

# Existing Building Investigation & Evaluation Report

## *Prescriptive Compliance Method*

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123 Main Street  
Anytown, MA 00001

Prepared by:

*Massachusetts Registered Design Professional (RDP)*

August 24, 2016

### **Note:**

*This report was developed for education purposes and is to be referenced only as a sample of what **may be provided** as part of an existing building investigation and evaluation report. Each building renovation project is unique and should be treated as such. Depending on the project, a greater or lesser level of detail may be required. This sample report may help to establish parameters for a project report, but should not be used as a gauge for code compliance. Photos contained herein were excerpted from internet public images. Information contained in this report is hypothetical and does not reflect actual conditions of internet images used.*

## Part A.

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### Existing Building General Information:

1. Use Group Classification: Mixed Use of Office (B) and Storage (S-1).
2. Type of Construction: IIA
3. Area: 100,000 square feet
4. Height above grade plane: 30 feet
5. Stories above grade: 1 story, slab on grade
6. Sprinkler System: NFPA 13 system

The existing building was originally designed and constructed in 1993 in accordance with 780 CMR (The Massachusetts Building Code), Fifth Edition as a footwear storage warehouse and distribution center. According to the original building permit application, associated plans and specifications, the mixed used building was designed utilizing the non-separated use option, designed to the more restrictive S-1 code requirements as applicable. According to building department records, there have not been any additions or major renovations made to the structure since its original occupancy.



Ariel View of Site

The building sits on a ten acre parcel of land with full perimeter access, shared with 3 other existing retail buildings of similar construction type, with 6 points of fire department access to the site. Ample parking is available on site.

## Part B.

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### Renovated Building General Specifications:

The existing building will be fully renovated in compliance with **780 CMR, Ninth Edition, Existing Building Code Prescriptive Compliance Methods**. The renovated structure shall serve as a **Bulk Merchandising Retail Building** which is defined as “A building where sales areas contain high piled combustible commodities, or high piled, high hazard commodities as defined in Chapter 3 and 4”.

This report is prepared to assess existing conditions for the current use; identify any and all current code deficiencies requiring attention as part of the renovation project; and to generally assess the suitability of the structure for new use conditions. As required by 780 CMR Section 104.2.2.1, the report shall assess:

- Structural conditions;

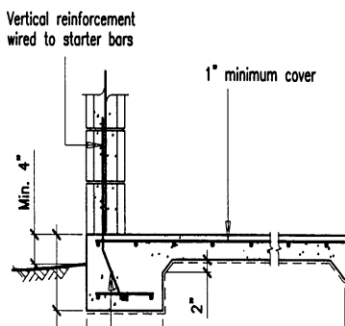
- means of egress conditions and requirements;
- fire protection systems;
- energy conservation conditions and requirements;
- lighting and ventilation conditions;
- hazardous materials; and
- accessibility to, in and around the building.

**Part C.**

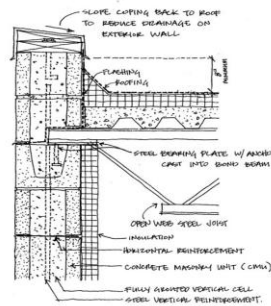
**Existing Structural Conditions** (*Construction Type, Height & Area Requirements*):

The existing building conforms to Type IIA as established by 780 CMR, Ninth Edition, comprised of:

- Eight (8) inch split-faced, concrete masonry unit (CMU) exterior bearing walls, fully grouted and reinforced with #5 bars @ 4'-0" o.c.;
- Interior 6" x 6" nominal steel tube columns support, wide flange steel beams in 20'-0" bays;
- Open-web, steel bar joists @ 2'-0" o.c. roof structure with corrugated metal decking, light-weight concrete surface, rigid insulation and adhered, EPDM roof membrane (*see typical details below*).
- Interior walls are non-bearing, steel studs with 1/2" g.w.b. and skim coat of plaster.



**Typical Exterior Wall Detail**



**Typical Roof Detail**

**Ninth Edition 780 CMR Section 602.2** establishes that "Types I and II construction are those types of construction in which the building elements listed in Table 601 are of noncombustible materials, except as permitted in Section 603 and elsewhere in this code". Type IIA construction shall achieve fire resistance ratings for structural elements as detailed in Table 601 (*copy of current table appended below*).

