

THE UNIVERSITY OF TENNESSEE
MUNICIPAL TECHNICAL ADVISORY SERVICE

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Recommendations for the Dana Truck Terminal

Kate Collier
Director of Human Resources
City of Columbia
707 North Main Street
Columbia, TN. 38401

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Dear Ms. Collier:

At your request, I have reviewed the Dana Truck Terminal owned by Mr. Steve Hall to determine if the facility meets or exceeds fire codes and how much, if any the City of Columbia or any of its employees may have contributed to any misunderstanding regarding whether the building should or should not have been sprinkled.

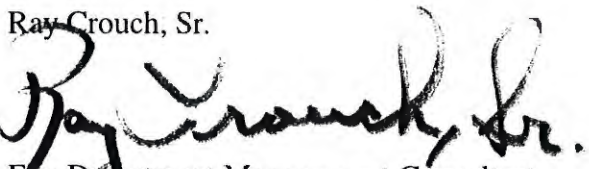
First, let me address the issue of does the size of the building require it to be sprinkled? The answer is "no." Based on the 1999 Standard Building Code, Table 500 for Type IV construction for a "storage occupancy," the building could be up to 16,000 square feet without a sprinkler system. The building has 10,300 square feet.

Second, we must address the issue of the role that the contents of the building play in determining the extent of built-in fire protection that must be designed into a facility. Most truck terminals handle a wide variety of materials and without documentation to the contrary, would need to be fully sprinkled to handle the types of freight that flow through the terminal. Both the owner and the manager stated that this facility is a speciality hauler and has only limited types of freight. However, based on a "rough, top of the head guess" they estimate that less than 1% of the freight is placarded or as referred to in the code, physical hazard materials.

Based on this estimate, 100% of the fire code officials that I polled, ruled that this would require the building to be fully sprinkled. On my site visit yesterday, (1/13/2000) I observed several palates of class 1 Oxidizers. These were stored in paper bags and enclosed in shrink-wrap on wooden palettes, therefore considered as an open-package system. Class 1 oxidizers in open storage systems are limited to 200 lbs. total in an unsprinkled facility. Even if the oxidizer had been containerized, there appeared to be more than 1000 lbs. in the building.

Based on Table 407.3A on page 46 of the 1999 Standard Building Code, this facility does appear to handle amounts of one or more of the "physical hazard items" in quantities that exceed the maximum allowable quantities that can be stored in an unsprinklered building. Therefore, my answer to the question of "Would the building meet the code with it's present tenant if it were not sprinkled," is "no."

I trust that this answers the questions that you presented me. If I can be of future assistance, please let me know.

Ray Crouch, Sr.

Fire Department Management Consultant
University of Tennessee

404.2.7 A clearly labeled, manually operated pump master switch shall be provided in an approved location, readily accessible to the station attendant.

404.3 Bowling alleys

404.3.1 Where bowling pin finishing or refinishing operations are carried on, a separate building, or a separate room, constructed as specified herein, shall be provided. Finishing or refinishing operations shall comply with Chapter 11 of the Standard Fire Prevention Code.

404.3.1.1 Such a room shall be located at or above street level and shall have one or more windows opening to the outside of the building.

404.3.1.2 Walls and ceilings of such rooms shall have not less than 1-hour fire resistance. Floors shall be of concrete at least 2 inches (51 mm) thick or equivalent noncombustible protective material. Walls shall be liquidtight where they meet the floor.

404.3.1.3 Door openings shall be provided with noncombustible sills raised 6 inches (152 mm) above floor level and protected with approved fire doors.

404.3.1.4 Shelving, containers, and all furnishings shall be of noncombustible material. Machinery shall be effectively grounded.

404.3.1.5 Ventilation sufficient to effect a complete change of air at least once every 3 minutes shall be provided.

404.4 Automotive lubrication service facility

404.4.1 An automotive lubrication service facility of Group B occupancy is a place of retail business at which the periodic servicing of automotive equipment is accomplished by the removal and/or replacement of oils, fluids, filters, greases and minor parts necessary for the maintenance and upkeep of vehicles normally used for transportation on the public roads and highways. These facilities may include provisions for the tuning of engines.

