VENDOR INFORMATION CONTROL
#IO-6074-16000-008-000
DANIEL INC.
AAN APPROVED AS NOTED
ANR APPROVED AS NOTED AND RESUBMIT
DIS DISAPPROVED AND RESUBMIT
FOR INFORMATION ONLY
LIABILITY UNDER THE
CONTRACT/PURCHASE ORDER.

JUL 13 1994

LIGHTNING PROTECTION SYSTEM
GENERAL INSTALLATION NOTES

A. THESE SPECIFICATIONS CONTEMPLATE & COMPRISE A PERFECT AND COMPLETE INSTALLATION OF EQUIPMENT FOR PROTECTION AGAINST LIGHTNING DAMAGE AND ANYTHING NECESSARY TO THAT RESULT IS INCLUDED THE SAME AS IF SPECIFICALLY MENTIONED.

B. THE INSTALLATION SHALL COMPLY IN ALL RESPECTS TO THE FOLLOWING CODES AND STANDARDS: UL96A & NFPA 780

C. LOCATE AIR TERMINALS (POINTS AND BASES) AS SHOWN ON DRAWING WITHIN 2' OF OUTSIDE BUILDING EDGE, OUTSIDE CORNERS, AND RIDGE ENDS. MAXIMUM SPACING BETWEEN AIR TERMINALS SHALL NOT EXCEED 20'-0" AND THE APEX OF THE POINTS WILL EXCEED A MINIMUM OF 10" ABOVE THE ROOF, PARAPET WALL, OR EQUIPMENT PROTECTED.

D. AIR CONDITIONING UNITS, FANS, VENT STACKS, HOUSING, SCREENS, HVAC UNITS, SKY LIGHTS, ETC., EXTENDED ABOVE THE FLAT ROOF OR PARAPET WALLS SHALL BE PROTECTED WITH AIR TERMINALS AND INTERCONNECTING CABLES BACK TO THE MAIN LIGHTNING PROTECTION SYSTEM.

E. IN ADDITION TO THE AIR TERMINALS AND CABLES ON THE ROOF MOUNTED EQUIPMENT SHOWN, BOND TO METAL BODIES OF CONDUCTANCE ON ROOF WITH MAIN SIZE CONDUCTORS AS REQUIRED BY CODES AND STANDARDS. THESE INCLUDE, BUT ARE NOT LIMITED TO, VENTS, METAL SCREENS AND PANELS, HATCHES, ANTENNAS, ETC., OR ANY LARGE METAL BODIES SUBJECT TO A DIRECT LIGHTNING STRIKE.

F. MAINTAIN HORIZONTAL OR DOWNWARD COURSING OF MAIN CONDUCTOR CABLES AND ENSURE THAT ALL BENDS ARE GRADUAL WITH AT LEAST AN 8" RADIUS AND ARE NOT LESS THAN 90 DEGREES.

G. ALL EXPOSED AND CONCEALED ROOF CONDUCTORS AND BONDING CABLES MUST BE SUPPORTED WITH FASTENERS OF LIKE MATERIAL AT INTERVALS NOT TO EXCEED 3'-0".

H. BOND TO ALL METAL BODIES OF INDUCTANCE (SUBJECT TO AN INDUCED CHARGE) LOCATED WITHIN 6'-0" OF MAIN CONDUCTOR OR OTHER METAL BODY ALREADY BONDED TO THE LIGHTNING PROTECTION SYSTEM WITH APPROVED SECONDARY BONDING CONDUCTOR AND CLAMPS AS REQUIRED BY UL & NFPA CODES. SUCH

Item # 112
Section & Log # 16000_008

OBJECTS INCLUDE, BUT ARE NOT LIMITED TO, METAL FLASHING, METAL COPING CAPS, GRAVEL GUARDS, INTERIOR STRUCTURAL "I" BEAMS, ROOF DRAINS, DOWN SPOUTS, INTERIOR DUCTS, PIPING, ETC. IN GENERAL, ANY ISOLATED BODY AT OR BELOW THE FLAT ROOF OR TOP OF PARAPET WALL SUBJECT TO INDUCTANCE AND WITHIN 6'-0" OF THE SYSTEM.

I. THE BUILDING STRUCTURAL STEEL WILL BE USED AS DOWNLEAD CONDUCTORS AS PER SPECIFICATIONS. ALL CONNECTIONS BETWEEN CONDUCTOR CABLE AND STRUCTURAL STEEL SHALL BE MADE BY EXOTHERMIC WELDS. ALL GROUND TERMINALS SHALL BE LOCATED AROUND THE PERIMETER OF THE STRUCTURE NOT OVER 100' APART AND NOT LESS THAN 1'-0" BELOW GRADE AND OUT A MINIMUM OF 2'-0" FROM FOUNDATION WALLS. DRIVEN GROUND TERMINALS SHALL PENETRATE EARTH AT LEAST 10'. LONGER DEPTH SECTIONAL GROUND TERMINALS MAY BE REQUIRED IN SANDY OR POOR GROUNDING CONDITIONS.

J. COUNTERPOISE CONDUCTOR SHALL BE TRENCHED AT LEAST 2'-0" BELOW GRADE, AND SHALL BE CONNECTED TO GROUND TERMINALS BY MEANS OF EXOTHERMIC WELDS. ONE END OF COUNTERPOISE SHALL BE LEFT DISCONNECTED AT DESIGNATED GROUND TEST WELL AS NOTED IN SPECIFICATIONS.

K. BOND TO METAL WATER SERVICE AND OTHER METALLIC PIPING SYSTEMS AS NEAR AS POSSIBLE WHERE THEY ENTER THE BUILDING AS REQUIRED BY CODES AND STANDARDS.

L. INTERCONNECT ONE GROUND TERMINAL TO THE ELECTRIC SERVICE GROUND, TELEPHONE SERVICE GROUND, AND OTHER BUILDING GROUND SYSTEMS AS REQUIRED BY CODES AND STANDARDS.

