Review shall not relieve the applicant of the responsibility to comply

To schedule an inspection, go to: https://dfpc.colorado.gov/inspections Allow 5 business days lead time. Call 303-239-4100 if you have questions.

Review of these documents shall not be considered as approval of any conditions shown on the plans that are in violation of the

This project requires rough-in inspection per Chapter 1 of the IBC. These inspections shall be performed by either a DFPC Certified 3rd Party inspector or the DFPC inspector. In all cases, DFPC shall do the final inspections. See the job card for required

Deferred shop drawing submission is required for any work on any fire protection system prior to the start of that work. Deferred submissions shall be provided to the authority having jurisdiction for

Fire Inspection may be required for this project. Contact the local fire authority and/or DFPC (303)239 4100 for requirements. Approval from both entities

SHEET INDEX:

/1\ A1.1

∕2\ A1.2

FA0.0

FA0.1

INFORMATION

CEILING PLANS

ASHRAE 62.1

GRAPHIC MAP

UL DATA SHEETS

FIRE ALARM COVER SHEET

The fire alarm rough wiring shall be inspected and approved by a DORA electrical inspector prior to covering of system wiring. Permit for fire alarm wiring must be obtained from the DORA **Electrical Program.**

https://dpo.colorado.gov/EandP/Permits

VICINITY MAP, CODE PLAN AND CODE

FIRE ALARM SYSTEM GENERAL NOTES

OVERALL FIRE ALARM SYSTEM PLAN

BATTERY AND LOAD CALCULATIONS

NEW AND EXISTING OVERALL FLOOR PLANS

AREA OF WORK DEMOLITION, FLOOR AND

POUDRE SCHOOL DISTRICT

CHANGE OF OCCUPANCY AND BUILDING MODIFICATIONS FUTURES LAB: VOCATIONAL EDUCATION CLASSROOMS AND BUSINESS OPERATIONS

1630 STOVER STREET FORT COLLINS, COLORADO 80525

inspections shall be performed by the State of Colorado Department of Regulatory Agencies

https://dpo.colorado.gov/EandP/Permits

subject to interpretation and enforcement by DORA. DFPC recommends you consult with DORA prior to starting construction. https://dpo.colorado.gov/EandP/Permits

OWNER:

POUDRE SCHOOL DISTRICT 2445 LAPORTE AVENUE FORT COLLINS, COLORADO 80521 PHONE: 970|490|3017 EMAIL: jlee@psdschools.org

E OCCUPANCY

PER TABLE 1004.1.2 MAXIMUM FLOOR AREA PER OCCUPANT

EDUCATION: SHOPS AND OTHER VOCATIONAL ROOM AREAS

= 50 SF (NET) / OCCUPANT

AREA = 2,315 SF

RECORDING A134A

AUDIO VOCATIONAL

OCCUPANCY E: VOCATIONAL EDUCATION AREAS

/1\ ---- EXISTING 1-HR RATED WALLS: U465 - ANSI/UL 263

EDUCATIONAL ADMINISTRATION AREAS

25 OCCUPANTS

USING

ACCESSIBLE EXIT

A140

Jason Lee Construction Project Manager

ARCHITECT:

KALERT CONSULTING GROUP|LLC 2429 STONECREST DRIVE FORT COLLINS, COLORADO 80521 PHONE: 970|412|3049 EMAIL: tomkalert@gmail.com

25 OCCUPANTS

USING ACCESSIBLE EXIT

A109

A110

BREAK/LOUNGE

A129

A130

<u>STAFF</u> GENDER

NUETRAL

RESTROOM

STOR A128

A127

with adopted codes.

Tom Kalert|AIA Architect

LENTRY

A136

OPEN VOCATIONA EDUCATION A135

FIRE AREA 1

FIRE AREA 3

MALE RR

TOILET

ROOM

A125

STUDENT FEMALE TOILET

ROOM

USING ACCESSIBLE EXIT

4,760 SF

CODE INFORMATION:

CONF A113

ELECT/IT

A121

CODE USED: 2015 IBC, IFC, IMC, IEBC, IECC, IRC, 2018 IFGC 1\ 2020 NEC, 2018 COLORADO PLUMBING CODE ICC/ANSI A117.1 - 2009 ACC. STANDARDS **BUILDING OWNER:** POUDRE SCHOOL DISTRICT **BUILDING OCCUPANCY:** MAX ALLOWABLE OCCUPANCY IS 99 FOR TOTAL BUILDING **ACTUAL OCCUPANCY - SEE TABLES A0.1:** $\frac{1}{1}$ 64 - E OCCUPANCY - VOCATIONAL EDUCATION 32 - E OCCUPANCY - ADMINISTRATION OFFICES 96 = TOTAL ACTUAL OCCUPANTS **BUILDING AREA: BUILDING TYPE:** NUMBER OF STORIES: FIRE RATED ASSEMBLIES EXISTING TO REMAIN - ADDING 1-HR CEILING IN CORRIDOR A124 TO CREATE 'TUNNEL CONSTRUCTION' FOR EGRESS EXISTING FIRE ALARM UPGRADE TO INCLUDE VOICE FIRE PROTECTION:

B OCCUPANCY

PER TABLE 1004.1.2 MAXIMUM FLOOR AREA PER OCCUPANT

EDUCATION: ADMINISTRATION AREA

= 100 SF (GROSS) / OCCUPANT

OPEN OFFICE

OFFICE A114

OPEN VOCATIONAL, 2 EDUCATION SF

EDUCATION: SHOPS AND OTHER VOCATIONAL ROOM AREAS

8 OCCUPANTS

A120

A115

USING EXIT

A112

EVACUATION SYSTEM - NON-SPRINKLERED

25 OCCUPANTS **USING ACCESSIBLE EXIT**

AREA OF WORK: ALTERATION LEVEL: LEVEL 2 - PER CHAPTER 5 - 2015 IBC - 107.2.1 PLUMBING FIXTURE COUNT PER TABLE 2902.1 OCCUPANCY (VOCATIONAL EDUCATION - FUTURES LAB) 1 WATER CLOSET, 1 LAVATORY, 1 SHARED WATER FOUNTAIN FOR FACILITY 31 FEMALE OCCUPANTS 1 WATER CLOSET, 1 LAVATORY, 1 SHARED WATER FOUNTAIN FOR FACILITY B OCCUPANCY (ADMINISTRATION OFFICES) 30 OCCUPANTS (15 MALE/15 FEMALE) (1) GENDER NUETRAL RESTROOM WITH 1 WATER CLOSET

1 LAVATORY, 1 SHARED WATER FOUNTAIN FOR FACILITY PER TABLE 1006.2.1: MINIMUM (2) EXITS REQUIRED, (4) PROVIDED

MAXIMUM TRAVEL DISTANCE:

E OCCUPANCY TABLE: VOCATIONAL EDUCATION AREAS

NUMBER	NAME	AREA	OCCUPANTS
A119	OPEN VOCATIONAL ED.	805 SF	17
A133	AUDIO LAB	125 SF	3
A134	AUDIO VOCATIONAL ED.	575 SF	12
A134A	AUDIO LAB	210 SF	5
A134B	AUDIO LAB	100 SF	2
A135	OPEN VOCATIONAL ED.	995 SF	20
A136	ENTRY	250 SF	5
TOTALS		3,060 SF	64

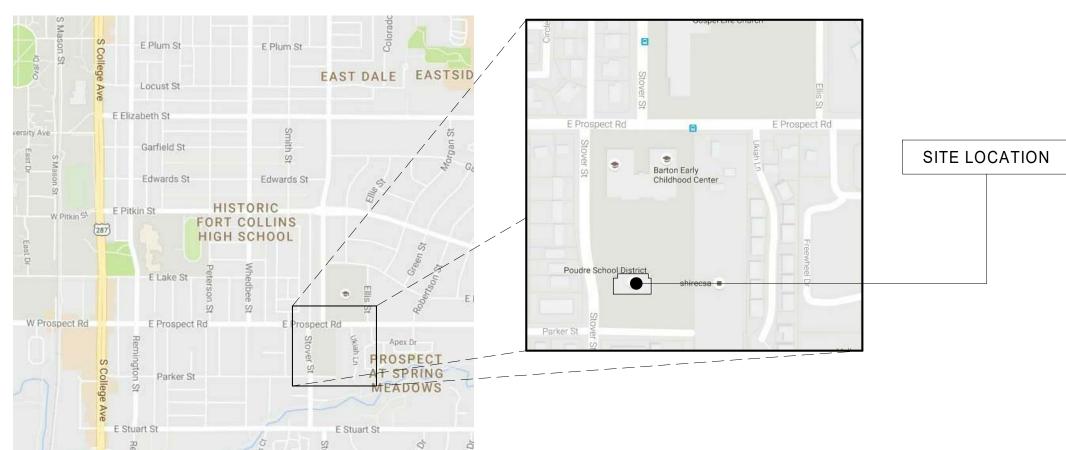
B OCCUPANCY TABLE: EDUCATIONAL ADMINISTRATION AREAS

NUMBER	NAME	AREA	OCCUPANTS
A109	OFFICE	130 SF	2
A110	OFFICE	135 SF	2
A111	OFFICE	110 SF	2
A112	OPEN OFFICE	475 SF	5
A113	CONFERENCE	215 SF	3
A114	OFFICE	135 SF	2
A115	OFFICE	135 SF	2
A116	OFFICE	145 SF	2
A117	OPEN OFFICE	440 SF	5
A117A	WORK AREA	80 SF	1
A118	OFFICE	140 SF	2
A127	WORK AREA	105 SF	2
A129	BREAK/LOUNGE	190 SF	2
TOTALS		2,435 SF	32

(URINALS SEE SECTION 419.2 OF FOUNTAINS (SEE SECTION 410 OF THE CODE) Female 1 per 65 1 per 200 1 per 500 1 per 75 1 per 500 1 per 200 1 per 65 1 per 200 1 per 1,000 1 per 500 1 per 1,000 first 80 and 1 per 80 for the remainder exceeding 80 1 per 100 1 per 50 1 per 100

1 per 100

VICINITY MAP



F-1 and F-2 fabricating, assembly



OPEN OFFICE A117

A118

CODE PLAN EXITING PLAN SHOWING OCCUPANT LOAD USING EACH EXIT 2\ BUILDING OCCUPANCY IS CHANGING FROM 'B' TO A NON-SEPARATED 'B' AND 'E' OCCUPANCY - SEE 1-2/A0.1 **NOTE:** MAXIMUM OCCUPANCY = 99 THROUGHOUT FACILITY



SHE

2



AUDIO LAB

\A133\

System:	(E) FURNACE-	2 IN CUSTOD	IAL A130				
Type of Space	Zone Area (Az)	Zone Population (Pz)	cfm/ft2 (Ra)	cfm/person (Rp)	<u>Vbz</u> (Az*Ra) + (Pz*Rp)	<u>Ez</u> (Table 6.2)	Voz (Vbz/Ez)
A135 OPEN VOC	995	20	0.12	10	319.4	0.8	399.3
						TOTAL:	399.3

Rebalance existing furnace 2 to 400 cfm of OSA.

System:	(E) FURNACE-	2 IN MECH 12					
Type of Space	Zone Area (Az)	Zone Population (Pz)	cfm/ft2 (Ra)	cfm/person (Rp)	<u>Vbz</u> (Az*Ra) + (Pz*Rp)	<u>Ez</u> (Table 6.2)	<u>Voz</u> (Vbz/Ez)
A119 OPEN VOC	805	17	0.12	10	266.6	0.8	333.3
						TOTAL:	333.3

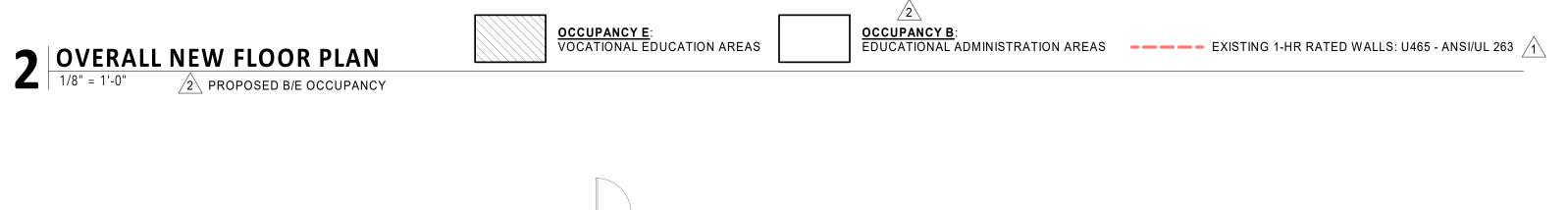
Rebalance existing furnace 2 to 340 cfm of OSA.

System:	(E) FURNACI	E-1 IN MECH A	122				
Type of Space	Zone <u>Area</u> (Az)	Zone Population (Pz)	cfm/ft2 (Ra)	cfm/person (Rp)	<u>Vbz</u> (Az*Ra) + (Pz*Rp)	<u>Ez</u> (Table 6.2)	<u>Voz</u> (Vbz/Ez)
A136 ENTRY	250	5	0.06	5	40	0.8	50.0
A109 OFFICE	130	2	0.06	5	17.8	0.8	22.3
A110 OFFICE	137	2	0.06	5	18.22	0.8	22.8
A111 OFFICE	109	2	0.06	5	16.54	1.8	9.2
A112 OPEN OFFICE	350	2	0.06	5	31	0.8	38.8
						TOTAL:	143.0

Rebalance existing furnace 1 to 150 cfm of OSA.

Type of Space	Zone Area (Az)	Zone Population (Pz)	<u>cfm/ft2</u> (Ra)	cfm/person (Rp)	<u>Vbz</u> (Az*Ra) + (Pz*Rp)	<u>Ez</u> (Table 6.2)	<u>Voz</u> (Vbz/Ez)
A133 LAB	125	3	0.12	10	45	0.8	56.3
A134 AUDIO VOC	575	12	0.12	10	189	0.8	236.3
A134A RECORDING	210	5	0.12	10	75.2	0.8	94.0
A134B AUDIO LAB	100	2	0.12	10	32	0.8	40.0
						TOTAL	.: 426

Rebalance existing furnace 4 to 430 cfm of OSA.



VEST

OPEN VOCATIONAL EDUCATION \A135\

PROVIDE NEW ADA COMPLIANT DRINKING FOUNTAIN AT THIS LOCATION, CONNECT TO

EXISTING SUPPLY AND WASTE

LINES IN WALL

ENTRY A136

AUDIO LAB A133

RECORDING A134A

AUDIO VOCATIONAL

EDUCATION A134

AUDIO LAB

A134B

VEST A140 OFFICE A109

OFFICE A111

CONF A113

MECH A122

ELECT/IT A121

OPEN OFFICE A112

OFFICE A114

OPEN VOCATIONAL EDUCATION `A119

MECH

OFFICE A115

OFFICE A116

OPEN OFFICE

OFFICE A118

WORK A117A

OFFICE

A110

BREAK/LOUNGE A129

A128

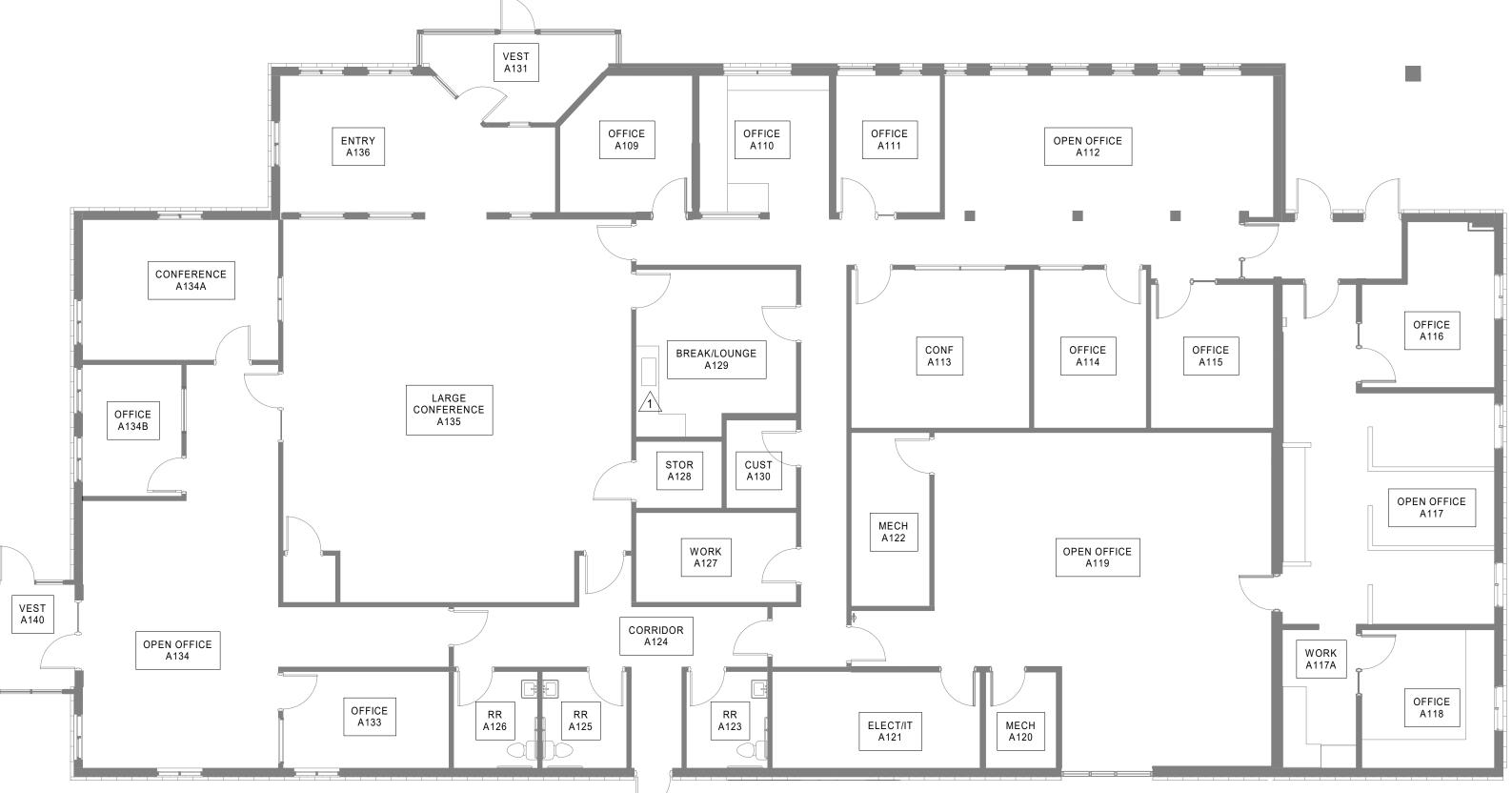
CORRIDOR A124

FEMALE RR A125

WORK A127

CUST

A130



OASIS INTERNATIONAL

HEAVY DUTY 14 GAUGE STAINLESS STEEL **DRINKING FOUNTAIN**

MSSLPM-14G (split-level)

Suggested Specification

Wall mounted drinking fountain fabricated from 14 gauge, type 304 stainless steel polished to a #4 satin finish. Wall bracket and backpanels are included for easy installation Contoured basin minimizes splashing and has a one piece vandal resistant bubbler keyed into position to prevent rotation. Single push button manually activated with adjustable water cartridge. Stainless steel removable drain, 11/2" slip joint, cast brass union p-trap included and removable bottom panel attached with vandal resistant screws (vandal bit included). Drinking fountain complies with the requirements of ADA. when properly installed. Unit is compliant if installed in an alcove and is also compliant when mounted on an exposed wall if a wing wall is located on the left side.

Drinking fountain complies with the Safe Drinking Water Act Amendments of 1986, and the Lead Contamination Control Act of 1988. Model

MSSLPM-14G is a non-refrigerated stainless steel drinking fountain for direct connection to a cold water supply or for use with remote water chillers.