404.4.2 An automotive lubrication service facility may have a basement or underfloor work and storage area whereby access may be gained to portions of vehicles being serviced through openings in the floor complying with 705.2.1.1. A basement or underfloor work area shall be continuously ventilated to the outside air by fans supplying not less than six air changes per hour.

404.4.3 Facilities dispensing gasoline or motor fuel shall meet the requirements of 404.2.

SECTION 405 SPECIAL EDUCATIONAL OCCUPANCIES

405.1 Special protective requirements. Where permanent motion picture projectors using cellulose nitrate film are installed, booths shall be provided, as set forth in 403.3.

SECTION 406 SPECIAL FACTORY-INDUSTRIAL OCCUPANCIES

No requirements for special Group F buildings are currently contained in this code.

SECTION 407 SPECIAL HAZARDOUS OCCUPANCIES

407.1 Special requirements

407.1.1 General

407.1.1.1 Storage, dispensing, handling and use of solid, liquid and gaseous hazardous materials shall be in accordance with this section and the Standard Fire Prevention Code.

407.1.1.2 An increase in the allowable areas or heights as set forth in Table 500 shall not be permitted when the principal use of the building or structure is a hazardous occupancy or the building or structure is classified as a hazardous occupancy.

407.1.2 Definitions. For definitions, see Chapter 2.

407.1.3 Automatic protection systems

407.1.3.1 General. Indoor storage areas, storage buildings, and areas or rooms in which hazardous materials are dispensed or used shall be protected by an approved automatic sprinkler system. The design of the sprinkler system shall be not less than ordinary hazard, Group 2 in accordance with NFPA 13.

Exceptions:

1. Detached storage buildings storing oxidizers and organic peroxides when meeting the separation distances and storage requirements of the Standard Fire Prevention Code.
2. Approved alternate automatic fire extinguishing systems may be used in indoor storage and dispensing rooms or areas.

407.1.3.2 Water reactive materials. Where Class 3 water reactive materials are stored in areas protected by an approved automatic sprinkler system, the materials shall be stored in closed, watertight containers.

407.1.3.3 Highly toxic and toxic compressed gas. Gas cabinets and exhausted enclosures for the storage of cylinders shall be internally sprinklered. Alternate fire extinguishing systems shall not be permitted for either storage areas, gas cabinets, or exhausted enclosures. An automatic sprinkler system shall be provided for roof structures provided for the storage of highly toxic or toxic compressed gases.

407.1.3.4 Highly toxic solids and liquids. Exterior storage of highly toxic solids and liquids shall be in fire resistant containers or shall comply with one of the following:

TABLE 407.3A
EXEMPT AMOUNTS OF HAZARDOUS MATERIALS: PHYSICAL
HAZARD (MAXIMUM QUANTITIES PER CONTROL AREA⁷)