Through cable to side of ground rod.

type GY

CABLE CODE	MOLD NUMBER	WELD METAL SIZE	GROUND ROD SIZE	PRICE KEY
A	GYE-148A	90	1/2"	E
B	GYE-148B	115	1/2"	E
C	GYE-148C	150	1/2"	E
D	GYE-148D	150	1/2"	E
E	GYE-148E	150	1/2"	E
F	GYE-148F	150	1/2"	E
G	GYE-148G	200	1/2"	E
H	GYE-148H	200	1/2"	E
J	GYE-148J	200	1/2"	E
K	GYE-148K	200	1/2"	E
L	GYE-148L	250	1/2"	E
Q	GYE-142Q	150	1/2"	E
A	GYE-168A	90	5/8"	E
B	GYE-168B	115	5/8"	E
C	GYE-168C	150	5/8"	E
D	GYE-168D	150	5/8"	E
E	GYE-168E	150	5/8"	E
F	GYE-168F	150	5/8"	E
G	GYE-168G	200	5/8"	E
H	GYE-168H	200	5/8"	E
J	GYE-168J	200	5/8"	E
K	GYE-168K	200	5/8"	E
L	GYE-168L	250	5/8"	E
Q	GYE-162Q	150	5/8"	E
A	GYE-188A	90	3/4"	E
B	GYE-188B	115	3/4"	E
C	GYE-188C	150	3/4"	E
D	GYE-188D	150	3/4"	E
E	GYE-188E	150	3/4"	E
F	GYE-188F	150	3/4"	E
G	GYE-188G	200	3/4"	E
H	GYE-188H	200	3/4"	E
J	GYE-188J	200	3/4"	E
K	GYE-188K	200	3/4"	E
L	GYE-188L	250	3/4"	E
Q	GYE-182Q	150	3/4"	E
A	GYE-228A	90	1"	E
B	GYE-228B	115	1"	E
C	GYE-228C	150	1"	E
D	GYE-228D	150	1"	E
E	GYE-228E	150	1"	E
F	GYE-228F	150	1"	E
G	GYE-228G	200	1"	E
H	GYE-228H	200	1"	E
J	GYE-228J	200	1"	E
K	GYE-228K	200	1"	E
L	GYE-228L	250	1"	E
Q	GYE-222Q	150	1"	E

Ground rods are 3/4" diameter

FOR GR, GN, GV, GT, & GY CONNECTIONS

Mold numbers listed are for Copper-Bond Ground rods, either plain (except 1/2") or threaded ends. For 1/2" plain end copper-bond rod or for steel rods (stainless, stainless clad, galvanized, etc.), change the mold part number as follows:

1/2" plain end copper-bond rod — change "14" to "15" (eg. GRC-158C)

1/2" steel rod — no change required

5/8" steel rod — change "16" to "31" (eg. GRC-318C)

3/4" steel rod — change "18" to "33" (eg. GRC-338D)

1" steel rod — change "22" to "37" (eg. GRC-378F)

Weld Metal Sizes do not change.

ERICO® PRODUCTS INC. CLEVELAND, OHIO 44139 | Phone 1-800-248-WELD In Ohio (216) 248-0100 Telex . . . 433-2143 FAX . . . (216) 248-0723
CADWELD®

LIGHTNING PROTECTION CONNECTIONS

Cable tap to top of ground rod.

type GR

CABLE CODE	MOLD NUMBER	WELD METAL SIZE	GROUND ROD SIZE	PRICE KEY
A	GRC-148A	90	1/2"	C
B	GRC-148B	90	1/2"	C
C	GRC-148C	90	1/2"	C
D	GRC-148D	115	1/2"	C
E	GRC-148E	115	1/2"	C
F	GRC-148F	115	1/2"	C
G	GRC-148G	115	1/2"	C
H	GRC-148H	115	1/2"	C
J	GRC-148J	115	1/2"	C
K	GRC-148K	115	1/2"	C
L	GRC-148L	150	1/2"	C
Q	GRC-142Q	90	1/2"	C
A	GRC-168A	90	5/8"	C
B	GRC-168B	90	5/8"	C
C	GRC-168C	115	5/8"	C
D	GRC-168D	115	5/8"	C
E	GRC-168E	115	5/8"	C
F	GRC-168F	115	5/8"	C
G	GRC-168G	115	5/8"	C
H	GRC-168H	115	5/8"	C
J	GRC-168J	115	5/8"	C
K	GRC-168K	115	5/8"	C
L	GRC-168L	150	5/8"	C
Q	GRC-162Q	90	5/8"	C
A	GRC-188A	90	3/4"	C
B	GRC-188B	90	3/4"	C
C	GRC-188C	115	3/4"	C
D	GRC-188D	115	3/4"	C
E	GRC-188E	115	3/4"	C
F	GRC-188F	115	3/4"	C
G	GRC-188G	115	3/4"	C
H	GRC-188H	115	3/4"	C
J	GRC-188J	115	3/4"	C
K	GRC-188K	115	3/4"	C
L	GRC-188L	150	3/4"	C
Q	GRC-182Q	90	3/4"	C
A	GRC-228A	150	1"	C
B	GRC-228B	150	1"	C
C	GRC-228C	150	1"	C
D	GRC-228D	150	1"	C
E	GRC-228E	150	1"	C
F	GRC-228F	200	1"	C
G	GRC-228G	200	1"	C
H	GRC-228H	200	1"	C
J	GRC-228J	200	1"	C
K	GRC-228K	200	1"	C
L	GRC-228L	250	1"	C
Q	GRC-222Q	150	1"	C

Parallel tap/Vertical — Tap up, streamlined for driving

type GN

CABLE CODE	MOLD NUMBER	WELD METAL SIZE	GROUND ROD SIZE	PRICE KEY
A	GNR-148A	90	1/2"	R
B	GNR-148B	90	1/2"	R
C	GNR-148C	115	1/2"	R
D	GNR-148D	150	1/2"	R
E	GNR-148E	150	1/2"	R
F	GNR-148F	150	1/2"	R
G	GNR-148G	150	1/2"	R
H	GNR-148H	150	1/2"	R
J	GNR-148J	200	1/2"	R
K	GNR-148K	200	1/2"	R
L	GNR-148L	250	1/2"	R
Q	GNR-142Q	150	1/2"	R
A	GNR-168A	90	5/8"	R
B	GNR-168B	90	5/8"	R
C	GNR-168C	115	5/8"	R
D	GNR-168D	150	5/8"	R
E	GNR-168E	150	5/8"	R
F	GNR-168F	150	5/8"	R
G	GNR-168G	150	5/8"	R
H	GNR-168H	150	5/8"	R
J	GNR-168J	200	5/8"	R
K	GNR-168K	200	5/8"	R
L	GNR-168L	250	5/8"	R
Q	GNR-162Q	150	5/8"	R
A	GNR-188A	115	3/4"	R
B	GNR-188B	115	3/4"	R
C	GNR-188C	150	3/4"	R
D	GNR-188D	200	3/4"	R
E	GNR-188E	200	3/4"	R
F	GNR-188F	200	3/4"	R
G	GNR-188G	200	3/4"	R
H	GNR-188H	200	3/4"	R
J	GNR-188J	200	3/4"	R
K	GNR-188K	200	3/4"	R
L	GNR-188L	250	3/4"	R
Q	GNR-182Q	150	3/4"	R
A	GNR-228A	150	1"	R
B	GNR-228B	150	1"	R
C	GNR-228C	200	1"	R
D	GNR-228D	200	1"	R
E	GNR-228E	200	1"	R
F	GNR-228F	250	1"	R
G	GNR-228G	250	1"	R
H	GNR-228H	250	1"	R
J	GNR-228J	250	1"	R
K	GNR-228K	250	1"	R
L	GNR-228L	2-150	1"	R
Q	GNR-222Q	200	1"	R

