

Transportation, storage and use must comply with OSHA safety and health standards 29CFR1910.109, applicable MSHA regulations, the DOT and hazardous materials regulations, BATF requirements and state and local transportation, storage and use regulations and ordinances.

Avoid any situation that may cause entanglement with machinery or moving equipment. Jerking and breaking Shock Tubing may lead to a premature detonation known as "Snap and Shoot". Do not drive equipment over Shock Tubing.

DOT or IMDG proper shipping description:
1) Standard packaging: Articles, Explosive, n.o.s., (contains HMX/Aluminum), 1.4S, UN0349, PGII.
2) Not regulated as an explosive when packaged on production or large volume shipping spools with end caps. May be shipped as: Plastic Tubing.

None of the components are listed in the 1987 IARC Monographs, Group 1, 2A or 2B as known, probable, or possible carcinogens, nor are they listed in the NTP annual report on carcinogens.

Appendix J

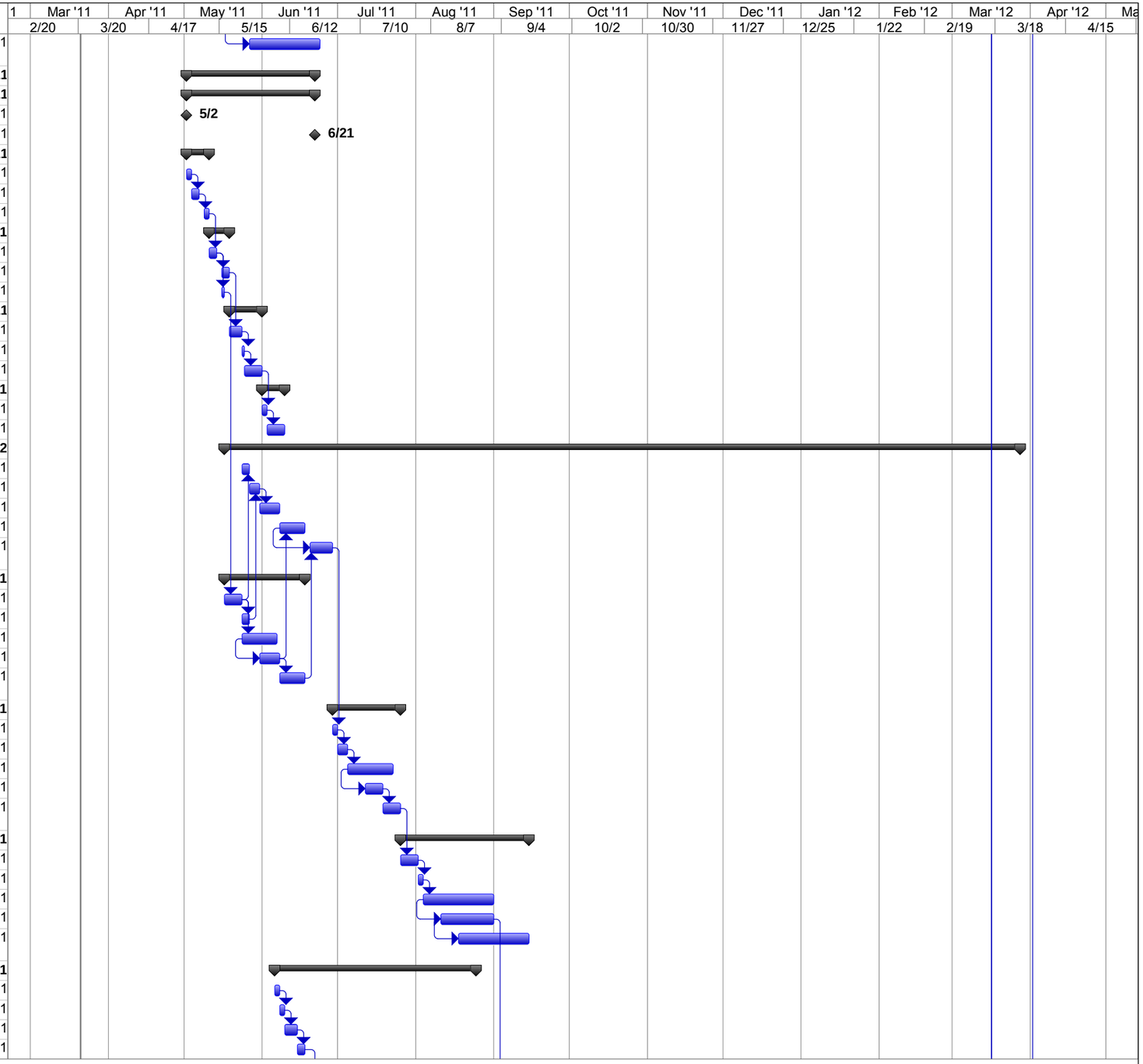
Project Schedule

ID	Task Name	Duration	Start	Finish
1	**Pre Construction Tasks**	**61 days**	**Fri 3/25/11**	**Fri 6/17/11**
7	**Contracting**	**11 days?**	**Wed 3/16/11**	**Wed 3/30/11**
12	**Submittals**	**33 days**	**Mon 3/28/11**	**Wed 5/11/11**
19	**Submittal Review**	**33 days**	**Mon 5/9/11**	**Wed 6/22/11**
26	**Procurement**	**30 days**	**Mon 6/20/11**	**Fri 7/29/11**
30	**Construction**	**115 days?**	**Tue 5/10/11**	**Sat 10/15/11**
31	Construction	115 days?	Tue 5/10/11	Sat 10/15/11
32	**52nd Street complete**	**261 days?**	**Mon 5/2/11**	**Fri 4/27/12**
33	**52nd Street South Sidewalk Realignment**	**7 days**	**Mon 5/9/11**	**Tue 5/17/11**
34	Sawcut & Remove surface construction and Cobbles	3 days	Mon 5/9/11	Wed 5/11/11
35	Relocate any utilities	2 days	Tue 5/10/11	Wed 5/11/11
36	New Temp Curb & Sidewalk	4 days	Thu 5/12/11	Tue 5/17/11
37	**52nd Street South Ductbank**	**252 days?**	**Fri 5/13/11**	**Fri 4/27/12**
38	Excavate and Dispose Earth, Rock & Install Sheeting	25 days	Wed 7/20/11	Tue 8/23/11
39	Install Conduit & Concrete Duct Bank	30 days?	Wed 7/27/11	Tue 9/6/11
40	Remove Sheeting, Backfill & Restore surface construction	27 days	Tue 8/30/11	Wed 10/5/11
41	**52nd Street North Side**	**252 days**	**Fri 5/13/11**	**Fri 4/27/12**
42	**Drill Rig Operations**	**90 days**	**Wed 6/15/11**	**Mon 10/17/11**
43	Drilling Operations (By others) Duration Per Adden #1 to start 6-1-11	90 days	Wed 6/15/11	Mon 10/17/11
44	**Transition Pit / HDD Pit**	**228 days?**	**Fri 5/13/11**	**Mon 3/26/12**
45	HDD Drill Operations	0 days	Wed 6/15/11	Wed 6/15/11
46	Transition Pit	0 days?	Wed 6/15/11	Wed 6/15/11
47	Sawcut and remove surface construction	2 days	Fri 5/13/11	Mon 5/16/11
48	Relocate any utilities and Water Mian	4 days	Fri 5/13/11	Wed 5/18/11
49	Build Curb Wall	4 days	Fri 5/13/11	Wed 5/18/11
50	Excavate Earth, Rock	20 days	Tue 5/17/11	Mon 6/13/11
51	Form & Pour Entry Collars	1 day	Tue 5/31/11	Tue 5/31/11
52	Install Precast Transition Vault	3 days	Tue 6/14/11	Thu 6/16/11
53	Install Temporary Cover	1.5 days	Fri 6/17/11	Mon 6/20/11
54	Backfill Vault with Sand Int & Ext	7 days	Fri 6/17/11	Mon 6/27/11
55	Install Cover and Backfill to Grade	4 days	Tue 6/28/11	Fri 7/1/11
56	Install Hydrant	2 days	Mon 7/4/11	Tue 7/5/11
57	Instal, Backfilll & Restore Sitework	9 days	Wed 3/14/12	Mon 3/26/12
58	**Fluid Vault**	**236 days**	**Fri 5/13/11**	**Thu 4/5/12**
59	Sawcut and remove surface construction	3 days	Tue 5/17/11	Thu 5/19/11
60	Relocate any utilities	2 days	Fri 5/13/11	Mon 5/16/11
61	Build Curb Wall	4 days	Thu 5/19/11	Tue 5/24/11
62	Excavate Earth, Rock	20 days	Fri 5/20/11	Thu 6/16/11
63	Install Precast Fluid Vault	6 days	Fri 6/17/11	Fri 6/24/11
64	Install Tanks	2 days	Mon 6/27/11	Tue 6/28/11
65	Install Piping (by Others) Support by RCC	15 days	Wed 6/29/11	Tue 7/19/11
66	Backfill Vault with Pea Gravel	4 days	Mon 4/2/12	Thu 4/5/12
67	Install Cover and Backfill to Grade	10 days	Wed 3/14/12	Tue 3/27/12
68	Remove Sheeting	2 days	Wed 3/14/12	Thu 3/15/12
69	Install & Restore Sitework	6 days	Wed 3/14/12	Wed 3/21/12
70	**52nd Street South Ductbank**	**30 days**	**Fri 5/13/11**	**Thu 6/23/11**
71	Excavate and Dispose Earth, Rock & Install Sheeting	25 days	Fri 5/13/11	Thu 6/16/11
72	Install Conduit & Concrete Duct Bank	20 days	Fri 5/20/11	Thu 6/16/11

Project: Sewer #2 Revised 10 Schedu
Date: Mon 3/21/11

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Progress
Split	External Tasks	Inactive Summary	Manual Summary	Deadline
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

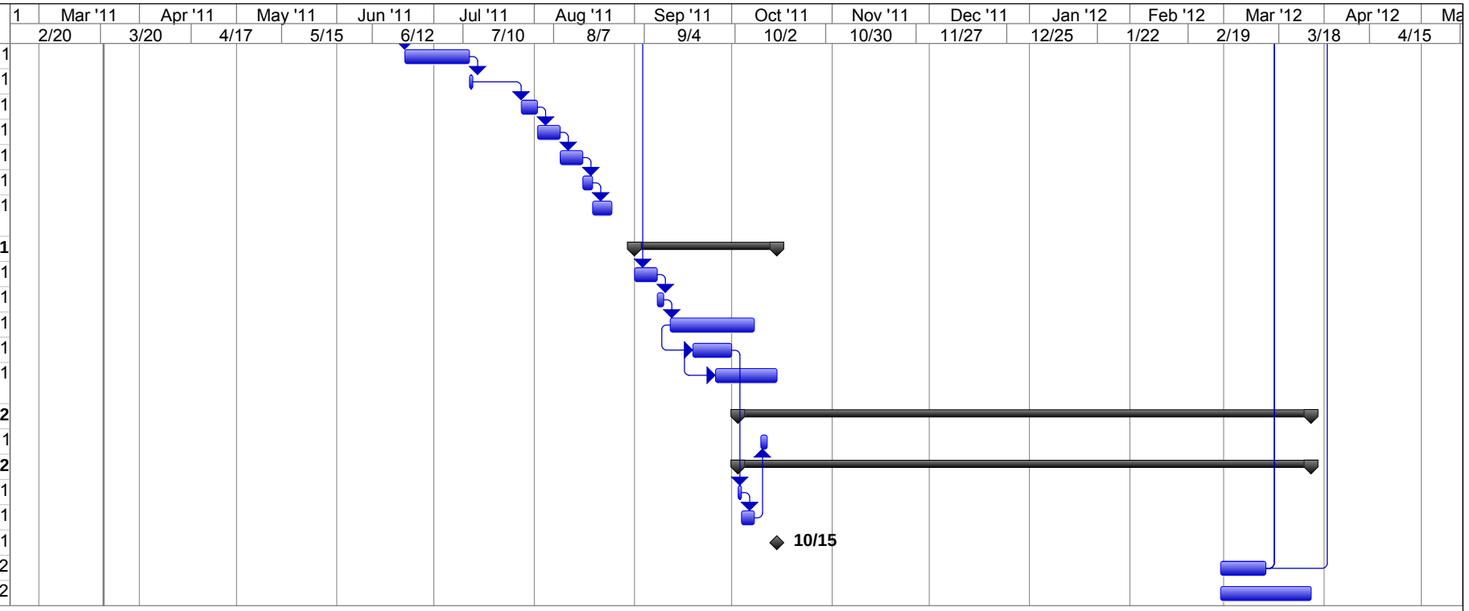
ID	Task Name	Duration	Start	Finish
73	Remove Sheeting, Backfill & Restore surface construction	20 days	Fri 5/27/11	Thu 6/23/11
74	**Con Ed Sub Station**	**37 days?**	**Mon 5/2/11**	**Tue 6/21/11**
75	**Con Edison Interior Sub Station**	**37 days?**	**Mon 5/2/11**	**Tue 6/21/11**
76	Con Edison Interior Sub Station	0 days?	Mon 5/2/11	Mon 5/2/11
77	Con Edison Interior Sub Station (no work alloud)	0 days?	Tue 6/21/11	Tue 6/21/11
78	**Underpinning Foundation**	**7 days**	**Mon 5/2/11**	**Tue 5/10/11**
79	Sawcut & Remove Interior SOG	2 days	Mon 5/2/11	Tue 5/3/11
80	Excavate foundation Wall Interior & Exterior	3 days	Wed 5/4/11	Fri 5/6/11
81	Form & Pour Underpinning Block	2 days	Mon 5/9/11	Tue 5/10/11
82	**Entering Substation**	**6 days?**	**Wed 5/11/11**	**Wed 5/18/11**
83	Cut Opening in Existing Wall	3 days	Wed 5/11/11	Fri 5/13/11
84	Install SS Wall Plate	3 days	Mon 5/16/11	Wed 5/18/11
85	Epoxy Grout Wall Opening	1 day?	Mon 5/16/11	Mon 5/16/11
86	**Interior SOG Work**	**9 days?**	**Thu 5/19/11**	**Tue 5/31/11**
87	Excavate & Grade New Pit location	3 days	Thu 5/19/11	Mon 5/23/11
88	Install New Waterproofing Membrane	1 day?	Tue 5/24/11	Tue 5/24/11
89	Form & Pour New Pit Slab & Walls	5 days	Wed 5/25/11	Tue 5/31/11
90	**Installing Steel Conduit Supports / Conduit**	**7 days**	**Wed 6/1/11**	**Thu 6/9/11**
91	Layout & delivery	2 days	Wed 6/1/11	Thu 6/2/11
92	Drill & Anchor Pipe Supports	5 days	Fri 6/3/11	Thu 6/9/11
93	**49th to 50th Street Sidewalk**	**227 days**	**Tue 5/17/11**	**Tue 3/27/12**
94	Sawcut & Remove Surface Construction	3 days	Tue 5/24/11	Thu 5/26/11
95	Relocate Any Utilities	2 days	Fri 5/27/11	Mon 5/30/11
96	Excavate and Dispose Earth, Rock & install sheeting	6 days	Tue 5/31/11	Tue 6/7/11
97	Install Conduit & Concrete Duct Bank	8 days	Wed 6/8/11	Fri 6/17/11
98	Remove Sheeting, Backfill & Restore surface construction	7 days	Mon 6/20/11	Tue 6/28/11
99	**12th Ave Roadwork Out of Con Ed**	**24 days**	**Tue 5/17/11**	**Fri 6/17/11**
100	Sawcut & Remove surface construction	5 days	Tue 5/17/11	Mon 5/23/11
101	Relocate any utilities	3 days	Tue 5/24/11	Thu 5/26/11
102	Excavate and Dispose Earth, Rock & install Sheeting	10 days	Tue 5/24/11	Mon 6/6/11
103	Install Conduit & Concrete Duct Bank	6 days	Tue 5/31/11	Tue 6/7/11
104	Remove Sheeting, Backfill & Restore surface construction	8 days	Wed 6/8/11	Fri 6/17/11
105	**50th Street Intersection**	**19 days**	**Wed 6/29/11**	**Mon 7/25/11**
106	Sawcut & Remove surface construction	2 days	Wed 6/29/11	Thu 6/30/11
107	Relocate any utilities	2 days	Fri 7/1/11	Mon 7/4/11
108	Excavate and Dispose Earth, Rock & install Sheeting	14 days	Tue 7/5/11	Fri 7/22/11
109	Install Conduit & Concrete Duct Bank	5 days	Tue 7/12/11	Mon 7/18/11
110	Remove Sheeting, Backfill & Restore surface construction	5 days	Tue 7/19/11	Mon 7/25/11
111	**50th to 51st Street Sidewalk**	**37 days**	**Tue 7/26/11**	**Wed 9/14/11**
112	Sawcut & Remove surface construction	5 days	Tue 7/26/11	Mon 8/1/11
113	Relocate any utilities	2 days	Tue 8/2/11	Wed 8/3/11
114	Excavate and Dispose Earth, Rock & install Sheet	20 days	Thu 8/4/11	Wed 8/31/11
115	Install Conduit & Concrete Duct Bank	15 days	Thu 8/11/11	Wed 8/31/11
116	Remove Sheeting, Backfill & Restore surface construction	20 days	Thu 8/18/11	Wed 9/14/11
117	**51st Street Intersection (Stand Alone Items)**	**58 days**	**Mon 6/6/11**	**Wed 8/24/11**
118	Sawcut & Remove surface construction	2 days	Mon 6/6/11	Tue 6/7/11
119	Relocate any utilities	2 days	Wed 6/8/11	Thu 6/9/11
120	Set Up Bupass Pump System	3 days	Fri 6/10/11	Tue 6/14/11
121	Gunite existing sewer	3 days	Wed 6/15/11	Fri 6/17/11



Project: Sewer #2 Revised 10 Schedu
Date: Mon 3/21/11

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Progress
Split	External Tasks	Inactive Summary	Manual Summary	Deadline
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

ID	Task Name	Duration	Start	Finish
122	Excavate and Dispose Earth, Rock & Install Sheeting	14 days	Wed 6/22/11	Mon 7/11/11
123	Demo Esisting Brick Sewer	1 day	Tue 7/12/11	Tue 7/12/11
124	Install Conduit & Concrete Duct Bank	3 days	Thu 7/28/11	Mon 8/1/11
125	Set Percast Box Culvert Pipe Sections	5 days	Tue 8/2/11	Mon 8/8/11
126	Form Rebar and Pour Doghouse Sanitary Manhole	5 days	Tue 8/9/11	Mon 8/15/11
127	Form Rebar Pour Coller Extensions at Manholes	3 days	Tue 8/16/11	Thu 8/18/11
128	Remove Sheeting, Backfill & Restore surface construction	4 days	Fri 8/19/11	Wed 8/24/11
129	**51st to 52nd Sidewalk**	**32 days**	**Thu 9/1/11**	**Fri 10/14/11**
130	Sawcut & Remove surface construction	5 days	Thu 9/1/11	Wed 9/7/11
131	Relocate any utilities	2 days	Thu 9/8/11	Fri 9/9/11
132	Excavate and Dispose Earth, Rock & Install Sheeting	20 days	Mon 9/12/11	Fri 10/7/11
133	Install Conduit & Concrete Duct Bank	10 days	Mon 9/19/11	Fri 9/30/11
134	Remove Sheeting, Backfill & Restore surface construction	15 days	Mon 9/26/11	Fri 10/14/11
135	**CON-Ed Building Finishes**	**128 days**	**Mon 10/3/11**	**Tue 3/27/12**
136	Install Floor Grating system	2 days	Mon 10/10/11	Tue 10/11/11
137	**Installing Cable**	**128 days**	**Mon 10/3/11**	**Tue 3/27/12**
138	Swab and Clean Duct	1 day	Mon 10/3/11	Mon 10/3/11
139	Pull Cable	4 days	Tue 10/4/11	Fri 10/7/11
140	**Pull Land Cable By**	0 days	Sat 10/15/11	Sat 10/15/11
141	Tie In	10 days	Wed 2/29/12	Tue 3/13/12
142	Hydraulic Testing	20 days	Wed 2/29/12	Tue 3/27/12



Project: Sewer #2 Revised 10 Schedu
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Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Progress
Split	External Tasks	Inactive Summary	Manual Summary	Deadline
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

Appendix K

Pre and Post-Construction
Foundation Survey

Railroad Construction Company, Inc.
Contractors – Engineers
75-77 Grove Street • Paterson, NJ 07503
Est. 1926
Phone: 973-684-0362 • Fax: 973-684-1355

Prysmian NYC Pre and Post Construction Surveys

Existing conditions surveys will be conducted to document the structures adjacent to the duct bank construction to provide a baseline for the post construction survey for the work to be performed during the installation of the duct bank. The surveys will be performed by an independent firm and contain the following:

- Photo documentation of the structures along the construction path.
- Written description corresponding to the photos.
- Written description of any deficiencies or distress in structures found during Preconstruction survey.
- Post Construction survey will be conducted if deemed necessary due to visual changes created by construction activities.
- A written detailed report will be provided for Preconstruction survey as a summery and narrative to photos and photo descriptions provided.

Appendix L

Facility Management Plan

HUDSON TRANSMISSION PARTNERS, LLC

HUDSON TRANSMISSION FACILITY

FACILITY MANAGEMENT PLAN

March 2011

Table of Contents

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1.2 Cable System Description 2
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3.0 Notification Procedures and Restrictions 5
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5.0 Annual Maintenance Plans 5
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8.0 Review, Evaluation, and Revision of Maintenance Plan 6

1.0 Introduction and Facility Description

1.1 General

Hudson Transmission Partners (HTP) holds a Certificate of Environmental Compatibility and Public Need (Certificate) for the construction and operation of the New York State portion of a controllable 660 MW 345kV transmission line ("Facility") that will extend from the Bergen Substation, Ridgefield, New Jersey to Con Ed's 49th Street facility, New York, New York (Figure 1). Its principal physical features include:

- An interconnection with the regional Pennsylvania-Jersey-Maryland ("PJM") grid and a 230 kV underground cable 0.3 miles from the Bergen substation to a converter station where the alternating current will be converted first to direct current and back to alternating current at 345 kV for transmission to New York;

- A submarine power transmission cable that will extend for a distance of approximately 4 miles (3.3 miles in New York waters) buried below the Hudson River bottom, to a landfall point west of the pier line and north of Pier 92;

- An upland power transmission cable system, which includes an underground fluid vault and 345kV underground cable that will extend underground for a distance of approximately 0.2 miles on West 52nd Street and 12th Avenue to the entrance of Consolidated Edison's West 49th Street Substation where the transmission facility terminates.

As required in Certificate condition #40, this Facility Management Plan ("Plan") addresses the underground, or upland, portion of the Facility that is buried under State-owned lands and highway rights-of-way; specifically, the segment that extends from West 52nd to West 49th Street in Manhattan. The inset on Figure 1 of the upland cable and HDD entry pit construction EM&CP shows the Manhattan upland segment of the Facility that is described in this Plan.

1.2 Cable System Description

The upland portion of the Facility includes HVAC cables installed in an 8-inch FRE IPS conduit. The fiber optic cables will be installed in 2-inch FRE conduit. A pre-cast fluid vault for the submarine cable will be constructed below 52nd street. The precast fluid vault will measure approximately 70-ft x 12-ft x 12-ft and will include removable precast concrete panel lids that will provide a seal with the vault walls. A 30-inch diameter manhole on West 52nd Street will

provide access to the fluid vault and will represent the only at grade structure for the facility. The upland cables are solid state, with no fluids used for installation or other purposes.

For those segments of the cable system installed via open cut trenching, installation will typically involve:

Saw cutting followed by digging using a conventional tire mounted mechanical backhoe; trench excavation to the lines and grades necessary for proper conduit clearance, bedding and stabilization; laying of conduit segments within the trench; backfilling the trench with excavated material; pulling of cable segments through the conduit; final site restoration.

Typical trench dimensions will differ for the cable/conduit arrangements but will range from approximately 2 to 6 feet in width and up to approximately 7 feet deep (Appendix I – Sheet 11 of 39). A total of approximately 964 linear feet of trenching is expected to be dug related to the conduit installation.

HDD will be used to install segments of the system from the transition pit on West 52nd Street to the cofferdam located in the bed of the Hudson River. Installation will involve: initial boring and installation of conduit; pulling of cable segments through the conduit; injection of the casing with bentonite grout to immobilize the cable and provide protection.

The Hudson Transmission Facility is designed as an integrated unit for operation and maintenance purposes, and installed in such a manner to be permanently embedded underground so that it will require no regular maintenance. The manhole on W. 52nd Street will provide access for the periodic inspection of the fluid vault. The cable system will be tested during commissioning of the Facility and any faults will be identified and repaired prior to completion. In the longer term (10 years or more), the chance of a line fault occurring remains remote. If a fault were to occur it would be detected immediately by the Facility operators. Detailed as-built drawings for the entire upland cable installation will be submitted to the NYSDPS as required by Certificate condition #74.

1.3 ROW Description & Coordination with Underlying Landowners and Managers

The ground surface under which the upland cable system will be buried is an existing state road (12th Avenue/State Route 9A/Joe DiMaggio Highway) and New York City municipal streets and sidewalks. There is no surface ROW dedicated to the Facility or under HTP's control.

The upland cable system will be constructed and operated so as not to interfere with the operation and maintenance of adjacent utilities such as, but not limited to, service connections, power lines, oil, water, air, and gas lines, sewers and other drains; circulating water lines; oil separators; septic tanks; telephone lines; electrical duct banks and raceway; or buried structures within the construction limits. The 345kV cables used in this HTP Project are engineered and constructed to be fully compatible with the operation and maintenance of nearby utility cables.

The upland cable system will comply with the requirements for the protection of underground facilities set forth in 16 New York Codes, Rules, and Regulations ("NYCRR") Part 753. The purpose of these rules is to establish procedures for the protection of underground facilities in order to assure public safety and to prevent damage to public and private property, as required by General Business Law Article 36 and Public Service Law Section 119-b (16 NYCRR Part 753-1.1).

As required in 16 NYCRR Part 753, before commencing or engaging in any non-emergency excavation, excavators working along the cable installation route will provide notice of the location and date of the planned excavation to the **New York City one-call notification system (1-800-272-4480)**. Such notice will be served at least two but not more than ten working days, not including the date of the call, before the commencement date of the excavation or demolition. The one call requirements will be adhered to during the length of the facility's operation.

1.4 Time Frame of Management Plan

The time frame envisioned for this Plan is 10 years. The cable is expected to be a permanent underground facility requiring no surface or underground maintenance for at least 10 years, with the likelihood of emergency repair or unintended damage considered remote. Notwithstanding, HTP has put into place an organization and procedures intended to assure protection of the Facility and prompt response to unexpected occurrences.

2.0 Key Positions in Facility Management

Responsibility for the operation and maintenance of the Facility, including the upland cable facility, will be that of the HTP Project Manager. Because of the heavily protected, underground nature of the Facility, no personnel will be dedicated solely to maintenance of the upland portion of the Facility.

3.0 Notification Procedures and Restrictions

The need to make repairs to the cable system, and the occurrence of an event that would jeopardize the integrity of the cable system, are remote. The most likely such event would be in connection with the installation of other facilities requiring ground penetration (i.e. other utilities) in close proximity to the cable route. For such contingencies, HTP has established safeguards and procedures.

In the unlikely event of a need for HTP to maintain or repair the cable system, principal notification would be to the NYSDOT and NYCDOT, to the attention of the personnel specified on the current NYSDOT Highway Work Permit (HWP) and the NYCDOT revocable consent agreement issued for such work.

Additional notifications would be directed to DPS and NYCDEC.

4.0 Management Techniques

Regular inspection and maintenance of the underground cable system is not required. The possibility of a fault in the Facility attributable to the upland cable exists, although it is considered very remote. In such an event, Facility operators would receive a signal of a line fault through the project control system, and would dispatch a crew with specialized sensing equipment to the cable route to identify the location of the fault.

Upon approval of NYSDOT under the existing Highway Work Permit and the NYCDOT under the revocable consent agreement, contractors would excavate at the location of the fault, and repair the cable as required. HTP has a long term agreement with Prysmian Cables & Systems, the manufacturer/installer of the cable system, to provide appropriately trained personnel to accomplish any needed cable repairs.

5.0 Annual Maintenance Plans

As explained in this Plan, HTP does not foresee the need to prepare annual maintenance plans for the cable system nor to maintain a dedicated workforce for maintenance purposes.

6.0 Management Issues

HTP believes there are no unresolved management issues associated with maintenance of the cable system.

7.0 Regulations, Licenses, and Permits

HTP will obtain and maintain in perpetuity the required Highway Work Permit to authorize any work that may be required in the future. Instructions for notifying the appropriate personnel and other conditions are included in the permit.

8.0 Review, Evaluation, and Revision of Maintenance Plan

This Plan will be reviewed, evaluated, and revised as necessary based on actual experience. In the event that repairs to the cable system or protective measures are experienced more frequently than currently anticipated, the Plan will be revised accordingly and submitted to the NYSDPS.

Appendix M

Independent Environmental Inspectors Statements of Qualifications

Scott A. Prugh

Education
B.S., Civil Engineering, Pennsylvania State University

Professional Endeavors
HDR
2005-Present

Kiewit Companies, 1998-2005

Experience
Mr. Prugh is a Project Manager in the New York Environmental and Resource Management Group. His tenure at HDR has involved field and office work on utility related projects. Prior to that, he worked for a heavy and highway contractor on many large utility projects including: fiber optics, high voltage electric underground lines, light rail signal-signal power & communication upgrade, and rehabilitation of a major train station. His experience has primarily consisted of construction management activities which include: safety, quality, planning, scheduling, cost control, estimating, and coordination with utilities and local & state agencies.

Neptune Regional Transmission System, 500 kV HVDC Cable System, Neptune RTS, Long Island, NY and Sayreville, New Jersey. Mr. Prugh served as a Client representative for various field operations. He was initially tasked with planning the cable delivery and installation along the Wantagh State Parkway. This entailed working closely with the heavy hauler, civil and electrical contractors, local and state agencies to develop a work plan that met the requirements of NYSDOT's (Region 10) highway work permit. Components of this plan included: general and site specific plans (MPT details with road closures, picking of reels, pulling cable, and splicing cable), temporary access details, proof of local agency coordination, and specialized equipment calculations and details. Mr. Prugh also prepared Requests for Proposals for retaining landscapers and sign installers. He also served as the Client's representative in Sayreville, New Jersey overseeing the installation of a direct bury 345 kV AC line within the Reliant Substation and installation of a backup 34.5kV service line at the converter station. For project closeout, he is preparing as-builts of the cable system, obtaining final permits from Nassau County Department of Health, final restoration of Parkway shoulder, and overseeing the installing of cable signs at water crossings. The overall project consisted of installing 60 miles of 500kVHVDC cable between Sayreville, New Jersey and North Hempstead, New York. Methods of installation included underwater jetting, direct bury, and horizontal directional drilling.

115 kV XLPE Cable System, Northeast Utilities, Bethel, Connecticut. Mr. Prugh served as the Quality Manager and was responsible for ensuring complete conformance to the plans and specifications. Specific responsibilities included: drafting, implementing, and overseeing the Contractor Quality Control Program on all self-perform and subcontractor work; maintaining a positive Owner relationship by openly discussing all quality efforts; promoting a positive attitude towards quality; assisting in-house operation planning; reviewing work plans with Owner; oversight of all inspection tasks; and reporting on tracking, trending, and analysis of all quality efforts to Management. He also managed the as-built process and delivery. The project entailed reconstruction of approximately 12 miles of the existing 115 kV service from overhead to underground. Work included construction survey, trenching and backfilling a 60-in. by 30-in. wide concrete encased ductbank, and cable pulling and splicing. The project team

also provided thermal testing equipment, splicing vaults, select thermal backfill (flowfill), site restoration (including pavement) and all associated cable racking and grounding. All ductbank work was installed on CDOT highways and local Connecticut roads.

Level 3 Intercity Fiber Optic Project, Level 3 Communications, Portion of Route from Princeton to Newark, New Jersey. As the Lead Field Engineer, Mr. Prugh was responsible route selection and assessment, assisting in permitting, managing junior field engineers, updating operation status using GIS, scheduling, safety, coordination of tandems, marking out utilities, and maintaining quality control program. Overall project was a 16,000-mile design-build national fiber optic network running through 38 states in the U.S. and three provinces in Canada. Project work included route development, system design, permitting, procurement and system construction. The network was installed in the right-of-ways of state, county and city highways; railroads; utilities; and private lands. The construction utilized convention trenching, plowing, horizontal directional drilling and bridge attachments.

Thomas Donnelly, PE

Education
M.S., Civil Engineering, Polytechnic University of NY
B.S., Civil Engineering, Polytechnic University of NY

Professional Registration
Professional Engineer: New York, New Jersey, Ohio

Experience

Mr. Donnelly currently oversees staff of 40 on fifteen projects in New York City with a total construction value of over $5 billion. In addition, his experience includes extensive scheduling, estimating, constructability and value engineering experience on over $2 billion of proposed construction. Tom's project experience includes: No. 7 Subway Line Extension; Central Artery/Tunnel (CA/T); Roosevelt Island Lift Bridge; reconstruction of Stuyvesant Cove water and sewer infrastructure.

MTACC, #7 Subway Extension Consultant Construction Management, New York, NY. Mr. Donnelly serves as a member of JV management team for the construction management of this $2.1 billion extension of the existing #7 line which will provide better public access to the west side of Manhattan, which includes the Javits Convention Center and the area known as Hudson Yards. The project will extend the No. 7 Line westward from Times Square under West 41st Street and southward along Eleventh Avenue to the southerly terminus at West 24th Street. The planned extension provides 7,200 feet of new tunnel to accommodate a two-track railroad with two lay-up tracks for the storage of six trains (three on each side). The extension also provides for a new terminal station on Eleventh Avenue at West 34th Street (34th Street Station). The joint venture is responsible for providing construction management services during all tunneling work and construction of all facilities and infrastructure including buildings, track, rail systems and stations, as well as project controls services throughout the project duration, which is anticipated to be completed by 2013.

NYCDDC, Installation of New 78" Combined Sewer in Fort Hamilton Parkway, Brooklyn, NY. Mr. Donnelly served as the project executive. The project involved the installation of a new 78" combined sewer by Microtunnelling Method including Chamber #2 that was a 67' deep shaft that is needed to receive the new 78" combined sewer pipe and allow for the removal of the Microtunnel Boring Machine. In addition, new sanitary sewers and water mains were installed and curbs, sidewalks and roadways reconstructed. The project required extensive community outreach.

NYCEDC, Reconstruction of Sewers in the Springfield Gardens Industrial and Residential Areas, Queens, NY. Mr. Donnelly was project manager for the construction management and inspection services for three separate construction contracts totaling $77M for installation of a new storm sewer system, upgrade of existing sanitary system and reconstruction of the street network in this 100 block project area. The new storm sewer included almost 40,000 LF of storm sewers including 5,500 LF of box culverts. The upgrade of existing sanitary sewer included over 36,000 LF of new sanitary sewers, 7,500 LF of DEP Approved In-Situ Lining and over 1,000 house connections. In addition, the project involved the removal and disposal of contaminated soil, and replacement of 70,000 LF of ductile iron restrained joint water main.

NYCDDC, HWQ248D Jamaica Avenue Area, Queens, NY. Mr. Donnelly served as the project executive. The project involved the installation of a new sanitary sewers, storm sewers, water mains, traffic signalization, street lighting and street reconstruction in this commercial and residential section of Jamaica. The project will involve extensive utility coordination regarding Con Ed and Verizon relocation work that required phased construction to allow the utility companies to complete their work.

NYCDDC, SEK002318 Owl's Head Area A, Brooklyn, NY. Mr. Donnelly served as the project executive. Project involves the installation of new sanitary sewers, storm sewers and 8", 12" & 20" diameter water mains and street reconstruction in this commercial and residential section of Brooklyn. Based upon a contractor initiated heavy cleaning and sewer video taping program, it was recommended that 10 of the 14 blocks of sanitary sewer replacement be changed to an approved NYCDEP Approved In-Situ Lining System. The project involved extensive community outreach work with the numerous businesses along 86th Street.

NYCDOT Street Design. Mr. Donnelly served as the project manager. Mr. Donnelly was responsible for the preliminary and final design on the following street reconstruction projects:

- Fulton Street, Brooklyn
- 93rd Avenue, Queens
- Merry Avenue, Queens
- Malba Drive, Queens
- Skillman Avenue, Queens Linden Place, Queens
- Booth Memorial Drive, Queens

NYCEDC, Fulton Avenue Streetscape Resident Engineering Services, Brooklyn, NY. Mr. Donnelly served as principal-in-charge. The project involved resident engineering services for this limited access street with heavy bus traffic and pedestrians. Strict adherence to Safety and the M&PT provisions and OCMC traffic stipulations, and installation of temporary pedestrian barrier, use of flag persons to protect pedestrians, and workers while maintaining traffic movements as well as NYCT coordination are major elements of the work.

NYCEDC, Jackson Avenue Streetscape Resident Engineering and Inspection Services, Long Island City, NY. Mr. Donnelly serves as the principal-in-charge. Work includes streetscape and adjacent open spaces improvements, such as the expansion of Rafferty and Sun Dial Parks and the creation of the Hunter Street Park. Also included minimal work to realign traffic and provide new street lighting on Jackson Ave. from 23rd to 21st Streets. Installation new landscaped medians, new pavements, sidewalks and curbs, new street lighting and traffic signals, signage, site furniture, landscaping, and other related improvements and project proceeded on schedule.

Michael Sandler

Education
Construction Supervision, Architectural Design, 1979

Concrete Design and Inspection, 1972

Training
First Aid 2006

CPR/AED-Adult 2007

Ops at Inactive HazWaste Sites 2007

Hazardous Waste Operations and Emergency Response – 29 CFR 1910.120 (e), (3), (4), (8)
- 40-hour training
- Supervisor class
- 8-hour refresher

29 CFR 1910.146
- Confined Space Training

HDR Tenure
1988 - Present

Experience
Mr. Sandler is a construction manager in HDR' Water Design Group. The following projects represent Mr. Sandler's experience:

Williams Property Groundwater Pumping and Treating System, NJDEP, Middletown, NJ. Resident Inspector. Resident Inspector for construction of a pump and treat system, including site and processing piping and equipment, drainage and sewer systems, forming and pouring of structures, erection of prefabricated building, and site work, including pavement, curbing and landscaping, in Cape May Court House, NJ. Responsibilities included: inspecting construction activities and insuring quality assurance/quality control. Coordinating with agencies and contractors. Maintaining correspondence files, shop drawings, contract specifications and drawings, preparation of daily reports, quantity surveys, and "As-Built" drawings. Project cost $1.4M.

Site Remediation, IBM Corporation, Poughkeepsie, NY. Resident Inspector. Resident Inspector for the remediation of approximately 3,200 cubic yards of lead-laden soils at a pistol range, rifle range and clay target shooting range at the former IBM Casperkill Country Club, Poughkeepsie, New York. The work included stabilizing and rendering the soils non-hazardous, and loading it onto trucks for off-site disposal. Responsibilities included Inspecting construction activities and insuring quality assurance/quality control. Coordinating with agencies and contractors. Maintaining files, shop drawings, contract specifications and drawings. Preparation of daily reports, quantity surveys, monthly reports, payment requisitions, change orders and "As-Built" drawings. Project cost $340K.

Brewster Central School District Wastewater Treatment Facility, Brewster, NY. Resident Inspector. Resident Inspector for the construction of a sewer system, including site work, pipe and manhole installation and landscaping at the Brewster Central School District, Brewster, New York. Responsibilities included inspecting construction activities and insuring quality assurance/quality control. Coordinating with agencies and contractors. Maintaining correspondence files, shop drawings, contract specifications and drawings, preparation of daily reports, quantity surveys, and "As-Built" drawings. Project cost $500K.

Site Development, Spackenkill Development Corporation, Poughkeepsie, NY. Resident Inspector. Resident Inspector for the sitework, which included construction of drainage, sewer and underground retention/ detention system, curbing and pavement placement, at Spackenkill Plaza, Poughkeepsie, New York. Project cost $67K.

NAPL Remediation, Metro-North Commuter Railroad, Croton-on-Hudson, NY. Resident Inspector. Resident Inspector for the construction of a NAPL recovery and remediation system, with underground piping, mechanical piping and equipment, buildings and landscaping at Metro North

Railroad, Harmon Lagoon, Remediation Site, Croton-on-Hudson, New York. Responsibilities included inspecting construction activities and insuring quality assurance/quality control. Coordinating with agencies and contractors. Maintaining correspondence files, shop drawings, contract documents, preparing daily reports, meeting minutes and "As Built drawings and performing quantity surveys. Project cost $260K.

Project Manager, Underground Infrastructure Replacement Program, Rockland County, New York, for United Water New York. Projects included the installing replacement water main and domestic and fire services. Responsibilities included: Overseeing and managing inspecting and construction personnel. Ensuring quality assurance/quality control. Coordinating with federal state and local agencies. Coordinating and scheduling systems testing and activations. Assist with projects close-outs and review final reports, 2008.

Resident Inspector, Construction of Water Systems, Rockland County, New York, for United Water New York. The projects included the installing and pressure and leakage testing of new water mains and domestic and fire services. Responsibilities included: Supervising the construction. Ensuring quality assurance/quality control. Coordinating with agencies and contractors, overseeing system testing, maintaining correspondence files, preparing daily reports and As-Built drawings, 2007.

Construction Manager, NJDEP, New Brunswick Landing Project, Waterfront Development, Docks & Navigational Aids, Middlesex County, Piscataway, New Jersey. The project included dredging and upland disposal of excavated contaminated waste, driving piles and constructing a moveable pier compatible with historic requirements. Responsibilities included: ensuring all Federal, state and local environmental regulations were enforced, liaising with NJDEP and its agents and contractors. Supervising, scheduling, monitoring and insuring quality assurance/quality control during construction. Maintaining files, preparing reports and payment requisitions, 2006.

Resident Inspector, Construction of Water Systems, Rockland County, New York, for United Water New York. The projects included the installing and pressure and leakage testing of new water mains and domestic and fire services. Responsibilities included: Supervising the construction. Ensuring quality assurance/quality control. Coordinating with agencies and contractors, overseeing system testing, maintaining correspondence files, preparing daily reports and As-Built drawings, 2004.

Chief Inspector, Marine Borer Elimination Project at Northshore, Queens, New York for the New York City Department of Sanitation. The project included dredging and upland disposal of excavated contaminated waste and pile wrapping and pier rehabilitation. Responsibilities included: Ensuring all Federal, state, and local environmental regulations were enforced. Liaison between DOS and its agents and contractors and between DOS and New York State Department of Environmental Conservation (NYSDEC) field representatives.

Supervising, scheduling and monitoring the inspection staff. Insuring quality assurance/quality control during construction. Maintaining correspondence files, shop drawings, daily logs, contract specifications and drawings. Preparation of daily reports, meeting minutes, monthly reports, payment requisitions and change orders, 2001.

Chief Inspector, Marine Borer Elimination Project at Greenpoint, Brooklyn, New York for the New York City Department of Sanitation. The project included dredging and upland disposal of excavated contaminated waste and pile wrapping and pier rehabilitation. Responsibilities included: Ensuring all Federal, state, and local environmental regulations were enforced. Liaison between DOS and its agents and contractors and between DOS and New York State Department of Environmental Conservation (NYSDEC) field representatives. Supervising, scheduling and monitoring the inspection staff. Insuring quality assurance/quality control during construction. Maintaining correspondence files, shop drawings, daily logs, contract specifications and drawings. Preparation of daily reports, meeting minutes, monthly reports, payment requisitions and change orders, 2000.

Chief Inspector, Marine Borer Elimination Project at 135th Street, New York, New York for the New York City Department of Sanitation. The project included dredging and upland disposal of excavated contaminated waste and pile wrapping and pier rehabilitation. Responsibilities included: Ensuring all Federal, state, and local environmental regulations were enforced. Liaison between DOS and its agents and contractors and between DOS and NYSDEC field representatives. Supervising, scheduling and monitoring the inspection staff. Insuring quality assurance/quality control during construction. Maintaining correspondence files, shop drawings, daily logs, contract specifications and drawings. Preparation of daily reports, meeting minutes, monthly reports, payment requisitions and change orders, 1999.

Town Project Representative, Construction of a 100+ Acre Shopping Mall on the Site of Former Municipal Landfills in West Nyack, New York for the Department of Environmental Control for the Town of Clarkstown and NYSDEC. Responsibilities included: Overseeing, attending meetings, report writing, record keeping and coordinating with the agencies and developer. The work included the closing of the landfills and the construction of temporary and permanent leachate collection systems. Site work, including, the blasting of approximately one million cubic yards of rock and its transport and backfill in other areas of the site. Re-grading to accommodate roadways, retaining walls, and parking areas and the construction of an overpass bridge over the New York State Thruway, 1998.

Harold Goldberg

Education
A.A.S., Construction Technology, Westchester Community College, 1962

Registration/Certifications
NA

Professional Endeavors
HDR
2006-Present

Jett Industries Inc.
2003-2004

Fratello Construction Corp.
2002

Thalle Construction Co.
2001

Ryder Construction Corp.
1999-2001

Kiska Construction Corp.
1995-1999

AFC Enterprises, Inc.
1990-1995

Bellino Construction/Burtis/ Omega
1980-1990

Professional Activities
NA

Experience
Mr. Goldberg is a construction professional with more than four decades of public and private project experience in the New York Metropolitan area. His unique management expertise includes experience in all construction management disciplines, from estimates to buyouts, field supervision, scheduling, and claim documentation. He has served as a construction manager, superintendent, and field engineer on a wide range of projects, including underground boilers/chillers, sewer and water main construction and reconstruction, wastewater treatment plant (WWTP) construction, and street, highway and bridge construction.

Elka Park Association, Watershed Wastewater Treatment Regulatory Upgrade Program, Hunter, NY. As resident engineer, Mr. Goldberg is currently providing construction inspection services for HDR's watershed upgrade project for the Elka Park Association (EKA). EKA is a year-round residential community consisting of around 20 homes, a club house, and a nine-bedroom motel. The existing WWTP originally constructed in the 1920s and renovated in 1995, consisted of two septic tanks in series, two trickling filters in parallel with recirculation, two sand filters in parallel, disinfection/dechlorination, and a cascade aeration system. The upgraded plant added phosphorus removal using an inclined plate clarifier, micro-filtration, and UV disinfection to replace the chlorine disinfection system. The construction was initiated in 2006 and completed in 2008 with start-up of the upgraded facility on May 7, 2008. The plant has operated smoothly since start-up with no SPDES permit violations. Mr. Goldberg provided day-to-day inspection services overseeing the general contractor and ensuring that the plant was built to specifications. Mr. Goldberg approved Contractor payment requests, developed the as-built drawings, and assisted with shop drawing reviews.

Cortina Mountain Estates LLC, Land Development - Stormwater Pollution Prevention Plan, Haines Falls, NY. Mr. Goldberg served as resident engineer for this land development project in Haines Falls, NY. Cortina Mountain Estates (CME) is a development located in the Catskill Mountains of NY. The proposed development will consist of a combination of 93 single family homes and townhouses. Because of the its location on the side of a mountain and located within the NYC Watershed stormwater runoff is a major issue. NYCDEP required CME to stabilize a roadside ditch; HDR designed the swale that was later approved by the NYCDEP. Mr. Goldberg provided construction oversight of the interim swale, which was constructed from 2007 to 2008. Mr. Goldberg visited the site daily to observe the work and ensure that it was done in accordance with the approved design. Mr. Goldberg also conducted weekly and post-rainfall inspections of the work as required by the NYSDEC Phase II Stormwater Permit. In December 2008 he took the four-hr training course required by the NYSDEC in order to perform inspections for the Phase II Stormwater Permit.

Frangel Realty, Regulatory Upgrade, Carmel, NY. As resident engineer, Mr. Goldberg was responsible for wastewater planning, design and construction oversight services for their wastewater treatment plant (WWTP) in Carmel, New York. The project is one of 107 upgrade projects in the NYC watershed. The facility consists of three two-story residential building complexes. The existing WWTP consists of a series of septic tanks (four, totaling 5,000 gal), an intermittent sand filter, and a chlorine contact tank. HDR prepared a amendment to the Facility Plan developed by the previous engineer for the project that determined that the original proposed design could not be used. HDR prepared the bid documents and provided construction services, including oversight inspection. Mr. Goldberg was responsible for the preliminary bid review.

Non-HDR Experience

Jett Industries, Inc., Colliersville, NY. Mr. Goldberg was served as a project manager/estimator on the Hunter and Windham Wastewater Treatment Plant (WWTPs). He supervised site work, excavation, and concrete and equipment installations. He also prepared estimates for watershed projects conducted for the NYCDEP and the New York State Environmental Facilities Corporation (NYSEFC).

Fratello Construction Corp., Delhi, NY. Mr. Goldberg served as a general contractor's superintendent on the Delaware County Correctional Facility in Delhi, New York. He supervised site work, including erosion controls, clearing, grading, road construction, and drainage systems.

Thalle Construction Corp., Athens, NY. Mr. Goldberg was a general contractor's superintendent for Thalle Construction Corp., where he worked on a 3-mile water supply pipeline and pump station supplying water from the Hudson River to the Athens Generating Plant in Athens, New York.

Ryder Construction Corp., Queens, NY. As a project superintendent/ construction manager, Mr. Goldberg worked on a project involving an underground boiler/chiller plant at the Fresh Meadows retail center in Queens, New York (Fee: $7.5 million).

Kiska Corp., Long Island City, NY. Mr. Goldberg was a project manager/superintendent for Kiska Corp. He worked on flushing effluent combined sewer overflow CSO for NYCDEP ($16 million). Mr. Goldberg was also involved in the reconstruction of Jamaica Bay swing bridges with the New York City Transit Authority and the reconstruction of the Bronx-Whitestone Bridge (Fee: $8.6 million).

AFC Enterprises, Inc., Glendale, NY. Mr. Goldberg was a project manager with AFC Enterprises, Inc., where he managed public works projects, including sewer and water mains (NYCDEP) and street and sewer construction (NYCDOT). Projects ranged in value from $100,000 to $10 million.

Publications and Presentations

NA

Awards
NA

Appendix N

Independent Environmental Inspector Forms

Hudson Transmission Project: Inspection Report

Name/Title:

Date of Inspection:

Locations Inspected:

Compliance	
Acceptable	Unacceptable

Item Inspected:

Solid Waste Storage Trash Bins Condition:

Hazmat Storage:

Environmentally Sensitive Areas / Wetlands / Sensitive Resource Areas / Project Site Limitations:

Access Road:

Vehicle Maintenance Areas/Fugitive Dust Controls:

Stormwater Control/Sediment Basins and Outfalls:

Erosion Controls and Silt Fencing:

Other Items Inspected:

Remarks:

Additional Comments:

Signed by _____

Received by _____

Date:

Hudson Transmission Project: Incident Data Sheet

Incident Description:

Emergency Coordinator(s) Responding:

Date/Time:

Releases/Spills

Product ID: Time of Release:
Physical State: Total Amount Released (units):

Offsite impact with threat to human health and/or environment?: Yes No

If "yes", New York State DEC contacted?

Date/Time/Case # :
Person Contacted:
Notes:

If "yes" and involving released resulting in visible sheen on surface waters, exceeding CERCLA RQ, and/or hazardous waste, was NRC contacted?

Date/time/case#:
Notes:

Offsite Emergency Response

Entity:
Time of Arrival: Team Leader:
Notes:

Injuries/Medical Response

Personal Injuries?:
Describe (name/nature of injury/medical services):

Clean-Up Activities

Date/Time Started: Date/Time Completed:
Responsible Individual:
Describe Action Taken:

Confirmatory Sampling (if appropriate):

Material Handling/Disposal

Hazardous Waste Generated?: Yes No
Physical State:

Describe waste type/estimated amount/storage actions:

Date Generated:

Hudson Transmission Project: Incident Root Cause Analysis Form

Name: Title: Date:
Site Description Briefly describe the events leading to an including the incident:
Incident Impacts Briefly describe the impact or potential impact the incident had, or could have had on personnel, operations, the environment, offsite areas or the public:
Root Cause Briefly describe the incident's root cause:
Correction Actions Taken Specify actions taken to prevent or minimize the recurrence of a similar incident:

Appendix O

List of Property Owners and
Notice of EM&CP Filing

HUDSON

March 22, 2011

To: Owners of Property and Businesses in Vicinity of
Hudson Transmission Partners Project

This letter and the attached notice will inform you of certain construction activity that will be taking place in West 52nd Street and along 12th Avenue (West Side Highway) between West 49th and West 52nd Streets, as shown on the attached aerial photo. Most of the work will take place in the spring and summer of 2011.

The work is being performed to install a new electric transmission line underground and under water between New Jersey and Manhattan (the Hudson Project). The Project was authorized by the New York State Public Service Commission (PSC) in Case 08-T-0034 and the work will be done pursuant to the PSC's requirements and the requirements of New York City Department of Transportation and New York State Department of Transportation.

The attached notice provides additional details and explains how you can find out more information.

Very truly yours,

Christopher Hocker
Vice President, Planning

Enclosures

Hudson Transmission Partners, LLC
501 Kings Highway East, Suite 300, Fairfield, CT 06825 • 203-416-5590 • 203-416-5599 fax

DIRECT NOTICE FOR BUSINESSES & PROPERTY OWNERS
OF FILING OF
ENVIRONMENTAL MANAGEMENT AND CONSTRUCTION PLAN

On or about March 25, 2011 and March 31, 2011 Hudson Transmission Partners, LLC (HTP) will file two of three Environmental Management and Construction Plans (EM&CP I and EM&CP II, respectively) with the New York Public Service Commission (NYPSC) in conformance with the requirements of the Order Granting Certificate of Environmental Compatibility and Public Need (Certificate) granted by the New York Public Service Commission on September 15, 2010, in PSC Case 08-T-0034, authorizing the construction of a portion of a proposed submarine/underground electric transmission cable system between Ridgefield, NJ and West 49th Street in Manhattan (Project).

Description of the Project: The Project will consist of a new transmission line connecting an existing substation in Ridgefield, New Jersey to a new converter station in Ridgefield, NJ, that will convert AC power to DC and back to AC power, and a new 345kV transmission line that will connect the converter station to the W. 49th Street Substation owned by Consolidated Edison Company of New York in Manhattan. The 345kV line will be routed as follows: the cable will enter the Hudson River at Edgewater, NJ, and will be buried beneath the riverbed and proceed due east to the New York side of the River, turning south still beneath the riverbed to a point adjacent to Piers 92 & 94 opposite West 52nd Street where it will enter Manhattan. From there it will be buried beneath a portion of the western-most block of West 52nd Street from where it will turn west to the West Side Highway (12th Avenue) and proceed south in 12th Ave. to the West 49th St. Substation. The Project will be entirely underground in New York City.