Standard Features

- > Built-in 100 micron strainer stops particles before they enter the waterway
- > Waterways are lead free in materials & construction 14 gauge Stainless Steel construction
 One-piece vandal resistant bubbler keyed into position
- > Single vandal resistant mechanical activation > Stream height adjustment > Brass P-Trap

> Vandal resistant bit

Finishes > Standard Cabinet Finish: Brushed Stainless Steel

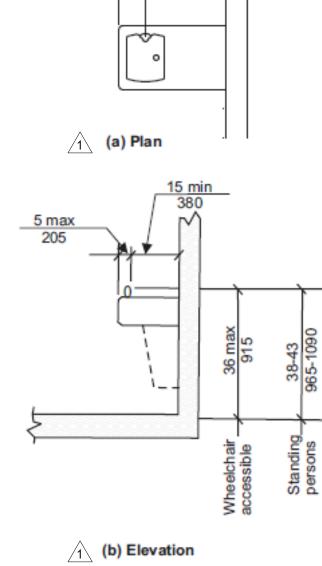


- Prior to roughing, consult with local, state and federal codes for proper mounting height
 Shipped with complete instructions
- Options (at additional costs)

> Removable bottom panel provides access for installation

- > Oasis filtration system > Bronze Finish
- Limited 1-Year Warranty: (Continental limits of the United States and Canada): One year from date of installation on parts only. Detailed warranty certificate enclosed with each drinking fountain; sample copy available upon request.
- Export Warranty: One year on the sealed refrigeration system and most component parts. Detailed warranty certificate enclosed with each drinking fountain; sample copy available upon request.
- Models covered by this specification compiles with all known Plumbing Codes.
- ADA Compliant for both adult or child when properly

Components in this fountain are lead free as defined by the Safe Drinking Water Act Amendments of 1986, and the Lead Contamination Control Act of 1988.



KCG

CONTENTS
AND NEW FLOOR

AND NEW PLANS

ING

TRICT

DIS

DRE

0

802

DRE SCHOOL DIS 1630 STOVER STREE COLLINS, COLORADO

RT

0

1 OVERALL EXISTING FLOOR PLAN EXISTING B OCCUPANCY





OPEN VOCA.EDU. - 134

135 OPEN VOCA.EDU. - 135

NEW 1-HR RATED DOOR AND HARDWARE IN HOLLOW METAL FRAME

EXISTING EXISTING 1-HR RATED DOOR AND FRAME - ADD NEW SMOKE SEALS

	DOOR SCHEDULE										
			DOOR								
MARK	LOCATION	WIDTH	HEIGHT	TYPE	NOTES						
119	OPEN VOC. EDU 119	3' - 0"	7' - 0"	EXISTING	EXISTING 1-HR RATED DOOR AND FRAME - ADD NEW SMOKE SEALS						
124	HALL - 124	3' - 0"	7' - 0"	EXISTING	EXISTING 1-HR RATED DOOR AND FRAME - ADD NEW SMOKE SEALS						
127	WORK - 127	3' - 0"	7' - 0"	Α	NEW NON-RATED WOOD DOOR AND HARDWARE IN NEW HOLLOW METAL FRAME						
128	HALL - 128	3' - 0"	7' - 0"	EXISTING	REINSTALL EXISTING 1-HR RATED DOOR AND FRAME - ADD NEW SMOKE SEALS						

В

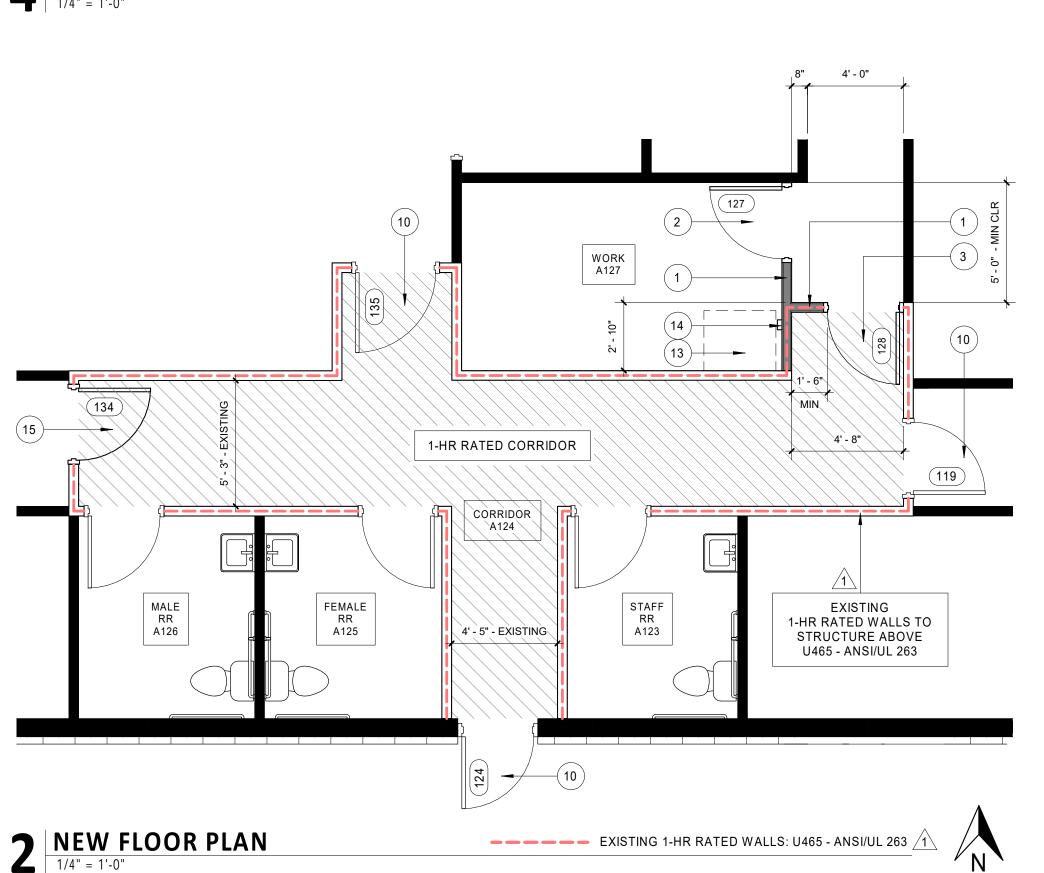
DOOR SCHEDULE, ELEVATIONS AND DETAILS 1/4" = 1'-0"

3' - 0"

3' - 0"

7' - 0"

7' - 0"



GENERAL NOTES:

- A. CONTRACTOR TO FIELD VERIFY ALL EXISTING SITE CONDITIONS AND SHALL INFORM ARCHITECT AND OWNER OF ANT MAJOR DISCREPANCIES
- B. CONTRACTOR SHALL PROTECT ALL FINISHES DURING
- CONSTRUCTION, TYPICAL ALL GLAZING SHALL MEET CLASS II SAFETY STANDARDS
- MECHANICAL AND ELECTRICAL ITEMS SHOWN FOR REFERENCE
- DOOR HARDWARE

QTY	DESCRIPTION	CATA	ALOG NUMBER	FINISH	MFR
3 EA	HINGE		5BB1 4.5 x 4.5	652	IVE
1 EA	VANDL ENTR LOC	CK	ND92TD RHO	626	SCH
1 EA	FSIC CORE		23-030 EV D	626	SCH
1 EA	KICK PLATE	8400	10 x 2 LDW B-CS	630	IVE
1 EA	WALL STOP		WS406/407CCV	630	IVE
3 EA	SILENCER		SR64	GRY	IVE

GENERAL CONTRACTOR TOCOMPLETE FULL TEST AND BALANCE REPORT FOR ENTIRE BUILDING AND SUBMIT TO STATE AS A DEFERRED SUBMITTAL

DEMOLITION NOTES

FLUSH WOOD

NON-RATED

- 2 1. REMOVE EXISTING ACP CEILING SYSTEM AND PREP FOR NEW 'CLASS A' ACP CEILING SYSTEM
- REMOVE EXISTING HORN-STROB THIS LOCATION, SALVAGE FOR REINSTALLATION - SEE NEW PLAN
- REMOVE PORTION OF EXISTING ACP CEILING SYSTEM TO ACCOMMODATE RELOCATION OF WALL, SALVAGE TILES FOR REINSTALLATION
- DEMO EXISTING DOOR AND DOOR FRAME
- REMOVE AND SALVAGE EXISTING 1-HR RATED WOOD DOOR AND HOLLOW METAL FRAME FOR REINSTALLATION - SEE NEW <u>/1</u>

FLUSH WOOD WITH VISION

1-HR RATED

1 DEMOLITION PLAN

1/4" = 1'-0"

KEY NOTES:

- 1\ 1. NEW 1-HR RATED 3-5/8" STEEL STUD WALL WITH 5/8" GYP .BD. BOTH SIDES - U465 - ANSI/UL 263 - FRAME TO METAL DECK ABOVE, FIRE CAULK AT HEAD - UL 2079 - HW-D-0042
- 2. NEW WOOD DOOR IN HOLLOW METAL FRAME, DOOR AND FRAME TO MATCH EXISTING
- REINSTALL SALVAGED 1-HR RATED WOOD DOOR IN HOLLOW METAL FRAME TO THIS LOCATION - PROVIDE NEW SMOKE
- REINSTALL SALVAGED CEILING TILES ABOVE
- NEW 'CLASS A' 1-HR RATED ACP CEILING AND CORRIDOR TO
- CREATE 'TUNNEL CONSTRUCTION' FOR EGRESS COMPLIANCE INTERIOR DOORS: 3'-0" x 7'-0" WOOD DOOR IN HOLLOW METAL FRAME - SEE DOOR ELEVATIONS - STAIN AND FINISH DOOR TO MATCH EXISTING, DOOR PREP, HARDWARE AND HARDWARE
- INSTALLATION BY GENERAL CONTRACTOR 7. 1/4" LAMINATED SAFETY GLAZING - GLAZING SHALL MEET CLASS II SAFETY STANDARDS
- PROVIDE SEALANT BEAD, FULL PERIMETER, BOTH SIDES, **TYPICAL** PROVIDE (2) 20 GA. METAL STUDS AT DOOR JAMB, TYPICAL
- PROVIDE NEW SMOKE SEALS AT EXISTING 1-HR RATED DOOR AND FRAME
- 11. REINSTALL EXISTING CEILNG MOUNTED ITEMS THIS AREA IN THEIR PREVIOUS LOCATIONS
- 12. WALL MOUNTED LIGHT FIXTURE TO REMAIN SHOWN FOR REFERENCE ONLY
- 13. RELOCATE EXISTING REF IN THIS ROOM TO THIS NEW
- 14. REINSTALL SALVAGED HORN-STROB THIS LOCATION
- 15. INSTALL NEW 1-HR RATED WOOD DOOR AND HOLLOW METAL
- FRAME THIS LOCATION

16. PROVIDE AND INSTALL RUSKIN FIRE/SMOKE DAMPER DFSDR1 AND CONNECT TO FIRE ALARM SYSTEM

INTERIOR FRAME **HEAD DETAIL**

5-3/4" HM TYPICAL

(1) NON-RATED

(1) 1-HR RATED

JAMB DETAIL NOT TO SCALE NOT TO SCALE

SPECIFICATION

designed for installation in metal stud tunnel corridor ceiling penetrations or in penetrations of fire rated floor/ceiling and roof/ceiling assemblies, meeting or exceeding the following specifications shall be furnished and installed at locations shown on plans or as described in schedules. Dampers shall meet the requirements of NFPA90A, 92A and 92B. Dampers shall be classified by Underwriters Laboratories as a "Corridor Damper" and shall have a fire rating of 1 hour in accordance with the latest edition of UL555 and shall be classified as Leakage Class I Smoke Dampers in accordance with the latest version of UL555S. Dampers also shall be classified as Ceiling Dampers in accordance with the latest edition of UL555C. Dampers shall be warranted to be free from defects in material and workmanship for a period of 5 years after date of ship-

In addition the dampers and their actuators shall have a UL555S elevated temperature rating of 250°F (121°C) or 350°F (177°C) depending upon the actuator. Appropriate electric or pneumatic

actuators shall be installed by the damper manufacturer at time of

hold open tested for a period of at least 1 year with no spring return

Each damper shall be equipped with a "controlled closure" quick detect heat-actuated release device to prevent duct and HVAC component damage. Instantaneous damper closure through the use of fusible links is unacceptable.

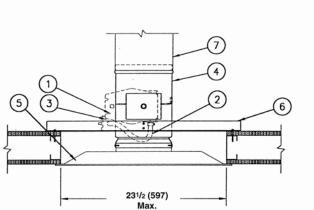
encompassing the blade edge (adhesive type seals are not acceptable). Dampers shall be Ruskin model DFSDR1.

4. U.L. Classified fire-rated ceiling. Refer to the UL Fire Resis-

TYPICAL INSTALLATIONS

DESCRIPTION

- 2. Flex Conduit
- fuse link) (location may vary)



DFSDR1 AS CORRIDOR DAMPER

16 MSG x 1¹/₂" Channel Thermal Blanket Insulation

ITEM



3900 Dr. Greaves Rd. Kansas City, MO 64030 (816) 761-7476 FAX (816) 765-8955 www.ruskin.com

RUSKIN

3900 Dr. Greaves Rd. • Kansas City, MO 64030 • (816) 761-7476 • FAX (816) 765-8955

90A, 92A, 92B and 101

UL CLASSIFIED

UL555C Listing R8039

SEE COMPLETE
MARKING
ON PRODUCT

detection or power failure condition.

require an additional EP switch.

BOCA National Building Codes

ICBO Uniform Building Codes

SBCCI Standard Building Codes

ICC International Building Codes

The DFSDR1 meets the requirements for fire, smoke, combi-

National Fire Protection Association NFPA Standards

CSFM California State Fire Marshal Fire Damper Listing

FEATURES

• EFL (Electric Fuse Link) or PFL (Pneumatic Fuse Link) heat-

actuated release devices permit controlled (rather than instanta-

neous) closure through the damper actuator. The EFL and PFL

allow the damper to automatically reopen after a test, smoke

EFL's may be ordered on dampers with pneumatic actuators but

The DFSDR1 combination fire and smoke dampers offer:

EFL is standard on dampers with electric actuators.

PFL is standard on dampers with pneumatic actuators.

Specification Tested Product

(Option)

(#3225-0245:113 and Smoke Damper Listing (#3230-

UL555 Listing R5531, UL555S Listing R5531,

nation fire smoke and ceiling dampers established by:

ROUND CORRIDOR FIRE/SMOKE DAMPER AND CEILING DAMPER 1 HOUR UL555 RATED, UL555S LEAKAGE CLASS 1 RATED AND UL555C RATED

APPLICATION

The DFSDR1 is a true round, Leakage Class 1, Corridor Fire/ Smoke Damper. It is also UL classified and labeled as a ceiling damper in accordance with UL555C. As a Corridor Fire/Smoke Damper it is designed for installation in tunnel corridor ceilings constructed from metal studs. As a UL555C ceiling damper it is designed for installation in fire rated floor/ceiling and roof/ceiling assemblies to provide protection where HVAC components pene-

IMPORTANT NOTE

The DFSDR1 is shipped with thermal insulation blankets (refer to the typical installation diagrams on page 2). The blankets are required when the DFSDR1 will install as a ceiling damper. The blankets are not required when the DFSDR1 will install as a Corridor fire/smoke damper.

STANDARD CONSTRUCTION

20 gage (1.0) galvanized steel, 12" (305) depth. BLADES 20 gage (1.0) galvanized steel.

BEARINGS Stainless steel sleeve pressed into frame. MOUNTING

trate the ceiling membrane.

CONTROLLED CLOSURE DEVICE (HEAT-ACTUATED)

EFL (Electric Fuse Link) - 165°F (74°C) standard. 212°F (100°C), 250°F (121°C), 350°F (177°C) available. PFL (Pneumatic Fuse Link) - 165°F (74°C) standard. 212°F

(100°C), 285°F (141°C). DIFFUSER (FIELD SUPPLIED)

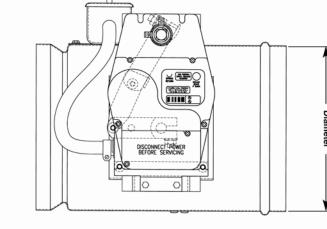
DAMPER SIZES 6" (152), 8" (203), 10" (254), 12" (305) damper. OPTIONS

FM Approved as Specification Tested Product. TS150 FireStat for reopenable operation in dynamic smoke

- management systems. SP100 Switch Package to remotely indicate damper blade posi-
- MCP control panels for test purposes or smoke management

• Retaining Angle 11/2" x 11/2" x 16 gage (38 x 38 x 1.6) angle NOTES 1. DFSDR1 is ordered "actual size" to install over diffuser neck

2. Dimensions shown in parentheses () indicate millimeters DISCONNECT FOWER BEFORE SERVICING



ALL STATED SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION.

Damper frame shall be a single piece of minimum 20 gage (1.0) galvanized steel formed in to an integral sleeve. Integral frame/sleeve shalt be strengthened with roll formed grooves at each end. Damper blade shall consist of 2 pieces of 20 gage (1.0) galvanized steel mechanically fastened together. Bearings shall be stainless steel turning in an extruded hole in the frame. Blade edge seals shall be silicone rubber mechanically locked in to and fully

(Consult Ruskin for detailed CSI MasterFormat Specification).

DESCRIPTION

Surface Mount or Lay-In Ceiling Diffuser

tance Directory for design information

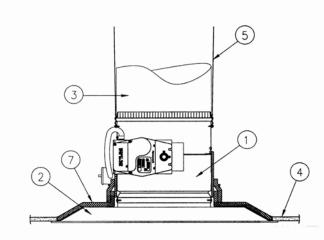
1. Integral Sleeve Damper Frame

3. Duct (Flexible or Hard)

12 Gage Steel Wire

1. Actuator (location may vary)

- 3. TS150 FireStat, EFL (electric fuse link) or PFL (pneumatic
- 4. Integral Sleeve Damper Frame 5. Steel Surface Mount Ceiling Diffuser (supplied by others)
- 6. Mounting Angles and Fasteners Duct (Flexible or Hard)



DFSDR1 AS CEILING DAMPER



DAM

DISTRIC 802 OVER STREET COLORADO DRE SCHOOL I 1630 STOVER STE COLLINS, COLORA DRE

1

0

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SHEE AREA OF FLOOR,



BXUV.U465 Fire Resistance Ratings - ANSI/UL 263

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Listed or Classified products, equipment, system, devices, and materials,
- Authorities Having Jurisdiction should be consulted before construction. • Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable
- requirements. The published information cannot always address every construction nuance encountered in the field.

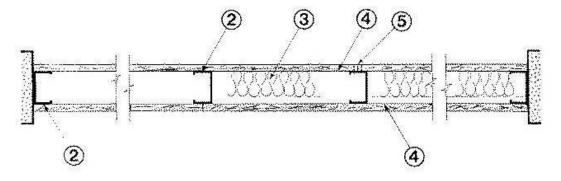
 When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and
- each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction. Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.

Fire Resistance Ratings - ANSI/UL 263

See General Information for Fire Resistance Ratings - ANSI/UL 263

Design No. U465

Nonbearing Wall Rating - 1 HR



1. Floor and Cailing Runners — (not shown) — Channel shaped runners, 3-5/8 in. deep (min), 1-1/4 in. legs, formed from min No. 25 MSG galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

1A. Framing Members* — Floor and Cailing Runners — (Not shown) — As an alternate to Item 1 - Channel shaped, min 3-5/8 in, deep, attached to floor and ceiling with fasteners 24 in, OC, max.

ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME Framing System

CONSOLIDATED FABRICATORS CORP.

BUILDING PRODUCTS DIV — Type SUPREME Framing System

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME Framing System

SCAFCO STEEL STUD MANUFACTURING CO - Type SUPREME Framing System

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME Framing System

1B. Framing Members* - Floor and Ceiling Runners - Not shown - In lieu of Item 1 - For use with Item 2B, proprietary nnel shaped runners, 1-1/4 in. wide by min 3-5/8 in. deep fabricated from min 0.020 in. thick galv steel, attached to flooi

CRACO MFG INC — SmarterTrack20™, SmartTrack20™

and ceiling with fasteners spaced 24 in. OC max.

MARINO\WARE A DIV OF WARE INDUSTRIES

INC — Viper20S™ Track, Viper20D™ Track

1C. Floor and Ceiling Runners - (Not shown)-For use with Item 2C- Channel shaped, fabricated from min 20 MSG corrosionprotected or galv steel, min depth to accommodate stud size, with min 1 in. long legs, attached to floor and ceiling with fasteners

F Ratings — 1 and 2 Hr (See Items 2 and 3A)

T Ratings — 1 and 2 Hr (See Items 2 and 3A)

1D. Framing Members* - Floor and Ceiling Runners - Not shown - In lieu of Items 1 through 1C - For use with Item 2D and 4G only, proprietary channel shaped runners, 1-1/4 in. deep by min 3-5/8 in. wide fabricated from min 0.015 in. thick gal

CLARKWESTERN BUILDING SYSTEMS INC - CW ProTRAK

DIETRICH INDUSTRIES INC — DIETRICH ProTRAK

DMFCWBS L L C — ProTRAK

to be cut 3/4 in. less than assembly height

2. Steel Studs — Channel shaped, 3-5/8 in. deep (min), formed from min No. 25 MSG galv steel spaced 24 in. OC max. Studs

2A. Framing Members* - Steel Studs - As an alternate to Item 2 - Channel shaped studs, min 3-5/8 in. deep, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height

ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME Framing System

CONSOLIDATED FABRICATORS CORP.