FOR STEEL GROUND RODS — SEE NOTE ON PAGE 8

ERICO® PRODUCTS INC. | Phone 1-800-248-WELD Telex . . . 433-2143
CLEVELAND, OHIO 44139 | In Ohio (216) 248-0100 FAX . . . (216) 248-0723

CADWELD®

LIGHTNING PROTECTION CONNECTIONS

Cross of horizontal cables, tap cable cut.

type XA

CABLE CODE RUN	CABLE CODE TAP	MOLD NUMBER	WELD METAL SIZE	PRICE KEY
A	A	XAC-8A8A	65	C
B	B	XAC-8B8B	90	C
B	A	XAC-8B8A	65	C
C	C	XAC-8C8C	150	C
C	B	XAC-8C8B	115	C
C	A	XAC-8C8A	90	C
D	D	XAC-8D8D	150	C
D	C	XAC-8D8C	150	C
D	B	XAC-8D8B	115	C
D	A	XAC-8D8A	90	C
E	E	XAC-8E8E	200	C
E	D	XAC-8E8D	200	C
E	C	XAC-8E8C	150	C
E	B	XAC-8E8B	115	C
E	A	XAC-8E8A	115	C
F	F	XAC-8F8F	200	C
F	E	XAC-8F8E	200	C
F	D	XAC-8F8D	150	C
F	C	XAC-8F8C	150	C
F	B	XAC-8F8B	115	C
F	A	XAC-8F8A	115	C
F	Q	XAC-8F8Q	200	C
G	G	XAC-8G8G	200	C
G	F	XAC-8G8F	200	C
G	E	XAC-8G8E	200	C
G	D	XAC-8G8D	150	C
G	C	XAC-8G8C	150	C
G	B	XAC-8G8B	115	C
G	A	XAC-8G8A	115	C
G	Q	XAC-8G2Q	200	C
H	H	XAC-8H8H	200	C
H	G	XAC-8H8G	200	C
H	F	XAC-8H8F	200	C
H	E	XAC-8H8E	200	C
H	D	XAC-8H8D	150	C
H	C	XAC-8H8C	150	C
H	B	XAC-8H8B	115	C
H	A	XAC-8H8A	115	C
H	Q	XAC-8H2Q	200	C

Type XA (continued)

CABLE CODE RUN	CABLE CODE TAP	MOLD NUMBER	WELD METAL SIZE	PRICE KEY
J	J	XAC-8J8J	250	C
J	H	XAC-8J8H	200	C
J	G	XAC-8J8G	200	C
J	F	XAC-8J8F	200	C
J	E	XAC-8J8E	200	C
J	D	XAC-8J8D	200	C
J	C	XAC-8J8C	150	C
J	B	XAC-8J8B	115	C
J	A	XAC-8J8A	115	C
J	Q	XAC-8J2Q	200	C
K	K	XAC-8K8K	250	C
K	J	XAC-8K8J	250	C
K	H	XAC-8K8H	250	C
K	G	XAC-8K8G	200	C
K	F	XAC-8K8F	200	C
K	E	XAC-8K8E	200	C
K	D	XAC-8K8D	200	C
K	C	XAC-8K8C	200	C
K	B	XAC-8K8B	150	C
K	A	XAC-8K8A	150	C
K	Q	XAC-8K2Q	200	C
L	L	XAD-8L8L	2-150	D
L	K	XAC-8L8K	250	C
L	J	XAC-8L8J	250	C
L	H	XAC-8L8H	250	C
L	G	XAC-8L8G	250	C
L	F	XAC-8L8F	250	C
L	E	XAC-8L8E	200	C
L	D	XAC-8L8D	200	C
L	C	XAC-8L8C	200	C
L	B	XAC-8L8B	150	C
L	A	XAC-8L8A	150	C
L	Q	XAC-8L2Q	250	C
Q	Q	XAC-2Q2Q	200	C
Q	F	XAC-2Q8F	200	C
Q	E	XAC-2Q8E	200	C
Q	D	XAC-2Q8D	150	C
Q	C	XAC-2Q8C	150	C
Q	B	XAC-2Q8B	115	C
Q	A	XAC-2Q8A	115	C

LIGHTNING PROTECTION CONNECTIONS

Splice of horizontal cables.

type SS

CABLE CODE	MOLD NUMBER	WELD METAL SIZE	PRICE KEY
A	SSC-8A	25	C
B	SSC-8B	45	C
C	SSC-8C	65	C
D	SSC-8D	90	C
E	SSC-8E	90	C
F	SSC-8F	90	C
G	SSC-8G	115	C
H	SSC-8H	115	C
J	SSC-8J	115	C
K	SSC-8K	115	C
L	SSC-8L	150	C
Q	SSC-2Q	90	C

Tee of horizontal run and tap cables.

type TA

CABLE CODE RUN	CABLE CODE TAP	MOLD NUMBER	WELD METAL SIZE	PRICE KEY
A	A	TAC-8A8A	45	C
B	B	TAC-8B8B	65	C
B	A	TAC-8B8A	45	C
C	C	TAC-8C8C	115	C
C	B	TAC-8C8B	90	C
C	A	TAC-8C8A	65	C
D	D	TAC-8D8D	115	C
D	C	TAC-8D8C	115	C
D	B	TAC-8D8B	90	C
D	A	TAC-8D8A	65	C
E	E	TAC-8E8E	150	C
E	D	TAC-8E8D	150	C
E	C	TAC-8E8C	115	C
E	B	TAC-8E8B	90	C
E	A	TAC-8E8A	90	C
F	F	TAC-8F8F	150	C
F	E	TAC-8F8E	150	C
F	D	TAC-8F8D	115	C
F	C	TAC-8F8C	115	C
F	B	TAC-8F8B	90	C
F	A	TAC-8F8A	90	C
F	Q	TAC-8F2Q	150	C
G	G	TAC-8G8G	150	C
G	F	TAC-8G8F	150	C
G	E	TAC-8G8E	150	C
G	D	TAC-8G8D	115	C

Type TA (continued)