MATERIAL	CLASS	CLOSED SYSTEMS			OPEN SYSTEMS	
		Solid lbs or (cu ft)	Liquid gal or (lbs)	Gas (cu ft)	Solid lbs or (cu ft)	Liquid gal or (lbs)
Combustible Liquid	II	-	120 ¹	-	-	30 ¹
	IIIA	-	330 ¹	-	-	80 ¹
	IIIB	-	13,200 ²	-	-	3,300 ²
Combustible Dust lbs/1,000 cu ft		1 ³	-	-	1 ³	-
Combustible Fiber	Baled	(1,000)	-	-	(200)	-
Cryogenics (Flammable or Oxidizing)		-	45 ¹	-	-	10 ¹
Explosives		1/4 ⁴	(1/4) ⁴	-	1/4 ⁴	(1/4) ⁴
Flammable Gas	Gaseous	-	-	750 ^{1,5}	-	-
	Liquefied	-	15 ^{1,5}	-	-	-
Flammable Liquid	IA	-	30 ¹	-	-	10 ¹
	IB	-	60 ¹	-	-	15 ¹
	IC	-	90 ¹	-	-	20 ¹
Combination IA, IB, IC		-	120 ^{1,6}	-	-	30 ^{1,6}
Flammable Solid		25 ¹	-	-	25 ¹	-
Organic Peroxide	UD	1/4 ⁴	(1/4) ⁴	-	1/4 ⁴	(1/4) ⁴
	I	1 ¹	(1) ¹	-	1 ¹	(1) ¹
	II	50 ¹	(50) ¹	-	10 ¹	(10) ¹
	III	125 ¹	(125) ¹	-	25 ¹	(25) ¹
	IV	500 ¹	(500) ¹	-	100 ¹	(100) ¹
V	NL	NL	-	NL	NL	
Oxidizer	4	1/4 ⁴	(1/4) ⁴	-	1/4 ⁴	(1/4) ⁴
	3	2 ¹	(2) ¹	-	2 ¹	(2) ¹
	2	250 ¹	(250) ¹	-	50 ¹	(50) ¹
	1	1,000 ¹	(1,000) ¹	-	200 ¹	(200) ¹
Oxidizer-Gas	Gaseous	-	-	1,500 ^{1,5}	-	-
	Liquefied	-	15 ^{1,5}	-	-	-
Pyrophoric		1 ⁴	(1) ⁴	10 ^{4,5}	0	0
Unstable (reactive)	4	1/4 ⁴	(1/4) ⁴	2 ^{4,5}	1/4 ⁴	(1/4) ⁴
	3	1 ¹	(1) ¹	10 ^{1,5}	1 ¹	(1) ¹
	2	50 ¹	(50) ¹	250 ^{1,5}	10 ¹	(10) ¹
	1	125 ²	(125) ²	750 ^{1,5}	25 ²	(25) ²
Water Reactive	3	5 ¹	(5) ¹	-	1 ¹	(1) ¹
	2	50 ¹	(50) ¹	-	10 ¹	(10) ¹
	1	125 ²	(125) ²	-	25 ²	(25) ²

For SI: 1 lb = 0.4536 kg, 1 gal = 3.7854 L, 1 cu ft = 0.02832 m³.

- Not applicable.
NL = Not limited.
UD = Unclassified detonatable.

Notes :

1. The amount may be doubled in sprinklered buildings.
2. The quantities permitted in a sprinklered building are not limited.
3. A dust explosion potential is considered to exist if 1 lb or more of combustible dust per 1,000 cu ft of volume is normally in suspension or could be put into suspension in all or a portion of an enclosure, including dust inside pieces of equipment. This also includes combustible dust which accumulates on horizontal surfaces inside buildings or equipment and which could be put into suspension by an accident, sudden force, or small explosion.
4. Permitted in sprinklered buildings only. No amount is allowed in unsprinklered buildings.
5. The amount may be doubled when dispensed or used inside approved exhausted gas cabinets, exhausted enclosures, or fume hoods. When Footnote 1 also applies, the increase for both footnotes may be applied.
6. Containing no more than the exempt amounts of Class IA, IB or IC flammable liquids.
7. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

TABLE 500 (continued)
ALLOWABLE HEIGHTS AND BUILDING AREAS

Lower case letters in table refer to Notes following table.
Height for types of construction is limited to the number of stories and height in feet shown.
Allowable building area (determined by definition of "Area, Building") is shown in thousands of sq ft per floor.