BUILDING PRODUCTS DIV — Type SUPREME Framing System

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME Framing System

SCAFCO STEEL STUD MANUFACTURING CO - Type SUPREME Framing System

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME Framing System

2B. Framing Members* - Steel Studs — Not shown - In lieu of Item 2 — For use with Item 1B, proprietary channel shaped steel studs, 1-1/4 in. wide by min 3-5/8 in. deep fabricated from min 0.020 in. thick galv steel. Studs cut 3/4 in. less in length

CRACO MFG INC - SmarterStud20™, SmartStud20™

MARINO\WARE A DIV OF WARE INDUSTRIES

INC — Viper20S™, Viper20D™

2C. Steel Studs — (As an alternate to Item 2, For use with Item 4E) Channel shaped, fabricated from min 20 MSG corrosionprotected or galv steel, 3-1/2 in. min depth, spaced a max of 16 in. OC. Studs friction-fit into floor and ceiling runners. Studs to be cut 5/8 to 3/4 in. less than assembly height.

2D. Framing Members* - Steel Studs - As an alternate to Items 2 through 2C- For use with Item 1D and 4G only, channel shaped studs, min 2-1/2 in. wide fabricated from min 0.018 in. thick galv steel, spaced a max of 24 in. OC. Studs to be cut 1/2 in, less than assembly height.

CLARKWESTERN BUILDING SYSTEMS INC - CW ProSTUD

DIETRICH INDUSTRIES INC - DIETRICH ProSTUD

DMFCWBS L L C - ProSTUD

3. Batts and Blankets* — (Optional) — Mineral wool or glass fiber batts partially or completely filling stud cavity.

See Batts and Blankets (BZJZ) category for names of Classified companies.

3A. Fiber, Sprayed* — As an alternate to Batts and Blankets (Item 3) — Spray applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. Nominal dry density of 3.0 lb/ft³. Alternate application method: The fiber is applied with U.S. Greenfiber LLC Type AD100 hot melt adhesive at a nominal ratio of one part adhesive to 6.6 parts fiber to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. Nominal dry density of 2.5 lb/ft³.

U S GREENFIBER L L C — Cocoon2 Stabilized or Cocoon-FRM (Fire Rated Material)

3B. Fiber, Sprayed* — As an alternate to Batts and Blankets (Item 3) and Item 3A - Spray applied cellulose insulation material. The fiber is applied with water to interior surfaces in accordance with the application instructions supplied with the product. Applied to completely fill the enclosed cavity. Minimum dry density of 4.3 pounds per cubic ft.

NU-WOOL CO INC - Cellulose Insulation

3C. Fiber, Sprayed* - As an alternate to Batts and Blankets (Item 3) - Spray applied cellulose fiber. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. The minimum dry density shall be 4.30 lbs/ft3.

${\bf INTERNATIONAL\ CELLULOSE\ CORP\ -\ Celbar\text{-}RL}$

4. Gypsum Board* - 5/8 in. thick, 4 ft wide, attached to steel studs and floor and ceiling track with 1 in. long, Type S steel screws spaced 8 in. OC. along edges of board and 12 in. OC in the field of the board. Joints oriented vertically and staggered on opposite sides of the assembly. When attached to item 6 (resilient channels) or 6A (furring channels), gypsum board is screw attached to furring channels with 1 in. long, Type S steel screws spaced 12 in. OC.

AMERICAN GYPSUM CO - Types AG-C, AGX-1

BEIJING NEW BUILDING MATERIALS PUBLIC

LTD CO - Type DBX-1.

CANADIAN GYPSUM COMPANY - Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC or WRX.

System No. HW-D-0042

CONFIGURATION B

1. Floor Assembly — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described

in the individual D700 or D900 Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

C. Spray-Applied Fire Resistive Materials* — (Optional, Not Shown) — Prior to or after the installation of the steel ceiling runners. Forming

A. Roof Assembly — (Not Shown) — As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof

Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof

assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire

Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly. The roof

B. Spray Applied Fire Resistive Materials* — (Not Shown) — Prior to or after the installation of the steel ceiling runners, Forming Material

and Fill, Void or Cavity Material (Items 2A, 3A, 3B), the roof assembly shall be sprayed with the type and thickness of fire resistive

assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire

Material and Fill, Void or Cavity Material (Items 2A, 3A, 3B, respectively) the steel floor units may be sprayed with a min 5/16 in. (8 mm)

A1. Steel Floor And Form Units* (Configuration B) — Composite max 2.5 in. (64 mm) deep galv steel fluted units.

B. Concrete — Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.

A1. Steel Floor And Form Units* (Configuration B) — Composite max 2.5 in. (64 mm) deep galv steel fluted units.

A1. Steel Floor And Form Units* (Configuration B) — Composite max 2.5 in. (64 mm) deep galv steel fluted units.

B. Roof Insulation — Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the floor units.

1B. Roof Assembly — As an alternate to Items 1 and 1A, a fire rated protected fluted steel deck roof assembly may be used. The roof

A. Steel Floor And Form Units* - Max 3 in. (76 mm) deep galv steel fluted units.

EPIC METALS CORP — Types "EC" or "Toris C"

ISOLATEK INTERNATIONAL — Type 300

assembly shall include the following construction features:

EPIC METALS CORP — Types "Toris C" or "ER2R"

assembly shall include the following construction features:

material indicated in the individual P700 Series design.

EPIC METALS CORP — Type "Toris C"

ISOLATEK INTERNATIONAL — Type 300

to max 1-3/4 in. (45 mm) thickness of fire resistive material.

GCP APPLIED TECHNOLOGIES INC — Types MK-6-HY or MK-10HB

A. Steel Roof Deck — Max 3 in. (76 mm) deep galv steel fluted roof deck.

A. Steel Roof Deck — Max 3 in. (76 mm) deep galv steel fluted roof deck.

GCP APPLIED TECHNOLOGIES INC — Types MK-6-HY or MK-10HB

CERTAINTEED GYPSUM INC — Types 1, EGRG, GlasRoc, ProRoc Type X, ProRoc Type C.

CERTAINTEED GYPSUM CANADA INC - ProRoc Type C, ProRoc Type X or ProRoc Type Abuse-Resistant.

GEORGIA-PACIFIC GYPSUM L L C - Types 5, 6, 9, C, DAP, DD, DA, DAPC, DGG, DS, GPFS6.

LAFARGE NORTH AMERICA INC — Types LGFC2, LGFC2A, LGFC6, LGFC6A, LGFC-C, LGFC-C/A, LGFC-WD.

NATIONAL GYPSUM CO - Types FSK, FSK-C, FSK-G, FSW-C, FSW-G, FSW-3, FSW-5, FSW-6.

PABCO BUILDING PRODUCTS L L C, DBA

PABCO GYPSUM - Type PG-C, PG-11 or PG-9.

PANEL REY S A - Type PRX.

SIAM GYPSUM INDUSTRY (SARABURI) CO LTD — Type EX-1

TEMPLE-INLAND — Type X, Veneer Plaster Base - Type X, Water Rated - Type X, Sheathing - Type X, Soffit - Type X, TG-C, GreenGlass Type X, Type X ComfortGuard Sound Deadening Gypsum Board

UNITED STATES GYPSUM CO - Type AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX, USGX (Joint tape and compound, Item 5, optional for use with Type USGX).

USG MEXICO S A DE C V — Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC or WRX.

4A. Gypsum Board* — (As alternate to Item 4) - Nom 5/8 in. thick gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. orizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered or backed by steel framing. Panels attached to steel study and floor runner with 1 in, long Type S steel screws spaced 8 in, OC when applied horizontally, of 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. When used in widths other

CANADIAN GYPSUM COMPANY — Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC or WRX.

CERTAINTEED GYPSUM INC - ProRoc Type X, ProRoc Type C.

than 48 in., gypsum panels to be installed horizontally

CERTAINTEED GYPSUM CANADA INC — ProRoc Type X, ProRoc Type C.

GEORGIA-PACIFIC GYPSUM L L C - Types DAP, DAPC, DGG, DS

LAFARGE NORTH AMERICA INC - Type LGFC6A, LGFC-C/A

UNITED STATES GYPSUM CO - T ype AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC, WRX, , USGX (Joint tape)

USG MEXICO S A DE C V − Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRC or WRX.

4B. Gypsum Board* — (As an alternate to Items 4 or 4A) — Nom 3/4 in. thick, 4 ft wide, installed as described in Item 4A with screw length increased to 1-1/4 in.

CANADIAN GYPSUM COMPANY - Types AR, IP-AR

UNITED STATES GYPSUM CO - Types AR, IP-AR

USG MEXICO S A DE C V − Types AR, IP-AR.

4C. Gypsum Board* - As an alternate to Items 4, 4A, and 4B - Nom. 5/8 in. thick gypsum panels, with square edges, applied orizontally. Gypsum panels fastened to framing with 1 in. long bugle head steel screws spaced a max 8 in. OC, with last 2 screws 3/4 in. and 4 in. from each edge of board. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs on interior walls need not be staggered or backed by steel framing.

TEMPLE-INLAND — GreenGlass Type X.

Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Gypsum panels fastened to framing with 1 in. long Type S steel screws 1-1/2 in. from board edges, 3 in. from board edge and every 8 in. OC in the field. Screws spaced a max 12 in. along the top and bottom edges of the wall.

NATIONAL GYPSUM CO — Types FSK, FSK-C, FSK-G, FSW-C, FSW-G, FSW.

4E. Gypsum Board* — (As an alternate to Items 4 through 4D) - Installed as described in Item 4, 5/8 in, thick, 4 ft, wide paper surfaced, applied vertically only and fastened to the studs and plates with 1 in. long, Type S steel screws spaced, 7 in. OC. Not to be used with item 6.

NATIONAL GYPSUM CO — SoundBreak XP Type X Gypsum Board

. Gypsum Board* — (Not Shown) - (As an alternate to Item 4 when used as the base layer on one or both sides of wall. For direct attachment only to steel studs Item 2C) - Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Gypsum board secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.

RAY-BAR ENGINEERING CORP - Type RB-LBG

4G. Gypsum Board* - (As an alternate to Items 4 through 4F) - For use with Items 1C and 2C only, 5/8 in. thick, 4 ft wide, attached to steel studs and floor and ceiling track with 1 in. long, Type S steel screws spaced 8 in. OC. along edges of board and 12 in. OC in the field of the board. Joints oriented vertically and staggered on opposite sides of the assembly.

NATIONAL GYPSUM CO — Types FSW

UNITED STATES GYPSUM CO - Type SCX

4H. Wall and Partition Facings and Accessories* - (As an alternate to Items 4 through 4G) - Nominal 5/8 in. thick, 4 ft wide panels, applied vertically and secured as described in Item 4.

QUIET SOLUTION INC - Types QuietRock ES, QuietRock 527.

5. Joint Tape and Compound — Vinyl, dry or premixed joint compound, applied in two coats to joints and screw heads; paper tape, 2 in. wide, embedded in first layer of compound over all joints. As an alternate, nominal 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of Classified veneer baseboard. Joints reinforced. Paper tape and joint compound may be omitted when gypsum boards are supplied with square edges.

6. Resilient Channel — (Optional-Not Shown) — 25 MSG galv steel resilient channels spaced vertically max 24 in. OC, flange portion attached to each intersecting stud with 1/2 in. long type S-12 pan head steel screws. May not be used with Item 4F.

6A. Steel Framing Members (Not Shown)* — As an alternate to Item 3, furring channels and resilient sound isolation clip as

a. Furring Channels — Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping No. 6 framing screws, min 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel.

b. **Framing Members*** — Used to attach furring channels (Item a) to studs (Item 1). Clips spaced 48 in. OC., and secured to studs with 1-5/8 in. wafer or hex head Type S steel screw through the center grommet. Furring channels are friction fitted into clips.

PAC INTERNATIONAL INC — Type RSIC-1.

6B. Framing Members* — Optional - Not Shown - Used as an alternate method to attach resilient channels (Item 6). Clips attached at each intersection of the resilient channel and the steel study (Item 2). Resilient channels are friction fitted into clips and then clips are secured to the stud with min. 1 in. long Type S-12 pan head steel screws through the center hole of the clip and the resilient channel flange.

KEENE BUILDING PRODUCTS CO INC — Type RC Assurance.

7. Wall and Partition Facings and Accessories* — (Optional, Not shown) — Nominal 1/2 in. thick, 4 ft wide panels, for optional use as an additional layer on one or both sides of the assembly. Panels attached in accordance with manufacturer's

recommendations. When the QR-510 panel is installed between the steel framing and the UL Classified gypsum board, the required UL Classified gypsum board layer(s) is/are to be installed as indicated as to fastener type and spacing, except that the required fastener length shall be increased by a minimum of 1/2 in. Not evaluated or intended as a substitute for the required

QUIET SOLUTION INC — Type QuietRock QR-510.

8. Lead Batten Strips — (Not Shown, For Use With Item 4E) - Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. Strips placed on the interior face of studs and attached from the exterior face of the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum board (Item 4E) and optional at remaining stud locations. Required behind vertical joints.

9. **Lead Discs or Tabs** — (Not Shown, For Use With Item 4E) - Used in lieu of or in addition to the lead batten strips (Item 8) or optional at other locations - Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards (Item 4E) underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification

*Bearing the UL Classification Mark

Last Updated on 2010-03-03

Questions?

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System No. HW-D-0042 YANSI/NL2079 CAN/ULC S115

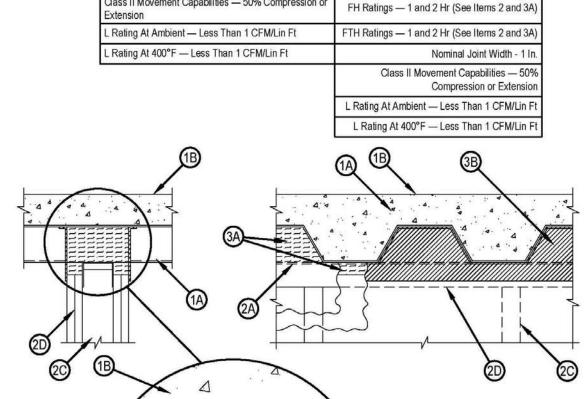
Nominal Joint Width 1 h

to UL 2079 and CAN/ULC-S11:

Hilti Firestop Systems

ssembly Ratings — 1 and 2 Hr (See Items 2 and 3A)

Class II Movement Capabilities — 50% Compression or



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Inderwriters Laboratories, Inc.

Hilti Firestop Systems

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eproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. February 07, 2019

System No. HW-D-0042

Wall Assembly — The 1 or 2 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following

max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material. A1. Light Gauge Framing* — Slotted Ceiling Runner — As an alternate to the ceiling runner in Item 2A, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2C). Slotted ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel fasteners or welds spaced max 24 in. (610 mm) OC before optional spray-applied fire resistive material is used. Ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive

A. Steel Floor And Ceiling Runners — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate

installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced

steel studs (Item 2C). Flange height of ceiling runner shall be min 1/4 in. (6 mm) greater than max extended joint width. Ceiling runner

material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied

BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS — SLP-TRK CALIFORNIA EXPANDED METAL PRODUCTS CO — CST

may only be used prior to the installation of the optional spray-applied material.

CLARKDIETRICH BUILDING SYSTEMS — Type SLT, SLT-H CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — SDT250, SDT300

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Type SLT METAL-LITE INC - The System

OLMAR SUPPLY INC — STT250, STT300 R & P SUPPLY — SCT250, SCT300

RAM SALES L L C - RAM Slotted Track SCAFCO STEEL STUD MANUFACTURING CO

TELLING INDUSTRIES L L C — True-Action Deflection Track A2. Light Gauge Framing* — Vertical Deflection Ceiling Runner — When the nom joint width is less than or equal to 3/4 in. (19 mm), vertical deflection ceiling runner may be used as an alternate to the ceiling runners in Items 2A and 2A1. Vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips provided with step bushings for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 2C), Vertical deflection ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced

max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner

THE STEEL NETWORK INC — VertiTrack VTD250, VTD362, VTD400, VTD600 and VTD800 A3. Light Gauge Framing* — Notched Ceiling Runner — As an alternate to the ceiling runners in Items 2A through 2A3, notched ceiling runners to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 2C). Notched ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors, steel fasteners or welds spaced max 24 in. (610 mm) OC. before or after optional spray-applied fire resistive material is used. The use of welds to secure the ceiling runner may only be used prior to the installation of the optional spray-applied material.

B. Steel Attachment Clips — (Optional — Not Shown) — When spray applied fireproofing is used ceiling runner may be secured to deck with Z-shaped dips formed from min 1 in. (25 mm) long strips of min 20 ga galv steel. Length of dips should not exceed the width (thickness) of the wall. Clips to be sized to extend through the thickness of the spray-applied fire-resistive material on the bottom of the steel deck with 1-1/2 or 2 in. (38 or 51 mm) long upper and lower legs. Legs of clips fastened to valleys of steel deck (prior to application of spray-applied fire-resistive materials) and top of ceiling runner with steel masonry anchors, steel fasteners or welds. Clips spaced max 24 in. (610 mm)

February 07, 2019

eproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. Hilti Firestop Systems

OLMAR SUPPLY INC — Type SCR

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System No. HW-D-0042

C. Studs — Steel studs to be min 2-1/2 in. (64 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. When Epic Metals composite floor or roof deck (Item 1A1) is used, steel studs to be min 3-5/8 in. (92 mm) wide. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. (13 mm) long wafer head steel screws at midheight of slot on each side of wall. When

vertical deflection ceiling runner (Item 2A2) is used, steel studs secured to slotted vertical deflection clips, through the bushings, with steel screws at midheight of each slot. Stud spacing not to exceed 24 in. (610 mm) OC. D. Gypsum Board* — Gypsum board installed to a min total thickness of 5/8 in. and 1-1/4 in. (16 and 32 mm) on each side of wall for 1 and 2 hr rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a max 1 in. (25 mm) gap shall be maintained between the top of the gypsum board and the bottom of the steel deck units and the top row of screws shall be installed into the studs 1-1/2 to 2 in. (38 to 51 mm) below the bottom of the ceiling runner. The

hourly rating of the joint system is dependent on the hourly rating of the wall. Joint System — Max separation between bottom of floor or roof and top of wall at time of installation of joint system is 1 in. (13 mm). The joint system is designed to accommodate a max 50 percent compression or extension from its installed width. The joint system consists of forming material and a fill material, as follows:

A. Forming Material* — Nom 4 pcf (64 kg/m³) density mineral wool batt insulation cut with a length approx equal to the overall thickness of the wall. Multiple pieces stacked on top of each other, as needed, and then compressed 25 percent in thickness and inserted into the flutes of the steel deck above the top of the ceiling runner. The mineral wool batt insulation is to project beyond each side of the ceiling runner, flush with wall surfaces. Alternately, nom 4 pcf (64 kg/m³) forming material cut to shape of flute and nom 1 in. (25 mm) longer than thickness of wall; mineral wool compressed from ends and firmly packed into each flute to attain a min compression rate of 14.3 percent in the length (wall thickness) direction to be flush with both wall surfaces. When Epic Metals Type "EC", "ER2R" or Type "Toris C" decks (Item 1A1) are used, the mineral wool is to be tightly packed into the inverted flutes to the full thickness of the wall. In addition, for the Epic Metals "Toris C" deck, the mineral wool is to be packed to min 25% compression within the recessed indentations immediately above the ceiling runners. Additional 5/8 in. and 1-1/4 in. (16 and 32 mm) wide strips for 1 and 2 hr rated assemblies, respectively, of nom 4 pcf (64 kg/m³)

mineral wool batt insulation are to be cut to fill the gap between the top of the gypsum board and bottom of the steel deck. The strips of

mineral wool are compressed 50 percent and tightly packed, cut edge first, into the gap between the top of the gypsum board and bottom of

the steel deck on both sides of the wall. INDUSTRIAL INSULATION GROUP L L C — MinWool-1200 Safing

the spray-applied fire resistive material a min of 2 in. (51 mm) on both sides of the wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-SP WB Firestop Joint Spray

ROCK WOOL MANUFACTURING CO - Delta- Board ROCKWOOL — SAFE THERMAFIBER INC — Type SAF

A1. Forming Material* — Plugs — (Optional, Not Shown) — Preformed mineral wool plugs, formed to the shape of the trapezoidal fluted floor units, friction fit to completely fill the flutes above the ceiling channel. The plugs shall project beyond each side of the ceiling runner, flush with wall surfaces. Additional forming material, described in Item 3A, to be used in conjunction with the plugs to fill the gap between the top of gypsum board and bottom of steel floor units. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP777 Speed Plugs

A2. Forming Material* — Strips — (Optional) — Nom 5/8 in. and 1-1/4 in. (16 and 32 mm) wide by 2 in. (51 mm) high precut mineral wool

strips for 1 and 2 hr rated assemblies respectively. The strips are compressed 50 percent and firmly packed, cut edge first, into the gap

between the top of the gypsum board and bottom of the steel floor units on both sides of the wall. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 767 Speed Strips B. Fill, Void or Cavity Material* — Min 1/16 in. (1.6 mm) dry thickness (1/8 in. or 3.2 mm wet thickness) of fill material sprayed or troweled on each side of the wall to completely cover mineral wool forming material and to overlap a min of 1/2 in. (13 mm) onto gypsum board and steel deck on both sides of wall. When Spray-Applied Fire Resistive Material* is applied to the Steel Floor and Form Units*, the fill material is to overlap the gypsum board a min of 1/2 in. (13 mm) and the Spray-Applied Fire Resistive Material a min of 2 in. (51 mm) on both sides of wall. When spray-applied fire resistive materials are used, the firestop joint spray shall overlap the wall a min 1/2 in. (13 mm) and overlap

Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada),

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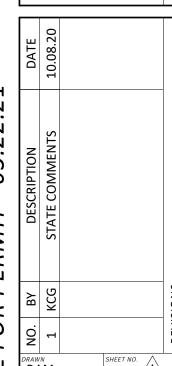
DAM





8 2 0 S 0 LORAD 0 0 CH 30 S S , <u>O</u> \propto 0 0





Δ.

occupied spaces.

junction with mechanical ventilation systems as required in **6.2 Ventilation Rate Procedure.** The outdoor air intake flow (V_{ot}) for a ventilation system shall be determined in accor-

dance with Sections 6.2.1 through 6.2.7. Note: Additional explanation of terms used below is contained in Normative Appendix A, along with a ventilation system schematic (Figure A-1).

