CITY OF LAS VEGAS CITY HALL
400 EAST STEWART AVE.
LAS VEGAS NEVADA

FIRE ALARM SYSTEM

WORST CASE = ENGINEERING BUILDING WIRING IS CLASS A
CALCULATION BASED ON 14 GAUGE WIRE AT 3 OHMS/ 1000
USING OHMS LAW (AMPERAGE X RESISTANCE = VOLTAGE)

DEVICE #	TYPE OF DEVICE	AMPERAGE OF DEVICE	CONDUIT LENGTH	CALCULATED WIRE RESISTANCE	CALCULATED VOLTAGE DROP
1	STROBE	0.077	400	1.200	0.092
2	STROBE	0.077	100	1.500	0.116
3	STROBE	0.077	75	1.725	0.133
4	STROBE	0.077	75	1.950	0.150
5	STROBE	0.077	75	2.175	0.167
6	STROBE	0.077	25	2.250	0.173
7	STROBE	0.077	50	2.400	0.185
8	STROBE	0.077	50	2.550	0.196
9	STROBE	0.077	50	2.700	0.208
			TOTAL =		1.421
			APPLIED VOLTAGE =		24.000
			VOLTAGE DROP % =		5.919
			VOLTAGE AT LAST DEVICE		22.579
			VOLTAGE RANGE OF DEVICE = 21 TO 30		

SPEAKER AT .25 WATT AT 70.7 VOLTS = 0.004 AMPS
SPEAKER AT .5 WATT AT 70.7 VOLTS = 0.007 AMPS
SPEAKER AT 1 WATT AT 70.7 VOLTS = 0.014 AMPS
CLASS A SPEAKER CIRCUIT WORST CASE = ENGINEERING BUILDING
CALCULATION BASED ON 16 GAUGE WIRE AT 5 OHMS/1000'
USING OHMS LAW (AMPERAGE X RESISTANCE = VOLTAGE)
THE FOLLOWING IS TRUE

DEVICE #	TYPE OF DEVICE	AMPERAGE OF DEVICE	CONDUIT LENGTH	CALCULATED WIRE RESISTANCE	CALCULATED VOLTAGE DROP
1	SPEAKER	0.014	400	2.000	0.028
2	SPEAKER	0.014	100	2.500	0.035
3	SPEAKER	0.014	75	2.875	0.040
4	SPEAKER	0.014	75	3.250	0.046
5	SPEAKER	0.014	75	3.625	0.051
6	SPEAKER	0.014	25	3.750	0.053
7	SPEAKER	0.014	50	4.000	0.056
8	SPEAKER	0.014	50	4.250	0.060
9	SPEAKER	0.014	50	4.500	0.063
10	SPEAKER	0.014	50	4.750	0.067
11	SPEAKER	0.014	50	5.000	0.070
12	SPEAKER	0.014	50	5.250	0.074
13	SPEAKER	0.014	50	5.500	0.077
14	SPEAKER	0.014	50	5.750	0.081
15	SPEAKER	0.014	50	6.000	0.084
16	SPEAKER	0.014	50	6.250	0.088
			TOTAL =		0.970
			APPLIED VOLTAGE =		70.700
			VOLTAGE DROP % =		1.371
			VOLTAGE AT LAST DEVICE		69.731

DATA CIRCUIT (ALD-21) MODULE.
MAX RESITANCE = 100 OHMS
MAX CAPACITANCE = .4 ufd

WORST CASE = ENGINEERING BUILDING
CALCULATION:
1800 FEET OF CONDUIT = 3600' FEET OF WIRE
#18 GAUGE = 7 OHMS/1000 = 25.2 OHMS
D975 CABLE OR EQUIVALENT = 25pf/ft X 3600ft = 0.09 ufd.

