

1299 Beacon Street Residences

Brookline, MA

CBT Architects

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CODE SUMMARY

1299 Beacon Street is a 10 story residential building with 74 apartments above one level of retail, situated on a through lot in Brookline MA. A 3 level subterranean garage is located directly below with access from Sewall Street. The structure is 122'-0" to the floor of the top occupied level measured from the mean grade of natural ground.

APPLICABLE CODES

| | |
|---------------|---|
| Building | 780 CMR - Massachusetts State Building Code 9 th Edition, which is an amended version of the 2015 International Building Code (IBC). |
| Fire | 527 CMR - Massachusetts Comprehensive Fire Safety Code, which is an amended version of the 2015 Edition of NFPA 1, Fire Code. The 2009 International Fire Code (IFC) is applicable for fire code references in 780 CMR not addressed by 527 CMR. |
| Accessibility | 521 CMR - Architectural Access Board (AAB) Rules and Regulations 2010 ADA Standards for Accessible Design |
| Electrical | 527 CMR 12.00 - Massachusetts Electrical Code, which is an amended version of the 2014 Edition of NFPA 70, National Electrical Code |
| Mechanical | 2009 International Mechanical Code (IMC) as amended by 780 CMR 28.00. |
| Plumbing | 248 CMR 10.00 – Uniform State Plumbing Code |
| Energy | 2012 Edition of the International Energy Conservation Code (IECC) as amended by the State of Massachusetts |
| Elevator | 524 CMR – Massachusetts Board of Elevator Regulations, which is an amended version of the 2004 ANSI A17.1, Safety Code for Elevators and Escalators |
| Other | National Fire Protection Association (NFPA) Standards, as referenced by the above codes |

CONSTRUCTION TYPES

Type IB –Protected noncombustible (concrete and steel)

Primary Occupancies

| Anticipated Occupancy Groups (780 CMR 301) | |
|--|------------------------|
| Description | 780 CMR Classification |
| Lounge; Gathering; Conference Rooms > 49 persons | Group A-3 |
| Offices; Conference Rooms ≤ 49 persons | Group B |
| Retail Shops | Group M |
| Residential Dwelling Units | Group R-2 |
| Light Hazard Storage, Parking | Group S-2 |

Table 1: Anticipated Occupancy Groups

SPECIAL USES

Enclosed Garage
Dry pipe sprinkler system
7' generally and 8'-2" clear height at accessible van locations
CO2 monitoring and mechanical ventilation system

BUILDING CONSTRUCTION

Construction Classification

The building is fully protected by an automatic sprinkler system. The building is 10 stories of occupied floors with a mechanical penthouse above. The building is classified as construction type IB. Per 780 CMR 403.2.1.1, types of construction under the High Rise section, the building is allowed to take reduction in construction type to IIA without a loss in building height or area.

The total above grade building area at 109,396 sf, meeting the allowable permitted by type IB. (Below grade is 52,872 sf)

Building Height and Area

Structures will not exceed the limitations of 780 CMR 503 for Type IB.

Area will meet the requirements in table 506.2 of 780 CMR (type IB: unlimited)

TABLE 504.3^a
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 ^b | UL | 160 | 65 | 55 | 65 | 55 | 65 | 50 | 40 | | | | | | |
| | S | UL | 180 | 85 | 75 | 85 | 75 | 85 | 70 | 60 | | | | | | |
| H-1, H-2, H-3, H-5 | NS ^{c, d} | UL | 160 | 65 | 55 | 65 | 55 | 65 | 50 | 40 | | | | | | |
| | S | | | | | | | | | | | | | | | |
| H-4 | NS ^{c, d} | UL | 160 | 65 | 55 | 65 | 55 | 65 | 50 | 40 | | | | | | |
| | S | | | | | | | | | | | | | | | |
| I-1 Condition 1, I-3 | NS ^{d, e} | UL | 160 | 65 | 55 | 65 | 55 | 65 | 50 | 40 | | | | | | |
| | S | | | | | | | | | | | | | | | |
| I-1 Condition 2, I-2 | NS ^{d, f, e} | UL | 160 | 65 | 55 | 65 | 55 | 65 | 50 | 40 | | | | | | |
| | S | | | | | | | | | | | | | | | |
| I-4 | NS ^{d, g} | UL | 160 | 65 | 55 | 65 | 55 | 65 | 50 | 40 | | | | | | |
| | S | | | | | | | | | | | | | | | |
| R | NS ^{d, h} | UL | 160 | 65 | 55 | 65 | 55 | 65 | 50 | 40 | | | | | | |
| | S13R | | | | | | | | | | 60 | 60 | 60 | 60 | 60 | 60 |
| | S | | | | | | | | | | 180 | 85 | 75 | 85 | 75 | 85 |

For SI: 1 foot = 304.8 mm.