6.2.1 Outdoor Air Treatment. If outdoor air is judged to be unacceptable in accordance with Section 4.1, each ventilation system that provides outdoor air through a supply fan shall comply with the following subsections.

Exception: Systems supplying air for enclosed parking garages, warehouses, storage rooms, janitor's closets, trash rooms, recycling areas, shipping/receiving/distribution areas

Note: Occupied spaces ventilated with outdoor air that is judged to be unacceptable are subject to reduced air quality when outdoor air is not cleaned prior to introduction to the

6.2.1.1 Particulate Matter Smaller than 10 Micrometers (PM10). When the building is located in an area where the national standard or guideline for PM10¹ is exceeded, particle filters or air-cleaning devices shall be provided to clean the outdoor air at any location prior to its introduction to occupied spaces. Particulate matter filters or air cleaners shall have a minimum efficiency reporting value (MERV) of 6 or $A_z =$ higher when rated in accordance with ASHRAE Standard

Note: See Appendix E for resources regarding selected PM10 national standards and guidelines.

6.2.1.2 Particulate Matter Smaller than 2.5 Micrometers (PM2.5). When the building is located in an area where the national standard or guideline for PM2.5¹ is exceeded, particle filters or air cleaning devices shall be provided to $R_a = 0$ outdoor airflow rate required per unit area as clean the outdoor air at any location prior to its introduction to occupied spaces. Particulate matter filters or air cleaners shall have a minimum efficiency reporting value (MERV) of 11 or higher when rated in accordance with ASHRAE Standard 52.2.15

Note: See Appendix E for resources regarding selected PM2.5 national standards and guidelines.

6.2.1.3 Ozone. Air-cleaning devices for ozone shall be other aspect of indoor air quality. provided when the most recent three-year average annual fourth-highest daily maximum eight-hour average ozone conlation (P_7) shall equal the largest (peak) number of people centration exceeds 0.107 ppm (209 μ g/m³).

Note: See Appendix E for a list of United States locations exceeding the most recent three-year average annual fourthhighest daily maximum eight-hour average ozone concentration of 0.107 ppm (209 μ g/m³).

Such air-cleaning devices shall have a minimum volumetric ozone removal efficiency of 40% when installed, operated, and maintained in accordance with manufacturer recommendations and shall be approved by the authority having jurisdiction. Such devices shall be operated whenever outdoor ozone levels are expected to exceed 0.107 ppm (209 μ g/m³).

People Outdoor

Air Rate

person person

3.8

3.8

3.8

1 Related requirements: The rates in this table are based on all other applicable requirements of this standard being met.

4 Default occupant density: The default occupant density shall be used when actual occupant density is not known

G Air from one residential dwelling shall not be recirculated or transferred to any other space outside of that dwelling.

vided such value is the product of the net occupi-

able area of the ventilation zone and the default

occupant density listed in Table 6.2.2.1.

6.2.2.2 Zone Air Distribution Effectiveness. The zone

Note: For some configurations, the default value depends

air distribution effectiveness (E_z) shall be no greater than the

default value determined using Table 6.2.2.2.

upon space and supply air temperature.

5 Default combined outdoor air rate (per person): This rate is based on the default occupant density.

A For high-school and college libraries, use values shown for Public Assembly Spaces-Libraries

D Rate does not include special exhaust for stage effects, e.g., dry ice vapors, smoke

B Rate may not be sufficient when stored materials include those having potentially harmful emissions

7.5

7.5

ANSI/ASHRAE Standard 62.1-2013

Occupancy

Sales (except as below)

Beauty and nail salons

Pet shops (animal areas)

Coin-operated laundries

Gym, sports arena

Spectator areas

Disco/dance floors

(play area)

Sports and Entertainment

Swimming (pool & deck)

Health club/aerobics room

Health club/weight rooms

GENERAL NOTES FOR TABLE 6.2.2.1

density, activities, and building construction shall be used

ITEM-SPECIFIC NOTES FOR TABLE 6.2.2.1

Bowling alley (seating)

Gambling casinos

Game arcades

Stages, studios

Mall common areas

Barbershop

Supermarket

Exceptions: Air cleaning for ozone is not required when 1. the minimum system design outdoor air intake

flow results in 1.5 ach or less,

2. controls are provided that sense outdoor ozone level and reduce intake airflow to result in 1.5 ach or less while complying with the outdoor airflow requirements of Section 6, or

3. outdoor air is brought into the building and heated by direct-fired, makeup air units.

6.2.1.4 Other Outdoor Contaminants. When the building is located in an area where the national standard for one or more contaminants not specifically addressed in Section 6.2.1 is exceeded, any design assumptions and/or calculations related to the impact on indoor air quality shall be included in the design documents.

6.2.2 Zone Calculations. Ventilation zone parameters shall be determined in accordance with Sections 6.2.2.1 through 6.2.2.3 for each ventilation zone served by the venti-

6.2.2.1 Breathing Zone Outdoor Airflow. The outdoor airflow required in the breathing zone of the occupiable space or spaces in a ventilation zone, i.e., the breathing zone outdoor airflow (V_{bz}) , shall be no less than the value determined in accordance with Equation 6.2.21.

 $V_{bz} = R_p \times P_z + R_a \times A_z$

zone floor area, the net occupiable floor area of the ventilation zone, ft² (m²) zone population, the number of people in the ventilation

zone during typical usage

outdoor airflow rate required per person as determined

from Table 6.2.2.1 *Note:* These values are based on adapted occupants.

determined from Table 6.2.2.1

Note: Equation 6.2.2.1 accounts for people-related sources and area-related sources independently in the determination of the outdoor air rate required at the breathing zone. The use of Equation 6.2.2.1 in the context of this standard does not necessarily imply that simple addition of outdoor airflow rates for different sources can be applied to any

6.2.2.1.1 Design Zone Population. Design zone popuexpected to occupy the ventilation zone during typical usage.

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TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone (Continued)

(This table is not valid in isolation; it must be used in conjunction with the accompanying notes.)

Area Outdoor

Air Rate

cfm/ft² L/s·m²

0.12

0.06

0.06

0.18

0.06

0.18

0.18

air temperature of 70°F (21°C). Rates may be adjusted for actual density but such adjustment is not required for compliance with this standard

5 0.06 0.3 D

2 Environmental Tobacco Smoke: This table applies to ETS-free areas. Refer to Section 5.17 for requirements for buildings containing ETS areas and ETS-free areas.

3 Air density: Volumetric airflow rates are based on an air density of 0.075 lb_{da}/ft³ (1.2 kg_{da}/m³), which corresponds to dry air at a barometric pressure of 1 atm (101.3 kPa) and an

6 Unlisted occupancies: If the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant

C Rate does not allow for humidity control. Additional ventilation or dehumidification may be required to remove moisture. "Deck area" refers to the area surrounding the pool that would

E When combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation and/or source control shall be provided.

F Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.

be expected to be wetted during normal pool use, i.e., when the pool is occupied. Deck area that is not expected to be wetted shall be designated as a space type (for example, "spectator

0.12 0.6

0.9

1. If the number of people expected to occupy the ventilation zone fluctuates, zone population equal to the average number of people shall be permitted, provided such average is determined

in accordance with Section 6.2.6.2. 2. If the largest or average number of people expected to occupy the ventilation zone cannot be established for a specific design, an estimated value for zone population shall be permitted, pro-

Occupant Density Combined Outdoor

or #/100 m²

(see Note 4) Air Rate (see Note 5)

person

L/s·person

7.8

12.8

7.6

4.6

8.3

5.4

7.0 2

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TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone (This table is not valid in isolation; it must be used in conjunction with the accompanying notes.)

	People	Outdoor	Area Outdoor			Default Values			
Occupancy Category		Rate R _p	Air i <i>F</i>	Rate l _a	Notes	Occupant Density (see Note 4)		ed Outdoor (see Note 5)	Air Class
Category	cfm/ person	L/s· person	cfm/ft ²	L/s·m ²	-	#/1000 ft ² or #/100 m ²	cfm/ person	L/s·person	Class
Correctional Facilities									
Cell	5	2.5	0.12	0.6		25	10	4.9	2
Dayroom	5	2.5	0.06	0.3		30	7	3.5	1
Guard stations	5	2.5	0.06	0.3		15	9	4.5	1
Booking/waiting	7.5	3.8	0.06	0.3		50	9	4.4	2
Educational Facilities									
Daycare (through age 4)	10	5	0.18	0.9		25	17	8.6	2
Daycare sickroom	10	5	0.18	0.9		25	17	8.6	3
Classrooms (ages 5–8)	10	5	0.12	0.6		25	15	7.4	1
Classrooms (age 9 plus)	10	5	0.12	0.6		35	13	6.7	1
Lecture classroom	7.5	3.8	0.06	0.3		65	8	4.3	1
Lecture hall (fixed seats)	7.5	3.8	0.06	0.3		150	8	4.0	1
Art classroom	10	5	0.18	0.9		20	19	9.5	2
Science laboratories	10	5	0.18	0.9		25	17	8.6	2
University/college laboratories	10	5	0.18	0.9		25	17	8.6	2
Wood/metal shop	10	5	0.18	0.9		20	19	9.5	2
Computer lab	10	5	0.12	0.6		25	15	7.4	1
Media center	10	5	0.12	0.6	\mathbf{A}	25	15	7.4	1
Music/theater/dance	10	5	0.06	0.3		35	12	5.9	1
Multiuse assembly	7.5	3.8	0.06	0.3		100	8	4.1	1
Food and Beverage Service									
Restaurant dining rooms	7.5	3.8	0.18	0.9		70	10	5.1	2
Cafeteria/fast-food dining	7.5	3.8	0.18	0.9		100	9	4.7	2
Bars, cocktail lounges	7.5	3.8	0.18	0.9		100	9	4.7	2
Kitchen (cooking)	7.5	3.8	0.12	0.6		20	14	7.0	2
General									
Break rooms	5	2.5	0.06	0.3		25	7	3.5	1

1 Related requirements: The rates in this table are based on all other applicable requirements of this standard being met

2 Environmental Tobacco Smoke: This table applies to ETS-free areas. Refer to Section 5.17 for requirements for buildings containing ETS areas and ETS-free areas. 3 Air density: Volumetric airflow rates are based on an air density of 0.075 lb_{ds}/ft³ (1.2 kg_{ds}/m³), which corresponds to dry air at a barometric pressure of 1 atm (101.3 kPa) and an air temperature of 70°F (21°C). Rates may be adjusted for actual density but such adjustment is not required for compliance with this standard.

4 Default occupant density: The default occupant density shall be used when actual occupant density is not known. 5 Default combined outdoor air rate (per person): This rate is based on the default occupant density.

6 Unlisted occupancies: If the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant density, activities, and building construction shall be used.

ITEM-SPECIFIC NOTES FOR TABLE 6.2.2.1

A For high-school and college libraries, use values shown for Public Assembly Spaces-Libraries. B Rate may not be sufficient when stored materials include those having potentially harmful emissions.

C Rate does not allow for humidity control. Additional ventilation or dehumidification may be required to remove moisture. "Deck area" refers to the area surrounding the pool that would be expected to be wetted during normal pool use, i.e., when the pool is occupied. Deck area that is not expected to be wetted shall be designated as a space type (for example, "spectato

D Rate does not include special exhaust for stage effects, e.g., dry ice vapors, smoke. E When combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation and/or source control shall be provided.

F Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom. G Air from one residential dwelling shall not be recirculated or transferred to any other space outside of that dwelling.

ANSI/ASHRAE Standard 62.1-2013

Max (Zp)

 ≤ 0.15

≤0.25

≤0.35

≤0.45

≤0.55

>0.55

TABLE 6.2.5.2 System Ventilation Efficiency

1.0

0.9

0.8

1. "Max (Z_{nz}) " refers to the largest value of Z_{nz} , calculated using Equation 6.2.5.1,

2. For values of Max (Z_{pz}) between 0.15 and 0.55, the corresponding value of E_{ν} may

3. The values of E., in this table are based on a 0.15 average outdoor air fraction for the

system (i.e., the ratio of the uncorrected outdoor air intake $[V_{ou}]$ to the total zone

primary airflow for all the zones served by the air handler). For systems with higher values of the average outdoor air fraction, this table may result in unrealistically low

values of E_{ν} and the use of Normative Appendix A may yield more practical results.

where V_{pz} is the zone primary airflow, i.e., the primary airflow

rate to the ventilation zone from the air handler, including

1. For VAV-system design purposes, V_{pz} is the lowest

2. In some cases, it is acceptable to determine these

6.2.5.2 System Ventilation Efficiency. The system venti-

6.2.5.3 Uncorrected Outdoor Air Intake. The uncor-

 $V_{ou} = D\Sigma_{all\ zones}(R_p \times P_z) + \Sigma_{all\ zones}(R_a \times A_z)$ (6.2.5.3)

6.2.5.3.1 Occupant Diversity. The occupant diversity

ratio (D) shall be determined in accordance with Equation

6.2.5.3.1 to account for variations in population within the

where the system population (P_s) is the total population in the

Exception: Alternative methods to account for occu-

Note: The uncorrected outdoor air intake (V_{ou}) is

6.2.5.3.2 Design System Population. Design system

adjusted for occupant diversity, but it is not corrected for sys-

population (P_s) shall equal the largest (peak) number of people

expected to occupy all ventilation zones served by the ventila-

pant diversity shall be permitted, provided the

resulting V_{ou} value is no less than that determined

 $D = P_s / \Sigma_{all\,zones} P_z$

using Equation 6.2.5.3.

lation efficiency (E_{ν}) shall be determined in accordance with

rected outdoor air intake (V_{ou}) flow shall be determined in

zone primary airflow value expected at the design

parameters for only selected zones as outlined in

among all the ventilation zones served by the system.

be determined by interpolating the values in the table.

outdoor air and recirculated air.

condition analyzed.

Table 6.2.5.2 or Normative Appendix A.

accordance with Equation 6.2.5.3.

area served by the system.

tem ventilation efficiency.

Normative Appendix A.

Use Appendix A

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Air Distribution Configuration	E_z
Ceiling supply of cool air	1.0
Ceiling supply of warm air and floor return	1.0
Ceiling supply of warm air 15°F (8°C) or more above space temperature and ceiling return	0.8
Ceiling supply of warm air less than 15°F (8°C) above space temperature and ceiling return provided that the 150 fpm (0.8 m/s) supply air jet reaches to within 4.5 ft (1.4 m) of floor level	1.0
Note: For lower velocity supply air, $E_z = 0.8$.	
Floor supply of cool air and ceiling return, provided that the vertical throw is greater than 50 fpm (0.25 m/s) at a height of 4.5 ft (1.4 m) or more above the floor	1.0
Floor supply of cool air and ceiling return, provided low-velocity displacement ventilation achieves unidirectional flow and thermal stratification, or underfloor air distribution systems where the vertical throw is less than or equal to 50 fpm (0.25 m/s) at a height of 4.5 ft (1.4 m) above the floor	1.2
Floor supply of warm air and floor return	1.0
Floor supply of warm air and ceiling return	0.7
Makeup supply drawn in on the opposite side of the room from the exhaust and/or return	0.8
Makeup supply drawn in near to the exhaust and/or return location	0.5

TABLE 6.2.2.2 Zone Air Distribution Effectiveness

 "Ceiling supply" includes any point above the breathing zone
 "Floor supply" includes any point below the breathing zone. As an alternative to using the above values, E_z may be regarded as equal to air-change effectiveness determined in accordance with ASHRAE Standard 12917 for all air

distribution configurations except unidirectional flow.

outdoor air intake flow (V_{ot}) shall be determined in accordance with Equation 6.2.3.

 $V_{ot} = V_{oz}$

6.2.4 100% Outdoor Air Systems. For ventilation systems wherein one or more air handlers supply only outdoor air to ventilation zones served by the system. one or more ventilation zones, the outdoor air intake flow (V_{ot})

shall be determined in accordance with Equation 6.2.4. $V_{ot} = \Sigma_{all\ zones} V_{oz}$

6.2.5 Multiple-Zone Recirculating Systems. For ventilation systems wherein one or more air handlers supply a mixture of outdoor air and recirculated air to more than one ventilation zone, the outdoor air intake flow (V_{ot}) shall be determined in accordance with Sections 6.2.5.1 through

6.2.5.1 Primary Outdoor Air Fraction. Primary outdoor air fraction (Z_{nz}) shall be determined for ventilation zones in accordance with Equation 6.2.5.1.

(6.2.5.1) tion system during typical usage. $Z_{pz} = V_{oz}/V_{pz}$

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TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone (Continued)

(This table is not valid in isolation; it must be used in conjunction with the accompanying notes.)

Area Outdoor

Air Rate

0.06 0.3

2.5 0.12 0.6

0.06

0.06

0.12 0.6

0.12 0.6

0.06 0.3

0.12 0.6

0.06 0.3

0.06 0.3

2.5 0.06 0.3

2.5 0.06 0.3

air temperature of 70°F (21°C). Rates may be adjusted for actual density but such adjustment is not required for compliance with this standard.

0.06 0.3

0.06 0.3

2 Environmental Tobacco Smoke: This table applies to ETS-free areas. Refer to Section 5.17 for requirements for buildings containing ETS areas and ETS-free areas.

3 Air density: Volumetric airflow rates are based on an air density of 0.075 lb_{dx}/ft³ (1.2 kg_{dx}/m³), which corresponds to dry air at a barometric pressure of 1 atm (101.3 kPa) and an

6 Unlisted occupancies: If the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant

C Rate does not allow for humidity control. Additional ventilation or dehumidification may be required to remove moisture. "Deck area" refers to the area surrounding the pool that would be expected to be wetted during normal pool use, i.e., when the pool is occupied. Deck area that is not expected to be wetted shall be designated as a space type (for example, "spectator

E When combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation and/or source control shall be provided.

F Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.

2.5

3.8

1 Related requirements: The rates in this table are based on all other applicable requirements of this standard being met.

4 Default occupant density: The default occupant density shall be used when actual occupant density is not known.

G Air from one residential dwelling shall not be recirculated or transferred to any other space outside of that dwelling.

5 Default combined outdoor air rate (per person): This rate is based on the default occupant density.

A For high-school and college libraries, use values shown for Public Assembly Spaces-Libraries.

D Rate does not include special exhaust for stage effects, e.g., dry ice vapors, smoke.

B Rate may not be sufficient when stored materials include those having potentially harmful emissions.