SOURCE OF ALARM \ SUPERVISORY	OUTPUT FUNCTIONS							
	CAPTURE ELEVATOR	AUDIBLE & VISUAL FLR. BELOW	AUDIBLE & VISUAL FLR. OF ALM.	AUDIBLE & VISUAL FLR. ABOVE	DOORS ON FLOOR OF ALARM ONLY	ANNUNCIATOR ZONE ALARM	ANNUNCIATOR ZONE SUPERVISORY	SHUT DOWN RESPECTIVE AIR HANDLER
SMOKE DET ELEV LOBBY	X	X	X	X	X	X		
SMOKE DET ELEV MACH RM.	X	X	X	X	X	X		
SMOKE DET		X	X	X	X	X		
DUCT DETECTOR		X	X	X	X	X		X
PULL STATION		X	X	X	X	X		
WATER FLOW		X	X	X	X	X		
VALVE SUPERVISORY							X	

-- UNDERGROUND CONDUIT 3/4" UNLESS NOTED OTHERWISE.

WIRE LEGEND

A = 2 # 16 TFN (I.D.C. FROM INTERFACE MODULE TO DEVICE).

B = 2 # 16 TFN (SPEAKER CIRCUIT) (RED = +) (BLACK = -). (TWISTED)

C = 2 # 14 THHN (LAMP CIRCUIT) (BLUE = +) (WHITE = -)

D = 2 # 18 SHEILDED & TWISTED (S.L.C. OR NETWORK OR AUDIO RISER) (RED = +) (BLACK = -).

E = 2 #14 THHN (DOOR HOLDER OR DOOR LOCK). (GRAY = +) (GRAY = -).

(WIRE FOR FEEDS SHALL BE TYPE MI CABLE)

GENERAL NOTES

FIRE ALARM SYSTEM SHALL HAVE SOUND PRESSURE LEVELS PER NFPA 72 OF 15db OVER AMBIENT WITH A 60 DB MINIMUM.

A WAIVER OF NEVADA STATE FIRE MARSHLL REGULATIONS REQUIRING 80 db IN ANY AREA IS REQUESTED DURING PLANS CHECK PER NOTE ABOVE.

EXISTING CONDUIT WILL BE REUSED WHEN POSSIBLE AND MAY BE SMALLER THAN 3/4" HOWEVER CONDUIT FILL WILL NOT EXCEED NATIONAL ELECTRIC CODE REQUIREMENTS.

SEE SHEETS 22 AND 23 FOR BATTERY AND LOAD CALCULATIONS.

ALL NEW CONDUIT SHALL BE 3/4" U.N.O.

PER ENGINEER REVIEW
PER LV FIREDEPT REVIEW
AS BUILT CHANGES

ON THE FLOOR OF ORIGIN AND ON THE

INSTALLATION / OPERATION NOTES

THIS IS A RENNOVATION OF AN EXISTING FIRE ALARM SYSTEM. ALL OLD DEVICES AND CONTROL PANELS WILL BE ELECTRICALLY DISCONNECTED AS THE NEW SYSTEM IS INSTALLED.

ALL WIRING IS INSTALLED NON-POWER LIMITED FASHION. ANY ALARM IN ALL AREAS OF THE BUILDING WILL CAUSE THE AUDIBLES AND THE STROBES TO OPERATE FLOOR ABOVE&FLOOR BELOW BASIS WITH ONE EXCEPTION WHICH IS THE ENGINEERING BUILDING WHICH WILL HAVE ITS AUDIBLES AND STROBES ACTIVATE ONLY FROM AN ALARM IN THE ENGINEERING BUILDING.

ALL SIGNALLING LINE CIRCUITS (S.L.C.) ARE CLASS A STYLE 6a., ALL NOTIFICATION APPLIANCE CIRCUITS (N.A.C.) ARE CLASS A STYLE Z.

EACH INITIATION DEVICE HAS A DISTINCT ADDRESS ON THIS SYSTEM WITH THE STATUS AND SENSITIVITY SETTING (IF APPLICABLE) AVAILABLE VIA THE ALPHA-NUMERIC DISPLAY OF THE MAIN FIRE ALARM CONTROL PANEL. THERE WILL NOT BE ANY OTHER TYPE OF ANNUNCIATION FOR ALARM INITIATING DEVICES PROVIDED AT THE FIRE ALARM CONTROL PANEL. THERE WILL BE ONE REMOTE ANNUNCIATOR LOCATED ON THE OUTSIDE OF THE BUILDING WITH ONE ZONE PER FLOOR LEVEL FOR THE FIRE DEPARTMENT TO LOCATE THE FLOOR IN ALARM. SEE THESE DRAWINGS FOR LOCATION OF ANNUNCIATOR.

THERE WILL BE A ZONED ANNUNCIATOR FOR THE CONTROL AND STATUS OF EACH COMBINATION SPEAKER-STROBE CIRCUIT. THERE WILL BE ONE ZONE FOR EACH LEVEL IN THE BUILDING AND IN ADDITION THERE WILL BE ONE ZONE FOR THE ENGINEERING BUILDING. A GREEN (CIRCUIT SELECTED) AND A YELLOW (TROUBLE LAMP) FOR EACH ZONE WILL BE PROVIDED. LABELING FOR EACH ZONE WILL BE AS FOLLOWS:

ZONE 1 = ENGINEERING BUILDING STROBE/SPEAKER.
ZONE 2 = BASEMENT STROBE/SPEAKER.
ZONE 3 = FIRST FLOOR STROBE/SPEAKER.
ZONE 4 = SECOND FLOOR STROBE/SPEAKER.
ZONE 5 = THIRD FLOOR STROBE/SPEAKER.
ZONE 6 = FOURTH FLOOR STROBE/SPEAKER.
ZONE 7 = FIFTH FLOOR STROBE/SPEAKER.
ZONE 8 = SIXTH FLOOR STROBE/SPEAKER.
ZONE 9 = SEVENTH FLOOR STROBE/SPEAKER.
ZONE 10 = EIGTHTH FLOOR STROBE/SPEAKER.
ZONE 11 = NINTH FLOOR STROBE/SPEAKER.
ZONE 12 = TENTH FLOOR STROBE/SPEAKER.
ZONE 13 = ELEVENTH FLOOR STROBE/SPEAKER.
ZONE 14 = HIGHRISE TOWER STAIRWELLS SPEAKER CIRCUIT.

ONE SWITCH FOR EACH OF THE ABOVE ZONES WILL BE PROVIDED FOR MANUAL PAGING/STROBE ACTIVATION. AN ALL CALL SWITCH, PAGE TO MANUAL SELECTED, PAGE TO EVACUATION, AND AN ALL EVACUATION SWITCH WILL SWITCH WILL BE BE PROVIDED.

THE SYSTEM WILL BE BACKED UP WITH BATTERIES BASED ON 24 HOURS OF STANDBY AND 15 MINUTES OF ALARM. (PER 1-5.2.5 OF NFPA 72 1993 EDITION)

CENTRAL STATION MONITORING IS EXISTING AND WILL MONITOR THE NEW SYSTEM IN THE SAME MANNER AS THE OLD SYSTEM.

LEGEND

FFJ — FIRE FIGHTER PHONE JACK PYROTRONICS FPJ WALL MOUNTED @ +48" USE 4"S"BOX W/1 GANG RING.

FACP — FIRE ALARM CONTROL PANEL PYROTRONICS MXLV WALL MOUNTED AT + 72" TO THE TOP OF THE CABINET.

FAT/R — FIRE ALARM TRANSPONDER PYROTRONICS WITH PSR-1 NETWORK MODULE AND ASSOCIATED POWER SUPPLY AND MODULES. USE MBR-2 BACK BOX WITH MDR-2 DOOR, WALL MOUNTED SURFACE STYLE AT +72" TO TOP OF CABINET.

F — PULL STATION, PYROTRONICS MSI-20 WALL MOUNTED AT + 48" TO TOP OF BACK BOX. USE 4 "S" BOX 2 &1/8" DEEP (MINIMUM) WITH A 1 GANG 5/8" (MIMIMUM) RAISED RING.