Note: UL = Unlimited; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

- a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- d. The NS value is only for use in evaluation of existing building height in accordance with the *International Existing Building Code*.
- e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.
- f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.
- g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
- h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

TABLE 504.4^{a, b}—continued
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

| 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 | |
| R-1 | NS ^{d, h} | UL | 11 | 4 | 4 | 4 | 4 | 4 | 3 | 2 | |
| | S13R | 4 | 4 | | | | | | 4 | 3 | |
| | S | UL | 12 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | |
| R-2 | NS ^{d, h} | UL | 11 | 4 | 4 | 4 | 4 | 4 | 3 | 2 | |
| | S13R | 4 | 4 | 4 | | | | | 4 | 3 | |
| | S | UL | 12 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | |
| R-3 | NS ^{d, h} | UL | 11 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | |
| | S13R | 4 | 4 | | | | | | 4 | 4 | |
| | S | UL | 12 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | |
| R-4 | NS ^{d, h} | UL | 11 | 4 | 4 | 4 | 4 | 4 | 3 | 2 | |
| | S13R | 4 | 4 | | | | | | 4 | 3 | |
| | S | UL | 12 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | |
| S-1 | NS | UL | 11 | 4 | 2 | 3 | 2 | 4 | 3 | 1 | |
| | S | UL | 12 | 5 | 3 | 4 | 3 | 5 | 4 | 2 | |
| S-2 | NS | UL | 11 | 5 | 3 | 4 | 3 | 4 | 4 | 2 | |
| | S | UL | 12 | 6 | 4 | 5 | 4 | 5 | 5 | 3 | |
| U | NS | UL | 5 | 4 | 2 | 3 | 2 | 4 | 2 | 1 | |
| | S | UL | 6 | 5 | 3 | 4 | 3 | 5 | 3 | 2 | |

Note: UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

- See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- The NS value is only for use in evaluation of existing building height in accordance with the *International Existing Building Code*.
- New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.
- New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.
- For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
- New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

Construction Type

Meet minimum fire-resistance ratings required for Type IIA, except for the columns which will maintain the rating as required by construction type IB.

**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 ^f (see Section 202) | 3 ^a | 2 ^a | 1 | 0 | 1 | 0 | HT | 1 | 0 |
| Bearing walls | | | | | | | | | |
| Exterior ^{d,e,f} | 3 | 2 | 1 | 0 | 2 | 2 | 2 | 1 | 0 |
| Interior | 3 ^a | 2 ^a | 1 | 0 | 1 | 0 | 1/HT | 1 | 0 |
| Nonbearing walls and partitions | See Table 602 | | | | | | | | |
| Exterior | See Table 602 | | | | | | | | |
| Interior ^d | 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} ^b | 1 ^{b,c} | 1 ^{b,c} | 0 ^e | 1 ^{b,c} | 0 | HT | 1 ^{b,c} | 0 |

For SI: 1 foot = 304.8 mm.

- 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.
- 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.
- In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
- Not less than the fire-resistance rating required by other sections of this code.
- Not less than the fire-resistance rating based on fire separation distance (see Table 602).
- Not less than the fire-resistance rating as referenced in Section 704.10.

Nonbearing Exterior Walls

Table 602 per 780 CMR, Fire Resistance Rating for Exterior Walls Based on Fire Separation Distance
 Less than 30' = 1 hr
 Greater than 30' = 0 hr

**TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE^{a, d, g}**

| FIRE SEPARATION DISTANCE = X (feet) | TYPE OF CONSTRUCTION | OCCUPANCY GROUP H ^a | OCCUPANCY GROUP F-1, M, S-1 ^f | OCCUPANCY GROUP A, B, E, F-2, I, R, S-2, U ^h |
|-------------------------------------|----------------------|--------------------------------|--|---|
| X < 5 ^b | All | 3 | 2 | 1 |
| 5 ≤ X < 10 | IA | 3 | 2 | 1 |
| | Others | 2 | 1 | 1 |
| 10 ≤ X < 30 | IA, IB | 2 | 1 | 1 ^c |
| | IIB, VB | 1 | 0 | 0 |
| | Others | 1 | 1 | 1 ^c |
| X ≥ 30 | All | 0 | 0 | 0 |

For SI: 1 foot = 304.8 mm.

- Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
- See Section 706.1.1 for party walls.
- Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
- The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
- For special requirements for Group H occupancies, see Section 415.6.
- For special requirements for Group S aircraft hangars, see Section 412.4.1.
- Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.
- For a building containing only a Group U occupancy private garage or carport, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet or more.