EM&CP I addresses excavation of the trenches to be located in West 52nd Street and the West Side Highway (12th Avenue), the installation of conduits in those trenches and all related preparatory and restoration work.

EM&CP II addresses the horizontal directional drilling (HDD) work by which holes will be bored beneath West 52nd Street and the West Side Highway (12th Avenue) starting from West 52nd Street opposite DeWitt Clinton Park to a cofferdam located in the Hudson River beyond Piers 92 and 94. EM&CP II addresses installation of the cofferdam, as well.

The EM&CPs provide details of construction plans, construction methods, traffic control plans for vehicles and pedestrians and environmental controls.

EM&CP III, which will be filed later, will address the details of submarine cable installation and cable pulling splicing and installation in the conduits previously installed in West 52nd Street and 12th Avenue.

Planned Work Locations: (1) Western half of block of West 52nd Street between 11th Avenue and West Side Highway. (2) East sidewalk and east taxi lane of West Side Highway from 52nd Street to West 49th Street. (3) Northbound lanes of West Side Highway between West 49th and 50th Streets.

Hours and Duration of Activities: The work described in EM&CP I is scheduled to commence on or about May 9, 2011. The excavation of trenches and installation of conduits will occur in

stages along the route and is expected to be completed on or about September 30, 2011. The HDD work described in EM&CP II is expected to take approximately 3 months to complete beginning on or about June 15, 2011. Work will take place during normal daytime hours from 7:00 a.m. to 6:00 p.m., except as required due to site conditions and for safety and traffic maintenance purposes. All work, including restoration, will be completed by April 30, 2012.

Provisions for Protection of Properties: Excavation shall be performed so as not to disturb existing adjacent buildings, streets and utility lines. All private property that may be disturbed or damaged by any construction activity shall be relocated, restored, repaired and/or replaced by the contractor at no cost to the owner of the property.

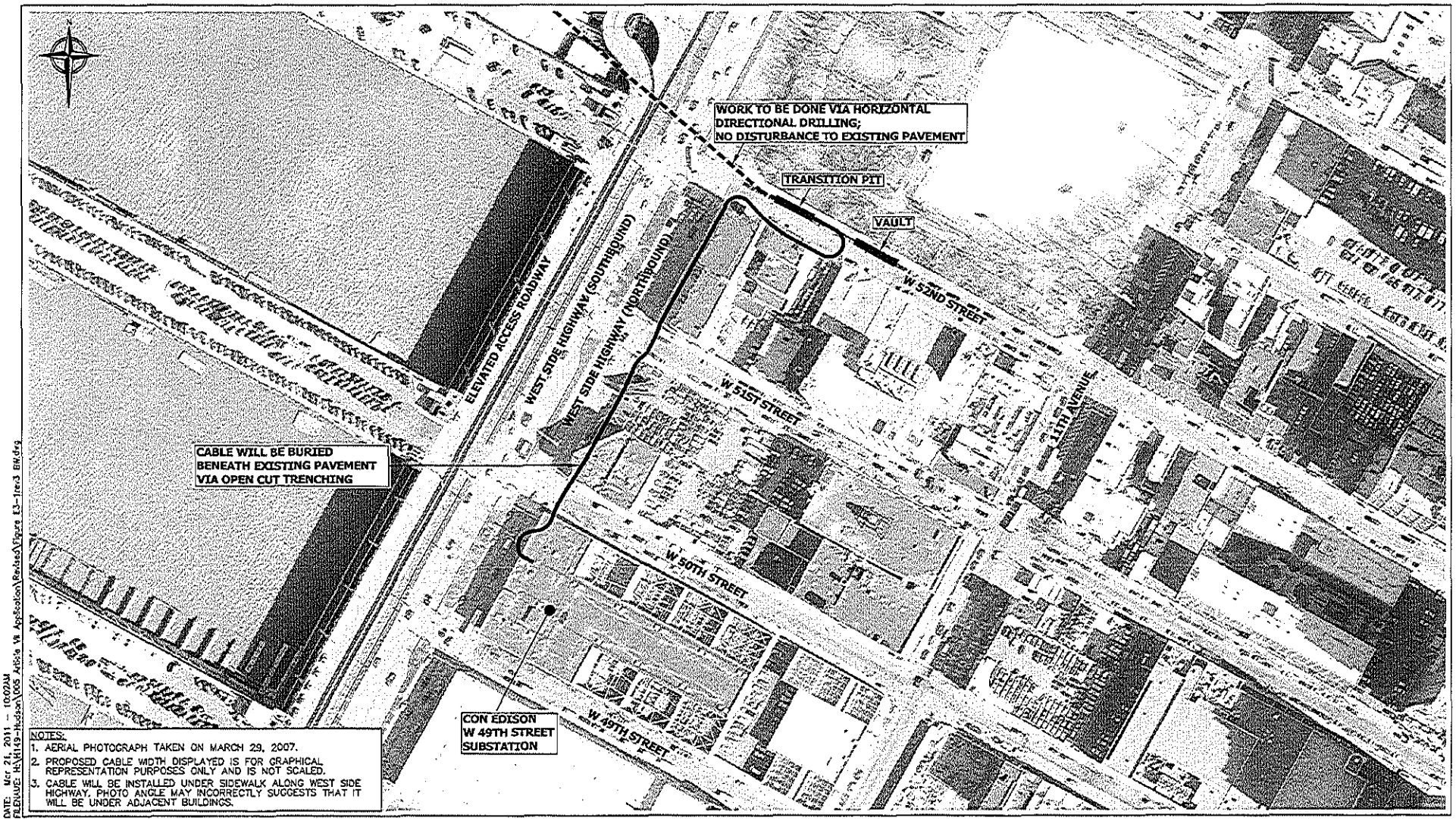
Offer to Inspect Building Foundation & Document Existing Conditions Prior to Construction Commencement: Business or property owners within 100 feet of the planned work area may request a building foundation inspection and/or may have existing conditions documented, by contacting the HTP representative identified below under "Additional Information."

Provisions for Maintenance and Protection of Pedestrian & Vehicle Access to Buildings & Properties: Contractor will at all times provide means of safe ingress and egress for the public within the Project area. The safe, orderly and expeditious flow of vehicle traffic will be maintained in accordance with recognized traffic control standards through the use of flagman, signing, barricades, flashing lights, cones and barrels. These measures have been approved by the relevant City agencies and are described in detail in the EM&CP.

Independent Inspector: Scott Prugh, HDR Engineering, Inc. (phone: 905-882-4100 or 845-735-8300), will be retained as Independent Inspector to monitor the construction work and its compliance with the Certificate.

Additional Information: Persons desiring additional information may contact Christopher Hocker of HTP at 203-416-5590 or Philipose Philip of the Department of Public Service at 518-486-6075. Copies of the EM&CP will be available for public inspection during normal business hours at: Department of Public Service, Central Files, 14th Floor, Three Empire State Plaza, Albany, NY 12223 or 90 Church Street, New York, NY 10007-2919 and Columbus Library, 742 10th Avenue, New York, NY 10019, and on the web at www.dps.state.ny.us.

Persons desiring to comment on EM&CP I must file their comments on or before April 25, 2011. Persons desiring to comment on EM&CP II must file their comments on or before May 2, 2011. All comments must be submitted in writing, addressed to Hon. Jaclyn A. Brilling, Secretary, Public Service Commission, Three Empire State Plaza, Albany, NY 12223-1350 with a copy to John W. Dax, Esq., The Dax Law Firm, P.C., 54 State Street, Suite 805, Albany, NY 12207 (Telephone [518] 432-1002). Comments should include the PSC Case Number 08-T-0034.



DATE: Mar 21, 2011 - 10:02AM
FILENAME: H:\H149-Hudson\005 Article VII Application\Revised\Figure 13-1rev3 BW.dwg

ESS Group, Inc.
Engineers
Scientists
Consultants

Hudson Transmission Partners, LLC
The Hudson Project

0 100 200
SCALE IN FEET

LEGEND:
HUDSON TRANSMISSION CABLE LAYOUT

Hudson Transmission
New York City
Cable Route

A list of property owners and addresses located within 100 feet of the proposed work area based upon queries of the New York City tax lot database (MapPluto), New York City Department of Finance (Office of City Register) ACRIS database, and the NYC Property database in December 2010.

Borough	Block	Lot	OwnerName (MapPLUTO)	Business Name	Business Address
MN	1098	51	ENTERPRISE PARKING SY	Enterprise Parking Systems	634 West 51st Street, New York, NY 10019
MN	1098	54	ENTERPRISE PARKING SY	Enterprise Parking Systems	638 West 51st Street, New York, NY 10019
MN	1097	11	CONSOLIDATED EDISON C	Consolidated Edison	683 11th Avenue, New York, NY 10019
MN	1099	21	PIANO DEVELOPMENT COR	Certified of NY Inc.	623 West 51st Street, New York, NY 10019
MN	1099	21	PIANO DEVELOPMENT COR	Resident (3rd Floor)	623 West 51st Street, New York, NY 10019
MN	1099	21	PIANO DEVELOPMENT COR	Resident	621 West 51st Street, New York, NY 10019
MN	1099	21	PIANO DEVELOPMENT COR	Prada USA Corps	609 West 51st Street, New York, NY 10019
MN	1099	51	BEN 52ND ST., LLC	iTheatrics	628 West 52nd Street, New York, NY 10019
MN	1099	54	12TH AVENUE - NEW YO	Hustler Gentlemen's Club	641 West 51st Street, New York, NY 10019
MN	1099	47	620 WEST 52ND STREET	State of New York Motor Vehicle Repair Shop (No. 7111201)	620 West 52nd Street, New York, NY 10019
MN	1099	10	12TH AVENUE - NEW YO	Hustler Gentlemen's Club	641 West 51st Street, New York, NY 10019
MN	1098	11	CITIGRANT FUNDING COR	The Art of Tint	637 West 50th Street, New York, NY 10019
MN	1098	11	CITIGRANT FUNDING COR	BPK Special Effects Systems	638 West 50th Street, New York, NY 10019
MN	1098	11	CITIGRANT FUNDING COR	Lazer Check Cashing	680 12th Avenue, New York, NY 10019
MN	1098	11	CITIGRANT FUNDING COR	Money Gram	680 12th Avenue, New York, NY 10019
MN	1098	11	CITIGRANT FUNDING COR	Liberty Calling Center & Variety Store	680 12th Avenue, New York, NY 10019
MN	1099	14	51ST STREET REALTY IN	Bernsohn Fetner, LLC	625 West 51st Street, New York, NY 10019
MN	1099	48	PARK VIEW REALTY ASSO	Vacant	622 West 52nd Street, New York, NY 10019
MN	1099	43	PARK VIEW REALTY ASSO	Clinton Park Stables Association, LLC	618 West 52nd Street, New York, NY 10019
MN	1099	49	CELTIC REALTY, LLC	Manhattan Laminates Ltd.	624 West 52nd Street, New York, NY 10019
MN	1099	12	511 WEST 25TH STREET	Whitehall Mini-Storage	641 West 51st Street, New York, NY 10019
MN	1099	27	MODERN COMMUNICATIONS SERVICES INC	McKinney Welding Supply	600 West 52nd Street, New York, NY 10019
MN	1099	27	MODERN COMMUNICATIONS SERVICES INC	nep studios	604 West 52nd Street, New York, NY 10019
MN	1099	27	MODERN COMMUNICATIONS SERVICES INC	*no business name*	607 West 51st Street, New York, NY 10019
MN	1099	36	600 West 52nd Street	Subway	735 11th Avenue, New York, NY 10019
MN	1099	36	601 West 52nd Street	Residents	600 West 52nd Street, New York, NY 10019
MN	1099	32	MODERN COMMUNICATIONS SERVICES INC	The Daily Show (nep studios)	733 11th Avenue, New York, NY 10019
MN	1098	15	JAFROG REALTY, LLC	Park It NY	631-645 West 50th Street, New York, NY 10019
MN	1098	48	JAFROG REALTY, LLC	Park It NY	622-630 West 51st Street, New York, NY 10019

Chelsea Clinton News
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16th Floor
New York, N Y 10016
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Fax: 212-268-0502

Affidavit of Publication

HDR One Company
One Blue Hill Plaza
Pearl River, NY 10965
Attn: Dave Brizzolara

Legal notice

State of New York

County of New York

I, Colleen Conklin, being duly sworn, depose and say: that I am the Publisher's Designee of the Chelsea Clinton News a weekly newspaper of general circulation published in New York, County of New York, State of New York; that a notice, of which the annexed is a printed copy, has been duly and regularly published in the Chelsea Clinton News once each week for 1 week and that the date of publication is as follows: 4/28/11.

Tom Allon, Publisher

Colleen Conklin

Colleen Conklin, Designee

Subscribed and sworn before me,
This 28th **day of** April **2011**

Notary Signature

MARA N. SABALONES
Notary Public - State of New York
NO. 01SA6224601
Qualified in New York County
My Commission Expires 11/6/14

NOTICE

Construction of the Hudson Transmission Facility is scheduled to begin on or about **May 9, 2011.** The Hudson Transmission Facility is a 345kV submarine/underground electric transmission cable extending from Ridgefield, New Jersey to the West 49th Street Substation owned by Consolidated Edison Company of New York (Con Ed) in Manhattan. The cable will provide New York City with access to additional energy sources.

Construction activities in Manhattan – Clinton neighborhood will include excavation of trenches on West 52nd Street and the West Side Highway (12th Avenue), the installation of conduits in those trenches, and horizontal directional drilling (HDD) work by which holes will be bored beneath West 52nd Street and the West Side Highway. Excavation, drilling, and conduit and cable installation work (including restoration) is scheduled to proceed in stages through April 30, 2012. The initial phase, which includes all of the trench excavation and directional drilling work, will start on May 9 and be completed in November of 2011. Trench excavation on 12th Ave. will start in the block between W 49th and W 50th Streets proceeding north and is to be completed by the end of July 2011. Excavation on W 52nd St. will be completed on or about mid-June at which time HDD will begin.

The actual cable installation is expected to occur during the fall of 2011 and will include cable installation activities along the submarine route and cable delivery, pulling and splicing of cable along the upland route.

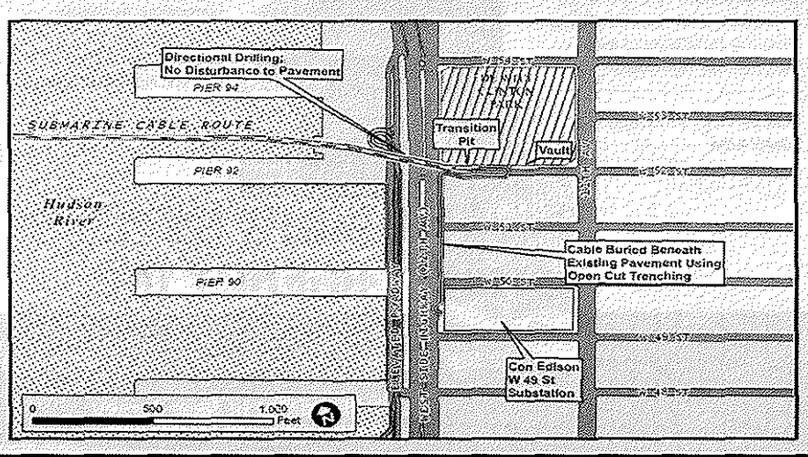
The Hudson Transmission Facility is authorized by and under the jurisdiction of the New York State Public Service Commission (NYSPSC), which is responsible for enforcing compliance with environmental and construction conditions.

NYSPSC may be contacted at:

Philipose Philip
New York State Department of Public Service
Three Empire State Plaza
Albany, NY 12223-1350
518 486-6075
philipose.philip@dps.state.ny.us

Questions and comments regarding this notice may be directed to:

Christopher Hocker
Vice President, Planning and Communication
Hudson Transmission Partners, LLC
501 Kings Highway East
Fairfield, CT 06825
Toll-Free: 1-877-466-7344
chocker@powerbridge.us



Appendix P

Construction Health & Safety Manuals

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I. Prysmian Health and Safety Manual.…….…….1

II. Railroad Construction Company, Inc Health and Safety Manual…...…….267

Prysmian Construction Services, Inc.

CORPORATE SAFETY PROGRAM

REVISION DATE
01 August 2010

29 CFR 1910 - 1926
REGULATORY STATUTE

PCSI Occupational Health and Safety Program

CORPORATE SAFETY MISSION

In all phases of its endeavors, an established Health and Safety Program guide our Company. This program is based on a sincere desire to eliminate personal injuries, occupational injuries or illnesses and damage to equipment and property, as well as to protect the public whenever and wherever the public is exposed to, in contact with, or is affected by, the company's work. All members of management and supervision are charged with the responsibility of identifying and preventing unsafe acts and/or conditions that could lead to occupational injuries or illnesses. While the ultimate success of a health and safety program depends upon the full cooperation of each individual employee, it is management's responsibility to see that health and safety work practices and procedures are not only adequate, but also, enforced. Moreover see that effective training and education programs are employed to the greatest advantage. Safety shall not be sacrificed for production but rather considered an integral part of quality control, cost reduction and job efficiency. Every supervisor shall be aware of the safety performance demonstrated by the employees under his/her supervision. Our Company has achieved a high level of safety consciousness and is proud of its achievement in accident prevention. Nevertheless, as long as the possibility exists for even one person to suffer injury or illness we must continue to stress and strive for improvement. It is our goal to totally eliminate accidents and illnesses from our operations for these reasons:

1. No endeavor is worthy if it should bring about human suffering through injury, illness, or loss of life.

2. A good safety record reflects the quality of management, supervision and work force. It also serves to promote business and thereby contributes to the continuing growth and success of the Company.

3. Accidents increase costs and decrease profits.

"Our mission is to accomplish work in the safest possible manner, to be the company of choice for our customers, the employer of choice for our people, and to achieve a fair balance of safety, responsibility, profitability, and citizenship. Our goal is nothing less than zero accidents and injuries."

_____ _____

President Safety Director

INTRODUCTION

Our Company is committed to providing a safe and healthful working environment for all our employees. As part of this goal, we are pledged to achieving voluntary compliance with OSHA, and other regulatory agencies. This can only be accomplished through cooperation from all employees. This manual constitutes our Corporate Health and Safety Program. It defines Safety Management systems to effectively implement job site safety programs, and defines individual responsibilities. This manual is not designed to, and no representations are made that it will, satisfy all federal, state, local, or client requirements. It is the responsibility of each project management team to have a working knowledge of the standards and regulations necessary to meet all requirements for the assigned project.

A. This Health and Safety Program Manual has been developed as a guide to:

1. Promote systematic and uniform coordination of our Corporate Health and Safety Program on each project.

2. Facilitate and improve communication through all levels of management and to establish responsibility for implementing safety compliance programs and enforcement.

3. Encourage voluntary compliance with federal, state, local, and client health and safety requirements.

4. Eliminate personal injury, illness, and property damage losses to the Company and our clients.

ROLES AND RESPONSIBILITIES

A. EXECUTIVE MANAGEMENT

1. Executive Management shall outline policies and procedures, stimulate thinking and visibly show their own interest with implementing the Health and Safety Program if others are to follow and cooperate in making operations safe.

2. Executive management shall provide goals, allocate resources, assign responsibilities and evaluate performance in the safety and health areas just as they do in others. Management is fully responsible and accountable for the overall effectiveness of the Health and Safety Program.

3. Ensure the full cooperation and support of the Health and Safety Program by all staff and field employees.

4. Ensure that each project has been preplanned with safety and health as important as cost, quality, production and morale and shall ensure that adequate funds have been provided for the implementation of the Health and Safety Program.

5. Authorize necessary expenditures to obtain the necessary safety equipment as required by Federal, State and Local laws and safe working practices.

6. Periodically monitor individual Project's Accident Experience to ensure that the Health and Safety Program is being implemented and is effective in reducing losses and loss exposures.

7. Include a Project's Safety experience and the individual's attitude for compliance with the Health and Safety Program, in all employee performance evaluations.

8. Require all sub-contractors to abide by the Health and Safety Program or their own Program, whichever is the most stringent.

B. CORPORATE SAFETY DIRECTOR

1. In the performance of his/her duties the Corporate Safety Director shall periodically:

2. Visit and observe Company operations at various locations in order to be knowledgeable of work being performed, audit the implementation of the Corporate Health and Safety Program and communicate personally with the employees to promote safety.

3. Study and provide current information regarding Government Regulations/standards of the Occupational Health and Safety Administration (OSHA), and other appropriate agencies, and keep Management and Supervisors appraised of revisions or new standards/regulations that may be issued that affects Company operations.

4. Establish procedures and guidelines for the Health and Safety Program and keep them updated.

5. Maintain and monitor the Corporate Health and Safety Training Program.

6. Develop safety recommendations for specific operations.

7. Investigate accidents, as directed by management. Communicate with the insurance carrier's personnel, attorneys and others in the interest of the Company business regarding safety and incurred losses. Maintain relationships with the insurance carrier to facilitate monitoring/tracking of incurred losses.

8. Collect reports required for records and the evaluation of the implementation and effectiveness of the Health and Safety Program. Maintain all records as required by federal, state and local laws pertaining to occupational safety and health.

9. Solicit educational and promotional material for the benefit of the Health and Safety Program(s), and assist with the implementation of such material.

10. Maintain his/her own professional proficiency through continuing education in the Occupational Health and Safety, Risk/Loss Control fields.

C. PROJECT MANAGER

1. The Project Manager has the ultimate responsibility, and accountability, for the effectiveness of a Project Health and Safety Program. This responsibility includes the initial conception, implementation, enforcement and monitoring of the complete Safety Program.

2. The initial conception of the “Site Specific Safety Program” should be developed during the review of the “Pre-Construction Safety Meeting” and project specifications. The Project Manager should solicit the input of the Corporate Health and Safety Department, regarding what anticipated safety requirements would be needed for the Project. This shall be accomplished by conducting a Pre-Construction Safety Meeting.

3. Once the projects foreseeable safety requirements are determined, their cost should be estimated and that cost included with the estimate.

D. SITE MANAGER

1. The Site Manager has the full responsibility to implement, direct and enforce the Health and Safety Program of/on the project that they are responsible for. The execution of such programs must be in keeping with the explicit and implied statements of the Corporate Safety Mission.

2. The Site Manager shall actively support the Health and Safety Program as an example to subordinates with deeds, decisions and directives as may be required.

3. He/She shall be cognizant of any reasonably available regulations and recommendations pertaining to safety and health of employees in the work place and utilize such information in directing the project activities.

4. He/She has the responsibility/duty to enforce the observance of all Safety Rules and Regulations by all persons entering or connected with the project.

5. The Site Manager may delegate authority to others under their supervision to expedite and facilitate the application of the Health and Safety program.

6. Comply with all the provisions of the contract dealing with safety and loss prevention requirements.

7. Comply with all Federal, State and Local Safety Regulations and Codes.

8. Cooperate with the owner's designated Safety Representative to resolve safety issues.

9. Authorize necessary immediate action to correct substandard safety conditions existing on the project when they are reported or observed.

10. Conduct periodic safety inspections of the job sites and implement necessary corrective action to eliminate all unsafe acts and/or conditions observed. Record observations of inspection and the corrective action implemented in compliance with the reporting/Recordkeeping procedures of the Health and Safety Program.

11. Review accident reports and investigations for completeness/accuracy and implement appropriate corrective action. Ensure proper distribution of all accident reports.

12. Review Safety Meeting reports submitted by the project's foremen and implement action to ensure that the foreman conducts the weekly safety meetings.

13. Periodically attend Foremen Weekly Toolbox Safety Meetings and evaluate them for effectiveness.

14. Be responsible for the control and availability of necessary/required safety materials/equipment, including Personal Protective Equipment for employees.

15. Site Managers should share their experiences, questions and problems with other Superintendents and sub-contractors on the project to resolve problems and unsafe conditions.

E. SAFETY PROFESSIONAL

1. When it is deemed necessary by Executive Management or the Corporate Safety Director, a project may employee a full-time or part-time Project Safety Professional. The Safety Professional shall work directly with the Project Manager under a direct line authority to the Corporate Safety Director. It shall be the duties of the Safety Professional to assist with inspections, accident investigations, conduct safety meetings, and the overall implementation of the Projects Health and Safety Program.

2. The Safety Professional shall be responsible for compiling and maintaining necessary records, logs and other reports pertaining to safety required by the worker, client, Federal, State and Local regulations. Duties shall, in general, be devoted to the health and welfare of the project personnel, public protection and reporting of equipment and material losses.

F. FOREMAN /CREW LEADERS

The supervisor/crew leader shall be held responsible to implement and enforce the Health and Safety Program for/on all assignments/jobs that they are responsible to perform. They shall be held responsible for the overall safety of the employees under their supervision. The supervisor/crew leader shall set a good example by complying

with the Health and Safety Program and performing all duties in a safe manner. The supervisor/crew leader shall:

1. Be knowledgeable of the Company Health and Safety Program and any applicable federal, state regulations and capably implement them in the work environment.

2. Be knowledgeable in proper safety practices that pertain to the particular type of work to be performed and the environment in which it is to be performed.

3. Be capable of identify an unsafe condition and implement immediate corrective action.

4. Ensure that personal protective equipment is available and utilized by the employees in order to perform their duties.

5. Ensure that there are first aid supplies immediately available, that there is someone within the crew who is trained in first aid and there is a means of communication to obtain professional emergency response personnel if needed.

6. Investigate all accidents, complete the necessary paper work in a timely manner and submit it to the proper personnel for review and disposition.

G. EMPLOYEES

Despite every effort made by the Company the basic responsibility for employee health and safety rests with the individual. It is a condition of employment for all employees to conduct their work in a safe and healthful manner. Each employee shall work in accordance with good safety practices as directed by federal, state and local laws, codes and standards, as well as any instructions pertaining to a specific operation/job.

EMPLOYEES SHALL:

1. Accept responsibility for their own safety and report all unsafe conditions or acts to their immediate supervisor.

2. Report all accidents or injuries immediately upon occurrence to their supervisor. Report for medical treatment as directed.

3. Refrain from any unsafe acts that may endanger themselves or others.

4. Report any unsafe conditions or unsafe personal acts to their supervisor immediately.

5. Participate in an accident investigation as requested.

6. Wear appropriate attire and footwear for the work environment to be encountered.

7. Utilize personal protective equipment as required and maintain it in a serviceable condition.

8. Not be permitted to use or transport intoxicants nor be under the influence of any illegal substance on a job site or during working hours. This includes while operating a Company vehicle at any time.

9. Keep the work area clean. Housekeeping is an individual responsibility.

H. SUBWORKERS SUPERINTENDENT/FOREMAN

1. Plan and execute all work operations so as to comply with stated objectives of the Project Safety Program.

2. Recognize and implement the Projects Safety and Loss Control requirements as contained in the General Conditions of their contract.

3. Provide and enforce the use of Personal Protective Equipment of their employees as is required by Federal, State and Local Regulations and Codes.

4. Complete an accurate investigation report of all injuries, losses to public property/personnel, equipment and material and submit it to the Project Superintendent in a timely manner.

5. Attend Supervisory Personnel Safety Meetings as are scheduled by the Superintendent.

6. Schedule weekly Safety Meetings to be conducted by job foreman for all employees under their supervision.

7. Periodically attend foreman's safety meetings to evaluate the effectiveness and offer suggestions for improvement.

8. Implement immediate corrective action to alleviate/eliminate unsafe practices or conditions when observed or reported.

9. Report to the Project Manager/Superintendent all observed unsafe conditions, practices and violations of the Project Safety Program, which are not within PCSI's jurisdiction to implement corrective action.

I. EXECUTIVE SAFETY COMMITTEE

1. Establish Health and Safety Program policies that meet or exceed the goals set forth in the Corporate Safety Mission.

2. Ensure that the Corporate Health and Safety Program comply with federal, state, local and client requirements and periodically review corporate and project safety performances.

PROGRAM OBJECTIVES

This Health and Safety Program has been established to coordinate all available means of eliminating or controlling hazards and risks associated with the type of work activities undertaken by the Company and thereby to:

1. Minimize personal injury.
2. Maximize property conservation.
3. Achieve greater efficiency.
4. Reduce direct and indirect cost of operations.

The effectiveness of this Health and Safety Program will depend on the active participation and full cooperation of all supervisors and employees, and the coordination of their effort in carrying out the following basic responsibilities:

1. Plan all work to minimize personal injury, property damage and loss of productive time.

2. Establish and conduct an educational program to stimulate and maintain interest and participation of all employees through:

a). Safety meetings and safety communication.
b). Investigate all accidents/losses and serious potential incidents to determine the true cause and implement necessary corrective action to eliminate future potential losses.
c). Use of proper work methods and use of appropriate personal protective equipment.
d). Adherence to employee safety instructions that are applicable to all assigned work.
e). Safety training programs.
f). Maintenance of records as to accidents and losses.

3. Maintain a system of prompt detection and correction of unsafe acts or conditions.

4. Provide for the protection and safety of the general public and their property.

HEALTH AND SAFETY STANDARDS

Standards have been established which address those work activities judged to be the most valuable for our operations. These are as follows:

FEDERAL, STATE and LOCAL LAWS/CODES

These Laws and Codes have been developed, by the respective agencies, to assist employers with minimizing hazardous conditions, which may exist within the work place. These Laws and Codes must be complied with at all times.

SAFETY RULES

Rules are time savers and accident preventers. They set certain behavioral procedures to be followed by all concerned, thus saving management time. Their development, reinforcement and updating is a continuous activity.

PROPER JOB INSTRUCTION

The purpose of this work activity is to assist employees to perform an assignment quickly, conscientiously, safely and correctly the very first time. This is a prime tool of the first line supervisor that will reduce the potential for losses to be incurred.

SAFETY SUGGESTIONS

To facilitate better communication and encourage employee participation a suggestion box should be established and employees should be encouraged to inform management of any safety suggestions they may have. In addition, Safe work habits and safety suggestions should be given to employees on any new, unusual or critical assignments/jobs. Safety suggestions are personalized reminders that promote production, quality and safety requirements.

ACCIDENT INVESTIGATION

The purpose of this work activity is Loss Prevention. We can learn from incurred losses by finding the true cause of the loss and then developing and implementing controls to minimize the potential to incur a similar loss.

STANDARD OPERATING PROCEDURES

There are certain jobs where there is a risk of serious injury, lost production or property damage if certain safety precautions are not observed at all times. It is vital that we have control over these jobs and the manner in which they are performed. In order to do this, we must identify the methods to be used to prevent loss, establish written minimum procedures, train our employees and follow up to ensure compliance.

PROJECT PROGRESS/SCHEDULING MEETINGS

This meeting is to obtain construction progress, to schedule forth-coming construction activities and to disseminate Safety information to the projects entire workforce. This meeting provides an opportunity for both Project Management and sub-contractors to bring forth any concerns regarding safety procedures and/or unsafe conditions/practices, which may exist on the project.

COMMITMENT TO SAFETY EDUCATION AND TRAINING

We recognize that safety education and training are essential elements of an effective safety management program. Therefore, a safety training curriculum and video library

has been developed to address the safety training requirements of each employee. Typically, courses may include but not limited to, hazard recognition, employee safety orientation, OSHA compliance, safety program planning for supervisors; CPR/First Aid training and site specific programs to fit project needs.

The video library contains a wide array of educational videos, concentrating on safety procedures and safety training. These videos are available through the Corporate Health and Safety Department.

Training offered by the Company encourages each employee to actively participate in their own safety, and demonstrates the relationship between safety, quality and productivity.

We have committed to making sure that all of our project supervisors are adequately trained and possess the knowledge to manage their projects in a safe manner. Therefore, all project managers, site manager, and site engineers, in the company will have at a minimum the OSHA 10-hour construction certification course.

SAFETY RECORDKEEPING AND REPORTING

Recordkeeping is an integral part of a Health and Safety Program, assuring compliance with many federal, states, and local and corporate regulations. In addition, statistical analysis generated by accurate Recordkeeping and reporting provides the information needed to determine strengths and weaknesses in the safety program.

The following is a list of safety records that are to be maintained. *(Note: Some items may not to be required for every project):*

A. All personal injury accidents and illnesses:

1. Supervisor's Accident Investigation Report
2. First Report of Injury Reports
3. Physicians statement and/or releases
4. OSHA 300 Logs
5. Workers' Compensation Records

B. OSHA and/or other regulatory citations.

C. Equipment/Incident/Accident Reports.

D. Major Incident or Loss Reports.

E. Occupational Medical Records.

F. Environmental Monitoring Records as required.

G. Equipment/Crane Records:

1. Crane Inspections
2. Operator Certifications

H. Safety Training Records, including:

1. Project Safety Meetings signature page
2. Employee handbook signature page
3. Safety orientation signature page
4. Hazard communications signature page

I. First Aid/CPR Certifications

J. Attendance of Safety Meetings:

1. Corporate Executive Safety Committee
2. Project Safety Committee (if applicable)
3. Supervisor's Safety Meetings
4. Toolbox Safety Meetings

K. Client/Sub-contractors/Company Safety Communications

L. Hazard Communications:

1. List of Hazardous Chemicals
2. Hazard Communication Training Program
3. Hazard Communication Training Certification
4. Material Safety Data Sheets
5. Assignment of Responsibilities
6. Communications with Workers and Vendors

M. Company and Client Work Permits

1. Excavation
2. Scaffolding
3. Hot work
4. Confined Space
5. Others as Required

PCSI
Occupational Health and Safety Program

Health and Safety Guidelines

Program Responsibility: The company Safety Director is solely responsible for all managerial facets of this program and has full authority to make necessary decisions to ensure success of the program. Safety is also the responsibility of every sub-contractors and employee of this company. The corporate safety director will develop written detailed instructions covering each of the basic elements in this program, and is the sole person authorized to amend these instructions. The company has expressly authorized the Safety Director to halt any operation of the jobsite where there is danger of serious personal injury.

Program Content

The PCSI, Construction Safety and Health Program will include, but is not limited to development and maintenance of the following:

1. **Jobsite Health and Safety Program Guidelines.**
2. **Written Programs.**
3. **Safety Committee.**
4. **Routine Safety and Health Inspections.**
5. **Safety Meetings.**
6. **Accident and Incident Reporting.**
7. **Accident Investigation.**
8. **General Safety Rules for all Job locations.**
9. **Recordkeeping Requirements.**
10. **Disciplinary Actions for Willful Unsafe Acts.**
11. **Substance Abuse Program**

1. **Health and Safety Program Guidelines**. PCSI Safety Management will review and evaluate this document:

1.1 On an annual basis.

1.2 When changes occur to 29 CFR that prompt a revision.

1.3 When changes occur to any related regulatory document that prompts a revision of this document.

1.4 When operational changes occur that require a revision of this document.

2. Written Individual Programs. This company will maintain written individual procedures for the types of hazards/issues that our employees will or could potentially are exposed to. Each program will be reviewed/revised on an annual basis or as required by the respective governing OSHA Standard. Each program insofar as possible will be maintained as an independent program to avoid situations where it is unclear where responsibility for given issues belong. Effective implementation of these program's require support from all levels of management within this company. Each written program will be communicated to all personnel that are affected by it. Each will encompass the total workplace, regardless of the number of workers employed or the number of work shifts. They will be designed to establish clear goals, and objectives. The following individual safety programs will be maintained.

2.1 Site Safety Analysis
2.2 Job Hazard Analysis
2.3 Accident Investigation
2.4 Hazard Communication
2.5 Fire Prevention
2.6 Lock-Out/Tag-Out
2.7 Confined-Space
2.8 Slings Safety
2.9 Cranes and Hoists
2.10 Electrical Safety
2.11 Machine Guarding
2.12 First Aid/Injury Procedures
2.13 Power Tools Safety
2.14 Welding and Cutting safety
2.15 Compressed Gas Safety
2.16 Ladders and Stairs
2.17 Working in Hot Conditions
2.18 Working in Cold Conditions
2.19 Slips, Trips and Falls
2.20 Protective Clothing/Equipment
2.21 Head Protection
2.22 Eye and Face Protection
2.23 Hand Protection

2.24 Skin Protection
2.25 Foot Protection
2.26 Hearing Conservation
2.27 Bloodborne Pathogens
2.28 Forklifts
2.29 Preparation for Workplace Emergencies
2.30 Office Safety
2.31 Compressed Gas Safety

3. Safety Committee.

3.1 Composition. The corporate safety committee will be comprised of members of PCSI project management, site management and engineer personnel. The make up of the committee will consist of the following:

Safety Committee

Title	Member
Chairman	PCSI Safety Management
Vice Chairman	PCSI Project Manager
Members	PCSI Site Managers and PCSI Engineers

3.2 Principal Responsibilities. The principal responsibilities of the safety committee will be as follows:

3.2.1 Assemble on a quarterly basis to conduct safety meetings.

3.2.2 Conduct and oversee jobsite safety inspections.

3.2.3 Review accident/injury reports and discuss corrective actions.

3.2.4 Direct and monitor safety training and safety meetings.

3.2.5 Discuss and report on unfinished business from previous meetings.

3.2.6 Discuss new business.

3.2.7 Maintain appropriate records of activities.

3.2.8 Require other PCSI employees to sit in on the committee meetings whenever deemed necessary.

4. Routine Safety and Health Inspections. Routine safety and health inspections of all jobsite locations. The inspection will be conducted to discover through specific, methodical auditing, checking, or inspection procedures; conditions and work practices that lead to job accidents and illnesses.

4.1 Inspection team composition. The jobsite safety inspection team will be comprised of members of management/supervision and sub-contractors personnel. The recommended make up of the team will consist of the following:

Safety Inspection Team

Title	Member
Member	PCSI Project Manager
Member	Corporate Safety Director or Site Safety Professional
Member	PCSI Site Manager
Member	PCSI Engineer

4.2 Inspection Intervals. The corporate safety director will coordinate inspection dates and times with all assigned inspection team members on each project. The team will conduct inspections on at least a quarterly basis.

4.3 Hazard priority classification system. Hazards will be rated according to the following rating system. Where it is unclear where a hazard should be rated the next higher priority classification will be assumed.

4.3.1 Priority 1 Hazard. The most serious type of unsafe condition or unsafe work practice that could cause loss of life, permanent disability, the loss of a body part (amputation or crippling injury), or extensive loss of structure, equipment, or material.

4.3.2 Priority 2 Hazard. Unsafe condition or work practice that could cause serious injury, industrial illness, or disruptive property damage.

4.3.3 Priority 3 Hazard. Unsafe condition or work practice that might cause a recordable injury or industrial illness or nondisruptive property damage.

4.3.4 Priority 4 Hazard. Minor condition, a housekeeping item or unsafe work practice infraction with little likelihood of injury or illness other than perhaps a first-aid case.

4.4 Inspection elements. The following inspection elements will be checked during safety inspections. Where an individualized safety program exists, the jobsite standard practice instruction will be used as the basis for development of inspection criteria.

Element	Criteria
Floors/Ground	Condition, slip, trip, falls
Aisles	Marking, obstructions
Stairs	Condition, railings, obstructions
Ladders	Condition, Metal in electrical areas
Scaffolds	Condition, Nonskid, level, 2 feet wide

Lighting	Suitable Illumination for work
Exits	Obstructions, locked?, lighted?
Ventilation	Adequate, fans guarded?, maintained
Noise control	85db or less?, hearing protection?
Hand tools	Grounded, guarded, pressure switches
Machine tools	Guarded, stop buttons, training?
Chemicals	MSDS's, labels, storage, separated
Hoists/lifts	Load limits, unrestricted view, limits
Compressed gas	Storage, heat sources, labels, training
Guarding	Installed, over, under, around, between
Forklifts	Licenses, checklists, capacity, keys
Lockout Tagout	Procedures, training, devices, tags
Eye protection	Used, training, Z-87 rated protectors
Fire protection	Extinguishers, training, locations
First Aid	Kits, OSHA 300 logs, training
Waste disposal	Containers, labeled, separated
Yards/roads	Obstructions, housekeeping, signs
Confined Spaces	Marked, training, ventilation, equipment
Offices	Floors, aisles, exits
Power systems	Mechanical, hydraulic, electrical
Work practices	Unsafe work practices observed? (list)

4.5 Inspection report. The PCSI Project Manager will develop a safety report based on the inspection items noted during the inspection. The following items will be accomplished:

4.5.1 The report will be distributed immediately to project personnel responsible for correcting deficiencies noted during the inspection. Personnel will use the hazard classification system to prioritize deficiency correction.

4.5.2 The report will be distributed to all key management personnel. Supervisors will brief the results to all employees under their control.

4.5.3 The corporate safety director will develop a statistical analysis of deficiencies noted to determine jobs/areas that have a high incidence of injury potential. These areas will be emphasized during inspections and meetings.

5. Safety Meetings. A well-ordered flow of information is essential to a good safety program. The jobsite, through a program of safety meetings at all levels, intends to accomplish the goals of safety awareness, education, and participation.

5.1 Safety meeting outlines. The jobsite safety manager or site manager will maintain outlines serving various topics of importance to the safety of jobsite employees. The outlines will be flexible. They will be intended to be adapted to

the widest range of situations and groups. Supervisors can add the level of detail required to make the material completely relevant to his or her employees.

5.2 Safety meeting schedules. Employees will be given safety briefings by their respective supervisors on a daily basis at the start of the workday. Safety briefings will be given immediately:

5.2.1 Upon initial job assignment or reassignment.

5.2.2 When operational changes to equipment or the job occurs.

5.2.3 When a co-worker in their job location is injured.

5.2.4 When PCSI suppliers provide safety related information pertaining to defects, use, etc., for equipment used by this jobsite.

5.3 Jobsite project meetings. Safety will be included in the agenda of all staff meetings. The project site manager will keep jobsite superintendents informed of safety performance developments in the area of accident prevention, and safety. Jobsite superintendents may be asked to provide safety briefings as required.

5.4 Supervisor meetings. Safety will be included in the agenda of all routine supervisor meetings. The jobsite safety manager will keep jobsite superintendents informed of safety performance developments in the area of accident prevention, and safety. Jobsite superintendents will ensure the information is transmitted to supervisors for inclusion in meetings. Supervisors may ask the jobsite safety manager to provide safety briefings as required.

6. Accident and Incident Reporting. All employees are required to report potential or known hazards will use the PCSI Hazard Report. The following procedures apply:

6.1 Person reporting hazard:

6.1.1 Notify jobsite superintendents of the hazard.

6.1.2 Accomplish lock-out/tag-out if required on the machine.

6.1.3 Fill out required sections of the hazard report.

6.1.4 Forward report immediately to the PCSI Project Manager, and then report it to the corporate safety director.

6.2 Supervisor:

6.2.1 Notify all affected workers of hazard.

6.2.2 Ensure hazard is properly marked and controlled.

6.2.3 Contact corporate safety director as needed. Serious injuries requiring hospitization shall be reported immediately by phone.

7. Accident Investigation. Accident investigation is primarily a fact-finding procedure; the facts revealed are used to prevent recurrences of similar accidents. The focus of accident investigation will be to prevent future accidents and injuries to increase the safety and health of all our employees.

7.1 Immediate concerns.

7.1.1 Ensure any injured person receives proper care.

7.1.2 Ensure co-workers and personnel working with similar equipment or in similar jobs are aware of the situation. This is to ensure that procedural problems or defects in certain models of equipment do not exist.

7.1.3 Start the investigation promptly.

7.2 Investigation Team. The accident investigation team will be composed of the following:

Accident Investigation Team

Title	**Member**
Member	PCSI Project Manager
Member	PCSI Jobsite Safety Manager
Member	PCSI Site Manager
Member	Sub-contractor
Member	Supervisor of injured employee
Member	Sub-contractors Safety Professional

7.3 Accident Investigation Form. A standardized investigation form which details specific jobsite requirements for investigation will be developed and used to gather data to determine causes and corrective actions. As a minimum the form will contain the following areas of concern.

7.3.1 Accident investigation form data.

- Injured employee's name
- Date and time of injury
- Occupation or task being performed when injured
- Shift and job location
- Jobsite ID number
- Employee's address
- Sex/age/DOB
- Social security number

- Length of service
- Length of time at specific job
- Time shift started
- Overtime length when injury occurred
- Physician's and hospital name (if transported)
- Type of injury
- Resulting fatalities
- Description and analysis of accident
- Complete accident tree
- Action taken to prevent recurrence and person
- Employee's statement
- Witnesses' statement
- Employer's statement
- Person completing form and date
- Person reviewing form and date

7.4 Reviewers. All injury investigation reports will be reviewed by a member of management responsible for the job location/section involved to ensure pertinent information is transmitted to all concerned and remedial action taken.

Accident Investigation Review Team

Title	**Member**
Member	PCSI Project Manager
Member	PCSI Jobsite Safety Manager
Member	PCSI Site Manager
Member	Sub-contractors Safety Professional
Member	Supervisor of injured employee

7.5 Accident investigation report. The final report will be numbered in the upper right hand corner, Page of Pages. The report shall be sent within 48 hours to the Company Corporate Safety Director; and will include but is not limited to the following.

7.5.1 Investigation form and pertinent data

7.5.2 Photographs/drawings/exhibits of scene

7.5.3 Narrative of accident

7.5.4 Sequence of events

7.5.5 Contributing information

7.5.6 Findings and recommendations of review team

7.5.7 Action items and completion dates

7.5.8 Responsible persons

7.5.9 Follow-up procedures to ensure completion

7.5.10 Distribution list

8. General Safety Rules for all Job locations. The following safety rules are established by this jobsite as general safety rules for all job locations/sections.

8.1 Never operate any machine or equipment unless you are authorized and trained to do so.

8.2 Do not operate defective equipment. Do not use broken hand tools. Report them to your supervisor immediately.

8.3 Obtain full instructions for your supervisor before operating a machine with which you are familiar.

8.4 Never start on any hazardous job without being completely familiar with the safety techniques, which apply to it. Check with your supervisor if in doubt.

8.5 Make sure all safety attachments are in place and properly adjusted before operating any machine.

8.6 Do not operate any machine or equipment at unsafe speeds. Shut off equipment, which is not in use.

8.7 Wear all protective garments and equipment necessary to be safe on the job. Wear proper safety shoes; sandals or other open-toed or thin-soled shoes shall not be worn at any time on the job site.

8.8 Do not wear loose, flowing clothing or long hair while operating moving machinery.

8.9 Never repair or adjust any machine or equipment unless you are specifically authorized to do so by your foreman.

8.10 Never oil, clean, repair, or adjust any machine while it is in motion.

8.11 Never repair or adjust any electrically driven machine without opening and properly tagging the main switch.

8.12 Put tools and equipment away when they are not in use.

8.13 Do not lift items, which are too bulky or too heavy to be handled by one person. Ask for assistance.

8.14 Keep all aisles, stairways, and exits clear of skids, boxes, air hoses, equipment, and spillage.

8.15 Do not place equipment and materials so as to block emergency exit routes, fireboxes, sprinkler shutoffs, machine or electrical control panels, or fire extinguishers.

8.16 Stack all materials neatly and make sure piles are stable.

8.17 Keep your work area, machinery and all jobsite job sites, which you use clean and neat.

8.18 Do not participate in horseplay, or tease or otherwise distract fellow workers. Do not run on jobsite premises - always walk.

8.19 Power-truck operators must safeguard other workers at all times; workers must show courtesy to power-truck operators.

8.20 Filing cabinets, desks, storage cabinets, and other storage devices should have drawers closed when not in use to prevent tripping hazards.

8.21 Floor mounted extension cords shall be placed so that they are flush to the ground at all times.

8.22 Never overload electrical outlets.

8.23 Burned out light bulbs should be replaced immediately.

8.24 Frayed or damaged electrical cords shall replaced.

8.25 Never take chances. If you're unsure, you're unsafe!

8.26 Ask for help, Let good common sense be your guide.

9. Recordkeeping requirements. This employer fully understands that companies with eleven (11) or more employees at any time during the calendar year immediately preceding the current calendar year must comply with the provisions of 29 CFR 1904. This section provides for recordkeeping and reporting by PCSI, sub-contractors covered under 29 CFR 1904 as necessary or appropriate for developing information regarding the causes and prevention of occupational accidents and illnesses, and for maintaining a program of collection, compilation, and analysis of occupational safety and health statistics both for this jobsite and as part of the national system for analysis of occupational safety and health. Records shall be established on a calendar year basis.

9.1 This employer will report under 29 CFR 1904.8 concerning fatalities or multiple hospitalization accidents.

9.2 This employer will maintain a log of occupational injuries and illnesses under 29 CFR 1904.2 and to make reports under 29 CFR 1904.21 upon being notified in writing by the Bureau of Labor Statistics that the employer has been selected to participate in a statistical survey of occupational injuries and illnesses.

9.3 Log and summary of occupational injuries and illnesses. This employer shall:

9.3.1 Maintain a log and summary of all recordable occupational injuries and illnesses by calendar year.

9.3.2 Enter each recordable injury and illness on the log and summary as early as practicable but no later than 6 working days after receiving information that a recordable injury or illness has occurred. For this purpose form OSHA No. 300 log will be used. The log and summary shall be completed in the detail provided in the form and instructions on form OSHA No. 300.

9.3.3 If this employer elects to maintain the log of occupational injuries and illnesses at a place other than this establishment or by means of data-processing equipment, or both, it will meet the following criteria:

9.3.3.1 There will be available at the place where the log is maintained sufficient information to complete the log to a date within 6 working days after receiving information that a recordable case has occurred.

9.3.3.2 At each facility belong to this jobsite, there will be available a copy of the log which reflects separately the injury and illness experience of that establishment complete and current to a date within 45 calendar days.

9.4 Supplementary record. In addition to the log of occupational injuries and illnesses (OSHA 300) this employer shall have available for inspection at each of our job sites within 6 working days after receiving information that a recordable case has occurred, a supplementary record for each occupational injury or illness for that establishment. The record shall be completed in the detail prescribed in the instructions of the Occupational Safety and Health Administration Form OSHA No. 301. Workmen's compensation, insurance, or other reports are acceptable alternative records if they contain the information required by Form OSHA No. 301 (according to OSHA). If no acceptable alternative record is maintained for other purposes, Form OSHA No. 301 shall be used or the necessary information will be otherwise maintained.

9.5 Manual summary. This employer shall post an annual summary of occupational injuries and illnesses for each facility under our control. This

summary shall consist of a copy of the year's totals from the form OSHA No. 300 and the following information from that form:

9.5.1 Calendar year covered.

9.5.2 Jobsite Name and establishment address.

9.5.3 Certification signature, title, and date.

9.5.4 A form OSHA No. 301 shall be used in presenting the summary. If no injuries or illnesses occurred in the year, zeros will be entered on the totals line, and the form posted.

9.5.5 The summary shall be completed by February 1 of each calendar year. This jobsite, or the officer or employee of the employer who supervises the preparation of the log and summary of occupational injuries and illnesses, shall certify that the annual summary of occupational injuries and illnesses is true and complete. The certification shall be accomplished by affixing the signature of the employer, or the officer or employer who supervises the preparation of the annual summary of occupational injuries and illnesses, at the bottom of the last page of the log and summary or by appending a separate statement to the log and summary certifying that the summary is true and complete.

9.5.6 This Each employer shall post a copy of the establishment's summary in each facility in the same manner required under 29 CFR 1903.2 The summary covering the previous calendar year shall be posted no later than February 1, and shall remain in place until May 1. For employees who do not primarily report or work at a fixed site belonging to this jobsite, or who do not report to any fixed site on a regular basis, we shall satisfy this posting requirement by presenting or mailing a copy of the summary during the month of February of the following year to each such employee who receives pay during that month. (NOTE: For multi-establishment employers where operations have closed down in some establishments during the calendar year, it will not be necessary to post summaries for those establishments).

9.6 Records retention. Records provided for in 29 CFR 1904.2, 1904.4, and 1904.5 (including form OSHA No. 300 and its predecessor forms OSHA No. 100 and OSHA No. 102) will be retained for 5 years following the end of the year to which they relate.

9.7 Access to records. This employer shall provide, upon request, records provided for in 29 CFR 1904.2, 1904.4, and 1904.5, for inspection and copying by any representative of the Secretary of Labor for the purpose of carrying out the provisions of the OSHA act, and by representatives of the Secretary of Health, Education, and Welfare, or by any representative of a State accorded

jurisdiction for occupational safety and health inspections or for statistical compilation.

9.7.1 The log and summary of all recordable occupational injuries and illnesses (OSHA No. 300 & 300A) will, upon request, be made available to any employee, former employee, and to their representatives for examination and copying in a reasonable manner and at reasonable times. The employee, former employee, and their representatives shall have access to the log for any establishment in which the employee is or has been employed.

9.8 Reporting of fatality or multiple hospitalization accidents. Within 8 hours after the occurrence of an employment accident which is fatal to one or more employees or which results in hospitalization of three or more employees, this employer shall report the accident either orally or in writing to the nearest office of the Area Director of the Occupational Safety and Health Administration, U.S. Job location of Labor. The reporting may be by telephone or telegraph. The report shall relate the circumstances of the accident, the number of fatalities, and the extent of any injuries. It is understood that the Area Director may require such additional reports, in writing or otherwise, as he deems necessary, concerning the accident.

Specific Safety and Health Rules

1. Trenching and Excavating – No trenching or excavation work may begin until the Worker has designated a competent person to oversee the work and has informed PCSI of the name(s) of the competent person(s) and the basis for such determination. Workers are to assume the soil is Type C unless they prove otherwise with appropriate engineering tests. Worker is responsible for contacting the appropriate “Call Before You Dig” or “Dig Safe” agency the number of days (typically 2-3 business days) prior to the planned start of any excavation. All unattended trenches and excavations shall be guarded to prevent inadvertent falls.

2. Scaffolding – 100% fall protection or restraint is required at all times during erection, maintenance, use and dismantling of the scaffold whenever the fall hazard is six (6) feet or greater unless the competent person possesses documentation clearly describing why using 100% fall protection or restraint is not feasible or creates greater hazards. The documentation shall also describe the methods that will be implemented to achieve as close to 100% fall protection or restraint as possible. Scaffold components may not be used for fall protection or restraint anchorage unless Worker similarly possesses documentation by a “qualified person” as defined by OSHA 29CFR 1926.450 validating the suitability of the components for such use. All documentation must be readily available for review by PCSI. In addition, from the time scaffold erection is begun until scaffold dismantling is completed, the competent person shall inspect all scaffolding and associated components at least once each work shift prior to their use and shall

affix signs, tags, or equivalent means to conspicuously mark whether the scaffolding is or is not safe to use. Transfer of responsibility for the maintenance and inspection of the scaffolding must be coordinated and clearly noted among PCSI and other parties involved.

