

20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

**FIRE ALARM VOLTAGE DROP (VD) CALCULATION**

PROJ. NAME ----- CANADA COLLEGE - CDC  
SIG CKT #----- Z1-A

DEVICE #	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Gauge Wire	12	12	12	12	12	12	12	12	12	12
Distance (ft)	15	30	45	60	75	90	105	120	135	150
AMPS OF DEVICE	0.087	0.041	0.05	0.05	0.087	0.041	0.05	0.05	0.12	0.05
TOTAL AMPS@DEV.	1.517	1.43	1.389	1.339	1.289	1.202	1.116	1.111	1.081	0.941
VOLT. DROP @ DEV.	0.0783	0.1419	0.1562	0.0797	0.0512	0.1431	0.0922	0.0551	0.0842	0.0934

DEVICE #	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th
Gauge Wire	12	12	12	12	12	12	12	12	12	12
Distance (ft)	15	30	45	60	75	90	105	120	135	150
AMPS OF DEVICE	0.12	0.12	0.05	0.05	0.12	0.12	0.05	0.12	0.05	0.041
TOTAL AMPS@DEV.	0.891	0.771	0.661	0.601	0.551	0.431	0.311	0.261	0.141	0.091
VOLT. DROP @ DEV.	0.0295	0.1581	0.0689	0.0497	0.0385	0.0228	0.0154	0.0138	0.0075	0.0045

DEVICE #	21th	22nd	23rd	24th	25th	26th	27th	28th	29th	30th
Gauge Wire	12	12	12	12	12	12	12	12	12	12
Distance (ft)	15	30	45	60	75	90	105	120	135	150
AMPS OF DEVICE	0.05	0	0	0	0	0	0	0	0	0
TOTAL AMPS@DEV.	0.0066	0	0	0	0	0	0	0	0	0
VOLT. DROP @ DEV.	0.0066	0	0	0	0	0	0	0	0	0

TOTAL CKT. AMPS	1.517 AMPS	WIRE RESIS. /M FT.	1.59	CIRC. MILS.	6530
TOTAL CKT V DROP	1.3858 VDC	14	2.52	4110	** FORMULA **
CKT VOLTAGE =	24	16	4.02	2580	1" FEET * 21.6
% VOLTAGE DROP=	5.8%	18	6.39	1620	C.M.
TOTAL CKT. LENGTH	288	20	10.1	1020	
		22	18.2	640	
		24	25.7	404	

**VOLTAGE DROP (VD) CALCULATION**

PROJ. NAME ----- CANADA COLLEGE - CDC  
SIG CKT #----- Z2-A

DEVICE #	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Gauge Wire	12	12	12	12	12	12	12	12	12	12
Distance (ft)	15	30	45	60	75	90	105	120	135	150
AMPS OF DEVICE	0.05	0.12	0.05	0.12	0.041	0.12	0.05	0.12	0.05	0.05
TOTAL AMPS@DEV.	0.771	0.721	0.601	0.551	0.431	0.39	0.27	0.22	0.1	0.05
VOLT. DROP @ DEV.	0.1071	0.0525	0.0517	0.082	0.0399	0.1935	0.0107	0.0116	0.0053	0.0038

DEVICE #	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th
Gauge Wire	12	12	12	12	12	12	12	12	12	12
Distance (ft)	15	30	45	60	75	90	105	120	135	150
AMPS OF DEVICE	0.041	0	0	0	0	0	0	0	0	0
TOTAL AMPS@DEV.	0	0	0	0	0	0	0	0	0	0
VOLT. DROP @ DEV.	0	0	0	0	0	0	0	0	0	0

DEVICE #	21th	22nd	23rd	24th	25th	26th	27th	28th	29th	30th
Gauge Wire	12	12	12	12	12	12	12	12	12	12
Distance (ft)	15	30	45	60	75	90	105	120	135	150
AMPS OF DEVICE	0	0	0	0	0	0	0	0	0	0
TOTAL AMPS@DEV.	0	0	0	0	0	0	0	0	0	0
VOLT. DROP @ DEV.	0	0	0	0	0	0	0	0	0	0