2.5 0.06 0.3

People Outdoor

Air Rate

person person

2.5

Occupancy

Coffee stations

Corridors

Conference/meeting

for liquids or gels

Bedroom/living room

Barracks sleeping areas

Laundry rooms, centra

Laundry rooms within

Lobbies/prefunction

Office Buildings

Main entry lobbies

for dry materials

Office space

Reception areas

Telephone/data entry

Miscellaneous Spaces

Banks or bank lobbies

Computer (not printing)

GENERAL NOTES FOR TABLE 6.2.2.1

density, activities, and building construction shall be used.

ITEM-SPECIFIC NOTES FOR TABLE 6.2.2.1

ANSI/ASHRAE Standard 62.1-2013

Bank vaults/safe deposit

Occupiable storage rooms

Breakrooms

Multipurpose assembly

dwelling units

Occupiable storage rooms

Hotels, Motels, Resorts, Dormitories

Default Values

Occupant Density Combined Outdoor

or #/100 m²

(see Note 4) Air Rate (see Note 5)

32.5

4.8

2.8

3.5

3.5

3.0

6.0

less than the sum of design zone population for all zones in be reset in response to current occupancy and shall be no less the area served by the system, since all zones may or may not than the building component $(R_a \times A_z)$ of the DCV zone. be simultaneously occupied at design population. 6.2.5.4 Outdoor Air Intake. The design outdoor air

 $V_{ot} = V_{ou} / E_v$

6.2.6 Design for Varying Operating Conditions **6.2.6.1 Variable Load Conditions.** Ventilation systems shall be designed to be capable of providing no less than the minimum ventilation rates required in the breathing zone shall comply with Section 5.9.2. whenever the zones served by the system are occupied, including all full- and part-load conditions.

Note: The minimum outdoor air intake flow may be less than the design value at part-load conditions.

6.2.6.2 Short-Term Conditions. If it is known that peak occupancy will be of short duration and/or ventilation will be varied or interrupted for a short period of time, the design ciency with which outdoor air is distributed to the occupants may be based on the average conditions over a time period (T) under different ventilation system airflows and temperatures determined by Equation 6.2.6.2-1 using I-P units (Equation shall be permitted as an optional basis of dynamic reset. 6.2.6.2-2 using SI units).

> (6.2.6.2-1) $T = 3v/V_{hz}$ (I-P) (6.2.6.2-2) $T = 50v/V_{bz}$ (SI)

where

T = averaging time period, min

v = the volume of the ventilation zone for which averaging is being applied, ft³ (m³)

 V_{bz} = the breathing zone outdoor airflow calculated using Equation 6.2.2.1 and the design value of the zone

population (P_z) , cfm (L/s)Acceptable design adjustments based on this optional provision include the following:

a. Zones with fluctuating occupancy: The zone population (P_z) may be averaged over time (T).

b. Zones with intermittent interruption of supply air: The

average outdoor airflow supplied to the breathing zone over time (T) shall be no less than the breathing zone outdoor airflow (V_{hz}) calculated using Equation 6.2.2.1. c. Systems with intermittent closure of the outdoor air intake:

The average outdoor air intake over time (T) shall be no less than the minimum outdoor air intake (V_{ot}) calculated using Equation 6.2.3, 6.2.4, or 6.2.5.4 as appropriate. **6.2.7 Dynamic Reset.** The system may be designed to reset

the outdoor air intake flow (V_{ot}) and/or space or ventilation zone airflow (V_{oz}) as operating conditions change. 6.2.7.1 Demand Control Ventilation (DCV). DCV shall

Exception: CO₂-based DCV shall not be applied in zones with indoor sources of CO₂ other than occupants or with CO₂ removal mechanisms, such as gas-

Note: Design system population is always equal to or 6.2.7.1.1 The breathing zone outdoor airflow (V_{bz}) shall

Note: Examples of reset methods or devices include

population counters, carbon dioxide (CO₂) sensors, timers, intake flow (V_{ot}) shall be determined in accordance with occupancy schedules, or occupancy sensors. **6.2.7.1.2** The ventilation system shall be controlled such that at steady-state it provides each zone with no less than the breathing zone outdoor airflow (V_{bz}) for the current

> **6.2.7.1.3** The current total outdoor air intake flow with respect to the coincident total exhaust airflow for the building

6.2.7.1.4 Documentation. A written description of the equipment, methods, control sequences, set points, and the intended operational functions shall be provided. A table shall be provided that shows the minimum and maximum outdoor intake airflow for each system.

6.2.7.2 Ventilation Efficiency. Variations in the effi-

6.2.7.3 Outdoor Air Fraction. A higher fraction of out-

door air in the air supply due to intake of additional outdoor air for free cooling or exhaust air makeup shall be permitted as an optional basis of dynamic reset. 6.3 Indoor Air Quality (IAQ) Procedure. Breathing zone

outdoor airflow (V_{hz}) and/or system outdoor air intake flow (V_{ot}) shall be determined in accordance with Sections 6.3.1 through 6.3.5. **6.3.1 Contaminant Sources.** Contaminants or mixtures of

concern, for purposes of the design, shall be identified. For each contaminant or mixture of concern, indoor sources (occupants and materials) and outdoor sources shall be identified, and the emission rate for each contaminant of concern from each source shall be determined.

Note: Informative Appendix B provides information for some potential contaminants of concern.

of concern, a concentration limit and its corresponding exposure period and an appropriate reference to a cognizant authority shall be specified. Note: Informative Appendix B includes concentration

percentage of building occupants and/or visitors expressing

6.3.4 Design Approach. Zone and system outdoor airflow supply airflow rates).

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TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone (Continued) (This table is not valid in isolation; it must be used in conjunction with the accompanying notes.)

	People (Outdoor	Area O	utdoor		Defa	ult Values		Air Class
Occupancy Category	Air i	Rate R _p		Rate ^L a	Notes	Occupant Density (see Note 4)		ed Outdoor (see Note 5)	
cuttgo1,	cfm/ person	L/s∙ person	efm/ft ²	L/s·m ²		#/1000 ft ² or #/100 m ²	cfm/ person	L/s·person	Clas
Freezer and refrigerated spaces (<50°F)	10	5	0	0	Е	0	0	0	2
General manufacturing (excludes heavy industrial and processes using chemicals)	10	5.0	0.18	0.9		7	36	18	3
Pharmacy (prep. area)	5	2.5	0.18	0.9		10	23	11.5	2
Photo studios	5	2.5	0.12	0.6		10	17	8.5	1
Shipping/receiving	10	5	0.12	0.6	В	2	70	35	2
Sorting, packing, light assembly	7.5	3.8	0.12	0.6		7	25	12.5	2
Telephone closets	10-0		0.00	0.0		()			1
Transportation waiting	7.5	3.8	0.06	0.3		100	8	4.1	1
Warehouses	10	5	0.06	0.3	В				2
Public Assembly Spaces									
Auditorium seating area	5	2.5	0.06	0.3		150	5	2.7	1
Places of religious worship	5	2.5	0.06	0.3		120	6	2.8	1
Courtrooms	5	2.5	0.06	0.3		70	6	2.9	1
Legislative chambers	5	2.5	0.06	0.3		50	6	3.1	1
Libraries	5	2.5	0.12	0.6		10	17	8.5	1
Lobbies	5	2.5	0.06	0.3		150	5	2.7	1
Museums (children's)	7.5	3.8	0.12	0.6		40	11	5.3	1
Museums/galleries	7.5	3.8	0.06	0.3		40	9	4.6	1
Residential									
Dwelling unit	5	2.5	0.06	0.3	F,G	F			1
Common corridors	S	-	0.06	0.3					1

1 Related requirements: The rates in this table are based on all other applicable requirements of this standard being met.

Environmental Tobacco Smoke: This table applies to ETS-free areas. Refer to Section 5.17 for requirements for buildings containing ETS areas and ETS-free areas. 3 Air density: Volumetric airflow rates are based on an air density of 0.075 lb_{da}/ft³ (1.2 kg_{da}/m³), which corresponds to dry air at a barometric pressure of 1 atm (101.3 kPa) and an

air temperature of 70°F (21°C). Rates may be adjusted for actual density but such adjustment is not required for compliance with this standard. 4 Default occupant density: The default occupant density shall be used when actual occupant density is not known.

5 Default combined outdoor air rate (per person): This rate is based on the default occupant density. 6 Unlisted occupancies: If the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant

ITEM-SPECIFIC NOTES FOR TABLE 6.2.2.1

A For high-school and college libraries, use values shown for Public Assembly Spaces-Libraries. B Rate may not be sufficient when stored materials include those having potentially harmful emissions.

C Rate does not allow for humidity control. Additional ventilation or dehumidification may be required to remove moisture. "Deck area" refers to the area surrounding the pool that would be expected to be wetted during normal pool use, i.e., when the pool is occupied. Deck area that is not expected to be wetted shall be designated as a space type (for example, "spectator

D Rate does not include special exhaust for stage effects, e.g., dry ice vapors, smoke.

E When combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation and/or source control shall be provided. F Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.

G Air from one residential dwelling shall not be recirculated or transferred to any other space outside of that dwelling

ANSI/ASHRAE Standard 62.1-2013

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6.2.2.3 Zone Outdoor Airflow. The zone outdoor air-

flow (V_{07}) , i.e., the outdoor airflow rate that must be provided

shall be determined in accordance with Equation 6.2.2.3.

 $V_{oz} = V_{bz} / E_z$

to the ventilation zone by the supply air distribution system,

6.2.3 Single-Zone Systems. For ventilation systems

wherein one or more air handlers supply a mixture of out-

door air and recirculated air to only one ventilation zone, the

ANSI/ASHRAE Standard 62.1-2013

(6.2.5.3.1)

ANSI/ASHRAE Standard 62.1-2013

eous air cleaners.

be permitted as an optional means of dynamic reset.

6.3.2 Contaminant Concentration. For each contaminant

guidelines for some potential contaminants of concern.

satisfaction with perceived IAQ.

rates shall be the larger of those determined in accordance with Section 6.3.4.1 and either Section 6.3.4.2 or 6.3.4.3, based on emission rates, concentration limits, and other relevant design parameters (e.g., air cleaning efficiencies and

dynamic mass-balance analysis, determine the minimum out-

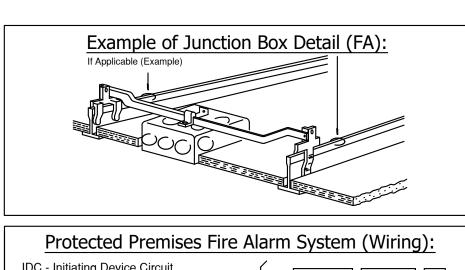
6.3.3 Perceived Indoor Air Quality. The design level of indoor air acceptability shall be specified in terms of the

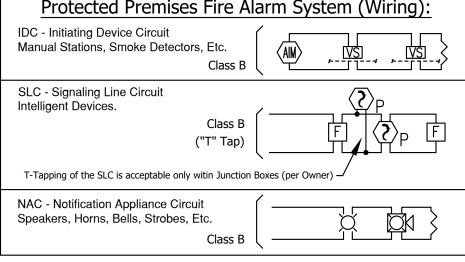
6.3.4.1 Mass Balance Analysis. Using a steady-state or

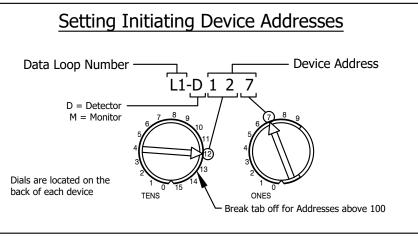
Poudre School District Partnership and Volunteers Building

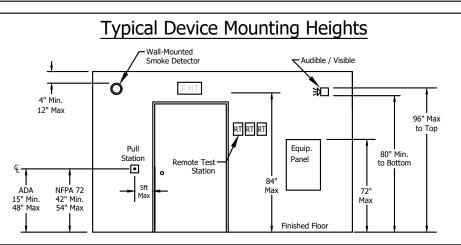
1630 Stover Street Fort Collins, Colorado 80525

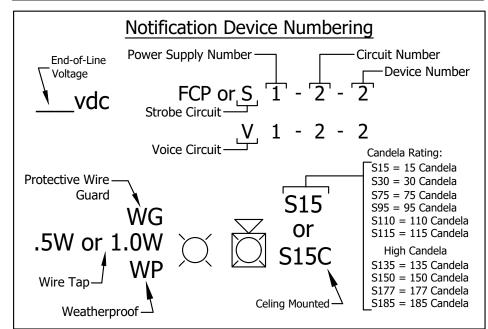
Fire Alarm System Drawings

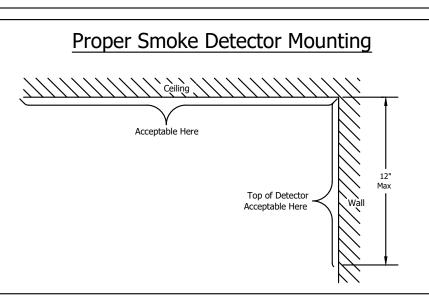


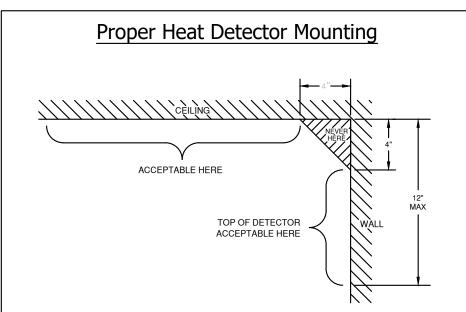








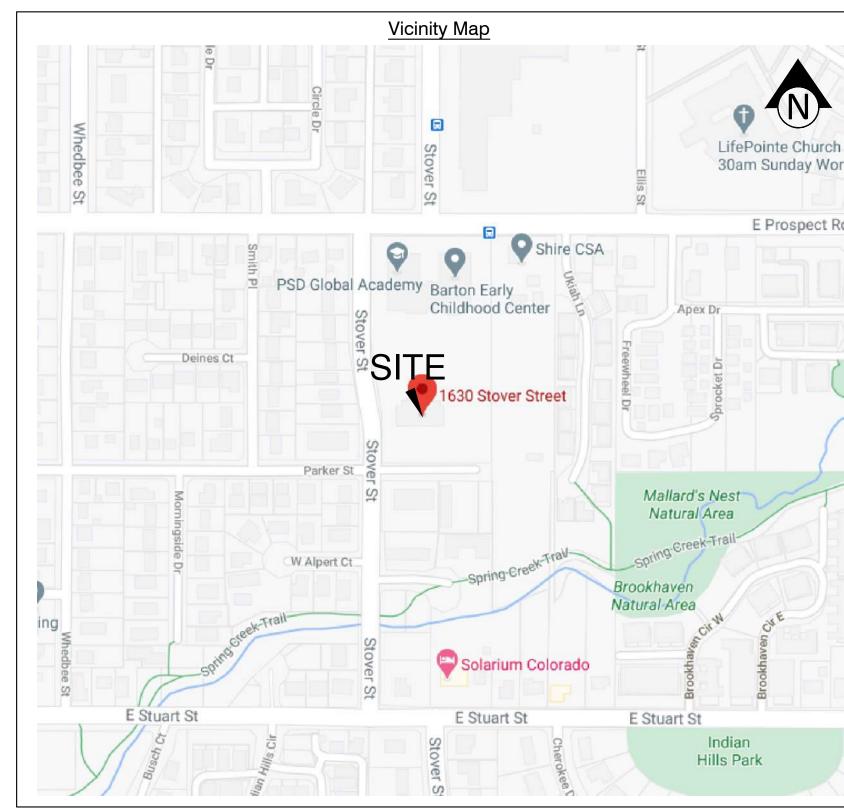




			mbols Legend		
Symbol	Qty.	Description	Mounting	Manufacturer	Part #
FACP	1	Intelligent Fire Alarm System Control Panel	Surface Enclosure at 72" to Top	Notifier	NFS-320
(S) b	26	Intelligent Photo Smoke Detector	4 Square Deep with 3" Round Ring	Notifier	FSP-851 with B710lp base
F 135°	1	Intelligent Heat Detector	4 Square Deep with 3" Round Ring	Notifier	FST-851 with B710lp base
R/F 135°	2	Intelligent Heat - Rate of Rise Detector	4 Square Deep with 3" Round Ring	Notifier	FST-851R with B710lp base
	6	Intelligent Manual Pull Station	1 Gang at 48" to Center	Notifier	NBG-12LX
IR	5	Intelligent Relay Module	4 Square Deep	Notifier	FRM-1
R	1	Remote Relay Single Circuit	Surface	Notifier	MR-101C
15cd	11	Multi Candela Sync Strobe at 15cd	1 Gang at 80" to Bottom	Notifier	SW
	1	Multi Candela Sync Strobe at 30cd	1 Gang at 80" to Bottom	Notifier	SW
32	2	Motorized Smoke Fire Damper			Supplied by Others
EVAC	1	Voice Evacuation Panel	Surface Mount	Notifier	NFC-50/100
GMAP	1	Custom Graphic Map (Picture Frame)	Surface Mount	Tech Electronics	Ref. to GMAP Sheet for size
⊘ _P	8	Intelligent Photo Smoke Detector	4 Square Deep with 3" Round Ring	Notifier	FSP-951 with B300-6 Base
(AIM) _m	9	Addressable Mini Monitor Module	4 Square Deep	Notifier	FMM-101
(AOM) _C	1	Addressable NAC Control Module	4 Square Deep	Notifier	FCM-1
△ co	7	Carbon Monoxide Detector	1 Gang	Notifier	CO1224TR
X 15cd	3	Multi Candela Sync Strobe at 15cd	1 Gang at 80" to Bottom	Notifier	SWL
X 75cd	4	Multi Candela Sync Strobe at 75cd	1 Gang at 80" to Bottom	Notifier	SWL
SW	17	Ceiling Speaker Only	4 Square Deep	Notifier	SPCWL
S15C W	1	Ceiling Speaker with Multi Candela Sync Strobe at 15cd	4 Square Deep	Notifier	SPSCWL
	2	Ceiling Speaker with Multi Candela Sync Strobe at 30cd	4 Square Deep	Notifier	SPSCWL
		W. 18.1			
S30C W S75C W	2	Ceiling Speaker with Multi Candela Sync Strobe at 75cd	4 Square Deep	Notifier	SPSCWL
∑ ¶ S30CW	2	Ceiling Speaker with Multi Candela Sync Strobe at 75cd Radio Transmitter / Communicator Package	4 Square Deep	Notifier	Supplied by Others

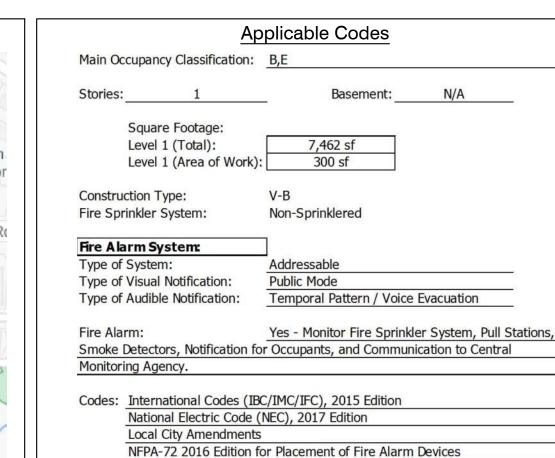
		V	Vire Legen	d	
Symbol	Description	MFG.	Part Number	Color Coded Cable	Type of Circuit Application
Α	1 pair 16 AWG Twisted / UNshielded Fire Alarm Cable (FPLP)	West Penn	60991BT-RD	Red + Black - Red Jacket w/ Brown Tracer	Conventional (IDC) Circuit Plenum
D	1 pair 16 AWG Twisted / UNshielded Fire Alarm Cable (FPLP)	West Penn	60991B-SLC	Red + Black - Red Jacket Pre-Printed "SLC"	Data (SLC) Circuit Plenum
J	2 14 AWG THHN (in EMT)			Red + Black - Red Jacket	HVAC Interface
K	2 14 AWG THHN (in EMT)			White (N) / Black (H) tag for Ckt type @ J box	Damper Interface
Р	1 pair 14 AWG Twisted / UNshielded Fire Alarm Cable (FPLP)	West Penn	60993B	Red + Black - Red Jacket tag for Ckt type @ J box	Aux Power Circuit Plenum
S	1 pair 14 AWG Twisted / UNshielded Fire Alarm Cable (FPLP)	West Penn	60993BT-GR	Red + Black - Red Jacket w/ Green Stripe	Strobe (NAC) Circuit Plenum
Т	CAT 6 Network Cable				Telephone Circuit
V	1 pair 16 AWG Twisted / UNshielded Fire Alarm Cable (FPLP)	West Penn	60991B-BL	Red + Black - Red Jacket w/ Blue Tracer	Speaker (NAC) Circuit Plenum

Wire Manufacturer is for Reference Purpose Only, Consult NEC and Specifications for Wiring Methods.