3. Fall Protection – 100% fall protection is required for workers exposed to fall hazards of six (6) feet or greater from structures that support overhead electrical lines (e.g., poles, towers, structures), six (6) feet or greater, in other construction activities, and lesser heights with the potential for serious injury, unless the competent person possesses documentation clearly describing why using 100% fall protection or restraint is not feasible or creates greater hazards. The documentation shall also describe the methods that will be implemented to achieve as close to 100% fall protection or restraint as possible.

4. Housekeeping – Workers shall keep the job site neat, clean, and free of debris, trash, and hazards. Worker shall store all materials in a neat and orderly fashion. At a minimum, the Worker shall police the work area at the end of each shift.

5. Hot Work – Hot work is any work that involves the use of burning or welding equipment, brazing equipment, explosives, open flames, grinders, powder actuated tools, and any other activity that produces a flame, spark, or excessive heat. Hot work shall be coordinated with the PCSI liaison in advance. Hot work requires the Worker to conduct a hazard assessment and take appropriate actions to prevent the ignition of combustible and flammable materials, including but not limited to the use of welding tarps, fire watches, and the ready availability of fire extinguishers.

6. Smoking – Smoking is prohibited in and within 25 feet of all PCSI Job Sites, within 25 feet of flammable materials, and in other designated areas.

7. Lifting and Hoisting – The Worker shall not move loads suspended from mobile equipment without the load being secured to prevent swinging. Tag lines shall be used on all loads except when there is a danger of the equipment, load, or tag line making contact with energized parts. Swing load radius must be kept clear during moving of suspended loads. Lifting devices and hardware (slings, chain, shackles, etc.) shall be rated and properly connected for the application. Load charts shall be available and no load may be lifted until its weight has been determined.

8. Guarding of Holes and Openings – The Worker shall guard or place appropriate barricades around temporary openings in floors, walls, excavations, etc., to prevent inadvertent entry. Covers over excavations or floor holes shall be of sufficient strength, conspicuously marked to indicate the hazard and the danger of removal, and secured to prevent inadvertent movement or removal whenever feasible.

9. Ladders – Only ladders constructed of fiberglass may be used in and around electrical equipment, including substations. Ladders are to be properly positioned. Straight and extension ladders are to be tied off at the top and bottom or footed by another person. Step ladders may not be used in the closed position. No person may stand or sit on the steps or platforms on which standing or sitting is prohibited.

10. Tools and Equipment – Workers are responsible for providing proper tools and equipment. Except in rare or emergency situations, PCSI will not provide or lend tools or equipment, including personal protective equipment (PPE.) Tools and equipment shall be maintained in safe condition and used as designed and without removing, defeating, or otherwise compromising guards or other safety devices. Any defective or otherwise unsafe tool shall not be used, and shall be tagged & removed from service until repaired. Workers are responsible for wearing appropriate PPE for hazards created by the use of power tools.

11. Walks and Roadways – When working on PCSI job sites, properties, or work sites, Workers shall not hinder or obstruct the normal flow of vehicular or pedestrian traffic without prior coordination with the PCSI liaison. In such cases, appropriate actions must be taken to alert traffic of the hazard and/or control the flow of traffic to ensure safety. In such cases, Worker shall provide approved lights, barriers, signs, warning devices, signal persons, and/or other precautions appropriate to the situation.

12. Lock out/Tag out – Work at PCSI job sites may require the use of a lock out/tag out system. The Worker is to coordinate lock out/tag out with the PCSI liaison. In some cases, Worker may be required to comply with PCSI's lock out/tag out requirements.

13. Confined Space Entry (including Enclosed Space Entry) – Worker is to consider all confined spaces as permit-required confined spaces until informed otherwise by PCSI or until Worker conducts a written hazard assessment that documents otherwise. The Worker is to coordinate all entries into confined spaces (whether permit-required confined spaces, non-permit confined spaces, or enclosed areas) with the PCSI liaison, the local job sites/building supervisor, and other work groups to ensure each other's activities will not affect the safety or health of any person.

14. Personal Protective Equipment (PPE) – As a minimum, most physical work requires the use of ANSI Z87 safety glasses (i.e., including side shields) and ANSI Z41 rated safety shoes. Workers shall comply with local PCSI PPE requirements for the location or the type of work. Determining any additional PPE requirements is the responsibility of the Worker. The Worker's PPE hazard assessment certifications are subject to review by PCSI.

15. Barriers, Warnings, Signs, and Signage Credibility – Work areas, whether indoors or outdoors, restricted to entry by authorized persons shall be clearly marked and

delineated. Unless otherwise permitted, such marking shall consist of conspicuous rope or tape barrier with appropriate DANGER, CAUTION, or other appropriate signs that (1) note the nature of the hazard and (2) provide guidance to the reader. The placement of orange cones or signs alone is generally not considered adequate. Detours, whether for vehicular or pedestrian traffic, shall be clearly marked along the entire route. Signs, barriers, and similar markings shall be checked and maintained throughout the period of need and shall be removed promptly when the need has ended. When the signs or barriers are not available or their use is not practicable, such as for a momentary hazard exposure, the Worker shall post employees to prevent others from being exposed to the hazard(s).

16. Fire Retardant (FR) Clothing – The wearing of fire retardant clothing is required in certain locations (e.g., substations) for performing certain electrical or gas activities. The Worker is to consult with the PCSI liaison to determine the specific requirements.

17. Hazard Communication – All Worker-supplied hazardous materials and chemicals must be approved by PCSI prior to entry and use on PCSI job sites, properties or work sites. All MSDS and associated instruction/warning sheets must be provided to PCSI far enough in advance of the time of intended use to allow for PCSI review or the materials or chemicals may not enter PCSI property. Worker must also have a copy of their Hazard Communication program available. All containers used to handle chemicals, fluids, or hazardous material must be labeled. Minimum label requirements are product name, manufacturer or distributor, and hazard warning.

18. Reporting Injuries and Other Incidents – Workers are required to report to PCSI all injuries, however slight, to their foreman immediately after occurrence, and to promptly investigate all injuries. Investigations, which shall include a list of corrective actions taken or planned, are subject to review by PCSI.

10. Disciplinary Actions for Willful Unsafe Acts. Employee safety is paramount at this jobsite. The willful commitment of an unsafe act cannot be condoned. Employees who willfully jeopardize their own or coworker's safety will be disciplined. The type of discipline can range from a verbal warning to dismissal. The jobsite safety director, and supervisory personnel in the administrative chain of any employee may give employees a verbal warning for a known unsafe act or procedural, or operational infraction. Project Manager must review disciplinary action other than a release from shift without pay.

10.1 Types of discipline.

10.1.1 Verbal warning. The jobsite safety director, and supervisory personnel in the administrative chain of any employee may give employees a verbal warning for a known unsafe act or procedural, or operational infraction. A second verbal warning in the same shift will be grounds for release from the current work shift without pay. The

immediate supervisor will be consulted in all cases and will make the determination for release.

10.1.2 Written warning. A written warning will be issued automatically for a second verbal warning for an unsafe act. The written warning will become part of the employee's permanent personnel record.

10.1.3 Retraining. It must be considered that the possibility exists that lack of proper training may be a cause of the unsafe act. Supervisors will review the need for employee remedial training in their job skill code to enable them to better accomplish their jobs.

10.2 Unsafe act priority classification system. Unsafe acts will be rated according to the following rating system. Where it is unclear where an unsafe act should be rated the next higher priority classification will be assumed. While any unsafe act is serious, this classification system will be used to gage the severity of an unsafe act for use in determining the appropriate level of disciplinary action.

10.2.1 Priority 1 Unsafe Act. The most serious type of unsafe act or unsafe work practice that could cause loss of life, permanent disability, the loss of a body part (amputation or crippling injury), or extensive loss of structure, equipment, or material.

10.2.2 Priority 2 Unsafe Act. Unsafe act or work practice that could cause serious injury, industrial illness, or disruptive property damage.

10.2.3 Priority 3 Unsafe Act. Unsafe act or work practice that might cause a recordable injury or industrial illness or nondisruptive property damage.

10.2.4 Priority 4 Unsafe Act. Minor unsafe work practice infraction with minimum injury or illness.

DATE: 01 September 2010

SUBJECT: Subcontractor Safety

REGULATORY STANDARDS: none

PCSI Subcontractor Safety Program

1. Written program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when jobsite operational changes occur that require revision. Effective implementation of this program requires support from all levels of management within this company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. Overview

2.1 PCSI has established procedures to review and require that subcontractor safety programs, training, procedures and initiatives coordinate with PCSI's own standards of safety.

2.2 The process is intended to help ensure that, in the event subcontractors are utilized by PCSI as part of a work project, each subcontractor's safety programs, OSHA compliance, training, confirmations, documentations and statistical results of previous safety performance are in accordance with requirements of the PCSI, the contractor, and project owner.

2.3 Under this program and its associated processes, any subcontractor will be reviewed and qualified by PCSI prior to performing work.

3. Subcontractor safety and health requirements

3.1 Pre-qualification by PCSI will include review of the subcontractor's:

3.1.1 OSHA 300 log for the last three years, or from the date the subcontractor began doing business if this time is less than three years;

3.1.2 OSHA experience regarding any previous inspections or citations;

3.1.3 Written safety and health programs as required by the PCSI and/or the respective host employer or general contractor;

3.1.4 Written subcontractor procedures for at-work incident, injury, illness and emergency response, reporting and investigation requirements;

3.1.5 Workers' compensation insurance EMR (Experience Modification Rating)

information;

3.1.6 Proof of insurance documented by a current certificate of insurance from the subcontractor's insurance agent(s);

3.1.7 Documentation of required safety training of subcontractor employees that will be assigned to the respective project, including supervisor, competent person training and site safety representative training;

3.1.8 Any other documentation as may be available to explain the ubcontractor's previous safety performance.

Review and evaluation will be performed by the PCSI Safety Director, PCIS President, and PCSI Project Manager. Written materials, submissions, results and documentations of subcontractor prequalification reviews will be maintained by the Safety Director in a file for a period to be determined in coordination with the Company's designated legal counsel.

4. Measurements of workplace safety and health results

4.1 For purposes of this program, a safety metric will be considered as any such measurement of safety performance and injury/illness/incident prevention results.

4.2 Specific safety metrics to be considered during subcontractor pre-qualification will include, but are not limited to, items 3.1.1 through 3.1.8, above.

4.3 Subcontractor safety performance will be reviewed and evaluated in part through comparisons of the subcontractor's safety metrics with levels of accomplishment as identified by the PCSI Subcontractor Standards of Safety for each project, if applicable. At a minimum, subcontractors safety performance metrics shall not exceed 150% of the subcontractor's BLS (latest figures) published statistics (subcontractor specific NAICS).

4.6 Subcontractors that evidence safety metrics that are not in accordance with project requirements, if applicable, or are at or above 150% of the published BLS statistics, iwill not be utilized for that specific project; or they will be utilized in roles and assignments that have lower levels of risk and are acceptable to the PCSI and host employer or general contractor.

4.7 All determinations of acceptability of a subcontractor's safety metrics, as requested and reviewed in accordance with this program, will be made by the PCSI and/or the host employer or general contractor for the respective project.

5. Inclusion and participation of subcontractors in project safety initiatives

5.1 Subcontractors assigned by PCSI to a project will attend initial safety and planning meetings; project safety orientations; incident, injury and illness response planning and coordination meetings.

5.2 Subcontractor personnel will participate in these and other such activities as required in preparation for working safely at the project location.

5.3 Subcontractor personnel will utilize, cooperate with, attend and support all pertinent components of safety programs and procedures; safety orientation, training, tailgate and daily meetings; qualification and/or certification requirements; periodic safety meetings and awareness activities; safety inspections; incident reporting and investigation procedures; and other such safety, health and incident prevention initiatives as may be established for all workers at a project location.

5.4 Subcontractor personnel will participate in and cooperate with Job Hazard Analysis (JHA), Job Safety Analysis (JSA) and Job Safety Observations (JSO) as established for the project workplace.

6. Requirements for reporting hazards, incidents, injuries and illnesses

6.1 Subcontractor employees are responsible for reporting any observed near-miss, hazard or unsafe behavior of another person when there is a potential for causing an incident, chemical release, injury or illness in the project workplace. First report will be made to the subcontractor's on-site supervisor or to the PCSI contact person if the supervisor is not readily available. Reporting should be made without delay to help facilitate intervention and preventive measures.

6.2 Subcontractor supervisors and/or management will forward any such report to their PCSI contact person so that additional communication can be made and/or actions taken if PCSI deems this necessary.

6.3 Any on-the-job injury or illness that requires medical attention by a physician or professional medical provider will be reported immediately to the PCSI contact person after the individual(s) requiring treatment are in route to medical care.

6.4 Subcontractors will investigate near-misses, first aid injuries, and incidents, injuries or illnesses in the project workplace in accordance with requirements established by PCSI and for the project, if applicable.

7. Post-project review of subcontractor safety performance and results

7.1 On conclusion of a project, PCSI will make a timely review of each subcontractor's safety performance, incident and injury experience, and other factors that will be helpful in evaluating the subcontractor's suitability for future projects.

7.2 In the event that a subcontractor exits or is terminated from a project that remains in progress, a similar timely review as explained in 7.1 will be performed.

7.3 Post-project evaluations will be performed by the PCSI Safety Director in coordination with PCSI managers and supervisors who worked with the subcontractor during the specific project under review.

DATE: 01 August 2009

SUBJECT: Fall Protection Program

REGULATORY STANDARDS: OSHA - 29 CFR 1910.66
29 CFR 1926.104
29 CFR 1926.500-503

PCSI Fall Protection Program

1. Written Program. The company will review and evaluate this standard practice instruction:

- On an annual basis
- When changes occur to 29 CFR, that prompt revision of this document
- When jobsite operational changes occur that require a revision of this document
- When there is an accident or close-call that relates to this area of safety
- Review the program any time fall protection procedures fail

Effective implementation of this program requires support from all levels of management within This company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of the number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. Statement of Policy. The hazards of potential falls at heights of 6 feet and above will be addressed in this document. This instruction describes a systematic approach that must be used to protect and prevent people from falling. This instruction also lists some of the most common fall hazards, and provides recommendations and guidelines for selecting fall arrest systems.

3. Jobsite Evaluation. The workplace will be assessed before each assigned job for potential fall hazards. Proper fall arrest equipment will be used for jobs requiring fall protection when elimination of the hazard(s) is not possible. This company will evaluate the jobsite by location to determine fall hazards. This preliminary evaluation will detail the required steps for protecting employees from fall hazards. A fall hazards assessment sheet (see appendix) will be used to document fall hazard assessments. A complete list of fall hazard locations and protective measures procedures will be maintained.

4. Training. A training program will be provided for all employees who will be exposed to fall hazards in the work area, and will be conducted by competent personnel. The program will include but will not be limited to:

- A description of fall hazards in the work area

- Procedures for using fall prevention and protection systems
- Equipment limitations
- The elements encompassed in total fall distance
- Prevention, control and fall arrest systems
- Inspection and storage procedures for the equipment

Generally, workers will be trained to recognize the hazards of falling from elevations and to avoid falls from grade level to lower levels through holes or openings in walking/working surfaces. Training programs will include prevention, control and fall arrest systems. It must be ensured that appropriate fall arrest systems are installed, and that employees know how to use them before beginning any work that requires fall protection.

4.1 Initial training. Training will be conducted prior to job assignment. PCSI will provide training to ensure that the purpose, function, and proper use of fall protection is understood by employees and that the knowledge and skills required for the safe application, and usage is acquired by employees. This standard practice instruction will be provided to, and read by all employees receiving training. The training will include, as a minimum the following:

4.1.1 Types of fall protection equipment appropriate for use.

4.1.2 Recognition of applicable fall hazards associated with the work to be completed and the locations of such.

4.1.3 Load determination and balancing requirements.

4.1.4 Procedures for removal of protection devices from service for repair or replacement.

4.1.5 All other employees whose work operations are or may be in an area where fall protection devices may be utilized, will be instructed to an awareness level concerning hazards associated with fall protection operations.

4.1.6 Fall protection equipment identification. Fall protection equipment having identification numbers will be checked for legibility. Fall protection equipment having illegible identification markings will be turned in to the supervisor for inspection.

4.1.7 Equipment maintenance and inspection requirements.

4.1.8 Equipment donning and doffing procedures.

4.1.9 Equipment strengths and limitations.

4.1.10 Certification. PCSI will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Training will be accomplished by competent personnel.

4.2 Refresher training. This standard practice instruction will be provided to, and read by all employees receiving refresher training. The training content will be identical to initial training. Refresher training will be conducted on a semi-annual basis or when the following conditions are met, whichever event occurs sooner.

4.2.1 Retraining will be provided for all authorized and affected employees whenever (and prior to) a change in their job assignments, a change in the type of fall protection equipment used, or when a known hazard is added to the work environment which affects the fall protection program.

4.2.2 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever PCSI has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of fall protection equipment or procedures.

4.2.3 Whenever a fall protection procedure fails.

4.2.4 The retraining will reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

4.2.5 Certification. PCSI will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Training will be accomplished by competent personnel.

5. Fall Hazard Control Procedures (Fall Prevention).

5.1 Control Procedures Development. Once a jobsite evaluation has been accomplished, procedures will be developed, documented and utilized for the control of potential fall hazards. Fall prevention plans will be designed by competent individuals or other competent personnel. Engineers (where utilized) or other competent personnel will be provided with any required specialized training to recognize fall hazards, to understand and address fall prevention techniques, and to become familiar with fall arrest equipment and procedures. It is critical that they consider fall protection design for the safety of operations where employees must work at elevated heights. Safety during access and egress from elevated work sites will also be considered. The following guidelines will be used when planning work at elevated heights:

- Involve the Jobsite Safety Director early in the project planning/job planning so that they can recommend appropriate fall-protection measures and equipment.

- Involve qualified Engineers when load rating of anchorage points must be determined or is in doubt. Required training will be provided as necessary.

- Involve Engineering when anchorage points must be installed.

- PCSI will use the expertise of fall protection equipment manufacturers such as, but not limited to, Rose Manufacturing Company., Miller Equipment Company, Research and Trading Company and DBI/SALA.

- This company will be specific in dealing with fall hazards when developing contracts. Contractors will be required to provide a written fall protection program which describes the Contractors' fall protection policies and procedures when they will be working at elevated heights.

5.2 Procedural Format. The following format will be followed when developing fall protection procedures. PCSI will be responsible for the implementation of these procedures. The procedures will clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized to control fall hazards, and the means to enforce compliance including, but not limited to, the following:

5.2.1 A specific statement of the intended use of the procedure.

5.2.2 A review of accident records, including OSHA 300 logs and Workers' Compensation documentation.

5.2.3 Interviews with employees and groups of employees whose work environment includes or may include fall hazards.

5.2.4 Physical observations of the work environment(s) that involve fall hazards or the potential of such.

5.2.5 Observations of individuals and their job tasks and work habits that expose them to existing or potential fall hazards.

5.2.6 The procedures contained in this fall protection program.

5.2.7 Specific procedural steps for the use and operation of body harness systems, and other fall protection systems.

5.2.8 Specific procedural steps for the placement, erection, inspection, maintenance, disassembly and transfer of fall protection systems or devices and the person(s) responsible for them.

5.2.9 Specific requirements for testing fall protection systems or equipment to determine and verify the effectiveness of the fall protection control measures (not load testing).

5.2.10 The correct procedures to promptly rescue employees who have fallen.

5.2.11 The role of each employee in fall protection plans and applicable policies.

5.2.12 Specific requirements for testing fall protection systems or equipment.

6. Protective Materials and Hardware. Appropriate fall protection devices meeting OSHA requirements will be provided for potential fall hazards. Selection of the equipment will be based on the fall protection evaluation.

6.1 Selection Criteria.

6.1.1 Fall Protection devices will be singularly identified; will be the only devices(s) used for controlling falls; will not be used for other purposes; and will meet the following requirements:

6.1.1.1 Capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

6.1.1.2 Anchor points will not deteriorate when located in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

6.1.1.3 Capable of withstanding the ultimate load of 5,000 lbs. for the maximum period of time that exposure is expected.

6.1.1.4 Standardization within company jobsite. Fall protection devices will be standardized whenever possible.

7. Fall Protection Systems. When fall hazards cannot be eliminated through any other means, fall arrest systems will be used to control falls. Proper training on the use of fall arrest equipment is essential and will be provided prior to use.

7.1 Full Body Harness Systems. A full body harness system consists of a full-body harness, lanyard, energy shock absorber, and self-locking snap hook. Before using a full-body harness system, the supervisor and/or the user must address such issues as:

7.1.1 Has the user been trained to recognize fall hazards and to use fall arrest systems properly?
7.1.2 Are all components of the system compatible according to the manufacturer's instructions?

7.1.3 Have appropriate anchorage points and attachment techniques been reviewed?

7.1.4 Has free fall distance been considered so that a worker will not strike a lower surface or object before the fall is arrested?

7.1.5 Have swing fall hazards been eliminated?

7.1.6 Have safe methods to retrieve fallen workers been planned?

7.1.7 Has the full-body harness and all of its components been inspected both before each use and on a regular semi-annual basis?

7.1.8 Is any of the equipment, including lanyards, connectors, and lifelines, subject to such problems as welding damage, chemical corrosion, or sandblasting operations?

7.2 Retractable Lifelines

7.2.1 A retractable lifeline is a fall arrest device used in conjunction with other components of a fall arrest system. Retractable lifelines should be used by one person at a time.

7.2.2 A properly inspected and maintained retractable lifeline, when correctly installed and used as part of the fall arrest system, automatically stops a person's descent in a short distance after the onset of an accidental fall.

7.2.3 Retractable lifelines may be considered when working in areas such as on roofs and scaffolds, or in tanks, towers, vessels, and manholes. Also, retractable lifelines should be considered when climbing such equipment as vertical fixed ladders. Before using a retractable lifeline, the supervisor and/or the user must address the following questions:

7.2.3.1 Has the user been trained to use a retractable lifeline correctly?

7.2.3.2 Is the retractable lifeline being used in conjunction with a complete fall arrest system?

7.2.3.3 Is the equipment under a regular maintenance program?

7.2.3.4 Has the equipment been inspected within the last six months?

7.3 Standard Harnesses. Harnesses for general purpose work should be Class III, constructed with a sliding back D-ring. Standard harnesses are suitable for continuous fall protection while climbing, riding, or working on elevated personnel platforms. They are suitable for positioning, fall arrest, and the rescue and evacuation of people who are working at elevated heights.

8. Inspection and Maintenance. To ensure that fall protection systems are ready and able to perform their required tasks, a program of inspection and maintenance will be implemented and maintained. The following as a minimum, will comprise the basic requirements of the inspection and maintenance program:

8.1 Equipment manufacturer's instructions will be incorporated into the inspection and preventive maintenance procedures.

8.2 All fall protection equipment will be inspected prior to each use, and a documented inspection at intervals not to exceed 6 months, or in accordance with the manufacturers guidelines.

8.3 The user will inspect his/her equipment prior to each use and check the inspection date.

8.4 Any fall protection equipment subjected to a fall or impact load, will be removed from service immediately and inspected by a qualified person (sent back to the manufacturer).

8.5 Check all equipment for mold, damage, wear, mildew, or distortion.

8.6 Hardware should be free of cracks, sharp edges, or burns.

8.7 Ensure that no straps are cut, broken, torn or scraped.

8.8 Special situations such as radiation, electrical conductivity, and chemical effects will be considered.

8.9 Equipment that is damaged or in need of maintenance will be tagged as unusable, and ***will not be stored*** in the same area as serviceable equipment.

8.10 A detailed inspection policy will be used for equipment stored for periods exceeding one month.

8.11 Anchors and mountings will be inspected before each use by the user and supervisor for signs of damage.

9. Most Common and Most Dangerous Fall Hazards. The tasks and situations listed below present inherent fall hazards. Give special attention to providing fall prevention and/or fall control for them, remembering that this attention is necessary in the design,

engineering, planning, and execution stages of work. Supervisors will give special consideration to fall protection for the following tasks:

9.1 Working from crane booms and tower cranes.

9.2 Working on top of machinery and equipment, such as overhead cranes, furnaces, conveyors and presses.

9.3 Other work that involves fall hazards, such as 'off-chutes' from main piping in duct work or boilers.

9.4 Working on roofs, with deteriorating or unsupported sections and framing.

9.5 Working over chemical tanks or open pits.

9.6 Working from a fixed or portable ladders, or climbing systems.

9.7 Performing work on water towers, product tanks, silos, pipe racks, presses, and floor pits.

10. Subcontractor Responsibilities. In addition to complying with the fall protection requirements that apply to all subcontractor employees, each subcontractor who is retained to perform operations that involve fall protection will:

10.1 Obtain any available information regarding fall hazards and protective measures from This company.

10.2 Coordinate fall protection operations with the Jobsite Safety Director, when both company personnel and contractor personnel will be working in or near recognized fall hazard locations.

10.3 Inform the Jobsite Safety Director of the fall protection program that PCSI will follow and of any hazards confronted or created in conducting operations involving fall protection within the jobsite through a debriefing immediately prior to the operation.

11. Definitions

Anchorage means a secure point of attachment for lifelines, lanyards or deceleration devices.

Body harness means straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

Competent person means a person who is capable of identifying hazardous or dangerous conditions in any personal fall arrest system or any component thereof, as well as in their application and use with related equipment.

Connector means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an integral component of part of the system.

Deceleration device means any mechanism with a maximum length of 3.5 feet, such as a rope grab, ripstitch lanyard, tearing or deforming lanyards, self-retracting lifelines, etc. which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

Energy shock absorber means a device that limits shock-load forces on the body.

Failure means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

Fall arrest system means a system specifically designed to secure, suspend, or assist in retrieving a worker in or from a hazardous work area. The basic components of a fall arrest system include anchorage, anchorage connector, lanyard, shock absorber, harness, and self-locking snap hook.

Free fall means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free fall *distance* means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall (maximum of 6 feet). This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.
Hole means a gap or void 2 inches or more in its least dimension, in a floor, roof, or other walking/working surface.

Lanyard means a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchorage.

Leading edge means the edge of a floor roof, or formwork for a floor or other walking/working surface which changes location as additional floor, roof, decking, or formwork sections are placed, formed or constructed. A leading edge is considered to be an unprotected side and edge during periods when it is not actively and continuously under construction.

Lifeline means a component consisting of a flexible line for connection to an anchorage at one end to hang vertically or for connection to anchorages at both ends to stretch horizontally and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Opening means a gap or void 30 inches or more high and 18 inches or more wide, in a wall or partition, through which employees can fall to a lower level.

Personal fall arrest system means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. NOTE: the use of a body belt for fall arrest is prohibited.

Positioning device system means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

Qualified person means one with a recognized degree or professional certificate and extensive knowledge and experience in the subject field who is capable of design, analysis, evaluation and specifications in the subject work, project, or product.

Retractable lifeline means a fall arrest device that allows free travel without slack rope, but locks instantly when a fall begins.

Rope grab means a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

Safety-monitoring system means a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

Self-retracting lifeline/lanyard means a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

Snaphook means a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snaphooks are generally one of two types:

- The locking type with a self-closing , self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or
- The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use

of a non-locking snaphook as part of personal fall arrest systems and positioning device systems is prohibited.

Toeboard means a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Walking/Working surface means any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

Warning line system means a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.

Work area means that portion of a walking/working surface where job duties are being performed.

DATE: 01 August 2009

SUBJECT: Assured Equipment Grounding Conductor Program

REGULATORY STANDARD: OSHA - 29 CFR 1926.404

PCSI Assured Equipment Grounding Program

1. Written Program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur to 29 CFR 1926.404, that prompt revision of this document, or when jobsite operational changes occur that require a revision of this document. Effective implementation requires a written program for job safety, health, that is endorsed and advocated by the highest level of management within this company and that outlines our goals and plans. This written program will be communicated to all required personnel. It is designed to establish clear goals, and objectives.

2. General Requirements. PCSI shall designate a competent employee at each job site who will be responsible for the safe condition of electrical tools and equipment used by its employees, including tools and equipment which may be furnished by employees. PCSI will develop assured grounding operational procedures through the use of this document. After tool and equipment selection and evaluation, equipment will be used and maintained in a safe condition. Foreman will ensure that equipment utilized at each job site is maintained in a safe condition.
It is PCSI's policy that all 120 volt, single-phase 15 and 20 ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure equipped with approved ground-fault circuit interrupters for personnel protection.

3. Power Tool and Accessories Selection, Evaluation and Condition. The greatest hazards posed by power tools usually results from misuse and or improper maintenance. Tool selection sometimes is not considered a priority when arrangements are made to begin work. All employees will consider the following when selecting tools:

3.1 Is the tool correct for the type work to be performed?

3.2 Are grounding methods sufficient when working in wet conditions?

3.3 Is the grounding terminal present on the plug?

3.4 Is the polarity of connections correct? No grounded conductor can be attached to any terminal or lead which results in a reversed designated polarity.

3.5 Are grounding terminals or grounding-type devices on receptacles, cord connectors, or attachment plugs used for the intended purpose?

3.6 Are grounding terminals or grounding-type devices on receptacles, cord connectors, or attachment plugs defeated in any way?

3.7 Are all receptacles and attachment caps or plugs tested for correct attachment of the equipment grounding conductor? The equipment grounding conductor must be connected to its proper terminal.

3.8 Are grounding terminals or grounding-type devices on receptacles, cord connectors, or attachment plugs defeated in any way?

3.9 Are all 120 volt, single-phase 15 and 20 ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure equipped with approved ground-fault circuit interrupters for personnel protection?

3.10 Are conductors used as a grounded conductor identifiable and distinguishable from all other conductors?

3.11 Is each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, visually inspected daily before use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage? (Exception - cord sets and receptacles which are fixed and not exposed to damage).

3.12 Is equipment found damaged or defective removed from service until repaired or replaced?

3.13 Are guards installed properly and in good condition?

3.14 Are all required tests performed:

3.14.1 Before first use;

3.14.2 Before equipment is returned to service following repairs;

3.14.3 Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over; and;

3.15.4 At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage must be tested at intervals not to exceed 6 months.

3.15 Are all required tests documented, maintained and include the following:

3.15.1 Identity of all equipment having passed the test?

3.15.2 The last date tested or the testing interval?

3.15.3 Is the test documentation maintained until replaced by a more current record?

3.16 Does the tool create sparks or heat? Has this been considered when working around flammable substances?

3.17 Are cutting tools sharp? Dull tools are more hazardous than sharp ones.

3.18 Is the tool used on the proper working surface? Tools used on dirty or wet working surfaces can create a multitude of hazards.

3.19 Are tools stored properly when not being used? Saw blades, and like sharp tools should be stored so that sharp edges are directed away from aisles and coworkers.

4. Power Tool Precautions. Power tools can be hazardous when improperly used, this company uses several types. The following precautions will be taken by employees of this company to prevent injury.

4.1 Power tools will always be operated within their design limitations.

4.2 Eye protection, gloves and safety footwear are recommended during operation.

4.3 Tools will be stored in an appropriate dry location when not in use.

4.4 Tool work will only be conducted in well illuminated locations.

4.5 Tools will not be carried by the cord or hose.

4.6 Cords or hoses will not be yanked to disconnect it from the receptacle.

4.7 Cords and hoses will be kept away from heat, oils, and sharp edges or any other source that could result in damage.

4.8 Tools will be disconnected when not in use, before servicing, and when changing accessories such as blades, bits and cutters.

4.9 Observers will be kept at a safe distance at all times from the work area.

4.10 Work will be secured with clamps or a vice where possible to free both hands to operate tools.

4.11 To prevent accidental starting, employees should be continually aware not to hold the start button while carrying a plugged-in tool.

4.12 Tools will be maintained in a clean manner, and properly maintained in accordance with the manufacturers guidelines.

4.13 Ensure that proper shoes are worn and that the work area is kept clean to maintain proper footing and good balance.

4.14 Ensure that proper apparel is worn. Loose clothing, ties, or jewelry can become caught in moving parts.

4.15 Tools that are damaged will be removed from service immediately and tagged "Do Not Use". They will be reported and turned over to the foreman for repair or replacement.

4.16 Cracked saws. All cracked saws will be removed from service.

5. Methods of Guarding. One or more methods of guarding shall be provided where required to protect the operator and other employees in the area from hazards such as those created by point of operation, inrunning nip points, rotating parts, flying chips and sparks. Examples of guarding methods are; barrier guards, two-hand tripping devices, electronic safety devices, etc. The guard shall be such that it does not offer an accident hazard in itself. Employee's will:

5.1 Inspect tools without guards for signs of guard removal. If it is evident that a guard is required. Tag-out the tool and obtain a replacement. Tools will not be energized during inspection.

5.2 Inspect tools having guards for proper operation and maintenance prior to use. Tools will not be energized during inspection.

5.3 Never remove a guard during use.

6. Initial Training. Training shall be conducted prior to job assignment. PCSI shall provide training to ensure that the grounding requirements, purpose, function, and proper use of tools to be used in the normal function of their jobs is understood by employees and that the knowledge and skills required for the safe application, and usage is acquired by employees. This program shall be provided to, and read by all employees receiving training. The training shall include, as a minimum the following:

6.1 Grounding requirements for tools and associated site electrical equipment.

6.2 Types of tools appropriate for use.

6.3 Recognition of applicable electrical hazards associated with work to be completed.

6.4 Tool selection requirements.

6.5 Procedures for removal of an electrical tool/accessory from service.

6.6 All other employees whose work operations are or may be in an area where tools which could present a hazard to other than the user, will be instructed to an awareness level concerning hazards.

6.7 Tools identification. Tools having identification numbers will be checked for legibility.

6.8 Certification. PCSI shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

DATE: 01 August 2009

SUBJECT: Confined Space Entry Program

REGULATORY STANDARD: OSHA - 29 CFR 1926.21-(b)(6)(i)
OSHA – 1910.146

Confined Space Entry Program

1. Written program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur to 29 CFR 1926.21, 1910.146 that prompt revision of this document, or when facility operational changes occur that require a revision of this document. Additionally, PCSI will review the permit-required confined space program, using the canceled permits retained within 1 year after each entry and revise the program as necessary, to ensure that employees participating in entry operations are protected from permit space hazards.

2. General requirements. PCSI will establish a confined space operational procedures through the use of this document.

2.1 After jobsite evaluation, spaces that meet the following criteria will be designated as a confined space:

2.1.1 It is large enough and so configured that an employee can bodily enter and perform assigned work.

2.1.2 Has limited or restricted means for entry or exit (for example, excavations, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.)

2.1.3 Is not designed for continuous employee occupancy.

2.1.4 Contains or has a potential to contain a hazardous atmosphere.

2.1.5 Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.

2.1.6 Contains any other recognized serious safety or health hazard.

2.2 Jobsite Evaluation. PCSI shall evaluate the jobsite or workplan to determine if any spaces meet the criteria for designation as a confined space. The decision flow chart in Appendix A to 29 CFR 1910.146 will be used to facilitate compliance with this requirement.

2.3 Confined Space Identification.

2.3.1 Permit-required confined spaces. Those spaces meeting the criteria delineated in this section and having a known potential to contain hazardous atmospheres will be designated as permit-required confined spaces. All spaces shall be considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise. PCSI shall inform exposed employees, by posting danger signs, conducting awareness training, or by any other equally effective means, of the existence and location of and the danger posed by the permit confined spaces. A sign reading "DANGER PERMIT REQUIRED CONFINED SPACE, DO NOT ENTER" or similar language will be used to satisfy the requirement for a sign.

2.3.2 Non-permit confined spaces. Those spaces meeting the criteria delineated in this section that do not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm will be designated as non-permit confined spaces.

2.4 For employees that are required to perform work in permit-required confined spaces, PCSI shall implement the permit-required confined space entry program as delineated within this instruction. This written program will be available for inspection by employees, their authorized representatives, and authorized government inspectors.

2.5 Non-permit required confined spaces. Non-permit required confined spaces will be designated where the atmosphere and safety conditions can be controlled. Confined spaces may be entered without the need for a written permit or attendant provided that: 1. The space is determined not to be a permit-required confined space. 2. The space can be maintained in a safe condition for entry by mechanical ventilation alone. All spaces shall be considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise. PCSI will ensure that any employee required or permitted to pre-check or enter a confined space shall have successfully completed the training as required by this instruction. A written copy of operating and rescue procedures as required by this instruction shall be at the work site for the duration of the job. A site specific Confined Space Pre-Entry Check List must be completed by the LEAD WORKER before entry into a confined space. This list will verify completion of the items required to verify safe entry. This check list shall be kept at the job site for the duration of the job. If circumstances dictate an interruption in the work, the permit-required confined space must be re-evaluated and a new check list must be completed. Assuming the conditions set forth in the paragraphs listed below can be met, the following elements of the permit required confined space program need not be complied with if: (see 2.7.1 - 2.7.3)

(1) Permit required confined space program
(2) Permit system

(3) Entry permit
(4) Duties of authorized entrants
(5) Duties of attendants
(6) Duties of entry supervisors
(7) Rescue and emergency services

2.5.1 It can be demonstrated that the only hazard posed by the permitted space is an actual or potentially hazardous atmosphere.

2.5.2 It can be demonstrated that continuous forced air ventilation alone is sufficient to maintain the space safe for entry.

2.5.3 Monitoring and inspection data supports the demonstrations required by paragraphs 2.7.1 and 2.7.2.

2.6 If an initial entry of the permit space is necessary to obtain complete monitoring and inspection data, worst case will be assumed and the full provisions of permit-required confined space entry procedures will be implemented. NOTE: This method should only be used as a last resort, only after all other avenues of obtaining the data have been exhausted, and only after consulting with the corporate EHS manager.

2.7 Entry can be performed by company personnel, once determinations and supporting data required by paragraphs 2.7.1, 2.7.2, and 2.7.3 are documented, and are made available to each employee who enters the permit space.

2.8 Reclassification of a permit space after all hazards within the space have been eliminated. The following requirements apply to entry into permit spaces that meet the conditions set forth in paragraphs 2.7.1, 2.7.2, and 2.7.3. No company personnel will enter the confined space unless:

2.8.1 Conditions making it unsafe to remove an entrance cover are eliminated before the cover is removed.

2.8.2 The opening at entrance covers are guarded by a railing, temporary cover, or other temporary barrier that will prevent accidental fall-through and will protect each employee working in the space from foreign objects entering the space.

2.8.3 In the event the opening is in a public access area such as a street or sidewalk, additional controls such as barricades and fencing shall be erected to protect both entrants and the public.

2.8.4 The internal atmosphere has been tested, with a calibrated direct-reading instrument, for the following conditions in the order given:

(1) Oxygen content. (19.5% - 23.5%)	OSHA Mandated
(2) Flammable gases and vapors.	OSHA Mandated
(3) Potential toxic air contaminants.	OSHA Mandated
(4) Airborne combustible dusts	Site Specific

2.9 There may be no hazardous atmosphere within the space whenever any employee is inside the space. This means no oxygen content less than 19.5% or greater than 23.5%, no flammable gasses or vapors present above 10% of the LFL, and no toxic or other listed air contaminant above its' OSHA PEL or ACGIH TLV.

2.10 Continuous forced air ventilation shall be used, as follows:

2.10.1 No employee may enter the space until testing confirms that the forced air ventilation has eliminated any hazardous atmosphere.

2.10.2 The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space.

2.10.3 The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.

2.10.4 The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.

2.10.5 If a hazardous atmosphere is detected during entry:

(1) All employees will evacuate.

(2) The space shall be evaluated to determine how the hazardous atmosphere developed.

(3) Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

3. <u>Permit-required confined space program</u>. Under the permit-required confined space program required by 29 CFR 1910.146, PCSI shall:

3.1 Implement the measures necessary to prevent unauthorized entry.

3.2 Identify and evaluate the hazards of permit spaces before employees enter them.

` 3.3 Develop and implement the means, procedures, and practices necessary for safe permit space entry operations, including, but not limited to, the following:

3.3.1 Specifying acceptable entry conditions.

3.3.2 Isolating the permit space.

3.3.3 Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards.

3.3.4 Provide pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards.

3.3.5 Verify that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.

3.3.6 Develop and utilize checklists based on this standard practice instruction and 29 CFR 1910.146.

3.4 Provide the following equipment at no cost to employees, maintain that equipment properly, and ensure that employees are trained in the proper use of the equipment:

3.4.1 Testing and monitoring equipment needed to determine if hazardous conditions exist or to verify that they do not exist.

3.4.2 Ventilating equipment needed to obtain acceptable air quality entry conditions.

3.4.3 Communications equipment necessary for communication between personnel involved in the entry operation.

3.4.4 Personal protective equipment insofar as feasible engineering and work practice controls do not adequately protect employees.

3.4.5 Lighting equipment needed to enable employees to see well enough to work safely and to exit the space quickly in an emergency.

3.4.6 Barriers and shields as required to protect workers from pedestrian, and vehicular traffic.

3.4.7 Ladders, needed for safe ingress and egress by authorized entrants.

3.4.8 Rescue, Retrieval, and Emergency equipment needed to extract or treat injured personnel, except to the extent that the equipment and or service is provided by rescue services that are immediately available.

3.4.9 Any other equipment necessary for safe entry into and rescue from permitted spaces at our facility.

3.4.10 Principal equipment needed to conduct confined space operations. The below listed intrinsically safe equipment as a minimum will be maintained where required for confined space operations.

(1) Multi-gas monitors
(2) Ventilation Equipment
(3) Rescue tripod/davit arm and winch system
(4) Body harness's
(5) Extraction cable and lanyards
(6) Air Compressors (as required)
(7) Supplied Air respirators (as required)
(8) Air purifying respirators (as required)
(9) SCBA equipment (as required)
(10) Emergency escape breathing app. (as required)
(11) Radio communication system (as required)
(12) Signage (as required)
(13) Lock-out/Tag-out Equipment (as required)
(14) Intrinsically safe lighting equipment
(15) Personal protective clothing
(16) Hearing protection equipment
(17) Head protection equipment
(18) Eye Protection equipment
(19) First Aid kits
(20) Time keeping equipment
(21) Hand tools
(22) Escape ladders for depths of four feet or shoulder height

3.5 Evaluation of Permitted Space Conditions. PCSI will evaluate permit space conditions as follows when entry operations are conducted:

3.5.1 Test conditions in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin, except that, if isolation of the space is infeasible because the space is large or is part of a continuous system (such as a sewer), pre-entry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored in the areas where authorized entrants are working.

3.5.2 Test or monitor the permit space as necessary to determine if acceptable entry conditions are being maintained during the course of entry operations.

3.5.3 When testing for atmospheric hazards, use the following protocol; first for oxygen, then for combustible gases and vapors, and then for toxic gases and vapors.

Note: Atmospheric testing conducted in accordance with the "procedures for atmospheric testing" section of this instruction or Appendix B to 29 CFR 1910.146 will be used to satisfy this requirement. This appendix can also be used develop procedures for permit space operations in sewers and other job sites, when supplemented by Appendix C (Examples) to 29 CFR 1910.146.

Note: Attendants may be assigned to monitor more than one permit space provided their duties can be effectively performed for each permit space that is monitored. Likewise, attendants may be stationed at any location outside the permit space to be monitored as long as their duties can be effectively performed for each permit space that is monitored.

3.5.4 If multiple spaces are monitored by a single attendant, the permit will be annotated to provide the means and procedures by which the attendant is to respond to an emergency affecting one or more of the permit spaces being monitored.

3.5.5 When a confined space entry is to take place PCSI as part of the preplanning process, will designate in advance the persons who are to have active roles in the entry operation. Additionally the duties of each such employee will be identified, and provided with the required training required by the training section of this instruction. The confined space entry team will include but is not limited to the following:

(1) Authorized entrants
(2) Attendants
(3) Entry supervisors
(4) Atmospheric monitoring personnel
(5) Certifying personnel
(6) Rescue/Emergency services personnel

3.5.6 PCSI will develop procedures prior to the commencement of confined space operations for the following:

(1) Summoning rescue and emergency services
(2) Rescuing entrants from permit spaces
(3) Providing necessary emergency services for rescue
(4) Preventing unauthorized personnel from attempting a rescue

3.5.7 Development and implementation for the preparation, issuance, use, and cancellation of entry permits will be as follows:

3.5.7.1 When employees of contractor personnel or non-company employees are working simultaneously as authorized entrants in a permit space, the certifying official of the permit (or predesignated representative) will ensure that all parties concerned are aware of the accepted entry procedures for the specific operation. This will ensure entry operations are properly coordinated.

3.5.7.2 The certifying official of the permit (or predesignated representative) will ensure that all parties concerned are aware of the accepted procedures necessary for concluding the entry after entry operations have been completed (such as closing off a permit space and canceling the permit).

3.5.7.3 PCSI will immediately review and as necessary halt and revise entry operations when there is reason to believe that the measures taken under the permit space program may not protect employees. The focus will be directed at the correction of deficiencies found to exist before subsequent entries are authorized. Examples of circumstances requiring the review of the permit-required confined space program are as a minimum:

(1) Any unauthorized entry of a permit space.
(2) The detection of a permit space hazard not covered by the permit.
(3) The detection of a condition prohibited by the permit.
(4) The occurrence of an injury or near-miss during entry.
(5) A change in the use or configuration of a permit space.
(6) Employee complaints about the effectiveness of the program.

3.5.7.4 Review of the permit-required confined space program, using the canceled permits retained will be accomplished within 1 year after each entry and the program revised as necessary, to ensure that employees participating in entry operations are protected from permit space hazards.

Note: Single annual reviews covering all entries performed during a 12-month period will be accomplished. If no entry is performed during a 12-month period, no review is necessary.

4. <u>Permit system</u>. To comply with the permit-system required by 29 CFR 1910.146, PCSI shall:

4.1 Before entry is authorized, document the completion of the following measures:

4.1.1 Specifying acceptable entry conditions.

4.1.2 Isolating the permit space.

4.1.3 Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards.

4.1.4 Provide pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards.

4.1.5 Verify that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.

4.1.6 Develop and utilize checklists based on this standard practice instruction and 29 CFR 1910.146.

4.2 Before entry begins, the entry supervisor identified on the permit shall sign the entry permit to authorize entry.

4.3 The completed permit shall be made available at the time of entry to all authorized entrants, by posting it at the entry portal or by any other equally effective means, so that the entrants can confirm that pre-entry preparations have been completed.

4.4 The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit.

4.5 The entry supervisor shall terminate entry and cancel the entry permit when:

4.5.1 The entry operations covered by the entry permit have been completed.

4.5.2 A condition that is not allowed under the entry permit arises in or near the permit space.

4.6 PCSI shall retain each canceled entry permit for at least 1 year to facilitate the review of the permit-required confined space program. Any problems encountered during an entry operation shall be noted on the pertinent permit so that appropriate revisions to the permit space program can be made.

5. Entry permit. PCSI shall develop or use a standardized entry permit form (see section 11 this document) that documents compliance with this section and authorizes entry to a permit space. As a minimum the permit in use shall identify the following:

5.1 The permit space to be entered.

5.2 The purpose of the entry.

5.3 The date and the authorized duration of the entry permit.

5.4 The authorized entrants within the permit space, by name or by such other means (for example, through the use of rosters or tracking systems) as will enable the attendant to determine quickly and accurately, for the duration of the permit, which authorized entrants are inside the permit space. If a tracking system is used for certain entries this requirement may be met by inserting a reference on the entry permit as to the means used, such as a roster or tracking system, to keep track of the authorized entrants within the permit space.

5.5 The personnel, by name, currently serving as attendants.

5.6 The individual, by name, currently serving as entry supervisor, with a space for the signature or initials of the entry supervisor who originally authorized entry.

5.7 The hazards of the permit space to be entered.

5.8 The measures used to isolate the permit space and to eliminate or control permit space hazards before entry. Such as; the lockout or tagging of equipment and procedures for purging, inerting, ventilating, and flushing permit spaces.

5.9 The acceptable entry conditions.

5.10 The results of initial and periodic atmospheric tests performed, accompanied by the names or initials of the testers and by an indication of when the tests were performed.

5.11 The rescue and emergency services that can be summoned and the means (such as the equipment to use and the numbers to call) for summoning those services.

5.12 The communication procedures used by authorized entrants and attendants to maintain contact during the entry.

5.13 Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment, to be provided for compliance with the permit requirement.

5.14 Any other information whose inclusion is necessary, given the circumstances of the particular confined space, in order to ensure employee safety.

5.15 Any additional permits, such as for hot work, that have been issued to authorize work in the permit space.

5.16 PCSI shall provide training so that all employees whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.

6. Training. PCSI shall develop a standardized training format to meet the requirement for a safe confined space entry.

6.1 Training shall be provided to each affected employee:

6.1.1 Before the employee is first assigned duties that require a confined space entry.

6.1.2 Before there is a change in assigned duties.

6.1.3 Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained.

6.1.4 Whenever PCSI has reason to believe that there are deviations from the permit space entry procedures required by this instruction or inadequacies in the employee's knowledge or use of these procedures.

6.2 The training shall establish employee proficiency in the duties required by this instruction and shall introduce new or revised procedures, as necessary, for compliance with this instruction or when future revisions occur.

6.3 PCSI shall certify that the training required by this section has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

7. Duties of authorized entrants. PCSI shall ensure that all authorized entrants:

7.1 Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.

7.2 Properly use equipment as required by paragraph 29 CFR 1910.146 (d)(4) of this section.

7.3 Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space as required by this section.

7.4 Alert the attendant whenever:

7.4.1 The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.

7.4.2 The entrant detects a prohibited condition.

7.5 Exit from the permit space as quickly as possible whenever:

7.5.1 An order to evacuate is given by the attendant or the entry supervisor.

7.5.2 The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.

7.5.3 The entrant detects a prohibited condition.

7.5.4 An evacuation alarm is activated.

8. Duties of authorized attendants. PCSI shall ensure that each attendant:

8.1 Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.

8.2 Is aware of possible behavioral effects of hazard exposure in authorized entrants.

8.3 Continuously maintains an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants under this section accurately identifies who is in the permit space.

8.4 Remains in a predesignated location outside the permit space during entry operations until relieved by another attendant.

Note: When PCSI's permit entry program allows attendant entry for rescue, attendants may enter a permit space to attempt a rescue if they have been trained and equipped for rescue operations as required by the "rescue and emergency services" section of this instruction and if they have been relieved as required by this section.

8.5 Communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space.

8.6 Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions.

8.6.1 If the attendant detects a prohibited condition.

8.6.2 If the attendant detects the behavioral effects of hazard exposure in an entrant.

8.6.3 If the attendant detects a situation outside the space that could endanger the entrants.

8.6.4 If the attendant cannot effectively and safely perform all the duties required under this section.

8.7 Summon rescue and other emergency services as soon as the attendant determines that entrants may need assistance to escape from permit space hazards.

8.8 Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:

8.8.1 Warn the unauthorized persons that they must stay away from the permit space.

8.8.2 Advise the unauthorized persons that they must exit immediately if they have entered the permit space.

8.8.3 Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.

8.9 Performs non-entry rescues as specified by PCSI's rescue procedure.

8.10 Performs no duties that might interfere with the attendant's primary duty to monitor and protect the entrants.

9. Duties of entry supervisors. PCSI shall ensure that each entry supervisor:

9.1 Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.

9.2 Verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.

9.3 Terminates the entry and cancels the permit as required in accordance with the "permit section" this instruction.

9.4 Verifies that rescue services are available and that the means for summoning them are operable.

9.5 Ensures removal of unauthorized individuals who enter or who attempt to enter the permit space during entry operations.

9.6 Determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

10. Rescue and emergency services. 911 is to be called for Rescue services. Prior to initiating entry procedures at a job site, local rescue services shall be contacted and invited on site to inspect the entry location and practice rescue if desired. In the event the service declines, PCIS shall document the offer and response.

11. Procedures for Atmospheric Testing. PCSI will provide entrants, or their authorized representatives, an opportunity to observe any testing of a space prior to entry or subsequent to entry. In addition, any employee or their representative may request that a space be re-evaluated at any time. Atmospheric testing for confined space entry is required for two distinct purposes: Evaluation of the hazards of the permit space and verification that acceptable entry conditions for entry into that space exist.

11.1 Evaluation testing. PCSI will ensure that the atmosphere of a confined space is analyzed using equipment of sufficient sensitivity and specificity to identify and evaluate any hazardous atmospheres that may exist or arise. This is required to ensure that appropriate permit entry procedures specific to the operation can be developed and acceptable entry conditions stipulated for that specific space. Evaluation and interpretation of these data, and development of the entry procedure, will be done by, or reviewed by, a technically qualified professional (e.g., OSHA consultation service, or certified industrial hygienist, registered safety engineer, certified safety professional, certified marine engineer etc.) based on evaluation of all serious hazards. The internal atmosphere will be tested, with a calibrated direct-reading instrument, for the following conditions in the order given:

(1) Oxygen content. (19.5% - 23.5%)	OSHA Mandated
(2) Flammable gases and vapors.	OSHA Mandated
(3) Potential toxic air contaminants.	OSHA Mandated
(4) Airborne combustible dusts	Site Specific

11.2 Verification testing. The atmosphere of a permit space which may contain a hazardous atmosphere will be tested for residues of all contaminants identified by evaluation testing using permit specified equipment to determine that residual concentrations at the time of testing and entry are within the range of acceptable entry conditions. Results of testing (i.e., actual concentration, etc.) will be recorded on the permit in the space provided adjacent to the stipulated

acceptable entry condition. The atmosphere will be verified, with a calibrated direct-reading instrument, for the following conditions in the order given:

(1) Oxygen content. (19.5% - 23.5%)	OSHA Mandated
(2) Flammable gases and vapors.	OSHA Mandated
(3) Potential toxic air contaminants.	OSHA Mandated
(4) Airborne combustible dusts	Site Specific

11.3 Duration of testing. Measurement of values for each atmospheric parameter will be made for at least the minimum response time of the test instrument specified by the manufacturer.