Exterior Wall Openings

Project meets area percentages of wall openings (see attached elevations).
 Maximum area of unprotected exterior wall openings based on fire separation distance (780 CMR 705.8).

| Allowable Exterior Wall Openings Based on Fire Separation Distance | |
|--|-----------------------------|
| Fire Separation Distance | Allowable area ¹ |
| 0 to less than 3 feet | Not Permitted |
| 3 feet to less than 5 feet | 15% |
| 5 feet to less than 10 feet | 25% |
| 10 feet to less than 15 feet | 45% |
| 15 feet to less than 20 feet | 75% |
| 20 feet or greater | No Limit |

Spray Fire Resistant Materials

Minimum bond strength of 430 psf

Corridor Walls

Residential = 0.5 hr fire ration. 20 minute doors.

Dwelling Unit Separation Walls

Not Applicable

Draft and Fire Blocking

Fire blocking will be provided as per 780 CMR 717.2.2 through 717.2.7.

INTERIOR WALLS AND PARTITIONS

Fire/Smoke Resistive Assemblies

| Fire/Smoke Resistive Assemblies | | |
|---------------------------------------|-------------------------|--------------------|
| Type of Assembly | Construction | Code Reference |
| Corridors | | |
| Above grade | No fire rating required | 780 CMR 1018.1 |
| Below Grade | 1-hour smoke barrier | 780 CMR 710 |
| Special Rooms/Incidental Uses | | |
| Dry Type Transformer Room > 35,000 V | 3 hour fire barrier | NFPA 70, 450.42 |
| Elevator Machine Room / Controls Room | 2 hour fire barrier | 780 CMR 3006.4 |
| Nonsprinklered Electrical Room | 2 hour fire barrier | NFPA 13, 8.15.10.3 |
| Emergency Generator Room | 2 hour fire barrier | NFPA 110, 7.2.1.1 |
| Fire Pump Room | 2 hour fire barrier | 780 CMR 913.2.1 |
| Fire Service Elevator Lobbies | 1 hour smoke barrier | 780 CMR 3007.4.2 |
| Dry Type Transformer Room > | 1 hour fire barrier | NFPA 70, 450.21(B) |

| Fire/Smoke Resistive Assemblies | | |
|--|--|-------------------------|
| Type of Assembly | Construction | Code Reference |
| 112.5 kVA | | |
| Fire Command Center | 1 hour fire barrier | 780 CMR 911.1.2 |
| Elevator Lobbies | Smoke partition | 780 CMR 708.14.1 |
| Boiler room where the largest piece of equipment is > 15 psi and 10 horsepower | Wall capable of resisting the passage of smoke | 780 CMR 508.2.5 |
| Waste Rooms & Trash Chutes | 2 hour fire barrier | NFPA 82 |
| Exit Access Corridor | 0.5 hour smoke barrier | 780 CMR 1018.1 |
| Dwelling Unit Separation Walls | 1 hour fire barrier | 780 CMR 420.2 |
| Shafts | | |
| Connecting any number of stories | 2 hour fire barrier | 780 CMR 403.2.3 & 708.4 |

INTERIOR FINISHES

Wall Ceiling Finishes

Interior wall and ceiling finish ratings are classified in accordance with ASTM E 84 or UL 723 (780 CMR 803.1.1). Class C

Interior Floor Finishes

In all areas, interior floor covering materials are required to comply with the requirements of the DOC FF-1 "pill test" (CPSC 16 CFR Part 1630) (780 CMR 804.4.1).

HIGH RISE REQUIREMENTS

1299 Beacon Street will be classified as a high rise as the height from grade plane to the highest roof surface exceeds 70 feet (780 CMR 403). Specific high-rise requirements are provided below or in the appropriate sections throughout the report.

Fire Alarm and Detection Systems

- An emergency voice/alarm communication system is required to be installed throughout in accordance with NFPA 72 (780 CMR 907.2.13).
- An automatic smoke detection system is required to be installed in the following locations of each structure:
- In each elevator machine room and in elevator lobbies (780 CMR 907.2.13.1.1(2)).
- On each floor level at the entrance to smoke proof enclosures/pressurized stairs(780 CMR 909.20.6). Heat detection can be used at parking levels if approved by the AHJ.

Fire Command Center

A 200 square foot, 1-hour FRR fire command center complying with 780 CMR 911 is required to be provided in a location approved by the fire department (780 CMR 403.22).

Smoke Control Systems

- All stairs are required to be pressurized in accordance with 780 CMR 909.20.5.
- Elevators that are not provided with an elevator lobby should be provided with an elevator pressurization system.

Post-Fire Smoke Removal Systems

To facilitate smoke removal in post-fire salvage and overhaul operations, 1299 Beavon Street is required to be provided with a natural or mechanical post-fire smoke removal system (780 CMR 403.4.6). A natural post-fire smoke removal system must provide manually operated windows or panels distributed around the perimeter of each floor at not more than 50-foot intervals and the area of such panels or windows may not be less than 40 square feet per 50 linear feet of perimeter (780 CMR 403.4.6 (1)). A mechanical post-fire smoke removal system must be capable of providing 4 air changes per hour with return and exhaust air moved directly outside without recirculation (780 CMR 403.4.6 (2)).