FIRE ALARM SYSTEMS GENERAL APPLICATION NOTES

- INSTALLATION SHALL BE ACCOMPLISHED IN STRICT COMPLIANCE WITH NFPA, LOCAL AND STATE AHJ'S,
- WIRE ROUTING IS DIAGRAMMATIC IN NATURE ONLY AND NOT INTENDED FOR ACTUAL CONDUIT ROUTING.
- ALL CONDUIT SIZING AND ROUTING BY ELECTRICAL CONTRACTOR PER NEC AND AHJ.
- THE SYSTEM SHALL BE MONITORED BY A UL LISTED MONITORING STATION BEFORE THE AHJ TEST.
- FIELD VERIFY SPRINKLER WATER FLOW, SMOKE DAMPERS AND DUCT DETECTOR LOCATIONS.
- FIELD VERIFY ALL WIRING LOCATIONS AND REQUIREMENTS FOR HVAC AND FAN CONTROL
- SMOKE DETECTORS SHALL NOT BE LOCATED WITHIN 3'-0" OF AIR DIFFUSERS.
- NFPA 72 REOUIRES THAT NO SMOKE DETECTORS ARE TO BE INSTALLED UNTIL AFTER FINAL CONSTRUCTION CLEAN-UP. DETECTORS THAT HAVE BEEN INSTALLED PRIOR TO CLEAN-UP MUST BE CLEANED OR REPLACED ACCORDING TO NFPA 72 CHAPTER, 2016 edition.
- 9. FACP SHALL NOT BE ENERGIZED WITHOUT THE PRESENCE OF TECH ELECTRONICS TECHNICIANS.
- 10. ALL CIRCUITS WILL BE PROPERLY TAGGED AND TESTED FOR OPENS, SHORTS, GROUNDS AND PROPER END OF LINE RESISTANCE. EACH CIRCUITS METER READING MUST BE DOCUMENTED AND PRESENTED TO FIELD TECHNICIAN UPON ARRIVAL ON SITE FOR CHECKOUT.
- 11. A SET OF INSTALLATION AS-BUILT DRAWINGS SHOWING ACTUAL CONDUIT AND CONDUCTOR ROUTES SHALL BE KEPT BY PROJECT FOREMAN FOR USE BY FIELD TECHNICIANS.
- 12. AGREEMENT AND CONFIRMATION OF ALL MILESTONE EVENTS WILL BE MADE WITH TECH ELECTRONICS PROJECT MANAGER. SERVICES MUST BE SCHEDULED WITH PROJECT MANAGER WITH A MINIMUM OF TEN WORKING DAYS NOTICE.
- 13. NO "T" TAPPING OF SIGNALING OR INITIATING ZONE CIRCUITS ARE ALLOWED. "T" TAPPING OF ADDRESSABLE CIRCUITS IS ALLOWED PROVIDING THE SPLICE IS PROFESSIONALLY INSTALLED. POLARITY IS OBSERVED, AND SHALL BE CONTINUOUS AND FREE OF GROUNDS. FIRE ALARM CONDUCTORS (EXCEPT POWER GROUNDS) SHALL BE INSULATED AND COMPLETELY FREE FROM CONDUIT OR EARTH GROUNDS.
- 14. MOUNT AUDIBLE/VISUAL WALL DEVICE BACK BOX BETWEEN 80" AND 96" TO BOTTOM OF BACK BOX AFF. SEE FLOOR PLANS FOR CANDELA RATING OF DEVICE BEING INSTALLED.
- 15. DO NOT ATTACH THE LAST NOTIFICATION APPLIANCE TO THE WALL UNTIL VOLTAGE READINGS ARE RECORDED ON DRAWINGS BY TECH ELECTRONICS TECHNICIAN.
- 16. REFERENCE THE INSTALLATION MANUALS FOR THE DUCT SMOKE DETECTORS. INSTALL THE PROPER DUCT SAMPLING TUBE FOR THE WIDTH OF THE DUCT AS INDICATED IN THE INSTALLATION MANUAL. IF PROPER SAMPLE TUBES HAVE NOT BEEN SUPPLIED CALL TECH ELECTRONICS FOR THE PROPER TUBE
- 17. REFER TO MANUFACTURER INSTALLATION SHEETS FOR ALL MONITOR MODULES, RELAY MODULES AND CONTROL MODULES.



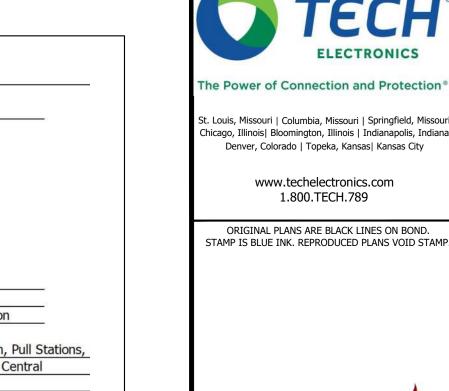
Authority Having Jurisdiction Poudre Fire Authority 102 Remington Street Fort Collins, Colorado 80524 (970) 416-2892

Poudre School District 2407 LaPorte Avenue Fort Collins, Colorado 80521 (970) 490-3017

Installing Electrical Contractor (xxx) xxx-xxxx Contact: xxxx

> Fire Protection Engineer TLH Fire 6901 S Pierce Street Littleton, Colorado 80128 (303) 517-1775

	Sheet Index
Sheet Number	Description
FA-0.0	Cover Sheet
FA-0.1	General Notes - Fire Alarm System
FA-1.0	Overall - Fire Alarm System Plan / Battery and Load Calculations
FA-2.0	Graphic Map



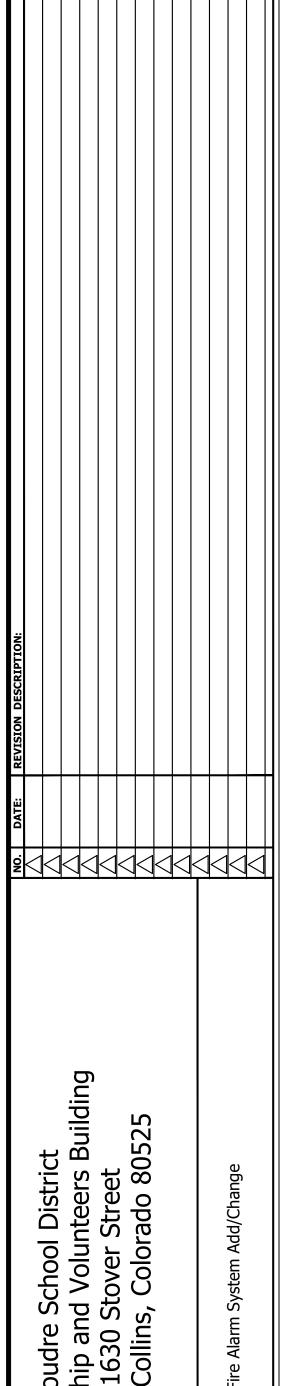


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FOR SUBMITTAL PURPOSES ONLY lames W. McGee 09/25/2020 CET # 111023 LEVEL: III EXPIRATION: 04/01/2022

THIS DRAWING HAS BEEN REVIEWED



FA-0.0

09/25/2020 CONSTRUCTION

DESIGN CRITERIA POUDRE SCHOOL DISTRICT DESIGN STANDARDS IN COMPLIANCE WITH STATE CODE REQUIREMENTS (INTERNATIONAL BUILDING CODE 2015 AND NFPA 72 2016) AND EXCEEDING REQUIREMENTS IN VERY LIMITED CIRCUMSTANCES, THE FIRE ALARM SYSTEM A SMOKE DETECTOR SHALL BE LOCATED IN THE MAIN ELECTRICAL ROOM.

DESIGN INCORPORATES THE FOLLOWING DESIGN CRITERIA. (EXCEPTIONS FOR SCHOOLS PROTECTED THROUGHOUT WITH AUTOMATIC SPRINKLERS ARE NOTED WHERE APPLICAB) SMOKE DETECTION

SMOKE DETECTORS SHALL BE LOCATED THROUGHOUT ALL COMMON CORRIDORS. THESE SMOKE DETECTORS SHALL CONTROL MAGNETIC DOOR HOLD OPENS. DOOR HOLDERS SHALL RELEASE UPON GENERAL ALARM. (FULLY SPRINKLERED SCHOOLS SHALL ONLY HAVE SMOKE DETECTORS WITHIN 5 FEET OF MAGNETIC DOOR HOLDERS.)

SMOKE DETECTORS SHALL BE LOCATED AT ALL FIRE ALARM REMOTE POWER SUPPLY PANELS AND FIRE ALARM CONTROL PANEL LOCATIONS UNLESS THE ENVIRONMENT IS UNSUITABLE FOR SMOKE DETECTORS IN WHICH CASE 135 DEGREE FIXED TEMPERATURE HEAT DETECTORS SHALL BE UTILIZED.

SMOKE DETECTORS SHALL BE LOCATED IN ALL COMPUTER CLASSROOMS. (NOT REQUIRED IF THE BUILDING IS PROTECTED THROUGHOUT WITH AUTOMATIC SPRINKLERS.)

SMOKE DETECTORS SHALL BE LOCATED IN THE LIBRARY/MEDIA CENTER. (NOT REQUIRED IF THE BUILDING IS PROTECTED THROUGHOUT WITH AUTOMATIC SPRINKLERS.)

6. A SMOKE DETECTOR SHALL BE LOCATED IN EACH MDF/IDF ROOM.

A SMOKE DETECTOR SHALL BE LOCATED IN EACH MODULAR CLASSROOM AND SHALL BE NON-INTELLIGENT

SMOKE DETECTORS SHALL BE LOCATED IN ELEVATOR LOBBIES, ELEVATOR MACHINE ROOM, AND THE TOP OF SHAFT FOR ELEVATOR CONTROL PURPOSES AS REQUIRED BY ANSI A 17.1.

SMOKE DETECTORS SHALL BE PROVIDED AS REQUIRED BY THE INTERNATIONAL MECHANICAL CODE FOR FIRE/SMOKE DAMPERS IF APPLICABLE TO THE SCHOOL 10. PROVIDE WIRE GUARDS FOR ALL GYM AND CAFETERIA SMOKE DETECTORS. CONTRACTOR SHALL NOTCH WIRE GUARDS TO ALLOW FOR MAGNETIC TESTING. NOTE: MAGNET TESTING IS NOT A

SUBSTITUTE FOR SMOKE CHAMBER ENTRY TESTING. HEAT DETECTION:

HEAT DETECTORS SHALL BE LOCATED IN THE ELEVATOR MACHINE ROOMS, BOTTOM OF SHAFT AND TOP OF SHAFT WITHIN 24 INCHES OF EACH SPRINKLER HEAD FOR ELEVATOR SHUNT TRIP PURPOSES AS REQUIRED BY STATE CODE. THESE DETECTORS SHALL BE INTELLIGENT ANALOG TYPE DEVICE

(THIS REMAINDER OF THE SECTION IS NOT APPLICABLE IF THE BUILDING IS PROTECTED THROUGHOUT WITH AUTOMATIC SPRINKLERS.)

HEAT DETECTORS SHALL BE LOCATED IN ALL CODE REQUIRED AREAS, NOT SUITABLE FOR SMOKE DETECTION. 3. INTELLIGENT 135 DEGREE RATE OF RISE HEAT DETECTORS SHALL BE LOCATED IN ALL CHEMICAL STORAGE AREAS, SCIENCE PREP ROOMS AND SCIENCE CLASSROOMS.

4. INTELLIGENT 135 DEGREE RATE OF RISE HEAT DETECTORS SHALL BE LOCATED IN CAFETERIAS AND GYMS

5. INTELLIGENT 135 DEGREE FIXED TEMP HEAT DETECTORS SHALL BE LOCATED IN KITCHENS AND HOME ECONOMICS CLASSROOMS, AND PRIMARY STAFF ROOM

HEAT DETECTORS SHALL BE LOCATED IN DISHWASH ROOMS WHERE EXISTING HEAT DETECTION IS IN PLACE AND SHALL BE 135 DEGREE WEATHERPROOF RATE ANTICIPATION THERMOTECH MODEL.

HEAT DETECTORS SHALL BE LOCATED IN ALL BOILER ROOMS, CHILLER ROOMS, AND OTHER SIMILAR ROOMS. THESE DETECTORS SHALL BE INTELLIGENT/ANALOG TYPE DEVICE SET TO THE HIGHEST

3. A HEAT DETECTOR SHALL BE LOCATED IN THE KILN ROOM. THE DETECTOR SHALL BE INTELLIGENT/ANALOG TYPE DEVICE SET TO THE HIGHEST FIXED TEMPERATURE.). INTELLIGENT 135 DEGREE RATE OF RISE HEAT DETECTORS SHALL BE LOCATED IN STORAGE ROOMS GREATER THAN 400 SQ FT OR IN STORAGE ROOMS WITH EXISTING HEAT DETECTORS.

10. PROVIDE WIRE GUARDS FOR ALL GYM HEAT DETECTORS, CONTRACTOR SHALL NOTCH WIRE GUARDS TO ALLOW FOR MAGNETIC TESTING. NOTE: MAGNET TESTING IS NOT A SUBSTITUTE FOR HEAT SOURCE TESTING.

DUCT SMOKE DETECTION DUCT SMOKE DETECTORS SHALL BE INTELLIGENT ANALOG/ADDRESSABLE TYPE, WHICH SHALL REPORT TO THE FIRE ALARM SYSTEM AS A "SUPERVISORY" TYPE DEVICE.

DUCT SMOKE DETECTORS SHALL BE LOCATED IN THE RETURN AIR DUCTWORK OF ALL HVAC UNITS GREATER THAN 2,000CFM.

DUCT SMOKE DETECTORS SHALL BE LOCATED AT EACH LEVEL IN THE RETURN DUCTWORK OF ALL HVAC UNITS GREATER THAN 15,000 CFM, OR AS REQUIRED BY THE INTERNATIONAL MECHANICAL CODE 4. WHERE SUPPLY SIDE DUCT DETECTORS ARE NO LONGER REQUIRED, CONTRACTOR SHALL REMOVE SUPPLY SIDE DUCT DETECTOR AND SAMPLING TUBE AND SEAL PENETRATIONS ON DUCTWORK WITH PLATE/POOKY IN ACCORDANCE WITH IMC REQUIREMENTS.

DUCT SMOKE DETECTORS SHALL BE PROVIDED AS REQUIRED BY THE INTERNATIONAL MECHANICAL CODE FOR FIRE/SMOKE DAMPERS (WITHIN 5 FEET) IF APPLICABLE TO THE SCHOOL.

REMOTE TEST SWITCHES FOR DUCT DETECTORS: i. SHALL BE KEYED AND LOCATED NO HIGHER THAN 7FT AFF. OBTAIN PSD ELECTRICAL DEPARTMENT PERMISSION TO MOUNT HIGHER THAN 7FT AFF. THE TEST SWITCH IN THIS CASE SHALL BE THE

MAGNET TYPE (NOT KEYED).

ii. SHALL BE LOCATED IN COMMON CORRIDORS OR OTHER PUBLIC AREAS. FOR SPECIAL CIRCUMSTANCES, OBTAIN APPROVAL FROM THE PSD ELECTRICAL DEPARTMENT FOR ALL LOCATIONS PRIOR TO MOUNTING.

iii. LABEL ALL SWITCHES WITH HVAC UNIT NUMBER AND DEVICE ADDRESS IN A MINIMUM TEXT SIZE OF 18 POINT FONT.

MANUAL FIRE STATIONS:

MANUAL STATIONS SHALL BE DUAL ACTION TYPE WITH A KEY (NOT ALLEN WRENCH).

ONE MANUAL PULL STATIONS SHALL BE LOCATED IN THE MAIN OFFICE (COORDINATE LOCATION WITH PSD PRIOR TO INSTALLATION).

MANUAL PULL STATIONS SHALL BE LOCATED AT EXTERIOR EXITS OF THE GYM. MANUAL PULL STATIONS SHALL BE LOCATED AT EXTERIOR EXITS IN HIGH SCHOOL AND MIDDLE SCHOOL TECH CLASSROOMS.

MANUAL PULL STATIONS SHALL BE LOCATED AT EACH KITCHEN, BOILER AND MECHANICAL ROOMS WITH EXTERIOR BUILDING ACCESS.

MANUAL PULL STATIONS SHALL BE PROVIDED AT ALL PORTABLE MODULAR CLASSROOM EXITS AND SHALL BE NON-INTELLIGENT. MANUAL STATIONS SHALL BE MOUNTED WITH THE OPERATING MECHANISM AT 48" ABOVE FINISHED FLOOR.

FOR EXISTING SCHOOLS PROTECTED WITH AUTOMATIC SPRINKLERS, THE NEW PULL STATIONS SHALL BE LOCATED TO MATCH EXISTING PULL STATION LOCATIONS.

9. PROTECT MANUAL PULL STATIONS IN GYM WITH STI DAMAGE STOPPER. MAGNETIC DOOR HOLDERS

EXISTING MAGNETIC DOOR HOLDERS SHALL REMAIN IN PLACE.

2. WHERE EXISTING MAGNETIC DOOR HOLDERS ARE NOT INSTALLED, NEW MAGNETIC DOOR HOLDERS SHALL BE INSTALLED AT GYM, CAFETERIA AND MAIN OFFICE DOORS.

3. CONTRACTOR SHALL REMOVE DOOR STOPS AT LOCATIONS OF NEW AND EXISTING MAGNETIC DOOR HOLDERS.

4. MAGNETIC DOOR HOLDERS SHALL BE 120VAC. EXISTING DOOR MAGS MAY BE REUSED IF THEY ARE FIELD VERIFIED TO BE 120VAC. OTHERWISE, THEY MUST BE REPLACED WITH NEW 120VAC DEVICES. CARBON MONOXIDE (CO) SENSORS:

CARBON MONOXIDE (CO) SENSORS SHALL BE MONITORED BY ADDRESSABLE FIRE ALARM MONITOR MODULE, AND SHALL REPORT TO THE FIRE ALARM SYSTEM AS AN "ALARM" TYPE DEVICE.

2. CARBON MONOXIDE (CO) SENSORS SHALL HAVE THREE CO EXPOSURE LEVEL SETTINGS FOR SHORT, MEDIUM, AND LONG DURATION PERIODS OF EXPOSURE TO CO GAS.

CARBON MONOXIDE DETECTORS SHALL BE LOCATED IN KITCHEN, BOILER ROOM, ROOMS WITH GAS FIRED EQUIPMENT INCLUDING SCIENCE PREP ROOMS, SCIENCE CLASSROOMS, LABORATORIES, HOME ECONOMICS (WITH GAS), GAS WATER HEATERS, GAS FURNACES, AND GAS FIRED AHUS OR FIRST ROOM SERVED BY A GAS FIRED AHU.

4. CARBON MONOXIDE DETECTORS SHALL BE LOCATED IN EACH MODULAR CLASSROOM AND SHALL BE NON-INTELLIGENT.

AUDIBLE, VISUAL, AND AUDIBLE/VISUAL NOTIFICATION APPLIANCES: SPEAKERS AND SPEAKER/STROBES SHALL BE GENERALLY LOCATED TO PROVIDE A MINIMUM OF 15DB ABOVE AMBIENT SOUND LEVELS THROUGHOUT ALL BUILDING AREAS.

SPEAKER/STROBES SHALL BE LOCATED IN ALL MECHANICAL ROOMS, AND OTHER HIGH-NOISE AREAS.

SPEAKER/STROBES SHALL BE LOCATED IN ALL CLASSROOM AREAS. 4. LOUDSPEAKERS AND STROBES SHALL BE LOCATED IN GYMNASIUMS.

5. ALL SPEAKERS SHALL BE SET TO THE VOLUME SETTING RECOMMENDED BY MANUFACTURER TO MEET INTELLIGIBILITY AND DB LEVEL REQUIREMENTS.

SPEAKER/STROBES SHALL BE LOCATED IN ALL COMMON "PUBLIC AREA" SPACES, INCLUDING CORRIDORS, CLASSROOMS, RESTROOMS. OPEN OFFICE AREAS. AND OTHER AREAS WHERE MORE THAN ONE PERSON OCCUPANCY WOULD BE EXPECTED.

STROBES SHALL BE LOCATED IN ALL RESTROOMS EXCEPT SINGLE WATER CLOSETS (TOILET ONLY) WITHOUT A SINK SPECIFICALLY IN KINDERGARTEN AND PRE-SCHOOL CLASSROOMS.