**TABLE 601  
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame <sup>f</sup> (see Section 202)	3 <sup>a</sup>	2 <sup>a</sup>	1	0	1	0	HT	1	0
Bearing walls									
Exterior <sup>e, f</sup>	3	2	1	0	2	2	2	1	0
Interior	3 <sup>a</sup>	2 <sup>a</sup>	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions	See Table 602								
Exterior	See Table 602								
Interior <sup>d</sup>	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 1/2 <sup>b</sup>	1 <sup>b,c</sup>	1 <sup>b,c</sup>	0 <sup>c</sup>	1 <sup>b,c</sup>	0	HT	1 <sup>b,c</sup>	0

For SI: 1 foot = 304.8 mm.

- a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
- c. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
- d. Not less than the fire-resistance rating required by other sections of this code.
- e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
- f. Not less than the fire-resistance rating as referenced in Section 704.10.

**Assessment:** The general condition of the structure appears to be in good shape. Construction documents on file at the building department indicate that appropriate live and dead loads were anticipated in the design and construction of the building and there have not been any significant building code changes affecting design loads that would necessitate change.

**Height & Area Requirements:** The existing building stands one (1) story, 30 feet above grade plane. **Ninth Edition, 780 CMR, Section 427.2** establishes that “. . . unless otherwise noted in this section, the minimum requirements for bulk merchandising retail buildings shall be in accordance with the requirements set forth for Group M and Section 414”. **Tables 504.3 and 504.4** allow a maximum of 5 stories, 85 feet in height above grade plane for mercantile buildings. **Table 506.2** limits the building area to 86,000 square feet. However, 100% perimeter access and single-story occupancy provisions established by 780 CMR Section 506.3.2 allows for an area increase of approximately 16,000 square feet or 102,125 total square feet.

**TABLE 504.4<sup>a, b</sup>—continued**  
**ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE**

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
M	NS	UL	11	4	2	4	2	4	3	1
	S	UL	12	5	3	5	3	5	4	2

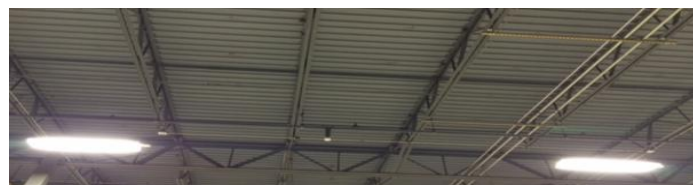
**TABLE 504.3<sup>a</sup>**  
**ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE**

OCCUPANCY CLASSIFICATION	TYPE OF CONSTRUCTION									
	SEE FOOTNOTES	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
A, B, E, F, M, S, U	NS <sup>b</sup>	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60

**TABLE 506.2<sup>a, b</sup>**  
**ALLOWABLE AREA FACTOR (A<sub>i</sub> = NS, S1, S13R, or SM, as applicable) IN SQUARE FEET**

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
M	NS	UL	UL	21,500	12,500	18,500	12,500	20,500	14,000	9,000
	S1	UL	UL	86,000	50,000	74,000	50,000	82,000	56,000	36,000
	SM	UL	UL	64,500	37,500	55,500	37,500	61,500	42,000	27,000

**Deficiencies:** Table 601 requires a one (1) roof construction fire resistance rating. Spray-on fire proofing was used to achieve required ratings. Portions of the rear north quadrant were missed and need to be protected. Protection material was applied properly in all other areas and is suitably in-tact.

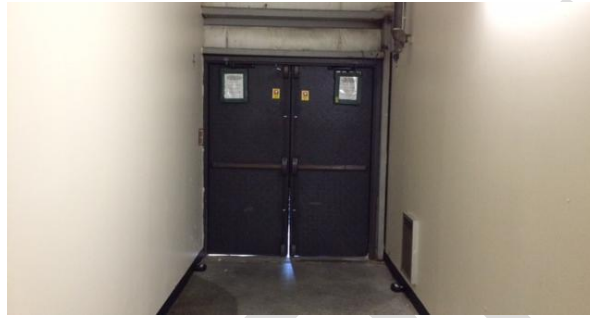


**Rear North Quadrant Requiring Fire Protection**

## Part D.

### Means of Egress Conditions:

**Assessment:** Currently, there are six (6) points of entry and exit from the building. Some conditions do not comply with current or previous code editions as illustrated below. However, means of egress patterns, exit and entry doors will be totally reconfigured in conformance with 780 CMR, Ninth Edition, to accommodate the new *Bulk Storage Merchandising Building* use requirements. Construction documents for the renovation project will establish new means of egress patterns.