11.4 Testing stratified atmospheres. When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope will be tested a distance of approximately 4 feet (1.22 m) in the direction of travel and to each side. If a sampling probe is used, the entrant's rate of progress will be slowed to accommodate the sampling speed and detector response. The stratified atmosphere will be tested, with a calibrated direct-reading instrument, for the following conditions in the order given:

(1) Oxygen content. (19.5% - 23.5%)	OSHA Mandated
(2) Flammable gases and vapors.	OSHA Mandated
(3) Potential toxic air contaminants.	OSHA Mandated
(4) Airborne combustible dusts	Site Specific

12. Employee Involvement in the Confined Space Program. 29 CFR 1910.146 requires that employers consult with their employees regarding the employers efforts in the development and implementation of the Confined Space Program. The Standard also requires us to train and educate our employees and to inform affected employees of the findings from incident investigations conducted under the Confined Space Program.

PCSI
Confined Space Entry Permit

Job Site: _____ Permit Number: _____

Permit Validity Period: (day/time) _____ to _____
Confined space identification code (if identified) (_____)
Notes:_____
_____

Authorized Personnel

Workers Authorized Entry	Attendants	Fire watch (hot work)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Known hazards (indicate specific hazards with initials)

_____Oxygen deficiency (less than 19.5%)
_____Oxygen enrichment (more than 23.5%)
_____Flammable gases or vapors (more than 10% of LEL)
_____Airborne combustible dust (meets or exceeds LFL)
_____Toxic gases or vapors (more than PEL)_____
_____Mechanical hazards
_____Electrical hazards
_____Engulfment hazards
_____Materials harmful to skin
_____Other:_____
_____Other:_____
_____Other:_____
_____Other:_____
_____Other:_____

Employee Training and Pre-Entry Briefing

1. Safe Entry and Rescue Training Conducted on? _____
2. Mandatory Pre-Entry Briefing Conducted on? _____
3. Does this job require any special training? Yes____ No ____
   If yes, type of training required. _____

Contractor Notification

Contractor Notified of: Permit Conditions: Yes____ No ____
Potential Hazards: Yes____ No ____

Communication Requirements: Intrinsically Safe? Yes____ No_____
Visually Inspected? Yes____ No_____

_____
_____
_____
_____
_____

Lighting Requirements: Intrinsically Safe? Yes____ No_____
Visually Inspected? Yes____ No_____

_____
_____
_____
_____
_____

Special Tools/Equipment: Intrinsically Safe? Yes____ No_____
Visually Inspected? Yes____ No_____

_____
_____
_____
_____
_____

Site Preparation

1. Work area isolated with signs and or barriers Yes____ No_____
2. All energy sources locked/tagged out? Yes____ No_____
3. All input lines capped/blinded? Yes____ No_____
4. If vessel, drained, flushed, neutralized? Yes____ No_____
5. If vessel, cleaned, purged? Yes____ No_____
6. Ventilation initiated 30 min. before entry? Yes____ No_____
7. Fire extinguishers on hand? Yes____ No_____

Pre-Entry Atmospheric Testing

Action Requirement	Reading	Time	Intervals	Levels
1. Test for oxygen content	%O2	____	_____	_____
2. Test for flamm. concent.	_____<10%LEL	____	_____	_____
3. Test for H2S	_____<10PPM	____	_____	_____
4. Test for Cl2	_____<0.5PPM	____	_____	_____
5. Test for CO	_____<35PPM	____	_____	_____
6. Test for SO2	_____<2PPM	____	_____	_____
7. Test for toxic concent.	_____PPM	____	_____	_____
		_____ of ____(TLV=_____)		
8. Test for heat stress	_____of ____	_____	_____	
9. Test for _____	_____	_____	_____	_____
10. Test for _____	_____	_____	_____	_____

Tester: Name:_____ Signature:_____

Title:_____ Date:_____ Time:_____

Emergency/Rescue Procedures

1. Location of written Emergency/Rescue Plan: _____
2. Type of Emergency/Rescue Team required:

On-site: Yes___ No___ Contact:_____ Phone: _____

Off-site: Yes___ No___ Contact:_____ Phone: _____

3. Additional Information:

_____
_____

Safety Equipment

Personal Protective Equipment Required

1. _____
2. _____
3. _____
4. Air purifying respirator? Type:_____ Yes____ No_____
5. Self-contained Breathing Apparatus Required? Yes____ No_____
6. Atmospheric Monitor Required? Type:_____ Yes____ No_____

Permit Authorization

I certify that I have inspected the work area for safety and reviewed all safety precautions recorded on this permit.

1. Name:_____ Signature:_____
Title:_____ Date:_____ Time:_____

2. Name:_____ Signature:_____
Title:_____ Date:_____ Time:_____

CONFINED SPACE ENTRY PROGRAM

	Permit		Non-Permit	CONFINED SPACE ASSESSMENT

SPACE INFORMATION

VERBAL SPACE DESIGNATION:			
NUMERICAL SPACE DESIGNATION:			
LOCATION:			
SPACE MARKED: ❑ YES ❑ NO		**ENTRY CONTROLLED: ❑ YES ❑ NO**	
SIGNAGE ❑ YES ❑ NO	**BARRIERS ❑ YES ❑ NO**	**LOCKS ❑ YES ❑ NO**	**OTHER:**
CURRENT USE OF SPACE:			
PREVIOUS USE OF SPACE:			

RELATED OPERATING PROCEDURES REVIEWED

HAZARD COMMUNICATION	❑	**RESPIRATORY PROTECTION**	❑	**ELECTRICAL SAFETY**	❑
LOCK OUT TAG OUT	❑	**JOB HAZARD ANALYSIS**	❑	**PROCESS SAFETY**	❑
WELDING SAFETY	❑	**ACCIDENT INVESTIGATION**	❑	**FIRE PREVENTION**	❑
	❑		❑		❑

CONFINED SPACE ASSESSMENT CHECKLIST

1. Can an employee enter & perform work either with or without permission?		**Yes**		**No**
2. Do people occupy the space even though it was not designed for it?		**Yes**		**No**
3. Is entry and or egress limited or present unusual rescue problems?		**Yes**		**No**
4. Does the space have any potential for a hazardous atmosphere?		**Yes**		**No**
5. Does the space contain a material or liquid that could engulf an entrant?		**Yes**		**No**
6. Does the internal space configuration present the hazard of entrapment?		**Yes**		**No**
7. Does the space contain any other recognized safety and or health hazards?		**Yes**		**No**
8. Is previous and or current entry hazard data available for review		**Yes**		**No**
9. Does entry hazard data confirm designation as a permit space?		**Yes**		**NA**
10 Were there any "yes" answers to 4-7 which cannot be controlled?		**Yes**		**No**
11. IF "9 & or 10" are YES, the space must be designated as a permit required confined space!				

ASSESSED HAZARDS & REQUIRED PERSONAL PROTECTIVE EQUIPMENT

XX	HAZARDS	REMARKS	PPE REQUIRED/OTHER EQUIPMENT
	Restricted Entry/Egress		
	Oxygen Deficiency	**Less than 19.5%**	
	Oxygen Enrichment	**More than 23.5%**	
	Oxygen Displacement		
	Flammable Gases or Vapors	**More than 10% LEL**	
	Toxic Gases or Vapors	**More than PEL**	
	Airborne Combustible Dusts	**Meets or Exceeds LFL**	
	Chemical Hazards		
	Mechanical Hazards		
	Electrical Hazards		
	Respiratory Hazards		
	Engulfment Hazards		
	Entrapment Hazards		
	Fall Hazards		
	Skin Hazards		
	Hot/Cold Hazards		
	Radiation Hazards		
	Biological Hazards		
	Toxic Liquids		
	Potential High Liquid Level		
	Internal Baffles		

DIAGRAM OR PHOTOS OF SPACE (Indicate Portals)

CONFIGURATION OF SPACE

❑ VESSEL	❑ PIT	❑ VAULT	❑ SILO	❑ HOPPER	❑ BIN
❑ TANK	❑ RAIL CAR	❑ TANK CAR	❑ SEWER	❑ WELL	❑ TUNNEL
❑ DIGESTER	❑ TANKER	❑ PIPELINE	❑ SHIPS HOLD	❑ OTHER:	☑

DIMENSIONS OF SPACE

DEPTH/HEIGHT:	WIDTH/INNER DIAMETER:	LENGTH:
VOLUME/CAPACITY:	SHAPE:	

❑ ELEVATED	❑ ABOVE GROUND	❑ BELOW GROUND	❑

ANTICIPATED RESCUE

☑ VERTICAL EXTRACTION	❑ HORIZONTAL EXTRACTION	❑ OTHER:

REMARKS/RECOMMENDATIONS

Computer File Name:

AUTHORIZATION

❑ APPROVED

I certify that I have conducted a confined space assessment of the above designated space. To the best of my knowledge, I believe the information contained herein to be true and accurate as of the time of the assessment.

NAME:	TITLE:	
SIGNATURE:	DATE:	TIME: ❑ AM ❑ PM

FURTHER DETAILED ON ATTACHMENT(S) ❑ YES ❑ NO

ASSESSMENT FORM RETENTION INFORMATION

PERMANENT RETENTION FILE:

FILE LOCATION:	DATE FILED:	TIME: ❑ AM ❑ PM
ATTACHMENT(S) INCLUDED: ❑ YES ❑ NO	FILED BY:	

PERMIT-REQUIRED CONFINED SPACE DECISION FLOW CHART

Does the workplace contain *Confined Spaces* as defined by §1910.146(b) **NO**

⇓

YES

Does the workplace contain *Permit-Required Confined Spaces* as defined by §1910.146(b) **NO ü** **Consult other applicable OSHA Standards**

⇓

YES

⇓

Inform employees as required by §1910.146(c)(2)

STOP

Will permit spaces be entered? **NO ⇒** **Prevent employee entry as required by §1910.146(c)(3) Do task from outside of space.**

⇓

YES

⇓

Will contractors enter? **YES ⇒** **Task will be done by contractors' employees. Inform contractor as required by §1910.146(c)(8)(i), (ii), and (iii). Contractor obtains information required by §1910.146(c)(9)(i), (ii), and (iii). from host.**

NO

⇓

⇓

⇓

Will host employees enter to perform entry tasks?

Will both contractor and host employees enter the space? **NO⇒**

⇓ **YES**

Coordinate entry operations as required by §1910.146(c)(8)(iv) and (d)(11) Prevent unauthorized entry.

YES **NO ⇒ Prevent unauthorized entry - STOP**

⇓

Does space have known or potential hazards **NO ⇒** **Not a permit-required confined space. §1910.146 does not apply. Consult other OSHA Standards.**

YES

⇓

Can the hazard be eliminated? **YES ⇒** **Employer may choose to reclassify space to non-permit -required confined space using §1910.146(c)(7). STOP**

NO

⇓

Can the space be maintained in a condition safe to enter by continuos forced air ventilation only **YES ⇒** **Space may be entered under §1910.146(c)(5). STOP**

NO

⇓

Prepare for entry via permit procedures.

⇓

Verify acceptable entry conditions (test results recorded, space isolated if needed, rescuers/means to summon available, entrants properly equipped, etc.). **NO ⇒ Permit not valid until conditions meet permit specifications.**

YES

⇓

Permit issued by authorizing signature. Acceptable entry conditions maintained throughout entry. **NO ⇒** **Emergency exists (prohibited condition).**

Entrants evacuated, entry aborts. Call rescuers if needed.) Permit is void. Re-evaluate program to correct/prevent prohibited condition. Occurrences of emergency (usually) is proof of deficient program. No re-entry until program (and permit) is ammended. (may require new program.)

YES

⇓

Entry tasks completed. Permit returned and canceled.

Audit permit program and permit based on evaluation of entry by entrants, attendants, testers and preparers, etc.

CONFINED SPACE ENTRY PROGRAM

SAFE ENTRY/EGRESS PROCEDURES

SPACE INFORMATION

VERBAL DESIGNATION:			
NUMERICAL DESIGNATION:			
LOCATION:			
SPACE MARKED: ❑ YES ❑ NO	**AREA DESIGNATED OFF LIMITS: ❑ YES ❑ NO**		
SIGNAGE ❑ YES ❑ NO	**BARRIERS ❑ YES ❑ NO**	**LOCKS ❑ YES ❑ NO**	**OTHER:**
CURRENT USE OF SPACE:			
PREVIOUS USE OF SPACE:			

RELATED OPERATING PROCEDURES REVIEWED

HAZARD COMMUNICATION	❑	**RESPIRATORY PROTECTION**	❑	**ELECTRICAL SAFETY**	❑
LOCK OUT TAG OUT	❑	**JOB HAZARD ANALYSIS**	❑	**PROCESS SAFETY**	❑
WELDING SAFETY	❑	**ACCIDENT INVESTIGATION**	❑	**FIRE PREVENTION**	❑
	❑		❑		❑

EMERGENCY RESCUE NOTIFICATION

1. Emergency rescue personnel call sign/phone number -			
2. Estimated response time for rescue personnel -			
3. Have emergency rescue personnel been notified of entry time?			**❑ YES ❑ NO**
4. EMERGENCY USE ONLY:	**Notification Time:**	**Arrival Time:**	

PRE-ENTRY PROCEDURES CHECKLIST

1. Are emergency rescue personnel immediately available?			**❑ YES ❑ NO**
2. Have emergency rescue personnel been notified of entry time?			**❑ YES ❑ NO**
3. Is emergency extraction equipment available and ready for immediate use?			**❑ YES ❑ NO**
4. Is atmospheric testing equipment available?			**❑ YES ❑ NO**
5. Has atmospheric testing equipment been properly calibrated?			**❑ YES ❑ NO**
6. Has atmospheric testing equipment been operationally inspected?			**❑ YES ❑ NO**
7. Is atmospheric testing equipment ready for immediate use?			**❑ YES ❑ NO**
8. Will the work deplete or enrich the oxygen atmosphere in the space?			**❑ YES ❑ NO**
9. Will the work create an explosive atmosphere in the space?			**❑ YES ❑ NO**
10. Will the work create a toxic atmosphere in the space?			**❑ YES ❑ NO**
11. Does the space need to be ventilated in preparation for work?			**❑ YES ❑ NO**
12. Has the space been ventilated in preparation for work?			**❑ YES ❑ NO**
13. Ventilation Data:	**Start Time:**	**Entry Time:**	
14.			**❑ YES ❑ NO**
15.			**❑ YES ❑ NO**
16.			**❑ YES ❑ NO**
17.			**❑ YES ❑ NO**
18.			**❑ YES ❑ NO**
19.			**❑ YES ❑ NO**
20.			**❑ YES ❑ NO**
21.			**❑ YES ❑ NO**
22.			**❑ YES ❑ NO**
23.			**❑ YES ❑ NO**
24.			**❑ YES ❑ NO**
25.			**❑ YES ❑ NO**

CONFINED SPACE ENTRANT PROCEDURES CHECKLIST	
1.	❑ YES ❑ NO
2.	❑ YES ❑ NO
3.	❑ YES ❑ NO
4.	❑ YES ❑ NO
5.	❑ YES ❑ NO
6.	❑ YES ❑ NO
7.	❑ YES ❑ NO
8.	❑ YES ❑ NO
9.	❑ YES ❑ NO
10.	❑ YES ❑ NO
11.	❑ YES ❑ NO
12.	❑ YES ❑ NO
13	❑ YES ❑ NO
14.	❑ YES ❑ NO
15.	❑ YES ❑ NO
16.	❑ YES ❑ NO
17.	❑ YES ❑ NO
18.	❑ YES ❑ NO
19.	❑ YES ❑ NO
20.	❑ YES ❑ NO

EGRESS PROCEDURES CHECKLIST	
1.	❑ YES ❑ NO
2.	❑ YES ❑ NO
3.	❑ YES ❑ NO
4.	❑ YES ❑ NO
5.	❑ YES ❑ NO
6.	❑ YES ❑ NO
7.	❑ YES ❑ NO
8.	❑ YES ❑ NO
9.	❑ YES ❑ NO
10.	❑ YES ❑ NO
11.	❑ YES ❑ NO
12.	❑ YES ❑ NO
13	❑ YES ❑ NO
14.	❑ YES ❑ NO
15.	❑ YES ❑ NO
16.	❑ YES ❑ NO
17.	❑ YES ❑ NO
18.	❑ YES ❑ NO

❑ APPROVED

AUTHORIZATION

This checklist is approved for use in the above designated space. To the best of my knowledge, the information contained herein is true and accurate as of this time.

NAME:	TITLE:	
SIGNATURE:	DATE:	TIME: ❑ AM ❑ PM

CONFINED SPACE - RESCUE ASSESSMENT SHEET

	Bi-Annual		Quarterly	REVIEWER:

SPACE INFORMATION

Space Designation	Verbal:	Numerical:
Current Use Of Space:		
Physical Location of Space:	Assessment Date:	Time:
Space Marked For "Emergency Operations": ❑ Yes ❑ No	Entry For Rescue Controlled: ❑ Yes ❑ No	
Signage Used To Control Entry: ❑ Yes ❑ No	Barriers Used To Control Entry: ❑ Yes ❑ No	
Notification Time Table:	Notification Time:	Arrival Time:

RELATED OPERATING PROCEDURES REVIEWED

Hazard Communication ❑	Respiratory Protection ❑	Electrical Safety ❑	Welding Safety ❑
Lock Out Tag Out ❑	Job Hazard Analysis ❑	Process Safety ❑	Fire Prevention ❑

TYPE RESCUE

❑ **Entry Rescue**	❑ **Non-Entry Rescue**	❑ **Other:**
❑ **Vertical Extraction**	❑ **Horizontal Extraction**	❑ **Other:**

RESCUE ASSESSMENT

PRE-ASSESSMENT FOR RESCUE:	
1. Has the space been previously assessed for rescue requirements?	❑ **YES** ❑ **NO**
2. Have written extraction procedures for the specific space been developed?	❑ **YES** ❑ **NO**
3. Have available extraction procedures been reviewed and updated?	❑ **YES** ❑ **NO**
4. Do local emergency responders have copies of the extraction procedures?	❑ **YES** ❑ **NO**
EMERGENCY RESCUE NOTIFICATION:	
1. Were emergency notification procedure used properly?	❑ **YES** ❑ **NO**
2. Was an initial situation briefing given in a timely manner to rescuers?	❑ **YES** ❑ **NO**
3. Were emergency rescue personnel notified in a timely manner?	❑ **YES** ❑ **NO**
4. Did rescue personnel arrive in a timely manner?	❑ **YES** ❑ **NO**
5. Where emergency rescue personnel notified of entry time upon arrival?	❑ **YES** ❑ **NO**
PROCEDURES:	
1. Were written notification procedures consulted and followed?	❑ **YES** ❑ **NO**
2. Were written extraction procedures consulted and followed?	❑ **YES** ❑ **NO**
3. Was a "worst case scenario" considered and planned for?	❑ **YES** ❑ **NO**
4. Were "backup" emergency response personnel considered and planned for?	❑ **YES** ❑ **NO**
5. Were pre-assessment procedures used to develop a rescue strategy?	❑ **YES** ❑ **NO**
EQUIPMENT:	
1. Was pre-assessed emergency extraction equipment inspected and serviceable?	❑ **YES** ❑ **NO**
2. Was atmospheric testing equipment available, properly calibrated and inspected?	❑ **YES** ❑ **NO**
3. Was atmospheric testing equipment maintained ready for immediate use?	❑ **YES** ❑ **NO**
4. Was respiratory protection equipment serviceable & ready for immediate use?	❑ **YES** ❑ **NO**
5. Was communication equipment available, serviceable & ready for immediate use?	❑ **YES** ❑ **NO**
6. Was fall protection equipment available, serviceable & ready for immediate use?	❑ **YES** ❑ **NO**
7. Was ventilation equipment available, serviceable & ready for immediate use?	❑ **YES** ❑ **NO**
8. Were the required extraction tools available, serviceable & ready for immediate use?	❑ **YES** ❑ **NO**
FIRST AID AND MEDICAL REQUIREMENTS:	
1. Were "inside" emergency first aid requirements considered & prepared for?	❑ **YES** ❑ **NO**
2. Were "outside" emergency medical services considered and notified?	❑ **YES** ❑ **NO**
3. Were special needs of the patient assessed and planned for?	❑ **YES** ❑ **NO**

EXTRACTION PREPARATION:	
1. Was an initial extraction assessment conducted for this rescue?	❑ YES ❑ NO
2. Were extraction problems identified & solutions solicited from the team?	❑ YES ❑ NO
3. Were extraction team members identified & briefed on their responsibilities?	❑ YES ❑ NO
4. Was the "sense of urgency" appropriate for the rescue conditions?	❑ YES ❑ NO
5. Were team members familiar with their assigned duties?	❑ YES ❑ NO
6. Did team members execute their assigned duties in a professional manner?	❑ YES ❑ NO
EXTRACTION EXECUTION:	
1. Was an initial extraction assessment conducted?	❑ YES ❑ NO
2. Were extraction problems identified & solutions solicited from the team?	❑ YES ❑ NO
3. Were pre-assessment extraction procedures used to develop the extraction plan?	❑ YES ❑ NO
DECONTAMINATION REQUIREMENTS:	
1. Were potential contaminants on the victim considered?	❑ YES ❑ NO
2. Were pre-assessments available to identify possible expected types of contaminants?	❑ YES ❑ NO
3. Were decontamination requirements considered and prepared for?	❑ YES ❑ NO
4. Were skin and clothing decontamination possibilities considered and prepared for?	❑ YES ❑ NO
5. Were decontaminants for acids, bases, organics etc., available?	❑ YES ❑ NO
POST-EXTRACTION ASSESSMENT:	
1. Were post-extraction requirements adequately planned for?	❑ YES ❑ NO
2. Was communication maintained continuously, or as required with medical personnel?	❑ YES ❑ NO
3. Was the local medical facility kept abreast of the situation during the extraction?	❑ YES ❑ NO
4. Was a response pathway cleared for emergency response personnel and vehicles?	❑ YES ❑ NO
5. Were "outside" life support requirements passed on to emergency medical personnel?	❑ YES ❑ NO
6. Was the parking lot cleared in the event aero-medical evacuation was required?	❑ YES ❑ NO

LESSONS LEARNED:
1.
2.
3.
4.
5.

CERTIFICATION:

I certify that I have conducted a rescue assessment of the above designated space. To the best of my knowledge the information contained herein is true and accurate as of the time of the assessment.

Name:	**Title:**		
Signature:	**Date:**	**Time:**	❑ am ❑ pm
Further Detailed On Attachment(s) ❑ Yes ❑ No	**Lessons Learned Attached** ❑ Yes ❑ No		

ASSESSMENT FORM RETENTION INFORMATION

Permanent Retention File:			
File Location:	**Date Filed:**	**Time:**	❑ am ❑ pm

DATE: 01 August 2010

SUBJECT: Crane Safety Program

REGULATORY STANDARDS: OSHA - 29 CFR 1910.179 - Overhead and Gantry Cranes
OSHA - 29 CFR 1926.550 - Cranes and Derricks
OSHA - 29 CFR 1903.1 (The General Duty Clause)
CMAA - Spec. No. 70 and 74 Crane Operator's Manual
ANSI - ANSI/ASME
B-30 series Cranes, Derricks, Hoists,
B- 30.2 Overhead And Gantry Cranes (Top Running Hoist)
B- 30.10 Hooks
B- 30.11 Monorail And Underhung Cranes
B- 30.16 Overhead Hoists (Underhung)
B- 30.17 Overhead & Gantry Cranes (Underhung Hoists)
B- 30.18 Stacker Cranes
B- 30.21 Manually Lever Operated Hoists

PCSI Crane Safety Program

1. Written Program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur to regulatory standards that prompt revision of this document, or when jobsite operational changes occur that require a revision of this document. Effective implementation of this program requires support from all levels of management within PCSI. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. General Requirements. PCSI will establish crane safety operational procedures through the use of this document. This standard practice instruction applies to cranes used in conjunction with other material handling equipment for the movement of material. The types of cranes covered are:

2.1 All cranes, forklifts and other lifting devises that will be used to accomplish work on all projects.

3. Initial Training. Training shall be conducted prior to job assignment. PCSI shall provide training to ensure that the purpose, function, and proper use of cranes is understood by employees and that the knowledge and skills required for the safe application, and usage is acquired by employees. This standard practice instruction

shall be provided to, and read by all employees receiving training. The training shall include, as a minimum the following:

3.1 Preoperational inspection requirements of the crane to be used.

3.2 Specific operational requirements of the crane to be used.

3.3 Principals of crane operations.

3.4 Recognition of applicable hazards associated with the work to be completed.

3.5 Load determination and balancing requirements.

3.6 Procedures for removal of a crane from service.

3.7 All other employees whose work operations are or may be in an area where cranes may be utilized, shall be instructed to an awareness level concerning hazards associated with cranes.

3.8 Physical and mental requirements of operators. Operators will meet as a minimum, the following requirements before being certified to operate cranes.

- Be drug and alcohol free during any lifting event.
- Be thoroughly trained in all facets of the required lift.
- Have a mature and safe attitude at all times.
- Have good depth perception (essential for load spotting).
- Have good hearing and vision (corrected or uncorrected).
- Have no history of unsafe acts in the workplace.
- Have the ability to react quickly in an emergency.
- Take no medication that will interfere with the operation.
- Understand the requirements for all phases of the lift.

3.8 Certification. PCSI shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

4. Refresher Training. This standard practice instruction shall be provided to, and read by all employees receiving refresher training. The training content shall be identical to initial training. Refresher training will be conducted on an as needed basis or when the following conditions are met, which ever event occurs sooner.

4.1 Retraining shall be provided for all authorized and affected employees whenever (and prior to) there being a change in their job assignments, a change in the type of crane used, equipment being lifted, lifting procedures, or when a known hazard is added to the lifting environment.

4.2 Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever PCSI has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of crane procedures.

4.3 The retraining shall reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

4.4 Certification. PCSI shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

5. Safe Operating Practices for Operators. Whenever any crane is used, the following safe practices (as a minimum) shall be observed:

1. Always check warning devices and signals before use.
2. Always document and maintain inspection records.
3. Always ensure cranes shall not be loaded in excess of their rated capacities.
4. Always ensure the new location support the weight?
5. Always keep employees clear of loads about to be lifted and suspended loads.
6. Always keep suspended loads clear of all obstructions.
7. Always lockout before maintenance or repairing cranes.
8. Always position the hook directly over the load before lifting.
9. Always test brakes by a short lift to ensure control.
10. Before being lifted, loads will be checked for proper balance.
11. Follow the manufacturer’s recommendations.
12. Frequently inspect cranes exposed to adverse conditions.
13. Hands must not be placed between the suspension means and the load during lifting.
14. Know where you’re going to set the load down!
15. Know your travel path in advance of the lift!
16. Loads will in all cases be properly balanced to prevent slippage.
17. Move loads only after being signaled by the designated, qualified signaler.
18. Never allow riders on loads or hooks.
19. Never allow unauthorized persons to operate cranes.
20. Never attempt to operate a crane or hoist that is suspected to be unsafe.
21. Never carry loads over workers.
22. Never carry loads past workers (they must yield right of way).
23. Never use a cranes that are damaged or defective in any way.
24. Operators must watch the signalers.
25. Shock loading is prohibited.
26. Signalers must keep line-of-sight with the operator.
27. Signalers must watch the load.

28. Test all hoist controls and brakes at the beginning of each shift.

6. Safe Operating Practices for Signalers. Whenever any crane is used, the following safe practices (as a minimum) shall be observed:

1. Ensure that only one person is the designated signaler.
2. Ensure the operator acknowledges every signal.
3. Follow the manufacturer's recommendations.
4. Know the new location will support the weight.
5. Maintain line-of-sight with the operator.
6. Operators must watch the signalers.
7. Plan in advance where the load is going!
8. Stop the operation any time comprehension is lost.

7. Leaving or Parking Hoists or Cranes. Whenever leaving or parking hoists or cranes, the following safe practices (as a minimum) shall be observed:

1. Follow the manufacturer's recommendations.
2. Make a visual check for any dangerous condition.
3. Place all controls in the "off" position.
4. Place main power switch in the "off" position.
5. Raise all hooks to - but not through - limit switches.
6. Report all cranes that are not in operation immediately.
7. Report any defects immediately.
8. Tag out defective equipment immediately.

8. Handling Sling Loads. The following general safe practices (as a minimum) shall be observed when handling slung loads:

1. Always keep hands and fingers clear of untensioned loads.
2. Always keep suspended loads clear of all obstructions.
3. Always keep suspended loads clear of employees.
4. Always pad or protect slings from sharp edges of the load.
5. Always think before you affect a load.
6. Determine the history of the care and usage of the sling.
7. Determine the number of sling legs (if used) and load requirements.
8. Ensure you know rated capacity of the sling.
9. Ensure you know the angle the sling makes with the horizontal line.
10. Ensure you know the size, weight, and center of gravity of the load.
11. Follow the manufacturer's recommendations.
12. Never load in excess of the rated capacity.
13. Never pull a sling from a suspended load under tension.
14. Never shorten with knots, bolts or other makeshift devices.
15. Never use a sling that is damaged in any way.

9. Estimating the Weight of Loads. Lifting will not be conducted until load weights have been determined. When estimating load weights operators will stay within 50% of the cranes rated capacity when estimating loads (or manufacturer recommendation). Never attempt a load lift based solely on a guess! The following methods may be used to estimate the weight of loads.

1. Check equipment nomenclature plates.
2. Check shipping papers.
3. Consult with the equipment manufacturer.
4. Estimate weight using weights of similar loads.
5. Use a dynamometer.
6. Use industry standard tables or charts.

10. Personal Protective Equipment. Supervisor will ensure that a Job Hazard Analysis is conducted for specific lifting operations. Operators will use the required PPE in the conduct of lifting operations. Protective clothing and equipment considerations:

1. Ensure PPE is appropriate for the particular hazard(s).
2. Ensure PPE is kept clean, fully functional, and sanitary.
3. Maintained all PPE in good condition..
4. Properly store PPE when not in use.

11. Crane Inspections. Where not other wise delineated, crane inspections will be conducted in accordance with this section.

11.1 Inspection intervals.

11.2.1 Daily inspections. Cranes will be inspected each day before being used, the crane will inspected in accordance with OSHA, Consensus Standards, and Manufacturer recommendations.

11.2.2 Periodic inspections. Supervisors will determine and schedule additional inspections periodically during crane use, where service conditions warrant. A thorough periodic inspection shall be made on a regular basis, to be determined on the basis of, frequency of crane use; severity of service conditions; nature of lifts being made; experience gained on the service life of cranes used in similar circumstances, and OSHA, Consensus Standards, and Manufacturer recommendations.

11.2.3 Scheduled inspections. PCSI will coordinate inspection dates and times with all assigned crane inspectors. The inspections will be conducted on a as needed basis. Such inspections shall in no event be at intervals greater than once every 12 months.

11.3 Inspection documentation. Cranes inspections will be documented as having been inspected. Scheduled inspections will be documented as having been conducted.

1. Identify items that were inspected.
2. Show the status of the inspected items.
3. Provide the signature of the inspector.
4. Show the date.
5. File it and maintain it!
6. Review the manufacturers specific inspection requirements!

11.4 Inspection documentation storage. Inspection records and certifications shall be maintained on the jobsite.

11.5 Damaged/unserviceable Cranes. Cranes found to be damaged or unserviceable will be immediately removed from service.

12. Daily Checks. The following items (as a minimum) shall be checked prior to use of any crane:

1. Check for air or hydraulic fluid leakage.
2. Check for load capacity stenciling on both sides of unit.
3. Check for twisted, broken or kinked cables or chains.
4. Check the operation of the crane; controls & movement.
5. Inspect for deformed, cracked, or stretched hooks.
6. Inspect for serviceable safety latches.
7. Observe correct drum spooling as the hook is raised.
8. Operate empty hook till it actuates the upper limit switch.
9. Operate hoist and trolley brakes, ensure no excessive coasting.
10. Visually inspect all units for integrity, leaks etc.
11. Review the manufacturers specific requirements!

13. Monthly Checks. The following items (as a minimum) shall be checked monthly:

1. Follow any additional recommendations of the manufacturer.
2. Inspect for twisted, broken or kinked cables or chains.
3. Inspect hooks for cracks, missing or broken parts.
4. Measure hooks for deformation or stretching.
5. Measure lifting chains for excessive stretch, twisting etc.
6. Review the manufacturers specific inspection requirements!
7. Visually inspect all critical items.
8. Review the manufacturers specific requirements!

14. Periodic Checks. Review the manufacturers specific inspection requirements! The following items (as a minimum) shall be checked at periodic inspections (1 to 12 month intervals):

1. Interval dependent on the type of activity performed.
2. Interval dependent on the severity of service.
3. Interval dependent on the environmental conditions.
4. As a minimum the inspection should cover:

Chain Or Cable	Reeving	Hook Condition
ElectrificationHoist	Drives	Travel Drives
Brakes	Limit Switches	Couplings
Rails	Balance	Controls
Warning Devices	End Stops	Signage

15. Periodic CMAA Inspection Recommendations:

Class	Description	Typical Schedule
A	Standby or infrequent service	Annually
B	Light service - 2-5 lifts hr.	Annually
C	moderate service - 50% capacity, 5-10 lifts hr.	Annually
D	Heavy service - 50% capacity, 10-20 lifts hr.	Semiannually
E	Severe service - near capacity, 20+ lifts hr.	Quarterly
F	Continuous severe service - near capacity and continuous service throughout day	Bi-monthly

Note: Different conditions may suggest different intervals.

16. New, Idle, Altered, Used Cranes: The use status of cranes will drive specific requirements for periodic maintenance and servicing. The status of the crane will be determined based on manufacturer recommendations and consultation with specific regulatory standards. Prior to initial or reintroduction into service cranes will be tested and inspected completely using the criteria applicable to periodic inspections. A report will be generated and kept on file for future reference. The manufacturers specific requirements will be reviewed!

17. Preventive Maintenance: Preventative maintenance procedures will be developed and used for specific cranes. Maintenance procedures will be determined on the basis of, frequency of crane use; severity of service conditions; nature of lifts being made; experience gained on the service life of cranes used in similar circumstances, and OSHA, Consensus Standards, and Manufacturer recommendations. Typical requirements include:

1. Adjusting the brakes.
2. Adjusting the operation of limit switches.
3. Checking and filling the gear cases to the proper levels.
4. Cleaning and lubricating the wire rope (cable) and load chain.
5. Cleaning or replacing pitted or burned electrical contacts.
6. Cleaning or replacing the air and fluid filters.
7. Inspecting the operation of all controls and warning systems.

8. Lubricating the bearings, gears, pinions, linkages, shafts, etc.
9. Replacing any contaminated oils.

18. Preoperational Testing Requirements: Preoperational tests will be conducted prior to use of any crane. Testing requirements will be determined on the basis of, frequency of crane use; severity of service conditions; nature of lifts being made; experience gained on the service life of cranes used in similar circumstances, and OSHA, Consensus Standards, and Manufacturer recommendations. Typical requirements include:

Preoperational Tests - General:

1. Check for obstructions in the travel path of the crane.
2. Check upper and lower limit switches.
3. Ensure all emergency disconnects are known before any test.
4. Ensure that the manufacturers recommendations are followed.
5. If you have a checklist - follow it!
6. If you're not familiar with the cranes' operation get help.
7. Inspect all electrical controls for proper operation.
8. Never unwind the spool completely!
9. Observe for smooth operation of the components.
10. Test all controls to determine proper operation.

Preoperational Tests - Hooks:

1. Replace if deformation or cracks are found.
2. Check for proper function of the safety latch.
3. Inspect for twists from the plane of the unbent hook.
4. Check for proper swivel.
5. Hook repair is generally not recommended.
6. Emergency hook repair must be performed only under competent supervision.
7. After any hook repairs, the hook must be load tested before being returned to normal service.

Preoperational Tests - Rope:

1. Broken or worn outside wires.
2. Corroded or broken wires at end of connections.
3. Corroded, cracked, bent, worn, or improperly applied end connections.
4. Reduction in rope diameter (replace if found).
5. Severe kinking, crushing, cutting or unstranding.

19. Lockout Tagout Considerations: Lockout Tagout will be conducted when maintenance or servicing is performed on any crane. Lockout requirements will be

determined on the basis of, OSHA, Consensus Standards, and Manufacturer recommendations. Typical requirements include:

1. Review requirements for the individual crane.
2. Integrate lock out and maintenance requirements.
3. Ensure training in adequate for level of maintenance.
4. Ensure written programs are established and reviewed.
5. Carefully select lockout devices, ask the manufacturer for recommendations.
6. Do not necessarily assume devices are interchangeable between different types of cranes.

DATE: 01 August 2009

SUBJECT: Electrical Safety-Related Work Practices Program

REGULATORY STANDARD: OSHA - 29 CFR 1926.400-449

PCSI
Electrical Safety-Related Work Practices Program

1. Written Program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur to 29 CFR 1926.400-449, that prompt revision of this document, or when jobsite operational changes occur that require a revision of this document. Effective implementation of this program requires support from all levels of management within this company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. Jobsite/Location Evaluation. PCSI shall evaluate our jobsite(s) by location to determine where high risk from electrical hazards exist. Jobs/areas that present such risks will meet the criteria for designation as an electrical hazard area.

2.1 Employee notification. PCSI shall inform exposed employees, by posting danger signs, conducting awareness training, or by any other equally effective means, of the existence and location of and the danger posed by electrical hazard areas. A sign reading "DANGER ELECTRICAL HAZARD, AUTHORIZED PERSONNEL ONLY" or similar language in accordance with 29 CFR 1926.400-449 will be used to satisfy the requirement for untrained employee/visitor notification.

2.2 High risk electrical hazard jobs/areas.

High Risk Electrical Hazard Jobs/Areas Listing

Location	Area/Job	Date Evaluated

(Continue listing as needed)

2.3 Alerting techniques. The following alerting techniques shall be used to warn and protect employees from hazards which could cause injury due to electric shock, burns, or failure of electric equipment parts:

2.3.1 Safety signs and tags. Safety signs, safety symbols, or accident prevention tags shall be used where necessary to warn employees about electrical hazards which may endanger them, as required by 29 CFR 1910.145.

2.3.2 Barricades. Barricades shall be used in conjunction with safety signs where it is necessary to prevent or limit employee access to work areas exposing employees to uninsulated energized conductors or circuit parts. Conductive barricades may not be used where they might cause an electrical contact hazard.

2.3.3 Attendants. If signs and barricades do not provide sufficient warning and protection from electrical hazards, an attendant shall be stationed to warn and protect employees.

3. General. This standard practice instruction will cover work by both qualified and unqualified persons. The provisions of 29 CFR 1910.331 through 1910.335 will be detailed to cover electrical safety-related work practices for both qualified persons (those who have training in avoiding the electrical hazards of working on or near exposed energized parts) and unqualified persons (those with little or no such training) working on, near, or with the following installations:

3.1 Premises wiring. Installations of electric conductors and equipment within or on buildings or other structures, and on other premises such as yards, carnival, parking, and other lots, and industrial substations.

3.2 Wiring for connection to supply. Installations of conductors that connect to the supply of electricity.

3.3 Other wiring. Installations of other outside conductors on the premises.

3.4 Optical fiber cable. Installations of optical fiber cable where such installations are made along with electric conductors.

3.5 General electrical safety work practices by PCSI employees.

4. Training.

4.1 Employees to be trained. Once an evaluation of jobs and areas of our jobsite is performed. Training will be conducted for employees who face a risk of electric shock that is not reduced to a safe level by the existing source.
4.2 High risk occupations. Employees in occupations listed in Table S-4 (29 CFR 1910.332) face such a risk and are required to be trained. Other employees who also may reasonably be expected to face a comparable risk of injury due to electric shock or other electrical hazards must also be trained. These employees

will be identified based upon their job title and or area(s) of the jobsite they are exposed to. The jobsite evaluation data referenced in section 2 of this SPI will be used to develop a personnel training listing by job and hazard area(s) exposure.

Table S-4 (29 CFR 1910.332)
Typical Occupational Categories of Employees
Facing a Higher Than Normal Risk of Electrical Accident

OCCUPATION

First line supervisors.
Equipment and machine operators.
Material handling equipment operators.
Mechanics and repairers.
Riggers
Welders.

NOTE: Workers in the above listed groups do not need to be trained if their work or the work of those they supervise does not bring them or the employees they supervise close enough to exposed parts of electric circuits operating at 50 volts or more to ground for a hazard to exist.

4.3 Content of training.

4.3.1 General electrical safety policy. The Safety Manager will develop a jobsite wide electrical policy that details this company's' general electrical safety policy.

4.3.2 Employee job specific training (unqualified). Employees who are classified as "unqualified" (i.e., those not permitted to work on or near exposed energized parts) persons shall also be trained in and familiar with any electrically related safety practices inherent to their jobs which are necessary for their safety. First line supervisors in coordination with the Maintenance Manager (where required) will develop a training outline detailing the electrical hazards associated with a work area or job when an initial evaluation reveals a risk of electrocution.

4.3.3 Employee job specific training (qualified). Employees who are classified as "qualified" (i.e., those permitted to work on or near exposed energized parts) persons shall be trained in and familiar with the safety-related work practices that pertain to their respective job assignments. First line supervisors in coordination with the Maintenance Manager (where required) will develop a training outline detailing the electrical hazards associated with a work area or job when an initial evaluation reveals a risk of electrocution. Qualified persons (i.e., those permitted to

work on or near exposed energized parts) shall, at a minimum, be trained in and familiar with the following:

4.3.3.1 The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.

4.3.3.2 The skills and techniques necessary to determine the nominal voltage of exposed live parts, and

4.3.3.3 The clearance distances specified in 29 CFR 1910.333(c) and the corresponding voltages to which the qualified person will be exposed.

NOTE 1: For the purposes of this plan, Employee's must have the training required by the definition of a "qualified person" detailed above in order to be considered a qualified person.

NOTE 2: Qualified persons whose work on energized equipment involves either direct contact or contact by means of tools or materials must also have the training needed for safe exposure to energized part (see below).

4.4 Type of training. The training required by this procedure shall be of the classroom or on-the-job type. The degree of training provided shall be determined by the evaluated risk to the employee.

4.4.1 Initial Training. PCSI shall provide training to ensure that the electrical hazards associated with their job are understood by employees and that the knowledge and skills required for the safe application, usage, of work place equipment, and removal of the energy controls are acquired by employees. The training shall include the following:

4.4.1.1 Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

4.4.1.2 Each affected employee shall be instructed in the purpose and use of the energy control procedure.

4.4.1.3 All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out. Tags are essentially warning devices affixed to energy isolating devices, and do not provide the

physical restraint on those devices that is provided by a lock. Non-legible or missing tags will be reported to the foreman immediately.

4.5 Refresher Training.

4.5.1 Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, when their work takes them into hazardous areas, or when there is a change in the energy control procedures.

4.5.2 Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever PCSI has reason to believe, that there are deviations from or inadequacies in the employee's knowledge of known hazards, or use of the energy control procedures.

4.5.3 The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

4.6 Certification. PCSI shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

5. Selection and use of work practices. Supervisors shall develop and ensure use of standardized safety-related work practices to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts. This will be accomplished whenever work is performed near or on equipment or circuits which are or may be energized. The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

5.1 Deenergized parts. Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them, unless it can be demonstrate that deenergizing introduces additional or increased hazards or is unfeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

NOTE 1: Examples of increased or additional hazards include interruption of life support equipment, deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, or removal of illumination for an area.

NOTE 2: Examples of work that may be performed on or near energized circuit parts because of unfeasibility due to equipment design or operational limitations include testing of electric circuits that can only be performed with the circuit energized and work on circuits that form an integral part of a continuous industrial process in a chemical

plant that would otherwise need to be completely shut down in order to permit work on one circuit or piece of equipment.

5.2 Lockout and tagging. While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both in accordance with the requirements of this company's lock-out/tag-out procedures program. Deenergized parts for which lock-out/tag-out has not completed shall be treated as Energized parts.

5.3 Energized parts. If the exposed live parts are not deenergized (i.e., for reasons of increased or additional hazards or unfeasibility), supervisors will ensure that other safety-related work practices are used to protect employees who may be exposed to the electrical hazards involved. Such work practices shall protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors, circuit parts, or materials. Only qualified company employees may work on electric circuit parts or equipment that have not been deenergized.

5.4 PCSI personnel. Our personnel will be notified that they may be required to provide proof of certification for working on energized circuits, and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

5.5 Overhead lines. If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before work is started. If the lines are to be deenergized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to deenergize and ground them. If protective measures, such as guarding, isolating, or insulating are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment. Unqualified persons are prohibited from performing this type of work.

5.5.1 Unqualified employees (elevated). When an unqualified employee is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

5.5.1.1 For voltages to ground 50kV or below--10 ft. (305 cm)
5.5.1.2 For voltages to ground over 50kV--10 ft. (305 cm) plus 4 in. (10 cm) for every 10kV over 50kV.

5.5.2 Unqualified employees (ground). Unqualified employees working on the ground in the vicinity of overhead lines, the person may not bring any conductive object closer to unguarded, energized overhead lines than the distances given below.

5.5.2.1 For voltages to ground 50kV or below--10 ft. (305 cm)

5.5.2.2 For voltages to ground over 50kV--10 ft. (305 cm) plus 4 in. (10 cm) for every 10kV over 50kV.

NOTE: For voltages normally encountered with overhead power lines, objects which do not have an insulating rating for the voltage involved are considered to be conductive.

5.5.3 Qualified persons. When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table S-5 (29 CFR 1910.333 unless:

5.5.3.1 The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed).

5.5.3.2 The energized part is insulated both from all other conductive objects at a different potential and from the person.

5.5.3.3 The person is insulated from all conductive objects at a potential different from that of the energized part.

Table S-5 (29 CFR 1910.333)

Approach Distances for Qualified Employees--Alternating Current

Voltage range (phase to phase)	**Minimum approach distance**
300V and less	Avoid contact
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm).
Over 750V, not over 2kV	l ft. 6 in. (46 cm).
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm).
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm).
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm).
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm).
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm).

5.5.4 Vehicular and mechanical equipment.

5.5.4.1 Company vehicles or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. (305 cm) is maintained. If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

5.5.4.1.1 If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. (122 cm). If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10kV over that voltage.

5.5.4.1.2 If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

5.5.4.1.3 If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in Table S-5.

5.5.4.2 Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless:

5.5.4.2.1 The employee is using protective equipment rated for the voltage.

5.5.4.2.2 The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than 10 ft. (305 cm). If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10kV over that voltage.

5.5.4.2.3 If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of

overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

5.6 Illumination.

5.6.1 Supervisors will ensure that employees do not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.

5.6.2 Where lack of illumination or an obstruction precludes observation of the work to be performed, employees may not perform tasks near exposed energized parts. Employees may not reach blindly into areas which may contain energized parts. Additionally, unless known otherwise the space shall be evaluated to determine if it meets the criteria for designation as a confined space. The company confined space program will be implemented to manage the entry.

5.7 Confined or enclosed work spaces. When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, PCSI shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts. Additionally, unless known otherwise the space shall be evaluated to determine if it meets the criteria for designation as a confined space. The company confined space program will be implemented to manage the entry.

5.8 Conductive materials and equipment. Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. Supervisors will ensure pre-written safety procedures are in place, and that all employees are trained when long dimensional conductive objects (such as ducts and pipes) in areas with exposed live parts, are used. Other protective measures (such as the use of insulation, guarding, and material handling techniques) will considered and used to minimize the hazard.

5.9 Portable ladders. Portable ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts.

5.10 Conductive apparel. Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) may not be worn if they might contact

exposed energized parts. However, such articles may be worn if they are rendered nonconductive by covering, wrapping, or other insulating means.

5.11 Housekeeping duties. Where energized parts present an electrical contact hazard, employees may not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided. Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) may not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

5.12 Interlocks. Only a qualified employee may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system shall be returned to its operable condition when this work is completed.

6. Use of equipment.

6.1 Portable electric equipment. This paragraph applies to the use of cord- and plug-connected equipment, including flexible cord sets (extension cords).

6.1.1 Handling. Portable equipment shall be handled in a manner which will not cause damage. Flexible electric cords connected to equipment may not be used for raising or lowering the equipment. Flexible cords may not be fastened with staples or otherwise hung in such a fashion as could damage the outer jacket or insulation.

6.1.2 Visual inspection.

6.1.2.1 Portable cord- and plug-connected equipment and flexible cord sets (extension cords) shall be visually inspected before use on any shift for external defects (such as loose parts, deformed and missing pins, or damage to outer jacket or insulation) and for evidence of possible internal damage (such as pinched or crushed outer jacket). Cord- and plug-connected equipment and flexible cord sets (extension cords) which remain connected once they are put in place and are not exposed to damage need not be visually inspected until they are relocated.

6.1.2.2 If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee may use it until repairs and tests necessary to render the equipment safe have been made.

6.1.2.3 When an attachment plug is to be connected to a receptacle (including any on a cord set), the relationship of the plug and receptacle contacts shall first be checked to ensure that they are of proper mating configurations.

6.1.3 Grounding-type equipment.

6.1.3.1 A flexible cord used with grounding-type equipment shall contain an equipment grounding conductor.

6.1.3.2 Attachment plugs and receptacles may not be connected or altered in a manner which would prevent proper continuity of the equipment grounding conductor at the point where plugs are attached to receptacles. Additionally, these devices may not be altered to allow the grounding pole of a plug to be inserted into slots intended for connection to the current-carrying conductors.

6.1.3.3 Adapters which interrupt the continuity of the equipment grounding connection may not be used.

6.1.4 Conductive work locations. Portable electric equipment and flexible cords used in highly conductive work locations (such as those inundated with water or other conductive liquids), or in job locations where employees are likely to contact water or conductive liquids, shall be approved for those locations.

6.1.5 Connecting attachment plugs.

6.1.5.1 Employees' hands may not be wet when plugging and unplugging flexible cords and cord- and plug-connected equipment, if energized equipment is involved.

6.1.5.2 Energized plug and receptacle connections may be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand (if, for example, a cord connector is wet from being immersed in water).

6.1.5.3 Locking-type connectors shall be properly secured after connection.

6.2 Electric power and lighting circuits.

6.2.1 Routine opening and closing of circuits. Load rated switches, circuit breakers, or other devices specifically designed as disconnecting means shall be used for the opening, reversing, or closing of circuits under load

conditions. Cable connectors not of the load-break type, fuses, terminal lugs, and cable splice connections may not be used for such purposes, except in an emergency.

6.2.2 Reclosing circuits after protective device operation. After a circuit is deenergized by a circuit protective device, the circuit may not be manually reenergized until it has been determined that the equipment and circuit can be safely energized. The repetitive manual reclosing of circuit breakers or reenergizing circuits through replaced fuses is prohibited.

NOTE: When it can be determined from the design of the circuit and the overcurrent devices involved that the automatic operation of a device was caused by an overload rather than a fault condition, no examination of the circuit or connected equipment is needed before the circuit is reenergized.

6.2.3 Overcurrent protection modification. Overcurrent protection of circuits and conductors may not be modified, even on a temporary basis, beyond that allowed by 29 CFR 1910.304(e), the installation safety requirements for overcurrent protection.

6.3 Test instruments and equipment.

6.3.1 Use. Only company qualified persons may perform testing work on electric circuits or equipment.

6.3.2 Visual inspection. Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee may use it until repairs and tests necessary to render the equipment safe have been made.

6.3.3 Rating of equipment. Test instruments and equipment and their accessories shall be rated for the circuits and equipment to which they will be connected and shall be designed for the environment in which they will be used.

6.4 Occasional use of flammable or ignitable materials. Where flammable materials are present only occasionally, electric equipment capable of igniting them shall not be used, unless measures are taken to prevent hazardous conditions from developing. Such materials include, but are not limited to: flammable gases, vapors, or liquids; combustible dust; and ignitable fibers or flyings.

NOTE: Electrical installation requirements for locations where flammable materials are present on a regular basis are contained Safeguards for personnel protection.

7. Safeguards for personnel protection.

7.1 Use of protective equipment.

7.1.1 Personal protective equipment.

7.1.1.1 Employees working in areas where there are potential electrical hazards shall be provided with, and shall use, electrical protective equipment that is appropriate for the specific parts of the body to be protected and for the work to be performed.

NOTE: Personal protective equipment requirements are contained in subpart I of 29 CFR 1910.

7.1.1.2 Protective equipment shall be maintained in a safe, reliable condition and shall be periodically inspected or tested, as required by 29 CFR 1910.137.

7.1.1.3 If the insulating capability of protective equipment may be subject to damage during use, the insulating material shall be protected. (For example, an outer covering of leather is sometimes used for the protection of rubber insulating material.)

7.1.1.4 Employees shall wear nonconductive head protection wherever there is a danger of head injury from electric shock or burns due to contact with exposed energized parts.

7.1.1.5 Employees shall wear protective equipment for the eyes or face wherever there is danger of injury to the eyes or face from electric arcs or flashes or from flying objects resulting from electrical explosion.

7.1.2 General protective equipment and tools.

7.1.2.1 When working near exposed energized conductors or circuit parts, each employee shall use insulated tools or handling equipment if the tools or handling equipment might make contact with such conductors or parts. If the insulating capability of insulated tools or handling equipment is subject to damage, the insulating material shall be protected.

7.1.2.1.1 Fuse handling equipment, insulated for the circuit voltage, shall be used to remove or install fuses when the fuse terminals are energized.

7.1.2.1.2 Ropes and handlines used near exposed energized parts shall be nonconductive.

7.1.2.2 Protective shields, protective barriers, or insulating materials shall be used to protect each employee from shock, burns, or other electrically related injuries while that employee is working near exposed energized parts which might be accidentally contacted or where dangerous electric heating or arcing might occur. When normally enclosed live parts are exposed for maintenance or repair, they shall be guarded to protect unqualified persons from contact with the live parts.

8. Definitions applicable to this standard practice instruction.

Acceptable. An installation or equipment is acceptable to the Assistant Secretary of Labor, and approved within the meaning of this 29 CFR 1910 Subpart S:

- If it is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or

- With respect to an installation or equipment of a kind which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another Federal agency, or by a State, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code and found in compliance with the provisions of the National Electrical Code as applied in this Subpart; or

- With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the Assistant Secretary and his authorized representatives. Refer to 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

Accepted. An installation is "accepted" if it has been inspected and found by a nationally recognized testing laboratory to conform to specified plans or to procedures of applicable codes.

Accessible. (As applied to wiring methods.) Capable of being removed or exposed without damaging the building structure or finish, or not permanently closed in by the structure or finish of the building. (See "concealed" and "exposed.")

Accessible. (As applied to equipment.) Admitting close approach; not guarded by locked doors, elevation, or other effective means. (See "Readily accessible.")

Ampacity. Current-carrying capacity of electric conductors expressed in amperes.

Appliances. Utilization equipment, generally other than industrial, normally built in standardized sizes or types, which is installed or connected as a unit to perform one or more functions such as clothes washing, air conditioning, food mixing, deep frying, etc.