TYPE CONSTRUCTION	I		II		III		IV 1-HOUR		IV UNPROT.		V 1-HOUR		V UNPROT.		VI 1-HOUR		VI UNPROT.	
Maximum Height In Feet:	NL		80'		65'		65'		55'		65'		55'		50'		40'	
OCCUPANCY	uns	spr	uns	spr	uns	spr	uns	spr	uns	spr	uns	spr	uns	spr	uns	spr	uns	spr
	j	j	h	j	h	j	h	j	h	j	h	j	h	j	h	j	h	j
I INSTITUTIONAL-RESTRAINED^b																		
Max. No. of stories	NL	NL	NL	NL	0	2	i	2	0	2	0	3	0	2	0	3	0	2
Area: Multistory	UA	UA	UA	UA		24.0	15.0	30.0		20.0		21.0		14.0		15.0		10.0
One Story only	UA	UA	UA	UA		36.0	15.0	45.0		30.0		31.5		21.0		22.5		15.0
I INSTITUTIONAL-UNRESTRAINED^b																		
Max. No. of Stories	0	NL	0	NL	0	2	0	3	0	1	0	1	0	0	0	1	0	0
Area: Multistory		UA		UA		24.0		30.0		30.0		31.5				22.5		
One Story only		UA		UA		36.0		45.0										
M MERCANTILE^{a,b}	f		f		f	5	f	5	f	5	f	5	f	5	f	2	f	2
Max. No. of Stories	NL	NL	NL	NL	5	5	5	5	2	5	5	5	2	5	2	2	2	2
Area: Multistory	15.0	UA	15.0	UA	13.5	27.0	13.5	27.0	9.0	18.0	13.5	27.0	9.0	18.0	9.0	18.0	6.0	12.0
One Story only	15.0	UA	15.0	UA	13.5	40.5	13.5	40.5	9.0	27.0	13.5	40.5	9.0	27.0	9.0	27.0	6.0	18.0
R RESIDENTIAL^{a,b,d}																		
Max. No. of Stories	NL	NL	NL	NL	3	3	5	5	2	5	5	5	2	5	3	3	2	2
Area: Multistory	UA	UA	UA	UA	18.0	36.0	18.0	36.0	12.0	24.0	18.0	36.0	12.0	24.0	10.5	21.0	7.0	14.0
One Story only	UA	UA	UA	UA	18.0	54.0	18.0	54.0	12.0	36.0	18.0	54.0	12.0	36.0	10.5	31.5	7.0	21.0
S STORAGE^{a,b,e,g}																		
Max. No. of Stories	NL	NL	6	6	2	6	2	4	2	4	2	4	2	4	1	1	1	1
Area: Multistory	UA	UA	30.0	60.0	24.0	48.0	24.0	48.0	16.0	32.0	24.0	48.0	16.0	32.0	9.0	27.0	6.0	18.0
One Story only	UA	UA	30.0	90.0	24.0	72.0	24.0	72.0	16.0	48.0	24.0	72.0	16.0	48.0				

For SI: 1 ft = 0.305 m, 1 sq ft = 0.0929 m².

NL = No Limit
UA = Unlimited Area

Notes:

- a. For height modifications and limitations by occupancy, see:
 1. Mezzanines 503.2.3
 2. Basements 503.2.4
 3. Assembly Basements 503.2.5
 4. Business 503.2.6
 5. Educational Basements 503.2.5
 6. Mercantile 503.2.6
 7. Residential 503.2.2, 503.2.6
- b. For area modifications and limitations by occupancy see:
 1. Area increase for separation (All occupancies except H) 503.3.2
 2. Assembly 503.4.3, 503.4.4, 503.4.5, 503.4.6, 503.4.8
 3. Business 503.4.1, 503.4.8
 4. Educational 503.4.2, 503.4.7
 5. Factory-Industrial 503.4.1, 503.4.8
 6. Mercantile 503.4.1, 503.4.8, 503.4.10
 7. Storage 503.4.1, 503.4.8, 503.4.11
- c. Modifications in height and area shall not be permitted in Group H occupancies.
- d. See 903.7.5 and 903.7.6 for height limitations of unsprinklered R1 and R2 occupancies. Height and area increases in 503 are not permitted for NFPA 13D and NFPA 13R sprinkler systems installed in accordance with 903.7.7 or as an option in 903.7.6.
- e. See 411.3.1 for allowable height and floor areas of Open Automobile Parking Structures.
- f. Total area for unsprinklered Group M occupancies after increase permitted by 503.3 shall not exceed 15,000 sq ft.
- g. Height in ft not applicable to Group S and Group F occupancies.
- h. When all portions of buildings are sprinklered in accordance with the standards listed in 903.2, the height of buildings listed under this column may be increased one story. A general area increase provided for in 503.3.2 may be applied before using footnote h. (Also, see note j.)
- i. Automatic sprinkler protection required throughout all buildings where Use Condition 5 is used. See 409.2.3. and 1024.2.2.
- j. When all portions of buildings are sprinklered in accordance with the standards listed in 903.2, the allowable heights and areas of buildings shall be as listed under this column. (Also, see note h.)