No Exit Signage

## Part E.

### Fire Protection Systems:

**Assessment:** The building is protected with a fire sprinkler system installed in accordance with NFPA Standard 13. Tests indicate that the system is in good working order. However, the system was originally designed for light hazard storage conditions. **Ninth Edition, 780 CMR Section 427.5** requires “*Fire sprinkler design and installation shall be provided in accordance with the applicable requirements set forth by NFPA 13, 30, 30B, 231, 430 or other nationally recognized codes and standards, or tests conducted in test laboratories as defined in 527 CMR*”. Preliminary assessments indicate that the system will have to be redesigned to meet new commodities anticipated by the Bulk Merchandising Storage use. Additionally, the fire alarm and notification system will have to be redesigned in accordance with Table 427.4 and 427.14 requirements. Access doors, hose connections and manual smoke and heat vents exist and appear to be in good working order. Construction documents for the renovation project will illustrate revised systems in accordance with 780 CMR 427, Ninth Edition.

**TABLE 427.4 FIRE PROTECTION REQUIREMENTS**

Commodity Class <sup>1</sup>	Size of High-Piled Display Area <sup>2</sup> (sq. ft.)	Fire Protection Requirements				
		Fire Suppression System (427.5)	Fire Alarm/Notification (427.14)	Fire Department Access Doors (427.8)	Hose Connections (427.7)	Manual Smoke and Heat Vents (427.16)
I-IV	0 to 2,500	NR	NR	NR	NR	NR

NR = Not required.

1. For commodity classifications definitions, see subsection 427.3.
2. Areas that are separated by 60 ft of display area with such areas not used for high piled storage, or that are separated with a one-hour fire resistance-rated separation barrier, can be considered as separated high piled areas.
3. If the building is required to be sprinklered under this code, then the sprinkler system protecting the high piled storage area and 15 ft beyond shall be designed in accordance with the appropriate NFPA Standard(s).

## Part F.

## Energy Conservation Conditions and Requirements:

**Assessment:** Construction documents on file at the building department indicate that the insulation values for the existing roof system were designed and constructed in excess of code requirements when originally constructed and meet enhanced values established by 780 CMR, Ninth Edition, for the area. A new EPDM roof was installed in 2012. Construction documents for this roof replacement project indicate, in part that “*all existing R-values shall be maintained at the roof assembly and all damaged, missing and\or otherwise compromised existing rigid insulation shall be replaced as new . . .*”.

**Deficiencies:** There is no intent to replace or disturb the existing of assembly during transition to the Bulk Merchandising use. Therefore, there is no need to upgrade existing insulation values for the assembly. However, all interior wall surfaces will be stripped down to the face of existing CMU wall. New wall surfaces will be furred-out with metal studs @ 16” o.c. with new rigid R-19 insulation filling cavities, in excess of 780 CMR, Ninth Edition requirements.

## *Part G.*

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### Lighting and Ventilation Conditions:

**Assessment:** All existing lighting and ventilation systems will be removed in their entirety. New systems will be reconfigured in conformance with 780 CMR, Ninth Edition, to accommodate the new *Bulk Storage Merchandising Building* use requirements. Construction documents for the renovation project will establish new lighting and ventilation conditions.

## *Part H.*

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### Hazardous Materials:

**Assessment:** The existing building does not contain any hazardous materials. As mentioned earlier, all fire protection systems will be designed and installed in accordance with commodity requirements as established *by Ninth Edition, 780 CMR, Table 427.4.*

## *Part I.*

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### Accessibility to, in and around building:

**Interior Assessment:** All existing accessible routes within the building will be removed in their entirety. New accessible ingress and egress patterns, exit and entry doors, bathrooms, aisle ways, and check-out areas will be totally reconfigured in conformance with 780 CMR, Ninth Edition, and 521 CMR to accommodate the new *Bulk Storage Merchandising Building* use requirements. Additionally, the renovated structure will be designed in accordance with ADA standards for employee areas. Construction documents for the renovation project will establish new patterns.

**Exterior Assessment:** There are over 500 available parking spaces on site for use by patrons of the four existing structures. The lot was recently repaired and re-stripped. All spaces are clearly delineated and 8 accessible spaces are dedicated to each of the 4 existing structures for a total of 32 available spaces. **521 CMR Section 23.2** establishes that parking facilities accommodating 501 – 1000 shall provide at least 2 percent of total as accessible spaces. Additionally, **Section 23.2.2** requires “*One in every eight accessible spaces, but not less*”

than one, shall be van accessible". Two (2) of the 8 spaces provided for each building are van accessible. All curbs, walkways and exterior accessible routes are in compliance with applicable provisions of 521 CMR.

**Deficiencies:** None

This report is respectfully submitted in accordance with **Ninth Edition, 780 CMR, Section 104.2.2.1 Existing Building Code Prescriptive Compliance Methods.**

Registered Design Professional 

Signed by:

*August 24, 2016*

Date:

SAMPLE