Approved. Acceptable to the authority enforcing 29 CFR 1910 subpart S. The authority enforcing this subpart is the Assistant Secretary of Labor for Occupational Safety and Health. The definition of "acceptable" indicates what is acceptable to the Assistant Secretary of Labor, and therefore approved within the meaning of 29 CFR 1910 Subpart S.

Approved for the purpose. Approved for a specific purpose, environment, or application described in a particular standard requirement. Suitability of equipment or materials for a specific purpose, environment or application may be determined by a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation as part of its listing and labeling program. (See "Labeled" or "Listed.")

Armored cable. Type AC armored cable is a fabricated assembly of insulated conductors in a flexible metallic enclosure.

Askarel. A generic term for a group of nonflammable synthetic chlorinated hydrocarbons used as electrical insulating media. Askarels of various compositional types are used. Under arcing conditions the gases produced, while consisting predominantly of noncombustible hydrogen chloride, can include varying amounts of combustible gases depending upon the askarel type.

Attachment plug (Plug cap) (Cap). A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

Automatic. Self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for example, a change in current strength, pressure, temperature, or mechanical configuration.

Bare conductor. See "Conductor."

Bonding. The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

Bonding jumper. A reliable conductor to assure the required electrical conductivity between metal parts required to be electrically connected.

Branch circuit. The circuit conductors between the final overcurrent device protecting the circuit and the outlet(s).

Building. A structure which stands alone or which is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors.

Cabinet. An enclosure designed either for surface or flush
mounting, and provided with a frame, mat, or trim in which a swinging door or doors are or may be hung.

Cable tray system. A cable tray system is a unit or assembly of units or sections, and associated fittings, made of metal or other noncombustible materials forming a rigid structural system used to support cables.

- Cable tray systems include ladders, troughs, channels, solid bottom trays, and other similar structures.

Cablebus. Cablebus is an approved assembly of insulated conductors with fittings and conductor terminations in a completely enclosed, ventilated, protective metal housing.

Center pivot irrigation machine. A center pivot irrigation machine is a multi-motored irrigation machine which revolves around a central pivot and employs alignment switches or similar devices to control individual motors.

Certified. Equipment is "certified" if it:

- Has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner, or
- Is of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and

- It bears a label, tag, or other record of certification.

Circuit breaker.

- (600 volts nominal, or less). A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without injury to itself when properly applied within its rating.

- (Over 600 volts, nominal). A switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

Class I locations. Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations include the following:

- Class I, Division 1. A Class I, Division 1 location is a location:

  - In which hazardous concentrations of flammable gases or vapors may exist under normal operating conditions; or

  - In which hazardous concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

  - In which breakdown or faulty operation of equipment or processes might release hazardous concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

Note: This classification usually includes locations where volatile flammable liquids or liquefied flammable gases are transferred from one container to another; interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used; locations containing open tanks or vats of volatile flammable liquids; drying rooms or compartments for the evaporation of flammable solvents; locations containing fat and oil extraction equipment using volatile flammable solvents; portions of cleaning and dyeing plants where flammable liquids are used; gas generator rooms and other portions of gas manufacturing plants where flammable gas may escape; inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids; the interiors of refrigerators and freezers in which volatile flammable materials are stored in open, lightly stoppered, or easily ruptured containers; and all other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

- Class I, Division 2. A Class I, Division 2 location is a location:

  - In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or

  - In which hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or

  - That is adjacent to a Class I, Division 1 location, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

Note: This classification usually includes locations where volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location. Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or a liquefied or compressed gases in sealed containers would not normally be considered hazardous unless also subject to other hazardous conditions. Electrical conduits and their associated enclosures separated from process fluids by a single seal or barrier are classed as a Division 2 location if the outside of the conduit and enclosures is a nonhazardous location.

Class II locations. Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

- Class II, Division 1. A Class II, Division 1 location is a location:

  - In which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures; or

  - Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes, or

  - In which combustible dusts of an electrically conductive nature may be present.

Note: This classification may include areas of grain handling and processing plants, starch plants, sugar-pulverizing plants, malting plants, hay-grinding plants, coal pulverizing plants, areas where metal dusts and powders are produced or processed, and other similar locations which contain dust producing machinery and equipment (except where the equipment is dust-tight or vented to the outside). These areas would have combustible dust in the air, under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures. Combustible dusts which are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and woodflour, oil meal from beans and seed, dried hay, and other organic materials which may produce combustible dusts

when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

- Class II, Division 2. A Class II, Division 2 location is a location in which:

  - Combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitable mixtures, and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

  - Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and dust accumulations resulting therefrom may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

Note: This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II Division 1 location, as described above, into which an explosive or ignitable concentration of dust may be put into suspension under abnormal operating conditions.

Class III locations. Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations include the following:

- Class III, Division 1. A Class III, Division 1 location is a location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

Note: Such locations usually include some parts of rayon, cotton, and other textile mills; combustible fiber manufacturing and processing plants; cotton gins and cotton-seed mills; flax-processing plants; clothing manufacturing plants; woodworking plants, and establishments; and industries involving similar hazardous processes or conditions. Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, and other materials of similar nature.

- Class III, Division 2. A Class III, Division 2 location is a location in which easily ignitable fibers are stored or handled, except in process of manufacture.

Collector ring. A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

Concealed. Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. [See "Accessible. (As applied to wiring methods.)"]

Conductor.

- Bare. A conductor having no covering or electrical insulation whatsoever.
- Covered. A conductor encased within material of composition or thickness that is not recognized as electrical insulation.
- Insulated. A conductor encased within material of composition and thickness that is recognized as electrical insulation.

Conduit body. A separate portion of a conduit or tubing system that provides access through a removable cover(s) to the interior of the system at a junction of two or more sections of the system or at a terminal point of the system. Boxes such as FS and FD or larger cast or sheet metal boxes are not classified as conduit bodies.

Controller. A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

Cooking unit, counter-mounted. A cooking appliance designed for mounting in or on a counter and consisting of one or more heating elements, internal wiring, and built-in or separately mountable controls. (See "Oven, wall-mounted.")

Covered conductor. See "Conductor."

Cutout. (Over 600 volts, nominal.) An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link), or may act as the disconnecting blade by the inclusion of a nonfusible member.

Cutout box. An enclosure designed for surface mounting and having swinging doors or covers secured directly to and telescoping with the walls of the box proper. (See "Cabinet.") Damp location. See "Location."

Dead front. Without live parts exposed to a person on the operating side of the equipment.
Device. A unit of an electrical system which is intended to carry but not utilize electric energy.

Dielectric heating. Dielectric heating is the heating of a nominally insulating material due to its own dielectric losses when the material is placed in a varying electric field.

Disconnecting means. A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

Disconnecting (or Isolating) switch. (Over 600 volts, nominal.) A mechanical switching device used for isolating a circuit or equipment from a source of power.

Dry location. See "Location."

Electric sign. A fixed, stationary, or portable self-contained, electrically illuminated utilization equipment with words or symbols designed to convey information or attract attention.

Enclosed. Surrounded by a case, housing, fence or walls which will prevent persons from accidentally contacting energized parts.

Enclosure. The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

Equipment. A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like, used as a part of, or in connection with, an electrical installation. Equipment grounding conductor. See "Grounding conductor, equipment."

Explosion-proof apparatus. Apparatus enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

Exposed. (As applied to live parts.) Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See "Accessible." and "Concealed.")

Exposed. (As applied to wiring methods.) On or attached to the surface or behind panels designed to allow access. [See "Accessible. (As applied to wiring methods.)"]

Exposed. (For the purposes of 29 CFR 1910.308(e), Communications systems.) Where the circuit is in such a position that in case of failure of supports or insulation, contact with another circuit may result.

Externally operable. Capable of being operated without exposing the operator to contact with live parts.

Feeder. All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit overcurrent device.

Fitting. An accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.

Fuse. (Over 600 volts, nominal.) An overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it. A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

Ground. A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

Grounded. Connected to earth or to some conducting body that serves in place of the earth.

Grounded, effectively. (Over 600 volts, nominal.) Permanently connected to earth through a ground connection of sufficiently low impedance and having sufficient ampacity that ground fault current which may occur cannot build up to voltages dangerous to personnel.

Grounded conductor. A system or circuit conductor that is intentionally grounded.

Grounding conductor. A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

Grounding conductor, equipment. The conductor used to connect the non-current-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor and/or the grounding electrode conductor at the service equipment or at the source of a separately derived system.

Grounding electrode conductor. The conductor used to connect the grounding electrode to the equipment grounding conductor and/or to the grounded conductor of the circuit at the service equipment or at the source of a separately derived system.

Ground-fault circuit-interrupter. A device whose function is to interrupt the electric circuit to the load when a fault current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

Guarded. Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

Health care facilities. Buildings or portions of buildings and mobile homes that contain, but are not limited to, hospitals, nursing homes, extended care facilities, clinics, and medical and dental offices, whether fixed or mobile.

Heating equipment. For the purposes of 29 CFR 1910.306(g), the term heating equipment includes any equipment used for heating purposes if heat is generated by induction or dielectric methods.

Hoistway. Any shaftway, hatchway, well hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

Identified. Identified, as used in reference to a conductor or its terminal, means that such conductor or terminal can be readily recognized as grounded.

Induction heating. Induction heating is the heating of a nominally conductive material due to its own I \2\ R losses when the material is placed in a varying electromagnetic field.

Insulated conductor. See Conductor.

Interrupter switch. (Over 600 volts, nominal.) A switch capable of making, carrying, and interrupting specified currents.

Irrigation machine. An irrigation machine is an electrically driven or controlled machine, with one or more motors, not hand portable, and used primarily to transport and distribute water for agricultural purposes.

Isolated. Not readily accessible to persons unless special means for access are used.
Isolated power system. A system comprising an isolating transformer or its equivalent, a line isolation monitor, and its ungrounded circuit conductors.

Labeled. Equipment is labeled if there is attached to it a label, symbol, or other identifying mark of a nationally recognized testing laboratory which, (a) makes periodic inspections of the production of such equipment, and (b) whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner.

Lighting outlet. An outlet intended for the direct connection of a lampholder, a lighting fixture, or a pendant cord terminating in a lampholder.

Line-clearance tree trimming. The pruning, trimming, repairing, maintaining, removing, or clearing of trees or cutting of brush that is within 10 feet (305 cm) of electric supply lines and equipment.

Listed. Equipment is listed if it is of a kind mentioned in a list which, (a) is published by a nationally recognized laboratory which makes periodic inspection of the production of

such equipment, and (b) states such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner.

Location

- **Damp location**. Partially protected locations under canopies, marquees, roofed open porches, and like locations, and interior locations subject to moderate degrees of moisture, such as some basements, some barns, and some cold-storage warehouses.

- **Dry location**. A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.

- **Wet location**. Installations underground or in concrete slabs or masonry in direct contact with the earth, and locations subject to saturation with water or other liquids, such as vehicle-washing areas, and locations exposed to weather and unprotected.

May. If a discretionary right, privilege, or power is conferred, the word "may" is used. If a right, privilege, or power is abridged or if an obligation to abstain from acting is imposed, the word "may" is used with a restrictive "no," "not," or "only." (E.g., no employer may . . . ; an employer may not . . . ; only qualified persons may. . . .)

Medium voltage cable. Type MV medium voltage cable is a single or multiconductor solid dielectric insulated cable rated 2000 volts or higher.

Metal-clad cable. Type MC cable is a factory assembly of one or more conductors, each individually insulated and enclosed in a metallic sheath of interlocking tape, or a smooth or corrugated tube.

Mineral-insulated metal-sheathed cable. Type MI mineral-insulated metal-sheathed cable is a factory assembly of one or more conductors insulated with a highly compressed refractory mineral insulation and enclosed in a liquid tight and gastight continuous copper sheath.

Mobile X-ray. X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled. Nonmetallic-sheathed cable.

Nonmetallic-sheathed cable is a factory assembly of two or more insulated conductors having an outer sheath of moisture resistant, flame-retardant, nonmetallic material. Nonmetallic sheathed cable is manufactured in the following types:

- Type NM. The overall covering has a flame-retardant and moisture-resistant finish.

- Type NMC. The overall covering is flame-retardant, moisture-resistant, fungus-resistant, and corrosion-resistant. Oil (filled) cutout. (Over 600 volts, nominal.) A cutout in which all or part of the fuse support and its fuse link or disconnecting blade are mounted in oil with complete immersion of the contacts and the fusible portion of the conducting element (fuse link), so that arc interruption by severing of the fuse link or by opening of the contacts will occur under oil.

Open wiring on insulators. Open wiring on insulators is an exposed wiring method using cleats, knobs, tubes, and flexible tubing for the protection and support of single insulated conductors run in or on buildings, and not concealed by the building structure.

Outlet. A point on the wiring system at which current is taken to supply utilization equipment.

Outline lighting. An arrangement of incandescent lamps or electric discharge tubing to outline or call attention to certain features such as the shape of a building or the decoration of a window.

Oven, wall-mounted. An oven for cooking purposes designed for mounting in or on a wall or other surface and consisting of one of more heating elements, internal wiring, and built-in or separately mountable controls. (See Cooking unit, counter mounted.)

Overcurrent. Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload (see definition), short circuit, or ground fault. A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Hence the rules for overcurrent protection are specific for particular situations.

Overload. Operation of equipment in excess of normal, full load rating, or of a conductor in excess of rated ampacity which, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload. (See Overcurrent.)

Panelboard. A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. (See Switchboard.)

Permanently installed decorative fountains and reflection pools. Those that are constructed in the ground, on the ground, or in a building in such a manner that the pool cannot be readily disassembled for storage and are served by electrical circuits of any nature. These units are primarily constructed for their aesthetic value and not intended for swimming or wading.

Permanently installed swimming pools, wading and therapeutic pools. Those that are constructed in the ground, on the ground, or in a building in such a manner that the pool cannot be readily disassembled for storage whether or not served by electrical circuits of any nature.

Portable X-ray. X-ray equipment designed to be hand-carried.

Power and control tray cable. Type TC power and control tray cable is a factory assembly of two or more insulated conductors, with or without associated bare or covered grounding conductors under a nonmetallic sheath, approved for installation in cable trays, in raceways, or where supported by a messenger wire.

Power fuse. (Over 600 volts, nominal.) See Fuse.

Power-limited tray cable. Type PLTC nonmetallic-sheathed power limited tray cable is a factory assembly of two or more insulated conductors under a nonmetallic jacket.

Power outlet. An enclosed assembly which may include receptacles, circuit breakers, fuseholders, fused switches, buses and watt-hour meter mounting means; intended to supply and control power to mobile homes, recreational vehicles or boats, or to serve as a means for distributing power required to operate mobile or temporarily installed equipment.

Premises wiring system. That interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all of its associated hardware, fittings, and wiring devices, both permanently and temporarily installed, which extends from the load end of the service drop, or load end of the service lateral conductors to the outlet(s). Such wiring does not include wiring internal to appliances, fixtures, motors, controllers, motor control centers, and similar equipment.

Qualified person. One familiar with the construction and operation of the equipment and the hazards involved.

- Note 1: Whether an employee is considered to be a "qualified person" will depend upon various circumstances in the workplace. It is possible and, in fact, likely for an individual to be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment. (See 29 CFR 1910.332(b)(3) for training requirements that specifically apply to qualified persons.)

- Note 2: An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person is considered to be a qualified person for the performance of those duties.

Raceway. A channel designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this subpart. Raceways may be of metal or insulating material, and the term includes rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquid tight flexible metal conduit, flexible metallic tubing, flexible metal conduit, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways.

Readily accessible. Capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See "Accessible.)

Receptacle. A receptacle is a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

Receptacle outlet. An outlet where one or more receptacles are installed.

Remote-control circuit. Any electric circuit that controls any other circuit through a relay or an equivalent device.

Sealable equipment. Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. The equipment may or may not be operable without opening the enclosure.

Separately derived system. A premises wiring system whose power is derived from generator, transformer, or converter winding and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system.

Service. The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.

Service cable. Service conductors made up in the form of a cable.

Service conductors. The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied.

Service drop. The overhead service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service-entrance conductors at the building or other structure.

Service-entrance cable. Service-entrance cable is a single conductor or multiconductor assembly provided with or without an overall covering, primarily used for services and of the following types:

- **Type SE**, having a flame-retardant, moisture-resistant covering, but not required to have inherent protection against mechanical abuse.

- **Type USE**, recognized for underground use, having a moisture-resistant covering, but not required to have a flame-retardant covering or inherent protection against mechanical abuse. Single-conductor cables having an insulation specifically approved for the purpose do not require an outer covering.

Service-entrance conductors, overhead system. The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.

Service entrance conductors, underground system. The service conductors between the terminals of the service equipment and the point of connection to the service lateral. Where service equipment is located outside the building walls, there may be no service-entrance conductors, or they may be entirely outside the building.

Service equipment. The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply.

Service raceway. The raceway that encloses the service-entrance conductors.

Shielded nonmetallic-sheathed cable. Type SNM, shielded nonmetallic-sheathed cable is a factory assembly of two or more insulated conductors in an extruded core of moisture-resistant, flame-resistant nonmetallic material, covered with an overlapping spiral metal tape and wire shield and jacketed with an extruded moisture-, flame-, oil-, corrosion-, fungus-, and sunlight-resistant nonmetallic material.

Show window. Any window used or designed to be used for the display of goods or advertising material, whether it is fully or partly enclosed or entirely open at the rear and whether or not it has a platform raised higher than the street floor level. Sign. See Electric Sign.

Signaling circuit. Any electric circuit that energizes signaling equipment.

Special permission. The written consent of the authority having jurisdiction.

Storable swimming or wading pool. A pool with a maximum dimension of 15 feet and a maximum wall height of 3 feet and is so constructed that it may be readily disassembled for storage and reassembled to its original integrity.

Switchboard. A large single panel, frame, or assembly of panels which have switches, buses, instruments, overcurrent and other protective devices mounted on the face or back or both. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (See Panelboard.)

Switches.

- **General-use switch**. A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage.

- **General-use snap switch**. A form of general-use switch so constructed that it can be installed in flush device boxes or on outlet box covers, or otherwise used in conjunction with wiring systems recognized by this subpart.

- **Isolating switch**. A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.

- **Motor-circuit switch**. A switch, rated in horsepower, capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.

- **Switching devices**. (Over 600 volts, nominal.) Devices designed to close and/or open one or more electric circuits. Included in this category are circuit breakers, cutouts, disconnecting (or isolating) switches, disconnecting means, interrupter switches, and oil (filled) cutouts.

Transportable X-ray. X-ray equipment installed in a vehicle or that may readily be disassembled for transport in a vehicle. Utilization equipment. Utilization equipment means equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose.

Utilization system. A utilization system is a system which provides electric power and light for employee workplaces, and includes the premises wiring system and utilization equipment.

Ventilated. Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes, or vapors.

Volatile flammable liquid. A flammable liquid having a flash point below 38 degrees C (100 degrees F) or whose temperature is above its flash point.

Voltage (of a circuit). The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

Voltage, nominal. A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240, 480Y/277, 600, etc.). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

Voltage to ground. For grounded circuits, the voltage between the given conductor and that point or conductor of the circuit that is grounded; for ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

Watertight. So constructed that moisture will not enter the enclosure.

Weatherproof. So constructed or protected that exposure to the weather will not interfere with successful operation. Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

Wet location. See Location.

Wireways. Wireways are sheet-metal troughs with hinged or removable covers for housing and protecting electric wires and cable and in which conductors are laid in place after the wireway has been installed as a complete system.

DATE: 01 September 2010

SUBJECT: Personal Protective Equipment

REGULATORY STANDARDS: 29 CFR 1910 Subpart I

PCSI Personal Protective Equipment Program

1. Written program

PCSI will review and evaluate this standard practice instruction on an annual basis, or when jobsite operational changes occur that require revision. Effective implementation of this program requires support from all levels of management within this company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. Purpose

2.1 Personal Protective Equipment (PPE), including protection for eyes, face, head, and extremities, by use of protective clothing, respiratory devices, protective shields and barriers, will be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

3. Scope

3.1 This policy applies to all PCSI employees and their subcontractors at PCSI sites/locations

4. Procedure

4.1 PPE devices alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls and responsible manufacturing practices where these controls are not completely adequate alone to provide protection against all hazards.

4.2 PCSI will provide employees with the proper PPE for use in their specific tasks.

4.3 This PPE includes, but is not limited to, protection for eyes, face, head, respiratory system, hearing, body and extremities.

4.4 PPE will be maintained and stored in accordance with the manufacturer's recommendations.

4.5 All PPE shall meet OSHA standards or other applicable standards/requirements. Where applicable standards do not apply, the PCSI safety director shall be consulted for guidance in PPE selection.

4.6 Where employees provide their own protective equipment, the site supervisor will be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.

5 Hazard Assessment And Selection

5.1 Selection of PPE will be based on PCSI supervision's written assessment of the hazards associated with the job site and the recommendations/requirements by the site owner or general contractor, and specific work permit for the task being conducted. The assement shall include the name(s) of the reviewers, be signed and dated. A copy of the assessment shall be maintained at the job site/location for the duration of the job.

5.2 Prior to the beginning of any job task, PCSI supervision will determine the PPE necessary to safeguard the employees assigned to do the work. When the job task is complicated in nature the PCSI safety director shall be consulted for guidance in PPE selection. In addition, the general contractor or site owner may be consulted for their expertise in determining the proper PPE for the task.

5.3 Company supervision will ensure that the PPE is readily available at the job site and is included on the work permit fior the task being performed, if applicable. The site supervisor is responsible to ensure the required PPE is maintained in a sanitary and reliable condition, and worn by employees assigned to do the work.

5.4 When reviewing the scope of work prior to the commencement of the job, PCSI supervision will assess the hazards associated with the work and its environment. If the assessment indicates the task(s) or hazard(s) may be complicated, this assessment will be discussed with the PCSI site safety representative, general contractor, site owner or PCSI safety director to determine the PPE requirements.

5.5 PPE requirements for the job will at a minimum be verbally communicated to the employees during a pre-job safety meeting prior to the commencement of the job.

5.6 PPE selected will be of the types that will protect the affected employee from the hazards identified in the hazard assessment, fitted to the employee as needed to be effective, and with PPE ordered in various sizes and types to accommodate a variety of individuals who may be assigned work.

5.7 Defective or damaged equipment will not be used. When PPE is removed for disposal it will be tagged as defective or disposed of immediately.

6. Training

6.1 PCSI will provide training to each employee who is required to use PPE.

Each such employee will be trained to know at least the following:

- When & what PPE is necessary;
- How to properly don, doff, adjust, and wear PPE;
- The limitations of the PPE; and
- The proper care, maintenance, useful life and disposal of the PPE.

6.2 Each affected employee will demonstrate an understanding of the training specified above and the ability to use PPE properly before being allowed to perform work requiring the use of PPE.

6.3 When PCSI supervision has reason to believe that any affected employee who has already been trained does not have the understanding and skill required, the employee will be retrained. Circumstances where retraining is required include, but are not limited to, situations where:

- Changes in the workplace render previous training obsolete; or
- Changes in the types of PPE to be used render previous training obsolete; or
- Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.

6.4 Company supervision will verify that each affected employee has received and understood the required training through a written certification that contains the name of each employee trained, the date(s) of training, and that identifies the subject of the certification.

7. Eye and Face Protection

7.1 Eye protection allowed outside of an office area is ANSI-approved (Z.87.1-latest edition) safety glasses with side shields.

7.2 Supervisors and the site owner or general contractor will determine what tasks require other eye protection, such as chemical goggles and face shields.

7.3 Impact-resistant Goggles or safety glasses that can be worn over corrective spectacles without disturbing the adjustment are acceptable.

7.4 All face and eye protection equipment will be kept clean and in good repair.

7.5 Full-face shields are required to be worn over safety glasses with side shields or impact-resistant goggles for grinding, chipping and any other task that may create similar hazards.

7.6 Other requirements as specified by permit shall be followed.

8. Head Protection

8.1 Approved hard hats (ANSI-Z89.1- latest edition) are required when working

in the laydown yard, construction areas, process areas and all other work areas where there is a potential for injury to the head from falling or flying objects.

8.2 Protective helmets designed to reduce electrical shock hazard will be worn by each affected employee when near exposed electrical conductors which could contact the head (ANSI -Z89.2- latest edition). Metal hard hats are strictly prohibited.

9. Hand Protection

9.1 Appropriate hand protection when employee's hands are exposed to hazards such as those from skin absorption of harmful substances, cuts or lacerations, abrasions, punctures, chemical burns, heat or cold burns, electrical contact, etc.

9.2 PCSI supervision will assess the hazards associated with the work and its environment to select appropriate had protection. If the assessment indicates the task(s) or hazard(s) may be complicated, this assessment will be discussed with the PCSI site safety representative, general contractor, site owner or PCSI safety director to determine hand protection requirements.

9.3 All employees should obtain protective gloves suitable for the work they will Perform, as indicated by the hazard assessment, or as indicated by site supervison. Gloves will be worn when required.

9.4 At a minimum cotton or leather work gloves shall be worn while handling materials or objects that may cause cuts or abrasions.

9.5 Other requirements as specified by permit shall be followed.

10. Foot Protection

10.1 Each affected employee will wear protective footwear when working in areas wherethere is a danger of foot injuries due to falling and rolling objects, or objects piercing the sole and where such employee's feet are exposed to electrical hazards.

10.2 Footwear required outside of an office area at work sites/locations is steel-toed shoes.meeting the requirements of ANSI Z41 – latest edition.

11. PPE Assessment Guidelines

11.1 PCSI supervision or safety representative will conduct a walk-through survey of the work site/location to identify potential hazards. The objective is to prepare for an analysis of the hazards in the environment to enable proper selection of protective equipment. Considerations include:

- Sources of motion (i.e., machinery or processes where movement of
- tools, machine elements or particles could exist), or movement of
- personnel that could result in collision with stationary objects;
- Sources of high temperatures that could result in burns, eye injury or

- ignition of protective equipment, etc.;
- Types of chemical exposures;
- Sources of harmful dust;
- Sources of light radiation (i.e., welding, brazing, cutting, furnaces, heat
- treating, high intensity lights, etc.);
- Sources of falling objects or potential for dropping objects;
- Sources of sharp objects which might pierce the feet or cut the hands;
- Sources of rolling or pinching objects which could crush the feet;
- Layout of workplace and location of co-workers; and
- Any electrical hazards.

11.3 In addition, injury/accident data should be reviewed to identify areas of concern.

11.4 Each of the basic hazards should be reviewed and a determination made as to the type, level of risk, and seriousness of potential injury from each of the hazards found in the area. The possibility of exposure to several hazards simultaneously should be considered.

12. Selection and Fit Guidelines

12.1. After completion of the hazard assessment, the general procedure for selection of protective equipment is to select PPE to ensure a level of protection adequated to protect employees from the identified hazards. PPE selection generally requires a high level of experience. In any case where selection is uncertain, consult the PCSI safety director for guidance.

12.2 Fit each affected employee with the protective device and give instructions on care anduse of the PPE, including all warning labels for and limitations of their PPE.

13. Selection Chart Guidelines For Eye and Face Protection

Work outside of office areas, including constructions areas and the yard, require eye protection. The following chart provides general guidance for the proper selection of eye and face protection to protect against hazards associated with the listed operations.

Source	Potential Hazard	PPE
IMPACT - Chipping, grinding machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, and sanding.	Flying fragments, objects, large chips, particles sand, dirt, etc.	Spectacles with side protection goggles, face shields. For severe exposure, use face shield.
HEAT-Furnace operations, pouring, casting, hot dipping, and welding.	Hot sparks Splash from molten metals High temperature exposure	Face shields, goggles, spectacles with side protection For severe exposure

		use face shield. Face shields worn over goggles. Screen face shields, reflective face shields.
CHEMICALS-Acid and chemicals handling, degreasing plating.	Splash Irritating mists	Goggles, eyecup and cover types. For severe exposure, use face shield. Special-purpose goggles.
DUST - Woodworking, buffing, general dusty conditions.	Nuisance dust Particles in eye	Goggles, eyecup and cover types.
LIGHT and/or RADIATION - Welding: Electric arc	Optical radiation	Welding helmets or welding shields. Typical shades: 10-14.
LIGHT and/or RADIATION Welding: Gas	Optical radiation	Welding goggles or welding face shield. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4.
LIGHT and/or RADIATION Cutting, Torch brazing, Torch soldering	Optical radiation	Spectacles or welding face-shield. shades, 1.5-3

14. Selection Guideline For Head Protection

All head protection (hard hats) is designed to provide protection from impact and penetration hazards caused by falling objects. Head protection is also available which provides protection from electric shock and burn. When selecting head protection, knowledge of potential electrical hazards is important. Where falling object hazards are present, helmets must be worn. Some examples include: working below other workers who are using tools and materials which could fall; working around or under conveyor belts which are carrying parts or materials; working below machinery or processes which might cause material or objects to fall; and working on exposed energized conductors.

14.1 Class A helmets, in addition to impact and penetration resistance, provide electrical protection from low-voltage conductors (to 2,200 volts).

14.2 Class B helmets, in addition to impact and penetration resistance, provide electrical protection from high-voltage conductors (to 20,000 volts).

14.3 Class C helmets provide impact and penetration resistance (they are usually made of aluminum which conducts electricity), shall be prohibited on PCSI sites/locations.

15. Selection Guidelines For Foot Protection

15.1 Safety shoes and boots which meet ANSI Z41-(latest edition) provide both

impact and compression protection. Where necessary, safety shoes can be obtained which provide puncture protection. In some work situations, metatarsal protection should be provided, and in other special situations electrical conductive or insulating safety shoes would be appropriate.

15.2 Safety shoes or boots with impact protection would be required for carrying or handling materials such as lumber, metal construction components and parts, or heavy tools -- any of which could be dropped; and for other activities in which objects might fall onto the feet.

15.3 Safety shoes or boots with compression protection would be required for work activities involving skid trucks (manual material handling carts) around bulk rolls (such as felt rolls) and around heavy pipes on a job site, all of which could potentially roll over an employee's feet.

15.4 Safety shoes or boots with puncture protection would be required where sharp objects such as nails, wire, tacks, screws, large staples, scrap metal, etc., could be stepped on by employees causing a foot injury.

16. Selection Guidelines For Hand Protection

16.1 Gloves are often relied upon to prevent cuts, abrasions, burns, and skin contact with chemicals that are capable of causing local or systemic effects following dermal exposure. One glove type will not provide protection against all potential hand hazards, and commonly available glove materials provide only limited protection against many chemicals. Therefore, it is important to select the most appropriate glove for a particular application and to determine how long it can be worn, and whether it can be reused. In any case where selection is uncertain, contact the PCSI safety director for guidance in glove slection.

16.2 It is important to know the performance characteristics of gloves relative to the specific hazard anticipated; e.g., chemical hazards, cut hazards, flame hazards, etc. These performance characteristics are typically provided by the glove manufacturer.

16.3. Before purchasing gloves, documentation should be requested from the manufacturer that the gloves meet the appropriate test standard(s) for the hazard(s) anticipated. Other factors to be considered for glove selection in general include:

- The degree of dexterity required, the duration, frequency, and degree of exposure of the hazard, and the physical stresses that will be applied.
- The toxic properties of the chemical(s) must be determined; in particular, the ability of the chemical to cause local effectson the skin and/or to pass through the skin and cause systemic effects;
- Generally, a "chemical resistant" glove can be used for dry powders if the glove is impervious to the chemical/product;

- For mixtures and formulated products (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest breakthrough time;
- Employees must be able to remove the gloves in such a manner as to prevent skin contamination.

DATE: 01 August 2009

SUBJECT: Fire Prevention

REGULATORY STANDARDS: OSHA - 29 CFR 1926.150-155

PCSI Fire Prevention Program

1. Written program. PCSI will review and evaluate this standard practice instruction on an annual basis, when changes occur to 29 CFR 1926.150-155, or when jobsite operational changes occur that require revision. Effective implementation of this program requires support from all levels of management within this company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. Emergency notification procedures. The following services/agencies will be requested/notified in the event of a fire that cannot be contained through the use of portable fire extinguishers.

2.1 Routine notification/requests for assistance will be made by Jobsite Guards, Company Officers, or the Safety Director. Anyone employee who cannot immediately contact a guard or the Safety Manager should immediately request assistance. This person should begin word-of-mouth evacuation notification then immediately evacuate.

Off-site fire and emergency services.

Dial 911

3. Warning and evacuations systems. At the time of an emergency, employees should know what type of evacuation is necessary and what their role is in carrying out the plan. In some cases where the emergency is very grave, total and immediate evacuation of all employees is necessary. In other emergencies, a partial evacuation of nonessential employees with a delayed evacuation of others may be necessary for continued plant operation. In some cases, only those employees in the immediate area of the fire may be expected to evacuate or move to a safe area such as when a local application fire suppression system discharge employee alarm is sounded. Employees must be sure that they know what is expected of them in all such emergency possibilities which have been planned in order to provide assurance of their safety from fire or other emergency.

4. Evacuation procedures. All employees will adhere to the following schedule for evacuation and relocation.

4.1 Jobsite Evacuation. The complete dispersal of all employees from the work location.

4.2 Jobsite Evacuation. The dispersal of all employees from the appropriate jobsite and surrounding jobsites of the affected area, in the case of a chemical spill, release or other safety and health concerns.

4.2.2 Notification of jobsite only evacuation. Notification of jobsite only evacuation will be accomplished by word of mouth.

4.3 Procedures. In the event the warning system is activated or if you are advised to evacuate the jobsite or jobsite, follow the below listed guidelines. Above all use your common sense.

4.3.1 Panic kills, if you're calm it will help others.

4.3.2 Move quickly in the opposite direction of known hazards towards the nearest unobstructed exit.

4.3.3 Notify co-workers along the way, talk later.

4.3.4 Once outside relocate to the evacuation relocation point: main gate.

4.3.5 Report to your foreman if he/she is present.

4.3.6 Senior employees will begin roll call immediately.

4.3.7 Notify senior management of missing, injured, deceased persons.

4.3.8 Don't forget jobsite visitors.

4.3.9 Refer media representatives to the project manager.

The designation of refuge or safe areas for evacuation should be determined and identified in the plan. In a building divided into fire zones by fire walls, the refuge area may still be within the same building but in a different zone from where the emergency occurs. Exterior refuge or safe areas may include parking lots, open fields or streets which are located away from the site of the emergency and which provide sufficient space to accommodate the employees. Employees should be instructed to move away from the exit discharge doors of the building, and to avoid congregating close to the building where they may hamper emergency operations.

5. Jobsite Evaluation. PCSI will evaluate our jobsite(s) to determine where the potential for fuel and ignition sources is high and where ignition sources are present. When these two components are present the criteria required for designation as an high risk fire hazard area exists.

5.1 Information program. Those areas/jobs meeting the criteria for a high risk fire hazard area or having a known potential to pose a hazard will be designated as high risk fire hazard areas. PCSI will inform exposed employees, by posting

danger signs, conducting awareness training, or by any other equally effective means, of the existence and location of the hazard and the danger posed.

6. Means of Egress. All facilities belonging to this company will meet as a minimum the basic building codes required for safety and health. This section details general fundamental requirements essential to providing a safe means of egress from fire and like emergencies.

7. Portable Fire Suppression Equipment. The requirements of this section apply to the placement, use, maintenance, and testing of portable fire extinguishers provided for the use of employees of PCSI (this section does not apply to extinguishers provided for use on the outside of workplace buildings or structures).

7.1 General requirements. PCSI shall provide portable fire extinguishers and shall mount, locate and identify them so that they are readily accessible to employees without subjecting the employees to possible injury.

7.2 Only approved portable fire extinguishers shall be used to meet the requirements of this section.

7.3 PCSI shall not provide or make available in the workplace portable fire extinguishers using carbon tetrachloride or chlorobromomethane extinguishing agents. Any employee finding such an extinguisher should report the find to the Safety Officer.

7.4 PCSI shall assure that portable fire extinguishers are maintained in a fully charged and operable condition and kept in their designated places at all times except during use.

7.5 Selection and distribution. Portable fire extinguishers shall be provided for employee use and selected and distributed based on the classes of anticipated workplace fires and on the size and degree of hazard which would affect their use.

7.5.1 Class A fires. Class A fires are classed as ordinary combustibles or fibrous material, such as wood, paper, cloth, rubber and some plastics. Portable fire extinguishers for use by employees on Class A fires will be distributed so that the travel distance for employees to any extinguisher is 75 feet (22.9 m) or less.

7.5.2 Class B fires. Class B fires are classed as flammable or combustible liquids such as gasoline, kerosene, paint, paint thinners and propane. Portable fire extinguishers for use by employees on Class B fires will be distributed so that the travel distance from the Class B hazard area to any extinguisher is 50 feet (15.2 m) or less.

7.5.3 Class C fires. Class C fires are classed as energized electrical equipment, such as appliances, switches, panel boxes and power tools.

Portable fire extinguishers for use by employees on Class C fires will be distributed so that the travel distance from the Class C hazard area to any extinguishing agent is 50 feet (15.2 m) or less.

7.5.4 Class D fires. Class D fires are classed as certain combustible metals, such as magnesium, titanium, potassium and sodium. Portable fire extinguishers or other containers of Class D extinguishing agent used by employees will be distributed so that the travel distance from the combustible metal working area to any extinguishing agent is 75 feet (22.9 m) or less.

7.6 Inspection, maintenance and testing. PCSI shall be responsible for the inspection, maintenance and testing of all portable fire extinguishers used by this company.

7.6.1 Monthly inspections. Portable extinguishers or hoses used in lieu thereof will be visually inspected monthly and documented.

7.6.2 Annual maintenance check. Portable fire extinguishers will be subjected to an annual maintenance check and documented.

7.6.2.1 PCSI shall record the annual maintenance date and retain this record for one year after the last entry or the life of the shell, whichever is less.

7.6.3 Hydrostatic testing. PCSI shall assure that hydrostatic testing is performed by trained persons with suitable testing equipment and facilities. Alternate equivalent protection will be provided when portable fire extinguishers are removed from service for maintenance and recharging.

7.6.3.1 Test records. PCSI shall maintain and provide upon request, evidence that the required hydrostatic testing of fire extinguishers has been performed at the time intervals shown in Table 1. Such evidence shall be in the form of a certification record which includes the date of the test, the signature of the person who performed the test and the serial number, or other identifier, of the fire extinguisher that was tested. Such records shall be kept until the extinguisher is hydrostatically retested at the time interval specified in Table 1 or until the extinguisher is taken out of service, whichever comes first.

7.6.4 Dry chemical extinguishers. PCSI shall assure that stored pressure dry chemical extinguishers that require a 12 year hydrostatic test are emptied and subjected to applicable maintenance procedures every 6 years. Dry chemical extinguishers having non-refillable disposable containers are exempt from this requirement. When recharging or

hydrostatic testing is performed, the 6 year requirement begins from that date.

7.6.5 In addition to an external visual examination, an internal examination of cylinders and shells will be made prior to being tested or subjected to hydrostatic tests.

7.6.6 Portable extinguishers will be hydrostatically tested at the intervals listed in Table 1 of this section, except under any of the following conditions:

7.6.6.1 When the unit has been repaired by soldering, welding, brazing, or use of patching compounds.

7.6.6.2 When the cylinder or shell threads are damaged.

7.6.6.3 When there is corrosion that has caused pitting, including corrosion under removable name plate assemblies.

7.6.6.4 When the extinguisher has been burned in a fire.

7.6.6.5 When a calcium chloride extinguishing agent has been used in a stainless steel shell.

Table 1

Type of Extinguishers	Test Interval (years)
Cartridge operated water and/or antifreeze	5
Stored pressure water and/or antifreeze	5
Wetting agent	5
Foam (stainless steel shell)	5
Aqueous Film Forming foam (AFFF)	5
Loaded stream	5
Dry chemical with stainless steel	5
Carbon dioxide	5
Dry chemical, stored pressure, with mild steel, brazed brass or aluminum shells	12
Dry chemical, cartridge or cylinder operated, with mild steel shells	12
Halon 1211	12
Halon 1301	12
Dry powder, cartridge or cylinder operated with mild steel shells	12

7.7 Training and education. Where portable fire extinguishers for employee use are provided in the workplace, PCSI will also provide an educational program to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting.

7.7.1 Training intervals. PCSI shall provide the education upon initial employment and at least annually thereafter.

7.7.2 Company specific training schedule.

8. PCSI fire prevention policy.

8.1 PCSI will ensure that the identity, address and phone number of the public fire jobsite and other emergency units to be summoned in the event of a fire will be posted in strategic locations within their respective jobsites.

8.2 A monthly self-inspection shall be conducted to identify and correct recognizable fire hazards.

8.3 Inspections of fire extinguishers shall be conducted on a monthly basis to identify and correct recognizable fire hazards.

8.4 Safety and fire prevention requirements shall be followed in any required shutdown or impairment of automatic sprinkler protection systems.

8.5 Procedures for a fire permit system shall be established to control flame- or spark-producing equipment.

8.6 Procedures hall be established to control the receipt, storage, handling, and use of flammable liquids. The use of safety cans for handling separate storage of flammables, minimizing concentrations, and proper identification of containers are typical procedures which shall be enforced.

8.7 Regulations shall be established to control smoking in hazardous areas.

8.8 Procedures shall be established for reporting and investigating fire and other incidents.

8.9 The training of selected personnel in the use of fire extinguishers shall be accomplished on a periodic schedule.

8.10 Procedures to accomplish after-hours notification of key personnel when the jobsite is operating at less than normal complement or shutdown shall be maintained and kept current.

8.11 Access of emergency vehicles shall be considered in regard to jobsite layouts. Parking of cars or other obstructions shall be restricted as necessary.

8.12 All personnel will:

8.12.1 Evacuate immediately when told to do so.

8.12.2 Take whatever immediate steps are necessary and feasible to minimize any hazard in leaving the work area unattended.

8.12.3 Not use elevators for evacuation purposes.

8.12.4 Assemble at the main gate, a predetermined safe location for attendance check.

8.12.5 Not reenter building until the "all clear" signal sounds or similar verbal instructions are given by responsible authority.

8.13 Foreman will:

8.13.1 Direct the evacuation of your area and account for personnel.

8.13.2 Advise the responding authority of the situation and warn of potentially hazardous conditions.

9. Locations/Types of Portable Fire Extinguishers.

LOCATIONS/TYPES OF PORTABLE FIRE EXTINGUISHERS

Location	Circle Type Extinguisher	Last Number	Annual Check	Remarks
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____
_____	A B C D H	_____	_____	_____

Class A Fire Extinguishers. Use on ordinary combustibles or fibrous material, such as wood, paper, cloth, rubber and some plastics. Travel distance for employees to any extinguisher is 75 feet (22.9 m) or less.

Class B Fire Extinguishers. Use on flammable or combustible liquids such as gasoline, kerosene, paint, paint thinners and propane. Travel distance from the Class B hazard area to any extinguisher is 50 feet (15.2 m) or less.

Class C Fire Extinguishers. Use on energized electrical equipment, such as appliances, switches, panel boxes and power tools. Travel distance from the Class C hazard area to any extinguishing agent is 50 feet (15.2 m) or less.

Class D Fire Extinguishers. Use on combustible metals, such as magnesium, titanium, potassium and sodium. Travel distance from the combustible metal working area to any extinguishing agent is 75 feet (22.9 m) or less.

H - Indicates hoses system.

DATE: 01 August 2009

SUBJECT: Medical and First Aid Program

REGULATORY STANDARD: OSHA - 29 CFR 1910.151

PCSI Medical and First Aid Program

1. Written Program. PCSI will ensure that first aid care is available at each job site/location prior to initiating work, either by making arrangements with a local provider that is reasonably accessable in terms of time and distance from the job site who can provide first aid treatment, or by providing a trained first aid responder at the location.

PCSI will review and evaluate this standard practice instruction:

- On an annual basis;
- When changes occur to 29 CFR 1910.151, that prompt revision of this document;
- When jobsite operational changes occur that require a revision of this document; and,
- When there is an accident or close-call that relates to this topic.

This written program will be communicated to all affected personnel. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. Jobsite First Aid Response Actions. PCSI will oversee the requirements of this section.

2.1 General Instructions.

2.1.1 Provide first aid care for those injuries ***clearly within your capability*** to handle. All questionable cases should be referred to local emergency care.

2.1.2 Enter all injuries and subsequent treatment or disposition in the first aid log book/computer file.

The following levels of first aid response will be used by PCSI.

2.2 Basic first aid responders. Respond to minor emergencies such as small cuts, abrasions, sprains, strains and non life-threatening emergencies. Any emergency requiring outside emergency services will reported as required in the ***Section 4*** of this document.

2.3 Advanced first aid responders. Respond to minor emergencies such as small cuts, abrasions, sprains, strains and life-threatening emergencies. Any

emergency requiring outside emergency services will reported as required in the ***Section 4*** of this document.

3. Training. PCSI will develop a standardized training format to meet the requirement for medical and first aid response.

3.1 Training shall be provided to each affected employee:

3.1.1 Before the employee is first assigned duties that require him or her to serve as a first aid responder.

3.1.2 Before there is a change in assigned duties.

3.1.3 Whenever there is a change first aid procedures or operations.

3.1.4 When ever PCSI has reason to believe that there are deviations from the first aid response procedures required by this instruction or inadequacies in the employee's knowledge or use of these procedures.

3.2 The training shall establish employee proficiency in the duties required by this instruction and shall introduce new or revised procedures, as necessary, for compliance with this instruction or when future revisions occur.

3.3 PCSI shall certify that the training required by this section has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

3.4 Levels of first aid training.

3.4.1 Basic First Aid. This basic course covers treatment of minor injuries and basic emergency procedures for more serious injuries or health problems.

3.4.2 Advanced First Aid. The advanced course handles first aid for many types of injuries and is under the direction of our local health care provider.

3.4.3 CPR. Cardiopulmonary Resuscitation (CPR).

3.4.4 EMT. Training for Emergency Medical Technicians involves extensive course work off site.

4. Emergency Reporting (Outside Emergency Services - Beyond Basic First Capabilities).

IF YOU'RE NOT SURE OF THE SEVERITY, SEEK OUTSIDE ASSISTANCE

Note: The local 911 system will be used by all employees for the reporting of any emergency requiring the assistance or presence of outside emergency services. In the event 911 is not available see the Crisis Management Plan.

4.1 Summoning outside emergency services. Dial 911 for emergency services.

4.2 Emergency Numbers.

4.2.1 Ambulance: 911

4.2.2 Fire: 911

4.2.3 Police: 911

4.2.4 Hospital: 911

4.3 In-house notification. Immediately dial 803-920-9387 and notify PCSI Safety Director anytime outside emergency services are summoned or medical treatment is provided.

4.4 Directing ambulance services. Post an employee(s) at key points to direct ambulance services to the injured employee's location. A supervisor of PCSI should accompany the person being treated. This person should report back to the foreman and or PCSI Safety Director phone number 803-920-9387, concerning the status of the employee being transported.

5. Emergency Reporting (Inside Emergency Services - Within Basic First Capabilities). Minor injuries, such as cuts, scratches, bruises, and burns that do not require a doctor's treatment, may be handled by one of the jobsite first-aid responders. If the situation escalates and additional or outside emergencies are required refer to Section 4 of this document.

6. First Aid Log of Activities. All injuries or complaints treated by first aid responders will be entered into the log book/computer system (detail site specific actions) located in the Safety Office. As a minimum, the following information will be entered.

6.1 Date and time of injury

6.2 Date and time of treatment

6.3 Name of injured person and clock number

6.4 Name of person rendering first aid

6.5 Nature of injury

6.6 Type of treatment given

6.7 Work or non-work related

6.8 First treatment or follow-up treatment

7. First Aid Kits. First aid kits will be maintained in sufficient locations/numbers at each job site/location so that they are readily available for use by employees and first aid responders. The standard type of first aid kit to be maintained will be for minor emergencies such as minor cuts, scratches, burns and skin abrasions. Where it is unclear as to what type of kit to procure or if other types of injuries may potentially occur, the PCSI Safety Director will be consulted.
At a minimum first aid kits and their contents shall be inspected (and replentished if required) before being placed at a job location/site and weekly thereafter. Records of inspections and stocking shall be maintained.

8. Eyewashes and Deluge Showers. Where the eyes or body of any employee may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. This will include but is not limited to, portable and fixed emergency eyewash stations and deluge showers. Where installed, these facilities will be installed in locations within the work area having ready access and periodically inspected in accordance with local requirements.

8.1 Considerations for installation. The following criteria will be considered when making a determination for installation of eyewashes and deluge showers.

8.1.1 Employee use of personal protective equipment.

8.1.2 Type and chemical concentration of concern.

8.1.3 Special guards and/or precautions intended to provide for employee protection from exposure.

8.1.4 Based upon employee job functions, determine the extent and type of probable employee exposure.

8.2 Personal Protective Equipment. Personal protective equipment for eyes, face, head, and extremities, protective clothing and protective shields and barriers, shall be provided, used and maintained in a sanitary and reliable condition wherever it is necessary by reason of chemical hazards encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

9. Definitions:

First Aid Responder is an employee who has received training in first aid, CPR, and blood-borne pathogens from an accredited instructor. This person would be recognized as being trained at levels 1,2,or 3 by the National Safety Council or American Red Cross. These employees have either volunteered or been assigned to respond to incidents in the facilities that require emergency first aid.

DATE: 01 August 2010

SUBJECT: Bloodborn Pathogens

REGULATORY STANDARD:

29CFR 1910.1030, Occupational Exposure to Blood-borne Pathogens
29 CFR 1910.20, Access to Employee Exposure and Medical Records

PCSI Bloodborn Pathogens Program

1. Scope

This program provides for a uniform policy for protection of Prysmian Construction Services, Inc. (PCSI) personnel who, as part of their job, face reasonably anticipated exposure to blood-borne pathogens and other potentially infectious materials. This procedure applies to all Prysmian employees at US sites who are considered first aid responders. Copies of this procedure shall be available at all job sites.

2. Responsibilities

The responsibility for the application and ongoing update of this procedure lies with the Corporate Environmental Health and Safety Manager and respective project/site manager.
The Corporate HR manager has the responsibility for the maintenance of records relating to annual training required by the standard and records of Hepatitis B shots and any waivers declining vaccination.
The Project Manager will ensure that the annual training is provided and the personal protective equipment required by this procedure is available with the emergency first aid equipment.
Trained First Aid Responders are responsible to follow this policy to protect them selves from Blood-borne Pathogens

3. Definitions

First Aid Responder is an employee who has received training in first aid, CPR, and blood-borne pathogens from an accredited instructor. This person would be recognized as being trained at levels 1,2,or 3 by the National Safety Council or American Red Cross. These employees have either volunteered or been assigned to respond to incidents in the facilities that require emergency first aid.

4. General

It is PCIS's policy that all body fluids should be considered potentially infectious; therefore universal precautions should be taken at all times where body fluids may

potentially be contacted. Personal Protective Equipment shall be provided to first aid responders at no cost.
First Responders will wear safety eyewear and latex or rubber gloves when handling blood, blood products, or administering first aid or any medical procedure where contact with body fluids is a potential.
A Laerdal Pocket mask or other types of ventilation devices shall be used during emergency mouth-to-mouth resuscitation. Such devices should be placed in all first aid kits and first responders trained in their use.
Handwashing facilities or antiseptic wipes shall be available at each work site. Employees shall wash gloved hands before removing contaminated gloves and thoroughly wash hands after removing gloves.
Place all used needles or other sharp instruments in containers designed for sharp instrument disposal (a 'Sharps' container). Any broken glass should be placed in a container with solid walls.
Place all waste contaminated with blood, blood products, or any body fluid in red plastic bags marked with the infectious agent symbol. A bag with contaminated material is to be disposed of by a regulated waste carrier and a record kept of the disposal.
Clean up blood spills immediately with detergent and water. Disinfect contaminated surface with a solution of 1 part household bleach and 10 parts water.
All First Aid Responders will be offered, at no cost, the HBV vaccine and vaccination series. Responders refusing the vaccination will sign a waiver, Hepatitis B Vaccine Declaration Form. (Appendix A)
Following an incident where an employee is exposed to possible contamination and the employee has not been vaccinated, the employee will be offered the HBV vaccine. The vaccine must be given within 24 hours of the incident. Employees refusing the offer will sign the waiver form.
The exposed employee will be offered the opportunity to see a licensed physician for medical examination. If the employee refuses the examination, the employee should sign the HBV/HIV refusal form. (Appendix B)

5. Post-Incident Evaluation

The physician performing the evaluation will be given the following:

- Copy of the Blood-borne Pathogens rule
- Accident/incident Report
- Result of source patient's blood tests, if available.
- Medical records of exposed employee relevant to appropriate treatment, including vaccination status.

The physician shall provide Prysmian with a written opinion within 15 days of the evaluation. The written opinion will address the following only:

- Whether the HBV vaccination series is indicated.
- What further follow up is necessary
- That the employee has been informed of any medical conditions resulting from exposure, which require further treatment.

NOTE: All other medical information shall remain confidential and shall not be included in written opinion.

After consent has been obtained, the source individual's blood shall be tested for HBV & HIV as soon as feasible. Document if the source patient refuses to consent to blood testing. (See appendix C) The testing physician will give results of the testing to the source patient and the exposed employee only. The results will otherwise be kept confidential.

6. Exposure Records Required – 29 CRF 1910.20

Medical records will be kept for employees with occupational exposure. That record shall include:
Name and social security number of the employee.
HBV vaccination records.
Copy of results of medical examinations, testing and follow-up due to an exposure incident.
Copy of information given to healthcare professional's written opinion
Records must be kept for the duration of employment plus 30 years in accordance with 29 CFR 1910.20.
The employer's copy of the healthcare professional's written opinion.
Transfer of records must follow 29 CFR 1910.20.

NOTE: All medical records are to be kept confidential and not disclosed or reported to anyone inside or outside the facility without the written consent of the employee.

7. Training

Training for First Aid Responders shall include the following:

- Copy of the blood-borne pathogens rule and explanation of its contents.
- Explanation of the Exposure Control Plan and how to get a copy.
- Explanation of causes and symptoms of blood-borne diseases.
- What activities may involve exposure to blood or infectious agents.
- Explanation of equipment, work practices, and personal protective measures to prevent or reduce exposure and their limitations.
- Explanation on types, use and disposal of personal protective equipment and why it was selected.
- Information on HBV vaccine.
- Actions to take and persons to contact in an emergency.
- Information on post-emergency follow-up.

Training is to be conducted upon initial assignment and on an annual basis.

Training Records shall include the following:

- Date of the training sessions
- Contents or summaries of the contents.

Name and qualification of instructors.
Names and job titles of all employees attending.

Training records are to be kept 15 years beyond the training date.

Appendix A

HEPATITIS B VACCINE DECLARATION FORM

I, _____, acknowledge that I have been offered the HBV vaccination series as required by law by my employer, Prysmian Construction Services, Inc., _____ at no charge.

I decline the vaccination for the following reasons:

I understand that by declining this vaccine series, I may continue to be at risk of acquiring Hepatitis B, a serious disease. If, in the future I continue to have exposure to blood or other infectious materials and I want to receive the vaccine, my employer, Prysmian Construction Services, Inc. shall provide the vaccination series at no charge.

_____ _____

Witness Employee signature

_____

Employee Social Security Number

_____

Date

Appendix B

HBV/HIV EXPOSURE MEDICAL FOLLOW-UP REFUSAL

I, _____, refuse my employer, Prysmian Construction Services, Inc. offer of a medical examination at no cost to me following exposure to blood, blood products, or body fluids due to an incident occurring on _____.

_____ Witness

_____ Employee Signature

_____ Employee Social Security Number

_____ Date

Appendix C

HBV/HIV BLOOD TESTING CONSENT

I, _____, (do) / (do not) consent to having my blood tested to determine HBV and HIV infectivity. I understand that this blood test is offered by my employer, Prysmian Construction Services, Inc., at no cost to me.

_____ _____

Witness Employee signature

_____

Employee Social Security Number

_____

Date

DATE: 01 August 2010

SUBJECT: Flammable and Combustible Liquids Safety Program

REGULATORY STANDARD: OSHA - 29 CFR 1910.106

PCSI
Flammable and Combustible Liquids Safety Program

1. Written Program. The company will review and evaluate this standard practice instruction:

On an annual basis.
When changes occur to 29 CFR 1910.106, that prompt revision of this document.
When jobsite operational changes occur that require a revision of this document.
When there is an accident or close-call that relates to this topic.

This written program will be communicated to all personnel. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

1.1 Emergency instructions.

1.1.1 Written instructions. All storage and dispensing locations will have detailed written emergency instructions for each location. Each instruction will detail the emergency actions to be taken in the event of fire, spill, leak, power failure, failure of any safety system (including detection/monitoring and ventilation systems) and any other emergency condition affecting the safe operation of the area.

1.1.2 Posting locations. Written emergency instructions will be posted at the entrance to all storage and dispensing location, or in a conspicuous manner in the area.

2. Related Written Programs. The following safety programs/policies relate to this topic. These programs should be read and understood by all personnel affected by this program. Understanding the related programs will allow you to better understand the requirements outlined in this program.

Electrical Safety
Fire Prevention
Forklifts/Powered Industrial Trucks
Hazard Communication
Job Hazard Analysis
Power Tools Safety

Protective Clothing Selection Policy
Protective Clothing/Equipment
Welding and Cutting safety

3. Classes of Flammable and Combustible Liquids. The following information is provided to ensure that users of this document are aware of the classes of flammable and combustible liquids.

3.1 Flammable liquid is defined as any liquid having a flashpoint below 100 deg. F. (37.8 deg. C.), except any mixture having components with flashpoints of 100 deg. F. (37.8 deg. C.) or higher, the total of which make up 99 percent or more of the total volume of the mixture. Flammable liquids are known as Class I liquids. Class I liquids are divided into three classes as follows:

- Class IA includes liquids having flashpoints below 73 deg. F. (22.8 deg. C.) and having a boiling point below 100 deg. F. (37.8 deg. C.).

- Class IB includes liquids having flashpoints below 73 deg. F. (22.8 deg. C.) and having a boiling point at or above 100 deg. F. (37.8 deg. C.).

- Class IC includes liquids having flashpoints at or above 73 deg. F. (22.8 deg. C.) and below 100 deg. F. (37.8 deg. C.).

3.2 Combustible liquid is defined as any liquid having a flashpoint at or above 100 deg. F. (37.8 deg. C.) Combustible liquids are divided into two classes as follows:

- Class II includes liquids with flashpoints at or above 100 deg. F. (37.8 deg. C.) and below 140 deg. F. (60 deg. C.), except any mixture having components with flashpoints of 200 deg. F. (93.3 deg. C.) or higher, the volume of which make up 99 percent or more of the total volume of the mixture.

- Class III includes liquids with flashpoints at or above 140 deg. F. (60 deg. C.) Class III liquids are subdivided into two subclasses:

- Class IIIA includes liquids with flashpoints at or above 140 deg. F. (60 deg. C.) and below 200 deg. F. (93.3 deg. C.), except any mixture having components with flashpoints of 200 deg. F. (93.3 deg. C.), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

- Class IIIB includes liquids with flashpoints at or above 200 deg. F. (93.3 deg. C.). This section does not cover Class IIIB liquids. Where the term "Class III liquids" is used in this section, it must mean only Class IIIA liquids.

4. Jobsite Assessment. All jobsite will be assessed for handling, storage, and use of flammable and combustible liquids. The jobsite assessment process will identify existing hazards and conditions, operations that create hazards, and areas where hazards may develop. This also includes close scrutiny and the tracking of accident records to identify areas that may indicate the development of future workplace hazards.

4.1 The purpose of jobsite assessment, is to recognize, identify, and correct recognized and potential hazards.

4.2 The objective will be to provide a starting point for finding and eliminating those work techniques, and workplace conditions which may be the source of problems. In addition to analyzing current workplace conditions, planned changes to existing and new jobsite, processes, materials, and equipment can be considered to ensure that changes are made to enhance production and reduce or eliminate risk factors. The principles of Industrial Hygiene (Recognition, Evaluation, and Control) apply to jobsite assessments. Jobsite assessment is divided into four main elements:

Gathering information from available sources.
Conducting jobsite surveys to determine handling, use and storage issues.
Performing hazard analyses of those work areas with identified risk factors.
After implementing control measures, conducting periodic surveys to evaluate changes.

4.3 Inspections. PCSI shall conduct a periodic inspection of storage and dispensing locations on a weekly basis to ensure that the requirements of this instruction are being followed.

4.3.1 The periodic inspection shall be performed by an authorized employee other than the ones(s) working in the area being inspected.

4.3.2 Inspections will be conducted by subcontractor personnel authorized to evaluate storage and dispensing locations:

4.3.3 The periodic inspection shall be conducted to identify deviations or inadequacies in the program.

4.3.4 Inspection Report. PCSI shall generate an inspection report detailing the findings of the inspection. The report will be distributed to supervisors and employee's in the chain-of-command of the area being evaluated. The report shall as a minimum identify:

4.3.4.1 The location being inspected.

4.3.4.2 The date of the inspection.

4.3.4.3 The employees included in the inspection.

4.3.4.4 The person performing the inspection.

4.3.4.5 A summary of findings.

4.3.4.6 The date when a follow-up inspection will be conducted.

5. Employee Training.

5.1 All employees whose duties involved them with flammable and combustible liquids will receive annual training applicable to their areas of responsibility.

5.2 Initial Training. PCSI shall provide training to ensure that the purpose and function of this program is understood by employees and that the knowledge and skills required for the safe usage of flammable and combustible liquids is acquired by employees. The training shall include the following:

5.2.1 Each affected employee shall be instructed in the purpose and use of these procedures.

5.2.2 Each affected employee shall receive training in the recognition and control of applicable hazards.

5.2.3 Each affected employee shall receive training in the usage of personal protective equipment.

5.2.4 All other employees whose work operations are or may be in an area where storage and dispensing is conducted, shall be instructed about the procedures, and prohibitions relating to usage of flammable and combustible liquids.

5.3 Refresher Training.

5.3.1 Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in equipment or processes that present a new hazard, or when there is a change in these procedures.

5.3.2 Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever PCSI has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of these procedures.

5.3.3 The retraining shall reestablish employee proficiency and introduce new or revised hazard control methods and procedures, as necessary.

5.4 Certification. PCSI shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

6. Handling of Flammable and Combustible Liquids (general requirements).

6.1 Flammable liquids shall be kept in covered containers when not actually in use.

6.2 There shall be no open flames or other sources of ignition within the vapor path of any flammable or combustible chemical used on company premises.

6.3 Transfer of liquids shall be accomplished by using a closed piping system, by gravity through a self-closing valve, or by safety cans.

6.4 The quantity of flammable and combustible liquids in any area should not exceed the amount required for one day or one shift or 120 gallons (NFPA 33).

6.5 *NO SMOKING* signs shall be posted in all locations where flammable or combustible liquids are used or stored. Supervisors shall strictly enforce this policy.

6.6 The transfer of flammable liquids shall be done using appropriate bonding and grounding of containers.

6.7 Containers supplying spray nozzles (i.e., spray guns, etc.) shall be kept closed.

6.8 There shall be no sources of ignition (flame or spark producing) in any area where flammable liquids are used, nor within 20 ft. unless separated by a partition.

6.9 Hot surfaces (steam pipes, etc.) shall not be located in areas where combustible residues may accumulate without approved fire protection controls.

6.10 Electrical equipment located within areas where combustible residues may accumulate shall be approved for Class I Div 1 locations. Electrical equipment adjacent to a spraying area in areas where combustible residues may accumulate and not separated by a partition shall be approved for Class I Div 2 locations.

6.11 Portable lamps shall not be used in any spraying area unless it is specifically designed for a maintenance operation. If used for maintenance, they must intrinsically safe and conform to Class I Div 1 locations.

6.12 Areas using Class I liquids shall be ventilated at a rate of not less than one cubic foot per minute per sq. ft. of floor area.

6.13 Maintenance operations involving hot work or the use of spark producing tools may be done if the area has been proven safe (see hot work/welding safety procedures) and the work is supervised.

6.14 Housekeeping, i.e., cleaning of spills and leakage control. These requirements shall be closely monitored. Supervisors shall strictly control housekeeping in areas where flammable and combustible liquids are used or stored.

6.15 Waste or residue shall be stored in approved covered metal containers.

7. Storage of Flammable and Combustible Liquids Outside Buildings.

7.1 General. Storage outside buildings must be in accordance with Table H-16 or H-17, §1910.106.

7.2 Where quantity stored exceeds 1,100 gallons, a minimum distance of 10 feet between buildings and nearest container of flammable or combustible liquid must be maintained.

7.3 Spill containment. The storage area must be graded in a manner to divert possible spills away from buildings or other exposures or must be surrounded by a curb at least 6 inches high. When curbs are used, provisions must be made for draining of accumulations of ground or rain water or spills of flammable or combustible liquids. Drains must terminate at a safe location and must be accessible to operation under fire conditions.

7.4 Security. The storage area must be protected against tampering or trespassers where necessary and must be kept free of weeds, debris and other combustible material not necessary to the storage.

8. Fire Control. Extinguishers. Suitable fire control devices, such as small hose or portable fire extinguishers, will be available at locations where flammable or combustible liquids are stored.

8.1 Portable and special equipment. Portable fire extinguishment and control equipment must be provided in such quantities and types as are needed for the special hazards of operation and storage.

8.2 Water supply. Water must be available in volume and at adequate pressure to supply water hose streams, foam-producing equipment, automatic sprinklers, or water spray systems as the need is indicated by the special hazards of operation, dispensing and storage.

8.3 Special extinguishers. Special extinguishing equipment such as that utilizing foam, inert gas, or dry chemical must be provided as the need is indicated by the special hazards of operation dispensing and storage.

8.4 When 2 or more classes of materials are stored in a single pile, the maximum gallonage in that pile must be the smallest of the 2 or more separate gallonages.

8.5 Within 200 ft. of each portable tank, there must be a 12-ft. wide access way to permit approach of fire control apparatus.

8.6 The distances listed apply to properties that have protection for exposures as defined. If there are exposures, and such protection for exposures does not exist, the distances in column 4 must be doubled.

8.7 When total quantity stored does not exceed 50 percent of maximum per pile, the distances in columns 4 and 5 may be reduced 50 percent, but not less than 3 ft.

8.8 At least one portable fire extinguisher having a rating of not less than 12-B units must be located outside of, but not more than 10 feet from, the door opening into any room used for storage.

8.9 At least one portable fire extinguisher having a rating of not less than 12-B units must be located not less than 10 feet, nor more than 25 feet, from any Class I or Class II liquid storage area located outside of a storage room but inside a building.

8.10 Sprinklers. When sprinklers are provided, they will be installed in accordance with NFPA requirements.

8.11 Open flames and smoking. Open flames, ignition sources and smoking are not be permitted in flammable or combustible liquid storage areas.

8.12 Water reactive materials. Materials which will react with water must not be stored in the same room with flammable or combustible liquids.

8.12.1 Flammable liquids must be kept in covered containers when not actually in use.

8.12.2 Where flammable or combustible liquids are used or handled, except in closed containers, means will be provided to dispose promptly and safely of leakage or spills.

8.12.3 Class I liquids may be used only where there are no open flames or other sources of ignition within the possible path of vapor travel.

8.12.4 Flammable or combustible liquids must be drawn from or transferred into vessels, containers, or portable tanks within a building only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container or portable tanks by gravity through an approved self-closing valve. Transferring by means of air pressure on the container or portable tanks is prohibited.

DATE: 01 August 2009

SUBJECT: Hazard Communication Program

REGULATORY STANDARD: OSHA – 29 CFR 1910.1200 Hazard Communication

PCSI Hazard Communication Program

1. Written Program. This standard practice instruction will be maintained in accordance with 29 CFR 1910.1200 and updated as required. Where no update is required this document will be reviewed annually. Effective implementation of this program requires support from all levels of management within PCSI. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives. PCSI shall:

1.1 Annually review and revise this written hazard communication program based on company operational requirements or, as required by the OSHA Hazard Communication Standard.

1.2 Provide a program for proper labeling of containers, describe other needed forms of warning, and detail the use and purpose material safety data sheets (MSDS). Describe how employee information and training requirements will be met, to include the following:

1.2.1 Generate a list of the hazardous chemicals known to be present in each project using an identity that is referenced from the appropriate material safety data sheet. This list will be available to all employees in the jobsite, and located as a minimum in the jobsite "Safety Trailer.

1.2.2 Detail the method PCSI will use to inform employees of the hazards of non-routine tasks (for example cleaning of heat treatment pits). Immediate supervisors of affected employees will oversee this requirement. The Site Safety Manager may be consulted to provide any task hazard analysis assistance required.

1.2.3 The hazards associated with chemicals contained in process or jobsite piping routed through their work area. Immediate supervisors of affected employees will oversee this requirement. The Site Safety Manager may be consulted to provide any hazard analysis assistance required.

1.2.4 The methods you will use to inform employee(s) of any precautionary measures that need to be taken to protect employees during normal operating conditions and in foreseeable emergencies.

Immediate supervisors of affected employees will oversee this requirement.

1.2.5 PCSI shall make the written hazard communication program available to all employees, during each work shift.

2. Training Program. PCSI shall provide employees with information and training on hazardous chemicals in their work area at the time of their initial assignment, annually, and whenever a new chemical is introduced into their work area that could present a potential hazard.

2.1 Information. PCSI employees shall be informed of:

2.1.1 Any operations in their work area where hazardous chemicals are present.

2.1.2 The location and availability of the written hazard communication program, including a list(s) of hazardous chemicals used in their department, and the associated material safety data sheet (MSDS). This information will be:

2.2 Training. Employee hazard communication training shall be conducted annually by department. This training will be conducted by an approved training instructor. Newly hired personnel will be briefed on the general requirements of the OSHA hazard communication standard by foreman, as well as duty specific hazards by their immediate supervisor before they begin any duties. Intradepartmentally transferred personnel will also be briefed on the duty specific hazards by their immediate supervisor before they begin any duties. This training will include at least the following:

2.2.1 Methods (subjective and objective) that may be used to detect the presence or release of a hazardous chemical in the work area. This will include; any monitoring conducted by PCSI, continuous monitoring devices, visual appearance, or odor of hazardous chemicals when being released, etc. Material Safety Data Sheets (MSDS) will be used augment this requirement where ever possible.

2.2.2 The physical and health hazards of the chemicals present in the work area (MSDS).

2.2.3 The measures employees can take to protect themselves from these hazards. Specific procedures PCSI has implemented to protect employees from exposure to hazardous chemicals, to include; appropriate work practices, Standard Practice Instructions, emergency procedures, and personal protective equipment.

2.2.4 An explanation of the labeling system used the jobsite, the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

2.2.5 The chemical (formal) and common name(s) of products used, and all ingredients which have been determined to be health hazards.

2.2.6 Physical and chemical characteristics of the hazardous chemical including, vapor pressure, and flash point.

2.2.7 The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity.

2.2.8 The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical.

2.2.9 The primary route(s) of entry; inhalation, absorption, ingestion, injection, and target organs.

2.2.10 The OSHA permissible exposure limit, ACGIH Threshold Limit Value, including any other exposure limit used or recommended by the chemical manufacturer.

2.2.11 Whether the hazardous chemical has been found to be a potential carcinogen by the International Agency for Research on Cancer (IARC).

2.2.12 Any generally applicable precautions for safe handling and use which are known including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks.

2.2.13 Any generally applicable control measures which are known appropriate engineering controls, work practices, or personal protective equipment.

2.2.14 Emergency and first aid procedures.

2.2.15 How to determine the date of preparation of the material safety data sheet concerned, and or the last change to it.

2.2.16 Specific chemical identity such as the chemical name, Chemical Abstracts Service (CAS) Registry Number, synonyms, or any other information pertinent to the training session.

2.3 Documentation. All training will be documented using a standard company attendance roster. Certificates of completion will be issued to attendees. A copy of the completion certificate will be maintain as part of the employees permanent company record.

3. Labeling Requirements. Labeling requirements of containers of chemicals used at the jobsite, as well as of containers of chemicals and hazardous materials being shipped off site. The following procedures apply:

3.1 Unmarked Containers. No unmarked container containing chemicals may be used in conjunction with any duties or operations. Unless the container is a **portable** container in the control of a specific person for their immediate use. **Container** means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this standard practice instruction, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers. **Immediate use** means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

3.2 Container Labeling. PCSI will maintain and provide a container labeling kit to any employee requesting its use. Employees shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced. Containers containing hazardous chemicals will be properly disposed of and the labels defaced after use. Once they are emptied, chemical containers can never be used in the place of any other container (for example, trash receptacles).

3.3 Label Information for a single chemical (non-mixture). PCSI will provide the appropriate hazard rating and chemical compatibility charts to label containers. The MSDS will be consulted first to determine labeling requirements. The label as a minimum will contain:

3.3.1 Information concerning the personal protective equipment (PPE) required to use or handle the chemical.

3.3.2 The DOT hazard class i.e., whether the chemical is Flammable, Toxic, Irritating, Corrosive, Water Reactive, or is an oxidizer.

3.3.3 The chemical name **as reflected on the MSDS**.

3.3.4 The normal operational use of the chemical.

3.3.5 Name, address, and emergency phone number of the chemical manufacturer, importer, or other responsible party.

3.4 Label Information (mixtures). PCSI will provide the appropriate hazard rating and chemical data to label containers. The MSDS's of the chemicals used to

create the mixture will be consulted first to determine labeling requirements, see para 3.3.

3.4.1 If a mixture has been tested by an approved laboratory as a whole to determine its hazardous characteristics, the results of such testing shall be used to determine whether the mixture is hazardous and to provide the appropriate labeling information.

3.4.2 If a mixture has not been tested as a whole to determine whether the mixture is a health hazard, the mixture shall be assumed to present the same health hazards as do the components which comprise one percent (by weight or volume) or greater of the mixture. Scientifically valid data such as that provided on the MSDS to evaluate the physical hazard potential of the mixture must be used. The Site Safety Manager may be consulted to provide any hazard analysis assistance required.

3.5 Where Labels are not required. Questions concerning any of the exceptions listed below should be directed to the Safety Manager for clarification. The Hazard Communication Standard does not require labeling of the following chemicals:

3.5.1 Any pesticide as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency.

3.5.2 Any food, food additive, color additive, drug, cosmetic, or medical or veterinary device, including materials intended for use as ingredients in such products (e.g. flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) and regulations issued under that Act, when they are subject to the labeling requirements under that Act by the Food and Drug Administration;

3.5.3 Any distilled spirits (beverage alcohols), wine, or malt beverage intended for nonindustrial use, as such terms are defined in the Federal Alcohol Administration Act (27 U.S.C. 201 et seq.) and regulations issued under that Act, when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Bureau of Alcohol Tobacco, and Firearms.

3.5.4 Any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, when subject to a consumer product safety standard or labeling requirement of those Acts, or regulations issued under those Acts by the Consumer Product Safety Commission.

3.6 Labeling of containers of chemicals and hazardous materials being shipped off site designated as hazardous waste**.** Where these materials are classified as hazardous waste they fall under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 et seq.), and the provisions of 40 CFR. And as such will be subject to regulations issued under that Act by the Environmental Protection Agency. Consult with the Safety and Environmental Administrator where this determination is unclear or assistance is required.

4. Evaluation and Distribution of Material Safety Data Sheets to Employees.

4.1 PCSI shall maintain copies of any material safety data sheets that are received with incoming shipments of the sealed containers of hazardous chemicals, shall obtain a material safety data sheet for sealed containers of hazardous chemicals received without a material safety data sheet if an employee requests the material safety data sheet, and shall ensure that the material safety data sheets are readily accessible during each work shift.

4.2 Each MSDS will be entered into the MSDS data base maintained on the main frame computer system within the jobsite. PCSI employees will have access to this system upon request.

4.3 Master copies of each MSDS will be maintained in the safety office.

4.4 Right-To-Know (worker) copies will be available to all employees on the jobsite, and located as a minimum in the safety office. PCSI will ensure a system is in place to maintain a current set of MSDS's.

4.5 MSDS copies will be maintained for all chemicals abandoned for use for a period of 30 years.

4.6 MSDS requests. A request letter will be forwarded to any vender who does not provide an MSDS with a product received by PCSI. The letter will be forwarded within 5 days of receipt of the material. The format will be the same as the sample letter located at the back of this instruction.

4.7 Employees must be familiar with the various sections of the MSDS.

Section	**Contents**
Section I	- Product Identity
Section II	- Hazardous Ingredients
Section III	- Physical/Chemical Characteristics
Section IV	- Fire and Explosion Hazard Data
Section V	- Reactivity Data

Section VI - Health Hazards Data
Section VII - Precautions for Safe Handling and Use
Section VIII - Control Measures/Protection Info
Section IX - Additional Information

5. Non-Company Employees Program. Visitors, Contract Employees, Site Owners, Contractor Personnel, Subcontractor Personnel and In-House Representatives. The principle company escort, contact or safety representative will advise visitors, contract employees, contractor personnel, and in-house representatives of any chemical hazards that may be encountered in the normal course of their work on the premises, the labeling system in use, the protective measures to be taken, the safe handling procedures to be used, and availability of MSDS's. Any subcontractor bringing chemicals on-site must provide PCSI with the appropriate hazard information on these substances, including the labels used and the precautionary measures to be taken in working with these chemicals. PCSI will cooperate with site owners, contractors, and subcontractors to ensure an efficient and thorough flow of information occurs and the employees of all companies are advised of potential hazards.
Consult with the site safety manager where this determination is unclear or assistance is required.

6. Definitions Commonly Found in the OSHA Hazard Communication Standard or that Relate to the Contents of the Standard.

Article means a manufactured item:

1. Which is formed to a specific shape or design during manufacture.

2. which has end use function(s) dependent in whole or in part upon its shape or design during end use.

3. which does not release, or otherwise result in exposure to, a hazardous chemical, under normal conditions of use.

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

Chemical means any element, chemical compound or mixture of elements and/or compounds.

Chemical manufacturer means an employer with a workplace where chemical(s) are produced for use or distribution.
Chemical name means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

Combustible liquid means any liquid having a flashpoint at or above 100 F (37.8 C), but below 200 F (93.3 C), except any mixture having components with flashpoints of 200 F (93.3 C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

Common name means any designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.

Compressed gas means:

1. A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 F (21.1 C); or

2. A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 F (54.4 C) regardless of the pressure at 70 F (21.1 C); or

3. A liquid having a vapor pressure exceeding 40 psi at 100 F (37.8 C) as determined by ASTM D-323-72.

Designated representative means any individual or organization to whom an employee gives written authorization to exercise such employee's rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

Manager means the Manager, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

Distributor means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

Employee means a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office workers or bank tellers who encounter hazardous chemicals only in non-routine, isolated instances are not covered.

Employer means a person engaged in a business where chemicals are either used, distributed, or are produced for use or distribution, including a contractor or subcontractor.

Explosive means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

Exposure or exposed means that an employee is subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.), and includes potential (e.g. accidental or possible) exposure.

Flammable means a chemical that falls into one of the following categories:

1. **Aerosol**, flammable means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening.

2. **Gas, flammable** means:

2.1 A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen (13) percent by volume or less.

2.2 A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve (12) percent by volume, regardless of the lower limit.

2.3 Liquid, flammable means any liquid having a flashpoint below 100 F (37.8 C), except any mixture having components with flashpoints of 100 F (37.8 C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.

2.4 Solid, flammable means a solid, other than a blasting agent or explosive as defined in § 190.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

Flashpoint means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

1. Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)) for liquids with a viscosity of less than 45 Saybolt University Seconds (SUS) at 100 F (37.8 C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

2. Pensky-Martens Closed Tester (See American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100 F (37.8 C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

3. Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTMD 3278-78)). Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

Foreseeable emergency means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

Hazardous chemical means any chemical which is a physical hazard or a health hazard.

Hazard warning means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the hazard(s) of the chemical(s) in the container(s).

Health hazard means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term health hazard includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A, to 29 CFR 1910.1200 provides further definitions and explanations of the scope of health hazards covered by this section, and Appendix B, 29 CFR 1910.1200 describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of this standard practice instruction.

Identity means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

Immediate use means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

Importer means the first business with employees within the Customs Territory of the United States which receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or employers within the United States.

Label means any written, printed, or graphic material, displayed on or affixed to containers of hazardous chemicals.

Material safety data sheet (MSDS) means written or printed material concerning a hazardous chemical which is prepared in accordance with 29 CFR 1910.1200, paragraph (g).

Mixture means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

Organic peroxide means an organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

Oxidizer means a chemical other than a blasting agent or explosive as defined in 29 CFR 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

Physical hazard means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

Produce means to manufacture, process, formulate, or repackage.

Pyrophoric means a chemical that will ignite spontaneously in air at a temperature of 130 F (54.4 C) or below.

Responsible party means someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

Specific chemical identity means the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

Trade secret means any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an
opportunity to obtain an advantage over competitors who do not know or use it.

Unstable (reactive) means a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under
conditions of shocks, pressure or temperature.

Use means to package, handle, react, or transfer.

Water-reactive means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard. Often when the water is heated it goes into a gaseous state allowing oxygen to be released which can help feed a fire.

Work area means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

Work place means an establishment, job site, or project, at one geographical location containing one or more work areas.

7. Sample Letter Requesting an MSDS.

SAMPLE LETTER REQUESTING AN MSDS

XYZ Manufacturing Company
1234 Street
Anytown, USA 11222

Dear Sir:

The Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200) requires employers be provided Material Safety Data Sheets (MSDS's) for all hazardous substances used in their jobsite, and to make these MSDS's available to employees potentially exposed to these hazardous substances.

We, therefore, request a copy of the MSDS for your product listed as Stock Number _____. We did not receive an MSDS with the initial shipment. We also request any additional information, supplemental MSDS's, or any other relevant data that your company or supplier has concerning the safety and health aspects of this product.

Please consider this letter as a standing request to your company for any information concerning the safety and health aspects of using this product that may become known in the future.

The MSDS and any other relevant information should be sent to us within 10, 20, 30, days (select appropriate time). Delays may prevent use of your product. Send the information to the address listed below.

Please be advised that if we do not receive the MSDS on the above chemical by _____, we may have to notify OSHA of our inability to obtain this information.

Your cooperation is greatly appreciated. Thank you for your timely response to this request. If you have any questions please contact me at (123) 456-7891.

Sincerely

_____ Safety and Health Manager
xxxxx Inc.
111 Street
Anytown, USA 12121

DATE: 01 August 2009

SUBJECT: Lead Safety Program

REGULATORY STANDARD: OSHA – 29 CFR 1926.62 Lead in Construction

PCSI Lead Safety Program

1. Written Program. This standard practice instruction will be maintained in accordance with 29 CFR 1926.62 and updated as required. Where no update is required this document will be reviewed annually. Effective implementation of this program requires support from all levels of management within PCSI. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

This program applies to all construction work where employees may be occupationally exposed to lead. Construction work is defined as work for construction, alteration and/or repair, including painting and decorating. It includes but is not limited to the following:

Demolition or salvage of structures where materials containing lead are present

Removal or encapsulation of materials containing lead

New construction, alteration, repair or renovation of structures, substrates, or portions thereof that contain lead, or materials containing lead

Installation of products containing lead

Lead contamination/emergency cleanup

Transportation, disposal, or storage of lead containing materials on the site or location at which construction activities are performed

Maintenance operations associated with the construction activities described above

2. Initial Exposure Assessment. PCSI shall conduct an initial exposure assessment of construction activities that represent the highest employee exposures to airborne lead. Within five (5) working days after the completion of the exposure assessment, Prysmian will notify each employee in writing of the results of their assessment. If an employee is exposed above the permissible exposure limit (PEL), a statement that the exposure was at or above the PEL and a description of the corrective action(s) to be taken to reduce the exposure level will be included with the results. A written record of the initial assessment shall be maintained by the EHS Manager.

Employees involved in construction activities that may occupationally expose them to lead above the PEL shall be provided with the following interim protection at no cost during the exposure assessment.

Appropriate respiratory protection

Appropriate personal protective clothing and equipment

Change areas and hand-washing facilities

Biological monitoring

Hazard communication and respiratory training

Training on any operations that could result exposures above the action level

It is the responsibility of the PCSI project superintendent to provide the above interim protection.

2. Frequency of Exposure Assessment. If the initial determination reveals that a certain construction activity does not expose employees above the action level, no additional exposure assessments will be required unless the activity changes. If the initial determination or subsequent determinations reveals an exposure at or above the action level, PCSI will continue to monitor in accordance with the lead in construction standard.

NOTE: For activities only involving lead-sheathed cable splicing, the initial determination indicated that the associated cutting, splicing, wiping of lead sheathed power cable, and area cleanup conducted in accordance with Prysmian procedures, work operations/practices, processes, control methods and workplace conditions results in airborne employee exposures sampling well below the action level of 30 ug/m3.

Employees performing lead-sheathed cable splicing are covered under section 5, “Lead Work That is Below the Action Level”, of this procedure.

3. Objective Data in Lieu of Initial Exposure Assessment. Where the employer has objective data, demonstrating that a particular product or material containing lead or a specific process, operation or activity involving lead cannot result in employee exposure to lead at or above the action level during processing, use, or handling, the employer may rely upon such data instead of implementing initial monitoring.

Objective data are information demonstrating that a particular product or material containing lead or a specific process, operation, or activity involving lead cannot release dust or fumes in concentrations at or above the action level under any expected conditions of use. Objective data can be obtained from an industry-wide study or from laboratory product test results from manufacturers of lead containing products or materials. The data the employer uses from an industry-wide survey must be obtained under workplace conditions closely resembling the processes, types of material, control methods, work practices and environmental conditions in the employer's current operations.

4. Access to Information. Affected employees may receive a copy of the lead standard, and any other related information from the Prysmian EHS Manager at 864-366-1239.

5. Lead Work that is Below the Action Level. Prysmian employees that perform work that disturbs lead containing material and are exposed below the action level shall be provided with the following:

Adequate washing facilities (hand cleaning wipes may be used when running water is not available)
Hazard Communication training

6. Lead Work that is at of Above the Action Level. Employees that perform work that exposes them to airborne concentrations of lead at or above the action level shall be provided with the following at no cost to the employee:

Respirators approved for protection against lead dust, fume, and mist by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH). All employees that require a respirator must be enrolled in the Prysmian respiratory protection program.
Protective clothing and equipment that prevents contamination of the employees' garments.
Clean change areas equipped with separate storage facilities for protective work clothing, equipment, and street clothing.
Where feasible, hand-washing and shower facilities.
Medical examination and blood lead level surveillance.
Medical removal protection in accordance with the lead in construction standard.
Lunchroom facilities that are as free as practicable from lead contamination.
Initial and annual training in accordance with the lead in construction standard.

Prysmian project managers and supervisors directing work that exposes employees to airborne concentrations of lead at or above the action level shall be responsible for the following:

Establish and implement a written compliance program for any maintenance activities that expose employees above the action level. Supervisors should contact the EHS Manager for assistance in developing their program. All written compliance programs must be approved by the EHS Manager.
Supervisors directing work that has airborne lead level at or above the action level must complete a forty (40) hour EPA-approved Lead Abatement Supervisor/Contractor course.
Ensure that employees have received the appropriate training.
Ensure that engineering controls and safe work practices are used to reduce lead exposure to below the PEL of 50ug/m3. Note that it is Prysmian's policy not to conduct work where unprotected lead exposures would exceed 50 ug/m3.

Ennsure that sanding and scraping of lead paint and sweeping of lead debris is done only after the material has been wetted.
Ensure that food, beverages, and tobacco products are not present or consumed and cosmetics are not applied in the work area.
Ensure that employees wash their hands and face prior to eating and do not enter the lunchroom with contaminated clothing or equipment.
Ensure that the job site is clean and all surfaces are maintained as free as practicable from accumulations of lead dust. At the completion of the project, ensure that the area is cleaned properly.
Inform building occupants of the nature and duration of the work to be conducted.
Post the following warning signs in each work area were employees are exposed above the PEL:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

Ensure that hazardous waste is disposed of in compliance with Federal, State and local regulations.
Ensure that employees remove their protective clothing in the appropriate area at the end of the work period. Also, ensure that all contaminated protective clothing which is to be cleaned, laundered, or disposed of is placed in a closed and properly labeled container(s). Notify in writing any person that cleans or launders the protective clothing of the potentially harmful effects of exposure to lead.
When respirators are required, ensure that employees are trained in their use, have been fit tested, and wear them properly.
Ensure employees receive medical surveillance required by 29 CFR 1926.62 and are notified of their results.
Ensure that all safety and health regulations and procedures are followed.

7. Contractors. Subcontractors that perform work covered under the Lead in Construction Standard shall be responsible for ensuring that their work is done in compliance with 29 CFR 1926.62.

8. Prohibited Activities. Burning, dry sanding, and dry scraping of lead, cleaning with compressed air, and the use of any powered hand tools that have the potential to create air borne lead are prohibited.

DATE: 01 August 2010

SUBJECT: Housekeeping, Walking and Working Surfaces

REGULATORY STANDARD: OSHA - 29 CFR 1926.25

PCSI
Housekeeping, Walking and Working Surface Safety Program

1. Written program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur to 29 CFR 1926.25 that prompt revision of this document, or when jobsite operational changes occur that require a revision of this document. Effective implementation requires a written program for job safety, health, that is endorsed and advocated by the highest level of management within this company and that outlines our goals and plans. This written program will be communicated to all required personnel. It is designed to establish clear goals, and objectives.

2. General requirements. All jobsites will be maintained in a safe and healthful manner. Certain environments within the jobsite(s) may contain a reasonable probability of injury that can be prevented by proper maintenance and supervision. PCSI shall do all possible to ensure the safety of everyone on the jobsite. No employee shall knowingly be subjected to a hazardous condition without all possible protective measures first being implemented.

3. Housekeeping.

3.1 All offices, work locations, work areas, passageways, storerooms, restrooms, and service rooms shall be kept clean, orderly, sanitary, and free of known hazards.

3.2 The area of every work location shall be maintained in a clean and, so far as possible, a dry condition. Where wet processes are used, drainage shall be maintained.

3.3 To facilitate cleaning, every floor, working place, work location and passageway shall be kept free from protruding nails, objects, splinters, holes, or loose boards or other hindrances that would prevent a safe environment.

3.4 Sufficient illumination will be provided in all areas at all times.

3.5 Work areas. All employees are responsible for maintaining their immediate work areas in a clean and orderly manner, and for notifying their foreman of conditions beyond their control.

3.6 Machines and equipment. Foreman will ensure that machines and equipment under their control are maintained in a clean and orderly manner.

3.7 Storage areas. Appropriate procedures will be followed based on the type of storage area.

3.8 Spills (untrained personnel). Spills will be immediately reported to jobsite safety director or supervisor by any employee discovering the spill not having training in containment measures.

4. Aisles and passageways.

4.1 Where mechanical handling equipment is used, sufficient safe clearances will be maintained for aisles, work locations, and wherever turns or passage must be made. Aisles and passageways shall be kept clear and, with no obstruction across or in aisles that could create a hazard.

5. Covers and guardrails. Covers and/or guardrails shall be provided to protect personnel from the hazards of open pits, tanks, ditches, etc.

5.1 Supervisory responsibilities. Work areas under their control will be properly guarded, covered, cordoned off, or marked to prevent injury. Foreman will ensure the following are properly secured and reported to maintenance:

5.1.1 Stairways unguarded/containing holes.

5.1.2 Ladder way floor openings unguarded.

5.1.3 Hatchway and floor opening unguarded.

5.1.4 Floor openings unguarded.

5.1.5 Pit and trapdoor floor openings unguarded.

5.1.6 Manhole floor openings unguarded.

5.1.7 Temporary openings unguarded.

5.1.8 Holes/openings unguarded.

5.1.9 Chute wall openings unprotected.

5.1.10 Window wall openings unprotected.

5.1.11 Temporary wall openings unprotected.
5.1.12 Open-sided floor or platforms unguarded.

5.1.13 Stairways unprotected.

6. Guarding floor and wall openings, and holes.

6.1 Protection for floor openings.

6.1.1 Stairway floor openings. Stairway floor openings shall be guarded by a standard railing constructed in accordance with 29 CFR 1910.23, paragraph (e). The railing shall be provided on all exposed sides (except at entrances to stairways). For infrequently used stairways where traffic across the opening prevents the use of a fixed standard railing (as when located in aisle spaces, etc.), the guard shall consist of a hinged floor opening cover of standard strength and construction and removable standard railings on all exposed sides (except at entrance to stairway).

6.1.2 Ladder way floor openings. Ladder way floor openings or platforms shall be guarded by a standard railing with standard toeboard on all exposed sides (except at entrance to opening), with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into the opening.

6.1.3 A removable railing with toeboard on not more than two sides of the opening and fixed standard railings with toeboards on all other exposed sides. The removable railings shall be kept in place when the opening is not in use. Where operating conditions necessitate the feeding of material into any hatchway or chute opening, protection shall be provided to prevent a person from falling through the opening.

6.1.4 Trench or conduit covers and their supports, when located in roadways, shall be designed to carry a truck rear-axle load of at least 20,000 pounds.

6.1.5 Manhole covers and their supports, when located in roadways, shall comply with local standard highway requirements if any; otherwise, they shall be designed to carry a truck rear-axle load of at least 20,000 pounds.

6.1.6 Stairway doors. Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall not reduce the effective width to less than 20 inches.

6.1.7 Wood railings. Wood railings, the posts shall be of at least 2 inch by 4 inch stock spaced not to exceed 6 feet; the top and intermediate rails shall be of at least 2 inch by 4 inch stock. If top rail is made of two right-angle pieces of 1 inch by 4 inch stock, posts may be spaced on 8 foot centers, with 2 inch by 4 inch intermediate rail.

6.1.8 Structural steel railings. Structural steel railings, posts and top and intermediate rails shall be of 2 inch by 2 inch by 3/8 inch angles or other metal shapes of equivalent bending strength with posts spaced not more than 8 feet on centers.

7. Definitions.

Floor hole. An opening measuring less than 12 inches but more than 1 inch in its least dimension, in any floor, platform, pavement, or yard, through which materials but not persons may fall; such as a belt hole, pipe opening, or slot opening.

Floor opening. An opening measuring 12 inches or more in its least dimension, in any floor, platform, pavement, or yard through which persons may fall; such as a hatchway, stair or ladder opening, pit, or large manhole. Floor openings occupied by elevators, dumb waiters, conveyors, machinery, or containers are excluded.

Handrail. A single bar or pipe supported on brackets from a wall or partition, as on a stairway or ramp, to furnish persons with a handhold in case of tripping.

Platform. A working space for persons, elevated above the surrounding floor or ground; such as a balcony or platform for the operation of machinery and equipment.

Runway. A passageway for persons, elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings.

Standard railing. A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.

Standard strength and construction. Any construction of railings, covers, or other guards that meets the requirements of 29 CFR 1910.23.

Stair railing. A vertical barrier erected along exposed sides of a stairway to prevent falls of persons.

Toeboard. A vertical barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway, or ramp to prevent falls of materials.

DATE: 01 August 2010

SUBJECT: PPE - Job Hazard Analysis Program

REGULATORY STANDARD: 29 CFR §1910.132-138/CFR §1926.95.

PCSI PPE - JHA Program

1. Written Program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur that prompt revision of this document, or when jobsite operational changes occur that require a revision of this document. Effective implementation requires a written program for job safety that is endorsed and advocated by the highest level of management within PCSI and that outlines our goals and plans. This written program will be communicated to all personnel. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. General Requirements. Once trained, first line supervisors will be responsible for job hazard analysis. The supervisor controls the work environment. PCSI will establish personal protective equipment (PPE) requirements, job hazard analysis procedures, and improve operational procedures through the use of this document. Preventing workplace injuries in the company is the principle purpose of job hazard analysis. This document will provide a basis for studying and recording each step of a job, identifying existing or potential job hazards (both safety and health), determining PPE requirements and establishing the best way to perform the job to reduce or eliminate these hazards.

3. OSHA Standard Applicability. Specific standards issued by OSHA will be consulted as part of the overall job hazard analysis. When OSHA standards apply to a specific job, these standards will be incorporated into the hazard analysis to ensure that the requirements of the standard and hazard analysis are combined to create as optimally safe job conditions as is possible.

4. Selection of Jobs for Hazard Analysis. PCSI will identify through the use of medical management records, injury statistics, and screening surveys, jobs that place workers at risk. After this analysis has been completed, a job hazard analysis for each job so identified will be conducted. Job hazard analyses will be routinely performed by a qualified person(s) for jobs that put workers at risk. This analysis will identify risk factors at jobs, establish a system to measure if risk factors have been reduced or eliminated to the maximum extent feasible, and recommend PPE.

4.1 PCSI Safety Professional is responsible to perform job hazard analysis and PPE surveys for PCSI when individual supervisors do not have a sufficient level of training. Supervisors will conduct the training once trained.

4.2 High risk jobs. Once the hazard analysis has been completed PCSI will compile a list of high risk jobs. Jobs will be analyzed to determine the following:

4.2.1 Procedural hazards of each job.

4.2.2 Physical hazards of each job.

4.2.3 Environmental hazards of each job.

5. Pre-Survey for Job Hazard Analysis. Prior to beginning a job hazard analysis the following pre-survey will be conducted to evaluate the general conditions under which the job is performed.

5.1 Are there tripping hazards in the job vicinity?

5.2 Is the lighting adequate for work conditions?

5.3 Are there explosive hazards associated with the job?

5.4 Are there electrical hazards associated with the job?

5.5 Are tools associated with the job in good condition?

5.6 Is the noise level excessive (below 85db TWA)?

5.7 Is communication hampered because of excessive noise?

5.8 Is the vibration level excessive, leading to numbness?

5.9 Is fire protection equipment readily available?

5.10 Have workers received fire training?

5.11 Are emergency exits properly marked and accessible?

5.12 Are workers wearing proper protective equipment?

5.13 Are trucks/motorized vehicles properly equipped?

5.14 Have workers received training in the use of trucks?

5.15 Have industrial hygiene complaints been received?
5.16 Does the job involve confined spaces?

5.17 Does the job involve lock-out tag-out?

5.18 Do workers know emergency response procedures?

5.19 Does the job isolate workers from other co-workers?

5.20 How often does the supervisor visit the job location?

5.21 What is the maximum amount of time a worker is alone?

5.22 Do workers know the evacuation relocation point?

5.23 What atmospheric testing has been performed?

5.24 What atmospheric contaminants are present?

5.25 Will jewelry or clothing get caught in machinery?

5.26 Can the worker get caught between moving parts?

5.27 Can the worker fall from one level to another?

5.28 Can anything fall on the worker from above?

5.29 Is the worker in an off-balance position at any time?

5.30 Is the standing surface clean to maintain stability?

5.31 Are the environmental conditions (heat/cold) adequate?

5.32 Do possible eye/face injury conditions exist?

5.33 Do possible head injury conditions exist?

5.34 Do possible foot injury conditions exist?

5.35 Do possible hand injury conditions exist?

5.39 Lifting Hazards. Work stations having tasks requiring manual materials handling will have the maximum weight-lifting values calculated. (The NIOSH *Work Practices Guide for Manual Lifting*, 1981 (or most recent edition), should be used for basic calculations. Note that this guide does not address lifting that involves twisting or turning motions.)

6. Job Hazard Analysis. Once trained, supervisors will be responsible for job hazard analysis. Once the pre-survey has been conducted this information will be used to reduce general hazards in the work area. After the general hazards in the work area

have been reduced to the lowest appropriate level. The following procedures for job hazard analysis will be followed:

6.1 Supervisor involvement. The procedure will be discussed with the worker's supervisor to explain its purpose. Ensure the supervisor understands that the job is being analyzed, not the worker's job performance. This will also serve as training for the supervisor. First line supervisors will be versed in the procedures used for job hazard analysis. Once trained, supervisors will be required to conduct future job hazard analyses for PCSI.

6.2 Worker involvement. Discuss the procedure with the worker performing the job to explain its purpose. Ensure the worker understands that the job is being analyzed, not the worker's job performance. Their input to procedural changes is critical.

6.3 Hazard analysis. Record the steps required to accomplish the job on the job hazard task analysis form. If the job is complex, it should be broken down into detailed segments. Each step will be reviewed in the order of occurrence as the worker is observed performing the job. Each segment will be reviewed in proper sequence.

6.4 Videotape hazard analysis method. The use of videotape, where feasible, will be used as a method for analysis of the work process. Slow-motion videotape or equivalent visual records of workers performing their routine job tasks will be used where practical to determine the demands of the task on the worker and how each worker actually performs each task. A job hazard analysis log/form will be used to break down the job into components that can be individually analyzed.

6.5 Immediate feedback. From reviewing the job steps discuss the potential hazards with the worker. Obtain his/her comments concerning safety improvements.

6.6 Documentation. Each job hazard analysis will be documented. PCSI will use the “Protective Measures Determination” form found in the appendixes to this instruction. Attachments will be included to the form as required to document or support protective measures requirements for the specific job. Copies of the form will be maintained as follows:

I. Worker’s will be given a copy of the form.
II. The supervisor will maintain a copy in his or her office files.
III. PCSI will submit a copy of the form to the jobsite safety office.

6.7 Job hazard reevaluation. Supervisors will conduct a reevaluation when one or more of the following conditions occur:

6.7.1 When an accident or injury occurs. It must be determined if the incident occurred as a result of the worker ignoring established safety practices, or if the safety practices need revision.

6.7.2 Anytime there is a change in the methods, materials, machinery, or procedures used in the conduct of the job.

6.7.3 Periodic review. A periodic review will be conducted on a(n) annual basis to ensure that the job is evaluated for safety.

7. Training and Education. The purpose of training and education is to ensure that our workers are sufficiently informed about the job hazards to which they may be exposed and thus are able to participate actively in their own protection.

7.1 Workers will be adequately trained about PCSI's personal protective equipment program. Proper training will allow managers, supervisors, and workers to better understand the hazards associated with a job, task, or process. The training program will include:

7.1.1 All affected workers.

7.1.2 Engineers and maintenance personnel.

7.1.3 Supervisors.

7.1.4 Managers.

7.2 Learning level. The program will be presented in language and at a level of understanding appropriate for the individuals being trained. It will provide an overview of the potential job hazards, their causes, and means of correction.

7.3 Evaluation. The program will also include a means for adequately evaluating its effectiveness. This will be achieved by using combinations of:

7.3.1 Worker surveys.

7.3.2 Injury and illness statistics.

7.3.3 Observation of work practices.

7.4 Training for affected workers will consist of both general and specific job training:

7.4.1 General Training. Workers who are working in jobs requiring changes do to a job hazard analysis will be given formal instruction on the hazards associated with their jobs and with their equipment. This will

include information on the varieties of hazards associated with the job, what risk factors cause or contribute to them, how to recognize and report suspected hazards. This training will be conducted on an annual basis.

7.4.2 Job-Specific Training. New workers and reassigned workers will receive an initial orientation and hands-on training prior to being placed in a full-production job. Each new hire will receive a demonstration of the proper use of and procedures for all tools and equipment. The initial training program will include the following:

7.4.2.1 Care, use, and handling techniques pertaining to tools.

7.4.2.2 Use of special tools and devices associated with work stations.

7.4.2.3 Use of appropriate guards and safety equipment, including PPE.

7.4.2.4 Use of proper lifting techniques and devices.

7.5 Training for Supervisors. Supervisors are responsible for ensuring that workers follow safe work practices and receive appropriate training to enable them to do this. Supervisors therefore will undergo training comparable to that of the person doing the initial job hazard analysis. First line supervisors are in the best position to control hazards in the workplace, and to correct such deficiencies.

7.6 Initial training. Worker training will involve instruction, and where necessary hands-on training in the following:

7.6.1 A description and identification of the hazards associated with particular jobs/tasks/machines/workstations.

7.6.2 Specific safeguards, how they provide protection, and the hazards for which it is intended to block.

7.6.3 How to properly use the safety devices and why.

7.6.4 How to install, operate, and remove safety devices.

7.6.5 What to do if the device is damaged, missing, unable to provide adequate protection.

7.6.6 Training in the recognition of applicable hazard sources.

7.6.7 Recognition of applicable hazards associated with guarding devices.

7.6.8 Procedures for removal of a guard from service.

7.6.9 Guard identification. Guards having identification numbers will be checked for legibility. Guards having illegible identification will be turned in for testing and remarking.

7.6.10 Personal Protective Equipment requirements of the individual worker.

7.6.11 Certification. PCSI shall certify that worker training has been accomplished and is being kept up to date. The certification shall contain each worker's name and dates of training.

7.7 Refresher training. This standard practice instruction shall be provided to, and read by all workers receiving refresher training. The training content shall be identical to initial training. Refresher training will be conducted on an annual basis or when the following conditions are met, which ever event occurs sooner.

7.7.1 Retraining shall be provided for all authorized and affected workers whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the type guard installed on a given machine. Training will be provided before reassignment.

7.7.2 Additional retraining shall be conducted whenever a periodic inspection reveals, or whenever PCSI has reason to believe, that there are deviations from or inadequacies in the workers' knowledge of safe job operations.

7.7.3 The retraining shall reestablish worker proficiency and introduce new or revised safe work practices, methods, procedures, and use of PPE as necessary.

7.7.4 Certification. PCSI shall certify that worker training has been accomplished and is being kept up to date. The certification shall contain each worker's name and dates of training.

8. Protective Clothing and Personal Protective Equipment (PPE). Where engineering controls and job hazard analyses do not eliminate all job hazards, workers will (where appropriate) wear personal protective equipment (PPE).

8.1 These include items such as, safety glasses, hard hats, face shields, safety goggles, glasses, hearing protection, footguards, gloves etc. Supervisors will ensure that equipment selected will meet the following requirements:

8.1.1 It will be appropriate for the particular hazard.

8.1.2 It will be maintained in good condition.

8.1.3 It will be properly stored when not in use, to prevent damage or loss.

8.1.4 It will be kept clean, fully functional and sanitary.

8.2 Hazards associated with wear of protective clothing, PPE, personal clothing and jewelry. Protective clothing and PPE can present additional safety hazards. Supervisors will ensure workers wear appropriate clothing and PPE. These items will be worn so as not create additional hazards.

8.3 Documentation. PPE requirements will be documented on the "Protective Measures Determination form and properly filed.

9. Tool Selection, Evaluation and Condition. The greatest hazards posed by tools usually result from misuse and or improper maintenance. Tool selection sometimes is not considered a priority when arrangements are made to begin work. The tools, personal protective equipment, and dimensions and adjustability of the work station will be noted for each job hazard analysis. All workers will consider the following when selecting tools:

9.1 Is the tool correct for the type work to be performed?

9.2 Are guards installed properly and in good condition?

9.3 Are grounding methods sufficient when working in wet conditions?

9.4 Does the tool create sparks or heat? Has this been considered when working around flammable substances?

9.5 Do impact tools such as chisels, wedges, or drift pins have mushroomed heads? The heads can shatter on impact, sending sharp fragments flying!

9.6 Are wooden handled tools loose or splintered? This can result in the heads flying off and striking the user/coworkers!

9.7 Are cutting tools sharp? Dull tools are more hazardous than sharp ones.

9.8 Is the tool used on the proper working surface? Tools used on dirty or wet working surfaces can create a multitude of hazards.

9.9 Are tools stored properly when not being used? Saw blades, knives, scissors and like sharp tools should be stored so that sharp edges are directed away from aisles and coworkers.

9.10 Is there sufficient clearance for tools requiring swinging motions such as hammers, axes, picks, etc.?

9.11 Tools will be checked for excessive vibration.

9.12 Have tools been modified beyond the manufacturers specification. If so have the modifications been approved by a “competent person”. See the appendix to this instruction for a sample of a modified tool documentation form.

10. Hazard Prevention and Control. PCSI understands that engineering solutions, where feasible, are the preferred method of control for workplace hazards. The focus of PCSI’s PPE/job hazard analysis program is to eliminate hazards from the workplace. This is accomplished whenever possible by redesigning the work station, work methods, or tool(s) to reduce the hazards associated with the demands of the job. This program will whenever possible research into currently available controls and technology. PPE will be a last choice.

11. Worker Notification. Worker's will be notified when they are placed in job descriptions where it is known or suspected that unresolved job hazards exist. These positions will be identified through the PPE/job hazard analysis program, and from the list of known high-risk jobs.

DATE: 01 September 2010

SUBJECT: Hearing Conservation Noise Control Program.

REGULATORY STANDARDS:
29 CFR 1926.52 Occupational Noise Exposure
29 CFR 1926.101 Hearing Protection

PCSI Hearing Conservation Noise Control Program

1. Written program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur to the governing regulatory statutes, that prompt revision of this document, or when jobsite operational changes occur that require a revision of this document. Effective implementation requires a written program for job safety, health, that is endorsed and advocated by the highest level of management within this company and that outlines our goals and plans. This written program will be communicated to all required personnel. It is designed to establish clear goals, and objectives.

2. General requirements.
To provide the information necessary to implement an effective occupational hearing conservation and noise control program. All PCSI employees are provided information and training on the potentially harmful effects of noise and on measures to protect themselves. Employees who are exposed to 85 dBA TWA-8 or higher are included in the audiometric test program.

3. Scope
The scope of this procedure for training of all employees; and audiometric testing of employees whose average exposure exceeds 85 dBA.

3. Procedure Requirements.

3.1. Employees of the plant are made aware of the potentially harmful effects of noise exposure. Employees will be provided with procedures, information and materials to enable them to protect themselves from noise exposure.

3.2. High noise areas will be identified where 85 dBA or greater exists and such areas will be marked. In the event of further information indicating employees may be subjected to 85 dBA TWA-8, a monitoring program will be developed by the Safety Director to identify those employees subject to exposure above this threshold.

3.3. Hearing protection devices will be provided at no cost and will be worn at all times by employees in areas identified to have noise levels above 85 dBA or greater.

3.4. Surveys will be conducted every two (2) calendar years to determine noise levels and employee exposures who on occasion work in high noise areas. I

3.5. Before starting work at PCSI all personnel will receive hearing conservation training. Subsequently, all personnel, exposed to noise levels at or above 85 dBA will receive subject training annually.

3.6. An audiometric test program is provided for empoloyees exposed to noise levels at or above 85 dBA.

3.6.1. All employees exposed to noise levels at or above 85 dBA will have base line audiograms administered by a trained and certified person upon employment.

3.6.2. Each calendar year follow-up audiograms will be conducted with all employees whose daily eight (8) hour Time Weighted Average (TWA) noise exposure is 85 dBA or above. A standard threshold shift of >10 dBA, as defined in the regulations, will necessitate retesting and referral to an otologist, if necessary.

3.6.3. All employees undergoing audiometric testing (baseline or annual) shall have a minimum period of 14 hours without workplace noice prior to testing.

3.7. Feasible engineering and/or administrative controls are applied to achieve compliance with government or internal noise standards.

3.8. Records of noise exposure and audiometric testing will be maintained as required by PCSI and government requirements.

3.9. Employees will be notified in writing of their monitoring and audiometric test results.

3.10. Minimum annual audits, as noted in responsibility portion of this policy, will be conducted to assure maintenance and compliance with this program program.

3.11. Hearing protection devices shall be evaluated by the Safety Director for the specific noise environment in which they are to be used. Hearing protection devices supplied by PCSI afford more than adequate protection against the noise encountered in designated noise areas. Containers for disposable ear protectors are placed at strategic points around the noise areas for anyone needing temporary protection when fitted ear plugs may not be immediately available. Ear muffs are also available for specific jobs and may be obtained from the appropriate Supervisor.

3.12. Continued exposure to high noise levels without the use of hearing protection will cause hearing loss over a period of years. The gradual loss of hearing may not be noticeable and there may be no accompanying discomfort. Therefore this is a mandatory program. Wearing hearing protection in defined areas must and will be enforced.

3.13. All supervisors will outline to the people in their groups the details of the plant hearing conservation program, explaining that the wearing of ear protection in noise areas is compulsory. No distinction will be made between the needs for hard hats, safety glasses, and ear protection.

4. **RESPONSIBILITIES**

4.1.1. The Safety Director will be responsible for conducting noise surveys every other calendar year for noise exposure monitoring.

4.1.2. Personnel exposure monitoring data will be retained by the Safety Department. Copies of this information will be sent to the employee's department manager and the HR department.

4.1.3. The Safety Department is accountable for conducting audits of this procedure every two (2) calendar years. Audit results will be reported to project manager and president of the company..

4.1.4. After controls have been applied to reduce noise exposure the Safety Department will evaluate the effectiveness of the control measures.

4.1.5. The Safety Department will have noise monitoring and testing instruments calibrated as recommended/required by the instrument manufacturer.

4.2. Project Manager Responsibilities:

4.2.1. Ensure that all high noise areas are posted with signs.

4.2.2. Ensure all new personnel receive training and all personnel exposed to 85 dBA and greater are trainied each calendar year on hearing conservation, including review of the policy and the aspects of the program. Maintain copies of training data and records.

4.2.3. Ensure personnel are wearing hearing protection in areas where required.

4.2.4. Communicate sampling results with employees.

3.3. Safety Department Responsibilities:

4.3.1. Medical surveillance in the form of an audiometric testing program shall be provided by the safety department for all employees subjected to noise levels at or above 85 dBA.

4.3.2. A baseline audiogram for each new employee subjected to noise levels at or above 85 dBA will be recorded within 90 days of employment date.

4.3.3. Audiograms will be taken each calendar year on all employees whose daily 8 hour Time Weighted Average (TWA) noise exposure is 85 dBA or above, and for all employees whose occupational noise exposure is controlled by personal protective equipment.

4.3.4. The safety department will inform the employee of the audiometric testing results. The safety department will notify the employee in writing within 21 days the determination of a significant threshold shift (STS). Records of this notice shall be maintained by the safety department.

4.3.4.1 In the event of an STS, the work site where the STS occurred, and the use of hearing protection at the work site shall be re-evaluated and/or re-fitted.

4.3.4.2 In the event of an STS, a referral for medical evaluation shall be offered the employee.

4.3.5. Hearing protection devices will be available to all employees who might be exposed to noise levels of 85 dBA TWA (8) or above.

4.3.6. Employees who have been determined to have a significant threshold shift in hearing and who are exposed to noise levels of 85 dBA TWA (8) or greater must wear hearing protection at all times while in noise area. The project manager is responsible for consultation and informing an employee of this requirement.

4.3.7. Complete and precise audiogram records will be maintained by the safety department.

DATE: 01 September 2010

SUBJECT: Ladder Safety Program.

REGULATORY STANDARDS: 29 CFR 1926.1053 Ladders.

PCSI Ladder Safety Program

1. Written program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur to the governing regulatory statutes, that prompt revision of this document, or when jobsite operational changes occur that require a revision of this document. Effective implementation requires a written program for job safety, health, that is endorsed and advocated by the highest level of management within this company and that outlines our goals and plans. This written program will be communicated to all required personnel. It is designed to establish clear goals, and objectives.

2. General requirements.
All ladders purchased and used by PCSI shall meet OSHA/ANSI requirements. Ladders shall only be used for their intended purpose. Ladders shall be inspected before each use and defective ladders tagged out of service and not used until repaired/replaced.

3. Scope
The scope of this procedure is limited to portable extension and step ladders. Other procedures or authoritative sources must be consulted regarding permanently installed ladders, scaffolding, aerial lifts, and other devices or conditions that present a fall hazard (e.g., platforms, roofs; floor openings where it would be possible to fall from one level to another; etc.).

4. Hazards
The main hazard associated with the use of portable ladders is falls. Falls occur for a number of reasons, including the following:

- The ladder is in poor condition or is improper for the task at hand.
- The ladder is poorly located and/or incorrectly positioned.
- The surface on which the ladder is located is slippery or uneven.
- Proper techniques are not observed when using the ladder.

5. Procedure Requirements.
The following requirements are intended to minimize the risk of falls when using portable ladders.

5. 1. Select ladders based on anticipated use and rated load capacity.
    • Load ratings, safe working height, and other safety information must be posted on the ladder by the manufacturer. This information should be replaced if it becomes worn or defaced. The rated capacity must be

sufficient to accommodate the weight of the person and everything that they are carrying.
• Portable ladders are not suitable for all situations. Depending on the task at hand, an aerial lift or other device may be the better choice. For example, a portable ladder is not a good choice when it is necessary for a person to carry heavy loads or shift their center of gravity while on the ladder; the resting point for the top of the ladder is weak or marginally secure (e.g., guttering); three points of contact cannot be maintained (two feet and one hand); the foundation/surface upon which the ladder will be placed is uneven, slippery, angled, or will otherwise make the ladder unstable; etc.
• Remember the full height of the ladder is not available for use. For example, multi-section extension ladders must maintain a minimum overlap distance and extend a minimum of 3' past the top of the landing The top step and next two rungs down on a step ladder are not intended for climbing.
• Do not use portable ladders when working near (<20') live electrical lines. Do not use metal ladders when working on or near electrical devices (e.g., changing light fixtures, etc.) and the ladder could become energized.

5.2. Keep the ladder, safety feet, and auxiliary equipment in good condition at all times, and inspect before each day's use and after any potential for damage.
• Keep dry and free of oil, grease, mud, etc.
• Verify that the joint between the steps and side rails is tight, all hardware and fittings are securely attached, and movable parts operate freely without binding or undue play; rivets are secure; and side rails and rungs are free of excessive denting or other signs of wear.
• Lubricate metal bearings of locks, wheels, pulleys frequently.
• Replace frayed or badly worn rope.
• Safety feet and other auxiliary equipment shall be kept in good condition to insure proper performance.
• Immediately remove damaged ladders from service, label them as "Out-of-Service" and notify the appropriate supervisor.
• Do not use ladders as guys, braces, skids, gin poles, or for other than their intended purpose.

5.3. Position the ladder appropriately and maintain a safe stance while on the ladder.
• Use a ladder of the proper height, as designed by the manufacturer. Do not splice or improvise to gain additional height.
• Wear proper footwear; closed-toe, sturdy, and clean.
• Inspect the area to be sure that it is free of electrical lines.
• Do not position a ladder in an area where it can be bumped or dislodged (e.g., doorway, passage, window opening, etc.). If a ladder must be located where it can be struck or displaced, secure the area by locking doors, placing barricades, having someone stand watch, or other appropriate action.

• The foundation upon which the ladder will be placed must be even, firm, level, and not subject to skidding/slippage. Do not use blocks, rocks, boxes, or other items to “level up” or gain height. Do not use a ladder in strong winds.
• Observe the proper placement angle for extension ladders. The base of the ladder should be one-foot (1’) out from the wall for every 4 feet of height. The side rails of an extension ladder that is used to access a higher landing must extend a minimum of 3’ beyond that landing.
• Secure extension ladders with tie downs or blocking of the base. If using step ladders, ensure that the ladder is fully opened and locked in place.
• Face the ladder while climbing and descending. Maintain three points of contact at all times.
• Do not lean sideways out of the ladder’s width. Do not lean so far that the naval passes outside of the ladder’s side rails.

5.4. Properly transport, store, and maintain ladders.
• Ladders should be secured while being transported in a vehicle.
• Get assistance when carrying large ladders to the work area.
• Store ladders in a sheltered area where they will not fall unexpectedly, and will not block access to hallways and fire exits.
• Wooden ladders are affected by exposure to heat and dampness. Therefore, they should be stored in a dry, well-ventilated area.
• Never paint a wooden ladder as it can hide structural defects.
• Ladders should be stored horizontally on racks or hooks with support points at the top, middle and bottom of the ladder to prevent sagging and warping.

DATE: 01 August 2009

SUBJECT: Control of Hazardous Energy Sources (Lockout/Tagout).

REGULATORY STANDARD: OSHA - 29 CFR 1926.417

PCSI Lockout/Tagout Program

1. Written Program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur to 29 CFR 1926.417, that prompt revision of this document, or when jobsite operational changes occur that require a revision of this document. Effective implementation of this program requires support from all levels of management within the company team. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of the number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. General Requirements. PCSI will establish lockout/tagout procedures through the use of this document. This standard practice instruction covers the servicing, maintenance, or installation of machines and equipment in which the unexpected energization or start up of the machines or equipment, or release of stored energy could cause injury to employees.

2.1. Application. This instruction applies to the control of energy during servicing and/or maintenance of machines and equipment. Normal production operations are not covered. Servicing and/or maintenance which takes place during normal production operations is covered if:

2.1.1 An employee is required to remove or bypass a guard or other safety device.

2.1.2 An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle.

Exception: Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, are not covered if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection in accordance with company operational procedures.

2.1.3 This instruction does not apply to the following:

2.1.3.1 Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or start up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.

2.1.3.2 Hot tap operations involving transmission and distribution systems for substances such as gas, steam, water or petroleum products when they are performed on pressurized pipelines, provided it is demonstrated that (1) continuity of service is essential; (2) shutdown of the system is impractical; and (3) documented company procedures are followed, and special equipment is used which will provide proven effective protection for our employees.

3. Program Implementation. PCSI will establish a program and utilize procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices, and to otherwise disable machines or equipment to prevent unexpected energization, start-up or release of stored energy in order to prevent injury to employees.

3.1 Energy control program. PCSI shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source, and rendered inoperative.

3.1.1 Tagout. If an energy isolating device is not capable of being locked out, PCSI's energy control program shall utilize a tagout system.

3.1.2 Lockout. If an energy isolating device is capable of being locked out, PCSI's energy control program shall utilize lockout, unless it is can be demonstrated that the utilization of a tagout system will provide full employee protection.

3.1.3 Future requirements. Whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for such machine or equipment shall be designed to accept a lockout device.

4. Full Employee Protection.

4.1 Tagout location. When a tagout device is used on an energy isolating device which is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached, and PCSI shall

demonstrate that the tagout program will provide a level of safety equivalent to that obtained by using a lockout program.

4.2 Lockout equivalency demonstration. In demonstrating that a level of safety is achieved in the tagout program which is equivalent to the level of safety obtained by using a lockout program, PCSI shall demonstrate full compliance with all tagout-related provisions together with such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the demonstration of full employee protection shall include where possible the implementation of additional safety measures such as the:

4.2.1 Removal of an isolating circuit elements.

4.2.2 Blocking of a controlling switches.

4.2.3 Opening of an extra disconnecting devices.

4.2.4 Removal of a valve handle to reduce the likelihood of inadvertent energization.

5. Energy Control Procedure Exceptions. Once a jobsite evaluation has been accomplished, documented procedures will not be developed when the following conditions exist:

5.1 The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down which could endanger employees.

5.2 The machine or equipment has a single energy source which can be readily identified and isolated.

5.3 The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment.

5.4 The machine or equipment is isolated from that energy source and locked out during servicing or maintenance.

5.5 A single lockout device will achieve a locked-out condition.

5.6 The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance.

5.7 The servicing or maintenance does not create hazards for other employees.

5.8 PCSI, in utilizing this exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during

servicing or maintenance in the event of such occurrences, energy control procedures will be developed.

6. Energy Control Procedures.

6.1 Once a jobsite evaluation has been accomplished, procedures shall be developed, documented and utilized for the control of potentially hazardous energy.

6.2 Procedural format. The following format will be followed for each machine requiring procedures. PCSI will be responsible for the implementation of these procedures. The procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

6.2.1 A specific statement of the intended use of the procedure.

6.2.2 Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy (manufacturers specification will be followed when ever possible.

6.2.3 Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the person(s) responsible for them.

6.2.4 Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

7. Jobsite Evaluation. PCSI shall evaluate our jobsite(s) by work location to determine which machines or pieces of equipment require steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy.

8. Protective Materials and Hardware. Appropriate lockout devices such as; locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by PCSI for isolating, securing or blocking of machines or equipment from energy sources based on the individual machine/equipment evaluation conducted by personnel authorized to evaluate lockout/tagout requirements:

8.1 Selection criteria.

8.1.1 Lockout/tagout devices shall be singularly identified; shall be the only devices(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:

8.1.2 Selected lockout and tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

8.1.3 Selected tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.

8.1.4 Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

8.1.5 Standardization within the jobsite. Lockout and tagout devices shall be standardized within the jobsite in at least one of the following criteria: Color; shape; or size; and additionally, in the case of tagout devices, print and format shall be standardized.

8.1.6 Removal requirements.

8.1.6.1 Lockout devices. Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

8.1.6.2 Tagout devices. Tagout devices, including and their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.

8.1.7 Identification requirements.

8.1.7.1 Lockout/tagout devices shall indicate the identity of the employee applying the device(s).

8.1.7.2 Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the following: Do Not Start, Do Not Open, Do Not Close, Do Not Energize, Do Not Operate, etc.

9. Periodic Inspections and Certifications.

9.1 Inspections. PCSI shall conduct a periodic inspection of the energy control procedure for each machine or piece of equipment at least annually to ensure that the procedure and the requirements of this instruction are being followed.

9.1.1 The periodic inspection shall be performed by an authorized employee other than the ones(s) utilizing the energy control procedure being inspected.

9.1.2 Inspections will be conducted by authorized to evaluate lockout/tagout requirements:

9.1.3 The periodic inspection shall be conducted to correct any deviations or inadequacies identified.

9.1.4 Lockout inspections. Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

9.1.5 Tagout inspections. Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected.

9.2 Certifications. PCSI shall certify that the periodic inspections have been performed. The certification shall as a minimum identify:

9.2.1 The machine or equipment on which the energy control procedure was being utilized.

9.2.2 The date of the inspection.

9.2.3 The employees included in the inspection.

9.2.4 The person performing the inspection.

10. Initial Training.

10.1 PCSI shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training shall include the following:

10.1.1 Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the

energy available in the workplace, and the methods and means necessary for energy isolation and control.

10.1.2 Each affected employee shall be instructed in the purpose and use of the energy control procedure.

10.1.3 All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

10.2 When tagout systems are used, employees shall also be trained in the following limitations of tags:

10.2.1 Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.

10.2.2 When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

10.2.3 Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.

10.2.4 Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.

10.2.5 Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

10.2.6 Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

10.3 Certification. PCSI shall certify that employee training has been accomplished. The certification shall contain each employee's name and dates of training.

11. Refresher Training.

11.1 Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines,

equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

11.2 Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever PCSI has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

11.3 The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

11.4 Certification. PCSI shall certify that employee retraining has been accomplished. The certification shall contain each employee's name and dates of training.

12. Energy Isolation. Lockout or tagout shall be performed only by the authorized employees who are performing the servicing, maintenance or new instillation.

13. Notification of Employees. Affected employees shall be notified of the application and removal of lockout devices or tagout devices. Notification shall be given before the controls are applied, and after they are removed from the machine or equipment.

14. Application of Control. The lockout or tagout procedures shall cover the following elements and actions and shall be done in the following sequence:

14.1 Preparation for shutdown. Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

14.2 Machine or equipment shutdown. The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.

14.3 Machine or equipment isolation. All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).

14.4 Lockout device application.

14.4.1 Lockout or tagout devices shall be affixed to each energy isolating device by authorized employees.

14.4.2 Lockout devices, where used, shall be affixed in a manner to that will hold the energy isolating devices in a "safe" or "off" position.

14.4.3 Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

14.5 Tagout device application.

14.5.1 Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached.

14.5.2 Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

14.6 Stored energy.

14.6.1 Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe.

14.6.2 If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

14.7 Verification of isolation. Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and deenergization of the machine or equipment have been accomplished.

15. Release from Lockout or Tagout.

15.1 Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized employee(s) to ensure the following:

15.1.1 The machine or equipment. The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

15.1.2 Employees. The work area shall be checked to ensure that all employees have been safely positioned or removed.

15.2 After lockout or tagout devices are removed. After lockout or tagout devices are removed and before a machine or equipment is started, affected employees shall be notified that the lockout or tagout device(s) have been removed.

15.3 Lockout or tagout devices removal. Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of PCSI's authorized superintendent, provided that specific procedures and training for such removal have been developed, documented and incorporated into PCSI's energy control program. PCSI shall demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. The specific procedure shall include at least the following elements:

15.3.1 Verification that the authorized employee who applied the device is not at the jobsite.

15.3.2 Making all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed.

15.3.3 Ensuring that the authorized employee has this knowledge before he/she resumes work at that jobsite.

16. Testing of Machines, Equipment, or Components.

16.1 Testing or positioning of machines, equipment or components thereof. In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions shall be followed:

16.1.1 Clear the machine or equipment of tools and materials.

16.1.2 Remove employees from the machine or equipment area.

16.1.3 Remove the lockout or tagout devices as specified as part of the individual machine procedures.

16.1.4 Energize and proceed with testing or positioning.

16.1.5 Deenergize all systems and reapply energy control measures in accordance with machine procedures and continue the servicing and/or maintenance.

17. Non-subcontractor Personnel.

17.1 Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this instruction, PCSI and the outside employer shall inform each other of their respective lockout or tagout procedures.

17.2 PCSI shall ensure that his/her employees understand and comply with the restrictions and prohibitions of the outside employer's energy control program.

18. Group Lockout or Tagout.

18.1 When servicing and/or maintenance is performed by a crew, craft, department or other group, they shall utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

18.2 Group lockout or tagout devices shall be used in accordance with the procedures required by this instruction governing individual procedures which shall include, but not necessarily limited to, the following specific requirements:

18.2.1 Primary responsibility will be vested in an authorized employee for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock).

18.2.2 Provision for the authorized employee to ascertain the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment will be made.

18.2.3 When more than one crew, craft, department, etc. is involved, assignment of overall job-associated lockout or tagout control responsibility will be vested to an authorized employee designated to coordinate affected work forces and ensure continuity of protection.

18.2.4 Each authorized employee shall affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

19. Shift or Personnel Changes. Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of lockout or tagout device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment, or the release of stored energy.

20. Definitions Applicable to this Instruction.

Affected employee - An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized employee - A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

Capable of being locked out - An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Energized - Connected to an energy source or containing residual or stored energy.

Energy isolating device - A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:

1. A manually operated electrical circuit breaker.
2. A disconnect switch.
3. A manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently.
4. A line valve; a block; and any similar device used to block or isolate energy.
5. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Energy source - Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other potential energy.

Hot tap - A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Lockout - The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device - A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in a safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Normal production operations - The utilization of a machine or equipment to perform its intended production function.

Servicing and/or maintenance - Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

Setting up - Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout - The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout device - A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

DATE: 01 August 2009

SUBJECT: Scaffolding Safety Program.

REGULATORY STANDARDS: 29 CFR 1926.450-454
Safety Requirements For Scaffolding.

PCSI Scaffolding Safety Program

1. Written Program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur to the governing regulatory standards, that prompt revision of this document, or when jobsite operational changes occur that require a revision of this document. Effective implementation requires a written program for job safety and health, that is endorsed and advocated by the highest level of management within this company and that outlines our goals and plans. This written program will be communicated to all required personnel. It is designed to establish clear goals, and objectives.

2. General Requirements. All jobsite and equipment owned by PCSI will be maintained in a safe and healthful manner. Certain work conditions may contain a reasonable probability of injury that can be prevented by proper maintenance and supervision. PCSI and this company will do all possible to ensure the safety of our employees. No employee will knowingly be subjected to a hazardous condition without all possible protective measures first being implemented.

3. Manufacturers Recommendations for Safety. To insure safety and serviceability the following general precautions concerning the care and use of wooden Scaffolding will be observed:

4. Company Fixed Scaffolding Safety Policy. To insure safety and serviceability the following general precautions concerning the care and use of Scaffolding will be observed:

4.1 Footing and anchorages. The footing and or anchorage for scaffolds will be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks will not be used to support scaffolds or planks.

4.2 Scaffolds and their components will be capable of supporting without failure at least four times the maximum intended load.

4.3 Scaffolds will be maintained in a safe condition at all times in accordance with the manufacturers recommendations. Fixed scaffolds will not be altered or moved horizontally while they are in use or occupied.

4.4 Any scaffold damaged or weakened from any cause will be immediately tagged out. The scaffold shall not be used until repairs have been completed and it has been re-inspected by a competent person.

4.5 Scaffolds will not be loaded in excess of the working load for which they are intended.

4.6 All load-carrying timber members of scaffold framing will be a minimum of 1,500 f. (Stress Grade) construction grade lumber.

4.7 All planking will be Scaffold Grade as recognized by grading rules for the type of wood used. The scaffold manufacturers recommendations will be followed.

4.8 Nails or bolts used in the construction of scaffolds will be of adequate size and in sufficient numbers at each connection to develop the designed strength of the scaffold. Nails will not be subjected to a straight pull and will be driven full length.

4.9 All planking or platforms will be overlapped (minimum 12 inches) or secured from movement.

4.10 An access Scaffold or equivalent safe access will be provided.

4.11 Scaffold planks will extend over their end supports not less than 6 inches nor more than 18 inches.

4.12 The poles, legs, or uprights of scaffolds will be plumb, and securely and rigidly braced to prevent swaying and displacement.

4.13 Materials being hoisted onto a scaffold will have a tag line.

4.14 Overhead protection will be provided for men on a scaffold exposed to overhead hazards.

4.15 Scaffolds will be provided with a screen between the toeboard and the guardrail, extending along the entire opening, consisting of No. 18 gauge U.S. Standard Wire one-half-inch mesh or the equivalent, where persons are required to work or pass under the scaffolds.

4.16 Employees will not work on scaffolds which are covered with ice or snow, unless all ice or snow is removed and planking sanded to prevent slipping.

4.17 Tools, materials, and debris will not be allowed to accumulate in quantities to cause a hazard.

4.18 Only treated or protected fiber rope will be used for or near any work involving the use of corrosive substances or chemicals.

4.19 Wire or fiber rope used for scaffold suspension will be capable of supporting at least six times the intended load.

4.20 The use of shore scaffolds or lean-to scaffolds will not be used by this company.

4.21 Lumber sizes, when used in this section, refer to nominal sizes except where otherwise stated.

4.22 Scaffolds will be secured to permanent structures, through use of anchor bolts, reveal bolts, or other equivalent means. Window cleaners' anchor bolts will not be used.

4.23 Special precautions will be taken to protect scaffold members, including any wire or fiber ropes, when using a heat-producing process.

5. Mobile (Rolling) Scaffolding Safety Policy. To insure safety and serviceability the following general precautions concerning the care and use of Scaffolding will be observed:

5.1 Working loads. Work platforms and scaffolds will be capable of carrying the design load under varying circumstances depending upon the conditions of use.

5.2 The design load of all scaffolds will be calculated on the basis of:

Light - Designed and constructed to carry a working load of 25 pounds per square foot.
Medium - Designed and constructed to carry a working load of 50 pounds per square foot.
Heavy - Designed and constructed to carry a working load of 75 pounds per square foot.

5.3 Nails, bolts, or other fasteners used in the construction of ladders, scaffolds, and towers will be of adequate size and in sufficient numbers at each connection to develop the designed strength of the unit. Nails will be driven full length. (All nails should be immediately withdrawn from dismantled lumber.)

5.4 All exposed surfaces will be free from sharp edges, burrs or other safety hazards.

5.5 Work levels. The maximum work level height will not exceed four (4) times the minimum or least base dimensions of any mobile scaffold. Where the basic mobile unit does not meet this requirement, suitable outrigger frames will be

employed to achieve this least base dimension, or provisions will be made to guy or brace the unit against tipping.

5.6 The minimum platform width for any work level will not be less than 20 inches for mobile scaffolds (towers). Ladder stands will have a minimum step width of 16 inches.

5.7 The supporting structure for the work level will be rigidly braced, using adequate cross bracing or diagonal bracing with rigid platforms at each work level.

5.8 The work level platform of scaffolds (towers) will be of wood, aluminum, or plywood planking, steel or expanded metal, for the full width of the scaffold, except for necessary openings. Work platforms will be secured in place. All planking will be 2-inch (nominal) scaffold grade minimum 1,500 f. (stress grade) construction grade lumber or equivalent.

5.9 All scaffold work levels 10 feet or higher above the ground or floor will have a standard (4-inch nominal) toeboard.

5.10 All work levels 10 feet or higher above the ground or floor will have a guardrail of 2- by 4-inch nominal or the equivalent installed no less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch nominal lumber or equivalent.

5.11 Wheels or casters. Wheels or casters will be inspected to ensure that they are provided with strength and dimensions to support four (4) times the design working load.

5.12 All scaffold casters will be inspected to ensure that they are provided with a positive wheel and/or swivel lock to prevent movement.

5.13 Where leveling of the elevated work platform is required, screw jacks or other suitable means for adjusting the height will be used.

5.14 Employees are not permitted to ride rolling scaffolds during relocation.

5.15 Adjusting screws may not be extended more than 12 inches.

5.16 Before moving the platform secure all equipment and material.

5.17 Casters or wheels must have a serviceable locking device.

5.18 Be aware of overhead obstructions when moving scaffolds.

5.19 Never run over electrical cords.

5.20 Never pull scaffolds from the top, always push at base level.

5.21 Work only from the platform area never extend work beyond guardrailing.

6. Erecting of Scaffolding. Only trained and authorized employees of this company will supervise the erection of scaffolding. Pertinent OSHA regulations and information and guidance provided by the manufacturer of the particular type of scaffolding will be used. The following apply:

6.1 Manufacturers erection instructions will be followed.

6.2 Advance planning considerations will be followed during the erection process.

6.3 Only trained and authorized employees will supervise the erection of scaffolding.

6.4 Each component will be visually inspected before use.

6.5 Defective or unserviceable materials will not be used,

6.6 Only approved lumber will be used.

6.7 Consult with the project manager where any instructions are unclear.

7. Pre-Inspection of Erected Scaffolding. The three main areas of inspection are for rust, straightness of members, and welds. Only trained employees of this company will conduct the pre-inspection. Pertinent OSHA regulations and information and guidance provided by the manufacturer of the particular type of scaffolding will be used. The following as a minimum apply:

7.1 Rust. Heavily rusted scaffolding equipment is a possible sign of abuse or neglect. Severely rusted components should be thoroughly inspected and cleaned before approved for use.

7.2 Straightness of members. Mishandling, trucking and storing may cause damage to scaffolding equipment. All members or parts of all steel scaffolding components should be straight and free from bends, kinks or dents.

7.3 Welds. Scaffolding equipment should be checked before use for damaged welds and any piece of equipment showing damaged welds or rewelding beyond the original factory weld should not be used. The factory weld reference pertains to location and quality of rewelds.

7.4 Check serviceability of locking devices.

7.5 Check alignment of coupling pins and braces.

7.6 Check serviceability of caster brakes (rolling scaffolds).

8. Final Inspection of Erected Scaffolding. Only trained and authorized employees (designated competent persons) of this company will conduct the final inspection of erected scaffolding. Inspections will occur prior to and periodically during use. Pertinent OSHA regulations and information and guidance provided by the manufacturer of the particular type of scaffolding will be used. The following as a minimum apply:

8.1 Check for proper support under every leg of every frame.

8.2 Check for wash out (if outside) due to rain.

8.3 Check to ensure all base plates or adjustment screws are in firm contact with supports.

8.4 Check frames for plumbness and squareness in both directions.

8.5 Check serviceability and correctness of all cross braces.

8.6 Check to ensure that all planking and accessories are properly installed.

8.7 Check to ensure that all guard rails are in place.

8.8 Recheck periodically to ensure conditions remain safe.

9. Dismantling of Scaffolding. Only trained and authorized employees of this company will supervise the dismantling of scaffolding. Pertinent OSHA regulations and information and guidance provided by the manufacturer of the particular type of scaffolding will be used. The following apply:

9.1 Manufacturers dismantling instructions will be followed.

9.2 Relocation planning considerations will be considered during the dismantling process.

9.3 Dismantling will be supervised by a competent employee.

9.4 Each component will be visually inspected after use.

9.5 Defective or unserviceable materials will not stored with serviceable materials.

9.6 Avoid dropping or throwing the components as this could result in damage to the equipment.

9.7 Consult with the project manager where any instructions are unclear.

10. Training. A training program will be provided for all employees who will be using scaffolding in the course of their duties. The training will be conducted by competent personnel. The program will include but will not be limited to:

- A description of fall hazards in the work area or job site
- Procedures for using fall prevention and protection systems
- Scaffolding access and egress procedures
- Scaffolding equipment limitations
- Inspection and storage procedures for the equipment

10.1 Initial training. Training will be conducted prior to job assignment. PCSI will provide training to ensure that the purpose, function, and proper use of scaffolding is understood by employees and that the knowledge and skills required for the safe application, and usage is acquired by employees. This standard practice instruction will be provided to, and read by all employees receiving training. The training will include, as a minimum the following:

10.1.1 Types of scaffolding used by this company.

10.1.2 Recognition of applicable fall hazards associated with the work to be completed and the locations of such.

10.1.3 Load determination and balancing requirements.

10.1.4 Safety precautions in the use of scaffolds.

10.1.5 All other employees whose work operations are or may be in an area where scaffolding may be utilized, will be instructed to an awareness level concerning the associated hazards.

10.1.6 Equipment maintenance and inspection requirements.

10.1.7 Equipment strengths and limitations.

10.1.8 Certification. PCSI will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Training will be accomplished by competent personnel.

10.2 Refresher training. This standard practice instruction will be provided to, and read by all employees receiving refresher training. The training content will

be identical to initial training. Refresher training will be conducted on an as needed basis or when the following conditions are met, whichever event occurs sooner.

10.2.1 Whenever (and prior to) a change in their job assignments, a change in the type of scaffolding equipment used, or when a known hazard is added to the work environment which affects this program.

10.2.2 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever PCSI has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of scaffolding equipment or procedures.

10.2.3 Whenever a scaffolding safety procedure fails.

10.2.4 The retraining will reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

10.2.5 Certification. PCSI will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Training will be accomplished by competent personnel.

DATE: 01 August 2009

SUBJECT: Sling, Rigging Safety Program

REGULATORY STANDARD: OSHA - 29 CFR 1926.251
ANSI - B30.9-1971

PCSI Sling Safety Program

1. Written program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur to 29 CFR 1926.251, that prompt revision of this document, or when jobsite operational changes occur that require a revision of this document. Effective implementation of this program requires support from all levels of management within this company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. General requirements. PCSI will establish sling safety operational procedures through the use of this document. This standard practice instruction applies to slings used in conjunction with other material handling equipment for the movement of material by hoisting. The types of slings covered are those made from alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope (conventional three strand construction), and synthetic web (nylon, polyester, and polypropylene).

3. Initial training. Training shall be conducted prior to job assignment. PCSI shall provide training to ensure that the purpose, function, and proper use of slings is understood by employees and that the knowledge and skills required for the safe application, and usage is acquired by employees. This standard practice instruction shall be provided to, and read by all employees receiving training. The training shall include, as a minimum the following:

3.1 Types of slings appropriate for use.

3.2 Recognition of applicable hazards associated with the work to be completed.

3.3 Load determination and balancing requirements.

3.4 Procedures for removal of a sling from service.

3.5 All other employees whose work operations are or may be in an area where slings may be utilized, shall be instructed to an awareness level concerning hazards associated with slings.

3.6 Sling identification. Slings having identification numbers will be checked for legibility. Slings having illegible identification will be taken out of service, and replaced.

3.7 Certification. PCSI shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

4. Refresher training. This standard practice instruction shall be provided to, and read by all employees receiving refresher training. The training content shall be identical to initial training. Refresher training will be conducted on an as needed basis or when the following conditions are met, which ever event occurs sooner.

4.1 Retraining shall be provided for all authorized and affected employees whenever (and prior to) there being a change in their job assignments, a change in the type of sling used, equipment being loaded, loading procedures, or when a known hazard is added to the loading environment.

4.2 Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever PCSI has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of sling procedures.

4.3 The retraining shall reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

4.4 Certification. PCSI shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

5. Safe operating practices. Whenever any sling is used, the following practices shall be observed:

5.1 Slings that are damaged or defective shall not be used.

5.2 Slings shall not be shortened with knots or bolts or other makeshift devices.

5.3 Sling legs shall not be kinked.

5.4 Slings shall not be loaded in excess of their rated capacities.

5.5 Slings used in a basket hitch shall have the loads balanced to prevent slippage.

5.6 Slings shall be securely attached to their loads.

5.7 Slings shall be padded or protected from the sharp edges of their loads.

5.8 Suspended loads shall be kept clear of all obstructions.

5.9 All employees shall be kept clear of loads about to be lifted and of suspended loads. Guide lines shall be used to ensure distance is maintained from suspended loads.

5.10 Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.

5.11 Shock loading is prohibited.

5.12 A sling shall not be pulled from under a load when the load is resting on the sling.

5.13 Before being lifted completely from its resting loads will be checked for proper balance.

5.14 Unapproved makeshift slings such as fan belts will never be used at this company.

5.15 Slings and other rigging equipment no longer in use will be removed from the immediate work area and stored appropriately.

5.16 Slings shall only be attached to lifting hooks or other attachment assemblies that can be closed and locked such that they eliminate the hook throat opening. Alternately a shackle with nut and locking pin may be used.

6. Sling inspections. Where not other wise delineated, sling inspections will be conducted in accordance with this section.

6.1 Sling inspectors. The following employees or position titles will receive training and as required, serve as sling inspectors. Company qualified inspectors will consist of the following:

SLING INSPECTORS

Title	Member
Sling Inspector	Superintendent
Sling Inspector	Foreman
Sling Inspector	Subcontractor Safety Professional (If involved)
Sling Inspector	Director of Safety

6.2 Inspection intervals.

6.2.1 Daily inspections. Slings will be inspected each shift before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by the user.

6.2.2 Periodic inspections. Supervisors will determine and schedule additional inspections periodically during sling use, where service conditions warrant. A thorough periodic inspection shall be made on a regular basis, to be determined on the basis of, frequency of sling use; severity of service conditions; nature of lifts being made; and experience gained on the service life of slings used in similar circumstances.

6.2.3 Scheduled inspections. PCSI will coordinate inspection dates and times with all assigned sling inspectors. The inspections will be conducted on a weekly basis. Such inspections shall in no event be at intervals greater than once every 1 month.

6.3 Inspection documentation. Slings having identification numbers will be documented as having been inspected. Scheduled inspections will be documented as having been conducted.

6.4 Inspection documentation storage. Inspection records and certifications shall be maintained with and made available by PCSI.

6.5 Damaged/unserviceable slings. Slings found to be damaged or unserviceable will be immediately removed from service and disposed of.

7. Requirements for specific types of slings.

7.1 Alloy steel chain slings.

7.1.1 Sling identification. Alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity, and reach.

7.1.2 Attachments.

7.1.2.1 Hooks, rings, oblong links, pear shaped links, welded or mechanical coupling links or other attachments shall have a rated capacity at least equal to that of the alloy steel chain with which they are used or the sling shall not be used in excess of the rated capacity of the weakest component.

7.1.2.2 Makeshift links or fasteners formed from bolts or rods, or other such attachments, shall not be used.

7.1.3 Inspections.

7.1.3.1 A thorough periodic inspection of alloy steel chain slings in use shall be made on a regular basis, to be determined on the basis of, frequency of sling use; severity of service conditions; nature of lifts being made; and experience gained on the service life of slings used in similar circumstances. Such inspections shall in no event be at intervals greater than once every 12 months.

7.1.3.2 PCSI shall make and maintain a record of the most recent month in which each alloy steel chain sling was thoroughly inspected, and shall make such record available for examination by employees, OSHA personnel or other persons having a need to know.

7.1.3.3 Inspection of alloy steel chain slings shall be performed by any member qualified by this company to inspect slings, and shall include a thorough inspection for wear, defective welds, deformation and increase in length. Where such defects or deterioration are present, the sling shall be immediately removed from service.

7.1.4 Proof testing. This company shall ensure that before use, each new, repaired, or reconditioned alloy steel chain sling, including all welded components in the sling assembly, shall be proof tested by the sling manufacturer, in accordance with paragraph 5.2 of the American Society of Testing and Materials Specification A391-65 (ANSI G61.1 1968). The certificate of the proof test and shall be retained and made available for examination to qualified persons.

7.1.5 Sling use. Alloy steel chain slings shall not be used with loads in excess of the rated capacities prescribed in Table N-184-1 of 29 CFR 1910.184. Slings not included in this table shall be used only in accordance with the manufacturer's recommendations.

7.1.6 Safe operating temperatures. Alloy steel chain slings shall be permanently removed from service if they are heated above 1000F. When exposed to service temperatures in excess of 600F, maximum working load limits permitted in Table N-184-1 of 29 CFR 1910.184 shall be reduced in accordance with the chain or sling manufacturer's recommendations.

7.1.7 Repairing and reconditioning alloy steel chain slings.

7.1.7.1 Worn or damaged alloy steel chain slings or attachments shall not be used until repaired. When welding or heat testing is performed, slings shall not be used unless repaired, reconditioned and proof tested by the sling manufacturer.

7.1.7.2 Mechanical coupling links or low carbon steel repair links shall not be used to repair broken lengths of chain.

7.1.8 Effects of wear. If the chain size at any point of any link is less than that stated in Table N-184-2 of 29 CFR 1910.184, the sling shall be removed from service.

7.1.9 Deformed attachments.

7.1.9.1 Alloy steel chain slings with cracked or deformed master links, coupling links or other components shall be removed from service.

7.1.9.2 Slings shall be removed from service if hooks are cracked, have been opened more than 15 percent of the normal throat opening measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook.

7.2 Wire rope slings.

7.2.1 Sling use. Wire rope slings shall not be used with loads in excess of the rated capacities shown in Tables N-184-3 through N-184-14 of 29 CFR 1910.184. Slings not included in these tables shall be used only in accordance with the manufacturer's recommendations.

7.2.2 Minimum sling lengths.

7.2.2.1 Cable laid and 6 x 19 and 6 x 37 slings shall have a minimum clear length of wire rope 10 times the component rope diameter between splices, sleeves or end fittings.

7.2.2.2 Braided slings shall have a minimum clear length of wire rope 40 times the component rope diameter between the loops or end fittings.

7.2.2.3 Cable laid grommets, strand laid grommets and endless slings shall have a minimum circumferential length of 96 times their body diameter.

7.2.3 Safe operating temperatures. Fiber core wire rope slings of all grades shall be permanently removed from service if they are exposed to temperatures in excess of 200 F. When nonfiber core wire rope slings of any grade are used at temperatures above 400 F or below minus 60 F, recommendations of the sling manufacturer regarding use at that temperature shall be followed.

7.2.4 End attachments.

7.2.4.1 Welding of end attachments, except covers to thimbles, shall be performed prior to the assembly of the sling.

7.2.4.2 All welded end attachments shall not be used unless proof tested at twice their rated capacity prior to initial use. Certificates of the proof test will be retained a made it available for examination by authorized persons.

7.2.5 Removal from service. Wire rope slings shall be immediately removed from service if any of the following conditions are present:

7.2.5.1 Ten randomly distributed broken wires in one rope lay, or five broken wires in one strand in one rope lay.

7.2.5.2 Wear or scraping of one-third the original diameter of outside individual wires.

7.2.5.3 Kinking, crushing, bird caging or any other damage resulting in distortion of the wire rope structure.

7.2.5.4 Evidence of heat damage.

7.2.5.5 End attachments that are cracked, deformed or worn.

7.2.5.6 Hooks that have been opened more than 15 percent of the normal throat opening measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook.

7.2.5.7 Corrosion of the rope or end attachments.

7.3 Metal mesh slings.

7.3.1 Sling marking. Each metal mesh sling shall have permanently affixed to it a durable marking that states the rated capacity for vertical basket hitch and choker hitch loadings.

7.3.2 Handles. Handles shall have a rated capacity at least equal to the metal fabric and exhibit no deformation after proof testing.

7.3.3 Attachments of handles to fabric. The fabric and handles shall be joined so that:

7.3.3.1 The rated capacity of the sling is not reduced.

7.3.3.2 The load is evenly distributed across the width of the fabric.

7.3.3.3 Sharp edges will not damage the fabric.

7.3.4 Sling coatings. Coatings which diminish the rated capacity of a sling shall not be applied.

7.3.5 Sling testing. All new and repaired metal mesh slings, including handles, shall not be used unless proof tested by the manufacturer or equivalent entity at a minimum of 1 1/2 times their rated capacity. Elastomer impregnated slings shall be proof tested before coating.

7.3.6 Proper use of metal mesh slings. Metal mesh slings shall not be used to lift loads in excess of their rated capacities as prescribed in Table N-184-15 of 29 CFR 1910.184. Slings not included in this table shall be used only in accordance with the manufacturer's recommendations.

7.3.7 Safe operating temperatures. Metal mesh slings which are not impregnated with elastomers may be used in a temperature range from minus 20 F to plus 550 F without decreasing the working load limit. Metal mesh slings impregnated with polyvinyl chloride or neoprene may be used only in a temperature range from zero degrees to plus 200 F. For operations outside these temperature ranges or for metal mesh slings impregnated with other materials, the sling manufacturer's recommendations shall be followed.

7.3.8 Repairs.

7.3.8.1 Metal mesh slings which are repaired shall not be used unless repaired by a metal mesh sling manufacturer or an equivalent entity.

7.3.8.2 Once repaired, each sling shall be permanently marked or tagged, or a written record maintained, to indicate the date and nature of the repairs and the person or organization that performed the repairs. Records of repairs shall be made available for examination.

7.3.9 Removal from service. Metal mesh slings shall be immediately removed from service if any of the following conditions are present:

7.3.9.1 A broken weld or broken brazed joint along the sling edge.

7.3.9.2 Reduction in wire diameter of 25 per cent due to abrasion or 15 per cent due to corrosion.

7.3.9.3 Lack of flexibility due to distortion of the fabric.

7.3.9.4 Distortion of the female handle so that the depth of the slot is increased more than 10 per cent.

7.3.9.5 Distortion of either handle so that the width of the eye is decreased more than 10 per cent.

7.3.9.6 A 15 percent reduction of the original cross sectional area of metal at any point around the handle eye.

7.3.9.7 Distortion of either handle out of its plane.

7.4 Natural and synthetic fiber rope slings.

7.4.1 Sling use.

7.4.1.1 Fiber rope slings made from conventional three strand construction fiber rope shall not be used with loads in excess of the rated capacities prescribed in Tables N-184-16 through N-184-19 of 29 CFR 1910.184.

7.4.1.2 Fiber rope slings shall have a diameter of curvature meet of 29 CFR 1910.184.

7.4.1.3 Slings not included in these tables shall be used only in accordance with the manufacturer's recommendations.

7.4.2 Safe operating temperatures. Natural and synthetic fiber rope slings, except for wet frozen slings, may be used in a temperature range from minus 20 F to plus 180 F without decreasing the working load limit. For operations outside this temperature range and for wet frozen slings, the sling manufacturer's recommendations shall be followed.

7.4.3 Splicing. Spliced fiber rope slings shall not be used unless they have been spliced in accordance with the following minimum requirements and in accordance with any additional recommendations of the manufacturer:

7.4.3.1 In manila rope, eye splices shall consist of at least three full tucks, and short splices shall consist of at least six full tucks, three on each side of the splice center line.

7.4.3.2 In synthetic fiber rope, eye splices shall consist of at least four full tucks, and short splices shall consist of at least eight full tucks, four on each side of the center line.

7.4.3.3 Strand end tails shall not be trimmed flush with the surface of the rope immediately adjacent to the full tucks. This applies to all types of fiber rope and both eye and short splices. For fiber rope under one inch in diameter, the tail shall project at least six rope diameters beyond the last full tuck. For fiber rope one inch in diameter and larger, the tail shall project at least six inches beyond the last full tuck. Where a projecting tail interferes with the use of the sling, the tail shall be tapered and spliced into the body of the rope using at least two additional tucks (which will require a tail length of approximately six rope diameters beyond the last full tuck).

7.4.3.4 Fiber rope slings shall have a minimum clear length of rope between eye splices equal to 10 times the rope diameter.

7.4.3.5 Knots shall not be used in lieu of splices.

7.4.3.6 Clamps not designed specifically for fiber ropes shall not be used for splicing.

7.4.3.7 For all eye splices, the eye shall be of such size to provide an included angle of not greater than 60 degrees at the splice when the eye is placed over the load or support.

7.4.4 End attachments. Fiber rope slings shall not be used if end attachments in contact with the rope have sharp edges or projections.

7.4.5 Removal from service. Natural and synthetic fiber rope slings shall be immediately removed from service if any of the following conditions are present:

7.4.5.1 Abnormal wear.

7.4.5.2 Powdered fiber between strands.

7.4.5.3 Broken or cut fibers.

7.4.5.4 Variations in the size or roundness of strands.

7.4.5.5 Discoloration or rotting.

7.4.5.6 Distortion of hardware in the sling.

7.4.6 Repairs. Only fiber rope slings made from new rope shall be used. Use of repaired or reconditioned fiber rope slings is prohibited.

7.5 Synthetic web slings.

7.5.1 Sling identification. Each sling shall be marked or coded to show the rated capacities for each type of hitch and type of synthetic web material.

7.5.2 Webbing. Synthetic webbing shall be of uniform thickness and width and selvage edges shall not be split from the webbing's width.

7.5.3 Fittings. Fittings shall be:

7.5.3.1 Of a minimum breaking strength equal to that of the sling.

7.5.3.2 Free of all sharp edges that could in any way damage the webbing.

7.5.4 Attachment of end fittings to webbing and formation of eyes. Stitching shall be the only method used to attach end fittings to webbing and to form eyes. The thread shall be in an even pattern and contain a sufficient number of stitches to develop the full breaking strength of the sling.

7.5.5 Sling use. Synthetic web slings illustrated in Fig. N-184-6 of 29 CFR 1910.184 shall not be used with loads in excess of the rated capacities specified in Tables N-184-20 through N-184-22 of 29 CFR 1910.184. Slings not included in these tables shall be used only in accordance with the manufacturer's recommendations.

7.5.6 Environmental conditions. When synthetic web slings are used, the following precautions shall be taken:

7.5.6.1 Nylon web slings shall not be used where fumes, vapors, sprays, mists or liquids of acids or phenolics are present

7.5.6.2 Polyester and polypropylene web slings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.

7.5.6.3 Web slings with aluminum fittings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.

7.5.7 Safe operating temperatures. Synthetic web slings of polyester and nylon shall not be used at temperatures in excess of 180 F. Polypropylene web slings shall not be used at temperatures in excess of 200 F.

7.5.8 Repairs.

7.5.8.1 Synthetic web slings which are repaired shall not be used unless repaired by a sling manufacturer or an equivalent entity.

7.5.8.2 Each repaired sling shall be proof tested by the manufacturer or equivalent entity to twice the rated capacity prior to its return to service. The employer shall retain a certificate of the proof test and make it available for examination.

7.5.8.3 Slings, including webbing and fittings, which have been repaired in a temporary manner shall not be used.

7.5.9 Removal from service. Synthetic web slings shall be immediately removed from service if any of the following conditions are present:

7.5.9.1 Acid or caustic burns.

7.5.9.2 Melting or charring of any part of the sling surface.

7.5.9.3 Snags, punctures, tears or cuts.

7.5.9.4 Broken or worn stitches.

7.5.9.5 Distortion of fittings.

8. Definitions.

Angle of loading is the inclination of a leg or branch of a sling measured from the horizontal or vertical plane as shown in Fig. N-184-5 of 29 CFR 1910.184; provided that an angle of loading of five degrees or less from the vertical may be considered a vertical angle of loading.

Basket hitch is a sling configuration whereby the sling is passed under the load and has both ends, end attachments, eyes or handles on the hook or a single master link.

Braided wire rope is a wire rope formed by plaiting component wire ropes.

Bridle wire rope sling is a sling composed of multiple wire rope legs with the top ends gathered in a fitting that goes over the lifting hook.

Cable laid endless sling mechanical joint is a wire rope sling made endless by joining the ends of a single length of cable laid rope with one or more metallic fittings.

Cable laid grommet-hand tucked is an endless wire rope sling made from one length of rope wrapped six times around a core formed by hand tucking the ends of the rope inside the six wraps.

Cable laid rope is a wire rope composed of six wire ropes wrapped around a fiber or wire rope core.

Cable laid rope sling mechanical joint is a wire rope sling made from a cable laid rope with eyes fabricated by pressing or swaging one or more metal sleeves over the rope junction.

Choker hitch is a sling configuration with one end of the sling passing under the load and through an end attachment, handle or eye on the other end of the sling.

Coating is an elastomer or other suitable material applied to a sling or to a sling component to impart desirable properties.

Cross rod is a wire used to join spirals of metal mesh to form a complete fabric. (See Fig. N-184-2 of 29 CFR 1910.184.)

Designated means selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.

Equivalent entity is a person or organization (including an employer) which, by possession of equipment, technical knowledge and skills, can perform with equal competence the same repairs and tests as the person or organization with which it is equated.

Fabric (metal mesh) is the flexible portion of a metal mesh sling consisting of a series of transverse coils and cross rods.

Female handle (choker) is a handle with a handle eye and a slot of such dimension as to permit passage of a male handle thereby allowing the use of a metal mesh sling in a choker hitch. (See Fig. N-184-1 of 29 CFR 1910.184.)

Handle is a terminal fitting to which metal mesh fabric is attached. (See Fig. N-184-1 of 29 CFR 1910.184.)

Handle eye is an opening in a handle of a metal mesh sling shaped to accept a hook, shackle or other lifting device. (See Fig. N-184-1 of 29 CFR 1910.184.)

Hitch is a sling configuration whereby the sling is fastened to an object or load, either directly to it or around it. Link is a single ring of a chain.

Male handle (triangle) is a handle with a handle eye.

Master coupling link is an alloy steel welded coupling link used as an intermediate link to join alloy steel chain to master links. (See Fig. N-184-3 of 29 CFR 1910.184.)

Master link or gathering ring is a forged or welded steel link used to support all members (legs) of an alloy steel chain sling or wire rope sling. (See Fig. N-184-3 of 29 CFR 1910.184.)

Mechanical coupling link is a nonwelded, mechanically closed steel link used to attach master links, hooks, etc., to alloy steel chain.

Proof load is the load applied in performance of a proof test.

Proof test is a nondestructive tension test performed by the sling manufacturer or an equivalent entity to verify construction and workmanship of a sling.

Rated capacity or working load limit is the maximum working load permitted by the provisions of this section.

Reach is the effective length of an alloy steel chain sling measured from the top bearing surface of the upper terminal component to the bottom bearing surface of the lower terminal component.

Selvage edge is the finished edge of synthetic webbing designed to prevent unraveling.

Sling is an assembly which connects the load to the material handling equipment.

Sling manufacturer is a person or organization that assembles sling components into their final form for sale to users.

Spiral is a single transverse coil that is the basic element from which metal mesh is fabricated. (See Fig. N-184-2 of 29 CFR 1910.184.)

Strand laid endless sling-mechanical joint is a wire rope sling made endless from one length of rope with the ends joined by one or more metallic fittings.

Strand laid grommet-hand tucked is an endless wire rope sling made from one length of strand wrapped six times around a core formed by hand tucking the ends of the strand inside the six wraps.

Strand laid rope is a wire rope made with strands (usually six or eight) wrapped around a fiber core, wire strand core, or independent wire rope core (IWRC).

Vertical hitch is a method of supporting a load by a single, vertical part or leg of the sling. (See Fig. N-184-4 of 29 CFR 1910.184.)