S — SMOKE DETECTOR PHOTOELECTRIC ADDRESSABLE TYPE, PYROTRONICS ILP-1 CEILING MOUNTED WITH PYROTRONICS DB-3S BASE. USE 4 "S" BOX 1 &1/2" DEEP WITH SINGLE GANG RING OR 4 " OCTAGON BOX 1 &1/2" DEEP.

D — DUCT DETECTOR PYROTRONICS AD-3P HOUSING WITH PYROTRONICS ILP-1 PHOTOELECTRIC DETECTOR INSIDE. MOUNT HOUSING ON DUCT WORK OF THE AIR HANDLER INDICATED ON THE DRAWINGS. (SA = SUPPLY SIDE RA = RETURN SIDE).

Z — DRY CONTACT MONITORING MODULE PYROTRONICS TRI-60, MOUNTED IN ANY ACESSIBLE INDOOR LOCATION. CAN BE WALL, CEILING, SURFACE OR FLUSH MOUNTED. WALL MOUNTING IS PREFERRED. USE 4 "S" BOX 1 &1/2" DEEP WITH 4 "S" EXTENSION BOX AND 1/2" RAISED 2 GANG RING OR 3 &1/2" DEEP 2 GANG MASONRY BOX. THIS DEVICE HAS ONE INPUT.

Z2 — DRY CONTACT MONITORING MODULE PYROTRONICS TRI-60D, MOUNTED IN ANY ACESSIBLE INDOOR LOCATION. CAN BE WALL, CEILING, SURFACE OR FLUSH MOUNTED. WALL MOUNTING IS PREFERRED. USE 4 "S" BOX 1 &1/2" DEEP WITH 4 "S" EXTENSION BOX AND 1/2" RAISED 2 GANG RING OR 3 &1/2" DEEP 2 GANG MASONRY BOX. THIS DEVICE HAS TWO SEPERATE INPUTS.

FC — DRY CONTACT MONITORING MODULE PYROTRONICS TRI-60R, WITH FORM "C" RELAY MOUNTED IN ANY ACESSIBLE INDOOR LOCATION. CAN BE WALL, CEILING, SURFACE OR FLUSH MOUNTED, WALL MOUNTING IS PREFERRED. USE 4 "S" BOX 1 &1/2" DEEP WITH 4 "S" EXTENSION BOX AND 1/2" RAISED 2 GANG RING OR 3 &1/2" DEEP 2 GANG CONCRETE BOX. THIS DEVICE HAS ONE INPUT.

SP — FIRE ALARM SPEAKER GENTEX SPK8B (BEIGE) CEILING MOUNTED. USE 4 "S" BOX 1 &1/2" DEEP WITH 4" EXTENSION BOX.

S — STROBE GENTEX GXS-4-1575 WALL MOUNTED AT + 80". USE ONE GANG BOX 1&1/2" DEEP.

DH — DOOR HOLDER PYROTRONICS SHD-2D WALL MOUNTED 4" TO 6" DOWN AND 4" TO 6" IN FROM NON HINGED EDGE OF DOOR. USE 4 "S" BOX 2 &1/8" DEEP WITH ONE GANG RING.

DL — ELECTRIC DOOR LOCK.

FS — EXISTING SPRINKLER FLOW SWITCH.

TS — EXISTING TAMPER SWITCH.

J — JUNCTION BOX SIZED TO ACCOMODATE THE CONDUIT BEING USED.

——— CONDUIT 3/4" UNLESS NOTED OTHERWISE (U.N.O.).

AS BUILT

REVISION	BY
1 2-10-95	DN
2 2-28-95	RJ
4 5/14/96	DT

CERBERUS PYROTRONICS
4080 EAST LAKE MEAD SUITE A
LAS VEGAS, NEVADA

FRONT COVER

FIRE ALARM SYSTEM

CITY OF LAS VEGAS, CITY HALL
400 EAST STEWART AVE
LAS VEGAS, NEVADA

DATE 12/20/94
SCALE 1/8"=1'
DRAWN REY
JOB
SHEET 1
OF 23 SHEETS

636-33

4-1