CABLE CODE RUN	CABLE CODE TAP	MOLD NUMBER	WELD METAL SIZE	PRICE KEY
G	C	TAC-8G8C	115	C
G	B	TAC-8G8B	90	C
G	A	TAC-8G8A	90	C
G	Q	TAC-8G2Q	150	C
H	H	TAC-8H8H	150	C
H	G	TAC-8H8G	150	C
H	F	TAC-8H8F	150	C
H	E	TAC-8H8E	150	C
H	D	TAC-8H8D	115	C
H	C	TAC-8H8C	115	C
H	B	TAC-8H8B	90	C
H	A	TAC-8H8A	90	C
H	Q	TAC-8H2Q	150	C
J	J	TAC-8J8J	200	C
J	H	TAC-8J8H	150	C
J	G	TAC-8J8G	150	C
J	F	TAC-8J8F	150	C
J	E	TAC-8J8E	150	C
J	D	TAC-8J8D	150	C
J	C	TAC-8J8C	115	C
J	B	TAC-8J8B	90	C
J	A	TAC-8J8A	90	C
J	Q	TAC-8J2Q	150	C
K	K	TAC-8K8K	200	C
K	J	TAC-8K8J	200	C
K	H	TAC-8K8H	200	C
K	G	TAC-8K8G	150	C
K	F	TAC-8K8F	150	C
K	E	TAC-8K8E	150	C
K	D	TAC-8K8D	150	C
K	C	TAC-8K8C	150	C
K	B	TAC-8K8B	115	C
K	A	TAC-8K8A	115	C
K	Q	TAC-8K2Q	150	C
L	L	TAC-8L8L	250	C
L	K	TAC-8L8K	200	C
L	J	TAC-8L8J	200	C
L	H	TAC-8L8H	200	C
L	G	TAC-8L8G	200	C
L	F	TAC-8L8F	200	C
L	E	TAC-8L8E	150	C
L	D	TAC-8L8D	150	C
L	C	TAC-8L8C	150	C
L	B	TAC-8L8B	115	C
L	A	TAC-8L8A	115	C
L	Q	TAC-8L2Q	200	C
Q	Q	TAC-2Q2Q	150	C
Q	F	TAC-2Q8F	150	C
Q	E	TAC-2Q8E	150	C
Q	D	TAC-2Q8D	115	C
Q	C	TAC-2Q8C	115	C
Q	B	TAC-2Q8B	90	C
Q	A	TAC-2Q8A	90	C

ERICO® PRODUCTS INC.
CLEVELAND, OHIO 44139
Phone 1-800-248-WELD
In Ohio (216) 248-0100
Telex . . . 433-2143
FAX . . . (216) 248-0723
CADWELD®

LIGHTNING PROTECTION CONNECTIONS

Horizontal cable tap to horizontal steel surface or pipe. Cable on surface.

type HA

CABLE CODE	MOLD NUMBER	WELD METAL SIZE	PRICE KEY
A	HAA-8A	45	A
B	HAA-8B	65	A
C	HAC-8C	90	C
D	HAC-8D	115	C
E	HAC-8E	115	C
F	HAC-8F	115	C
G	HAC-8G	115	C
H	HAC-8H	115	C
J	HAC-8J	150	C
K	HAC-8K	200	C
L	HAC-8L	250	C
Q	HAC-2Q	115	C

Horizontal cable tap to horizontal steel surface or pipe. Cable off surface.

type HS

CABLE CODE	MOLD NUMBER	WELD METAL SIZE	PRICE KEY
D	HSC-8D	115	C
E	HSC-8E	115	C
F	HSC-8F	115	C
G	HSC-8G	115	C
H	HSC-8H	115	C
J	HSC-8J	150	C
K	HSC-8K	200	C
L	HSC-8L	250	C
Q	HSC-2Q	115	C

Through horizontal cable to horizontal steel surface or pipe. Cable on surface.

type HC

CABLE CODE	MOLD NUMBER	WELD METAL SIZE	PRICE KEY
A	HCA-8A	65	A
B	HCA-8B	65	A
C	HCC-8C	90	C
D	HCC-8D	150	C
E	HCC-8E	150	C
F	HCC-8F	150	C
G	HCC-8G	150	C
H	HCC-8H	150	C
J	HCC-8J	200	C
K	HCC-8K	200	C
L	HCC-8L	250	C
Q	HCC-2Q	150	C

Through horizontal cable to horizontal steel surface or pipe. Cable off surface.

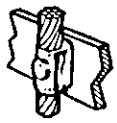
type HT

CABLE CODE	MOLD NUMBER	WELD METAL SIZE	PRICE KEY
D	HTC-8D	150	C
E	HTC-8E	150	C
F	HTC-8F	150	C
G	HTC-8G	150	C
H	HTC-8H	150	C
J	HTC-8J	200	C
K	HTC-8K	200	C
L	HTC-8L	250	C
Q	HTC-2Q	150	C

Cable tap down at 45° to vertical steel surface or side of horizontal or vertical pipe.

type VS

CABLE CODE	MOLD NUMBER	WELD METAL SIZE	PRICE KEY
A	VSC-8A	65	C
B	VSC-8B	65	C
C	VSC-8C	90	C
D	VSC-8D	115	C
E	VSC-8E	115	C
F	VSC-8F	115	C
G	VSC-8G	150	C
H	VSC-8H	150	C
J	VSC-8J	150	C
K	VSC-8K	150	C
L	VSC-8L	200	C
Q	VSC-2Q	115	C



Through vertical cable to vertical steel surface or to the side of either horizontal or vertical pipe.

type VV

CABLE CODE	MOLD NUMBER	WELD METAL SIZE	PRICE KEY
A	VVC-8A	90	C
B	VVC-8B	115	C
C	VVR-8C	200	R
D	VVR-8D	250	R
E	VVR-8E	2-150	R
F	VVR-8F	2-150	R
G	VVR-8G	2-150	R
H	VVR-8H	2-150	R
J	VVF-8J	2-200	F
K	VVF-8K	2-200	F
L	VVF-8L	500	F
Q	VVR-2Q	250	R

1/2" SOLID POINTS

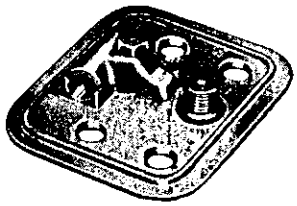
NOTE: All 1/2" solid copper points listed below are nickel tipped and with adapter with 5/8" inside thread.

No. 331 1/2" x 12" Copper. Wt. 12 oz. ea.
No. 331A 1/2" x 18" Copper. Wt. 17 oz. ea.
No. 331B 1/2" x 24" Copper. Wt. 1⅜ lb. ea.
No. 331C 1/2" x 36" Copper. Wt. 2⅛ lb. ea.
No. 331D 1/2" x 48" Copper. Wt. 2⅝ lb. ea.

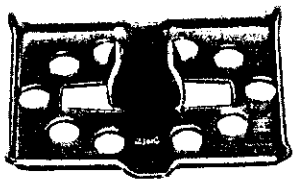
NOTE: 1/2" Solid Aluminum points listed below are furnished with a highly polished finish and adapter with 5/8" inside thread.

No. A331 1/2" x 12" Aluminum. Wt. 5 oz. ea.
No. A331A 1/2" x 18" Aluminum. Wt. 6 oz. ea.
No. A331B 1/2" x 24" Aluminum. Wt. 1/2 lb. ea.
No. A331C 1/2" x 36" Aluminum. Wt. 3/4 lb. ea.
No. A331D 1/2" x 48" Aluminum. Wt. 1 lb. ea.

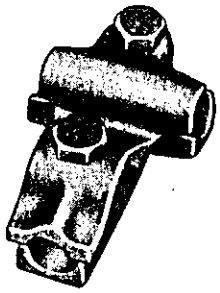
No. 303 Bronze Pressure Type Straight Cable Splicer for clamping cables through 2/0. Furnished complete with two hex bolts and washers. Clamp type cable action offers maximum strength. Wt. 3/4 lb. ea.