DATE: 01 August 2009

SUBJECT: Trenching and Excavation Safety

REGULATORY STANDARD: 29 CFR 1926.650 - 653

PCSI Trenching and Excavation Safety Program

1. Written Program. PCSI will review and evaluate this standard practice instruction:

- On an annual basis
- When regulatory changes occur that prompt revision of this document
- When jobsite operational changes occur that require a revision of this document
- When there is an accident or close call that relates to this topic

Effective implementation of this program requires support from all levels of management within the alliance team. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of the number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. General Requirements. PCSI will establish procedures for "trenching and excavation" undertaken by its employees, through the use of this document. Preventing future work-place injuries in the workplace is the principle purpose of this document. This document will provide a basis for ensuring that all procedures implemented, revised or modified meet our requirements for safety. This document will help identify hazards in our work place and enable us to determine the best course of action to take to reduce or eliminate known hazards.

3. Surface Encumbrances and Underground Installations Safety Guidelines. All surface encumbrances that are located so as to create a hazard to employees will be removed or supported, as necessary, to safeguard employees. The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, will be determined prior to opening an excavation by using the States One-Call-System. The following procedures are designed to provide employees of PCSI with a system for protection and safe conditions while working in a trenching or excavation environment. Employees at all levels within the work force design these guidelines for use.

3.1 Establish the locations of all underground and overhead utilities and services before beginning trenching or excavation operations.

3.1.1 Using the states One-Call-System, contact utility and service companies to include municipal owned and advise them prior to the start of all actual excavation. No exceptions.

3.1.2 Utility companies or owners will be contacted:

- Within established or customary local response times;
- Advised of the proposed work, and;
- Asked to establish the location of the utility underground installations prior to the start of actual excavation and provide advise concerning surface encumbrances.

3.1.3 When excavation operations approach the estimated location of underground installations, the exact location of the installations will be determined by safe and acceptable means (modern techniques and customary types of equipment) where this determination is unclear the owning utility will be contacted for assistance.

3.1.4 While any excavation is open, underground installations will be protected, supported or removed as necessary to safeguard employees.

4. Protection from Hazards Associated with Water Accumulation

4.1 Employees will not work in excavations in which there is accumulated water, or in excavations, in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline systems.

4.2 Inspect all excavations after any rainfall or other hazard-producing occurrence to determine if any change to the soils capacity to resist the force has occurred. A person that has the competence to do so will do this.

4.2.1 Authorized to inspect:

1. _____ Primary
2. _____ Alternate

4.2.2 Water should not be allowed to accumulate within the excavation. If such has occurred it will be removed utilizing proper pumping procedures and precautions.

4.3 Water will be controlled or prevented from accumulating by the use of water removal equipment; a competent person to ensure proper operation will monitor the water removal equipment and operations.

4.4 If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches or dikes, suitable means will be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. A competent person will inspect excavations subject to runoff from heavy rains

5. Protection from Superimposed Loads

5.1 Superimposed loads (crane, backhoe and other such equipment working close to the excavation edges) require extra sheet piling, shoring or other bracing be used to assure the ability of the soil to resist. The use of mobile equipment near the excavation requires proper vehicle barricades and/or stop blocks.

6. Accesses and Egress from Excavations

6.1. Structural ramps. A competent person will design structural ramps that are used solely by employees, as a means of access or egress from excavations. Structural ramps used for access or egress of equipment will be designed by a competent person qualified in structural design, and will be constructed in accordance with the design.

6.2. Means of egress from trench excavations (less than 20 ft deep). A stairway, ladder, ramp or other safe means of egress will be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

6.3. Means of egress from trench excavations (20 ft or greater in depth). Ladders will be equipped with ladder platforms at 20-foot intervals.

7. Trench Safety

7.1. Trenches more than five feet deep require shoring or will be laid back to its angle of repose (stabilized slope).

7.2. In hazardous soil conditions (loosely compacted or rocky) trenches under five-foot need protection.

7.3 There shall be at any excavation site a competently trained person, who is capable of identifying existing and predictable hazards and who shall have the authority to take prompt corrective action to eliminate them on the site. This individual shall be able to identify soil classifications and protective systems (shoring, bracing and piling) to be used in accordance with OSHA Trenching Standards found in 29 CFR 1926.652.

7.4 Trenches more than five (5) feet deep require shoring or will be laid back to a stable slope. In hazardous soil, trenches under five (5) feet will also be protected.

7.5 Portable trench boxes or sliding trench boxes used in place of shoring and sloping shall be designed, constructed and maintained to provide protection at least equal to the required sheeting and shoring. Shields shall be designed by a registered professional engineer and will meet the standards found in 29 CFR 1926.652.

7.6 Shields shall be installed so as to restrict lateral or other hazardous movement. Trench boxes and shields shall extend to the bottom of the trench and no less than eighteen (18) inches above the vertical top of the trench or excavation face. Exceptions are found in 29 CFR 1926.652. Excavation to a level not greater that 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield. No employee shall be allowed within the shield, or trench box during the installation, removal or relocation. If at anytime trench boxes are stacked, means shall be provided to prevent separation.

8. Exposure to Vehicular Traffic

Employees exposed to public vehicular traffic will be provided with, and will wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

9. Exposure to Falling Loads

9.1 No employee will be permitted underneath loads handled by lifting or digging equipment.

9.2 Employees will be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

9.3 Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with §1926.601, to provide adequate protection for the operator during loading and unloading operations.

10. Warning Systems for Mobile Equipment

When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system will be

utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

11. Hazardous Atmospheres

11.1 Testing and controls. Confined space entry procedures will be adhered to in accordance with the PCSI Confined Space Entry Program. To prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements apply:

11.1.1 Oxygen deficiency. Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation will be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

11.1.2 Flammable atmospheres. Adequate precaution will be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

11.1.3 Testing. When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing will be conducted as often as necessary to ensure that the atmosphere remains safe.

11.2 Emergency rescue equipment.

11.2.1 Availability. Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, will be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. The equipment will be attended when in use.

11.2.2 Lifelines. Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, will wear a harness with a lifeline securely attached to it. The lifeline will be separate from any line used to handle materials, and will be individually attended at all times while the employee wearing the lifeline is in the excavation.

12. Personal Protective Equipment (PPE). The following procedures are designed to provide employees of PCSI with a checklist system or procedure to follow for the selection of proper PPE for operations under this program.

12.1 Checklist

(1) Hard hat
(2) Long sleeve garment
(3) Trouser
(4) Safety toes work boot
(5) Proper eye and face protection
(6) Work glove, rubber or neoprene when working with or in chemicals
(7) NIOSH approved respirator where or when the job hazard may require
(8) Hearing protection
(9) Rubber or neoprene boots when exposed to waste-water products (a sanitary washing facility will be provided for cleanup)

Note: The foreman or superintendent on the site will be responsible for compliance for proper utilization of PPE.

13. Material Handling Equipment. All material handling equipment will be operated in accordance with established written policies, manufactures procedures and applicable OSHA standards.

14. Stability of Adjacent Structures

14.1 Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning will be provided to ensure the stability of such structures for the protection of employees.

14.2 Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees will not be permitted except when:

14.2.1 A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

14.2.2 The excavation is in stable rock; or

14.2.3 A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity: or

14.2.4 A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

14.3 Sidewalks, pavements and appurtenant structures will not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

15. Protection of Employees from Loose Rock or Soil

15.1 Adequate protection will be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection will consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

15.2 Employees will be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection will be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

16. Site Inspections

16.1 Daily inspections of excavations, the adjacent areas, and protective systems will be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. These inspections are only required when employee exposure can be reasonably anticipated. An inspection will be:

16.2 Conducted by the competent person prior to the start of work and as needed throughout the shift.

16.3 Inspections will also be made after every rainstorm or other hazard-increasing occurrence.

16.4 Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees will be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

17. Fall Protection

17.1 Where employees or equipment are required or permitted to cross over excavations, walkways or bridges with standard guardrails will be provided.

17.2 Adequate barrier physical protection will be provided at all remotely located excavations. All wells, pits, shafts, etc., will be barricaded or covered. Upon completion of exploration and other similar operations, temporary wells, pits, shafts, etc., will be backfilled.

18. Training Requirements

18.1 Initial Training.

18.1.1 PCSI shall provide training to ensure the purpose and function of the trenching and excavation program is understood by employees and the knowledge and skills required for safe trenching and excavation operations is acquired by all affected employees. The training shall include as a minimum, the following:

18.1.2 Training in the recognition of applicable hazards associated with trenching and excavation operations.

18.1.3 Each affected employee shall be instructed in the purpose and use of this standard practice instruction.

18.1.4 All other employees whose work operations are or may be in an area where trenching and excavation operation are conducted shall be instructed to an awareness level about the procedures, and prohibitions relating to work in such areas.

18.2 Refresher Training.

18.2.1 Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in equipment or processes that present a new hazard, or when there is a change in these procedures. **Note**: Retraining (to include a procedural review) will also be provided whenever there is a "close-call" or these procedures fail.

18.2.2 Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever PCSI has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of these procedures.

18.2.3 The retraining shall reestablish employee proficiency and introduce new or revised operational methods and procedures, as necessary.

18.3 Certification. PCSI shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

19. Protection of Employees in Excavations

19.1 Each employee in an excavation will be protected from cave-ins by an adequately designed protective system except when:

19.1.1 Excavations are made entirely in stable rock; or

19.1.2 Excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

19.2 Protective systems will have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

20. Design of Sloping and Benching Systems

20.1 The slopes and configurations of sloping and benching systems will be properly selected and constructed as follows:

20.1.1 Option 1 - Allowable configurations and slopes. Excavations will be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

20.1.2 Option 2 - Determination of slopes and configurations is made using 29CFR §1926.652 Appendices A and B Maximum allowable slopes, and allowable configurations for sloping and benching systems.

20.1.3 Option 3 - Designs using other tabulated data. Designs of sloping or benching systems will be selected from and in accordance with tabulated data, such as approved tables and charts. The tabulated data will be in written form and will include:

- Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;
- Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;
- Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

Note: At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, will be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data will be made available to OSHA upon request.

20.1.4 Option 4 - Design by a registered professional engineer.

20.2 Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) will be approved by a registered professional engineer. Designs will be in written form and will include at least the following:

20.2.1 The magnitude of the slopes that were determined safe for the particular project;

20.2.2 The configurations that were determined to be safe for the particular project;

20.2.3 The identity of the registered professional engineer approving the design.

Note: At least one copy of the design will be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy will be made available to OSHA upon request.

21. Design of Support Systems, Shield Systems, and other Protective Systems

21.1 Designs of support systems, shield systems, and other protective systems will be selected and constructed in accordance with the following options:

21.1.1 Option 1 - Designs using Appendices A, C and D of 29CFR §1926.652. Designs for timber shoring in trenches will be determined in accordance with the conditions and requirements set forth in appendices A and C. Designs for aluminum hydraulic shoring will be in accordance with appendix D of 29CFR §1926.652, but if manufacturer's tabulated data cannot be utilized, designs will be in accordance with appendix D.

21.1.2 Option 2 - Designs using Manufacturer's Tabulated Data. Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data will be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

21.1.2.1 Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer will only be allowed after the manufacturer issues specific written approval.

21.1.2.2 Manufacturer’s specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations will be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy will be made available to OSHA upon request.

21.1.3 Option 3 - Designs using other Tabulated Data. Designs of support systems, shield systems, or other protective systems will be selected from

and be in accordance with tabulated data, such as tables and charts. The tabulated data will be in written form and include all of the following:

21.1.3.1 Identification of the parameters that affect the selection of a protective system drawn from such data;

21.1.3.2 Identification of the limits of use of the data;

21.1.3.3 Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

Note: At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, will be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data will be made available to the OSHA upon request.

21.1.4 Option 4 - Design by a Registered Professional Engineer. A registered professional engineer will approve support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above. Designs will be in written form and will include the following:

21.1.4.1 A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

21.1.4.2 The identify of the registered professional engineer approving the design.

22. Materials and Equipment used for Protective Systems

22.1 Materials and equipment used for protective systems will be free from damage or defects that might impair their proper function.

22.2 Manufactured materials and equipment used for protective systems will be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

22.3 When material or equipment that is used for protective systems is damaged, a competent person will examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then the material or equipment will be removed from service, and will be evaluated and approved by a registered professional engineer before being returned to service.

23. Installations and Removal of Support Systems

23.1 General requirements.

23.1.1 Members of support systems will be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

23.1.2 Support systems will be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

23.1.3 Individual members of support systems will not be subjected to loads exceeding those, which those members were designed to withstand.

23.1.4 Before temporary removal of individual members begins; additional precautions will be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

23.1.5 Removal will begin at, and progress from, the bottom of the excavation. Members will be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

23.1.6 Backfilling will progress together with the removal of support systems from excavations.

23.2 Additional requirements for support systems for trench excavations.

23.2.1 Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system will be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.
23.2.2 Installation of a support system will be closely coordinated with the excavation of trenches.

24. Sloping and Benching Systems

24.1 Employees will not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

25. Shield Systems

25.1 Shield systems will not be subjected to loads exceeding those, which the system was designed to withstand.

25.2 Shields will be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

25.3 Employees will be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

25.4 Employees will not be allowed in shields when shields are being installed, removed, or moved vertically.

25.5 Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield will be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

26. Applicable Definitions

Accepted Engineering Practices - means those requirements, which are compatible with standards of practice, required by a registered professional engineer.

Aluminum Hydraulic Shoring - means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (cross braces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

Bell-Bottom Pier Hole - means a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a bell shape.

Benching (Benching System) - means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

Cave-In - means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or other wise injure and immobilize a person.

Competent Person - means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Cross Braces - mean the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

Excavation - means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

Faces or Sides - means the vertical or inclined earth surfaces formed as a result of excavation work.

Failure - means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

Hazardous Atmosphere - means an atmosphere, which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause, death, illness, or injury.

Kickout - means the accidental release or failure of a cross brace.

Protective System - means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Ramp - means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

Registered Professional Engineer - means a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

Sheeting - means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield (Shield System) - means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with 1926.652. Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

Shoring (Shoring System) - means a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sides. See "Faces."

Sloping (Sloping System) - means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Stable Rock - means natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

Structural Ramp - means a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock is not considered structural ramps.

Support System - means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Tabulated Data - means tables and charts approved by a registered professional engineer and used to design and construct a protective system.

Trench (Trench Excavation) - means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

Trench Box. See "Shield."

Trench Shield. See "Shield."

Uprights - means the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

Wales - means horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

DATE: 01 August 2009

SUBJECT: Welding, Cutting, and Brazing Safety-Related Work Practices Program

REGULATORY STANDARD: OSHA - 29 CFR 1926.350 - 354

PCSI
Welding, Cutting and Brazing Safety-Related Work Practices Program

1. Written Program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur to 29 CFR 1926.350 - 354, that prompt revision of this document, or when jobsite operational changes occur that require a revision of this document. Effective implementation of this program requires support from all levels of management within this company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. Fire prevention and protection. Fire and explosion pose a serious risk to our employees during welding, cutting, and brazing operations. Sparks can travel as much as 35 feet, and spatter can bounce on the floor or fall through openings creating hazards in other work areas of our jobsite.

2.1 Basic safety precautions. The below listed basic safety precautions will be followed by PCSI employee's performing welding, cutting, and brazing operations. The basic precautions for fire prevention in welding or cutting work are:

2.1.1 Fire hazards. If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity shall be taken to a safe place.

2.1.2 Guards. If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.

2.1.3 Restrictions. If the requirements stated in paragraph 2.1.1 and paragraph 2.1.2 cannot be followed then welding and cutting shall not be performed.

2.2 Special precautions. When the nature of the work to be performed requires the use of guarding devices certain additional precautions may be necessary:

2.2.1 Combustible material. Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions shall be taken so that no readily combustible materials on the floor below will be exposed to sparks

which might drop through the floor. The same precautions shall be observed with regard to cracks or holes in walls, open doorways and open or broken windows.

2.2.2 Fire extinguishers. Suitable fire extinguishing equipment shall be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, hose or portable extinguishers depending upon the nature and quantity of the combustible material exposed.

2.2.3 Fire watch.

2.2.3.1 Fire watchers shall be required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist:

2.2.3.1.1 Appreciable combustible material, in building construction or contents, closer than 35 feet (10.7 m) to the point of operation.

2.2.3.1.2 Appreciable combustibles are more than 35 feet (10.7 m) away but are easily ignited by sparks.

2.2.3.1.3 Wall or floor openings within a 35 foot (10.7 m) radius expose combustible material in adjacent areas including concealed spaces in walls or floors.

2.2.3.1.4 Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

2.2.3.2 Fire watchers shall have fire extinguishing equipment readily available and be trained in its use. They shall be familiar with jobsites for sounding an alarm in the event of a fire. They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch shall be maintained for at least a half hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

2.2.4 Authorization. Before cutting or welding is permitted, the area shall be inspected by the individual responsible for authorizing cutting and welding operations. He/she shall designate precautions to be followed in granting authorization to proceed preferably in the form of a written permit.

2.2.5 Floors. Where combustible materials such as paper clippings, wood shavings, or textile fibers are on the floor, the floor shall be swept clean for a radius of 35 feet (10.7 m). Combustible floors shall be kept wet, covered with damp sand, or protected by fire-resistant shields. Where floors have been wet down, personnel operating arc welding or cutting equipment shall be protected from possible shock.

2.2.6 Prohibited areas. Cutting or welding shall not be permitted in the following situations:

2.2.6.1 In areas not authorized by management.

2.2.6.2 In sprinklered buildings while such protection is impaired.

2.2.6.3 In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside uncleaned or improperly prepared tanks or equipment which have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.

2.2.6.4 In areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulfur, baled paper, or cotton.

2.2.7 Relocation of combustibles. Where practicable, all combustibles shall be relocated at least 35 feet (10.7 m) from the work site. Where relocation is impracticable, combustibles shall be protected with flame proofed covers or otherwise shielded with metal or asbestos guards or curtains.

2.2.8 Ducts. Ducts and conveyor systems that might carry sparks to distant combustibles shall be suitably protected or shut down.

2.2.9 Combustible walls. Where cutting or welding is done near walls, partitions, ceiling or roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition.

2.2.10 Noncombustible walls. If welding is to be done on a metal wall, partition, ceiling or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work shall be provided.

2.2.11 Combustible cover. Welding shall not be attempted on a metal partition, wall, ceiling or roof having a combustible covering nor on walls or partitions of combustible sandwich-type panel construction.

2.2.12 Pipes. Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings or roofs shall not be undertaken if the work is close enough to cause ignition by conduction.

2.2.13 Management. Management shall recognize its responsibility for the safe usage of cutting and welding equipment on its property and:

2.2.13.1 Based on fire potentials of plant jobsites, establish areas for cutting and welding, and establish procedures for cutting and welding, in other areas.

2.2.13.2 PCSI will be responsible for authorizing cutting and welding operations in areas not specifically designed for such processes.

2.2.13.3 Ensure that cutters or welders and their foreman's are suitably trained in the safe operation of their equipment and the safe use of the process.

2.2.13.4 Advise all subcontractors about flammable materials or hazardous conditions of which they may not be aware.

2.2.14 Foreman. The first line foreman:

2.2.14.1 Shall be responsible for the safe handling of the cutting or welding equipment and the safe use of the cutting or welding process.

2.2.14.2 Shall ensure welders inspect their equipment and work area prior to beginning work, report any equipment defect or safety hazard, and discontinue use of the equipment pending resolution of the defect or hazard.

2.2.14.3 Shall determine the combustible materials and hazardous areas present or likely to be present in the work location.

2.2.14.4 Shall protect combustibles from ignition by the following:

2.2.14.4.1 Have the work moved to a location free from dangerous combustibles.

2.2.14.4.2 If the work cannot be moved, have the combustibles moved to a safe distance from the work or have the combustibles properly shielded against ignition.

2.2.14.4.3 See that cutting and welding are so scheduled that plant operations that might expose combustibles to ignition are not started during cutting or welding.

2.2.14.5 Shall secure authorization for the cutting or welding operations from the jobsite safety professional.

2.2.14.6 Shall determine that the cutter or welder secures his approval that conditions are safe before going ahead.

2.2.14.7 Shall determine that fire protection and extinguishing equipment are properly located at the site.

2.2.14.8 Where fire watches are required, he/she shall see that they are available at the site.

2.2.15 Fire prevention precautions. Cutting or welding shall be permitted only in areas that are or have been made fire safe. When work cannot be moved practically, as in most construction work, the area shall be made safe by removing combustibles or protecting combustibles from ignition sources.

2.3 Welding or cutting containers.

2.3.1 Used containers. No welding, cutting, or other hot work shall be performed on used drums, barrels, tanks or other containers until they have been cleaned so thoroughly as to make absolutely certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors. Any pipe lines or connections to the drum or vessel shall be disconnected or blanked.

2.3.2 Venting and purging. All hollow spaces, cavities or containers shall be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended.

2.4 Confined spaces.

2.4.1 Accidental contact. When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so

that accidental contact cannot occur and the machine be disconnected from the power source.

2.4.2 Torch valve. In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the gas supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practicable, the torch and hose shall also be removed from the confined space.

3. Protection of personnel.

3.1 General

3.1.1 Railings. Employee's working on platforms, scaffolds, or runways shall be protected against falling. This may be accomplished by the use of railings, safety belts, life lines, or some other equally effective safeguards.

3.1.2 Welding cables. Employee's shall place welding cables and other equipment so that it is clear of passageways, ladders, and stairways.

3.2 Eye protection.

3.2.1 Selection.

3.2.1.1 Helmets or hand shields shall be used during all arc welding or arc cutting operations, excluding submerged arc welding. Helpers or attendants shall be provided with proper eye protection.

3.2.1.2 Goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations. Spectacles without side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing or for inspection.

3.2.1.3 All operators and attendants of resistance welding or resistance brazing equipment shall use transparent face shields or goggles, depending on the particular job, to protect their faces or eyes, as required.

3.2.1.4 Eye protection in the form of suitable goggles shall be provided where needed for brazing operations.

3.2.2 Specifications for protectors.

3.2.2.1 Helmets and hand shields shall be made of a material which is an insulator for heat and electricity. Helmets, shields and goggles shall be not readily flammable and shall be capable of withstanding sterilization.

3.2.2.2 Helmets and hand shields shall be arranged to protect the face, neck and ears from direct radiant energy from the arc.

3.2.2.3 Helmets shall be provided with filter plates and cover plates designed for easy removal.

3.2.2.4 All parts shall be constructed of a material which will not readily corrode or discolor the skin.

3.2.2.5 Goggles shall be ventilated to prevent fogging of the lenses as much as practicable.

3.2.2.6 All glass for lenses shall be tempered, substantially free from striate, air bubbles, waves and other flaws. Except when a lens is ground to provide proper optical correction for defective vision, the front and rear surfaces of lenses and windows shall be smooth and parallel.

3.2.2.7 Lenses shall bear some permanent distinctive marking by which the source and shade may be readily identified.

3.2.2.8 The following is a guide for the selection of the proper shade numbers. These recommendations may be varied to suit the individual's needs.

Welding operation	Shade No.
Shielded metal-arc welding:	
1/16-, 3/32-, 1/8-, 5/32-inch electrodes	10
Gas-shielded arc welding (nonferrous):	
1/16-, 3/32-, 1/8-, 5/32-inch electrodes	11
Gas-shielded arc welding (ferrous)	
1/16-, 3/32-, 1/8-, 5/32-inch electrodes	12
Shielded metal-arc welding:	
3/16-, 7/32-, 1/4-inch electrodes	12
5/16-, 3/8-inch electrodes	14
Atomic hydrogen welding:	10-14
Carbon arc welding:	14
Soldering:	2
Torch brazing:	3 or 4

Light cutting, up to 1 inch:	3 or 4
Medium cutting, 1 inch to 6 inches:	4 or 5
Heavy cutting, 6 inches and over:	5 or 6
Gas welding (light) up to 1/8 inch:	4 or 5
Gas welding (medium) 1/8 inch to 1/2 inch:	5 or 6
Gas welding (heavy) 1/2 inch and over:	6 or 8

Note: In gas welding or oxygen cutting where the torch produces a high yellow light, it is desirable to use a filter or lens that absorbs the yellow or sodium line in the visible light of the operation.

3.2.2.8 All filter lenses and plates purchased by this Alliance shall meet the test for transmission of radiant energy prescribed in ANSI Z87.1--1968--American National Standard Practice for Occupational and Educational Eye and Face Protection.

3.2.3 Protection from arc welding rays. Where the work permits, the welder should be enclosed in an individual booth painted with a finish of low reflectivity such as zinc oxide (an important factor for absorbing ultraviolet radiations) and lamp black, or shall be enclosed with noncombustible screens similarly painted. Booths and screens shall permit circulation of air at floor level. Workers or other persons adjacent to the welding areas shall be protected from the rays by noncombustible or flameproof screens or shields or shall be required to wear appropriate goggles.

3.3 Protective clothing. General requirements. Foreman's will ensure that employees exposed to the hazards created by welding, cutting, or brazing operations be protected by personal protective equipment in accordance with the requirements of 29 CFR 1910.132 (Personal Protective Equipment, General Requirements). Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed.

3.4 Work in confined spaces.

3.4.1 General. As used herein confined space is intended to mean a relatively small or restricted space such as a tank, boiler, pressure vessel, or small compartment of a ship.

3.4.2 Ventilation. Ventilation is a prerequisite to work in confined spaces. The Alliance confined space procedures will delineate ventilation requirements for specific operations where welding or cutting is required.

3.4.3 Securing cylinders and machinery. When welding or cutting is being performed in any confined spaces the gas cylinders and welding machines shall be left on the outside. Before operations are started, heavy

portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.

3.4.4 Lifelines. Where a welder must enter a confined space through a manhole or other small opening, means shall be provided for quickly removing him in case of emergency. When safety belts and lifelines are used for this purpose they shall be so attached to the welder's body that his body cannot be jammed in a small exit opening. An attendant with a preplanned rescue procedure (see Alliance confined space procedures) shall be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect.

3.4.5 Electrode removal. When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine disconnected from the power source.

3.4.6 Gas cylinder shutoff. In order to eliminate the possibility of gas escaping through leaks of improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practicable the torch and hose shall also be removed from the confined space.

3.4.7 Warning signs. After welding operations are completed, the welder shall mark the hot metal or provide some other means of warning other workers.

4. Health protection and ventilation.

4.1 General

4.1.1 Contamination. The requirements for contamination control have been established on the basis of the following three factors in arc and gas welding which govern the amount of contamination to which welders may be exposed:

4.1.1.1 Dimensions of space in which welding is to be done (with special regard to height of ceiling).

4.1.1.2 Number of welders.

4.1.1.3 Possible evolution of hazardous fumes, gases, or dust according to the metals involved.

4.1.2 Screens. When welding must be performed in a space entirely screened on all sides, the screens shall be so arranged that no serious restriction of ventilation exists. It is desirable to have the screens so mounted that they are about 2 feet (0.61 m) above the floor unless the work is performed at so low a level that the screen must be extended nearer to the floor to protect nearby workers from the glare of welding.

4.1.3 Maximum allowable concentration. Local exhaust or general ventilating systems shall be provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum allowable concentration as specified in 29 CFR 1910.1000 (Toxic and Hazardous Substances.

4.1.4 Precautionary labels. A number of potentially hazardous materials are employed in fluxes, coatings, coverings, and filler metals used in welding and cutting or are released to the atmosphere during welding and cutting. Foreman's will ensure employee's under their control are familiar with the Material Safety Data Sheets (MSDS) applicable to the welding materials they are using.

4.2 Ventilation for general welding and cutting.

4.2.1 General. Mechanical ventilation shall be provided when welding or cutting is done on metals other than the following: Fluorine compounds, Zinc, Lead, Beryllium, Cadmium, Mercury, and stainless steels.

4.2.1.1 In a space of less than 10,000 cubic feet (284 m3) per welder.

4.2.1.2 In a room having a ceiling height of less than 16 feet (5 m).

4.2.1.3 In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross ventilation.

4.2.2 Minimum rate. Such ventilation shall be at the minimum rate of 2,000 cubic feet (57 m3) per minute per welder, except where local exhaust hoods and booths provide an equivalent or better rate, or airline respirators approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health, pursuant to the provisions of 30 CFR part 11, are provided. Natural ventilation is considered sufficient for welding or cutting operations where the following restrictions are not present.

4.2.2.1 In a space of less than 10,000 cubic feet (284 m3) per welder.

4.2.2.2 In a room having a ceiling height of less than 16 feet (5 m).

4.2.2.3 In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross ventilation.

4.3 Local exhaust hoods and booths. Mechanical local exhaust ventilation may be by means of either of the following:

4.3.1 Hoods. Freely movable hoods intended to be placed by the welder as near as practicable to the work being welded and provided with a rate of air-flow sufficient to maintain a velocity in the direction of the hood of 100 linear feet (30 m) per minute in the zone of welding when the hood is at its most remote distance from the point of welding. The rates of ventilation required to accomplish this control velocity using a 3 inch (7.6 cm) wide flanged suction opening are shown in the following table:

Welding zone	Minimum air flow *(1) cubic feet/ minute	Duct diameter, inches *(2)
4 to 6 inches from arc or torch	150	3
6 to 8 inches from arc or torch	275	3 1/2
8 to 10 inches from arc or torch	425	4 1/2
10 to 12 inches from arc or torch	600	5 1/2

{Footnote}*(1) When brazing with cadmium bearing materials or when cutting on such materials increased rates of ventilation may be required.

{Footnote}*(2) Nearest half-inch duct diameter based on 4,000 feet per minute velocity in pipe.

4.3.2 Fixed enclosure. A fixed enclosure with a top and not less than two sides which surround the welding or cutting operations and with a rate of airflow sufficient to maintain a velocity away from the welder of not less than 100 linear feet (30 m) per minute.

4.4 Ventilation in confined spaces.

4.4.1 Air replacement. All welding and cutting operations carried on in confined spaces shall be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency. This applies not only to the welder but also to helpers and other personnel in the immediate vicinity. All replacement air shall be clean and respirable.

4.4.2 Airline respirators. In such circumstances where it is impossible to provide such ventilation, airline respirators or hose masks approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health, shall be used.

4.4.3 Self-contained units. In areas immediately dangerous to life and health (IDLH), hose masks with blowers or self-contained breathing equipment shall be used. The breathing equipment shall be approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health.

4.4.4 Outside helper. Where Alliance welding operations are carried on in confined spaces and where welders and helpers are provided with hose masks, hose masks with blowers, or self-contained breathing equipment approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health, a worker shall be stationed on the outside of such confined spaces to insure the safety of those working within. This will done in accordance with the Alliance confined space standard practice instructions.

4.4.5 Oxygen for ventilation. Because of it's flammable properties, Oxygen shall never be used for ventilation.

4.5 Fluorine compounds.

4.5.1 General. In confined spaces, welding or cutting involving fluxes, coverings, or other materials which contain fluorine compounds shall be done in accordance with the safety precautions and work practices delineated on the MSDS. A fluorine compound is one that contains fluorine, as an element in chemical combination, not as a free gas.

4.5.2 Maximum allowable concentration. The need for local exhaust ventilation or airline respirators for welding or cutting in other than confined spaces will depend upon the individual circumstances. However, experience has shown such protection to be desirable for fixed-location production welding and for all production welding on stainless steels. Where air samples taken at the welding location indicate that the fluorides liberated are below the maximum allowable concentration, such protection is not necessary.

4.6 Zinc.

4.6.1 Confined spaces. In confined spaces welding or cutting involving zinc-bearing base or filler metals or metals coated with zinc-bearing

materials shall be done in accordance with the "Ventilation in confined space" section of this SPI.

4.6.2 Indoors. Indoors, welding or cutting involving zinc-bearing base or filler metals coated with zinc-bearing materials shall be done in accordance with the "Local exhaust hoods and booths" section of this SPI.

4.7 Lead.

4.7.1 Confined spaces. In confined spaces, welding involving lead-base metals (erroneously called lead-burning) shall be done in accordance with the "Ventilation in confined space" section of this SPI.

4.7.2 Indoors. Indoors, welding involving lead-base metals shall be done in accordance with the "Local exhaust hoods and booths" section of this SPI.

4.7.3 Local ventilation. In confined spaces or indoors, welding or cutting involving metals containing lead, other than as an impurity, or involving metals coated with lead-bearing materials, including paint shall be done using local exhaust ventilation or airline respirators. Outdoors such operations shall be done using respiratory protective equipment approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health. In all cases, workers in the immediate vicinity of the cutting operation shall be protected as necessary by local exhaust ventilation or airline respirators.

4.8 Beryllium. Welding or cutting indoors, outdoors, or in confined spaces involving beryllium-containing base or filler metals shall be done using local exhaust ventilation and airline respirators unless atmospheric tests under the most adverse conditions have established that the workers' exposure is within the acceptable concentrations defined by 29 CFR 1910.1000. In all cases, workers in the immediate vicinity of the welding or cutting operations shall be protected as necessary by local exhaust ventilation or airline respirators.

4.9 Cadmium.

4.9.1 General. Welding or cutting indoors or in confined spaces involving cadmium-bearing or cadmium-coated base metals shall be done using local exhaust ventilation or airline respirators unless atmospheric tests under the most adverse conditions have established that the workers' exposure is within the acceptable concentrations defined by 29 CFR 1910.1000. Outdoors such operations shall be done using respiratory protective equipment such as fume respirators approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health.

4.9.2 Confined space. Welding (brazing) involving cadmium-bearing filler metals shall be done using ventilation in accordance with the "Ventilation in confined space" and the "Local exhaust hoods and booths" section of this SPI.

4.10 Mercury. Welding or cutting indoors or in a confined space involving metals coated with mercury-bearing materials including paint, shall be done using local exhaust ventilation or airline respirators unless atmospheric tests under the most adverse conditions have established that the workers' exposure is within the acceptable concentrations defined by 29 CFR 1910.1000. Outdoors such operations shall be done using respiratory protective equipment approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health.

4.11 Cleaning compounds.

4.11.1 Manufacturer's instructions. In the use of cleaning materials, because of their possible toxicity or flammability, appropriate precautions such as manufacturers instructions shall be followed.

4.11.2 Degreasing. Degreasing and other cleaning operations involving chlorinated hydrocarbons shall be so located that no vapors from these operations will reach or be drawn into the atmosphere surrounding any welding operation. In addition, trichloroethylene and perchlorethylene should be kept out of atmospheres penetrated by the ultraviolet radiation of gas-shielded welding operations.

4.12 Cutting of stainless steels. Oxygen cutting, using either a chemical flux or iron powder or gas-shielded arc cutting of stainless steel, shall be done using mechanical ventilation adequate to remove the fumes generated.

4.13 First-aid equipment. First-aid equipment shall be available at all times. All injuries shall be reported to site safety professional in accordance with jobsite procedures as soon as possible for medical attention. First aid shall be rendered until medical attention can be provided.

5. Training.

5.1 Types of training. Foreman’s will determine whether training required for specific jobs will be conducted in a classroom or on-the-job. The degree of training provided shall be determined by the complexity of the welding, brazing, or cutting requirements of the individual job and the associated hazards.

5.1.1 Initial Training. Prior to job assignment, this employer shall provide training to ensure that the hazards associated with welding, brazing, and

cutting operations are understood by employees and that the knowledge and skills required for the safe application, usage, of work place equipment, are acquired by employees. The training shall include the following:

5.1.1.1 Each authorized employee shall receive training in the recognition of applicable hazards involved with particular job. The methods and means necessary for safe work.

5.1.1.2 Each affected employee shall be instructed in the purpose and use of the confined space entry procedure (where needed).

5.1.1.3 All other employees whose work operations are or may be in an area where welding, brazing, or cutting is to be performed, shall be instructed about the procedure, and about the prohibitions relating to working in that area.

5.1.2 Refresher Training. Scheduled refresher training will be conducted on a new project start basis.

5.1.2.1 Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in welding equipment, equipment or processes that present a new hazard, when their work takes them into hazardous areas, or when there is a change in the confined space entry procedures (when used).

5.1.2.2 Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever this employer has reason to believe, that there are deviations from or inadequacies in the employee's knowledge of known hazards, or use of equipment or procedures.

5.1.2.3 The retraining shall reestablish employee proficiency and introduce new equipment, or revised control methods and procedures, as necessary.

5.1.3 Certification. This employer shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain a synopsis of the training conducted, each employee's name, and dates of training.

6. Selection and use of work practices. Foreman’s shall develop and ensure use of standardized safety-related work practices to prevent injuries resulting from hot-work accidents. The specific safety-related work practices shall be consistent with the nature and extent of the associated hot-work hazards.

7. Welding safety checklist.

7.1 General safety requirements.

- Has the employee had sufficient training to accomplish the job safely?

Action Taken: **YES (___) NO (___)**

_____

_____

- Has the employee been briefed on hazards unique to this particular job?

Action Taken: **YES (___) NO (___)**

_____

_____

- Has the employee read the manufacturer's instructions, cylinder labels, and MSDSs.?

Action Taken: **YES (___) NO (___)**

_____

_____

- Is heat and impact resistant clothing being used?

Action Taken: **YES (___) NO (___)**

_____

_____

- Is the proper clothing being worn to reduce skin burns.

Action Taken: **YES (___) NO (___)**

_____

_____

- Are leather aprons, leggings, and sleeves worn for very hot work?

Action Taken: **YES (___) NO (___)**

_____

_____

- Are dry welders gloves used during arc welding?

Action Taken: **YES (___) NO (___)**

_____

_____

- Are proper respirators used when welding cadmium, lead or other materials where toxic fumes could form?

Action Taken: **YES (___) NO (___)**

_____

_____

- Have fire resistant shield been place over floors, walls, or other objects that could potentially catch fire?

Action Taken: **YES (___) NO (___)**

_____

_____

- Have all flammable items in the hot work area been removed or covered?

Action Taken: **YES (___) NO (___)**

_____

- Is consumption (eating, drinking, smoking) prohibited while hot work is in progress?

Action Taken: **YES (___) NO (___)**

_____

_____

- Have all ducts that could carry sparks been closed?

Action Taken: **YES (___) NO (___)**

_____

_____

- Is adequate ventilation present in the hot work area?

Action Taken: **YES (___) NO (___)**

_____

_____

- Where welding is conducted near combustible material is a firewatcher routinely posted with operational fire extinguishers?

Action Taken: **YES (___) NO (___)**

_____

_____

7.2 Gas welders:

- Are cylinders regularly checked for leaks?

Action Taken: **YES (___) NO (___)**

_____

_____

- In storage, are cylinders stored upright and secured in a separate, dry, ventilated, fireproof room?

Action Taken: **YES (___) NO (___)**

_____

_____

- Are cylinders always turned off after use?

Action Taken: **YES (___) NO (___)**

_____

_____

- Are workers briefed to never roll or drop cylinders?

Action Taken: **YES (___) NO (___)**

_____

_____

- Are workers briefed to never use oxygen to blow dust away?

Action Taken: **YES (___) NO (___)**

_____

_____

- Is smoking forbidden during welding operations?

Action Taken: **YES (___) NO (___)**

_____

_____

- Do workers regularly review the MSDSs for the gases they are using?

Action Taken: **YES (___) NO (___)**

_____

_____

- Do workers know the proper lubricants to use on compressed oxygen cylinder connections?

Action Taken: **YES (___) NO (___)**

_____

_____

7.3 Arc welders:

- Are welders de-energized before touching electrical parts?

Action Taken: **YES (___) NO (___)**

_____

_____

- Are objects to be welded on, separately grounded?

Action Taken: **YES (___) NO (___)**

_____

_____

- Do welders know the correct size cable, with intact insulation to use for a given operation?

Action Taken: **YES (___) NO (___)**

_____

_____

- Do welders know that jewelry should not be worn when welding?

Action Taken: **YES (___) NO (___)**

_____

_____

- Is the work surface, floor, and object dry before starting to weld?

Action Taken: **YES (___) NO (___)**

_____

- Is it forbidden to weld in the rain?

Action Taken: **YES (___) NO (___)**

_____

_____

7.4 Confined spaces:

- Is the atmosphere tested before entering and while working?

Action Taken: **YES (___) NO (___)**

_____

_____

- Do gas cylinders remain outside at all times?

Action Taken: **YES (___) NO (___)**

_____

_____

- Is the space properly ventilated?

Action Taken: **YES (___) NO (___)**

_____

_____

- Are written procedures available?

Action Taken: **YES (___) NO (___)**

_____

_____

- Has Personal Protective Equipment (PPE) be considered?

Action Taken: **YES (___) NO (___)**

_____

_____

- Are safety attendants properly equipped and is first aid equipment readily available?

Action Taken: **YES (___) NO (___)**

_____

_____

8. Definitions.

Welder and welding operator mean, any operator of electric or gas welding and cutting equipment.

Approved means, listed or approved by a nationally recognized testing laboratory. Refer to 29 CFR 1910.155 for definitions of listed and approved, and 29 CFR 1910.7 for nationally recognized testing laboratory.

STANDARD PRACTICE INSTRUCTION

DATE: 01 August 2010

SUBJECT: Accident Investigation and Reporting

REGULATORY STANDARD: OSHA - 29 CFR 1904

BASIS: OSHA requires all employer's to maintain a written program. Accident investigation is primarily a fact-finding procedure; the facts revealed are used to prevent recurrences of similar accidents in the future. The focus of accident investigation at this company is to prevent future accidents and injuries in order to increase the safety and health of all our workers. This standard practice instruction establishes uniform requirements to ensure that accidents are evaluated, controls and procedures are implemented to reduce or prevent future occurrences, and that the proper hazard information is transmitted to all affected workers.

GENERAL: PCSI will ensure that jobs having a potential for worker injury within our facility or detached work site are evaluated and controlled. This company shall make available to workers, the required types of protectors, engineering controls and procedures suitable for the work to be performed. No unprotected person shall knowingly be subjected to a hazardous work or environmental condition.

RESPONSIBILITY: The company Safety Manager is solely responsible for all facets of this program and has full authority to make necessary decisions to ensure success of the program. The PCSI TRES Safety Manager is the sole person authorized to amend these instructions and is authorized to halt any operation of the company where there is danger of serious personal injury.

Contents of the Accident Investigation Program

1. **Written Program.**
2. **General Requirements.**
3. **Accident Investigation Team Composition.**
4. **Accident and Incident Reporting.**
5. **Accident Investigation.**
6. **Job Hazard Analysis Review.**
7. **Administrative Controls.**
8. **Accident Trend Analysis.**
9. **Training and Education.**
10. **Behavior Modification and Attitude.**

PCSI Accident Investigation Program

1. Written program. PCSI will review and evaluate this standard practice instruction on an annual basis, or when changes occur that prompt revision of this document, or when facility or detached work site operational changes occur that require a revision of this document. Effective implementation requires a written program for job safety, health, that is endorsed and advocated by the highest level of management within this company and that outlines our goals and plans. This written program will be communicated to all required personnel. It encompasses the total workplace, regardless of number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. General requirements. PCSI will establish accident investigation procedures, and improve operational procedures through the use of this document. Preventing future workplace injuries in our company is the principle purpose of accident investigation. This document will provide a basis for studying and recording the reasons an accident occurred, identifying existing or potential job hazards (both safety and health), and determining the best course of action to take to reduce or eliminate these hazards.

3. Accident investigation team composition. The accident investigation team will be composed of the following:

Accident Investigation Team

Title	Member
Member	Site Manager
Member	Safety Manager
Member	Engineer
Member	Supervisor of injured worker
Member	Injured worker (where possible)

4. Accident and incident reporting. The PCSI Hazard Report will be used by all workers to report potential or known hazards. The following procedures apply:

4.1 Person reporting hazard:

4.1.1 Notify department supervisor of the hazard.

4.1.2 Accomplish lock-out/tag-out if required on the machine.

4.1.3 Fill out required sections of the hazard report.

4.1.4 Forward report immediately to the safety manager.

4.2 Supervisor:

4.2.1 Notify all affected workers of hazard.

4.2.2 Notify maintenance of hazard, if required.

4.2.3 Ensure hazard is properly marked and controlled.

4.2.4 Contact Safety Manager if needed.

5. Accident Investigation. Accident investigation is primarily a fact-finding procedure; the facts revealed are used to prevent recurrences of similar accidents. The focus of accident investigation will be to prevent future accidents and injuries to increase the safety and health of all our workers.

5.1 Immediate concerns.

5.1.1 Ensure any injured person receives proper care.

5.1.2 Ensure co-workers and personnel working with similar equipment or in similar jobs are aware of the situation. This is to ensure that procedural problems or defects in certain models of equipment do not exist.

5.1.3 Start the investigation promptly.

5.2 Injury and Illness report. OSHA form 301 or a standardized investigation report form which details specific company requirements for investigation will be developed and used to gather data to determine causes and corrective actions. As a minimum the form will contain the following areas of concern.

5.2.1 Accident investigation form data.

- Injured worker's name
- Date and time of injury
- Occupation or task being performed when injured
- Shift and department
- Company ID number
- Worker's address
- Sex/age/DOB
- Social security number
- Length of service
- Length of time at specific job
- Time shift started
- Overtime length when injury occurred
- Physician's and hospital name (if transported)
- Type of injury
- Resulting fatalities
- Description and analysis of accident
- Complete accident tree

- Action taken to prevent recurrence and person
- Worker's statement
- Witnesses' statement
- Employer's statement
- Person completing form and date
- Person(s) reviewing form and date

5.3 Reviewers. All accident investigation reports will be reviewed by a member of management responsible for the department/section involved to ensure pertinent information in transmitted to all concerned and remedial action(s) taken.

Accident Investigation Review Team

Title	**Member**
Member	Department Manager
Member	Safety Manager
Member	Engineer
Member	Supervisor of injured worker

5.4 Accident investigation final report. The final report will be numbered in the upper right hand corner, Page of Pages. The report will include but is not limited to the following.

5.4.1 Investigation report form and pertinent data

5.4.2 Photographs/drawings/exhibits of scene

5.4.3 Narrative of accident

5.4.4 Sequence of events

5.4.5 Contributing information

5.4.6 Findings and recommendations of review team

5.4.7 Action items and completion dates

5.4.8 Responsible persons

5.4.9 Follow-up procedures to ensure completion

5.4.10 Distribution list

6. Job Hazard Analysis. This employer will identify through the use of information sources and screening surveys, jobs that place workers at risk. After any accident or

near miss the task or job in question will have a job hazard analyses routinely performed by a qualified person(s). This analysis will help to verify that all required actions are being taken to determine if risk factors for a work position have been reduced or eliminated to the maximum extent feasible.

6.1 The following personnel or job positions are qualified to perform job hazard analysis surveys for this company.

Personnel Qualified to Perform Job Hazard Analysis

	Title
(1)	Safety Manager
(2)	Project Manager
(3)	Site Manager / Foreman
(4)	Quality Manager

6.2 Task Analysis. Task analysis will be conducted to identify risk factors present in each job.

7. Administrative Controls. Once data has be gathered from the accident investigation report, company administrative controls will be used where needed to eliminate or reduce the frequency, and severity of accidents and near misses. Examples of administrative controls include the following:

7.1 Reducing the production rates and or line speeds where possible.

7.2 Providing rest pauses to relieve fatigued muscle-tendon groups.

7.3 Increasing the number of workers assigned to a task to alleviate severe conditions, especially in lifting heavy objects.

7.4 Using job rotation, used with caution and as a preventive measure, not as a response to physical symptoms. The principle of job rotation is to alleviate physical fatigue and stress of a particular set of muscles and tendons by rotating workers among other jobs that use different muscle-tendon groups. If rotation is utilized, the job analyses must be reviewed to ensure that the same muscle-tendon groups are not used when they are rotated.

7.5 Providing sufficient numbers of standby/relief personnel to compensate for foreseeable upset conditions on the line (e.g., loss of workers).

7.6 Job enlargement. Having workers perform broader functions which reduce the stress on specific muscle groups while performing individual tasks.

7.7 Machine maintenance/guarding. Ensure regular maintenance is performed on machines/tools used by workers are properly guarded and that maintenance is routinely performed.

7.8 Worker training. Ensure all workers are properly trained in the hazards associated with the job before work is performed unsupervised.

8. Accident trend analysis.

8.1 After an accident the accident investigation team will, where prudent, routinely review health care facility sign-in logs, OSHA-300 forms, and individual worker medical records to monitor trends for accidents in our facilities. This analysis should be made to monitor trends and to substantiate the information obtained from the accident investigation. The analysis will be done by department, job title, work area, etc.

8.2 The information gathered will help to identify areas or jobs where potential accident or injury conditions could or do exist. This information may be shared with anyone in the company, since workers' personal identifiers are not solicited. The analysis of medical records (e.g., sign-in logs and individual worker medical records) may reveal areas or jobs of concern, but it may also identify individual workers who require further follow-up. The information gathered while analyzing medical records will be of a confidential nature; thus care must be exercised to protect the individual worker's privacy.

8.3 The information gained from the trend analysis will help determine the effectiveness of the various programs initiated to decrease accidents in our facility or detached work site.

8.4 Worker survey. A survey may be used to provide a standardized measure of the extent of progress in reducing work-related accidents for each area of the facility or detached work site, and to determine which jobs are exhibiting problems and to measure progress of the overall safety program.

8.4.1 Design of the survey. A survey of workers will be conducted to measure worker awareness of work-related accident and to report the location, frequency, and type of accidents likely to occur.

8.4.2 Surveys normally will not include workers' personal identifiers, this is to encourage worker participation in the survey.

8.4.3 Frequency. Surveys will be conducted as a minimum on an annual basis or anytime deemed necessary by the accident investigation team. Conducting the survey annually should help detect any major change in the prevalence, incidence, and/or location of reported and unreported accidents.

9. Training and Education. The purpose of accident investigation training and education is to ensure that members of the accident investigation team and all of our workers are sufficiently informed about the accident investigation program.

9.1 Workers will be adequately trained about the PCSI's accident investigation program. Proper training will allow managers, supervisors, and workers to understand the procedures to follow to report an accident, hazards associated with a job or production process, their prevention and control, and their medical consequences.

9.2 Training program design. The program will be designed and implemented by 01 August 2003. Appropriate special training will be provided for personnel responsible for administering the program.

9.3 Learning level. The program will be presented in language and at a level of understanding appropriate for the individuals being trained. It will provide an overview of the potential risk of illnesses and injuries, their causes and early symptoms, the means of prevention, and treatment.

9.4 Training for affected workers will consist of both general and specific job training:

9.4.1 General Training. Workers will be given formal instruction on the hazards associated with their jobs and with their equipment. This will include information on the varieties of hazards associated with the job, what risk factors cause or contribute to them, how to recognize and report hazardous conditions, and how to prevent accident with their respective jobs. This instruction will be repeated for each worker as necessary. This training will be conducted on an annual basis. (OSHA's experience indicates that, at a minimum, annual retraining is advisable).

9.4.2 Job-Specific Training. New workers and reassigned workers will receive an initial orientation and hands-on training prior to being placed in a full-production job. Each new hire will receive a demonstration of the proper use of and procedures for all tools and equipment prior to assignment

9.5 Training for Supervisors. Supervisors are responsible for ensuring that workers follow safe work practices and receive appropriate training to enable them to do this. Supervisors therefore will undergo training comparable to that of the workers, and such additional training as will enable them to recognize hazardous work practices, to correct such practices, accident reporting/investigation requirements, and to reinforce the ABC safety program.

9.6 Training for Managers. Managers will be made aware of their safety and health responsibilities and will receive sufficient training pertaining to issues at each work station and in the production process as a whole so that they can effectively carry out their responsibilities.

9.7 Training for Engineers and Maintenance Personnel. Plant engineers and maintenance personnel will be trained in the prevention and correction of job hazards through job and work station design and proper maintenance, both in general and as applied to the specific conditions of the facility or detached work site.

9.8 Worker Training and Education. Company health care providers will participate in the training and education of all workers. This training will be reinforced during workplace walk-throughs and the individual health surveillance appointments. All new workers will be given such education during orientation. This demonstration of concern and the distribution of information should facilitate an elimination or reduction in, and early recognition of accident conditions prior to their development, and increase the likelihood of compliance with recognition, prevention and control.

10. Behavior Modification and Attitude.

10.1 External causative or contributing factors. Behavior and attitude are integral to the success of our accident investigation program. When accidents occur, the root cause or causes may not always be external to the individual involved. These external causes can include accidents within our facility or detached work site caused by:

10.1.1 Improperly maintained or defective machinery, equipment, tools, etc.
10.1.2 Coworker behavior and attitudes
10.1.3 Natural phenomenon such as lightening
10.1.4 Multiple causative situations
10.1.5 Lack of - or improper safety training
10.1.6 Operational or procedural inadequacies

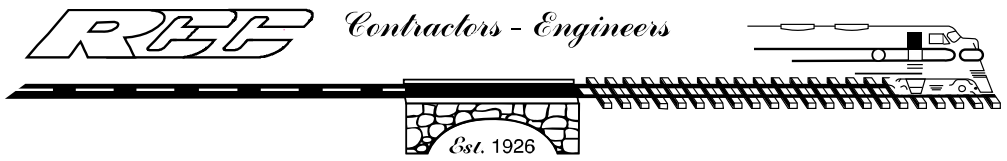
10.2 Internal causative or contributing factors. When it is determined that it is improbable that external factors were the principal cause(s) of an accident, behavior and attitude of the individual or group or will be reviewed.

10.3 Affecting attitudinal and behavioral change. An workers' attitude affects his or her behavior. Improper behavior can sometimes result in an unsafe act. The unsafe act can sometimes result in injury. Positive and proper attitudes toward safety are the key to reducing unsafe acts and ultimately reducing injury rates. Creating an internal change in individuals who otherwise would perform an unsafe act is the ultimate goal when attempting attitudinal change. If an worker believes he or she has a safe attitude but his or her behavior isn't (or hasn't in the past) been consistent with this belief, the person will usually alter their behavior eventually to be consistent with their self perception. An attitudinal change will occur which causes a behavioral change.

10.3.1 Creating attitudinal and behavioral change. This company is committed to creating and maintaining a safe work environment. We will demonstrate our commitment by:

- Promptly conducting accident investigations to determine the cause(s) of accidents.
- Assigning responsibility for recommended corrective actions to appropriate personnel within this facility or detached work site.
- Provide supervisors with the necessary support needed to implement safety changes in their respective areas.
- Where required, conducting worker training and or retraining promptly following investigations.
- Providing feedback to workers affected by an accident.
- Initiating team building efforts.
- Fostering a work environment which promotes a belief in individual responsibility for safety.
- Conducting appropriate follow up reviews to assess if recommended safety changes are effective.
- Conducting worker surveys to solicit recommendations for safety improvements following an accident.

Railroad Construction Company, Inc.



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Corporate Safety Manual

Revised January 2010

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