Standby/Emergency Power Systems

The standby and emergency power systems are required to be installed in accordance with 780 CMR, 527 CMR 12.00, NFPA 110, and NFPA 111.

The standby power system is required to be provided for the following building features (780 CMR 403.4.7.2 & 780 CMR 2702.2):

- Smoke control systems.
- Elevators that are part of the accessible means of egress in accordance with 780 CMR Section 1007.4. Standby power should be manually transferable to all elevators in each bank (780 CMR 3003.1).
- Power and lighting for the fire command center.

The emergency power system is required to be provided for the following building features (780 CMR 403.4.8.1 & 780 CMR 2702.2):

- Emergency voice/alarm communication systems.
- Exit signage in accordance with 780 CMR Section 1011.5.3.
- Means of egress illumination in accordance with 780 CMR Section 1006.3.
- Automatic fire detection systems.
- Fire alarm systems.
- Electrically powered fire pumps.

Elevator Lobbies

Elevator lobby construction to resist the passage of smoke to be provided.

A minimum of one fire service access elevator is required to serve every floor of 1299 Beacon Street in accordance with 780 CMR 3007 (780 CMR 403.6.1).

Enclosed Parking

1299 Beacon Street includes 3 levels of below grade parking. Enclosed parking will be in accordance with the following requirements:

- Each floor will be equipped throughout with dry-type automatic sprinkler protection.
- Meet the requirements of 780 CMR Table 503 for heights and areas; see section 3.2.4 of this report for analysis (780 CMR 406.4.1).
- A mechanical ventilation system in accordance with the International Mechanical Code (780 CMR 406.4.2) will be provided.
- The clear height of each floor level must be at least 7 feet in vehicle and pedestrian traffic areas (780 CMR 406.2.2).
- Vehicle and pedestrian traffic areas that accommodate van-accessible parking spaces must have a clear height of at least 8'-2" in accordance with MAAB Section 23.4.7.
- Vehicle ramps may not be considered as required exits unless pedestrian facilities are provided (780 CMR 406.2.5).

FIRE PROTECTION SYSTEMS

Automatic Sprinkler System:

An automatic sprinkler system is required to be installed throughout each structure in accordance with NFPA 13 (780 CMR 403.3 & 903.2). Each parking garage is required to be provided with a dry-type automatic sprinkler system (780 CMR Table 903.2 Note h).

Dry-pipe in Garage

Fire pump room for if required to be enclosed with not less than 2-hour FRR construction with direct access to grade.

Standpipe System

Class 1 standpipe system with 2 risers at each floor.

Water Supply

Hydraulic requirements to be researched and met. Secondary water supply to be reviewed.

Fire Department Connections

FDC locations at grade to be reviewed with Town FD.

Portable Fire Extinguishers

Provided every 75'.

Fire Pump Room:

The fire pump room for each structure is required to be enclosed with not less than 2-hour FRR construction. Access to the fire pump room is required to be directly from an exterior door at grade or through a 2-hour FRR enclosure (780 CMR 913.2.2).

EMERGENCY SYSTEMS

Fire Alarm Detection System

Voice/alarm communications, Manual Alarms, Smoke Detection at Elevator Lobbies and Machine Rooms, and Smoke Proof Enclosures.

Standby Emergency Power System

For Elevator, Exit Signs, Egress Lighting, Fire Detection, Fire Alarms,

Carbon Monoxide Detection

Included

Emergency Responder Radio Coverage

Included

MEANS OF EGRESS

Occupant Load

Load calculated on 200 gross sf per person. Parking 200 gross sf per person. Retail 30 gross sf per person.

Egress Width

44" at stairs. 60" at corridors.

Number of exits

Occupant load is less than 500 therefore 2 exits per floor.

Exit Discharge

Exits discharge to exterior. 50% through Lobby. 3 exits provided from Garage Level.

Accessible Means of Egress

Two accessible means of egress are provided. Elevator has standby power, signaling, for emergency operation. Two-way communication system.

Travel Distances

250' for R-2 use group

Dead Ends

50' max length

Exit Signage and Marking

Exit signage and Exit markings are to be provided.

Egress Illumination

The means of egress, including the exit discharge, must be illuminated at all times the building served by the means of egress is occupied (780 CMR 1006.1)

ACCESSIBILITY

Structure will meet the requirements of 521 CMR, Massachusetts Architectural Access Board (MAAB), the Fair Housing Act. Therefore, all residents units will be 521 CMR Group 1 compliant and FHA compliant. Additionally, 5% of the units will be 521 CMR Group 2A compliant for accessibility, and 2% of the units will be 521CMR Group 2A compliant for hearing impaired.