STROBES SHALL BE LOCATED IN COPY ROOMS, WORK ROOMS, STORAGE ROOMS GREATER THAN 400 SQUARE FEET, AND STORAGE ROOMS WHERE HIGH OCCUPANT USAGE LEVELS ARE ANTICIPATED

UNDER NORMAL CONDITIONS.

9. STROBES SHALL BE LOCATED IN CLINICS AND CONFERENCE ROOMS.

10. STROBES SHALL NOT BE INSTALLED IN SINGLE OCCUPANT OFFICES. 11. CEILING MOUNTED SPEAKER/STROBES ARE PREFERRED OVER WALL MOUNTED IN CLASSROOMS, RESTROOMS, AND OFFICES. CEILING MOUNTED SPEAKERS, STROBES, AND SPEAKER/STROBES SHALL

BE CENTERED IN THE SPACE AS MUCH AS POSSIBLE, BUT SHALL NOT EXCEED 5 FEET IN ANY DIRECTION FROM THE CENTER, UNLESS APPROVED BY THE ENGINEER OR AHJ.

12. WHEN CEILING MOUNTING IS NOT PRACTICAL, SPEAKERS, STROBES, AND SPEAKER/STROBES SHALL BE WALL MOUNTED WITH THE BOTTOM OF THE VISUAL SIGNAL (STROBE) LENS AT 80" ABOVE FINISHED FLOOR, OR WITH THE TOP OF THE VISUAL SIGNAL (STROBE) LENS AT 6" BELOW THE CEILING (FOR LOW CEILING AREAS), WHICHEVER IS LOWER.

13. FOR SPECIFIC LIMITED APPLICATIONS, THE SPEAKERS, STROBES, AND SPEAKER/STROBES MAY BE INSTALLED WITH THE TOP OF THE VISUAL SIGNAL (STROBE) LENS AT UP TO 96" ABOVE FINISHED FLOOR. EACH LOCATION MUST BE APPROVED IN WRITING BY THE ENGINEER OR AHJ.

14. EXTERIOR WEATHERPROOF HORN/STROBES SHALL BE PROVIDED AT THE FIRE DEPARTMENT RESPONSE POINT. THE HORN SHALL BE SILENCEABLE AND THE NOTIFICATION APPLIANCE SHALL BE

MOUNTED 10 FEET ABOVE GRADE.

15. PROVIDE WIRE GUARDS FOR ALL GYM AND CAFETERIA SPEAKERS, STROBES AND SPEAKER/STROBES. 16. SPEAKERS, STROBES AND SPEAKER/STROBES SHALL BE WHITE AND LABELED "FIRE"

AN AES RADIO COMMNUNICATOR SHALL BE PROVIDED FOR OFFSITE MONITORING. THE FIRE ALARM SYSTEM SHALL REPORT ALARM, TROUBLE, SUPERVISORY TO THE MONITORING COMPANY

REMOTE MONITORING, FIRE ALARM CONTROL PANEL AND REMOTE POWER SUPPLY:

PROVIDE A NETWORK DROP AT THE FACP FOR A WEB INTERFACE ALLOWING REMOTE VIEWING OF THE FACP.

3. AN ELECTRICAL OUTLET IS REQUIRED AND SHALL BE PROVIDED BY EACH FACP.

4. THE ELECTRICAL CONTRACTOR SHALL RUN EM POWER TO FACP AND RPS FROM THE FACILITY EM PANEL. MODULAR CLASSROOMS:

THE ELECTRICAL CONTRACTOR SHALL RUN 24VDC POWER TO EACH MODULAR CLASSROOM,

2. ALL MODULAR CLASSROOM DEVICES SHALL BE CONVENTIONAL (NON-INTELLIGENT). SMOKE DETECTORS AND PULL STATIONS MAY BE ON THE SAME ZONE. LABELS FOR DEVICES:

ALL EQUIPMENT SHALL BE CLEARLY LABELED WITH THE DEVICE ADDRESS ON THE BASE OF THE DETECTOR OR MANUAL PULL STATION WITH TYPE BLACK LETTERED ON A CLEAR BACKGROUND LABELS WITH A TEXT SIZE OF AT LEAST 18 POINT

iv. SMOKE DETECTORS AND MANUAL PULL STATIONS SHALL BE LABELED WITH THE DEVICE ADDRESS ON THE BASE OF THE DETECTOR OR MANUAL PULL STATION.

V. ALL NOTIFICATION APPLIANCES SHALL BE LABELED WITH THE NOTIFICATION CIRCUIT DESIGNATION. THE "END OF LINE" SHALL BE CLEARLY LABELED. vi. MONITOR AND RELAY MODULES SHALL BE LABELED WITH THE DEVICE ADDRESS AND FUNCTION. (FOR EXAMPLE: L1M-23 WATERFLOW; L1M-50 MAG DOOR RELEASE; ETC.)

VII. DUCT DETECTORS SHALL BE LABELED WITH THE DEVICE ADDRESS ON THE BASE OF THE DETECTOR AND THE CEILING GRID SHALL BE LABELED AS DUCT DETECTOR, HVAC UNIT AND DEVICE ADDRESS.

REMOTE TEST SWITCH SHALL INDICATE HVAC UNIT AND DEVICE ADDRESS.

2. ALL MODULES SHALL HAVE THE STATUS LEDS VISIBLE WITHOUT REQUIRING THE REMOVAL OF A CEILING TILE OR COVER PLATE.

GRAPHIC MAP: GRAPHIC MAPS SHALL BE SECURELY MOUNTED NEXT TO THE FIRE ALARM CONTROL PANEL. A GRAPHIC MAP IS ALSO REQUIRED NEXT TO THE REMOTE ANNUNCIATOR (IF PROVIDED). GRAPHIC MAP LOCATION AND COLORS SHALL BE APPROVED BY PSD AND TLH PRIOR TO MOUNTING AND INSTALLATION.

SCOPE OF WORK

END OF FIRE ALARM DESIGN CRITERIA

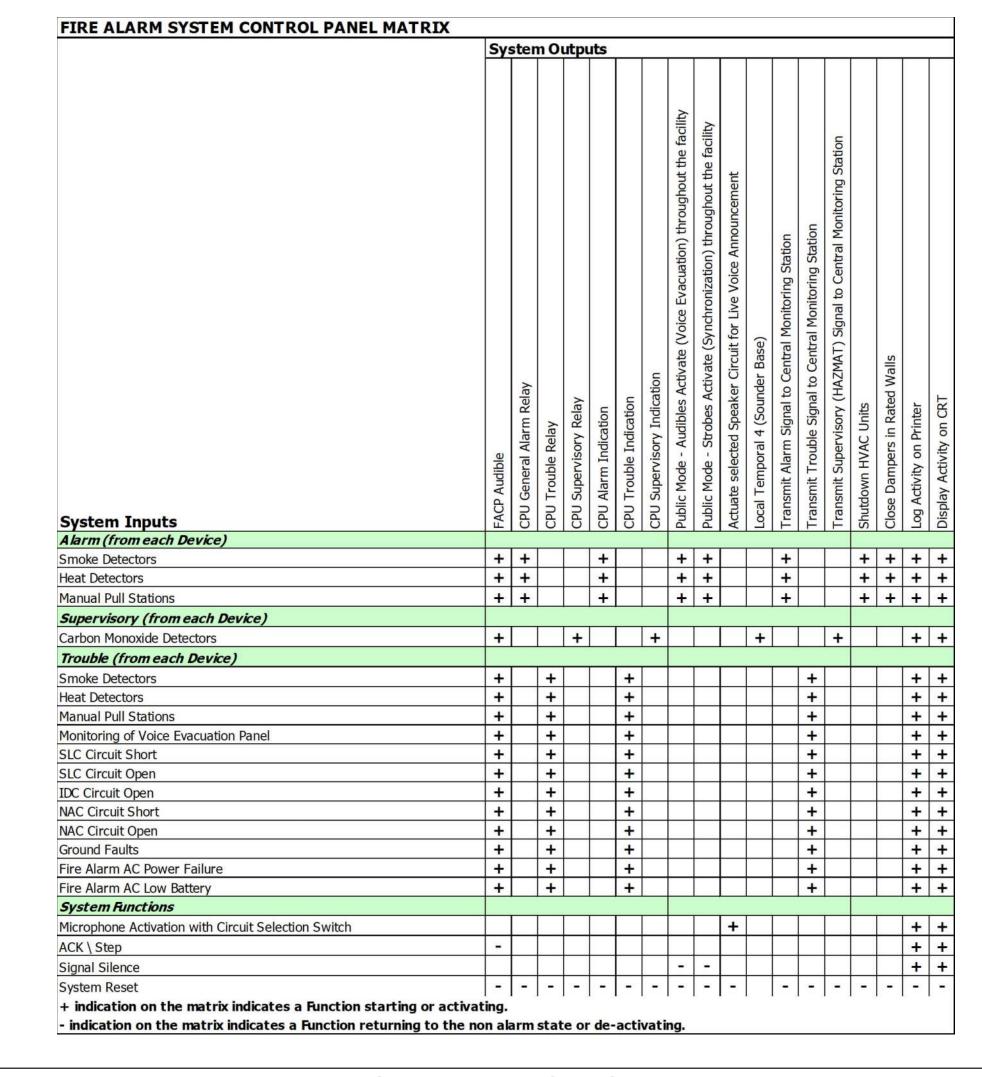
THE FACILITY WILL BE EQUIPPED WITH A NEW VOICE EVACUATION FIRE ALARM SYSTEM IN ACCORDANCE WITH 2018 IFC AND POUDRE SCHOOL DISTRICT DESIGN CRITERIA. THE FIRE ALARM PANEL SHALL BE AN EXISTING NOTIFIER NFS-320 WHICH IS ADDRESSABLE AND HAS THE ABILITY TO PROVIDE LOCAL FIRE ALARM NOTIFICATION AND EMERGENCY ANNOUNCEMENTS. ANNOUNCEMENTS CAN BE INITIATED THROUGH THE NFC-50/100 VOICE EVACUATION PANEL (EVAC) MICROPHONE LOCATED IN THE ENTRY VESTIBULE

SPEAKERS, SPEAKER/STROBES AND STROBES WILL BE WHITE AND LABELED "FIRE". THE FIRE ALARM PANEL LOCATED IN THE ENTRY VESTIBULE INCLUDES AN ADJACENT MANUAL PULL STATION. MANUAL PULL STATIONS SHALL ALSO BE LOCATED AT EXTERIOR EXITS OF THE BUILDING.

SMOKE DETECTORS WILL BE LOCATED IN ELECTRICAL ROOMS, TELECOM ROOMS, FACP, AND AT FIRE ALARM POWER SUPPLY AND AMPLIFIER LOCATIONS. HEAT DETECTORS WILL BE PROVIDED IN AREAS WHICH ARE UNSUITABLE FOR SMOKE DETECTORS.

SINCE PHONE LINES ARE NO LONGER ACCEPTABLE AS A MEANS TO COMMUNICATE FIRE ALARM SIGNALS TO THE MONITORING COMPANY. A RADIO COMMUNICATOR SHALL BE PROVIDED WHICH WILL REQUIRE THE SCHOOL DISTRICT TO ESTABLISH/ AND MAINTAIN A MONITORING CONTRACT WITH A COMPANY THAT PROVIDES RADIO MONITORING SERVICES.

SEQUENCE OF OPERATIONS

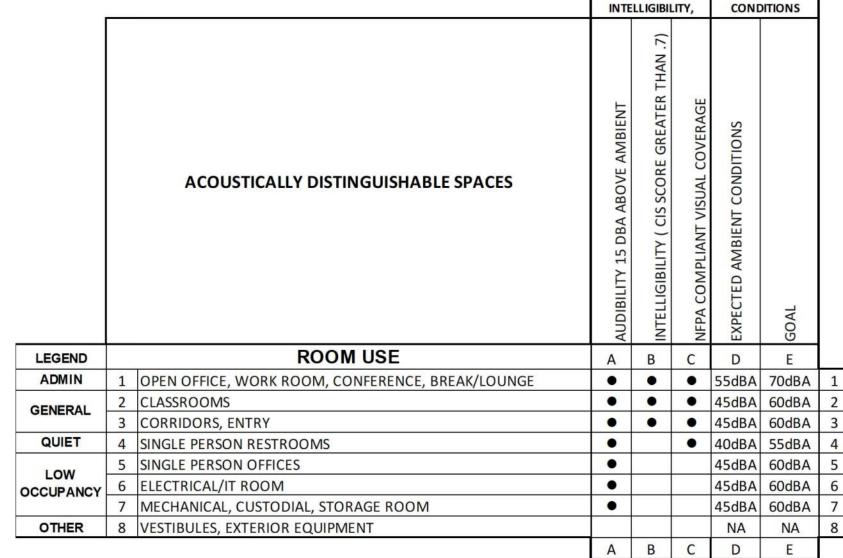


GENERAL NOTES

- EACH ALARM AND SUPERVISORY SIGNAL INITIATING DEVICE CIRCUIT SHALL BE WIRED FOR CLASS "B" / STYLE "4" OPERATION, FIRE ALARM NOTIFICATION APPLIANCE CIRCUIT SHALL BE WIRED FOR CLASS "B", STYLE "Y" OPERATION.
- 2. THE EXTERIOR OF ALL FIRE ALARM SYSTEM JUNCTION BOXES SHALL BE PAINTED RED.
- . ALL PENETRATIONS IN WALLS, CEILINGS, AND FLOORS SHALL BE SEALED TO THE FULL THICKNESS OF THE PENETRATION WITH AN APPROVED FIRE STOPPING MATERIAL. PENETRATIONS IN EXISTING FIRE RATED WALLS, CEILINGS AND FLOORS SHALL BE SEALED TO THE FULL THICKNESS OF THE
- PENETRATION WITH AN APPROVED FIRE-STOPPING MATERIAL OF EQUAL OR GREATER FIRE RESISTANCE.
- ALL WALL AND FLOOR PENETRATIONS SHALL BE CORE-DRILLED AND SLEEVED. 5. MANUAL PULL STATIONS SHALL BE MOUNTED AT 48 INCHES ABOVE THE FINISHED FLOOR TO CENTER OF DEVICE.
- . WALL-MOUNTED AUDIO APPLIANCES SHALL BE MOUNTED WITH THE TOP OF THE APPLIANCE NOT LESS THAN 90 INCHES ABOVE THE FINISHED FLOOR AND BELOW THE CEILING NOT LESS THAN 6 INCHES. . WALL-MOUNTED VISUAL APPLIANCES SHALL BE MOUNTED WITH THE ENTIRE LENS NOT LESS THAN 80 INCHES ABOVE THE FINISHED FLOOR OR 6 INCHES
- BELOW THE CEILING, WHICHEVER IS LOWER. B. WALL-MOUNTED AUDIO/VISUAL APPLIANCES SHALL BE MOUNTED WITH THE ENTIRE LENS NOT LESS THAN 80 INCHES ABOVE THE FINISHED FLOOR OR 6
- INCHES BELOW THE CEILING, WHICHEVER IS LOWER.
- 9. LOCATE DETECTORS A MINIMUM OF 3 FEET FROM AIR DIFFUSERS OF AIR HANDLING UNITS, AND A MINIMUM OF 12 INCHES FROM ANY PART OF ANY LIGHTING FIXTURE.
- 10. ALL DETECTOR BASES SHALL BE MARKED IN PERMANENT INK WITH DEVICE ADDRESS INTERNALLY AS WELL AS TYPEWRITTEN LABEL ON THE BASE.
- 11. LOCATE INTERFACE MODULES WITHIN 3 FEET OF DEVICE THAT IS CONTROLLED 12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING THE MEETING MINUTES AND DISTRIBUTING THEM ELECTRONICALLY WITHIN THREE BUSINESS
- DAYS OF THE MEETING. 13. THE FIRE ALARM SYSTEM VENDOR IS RESPONSIBLE FOR PROVIDING ALL COMPONENTS NECESSARY FOR PROPER SYSTEM FUNCTION ON THE SHOP
- DRAWING SUBMITTAL.
- 14. ALL SURFACE MOUNTED DEVICES SHALL HAVE THE BACKBOX PROTECTED WITH A DEVICE SPECIFIC BACKBOX SKIRT
- 15. WIRING SHALL NOT BE T-TAPPED. INTELLIGENT DEVICE WIRING T-TAPS SHALL BE APPROVED BY ENGINEER AND OWNER PRIOR TO INSTALLATION.

PERMITS AND FEES

THE CONTRACTOR SHALL INCLUDE ALL FEES AND COSTS ASSOCIATED WITH OBTAINING PERMITS FOR EACH SCHOOL. THE CONTRACTOR IS ADVISED THAT THERE MAY BE COSTS INCURRED BY THE STATE OF COLORADO, DORA AS WELL AS THE LOCAL AUTHORITY HAVING JURISDICTION. SOME JURISDICTIONS REQUIRE BOTH A FIRE ALARM PERMIT AS WELL AS AN ELECTRICAL PERMIT.



Speaker taps shall be modified if requested by owner

DEVICE CANDELA & LABELING

NOTIFICATION METHOD - PUBLIC MODE

xxC = CEILING MOUNT 15 = 15 CANDELA WATTAGE SETTING ─ 1W = 1 WATT

NOTIFICATION APPLIANCES SHALL BE WHITE AND LABELED "FIRE" SURVIVABILITY LEVEL = 0

Louis, Missouri | Columbia, Missouri | Springfield, Missouri cago, Illinois| Bloomington, Illinois | Indianapolis, Indiana Denver, Colorado | Topeka, Kansas | Kansas City www.techelectronics.com 1.800.TECH.789

ORIGINAL PLANS ARE BLACK LINES ON BOND.

ecializing in Fire Alarm Engineering none: 303-517-1775 Colorado Registration No. 33275 THE MANUFACTURER'S LOCAL REPRESENTATIVE'S WIRING PLICATION, BATTERY CALCULATIONS, AND VOLTAGE DRO

PLICATIONS FOR THIS BUILDING HAVE BEEN PROVIDED BY

THE ENGINEER OF RECORD

THIS DRAWING HAS BEEN REVIEWED

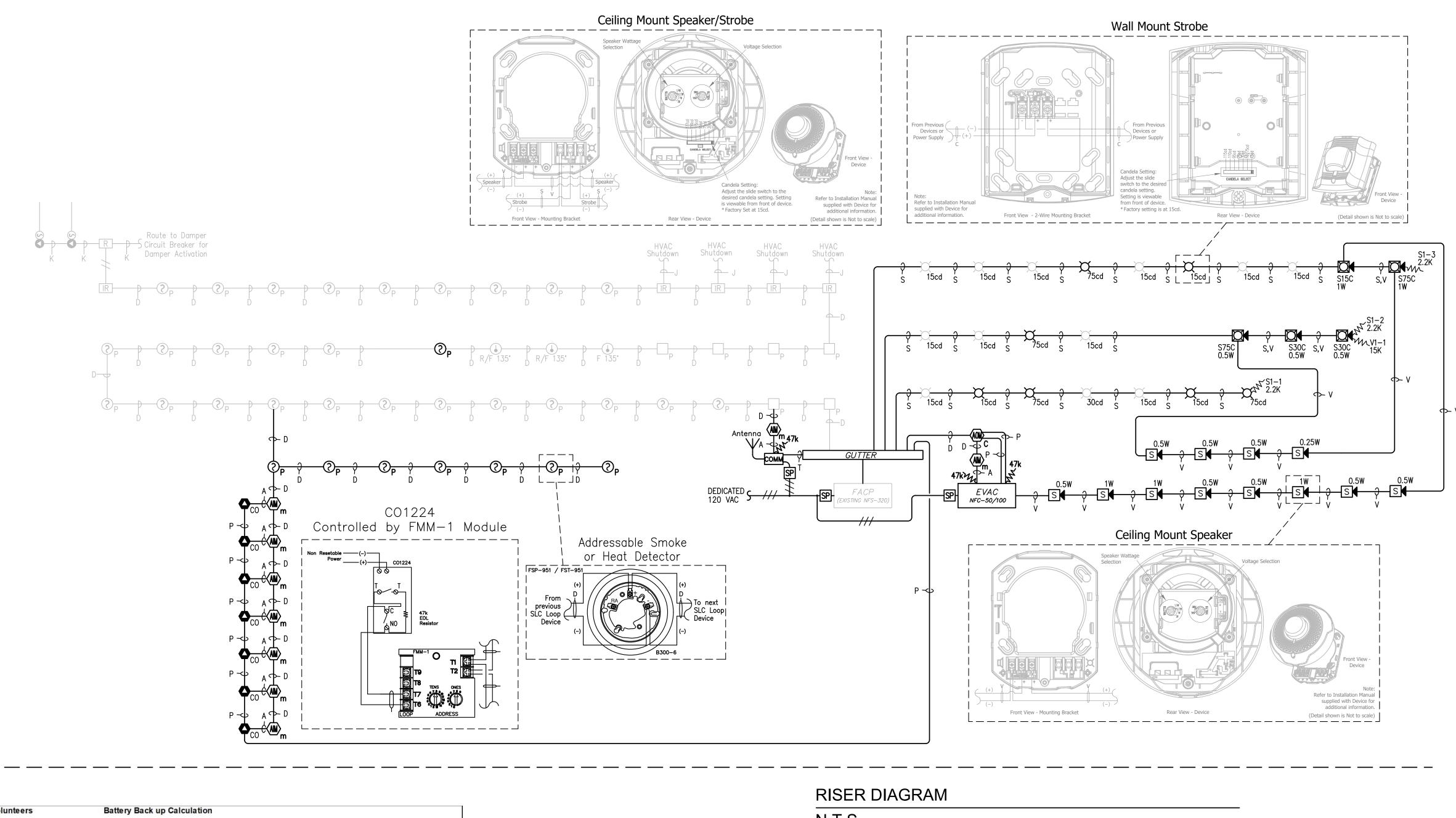
FOR SUBMITTAL PURPOSES ONLY James W. McGee DATE: 09/25/2020 ET # 111023 LEVEL: III EXPIRATION: 04/01/2022