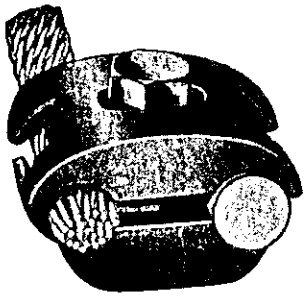
No. 60X Bronze No-Nail Point Base, with 5/8" outside thread, clamp type cable fastener. For use on flat, built-up roofs. Wt. 7/8 lb. ea.



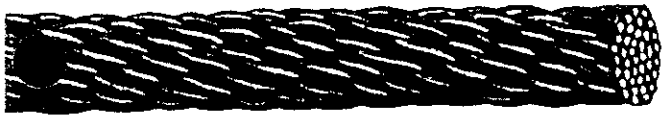
No. 265Z Zinc Adhesive Cable Fastener. 3¼"x2½". For use with both copper and aluminum cables. Wt. 2 oz. ea.



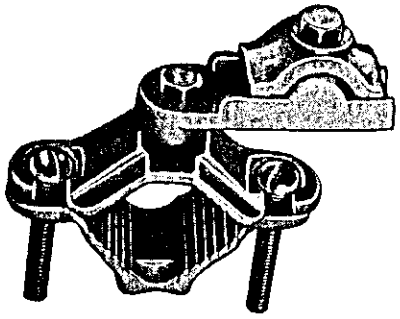
No. 304 Bronze Pressure Type "T" Cable Splicer for clamping standard cables through 2/0. Furnished complete with two hex bolts and washers. Clamp type cable action offers maximum strength. Wt. 5/8 lb. ea.



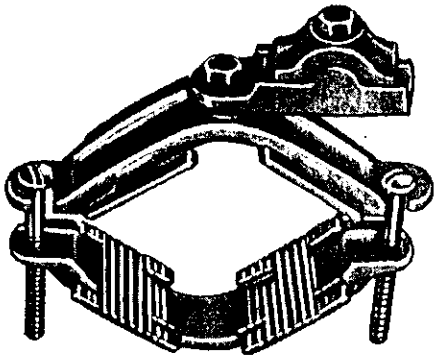
No. 297A Bronze Large Many Purpose Clamp heavy duty, for clamping two standard cables through 2/0 and/or 1/2" and 5/8" rods. Wt. 3/8 lb. ea.



No. 32S Smooth Twist Copper Cable. No. 2 size. 32 strand 17 gauge cable. Diameter 15/32". 65,600 circular mils. Net weight per 1000', 215 lbs. Exceeds Underwriters' Laboratories minimum requirements. Conductor most commonly used on average installations.



No. 306A, No. A306A



*No. 306B, No. A306B

No. 306A Bronze Large Perfection Pipe Clamp with clamp type cable fastener that swivels 360°. Fits 1¼" and 2" iron water pipes. (Max. 2½" O.D.). Lower casting may be inverted to fit smaller diameter pipes and rods. Tinned to prevent corrosion. Wt. 1⅛ lb. ea.

No. 306F Bronze Large Perfection Pipe Clamp similar to 306A, with finger type cable clamp. Wt. 1⅛ lb. ea.

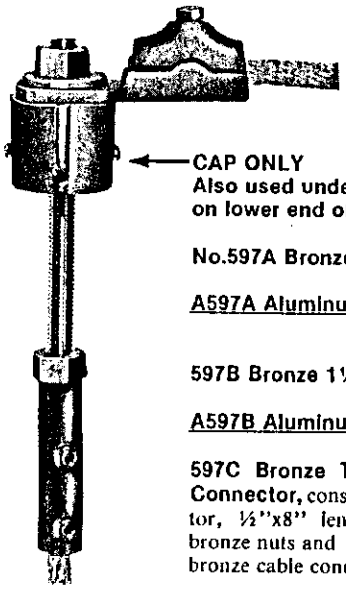
No. A306A Aluminum Large Perfection Pipe Clamp. Wt. 1/2 lb. ea.

No. A306F Aluminum Large Perfection Pipe Clamp similar to A306A with finger type cable clamp. Wt. 1/2 lb. ea.

***No. 306B Bronze Extra Large Perfection Pipe Clamp** with clamp type cable fastener that swivels 360°. Fits from 2½" to 4" iron water pipes. (Max. 4½" O.D.). Tinned to prevent corrosion. Wt. 1⅝ lb. ea.

***No. A306B Aluminum Extra Large Perfection Pipe Clamp.** Wt. 5/8 lb. ea.

THRU-ROOF PVC CONDUIT CONNECTORS



CAP ONLY
Also used under roof on lower end of PVC

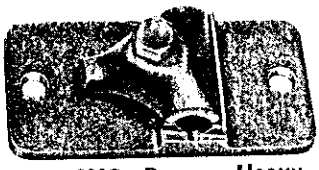
No.597A Bronze 1" PVC Cap, only

A597A Aluminum 1" PVC Cap, only

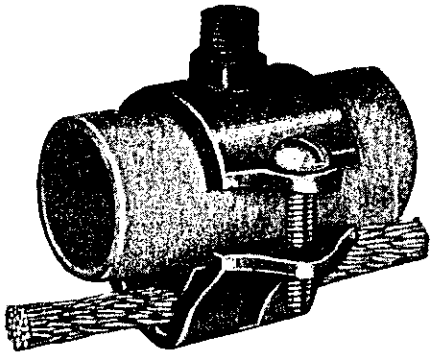
597B Bronze 1¼" PVC Cap, only

A597B Aluminum 1¼" PVC Cap, only

597C Bronze Thru-Roof 1" PVC Conduit Connector, consists of top bronze cable connector, ½"x8" length threaded stem two, ½" bronze nuts and ½" bronze washer and bottom bronze cable connector. Wt. 2¼ lbs. ea.



No. 238B Bronze Heavy Duty 2 Screw Metal Bonding Plate with clamp type cable fastener for all standard cables through 2/0. Affords 8 sq. inches of bonding surface. Wt. 5/8 lb. ea.



No. 181 Bronze Railing Bracket with 5/8" outside thread, clamp type cable fastener. Fits up to 1¾" O.D. railing. Wt. 3/4 lb. ea.

No. 181A Bronze Railing Bracket with 1/2" inside thread. Clamp type cable fastener. Wt. 3/4 lb. ea.

No. A181 Aluminum Railing Bracket. Wt. 1/4 lb. ea.

No. A181A Aluminum Railing Bracket. Wt. 1/4 lb. ea.

No. 181C Copper Strap Railing Cable Clamp. Fits up to 1¾" O.D. railing. Wt. 11 per lb.

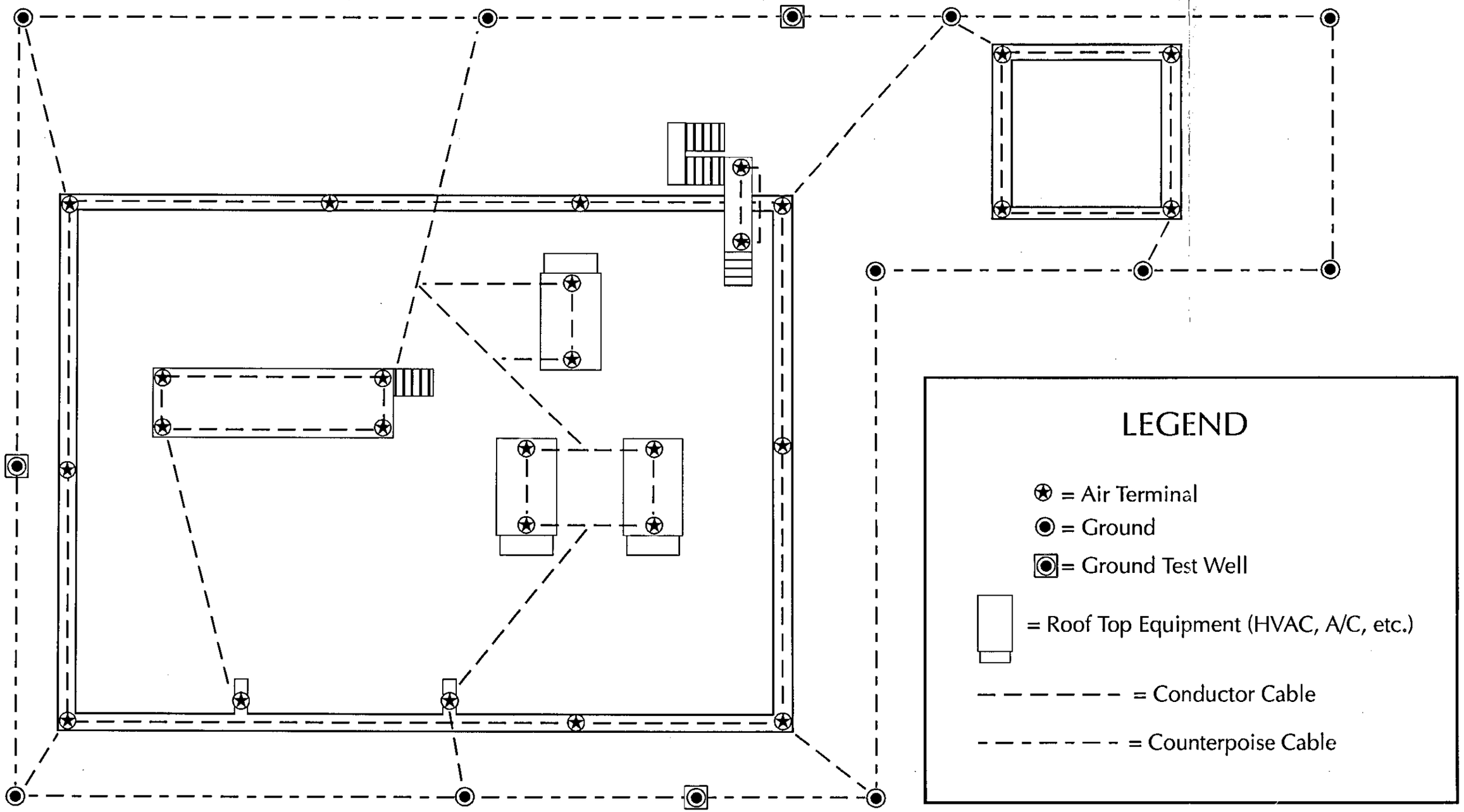
No. A181C Aluminum Strap Railing Cable Clamp. Wt. 27 per lb.

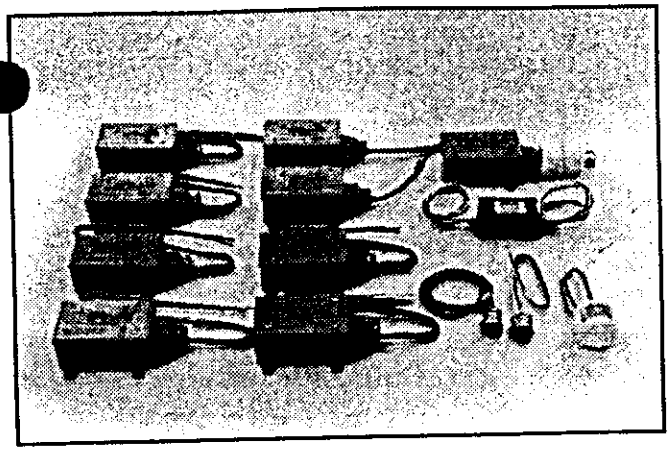
Above strap railing cable clamp not illustrated.

GROUND RODS

COPPERWELD

No. 137 1/2" x 8' Ground Rod. Wt. 5 lb. ea.
No. 137A 1/2" x 9' Ground Rod. Wt. 6 lb. ea.
No. 138 1/2" x 10' Ground Rod. Wt. 6½ lb. ea.
No. 138A 1/2"x12' Ground Rod. Wt. 7½ lb. ea.
No. 139 5/8" x 8' Ground Rod. Wt. 7¾ lb. ea.
No. 577 5/8" x 10' Ground Rod. Wt. 9½ lb. ea.
No. 579 3/4" x 10' Ground Rod. Wt. 14¼ lb. ea.


LEGEND
= Air Terminal
= Ground
= Ground Test Well
= Roof Top Equipment (HVAC, A/C, etc.)
= Conductor Cable
= Counterpoise Cable



Panel surge suppressors mount on the load side of main and sub panels. Panel Protectors, often called facility protectors, protect your main circuits from surges and spikes associated with lightning, grid switching, and inductive loads within your own facility.

When used in combination with low pass voltage AC plug-in surge suppressors, complete AC equipment and systems protection can be achieved.

Common Specifications for Main and Sub-Panel Protectors

- UL Listed TVSS 1449 - 78E6
- Response Time: <5 Nanoseconds
- Voltage: Voltage Sensitive
- Peak Surge Current:
  25,000 Amps Non-HE Products
  50,000 Amps — HE Products
- Current:
  Non-load Bearing
  Parallel Installation
- Follow on Current: None
- Operating Temperature: -40 to +85° C
- Fail-Safe Operation
- Multi-Stage Design
- Installation Configuration: Parallel Design
- Protection Modes: Phase/Phase
  Phase/Neutral
  Phase/Ground
  Neutral/Ground
- Full Heatsinking & Redundant Circuitry
- Meets or Exceeds ANSI/IEEE Standard 587 (C62.33, C62.41, C62.45)
- Enclosure: UL Listied 514, 61E8 & CSA Approved
  UL Listied — Marine Rating — Weather Proof
- Operating Environment:
  Exterior/Interior applications
  Weather Proof/Completely Encapsulated
- Clamping Voltage:

120 Volt Units	130 VRMS
208/240 Volt Units	250 VRMS
480 Volt Units	510 VRMS

Product	Description	Power Dissipation Joules	Power Dissipation Volt Amps (VA)
HARDWIRE			
120 HM	120VAC, 3-wire, Miniature	240	1,100,000
120 HW CP	120V Circuit Protector, 3 Wire, 15 Amp max.	600	6,500,000
120 H UL	120VAC, Wire	240	2,535,000
240 H UL	240VAC, 4 Wire	540	5,850,000
240 3D H UL	240VAC, 5 Wire	1040	12,350,000
208 3Y H UL	208VAC, 5 Wire	915	10,790,000
480 3D H UL	480VAC, 4 Wire	1480	19,890,000
480 3Y H UL	480VAC, 5 Wire	2100	24,505,000
HARDWIRE HIGH ENERGY			
120HE UL	120VAC, 3-wire	480	5,070,000
240HE UL	240VAC, 4-Wire	1080	11,700,000
240 3DHE UL	240VAC, 5-Wire	2080	24,700,000
208 3YHE UL	108VAC, 5-Wire	1830	21,580,000
480 3DHE UL	480VAC, 4-Wire	2960	49,010,000
480 3YHE UL	480VAC, 5-Wire	4200	39,780.000
MARINE			
120 HM-M	120VAC, 3 Wire Miniature	240	1,100,000
120 H-M	120VAC, 3 Wire	240	2,535,000
240 H-M	240VAC, 4 Wire	540	5,850.000
240 3D H-M	240VAC, 5 Wire	1040	12,350,000
208 3Y H-M	208VAC, 5 Wire	915	10,790,000
TWISTLOCK			
120VTL520P	120VAC w/20A TL Plug	240	1,100,000
240TL1420P	240VAC w/20A TL Plug	540	2,535,000
2403DTLP	240VAC, 5 Wire w/TL Plug	1040	12,350,000
2083YTL212	208VAC, 5 Wire w/ TL Plug	915	10,790,000
4803DTLP	480VAC, 4 Wire w/TL Plug	1480	19,890,000
4803YTLP	480VAC, 5 Wire w/TL Plug	2100	24,505,000

NOTE: *These items can be custom manufactured with any voltage or plug configuration.*

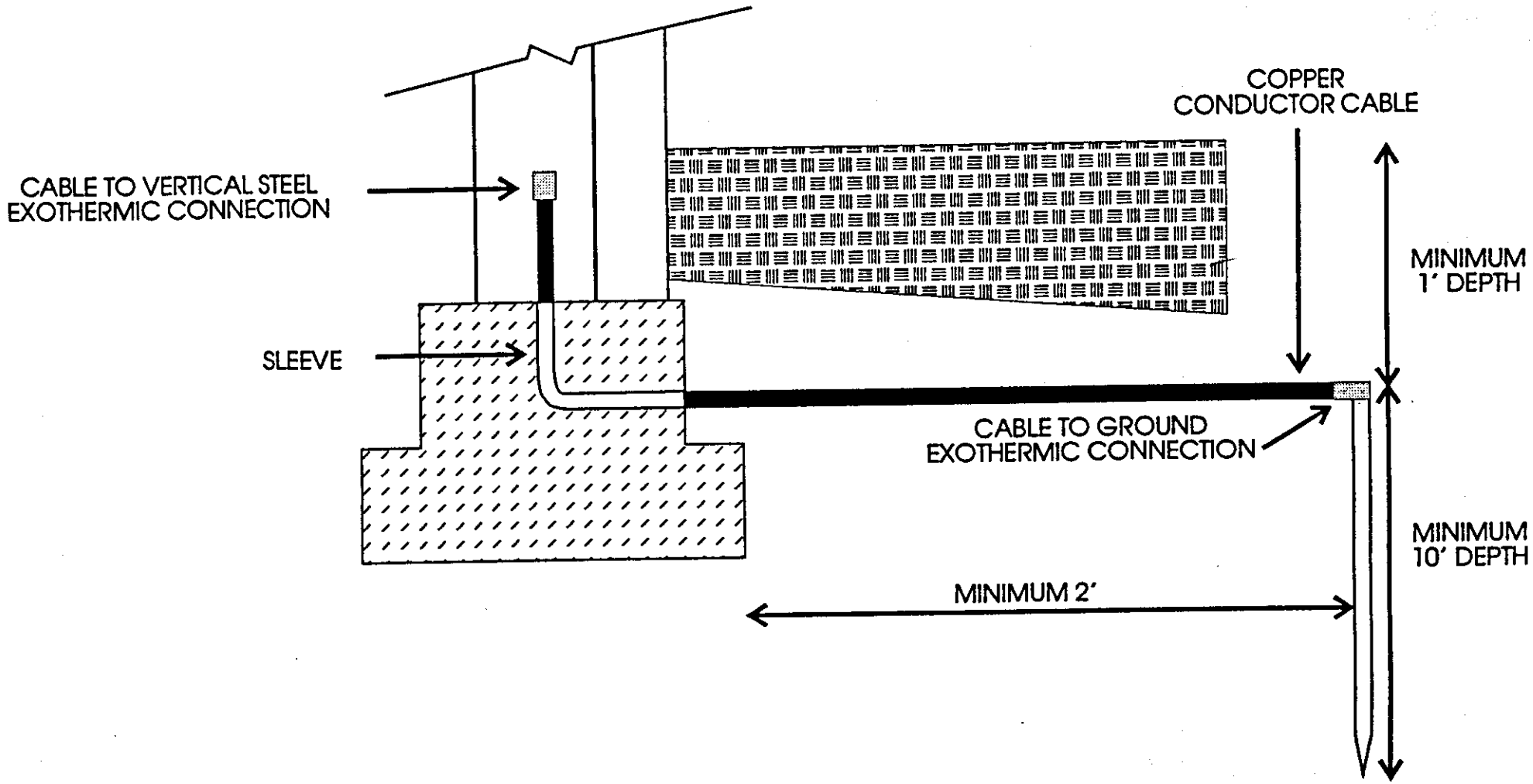


DIAGRAM SHOWING BUILDING STEEL BEING USED AS DOWN CONDUCTOR USING EXOTHERMIC WELD CONNECTIONS

ALL ITEMS MUST BE COMPLETED IN ORDER TO PROCESS APPLICATION

APPLICATION FOR: (PICK ONE ONLY)

MASTER LABEL ☑ INSTALLATION PER UL96A ☐ RECONDITIONED INSTALLATION PER UL96A

LETTER OF FINDINGS ☐ NFPA 78 ☐ AMCR 385-100 ☐ _____ (Specify) OTHER

Serial No. 40350

UNDERWRITERS LABORATORIES Inc.

333 Pfingsten Rd., Northbrook, IL 60062

4

Building Location:—Road directions must be given for reaching job from nearest town. If job is in city or town give street address; for large metropolitan areas, give general areas—i.e., Northwest, North, center of city, etc. or major intersection. Be definite. If road is known by name or number, write information below. Use reverse side of this report for other directions or sketches for Field Representative's use.

Building Name:

STREET: 1549 Gold Dr.

CITY: Goose | STATE: S.C. | ZIP CODE: 29651

Directions: Gold Mart

BUILDING OWNER'S NAME (Print): National Weather Service c/o Pluor Daniel Inc | TELE. No.

STREET ADDRESS, P.O. BOX or R.F.D. No.: 4600 Marium Ave #400

CITY: Kansas City | STATE: MO | ZIP CODE: 64112

OWNER

When the Master Label is received, please attach the Labels as numbered to the buildings as named. Locate the Label adjacent to the Installer's nameplate.

No.	TYPE OF STRUCTURE (Specify Office Bldg., House, Church, etc.)	No. of Air Terminals	Length of Cable (ft.)	No. of Grounds	Depth of Rod in Ground	Length of Structure	Width of Structure	Maximum Height	STRUCTURE MATERIAL Roof	STRUCTURE MATERIAL Walls	Date Installed	Master Label Serial Number	Date Issued
1	[illegible]	28	[illegible]	11	12'	41.4'	[illegible]	17.5'	[illegible]	[illegible]	1-9-95		
2	[illegible]	4	200	2'	12'	22.8'	22.0'	12.1	"	"	1-9-95		
3													
4													
5													

Is structure intended for or used for the manufacturing, storage or handling of explosives or flammable liquids? ☐ Yes ☑ No

Do the materials have UL Listing Marks? ☑ Yes ☐ No

MATERIAL MFR'S NAME:

Is there an existing system? ☐ Yes ☑ No

If yes, does the existing system bear a Master Label? ☐ Yes ☐ No

Master Label No.

INSTALLATION ☐ Completely exposed ☐ Partially or completely concealed (Enclose Installation Drawings)

GROUNDINGS—Did you show owner or his representative the type and manner of placing groundings? ☑ Yes ☐ No

WITNESS (Signature of Owner or his Representative Required)

NOTE: If trenched, illustrate and describe manner of grounding on reverse side of this report.

UNDERGROUND METAL PIPES Are all underground metal pipes entering the building bonded to the lightning protection system? ☑ Yes ☐ No

RADIO AND T.V. MASTS—Are all metal radio & television antenna masts located outside a zone of protection connected to the lightning protection system with main size conductors? ☑ Yes ☐ No

Are they provided with discharge units on lead in wires? ☑ Yes ☐ No

GROUNDED METAL BODIES—Are all grounded metal bodies located outside a zone of protection bonded to the lightning protection system? ☑ Yes ☐ No

STRUCTURAL STEEL—used in lieu of down conductors? ☑ Yes ☐ No

SURGE ARRESTERS—Are Listed surge arresters installed on electric and telephone service entrances? If NO, attach explanation. ☑ Yes ☐ No

ELECTRIC AND TELEPHONE SERVICE Do electric or telephone service enter structure? ☑ Yes ☐ No

If yes, is there grounding common with lightning protection system? ☑ Yes ☐ No

How is common grounding obtained? ☐ Water Pipe ☑ Direct Bonding ☐ Other

CONDUCTOR ☑ Copper ☐ Aluminum ☐ Other

AIR TERMINALS ☑ Copper ☐ Aluminum ☐ Other

INSTALLER'S NAMEPLATE—Has Installer's nameplate been placed on each structure? ☑ Yes ☐ No

Location [illegible]

COPY — Have you delivered the yellow copy of this report to building owner? ☑ Yes ☐ No

OWNER'S STATEMENT—I have carefully read this application and believe the statements herein to be correct.

Print Name John J. Gage III Tele. No. 816 756 6997

Signature of Owner or His Representative [signature] Date 1-5-95

INSTALLER'S STATEMENT—I certify that the materials utilized in this installation bear the UL Listing Mark, that this installation is in full compliance with the present requirements of Underwriters Laboratories Inc. (UL) and that all statements made herein are correct. I understand that if, upon inspection by UL, variations from the requirements are found, such varations must be corrected within the time allotted by UL as stated in their transmittal letter. If the variations are not corrected within the alloted time, UL may notify the Owner that the installations are not in compliance with the requirements.

Signature of Representative [signature] Date

Installer's (Co.) Name (Print) [illegible]

Address (Print) [illegible]

Tel. No. 214 516-9221

Contact person on job site: Richard Bickham

Does installer wish to be contacted prior to the inspection? ☑ Yes ☐ No

FORM 3000-721 REV 991

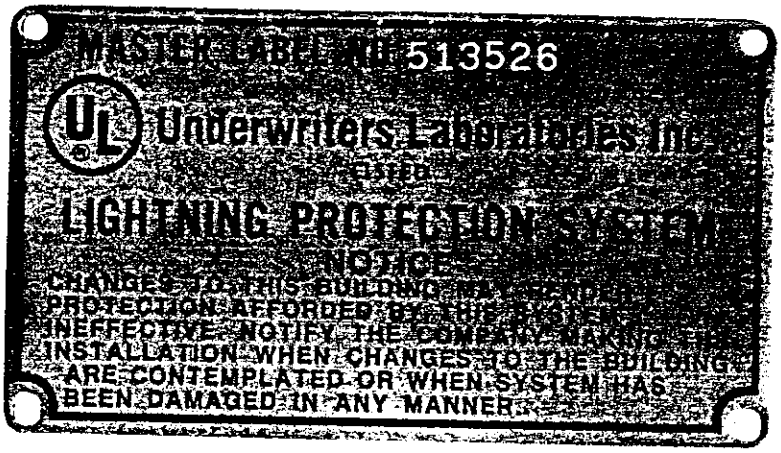
RECEIVED
APR 17 1995
FLUOR DANIEL INC

F.D.I. VENDOR INFORMATION CONTROL
I.D. 607416000 - 08A-001

FLUOR DANIEL INC.

☒ AAP APPROVED
☐ AAN - APPROVED AS NOTED
☐ ANR - APPROVED AS NOTED AND RESUBMIT
☐ DIS - DISAPPROVED AND REGUBMIT
☐ IO - INFORMATION ONLY

APPROVAL DOES NOT RELIEVE CONTRACTOR/VENDOR OF ITS RESPONSIBILITY OR LIABILITY UNDER THE CONTRACT/PURCHASE ORDER.



APPROVED

☑ AS IS ☐ AS NOTED

THIS APPROVAL FOR GENERAL LAYOUT ONLY. DETAIL DIMENSIONS ARE RESPONSIBILITY OF THE SUPPLIER.

NORUNGOLD-DAVIS INC.

BY K. Sandlight DATE 4-11-95