TOTAL CKT. AMPS	0.771 AMPS	WIRE RESIS. /M FT.	1.59	CIRC. MILS.	6530
TOTAL CKT V DROP	0.558 VDC	14	2.52	4110	** FORMULA **
CKT VOLTAGE =	24	16	4.02	2580	1" FEET * 21.6
% VOLTAGE DROP=	2.3%	18	6.39	1620	C.M.
TOTAL CKT. LENGTH	393	20	10.1	1020	
		22	18.2	640	
		24	25.7	404	

**WIRE SCHEDULE**

TYPE	DESCRIPTION
A	2 #12 THWN - INITIATION CIRCUIT
B	2 #12 THWN - HORN/STROBE CIRCUIT

**FIRE ALARM OPERATION MATRIX**

	ANNUNCIATE ALARM CONDITION AT FACP	ANNUNCIATE TROUBLE CONDITION AT FACP	ACTIVATE HORN/STROBE LIGHTS THROUGHOUT THE BUILDING	SHUTDOWN ASSOCIATED AHU (SMOKE DETECTORS ONLY)	ACTIVATE ALARM SIGNAL (SIGNAL VIA DRY CONTACTS)	ACTIVATE TROUBLE SIGNAL FOR EXTERNAL STATION (SIGNAL VIA DRY CONTACTS)
MANUAL STATION	X		X		X	
HEAT/SMOKE DETECTORS	X		X	X	X	
SYSTEM TROUBLE		X				X

**NAC BATTERY CALCULATION**

QTY	PRODUCT ID	MANUFACTURER - DESCRIPTION	STANDBY		ALARM	
			EACH	TOTAL	EACH	TOTAL
1	7100-2D	FCI - ADDRESSABLE FIRE ALARM PANEL	0.075000	0.075000	0.085000	0.085000
0	PS-12/24-8	WHEELOK - NAC EXPANDER	0.075000	0.000000	0.000000	0.000000
6	AMM-2	FCI - ADDRESSABLE MONITOR MODULE	0.000400	0.002400	0.007000	0.042000
0	ARB	FCI - AUX. RELAY BOARD	0.000000	0.000000	0.038000	0.000000
0	ADM2	FCI - ADDRESSABLE OUTPUT MODULE	0.000400	0.000000	0.007000	0.000000
PANEL STANDBY CURRENT			0.077400			
PANEL ALARM CURRENT				0.077400		0.137000

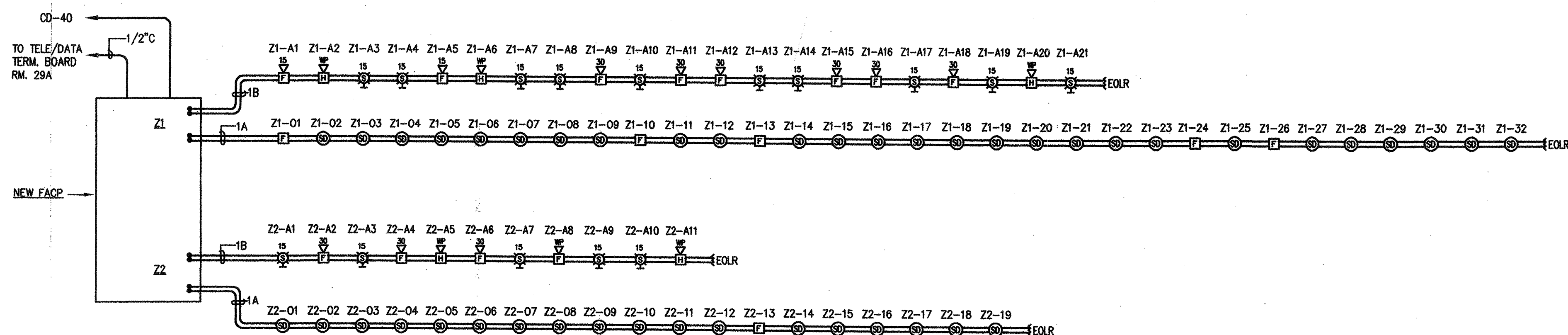
QTY	PRODUCT ID	DESCRIPTION	STANDBY		ALARM	
			EACH	TOTAL	EACH	TOTAL
6	MS2	FCI - MANUAL PULL STATION	0.000000	0.000000	0.000000	0.000000
2	AS-2415W-FR	WHEELOK - WALL MOUNT HORN/STROBE - 15cd	0.000000	0.000000	0.017400	0.034800
10	AS-2430W-FR	WHEELOK - WALL MOUNT HORN/STROBE - 30cd	0.000000	0.000000	0.120000	1.200000
0	AS-2475W-FR	WHEELOK - WALL MOUNT HORN/STROBE - 75cd	0.000000	0.000000	0.000000	0.000000
0	AS-24110W-FR	WHEELOK - WALL MOUNT HORN/STROBE - 110cd	0.000000	0.000000	0.000000	0.000000
15	RSS-2415W-FR	WHEELOK - WALL MOUNT STROBE - 15cd	0.000000	0.000000	0.220000	3.300000
5	AH-24MP-R	WHEELOK - WALL MOUNT WP HORN (EXTERIOR)	0.000000	0.000000	0.050000	0.250000
44	ASD-IL/ADB-FL	FCI - ADDRESSABLE PHOTOELECTRIC SMOKE DETECTOR	0.000300	0.013200	0.007000	0.308000
1	ATD-114-22020	FCI - ADDRESSABLE HEAT DETECTOR	0.000200	0.000200	0.007000	0.007000
DEVICE STANDBY CURRENT			0.013400			2.644800
DEVICE ALARM CURRENT						

**TOTAL SYSTEM CURRENT**

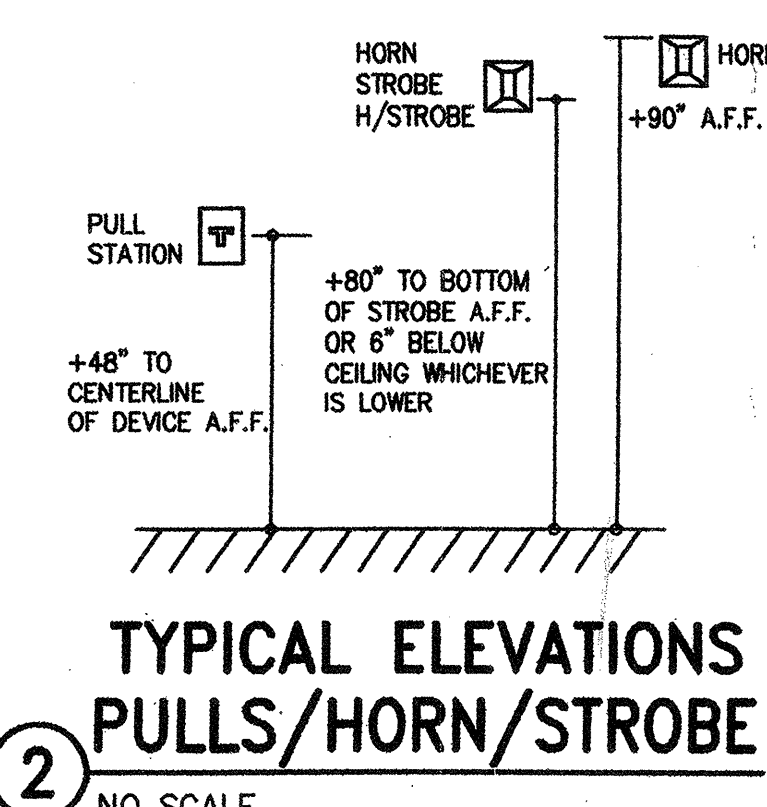
DESCRIPTION	STANDBY	ALARM
CONTROL PANEL	0.077400	0.137000
FIELD DEVICES	0.013400	2.379000
TOTAL STANDBY CURRENT	0.090800	
5 MINUTE HOUR STANDBY	5.448000	
TOTAL ALARM CURRENT		2.781000
5 MINUTES OF ALARM (X 0.85)		2.313825
TOTAL BATTERY REQUIREMENT		5.628825
BATTERY SUPPLY		7.04H

**FIRE ALARM SYSTEM COMPONENT DESCRIPTION**

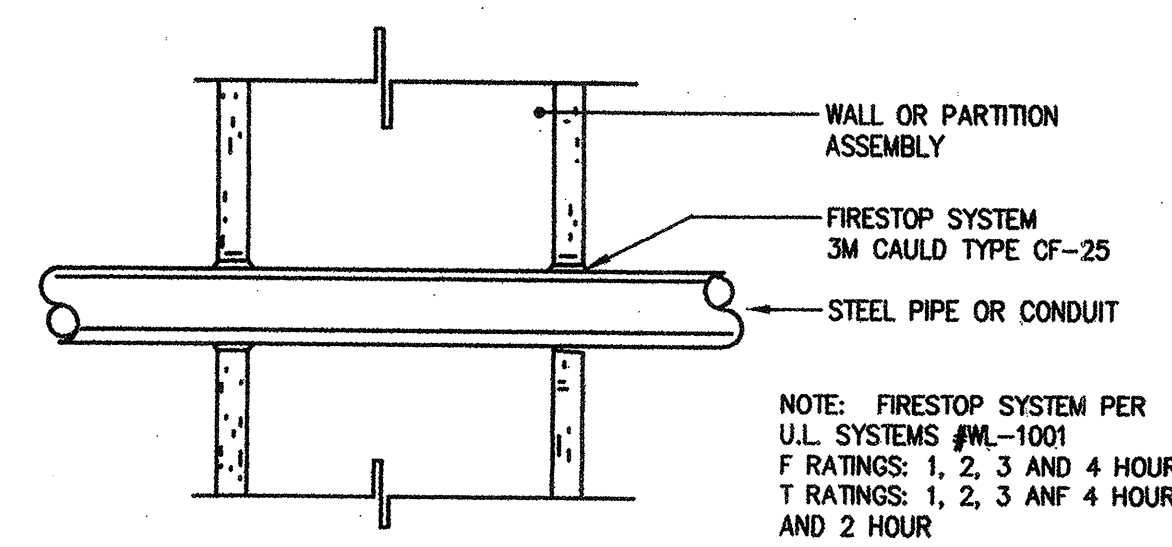
QTY	DESCRIPTION	MODEL #	MFR.	CSFM LISTING #
1	FIRE ALARM CONTROL PANEL	7100-2D	FCI	7165-0694:219
0	NAC EXPANDER PANEL	PS-12/24-8	WHEELOK	7315-0785:149
6	ADDRESSABLE MONITOR MODULES	AMM-2	FCI	7300-0894:178
0	ADDRESSABLE OUTPUT MODULE	ADM-2	FCI	7300-0894:178
44	ADDRESSABLE PHOTOELECTRIC SMOKE DETECTOR	ASD-IL/ADB-FL	FCI	7271-0894:199
1	ADDRESSABLE HEAT DETECTOR	ATD-114-22020	FCI	7270-0894:221
6	MANUAL PULL STATION	MS-2	FCI	7166-0894:107
15	STROBE 15cd	RSS-2415W-FR	WHEELOK	7129-0785:141
2	HORN/STROBE 15cd	AS-2415W-FR	WHEELOK	7125-0785:131
10	HORN/STROBE 30cd	AS-2430W-FR	WHEELOK	7125-0785:131
0	HORN/STROBE 75cd	AS-2475W-FR	WHEELOK	7125-0785:131
0	HORN/STROBE 110cd	AS-24110W-FR	WHEELOK	7125-0785:131
5	EXTERIOR WP HORN	AH-24MP-R	WHEELOK	7125-0785:131



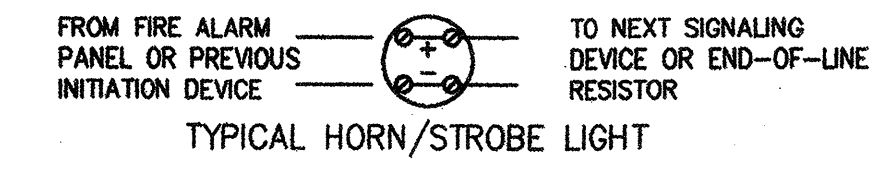
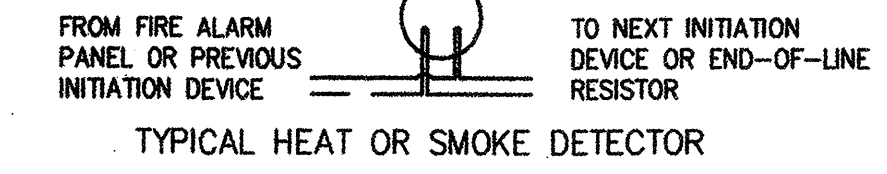
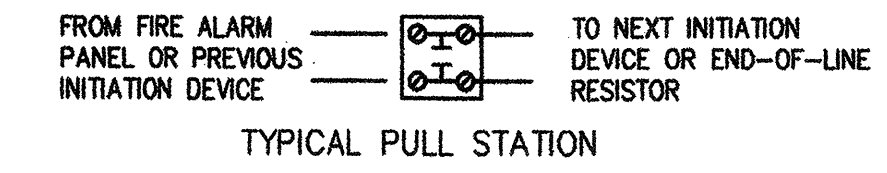
1 FIRE ALARM RISER DIAGRAM  
NO SCALE



2 TYPICAL ELEVATIONS PULLS/HORN/STROBE  
NO SCALE



3 CONDUIT PENETRATION - U.L. SYSTEM #WL-1001  
NO SCALE

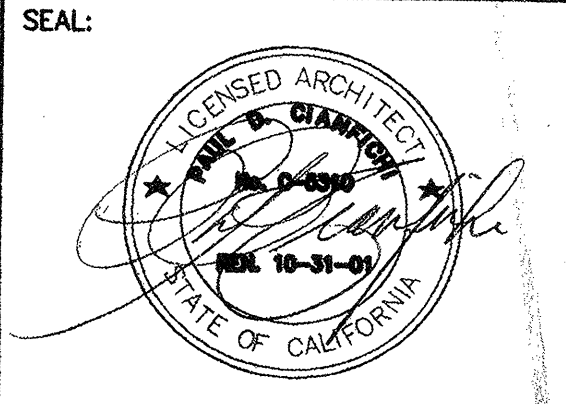


4 TYPICAL FIRE ALARM DETAILS  
NO SCALE

**REVISIONS:**

NO.	DATE	REASON	BY

ISSUE FOR PROGRESS REVIEW 1/15/01  
ISSUE FOR PLAN CHECK 1/25/01  
ISSUE FOR FINAL REVIEW 5/9/01  
ISSUE FOR BID  
ISSUE FOR CONSTRUCTION



CONSULTANT:  
**WHM INCORPORATED**  
Engineering Consultants  
1805 School Street  
Moraga, CA 94556  
Tel (925)376-2902 • Fax (925)376-2904  
0022

ARCHITECT:  
**C I A N F I C H I**  
ARCHITECTURE • PLANNING  
30 ANNE COURT  
WALNUT CREEK, CA 94598  
TEL: (925) 256-8638  
FAX: (925) 256-8652

PROJECT:  
**CHILD DEVELOPMENT CENTER CANADA COLLEGE**

4200 FARM HILL BLVD.  
REDWOOD CITY, CA 94061

SAN MATEO COUNTY COMMUNITY COLLEGE DISTRICT

STAMP: IDENTIFICATION STAMP

APPL NO: 108529

DATE: 10/11/01

KEY PLAN:

SHEET TITLE:  
**ELECTRICAL FIRE ALARM SYSTEM**

DRAWN BY: AK PROJECT NO: 304.99

CHECKED BY: FR DATE: 01-25-2001

APPL. NO.: SHEET: E-04

DATA NO.: NO. OF:

05/09/01 5:08:41 PM \\SERVER\CA\CD\2001\0024\0024.dwg

20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1