District nteers Bu Street an an 30 (3)

ROJECT MANAGER:

FA-0.1

09/25/2020 CONSTRUCTION



	Poudre School Volunteers Radio Communicator (AES-7		Battery Back up Calculation				
tuulo	CO	numeror (ALS	77001)			Total	Total
Item	Qty	Part #	Description	Standby	Alarm	Standby	Alarm
1	1	7788F	Cellular Communicator	0.175000	0.800000	0.175000	0.80000
						0.175000	0.80000
			Standby Current Total Hours =	0.175000	X 24 (Hours)	=	4.20000
			Alarm Current Total Minutes =	0.800000	X 0.25 (15 Mins)	= .	0.20000
			Total			=	4.40000
			20% Battery Depletion			=	0.88000
			Total AH Rated Batteries Needed			= .	5.28000
			Total AH Rated Batteries Supplied				7

Poudre School Volunteers				Circuit Numb	er		
NFS-320 (Existing)				Okt 1	Ckt 2	Okt 3	Ckt 4
		Candella	Amps	S1-1	S1-2	S1-3	Spare
Notifier Strobes (Existing)	SW	15	0.0710	2	3	6	
	SW	30	0.0960	1			
	SW	75	0.1530				
Notifier Strobes	SWL	15	0.0600	2		1	
Wall Mount	SWL	30	0.0830				
L-Series	SWL	75	0.1360	2	1	1	
	SWL	95	0.1550				
	SWL	110	0.1790				
Notifier Spkr Strobes	SPSCWL	15	0.0600			1	
Ceiling Mount	SPSCWL	30	0.0860		2		
L-Series	SPSCWL	75	0.1420		1	1	
		7H	# Devices	7	7	10	0
		Cir	cuit Amps	0.630	0.663	0.824	0.000
	C	ircuit Length	(ft)(14aw g)	150	230	180	
		EOL Volta	age (14aw g)	19.82	19.46	19.49	

Speaker Circuit Lo Amplifier - NFC-50/100	Total Amp	103/4	alculatio	J.I.,
(EVAC1)	Wattage	2007.	L	Ckt 1
Location	Total Watts Used:	22%	Amps	V-1
Speakers at 25 volt		1/8 watt	0.0050	
Max Watage		1/4 watt	0.0100	1
		1/2 watt	0.0200	11
		1 watt	0.0400	5
		2 watt	0.0800	
		4 watt	0.1600	
		7.5 watt	0.3000	
		8 watt	0.3200	
			# Devices	17
		C	ircuit Amps	0.430
		Circuit Lengt	h (ft)(16awg)	480
		EOL Vol	tage (16awg)	22.98

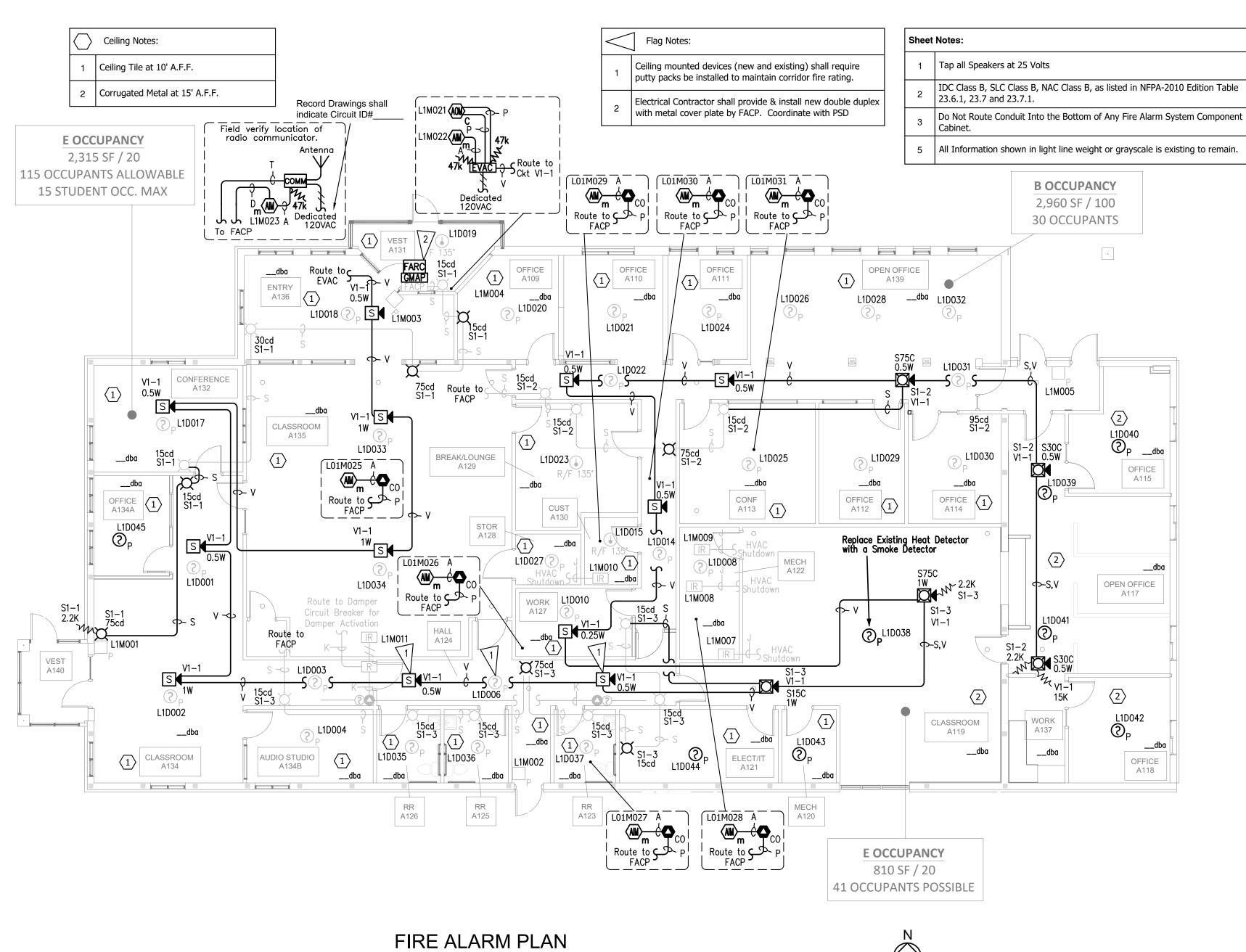
IFS-32	20 (Ex	isting)				Total	Total
tem	Qty	Part #	Description	Standby	Alarm	Standby	Alarm
1	1	NFS-320	Fire Alarm Control Panel	0.250000	0.250000	0.250000	0.25000
2	3	NAC	NAC Circuits in Use	0.035000	0.035000	0.105000	0.10500
3	1	KDM-R2	NFS-320 Fire Alarm Control Panel Display	0.100000	0.100000	0.100000	0.10000
4	26	FSP-851	Intelligent Photoelectric Smoke Detector Ip	0.000360	0.006500	0.009360	0.16900
5	1	FST-851	Intelligent Heat Detector Ip	0.000360	0.006500	0.000360	0.00650
6	2	FST-851R	Intelligent Heat Detector Ip Rate of Rise	0.000360	0.006500	0.000720	0.01300
7	5	NBG-12LX	Manual Pull Station	0.000270	0.000270	0.001350	0.00135
8	5	FRM-1	Intelligent Relay Module	0.000270	0.005100	0.001350	0.02550
9	1	MR-101C	Aux Relay	0.000000	0.015000	0.000000	0.01500
10	11	SW	Multi Candela Sync Strobe at 15cd	0.000000	0.071000	0.000000	0.78100
11	1	SW	Multi Candela Sync Strobe at 30cd	0.000000	0.096000	0.000000	0.09600
			New Devices				
12	9	FMM-101	Addressable Mini Monitor Module	0.000600	0.000600	0.005400	0.00540
13	1	FCM-1	Addressable Control Module	0.000375	0.006500	0.000375	0.00650
14	8	FSP-951	Intelligent Photoelectric Smoke Detector	0.000200	0.004500	0.001600	0.03600
15	7	CO1224TR	Conventional Carbon Monoxide Detector	0.020000	0.040000	0.140000	0.28000
16	3	SWL	Multi Candela Sync Strobe at 15cd	0.000000	0.060000	0.000000	0.18000
17	4	SWL	Multi Candela Sync Strobe at 75cd	0.000000	0.136000	0.000000	0.54400
18	1	SPSCWL	Ceiling Speaker with Multi Candela Sync Strobe at 15cd	0.000000	0.060000	0.000000	0.06000
19	2	SPSCWL	Ceiling Speaker with Multi Candela Sync Strobe at 30cd	0.000000	0.086000	0.000000	0.17200
20	2	SPSCWL	Ceiling Speaker with Multi Candela Sync Strobe at 75cd	0.000000	0.142000	0.000000 0.615515	0.28400 3.1302 5
			Standby Current Total Hours =	0.615515	X 24 (Hours)	=	14.77236
			Alarm Current Total Minutes =	3.130250	X .25	-	0.78256
			Total		(15 Mins)	=	15.55492
			30% Battery Depletion			= _	4.66647
			Total AH Rated Batteries Needed			-	20.22139
			Total AH Rated Batteries Supplied				26AH

	oudre School Volunteers Notifier NFC-50/100		Battery Back up Calculation				
						Total	Total
Item	Qty	Part #	Description	Standby	Alarm	Standby	Alarm
1	1	NFC-50/100	Emergency Voice Evacuation Panel	0.272000	0.446000	0.272000	0.446000
2 1	1		50W Speaker Circuit (Full Speaker Load)	0.000000	3.400000	0.000000	3.400000
						0.272000	3.846000
			Standby Current Total Hours =	0.272000	X 24 (Hours)	=	6.528000
			Alarm Current Total Minutes =	3.846000	X 0.25	=	0.961500
					(15 Mins)		
			Total			$i_{i}=i_{i}$	7.489500
			20% Battery Depletion			=	1.497900
			Total AH Rated Batteries Needed			= .	8.987400
			Total AH Rated Batteries Supplied				12AH

	oss dBA Calculato															
Circuit Number	Circuit Description	Wire Gauge (awg)	Circuit Voltage (vrms)	ত (watt) Speakers	(watt) Speakers	(watt) Speakers	w (watt) Speakers	watt) Speakers	.c. (watt) Speakers	∞ (watt) Speakers	Circuit Length(ft)	Nominal Power Load (watts)	Total Wire Loss (dB) (-3.0 dB Max)	Maximum Length (ft)	Extra Length Remaining (ft)	Total Resistance (ohms)
V1-1		16	25	1	11	5					480	10.75	-0.57	2,938	2,458	3.9
Amp Tota	I Count: Do not Dele	ete													4	
	_		Total W	atts							10.75	Total '	Watts U	sed %	229	6

N.T.S.

MAIN LEVEL



8' 0

The Power of Connection and Protection® t. Louis, Missouri | Columbia, Missouri | Springfield, Missouri Chicago, Illinois| Bloomington, Illinois | Indianapolis, Indiana Denver, Colorado | Topeka, Kansas| Kansas City www.techelectronics.com 1.800.TECH.789 ORIGINAL PLANS ARE BLACK LINES ON BOND. STAMP IS BLUE INK. REPRODUCED PLANS VOID STAMP. Specializing in Fire Alarm Engineering Phone: 303-517-1775 E-mail: tami@TLHFire.com Colorado Registration No. 33275 THESE DRAWINGS HAVE BEEN REVIEWED FOR THE ACCURACY OF THE MANUFACTURER'S LOCAL REPRESENTATIVE'S WIRING APPLICATION, BATTERY CALCULATIONS, AND VOLTAGE DROP CALCULATIONS. DEVICE LOCATIONS AND SPECIFIC
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THE ENGINEER OF RECORD. THIS DRAWING HAS BEEN REVIEWED FOR SUBMITTAL PURPOSES ONLY James W. McGee 09/25/2020 NICET # 111023 LEVEL: III EXPIRATION: 04/01/2022 9244444444444 ROJECT MANAGER:

JWM

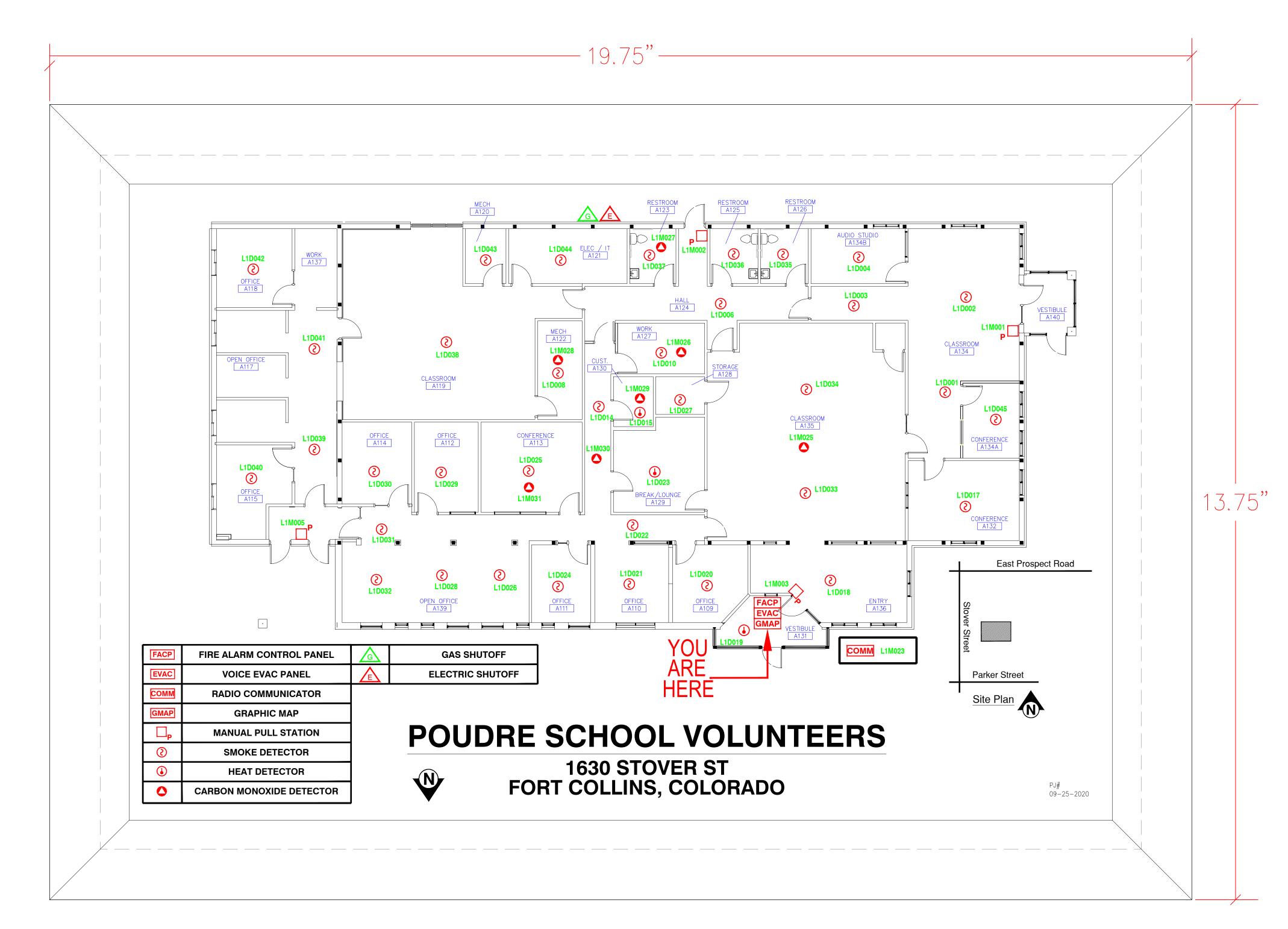
FA-1.0

09/25/2020

SSUED CONSTRUCTION

			SLC	Loop No.	1		
	400	D Address				M Address	W25
	Туре	Label	Extended		Туре	Label	Extended
D001	Smoke	N Classroom	A134	M001		Pending PSD	Classroom A134
D002	Smoke	S Classroom	A134	M002		Pending PSD	S. Hall by RRs
D003	Smoke	E Classroom	A134	M003	Manual Pull	Entry	A136
D004	Smoke	Audio Studio	A141	M004			
D005				M005	Manual Pull	NE Vestibule	
D006	Smoke	Hall	A124	M006		20	
D007				M007	Relay	Furnace1 SD	Mech A122
D008	Smoke	Mech	A122	M008	Relay	Furnace3 SD	Mech A122
D009		0.0000000000000000000000000000000000000	To the leaves	M009	Relay	Furnace4 SD	Mech A122
D010	Smoke	Work	A127	M010	Relay	Furnace2 SD	Cust A130
D011				M011	Relay	Smoke Dampers	Hall A124
D012			3	M012		50	
D013	0 1	11.11.0.1	1400	M013			
D014	Smoke	Hall by Cust	A130	M014		V	_
D015 D016	Heat	Cust	A130	M015 M016		e)	
D016	Cmake	Conf	A122	M017		w C	
D017	Smoke	Conf	A132 A136	M017	1	2	
D018	Smoke Heat	Entry N Vest	A131	M019	-		
D019	Smoke	Office	A109	M020		ev.	21
D020	Smoke	Office	A110	M020	Control	EVAC Panel	Vest A131
D021	Smoke	Hall by Off	A110	M021	Monitor	EVAC Panel	Vest A131
D022	Heat	Break	A129	M023	Monitor	Radio Comm	Vest A131
D024	Smoke	Office	A111	M024	WOTHER	radio comm	VESTATST
D025	Smoke	Conf	A113	M025	Monitor	Classroom	A135
D026	Smoke	W Open Office	A139	M026	Monitor	Work	A127
D027	Smoke	Stor	A128	M027	Monitor	Restroom	A123
D028	Smoke	Open Office	A139	M028	Monitor	Mech	A122
D029	Smoke	Office	A112	M029	Monitor	Cust	A130
D030	Smoke	Office	A114	M030	Monitor	Hall by Cust	A130
D031		Hall by Open	A139	M031	Monitor	Conf	A113
D032	Smoke	E Open Office	A139	M032			
D033	Smoke	N Classroom	A135	M033		0.	5 5
D034	Smoke	S Classroom	A135	M034			
D035	Smoke	RR	A126	M035			
D036	Smoke	RR	A125	M036	2	0.	
D037	Smoke	RR	A123	M037			
D038	Smoke	Classroom	A119	M038			0.00
D039	Smoke	N Open Office	A117	M039		ex .	1 6
D040	Smoke	S Open Office	A117	M040			
D041	Smoke	Office	A115	M041			
D042	Smoke	Office	A118	M042			
D043	Smoke	Mech	A120	M043			
D044	Smoke	Elect/IT	A121	M044			
D045	Smoke	Office	A134A	M045		6.	
D046				M046			
D047				M047			
D048		0		M048		Once The desired	
DAEE	1	Spare Through	1	MASS		Spare Through	
D155				M155		25	<u> </u>
D156				M156		76	
D157 D158				M157 M158		0	
D158				M158			

Poudre School District shall provide accurate room designations and labels for panel programming custom address list. Graphic Map and record drawings shall be updated to reflect accurate room designations.



Graphic Map - Fire Alarm System

Scale: 1" = 1" (Actual Display Size is 18"w x 12"h)

09/25/2020

ISSUED CONSTRUCTION FOR: