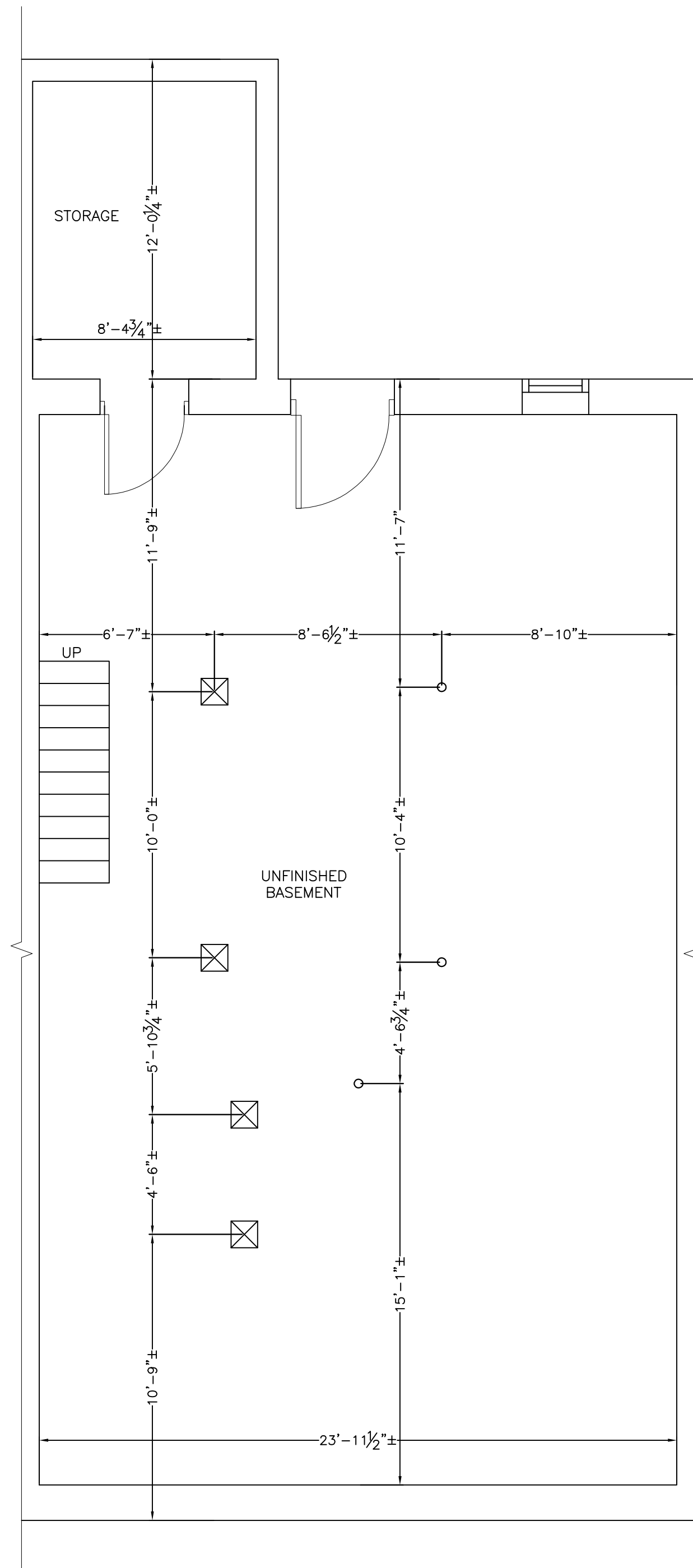
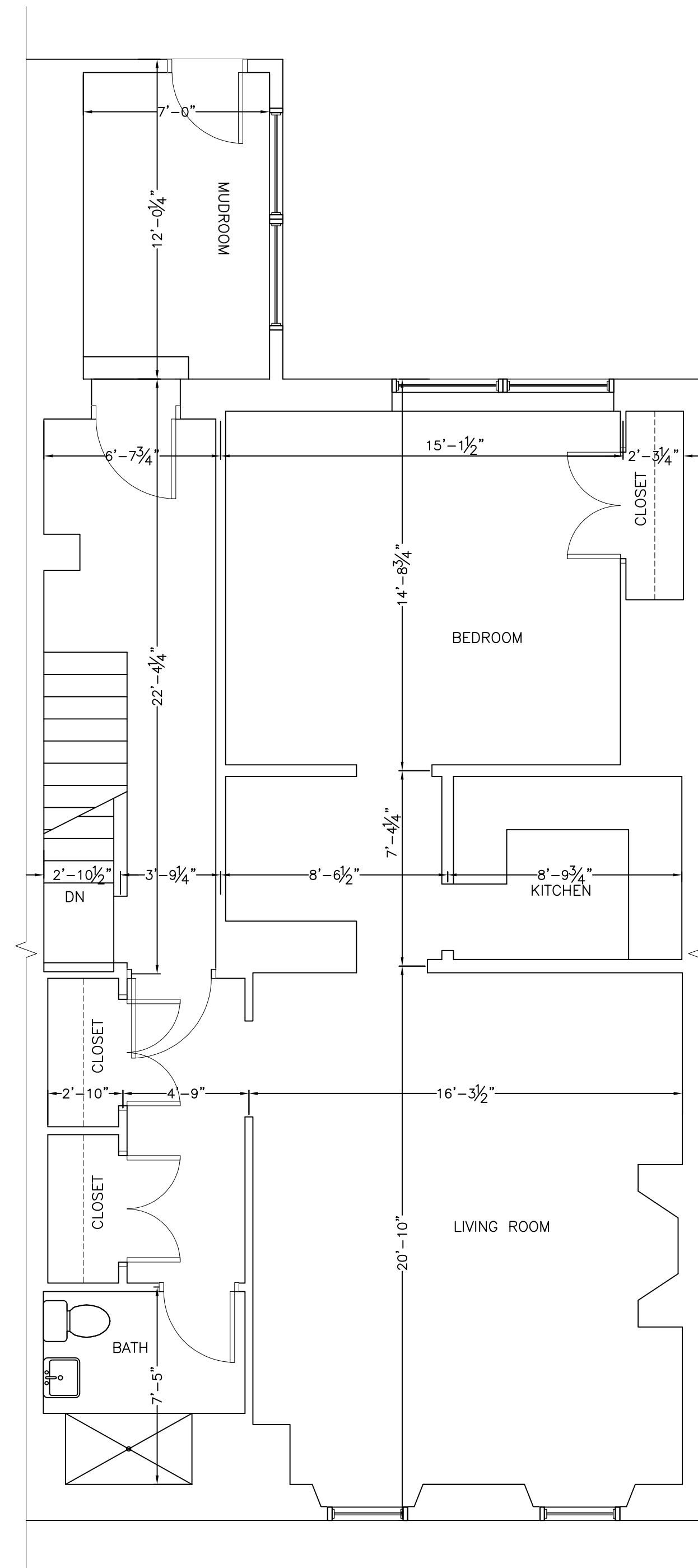


GENERAL NOTES

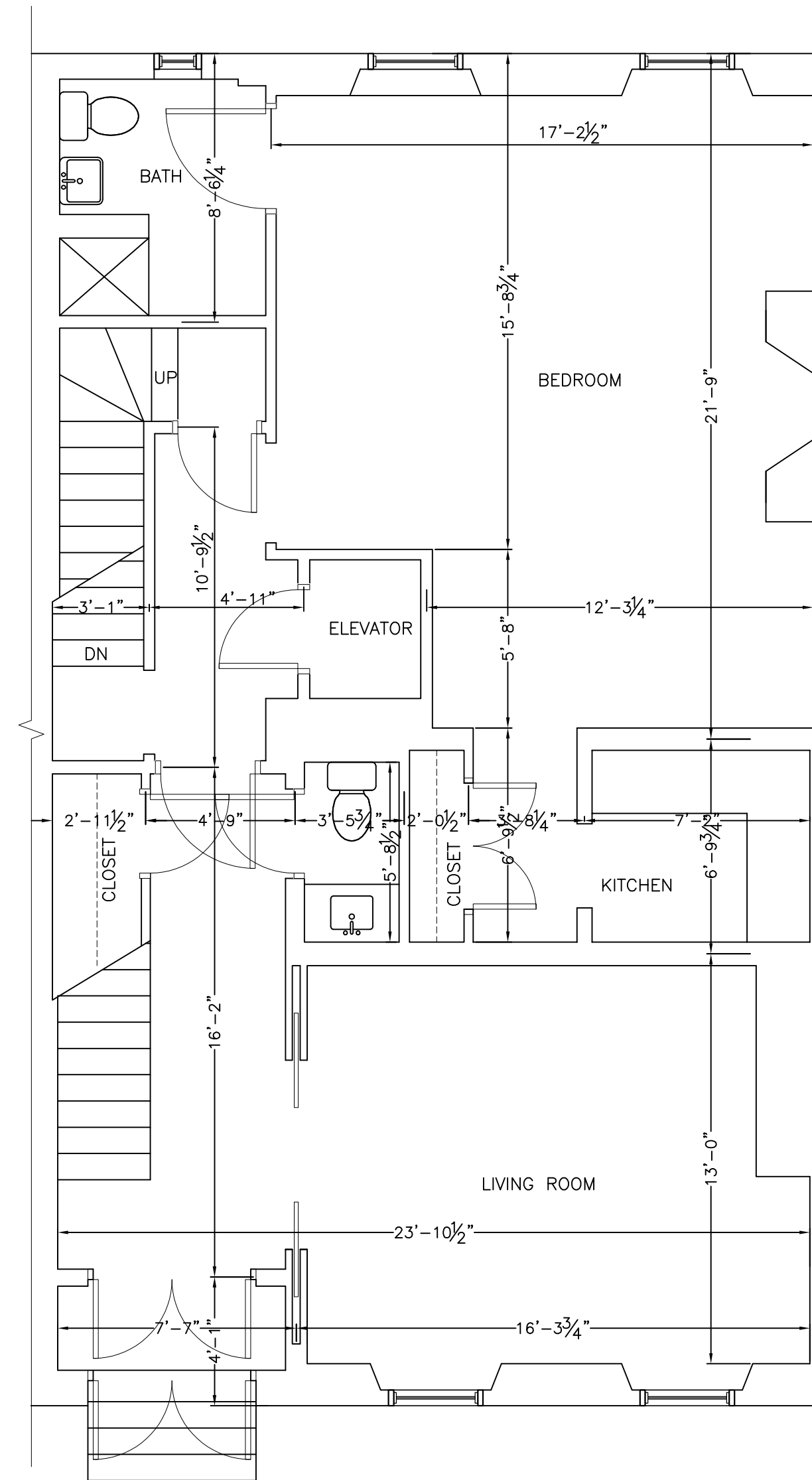
1. ALL WORK SHALL CONFORM TO MASSACHUSETTS BUILDING CODE AND ALL FEDERAL, STATE AND CITY OF BOSTON LAWS, CODES AND REGULATIONS AS EACH MAY APPLY.
2. ALL EXISTING CONDITIONS MUST BE VERIFIED IN FIELD. IF DISCREPANCIES ARE FOUND, THEY HAVE TO BE REPORTED TO THE ENGINEER PRIOR TO START OF WORK. OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS AND/OR THE SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE START OF SUCH WORK. FAILURE TO REPORT OMISSIONS, DISCREPANCIES, CONFLICTS, ETC. WILL RESULT IN CONTRACTOR'S RESPONSIBILITY FOR ENTIRE PROJECT.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE SCHEDULING AND WORK OF ALL TRADES AND SHALL CHECK ALL DIMENSIONS. ALL DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER AND SHALL BE RESOLVED PRIOR TO PROCEEDING WITH THE WORK.
4. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES, INCLUDING BUT NOT LIMITED TO BRACING AND SHORING.
5. THE CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY, AND THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
6. ALL WORK SHALL BE PERFORMED IN A FIRST CLASS AND WORKMANLIKE MANNER IN CONFORMITY WITH THE PLANS AND SPECIFICATIONS, AND SHALL BE IN GOOD USABLE CONDITION AT THE COMPLETION OF THE PROJECT.
7. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, UTILITY LOCATIONS AND STRUCTURE PLACEMENT, PRIOR TO START OF THE WORK. THE CONTRACTOR WILL OBSERVE ALL POSSIBLE PRECAUTIONS TO AVOID DAMAGE TO SAME. ANY DAMAGE TO EXISTING STRUCTURES AND UTILITIES, WHETHER SHOWN OR NOT ON THE DRAWINGS, SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
8. PRIOR TO BIDDING THE WORK THE CONTRACTOR SHALL VISIT THE SITE AND THOROUGHLY SATISFY HIMSELF AS TO THE ACTUAL CONDITIONS AND QUANTITIES, IF ANY. NO CLAIM AGAINST THE OWNER OR ENGINEER WILL BE ALLOWED FOR ANY EXCESS OR DEFICIENCY THEREIN, ACTUAL OR RELATIVE.
10. CONTRACTOR IS RESPONSIBLE FOR ALL DEMOLITION AND RELOCATION WORKS, IF ANY.



EXISTING  
BASEMENT PLAN



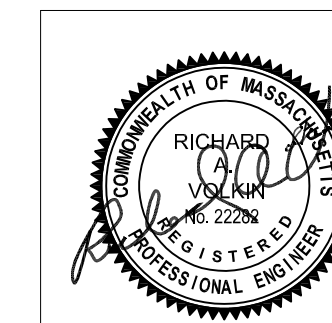
EXISTING GROUND  
FLOOR PLAN

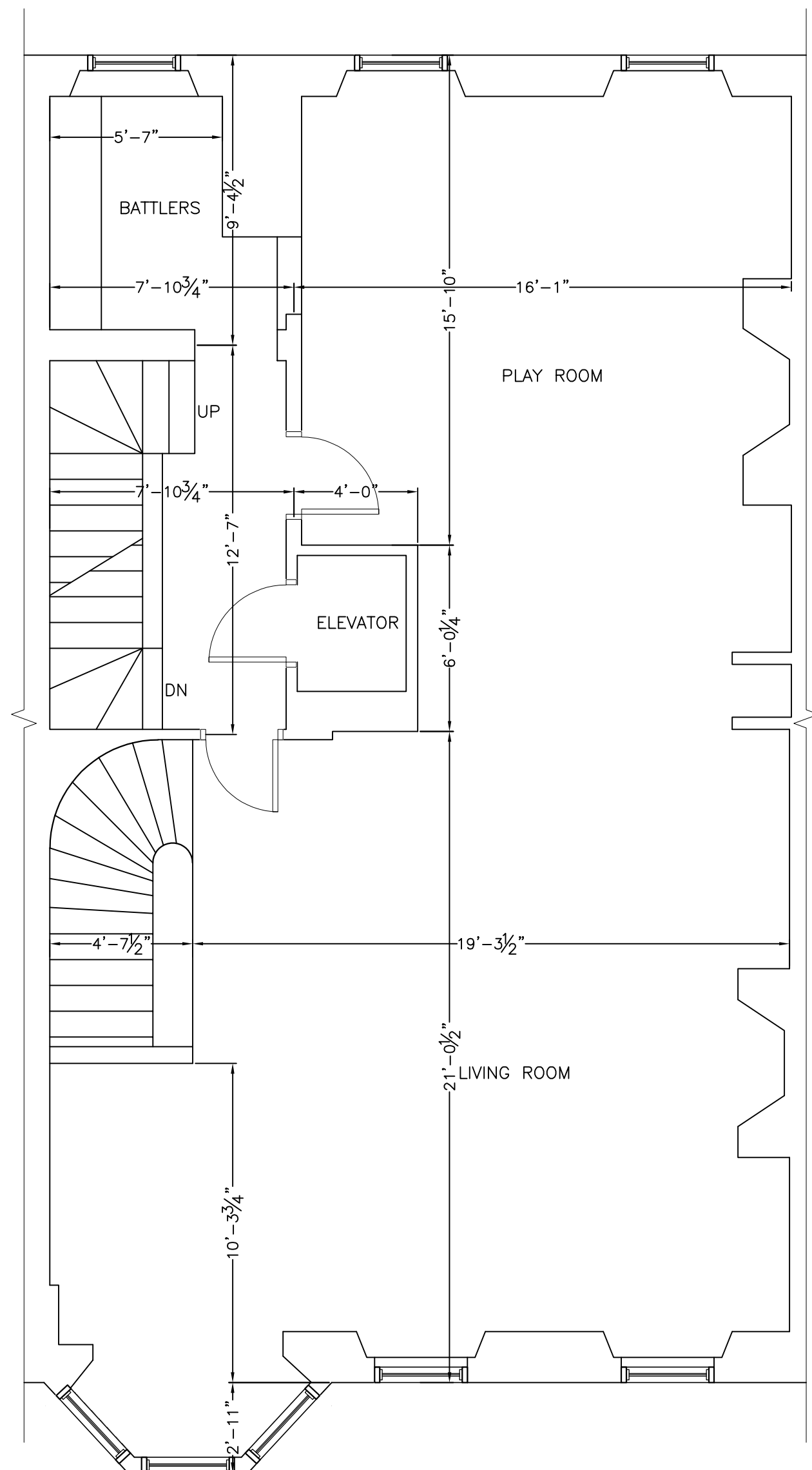


EXISTING FIRST  
FLOOR PLAN

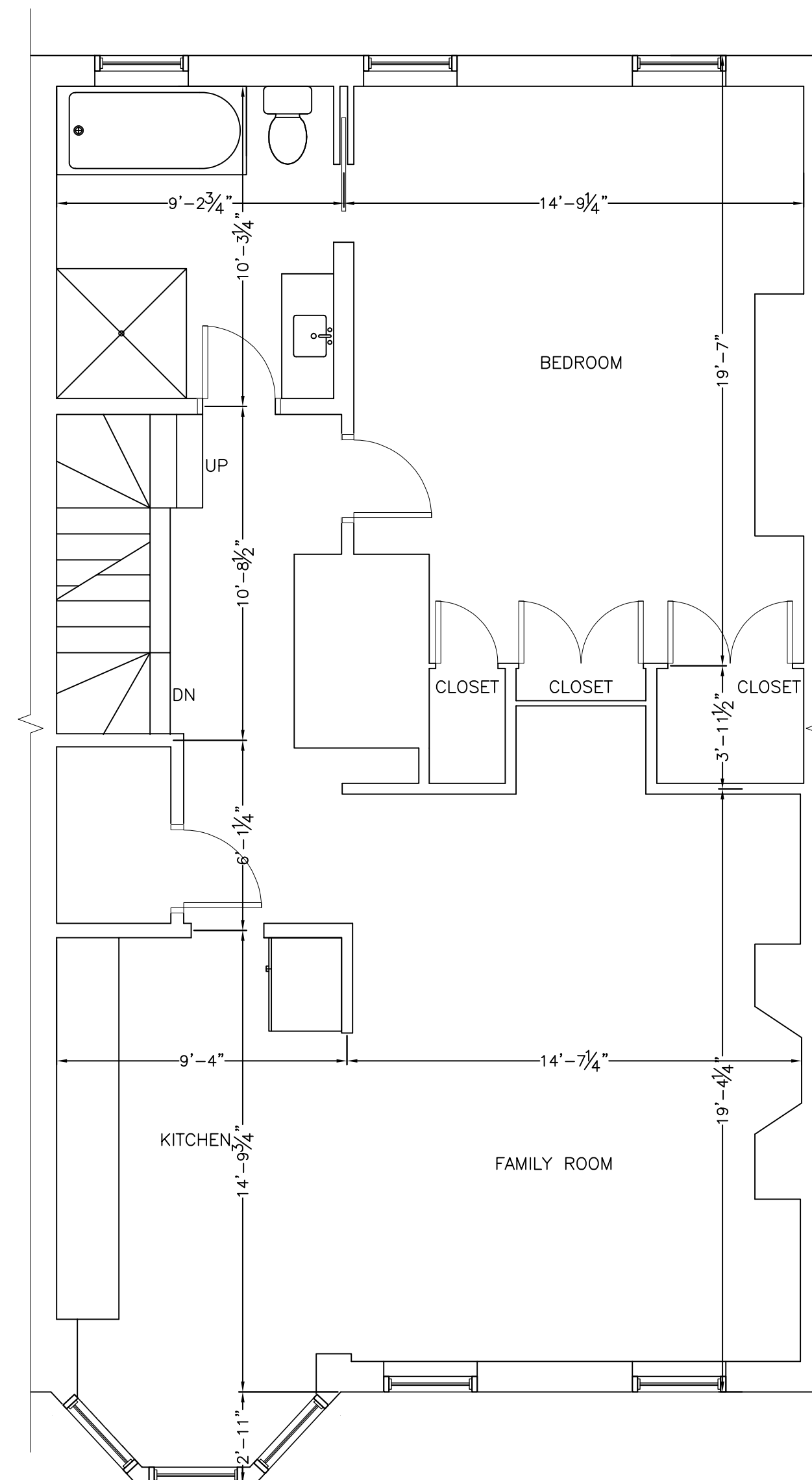
PERMIT SET

10/04/20	BASEMENT REVISION	
DATE	REVISION	
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<b>EXISTING FLOOR PLANS</b>  <b>30 CHESTNUT STREET,</b> <b>BOSTON, MASSACHUSETTS</b>  <b>RAV &amp; Assoc., Inc.</b> 21 HIGHLAND AVENUE NEEDHAM, MASSACHUSETTS 02494 TELEPHONE: (781) 449-8200 FAX: (781) 449-8205		
SCALE:	1/4"=1'-0"	
APPROVED:	R.A.V.	DESIGNED BY: E.F.
DATE:	08/08/2019	DRAWN BY: E.F.
		CHECKED BY: R.A.V.
		DRAWING No. A-1

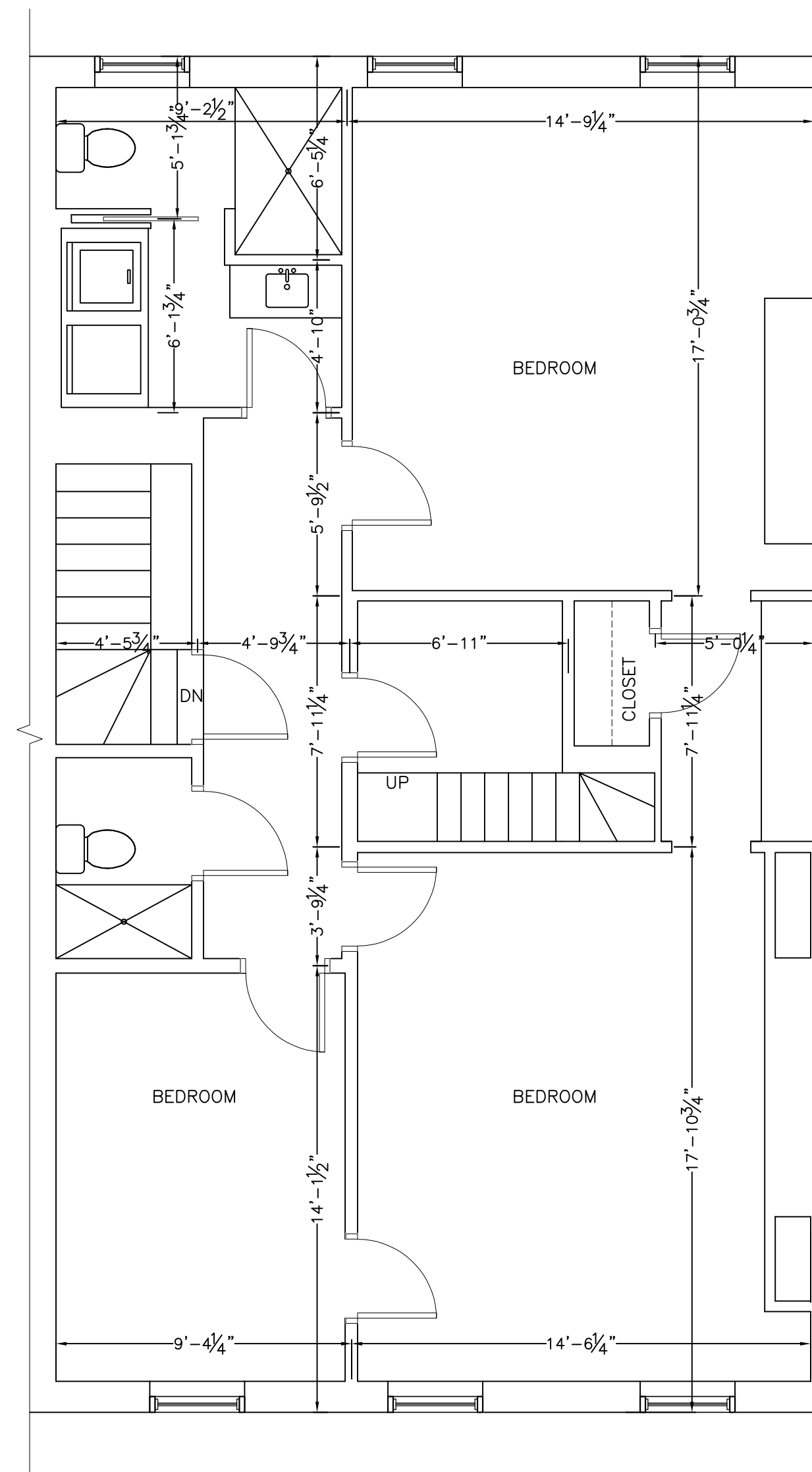




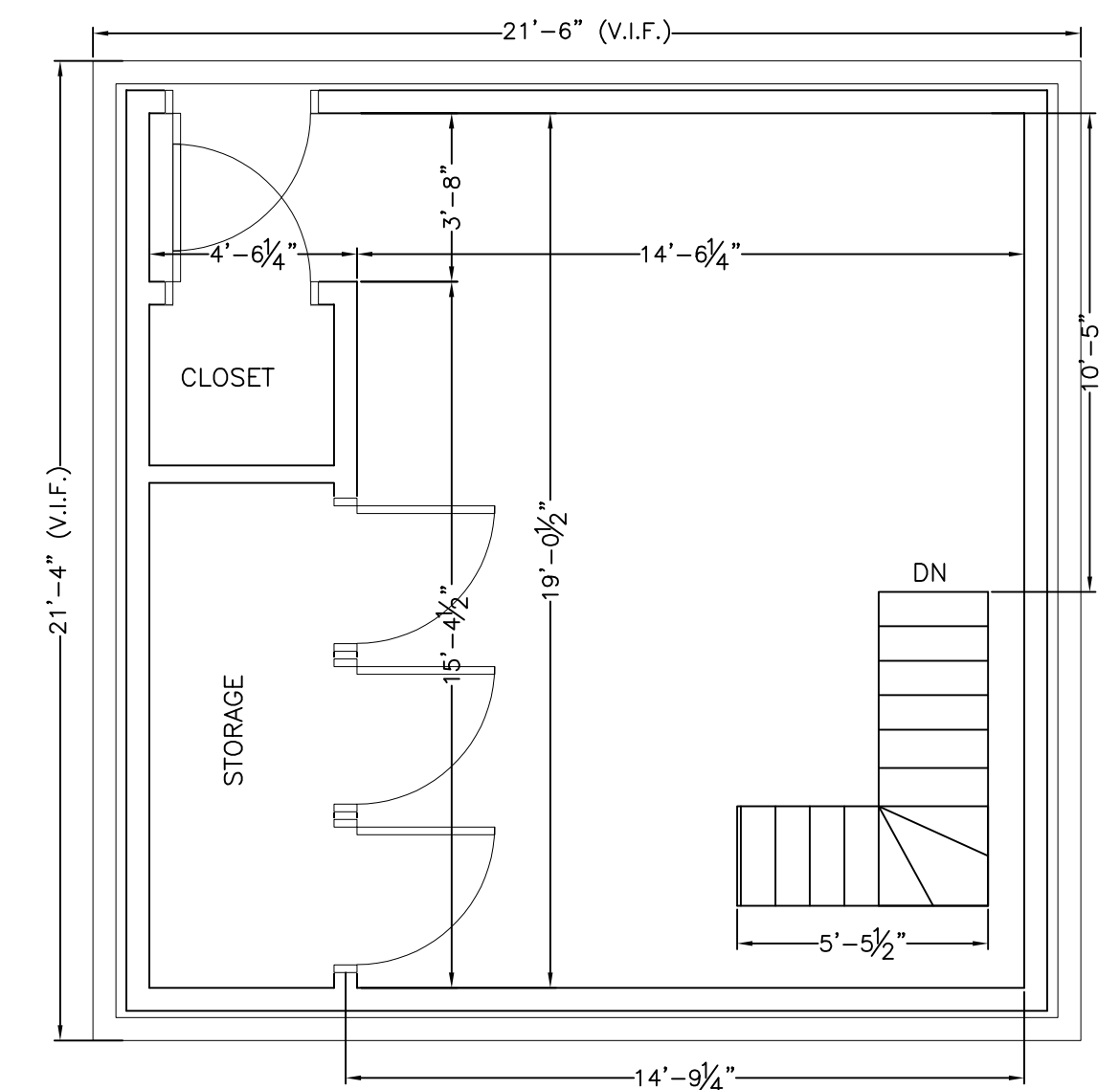
EXISTING SECOND FLOOR PLAN



EXISTING THIRD FLOOR PLAN



EXISTING FOURTH FLOOR PLAN



EXISTING LOFT PLAN

PERMIT SET

10/04/20	LOFT REVISED
DATE	REVISION

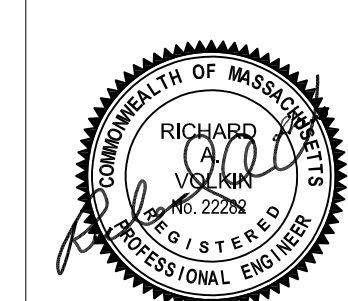
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EXISTING FLOOR PLANS

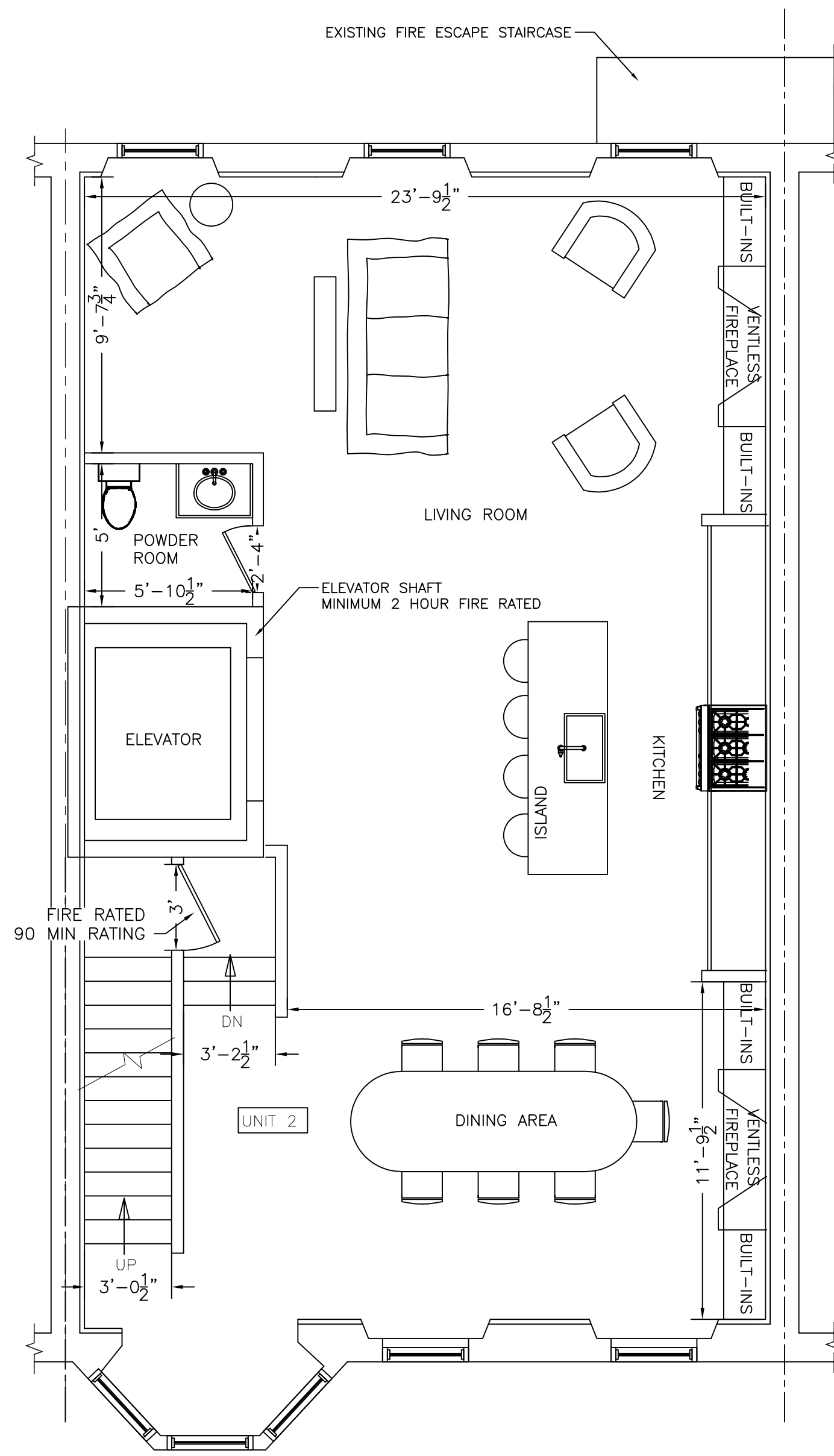
30 CHESTNUT STREET,  
BOSTON, MASSACHUSETTS

**RAV** & Assoc., Inc.  
21 HIGHLAND AVENUE  
NEEDHAM, MASSACHUSETTS 02494  
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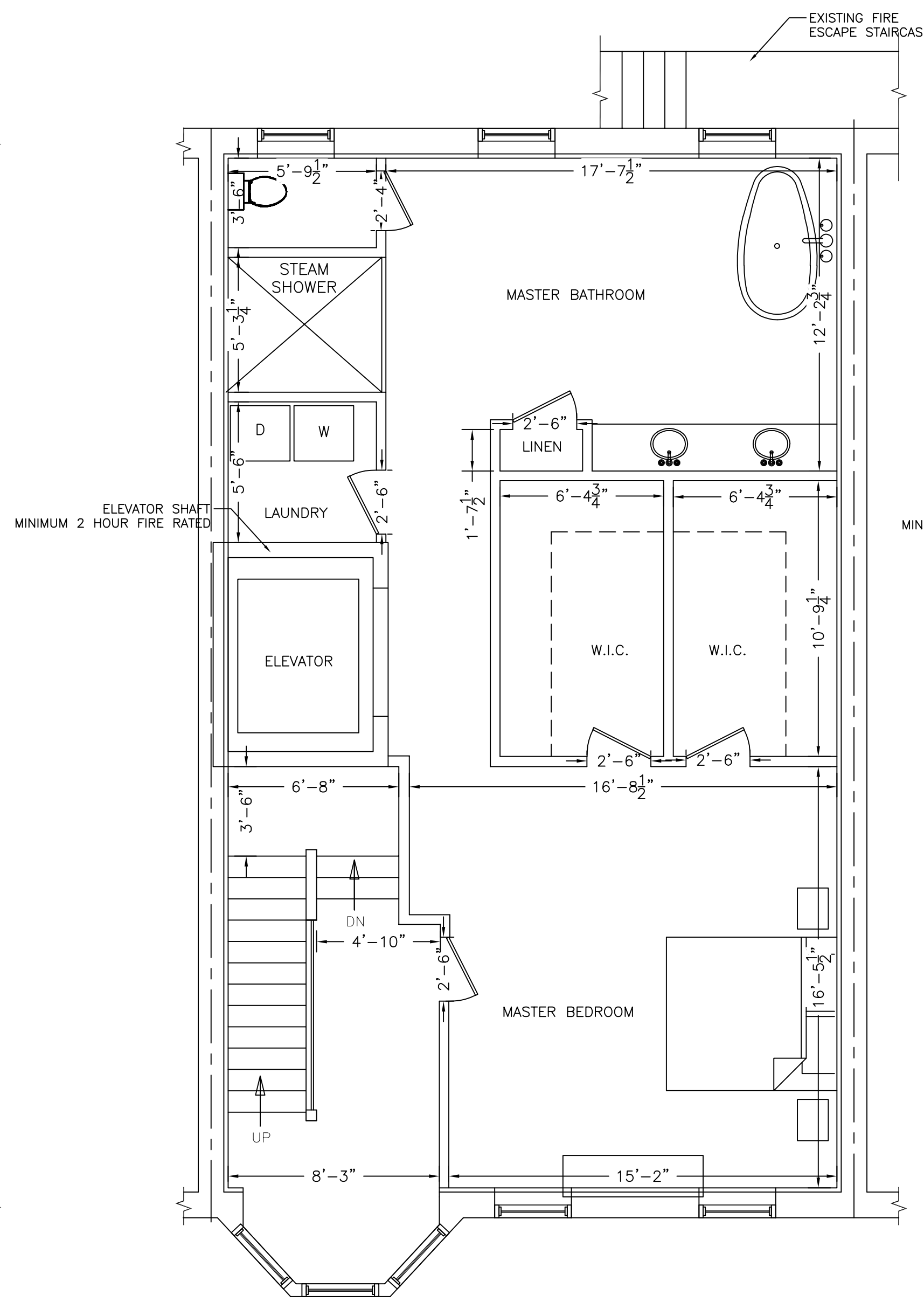
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	DATE: 08/08/2019	DRAWN BY: E.F.	
		CHECKED BY: R.A.V.	



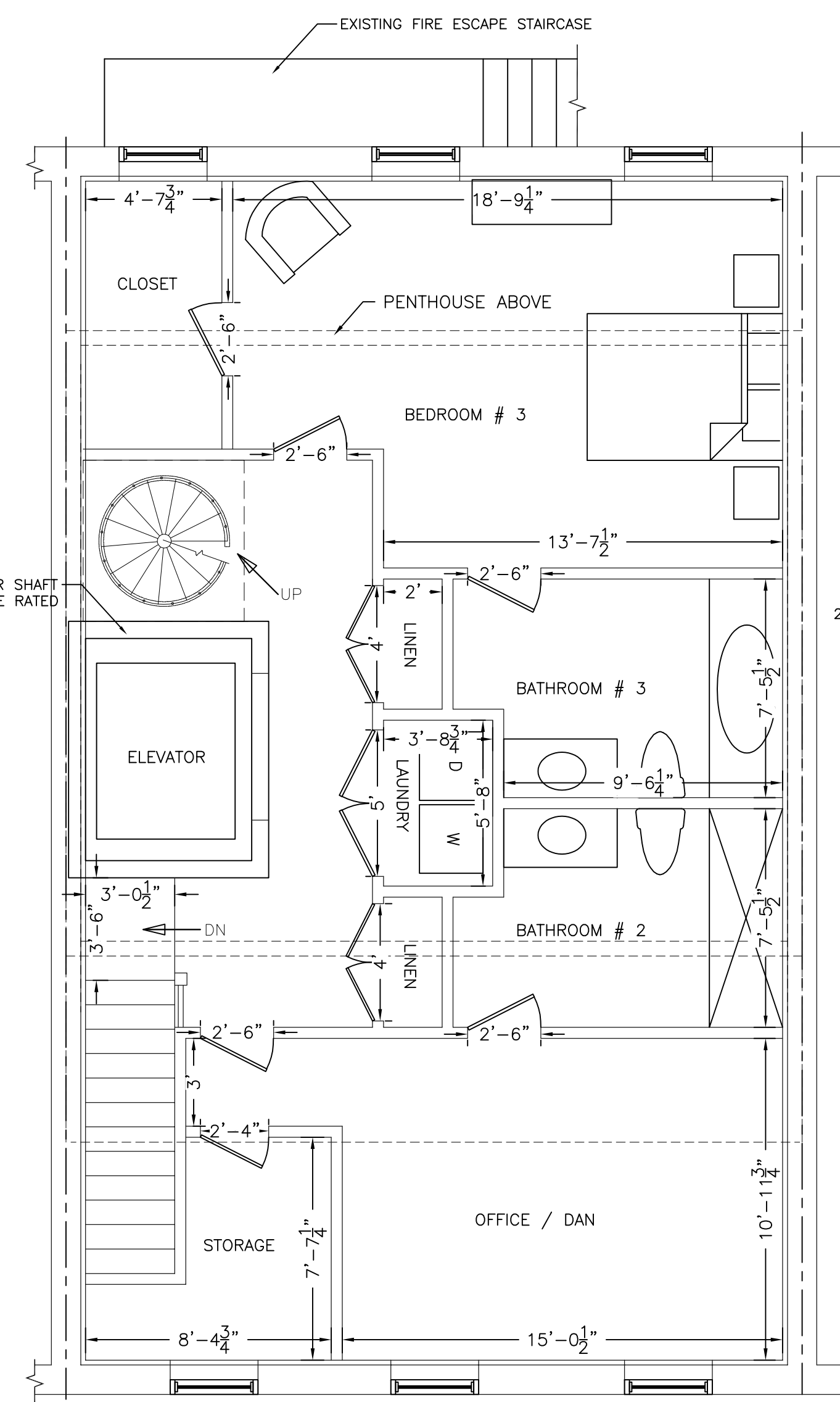




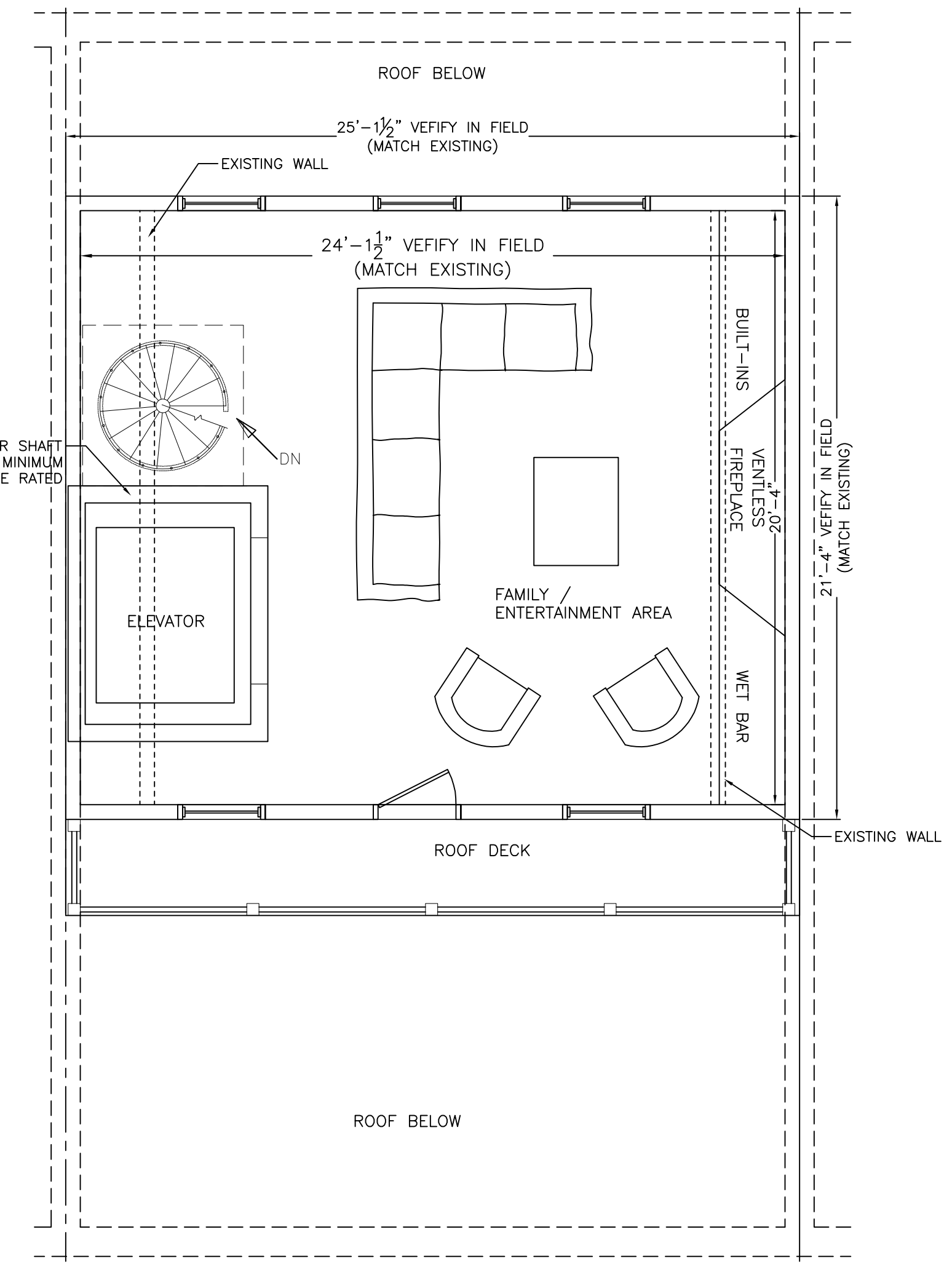
SECOND FLOOR PLAN  
FINISH FLOOR HEIGHT = 9'-5"



THIRD FLOOR PLAN  
FINISH FLOOR HEIGHT = 8'-1"

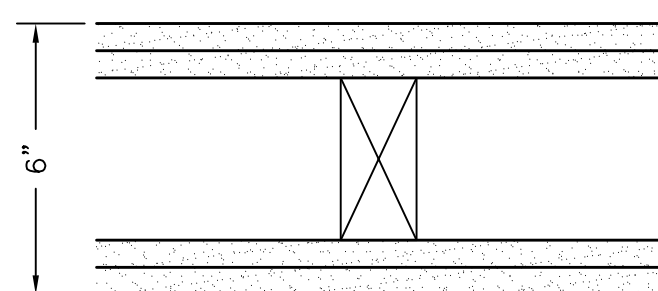


FOURTH FLOOR PLAN  
FINISH FLOOR HEIGHT = 9'-0"



PENTHOUSE PLAN

PERMIT SET



System Performance  
2 HR Fire  
UL Design U301

TWO LAYER 5/8" CONTINENTAL FIRECHECK TYPE X APPLIED VERT. OR HORZ. EACH SIDE OF 2x4 WOOD STUDS 16" O.C. FIRST LAYER ATTACHED WITH 1-7/8" NAILS 6" O.C. SECOND LAYER 2-3/8" NAILS 8" O.C. JOINTS STAGGERED BETWEEN LAYER & OPP. SIDES.

- NOTES:
- INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
  - IN PLACE OF 5/8" FIRECHECK TYPE X ANY OF THE FOLLOWING MAY BE USED: 5/8" FIRECHECK SOFFITBOARD TYPE X, 5/8" RAPID DECO? LEVEL 5 TYPE X, 5/8" FIRECHECK? PLASTERBASE TYPE X, 5/8" PROTECTA? AR 100 TYPE X, 5/8" PROTECTA? HIR 300 TYPE X, 5/8" MOLD DEFENSE? TYPE X, 5/8" WEATHER DEFENSE? TYPE X.

STAIR ENCLOSURE  
WALL DETAIL

10/07/20	3rd AND 4th PLANS REVISED
10/04/20	PENTHOUSE REVISED
10/04/20	FIRE ESCAPE STAIRCASE ADDED
DATE	REVISION

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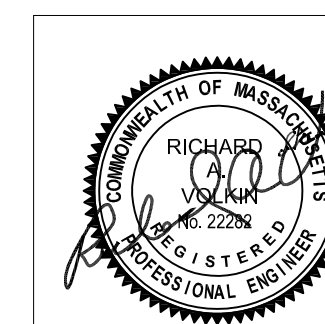
PROPOSED FLOOR PLANS

30 CHESTNUT STREET,  
BOSTON, MASSACHUSETTS

**RAV** & Assoc., Inc.  
21 HIGHLAND AVENUE  
NEEDHAM, MASSACHUSETTS 02494  
TELEPHONE: (781) 449-8200 FAX: (781) 449-8205

SCALE: 1/4"=1'-0"

APPROVED: R.A.V.	DESIGNED BY: I.M.	DRAWING No.
DATE: 06/28/2020	DRAWN BY: I.K.	A-4
	CHECKED BY: R.A.V.	







28 CHESTNUT STREET

30 CHESTNUT STREET

32 CHESTNUT STREET

EXISTING FRONT ELEVATION

NOTES:

ALL ELEVATIONS ARE PREPARED BY  
 CHOO & COMPANY INC,  
 ONE BILLINGS ROAD, QUINCY MA.  
 SUBMITTED BY OWNER.

PERMIT SET

DATE	REVISION

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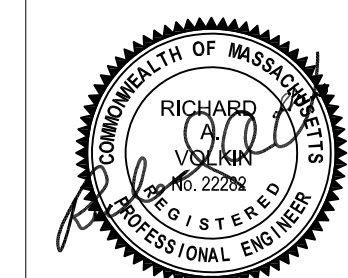
EXISTING FRONT ELEVATION

30 CHESTNUT STREET,  
 BOSTON, MASSACHUSETTS

**RAV** & Assoc., Inc.  
 21 HIGHLAND AVENUE  
 NEEDHAM, MASSACHUSETTS 02494  
 TELEPHONE: (781) 449-8200 FAX: (781) 449-8205

SCALE: 1/4"=1'-0"

APPROVED: R.A.V.	DESIGNED BY: I.M.	DRAWING No.
DATE: 06/28/2020	DRAWN BY: I.K.	A-5
	CHECKED BY: R.A.V.	





NOTES:  
 ALL ELEVATIONS ARE PREPARED BY  
 CHOO & COMPANY INC,  
 ONE BILLINGS ROAD, QUINCY MA.  
 SUBMITTED BY OWNER.

PERMIT SET

DATE	REVISION
10/04/20	FIRE ESCAPE STAIRCASE ADDED

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EXISTING BACK ELEVATION

EXISTING BACK ELEVATION  
 30 CHESTNUT STREET,  
 BOSTON, MASSACHUSETTS

**RAV** & Assoc., Inc.  
 21 HIGHLAND AVENUE  
 NEEDHAM, MASSACHUSETTS 02494  
 TELEPHONE: (781) 449-8200 FAX: (781) 449-8205



SCALE: 1/4"=1'-0"	DESIGNED BY: I.M.	DRAWING No.
APPROVED: R.A.V.	DRAWN BY: I.K.	A-6
DATE: 06/28/2020	CHECKED BY: R.A.V.	



- NOTES:
- CLEAN AND REPOINT AND REPAIR MASONRY AS REQUIRED;
  - REPLACE EXISTING WINDOWS, FRONT AND REAR, WITH NEW DOUBLE INSULATED GLASS WOOD WINDOWS TO MATCH IN KIND. REMOVE ALL STORM WINDOWS.
  - REPLACE PAINTED WOOD FRONT SHUTTERS IN KIND.
  - REPLACE COPPER GUTTER AND RELOCATE DOWNSPOUT ON TO INTERIOR OF PROPERTY.
  - REPLACE GRANITE CURBSTONE, REINSTALL BRICK SIDEWALK TO REMOVE UNSAFE CHANGE IN LEVEL BETWEEN DRIVEWAY AND DOOR.

NOTES:

ALL ELEVATIONS ARE PREPARED BY CHOO & COMPANY INC, ONE BILLINGS ROAD, QUINCY MA. SUBMITTED BY OWNER.

28 CHESTNUT STREET

30 CHESTNUT STREET

32 CHESTNUT STREET

PROPOSED FRONT ELEVATION

PERMIT SET

DATE	REVISION

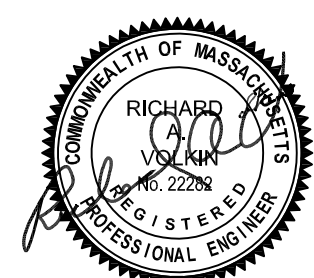
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PROPOSED FRONT ELEVATION

30 CHESTNUT STREET,  
BOSTON, MASSACHUSETTS

**RAV** & Assoc., Inc.  
21 HIGHLAND AVENUE  
NEEDHAM, MASSACHUSETTS 02494  
TELEPHONE: (781) 449-8200 FAX: (781) 449-8205

SCALE: 1/4"=1'-0"	DESIGNED BY: I.M.	DRAWING No. A-7
APPROVED: R.A.V.	DRAWN BY: I.K.	CHECKED BY: R.A.V.
DATE: 06/28/2020		





PROPOSED BACK ELEVATION

NOTES:

ALL ELEVATIONS ARE PREPARED BY  
 CHOO & COMPANY INC,  
 ONE BILLINGS ROAD, QUINCY MA.  
 SUBMITTED BY OWNER.

NOTES:

- CLEAN AND REPOINT AND REPAIR MASONRY AS REQUIRED;
- REPLACE EXISTING WINDOWS, FRONT AND REAR, WITH NEW DOUBLE INSULATED GLASS WOOD WINDOWS TO MATCH/IN KIND.
- REMOVE ALL STORM WINDOWS.
- REPAIR GARAGE HEADER IN KIND.
- CLEAN GARAGE BRICK FACADE AND REPOINT AND REPAIR BRICKS.
- REPLACE COPPER GUTTER AND RELOCATE DOWNSPOUT ON TO INTERIOR OF PROPERTY.
- INSTALL STEEL BALCONY AT FIRST FLOOR IN THE REAR PATIO.

PERMIT SET

DATE	REVISION
10/04/20	FIRE ESCAPE STAIRCASE ADDED

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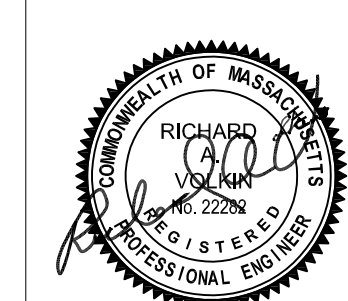
PROPOSED BACK ELEVATION

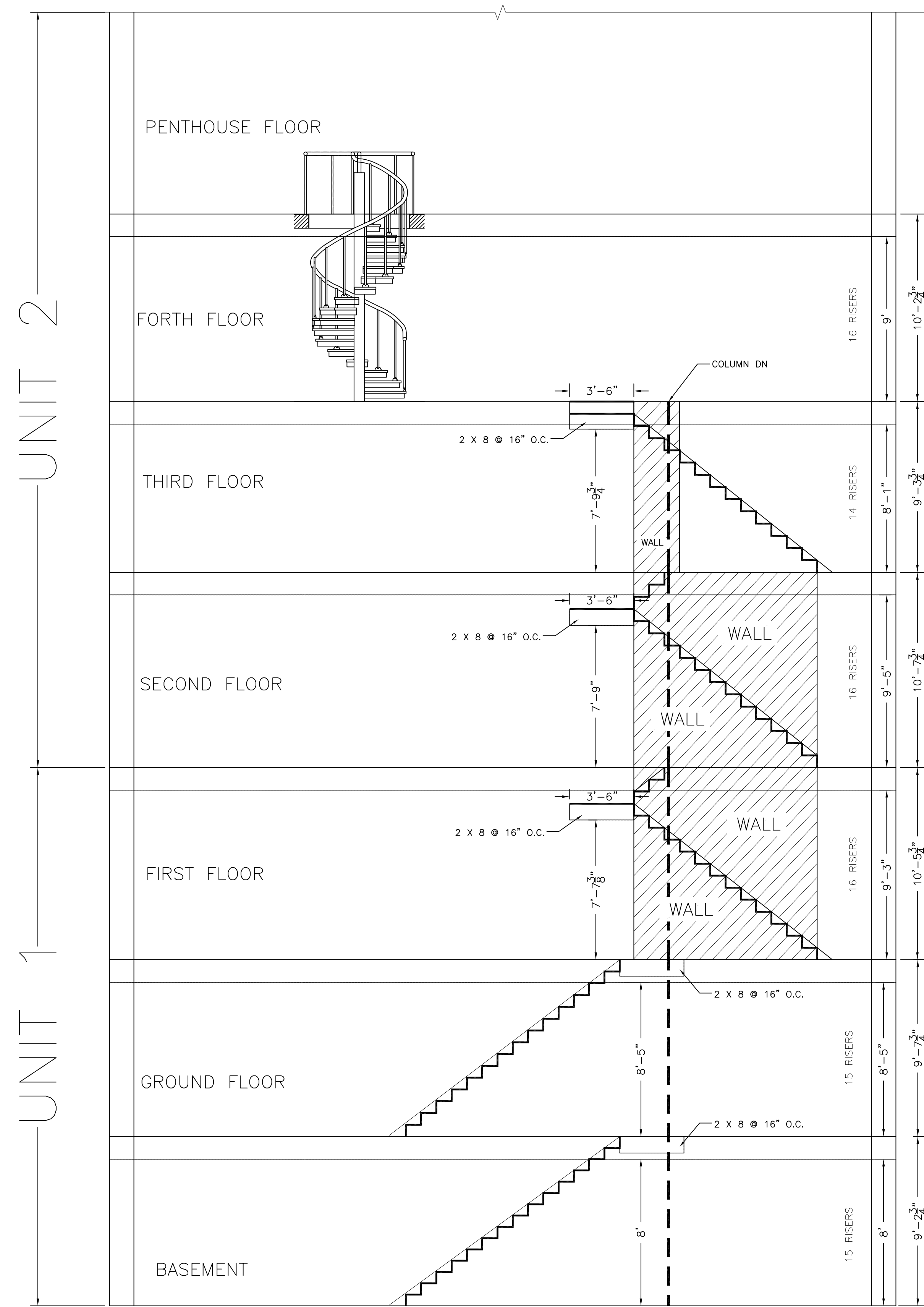
30 CHESTNUT STREET,  
 BOSTON, MASSACHUSETTS

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 21 HIGHLAND AVENUE  
 NEEDHAM, MASSACHUSETTS 02494  
 TELEPHONE: (781) 449-8200 FAX: (781) 449-8205

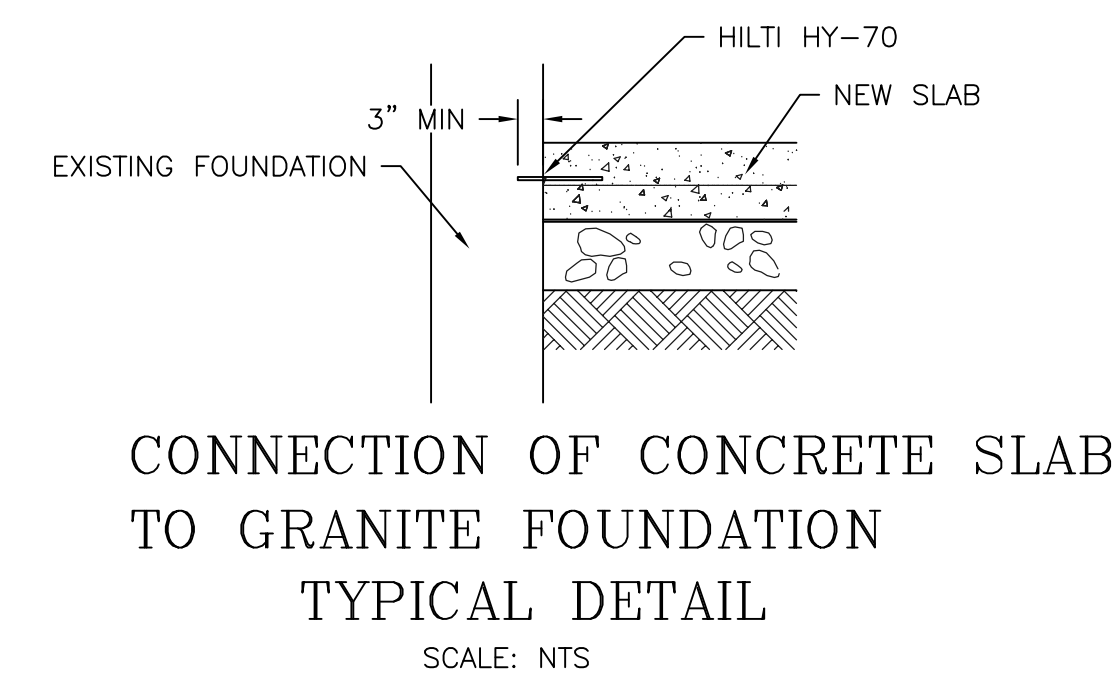
SCALE: 1/4"=1'-0"

APPROVED: R.A.V.	DESIGNED BY: I.M.	DRAWING No.
DATE: 06/28/2020	DRAWN BY: I.K.	A-8
	CHECKED BY: R.A.V.	

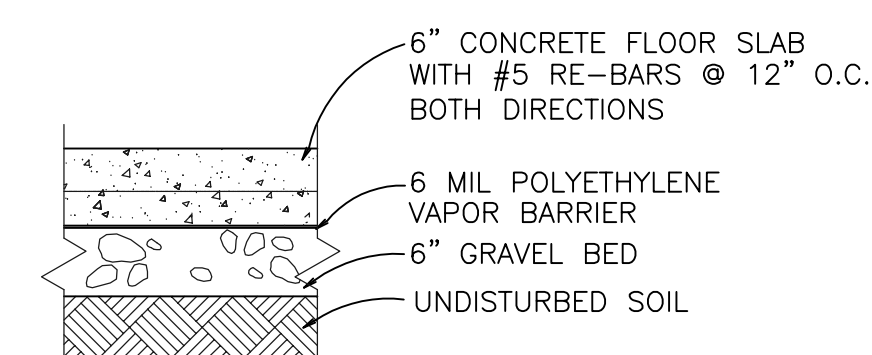




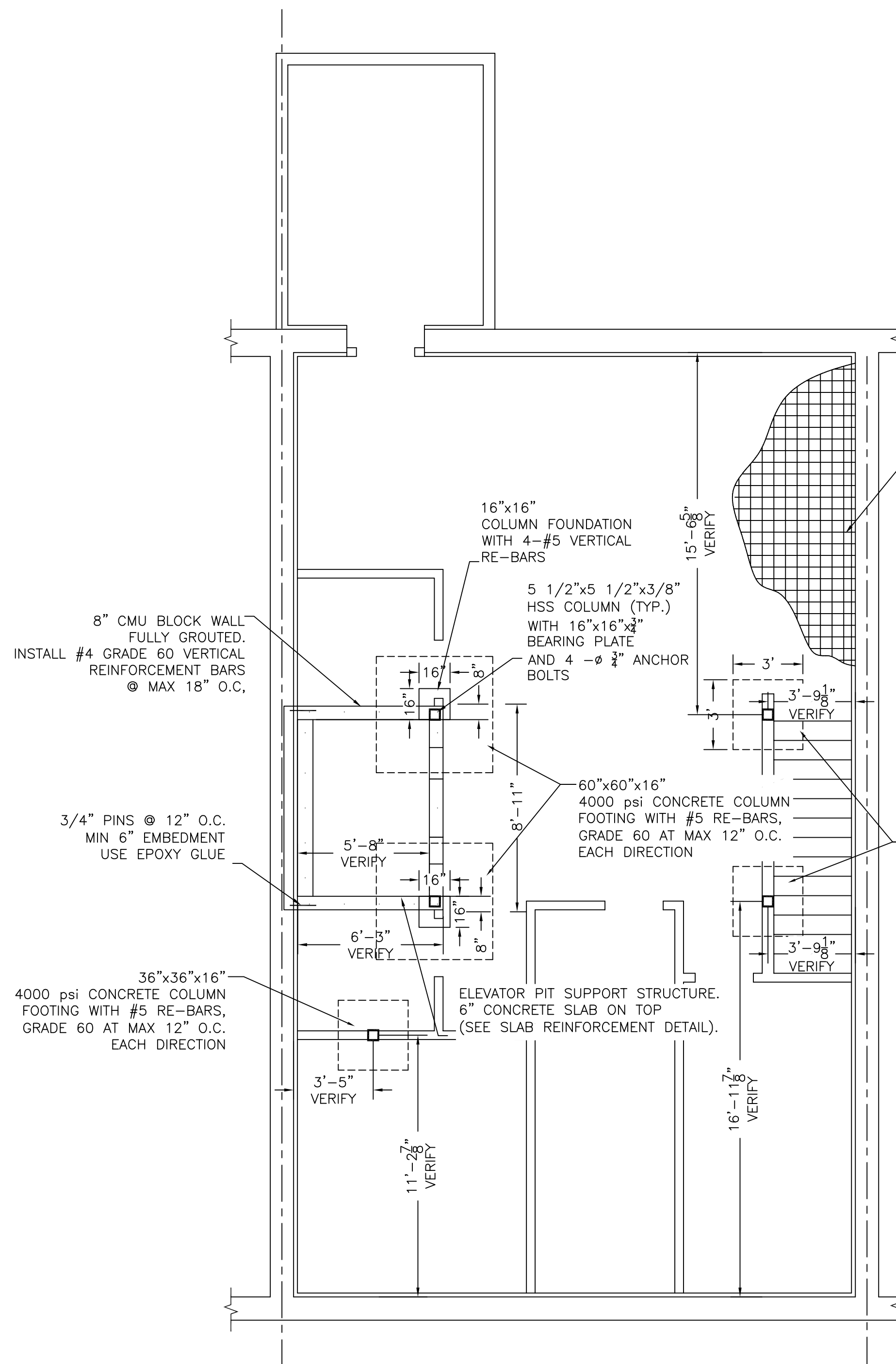
CROSS SECTION THROUGH STAIRCASES



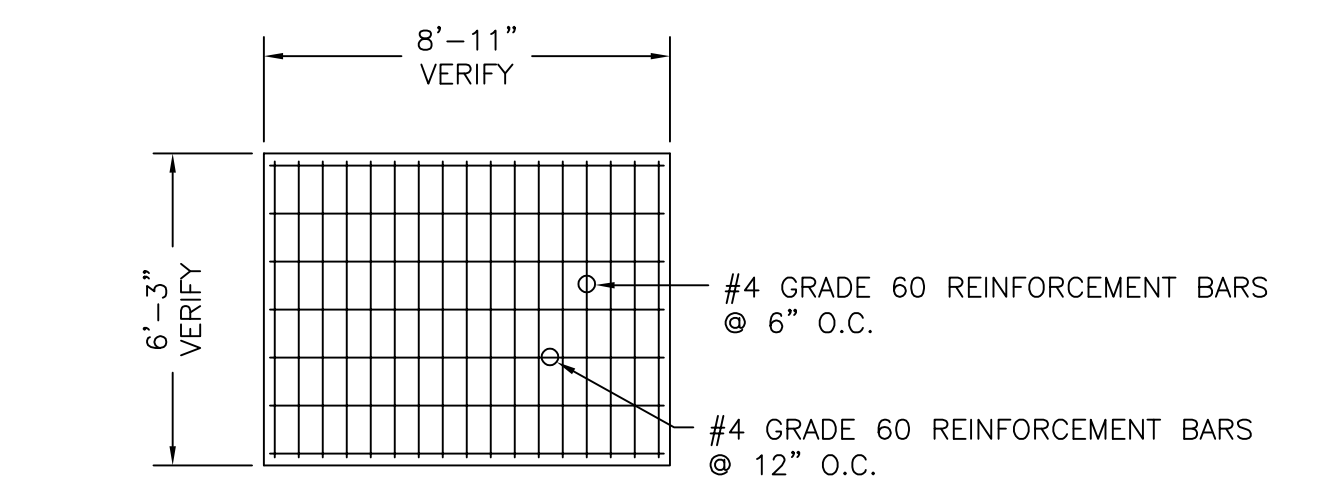
CONNECTION OF CONCRETE SLAB TO GRANITE FOUNDATION  
TYPICAL DETAIL  
SCALE: NTS



CONCRETE SLAB ON GRADE  
TYPICAL DETAIL  
SCALE: NTS



ELEVATOR FOUNDATION



STRUCTURAL SLAB  
(BOTTOM OF ELEVATOR PIT)  
REINFORCEMENT DETAIL

- FOUNDATION NOTES:
- A. GENERAL: (UNLESS OTHERWISE NOTED)
- 1.) ALL WORK SHALL CONFORM WITH THE MASS. STATE BUILDING CODE, THE CITY OF BOSTON ZONING BY LAWS, AND ALL APPLICABLE OSHA STANDARDS.
  - 2.) ANY WOOD FRAMING MEMBERS IN DIRECT CONTACT WITH CONCRETE SURFACES SHALL BE COATED WITH PRESERVATIVE.
  - 3.) ALL FOUNDATION WALLS SHALL BE BRACED DURING THE OPERATIONS OF BACKFILLING AND COMPACTION. BRACING SHALL BE LEFT IN POSITION UNTIL PERMANENT RESTRAINTS HAVE BEEN INSTALLED.
  - 4.) CONCRETE WALLS TO BE DAMPPROOFED BELOW GRADE, EXTERIOR SIDE. LOCAL BUILDING DEPARTMENT SHALL INSPECT EXCAVATION PRIOR TO CONSTRUCTION OF FOOTING AND WALLS, AND AT OTHER INTERVALS IN ACCORDANCE WITH LOCAL STANDARD PRACTICES.
  - 5.) IF THE CONTRACTOR MAKES ANY CHANGES OR DEVIATES FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE ENGINEER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TOTAL DESIGN.
  - 6.) SLAB POURED ON GROUND SHALL REST AGAINST 6" COMPACTED SAND ON 1 LAYER OF POLYETHYLENE SHEETING (6 MILS).

- B. FOUNDATION REQUIREMENTS:
- 1.) THE BOTTOM OF FOOTINGS SHALL BEAR ON UNDISTURBED INORGANIC GRANULAR SOIL OR COMPACTED STRUCTURAL FILL WITH A SAFE ALLOWABLE BEARING PRESSURE OF MINIMUM 2 TONS/SQ FT.
  - 2.) IF ORGANICS ARE ENCOUNTERED IN THE EXCAVATION, WORK SHALL BE SUSPENDED AND THE ENGINEER CONTACTED PRIOR TO COMMENCING WORK.
  - 3.) CONCRETE SHALL BE PLACED "IN THE DRY" ONLY, AND NO CONCRETE SHALL BE PLACED ON FROZEN GROUND.
  - 4.) SPECIAL CARE SHALL BE TAKEN IN BACKFILLING WALLS AND UTILITY TRENCHES. BACKFILL MATERIAL SHALL BE COMPACTED IN 12" LAYERS MAXIMUM WITH POWER TAMPERS OR BY OTHER APPROVED EQUIPMENT.
  - 5.) WALLS RETAINING EARTH SHALL BE BACKFILLED EQUALLY EACH SIDE UNLESS ADEQUATELY BRACED.

- C. CONCRETE: (UNLESS OTHERWISE NOTED)
- 1.) CONCRETE WORK SHALL CONFORM TO THE LATEST AMERICAN CONCRETE INSTITUTE BUILDING CODE, STANDARDS, RECOMMENDED PRACTICES AND SPECIFICATIONS AS REVISED TO DATE.
  - 2.) CONCRETE SHALL BE MIXED IN THE SPECIFIED PROPORTIONS TO GIVE MINIMUM COMPRESSIVE STRENGTH AT THE END OF 28 DAYS OF 3000 PSI.
  - 3.) CONSTRUCTION JOINTS IN STRUCTURAL CONCRETE SHALL BE LOCATED IN THE MIDDLE THIRD OF THE SPAN OR OTHER APPROVED LOCATION OF MINIMUM SHEAR.

- D. REINFORCING STEEL: (UNLESS OTHERWISE NOTED)
- 1.) BARS SHALL BE HIGH BOND DEFORMED BARS MEETING ASTM A-615, GRADE 60.
  - 2.) WHERE OPENINGS OCCUR IN WALLS OR SLABS, PROVIDE 2 - #4 EACH FACE EACH SIDE OF OPENINGS AND EXTEND 2'-6" BEYOND OPENING.
  - 3.) SLABS ON GRADE SHALL BE REINFORCED WITH 6x6-W10xW10 WELDED WIRE FABRIC. LAP CROSS WIRES ONE SPACE PLUS 2" ALL SIDES.

- E. MISCELLANEOUS: (UNLESS OTHERWISE NOTED)
- 1.) VERIFY IN FIELD ALL LOCATIONS AND CONDITIONS IN THE STRUCTURE SHOWN ON THE DRAWINGS AND/OR AFFECTING THE INSTALLATION OF NEW WORK. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE FABRICATION OF DEPENDENT WORK.
  - 2.) IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ADEQUATE SHORING AND BRACING TO SAFELY SUPPORT THE BUILDING DURING CONSTRUCTION. ANY APPROVAL BY THE ENGINEER WILL NOT RELIEVE THE CONTRACTOR OF FULL RESPONSIBILITY, FOR SHORING AND/OR BRACING.
  - 3.) DURING THE CONSTRUCTION PHASE OF THE PROJECT THE CONTRACTOR SHALL REVIEW DESIGN LOADS TO LIMIT AND CONTROL CONSTRUCTION LOADING, INCLUDING BUT NOT LIMITED TO MATERIAL STOCK PILING AND CONSTRUCTION EQUIPMENT.

PERMIT SET

DATE	REVISION

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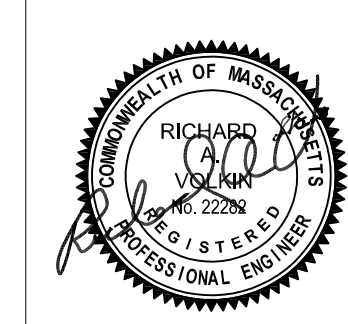
**FOUNDATION PLAN  
TYPICAL DETAILS**

**30 CHESTNUT STREET,  
BOSTON, MASSACHUSETTS**

**RAV & Assoc., Inc.**  
21 HIGHLAND AVENUE  
NEEDHAM, MASSACHUSETTS 02494  
TELEPHONE: (781) 449-8200 FAX: (781) 449-8205

SCALE: 1/4"=1'-0"

APPROVED: R.A.V.	DESIGNED BY: I.M.	DRAWING No.
DATE: 06/28/2020	DRAWN BY: I.K.	S-1
	CHECKED BY: R.A.V.	





1 3/4"x11 7/8" LVL LEDGER ANCHORED TO THE BRICK WALL WITH HILTI HY70 ANCHOR SYSTEM, 10"x3/4" HILTI THREADED RODS @ 16" O.C. AND STAGGERED AND SET 6" INTO BRICK (TYP.)

X-BRIDGING AT MAX 8 FT O.C. (TYP.)

1 3/4"x11 7/8" LVL LEDGER ANCHORED TO THE BRICK WALL WITH HILTI HY70 ANCHOR SYSTEM, 10"x3/4" HILTI THREADED RODS @ 16" O.C. AND STAGGERED AND SET 6" INTO BRICK (TYP.)

1 3/4"x11 7/8" LVL LEDGER ANCHORED TO THE BRICK WALL WITH HILTI HY70 ANCHOR SYSTEM, 10"x3/4" HILTI THREADED RODS @ 16" O.C. AND STAGGERED AND SET 6" INTO BRICK (TYP.)

1 3/4"x11 7/8" LVL LEDGER ANCHORED TO THE BRICK WALL WITH HILTI HY70 ANCHOR SYSTEM, 10"x3/4" HILTI THREADED RODS @ 16" O.C. AND STAGGERED AND SET 6" INTO BRICK (TYP.)

X-BRIDGING AT MAX 8 FT O.C. (TYP.)

SEE DETAIL FOR TYPICAL BEAM TO WALL CONNECTION (TYP. FOR ALL BEAMS)

SEE DETAIL FOR TYPICAL BEAM TO WALL CONNECTION (TYP. FOR ALL BEAMS)

1 3/4"x11 7/8" LVL LEDGER ANCHORED TO THE BRICK WALL WITH HILTI HY70 ANCHOR SYSTEM, 10"x3/4" HILTI THREADED RODS @ 16" O.C. AND STAGGERED AND SET 6" INTO BRICK (TYP.)

GROUND FLOOR FRAMING

1 3/4"x11 7/8" LVL LEDGER ANCHORED TO THE BRICK WALL WITH HILTI HY70 ANCHOR SYSTEM, 10"x3/4" HILTI THREADED RODS @ 16" O.C. AND STAGGERED AND SET 6" INTO BRICK (TYP.)

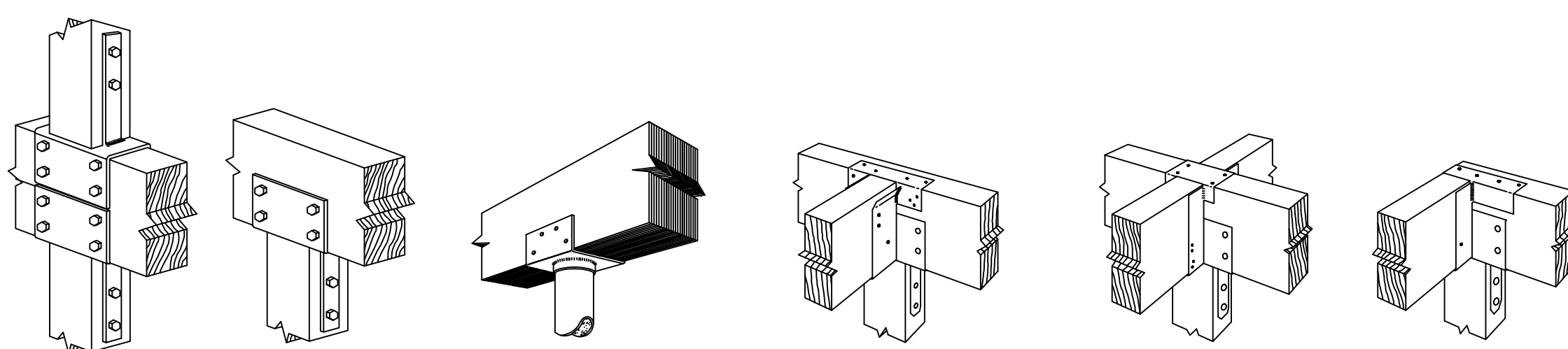
FIRST FLOOR FRAMING

NOTES:

REFER TO BOISE CASCADE OPEN WEB JOISTS INSTALLATION GUIDE, STANDARD DETAILS AND SPECIFICATIONS AND MANUFACTURER'S RECOMMENDATIONS.

NOTE:

COLUMNS OR BUILD-UP STUDS MUST BE INSTALLED UNDER EACH BEAM AND HEADER SUPPORT (TYP.) WHETHER IT IS SHOWN OR NOT ON THE PLANS. THESE COLUMNS MUST CARRY THE LOAD DOWN TO THE FOUNDATION OR BEAM BELOW.



TYPE CC TYPE LCC TYPE CC/GLT TYPE CC/WD TYPE CC/HW

TYPICAL BEAM/COLUMN CONNECTION DETAILS  
SCALE: NTS

PERMIT SET

DATE	REVISION

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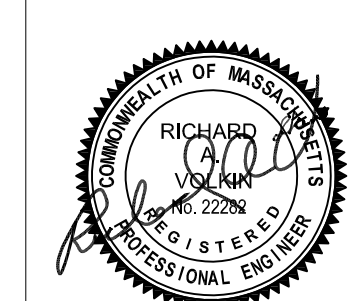
**FRAMING PLANS  
TYPICAL DETAILS**

30 CHESTNUT STREET,  
BOSTON, MASSACHUSETTS

**RAV & Assoc., Inc.**  
21 HIGHLAND AVENUE  
NEEDHAM, MASSACHUSETTS 02494  
TELEPHONE: (781) 449-8200 FAX: (781) 449-8205

SCALE: 1/4"=1'-0"

APPROVED: R.A.V.	DESIGNED BY: I.M.	DRAWING No.
DATE: 06/28/2020	DRAWN BY: I.K.	S-2
	CHECKED BY: R.A.V.	





1 3/4"x11 7/8" LVL LEDGER ANCHORED TO THE BRICK WALL WITH HILTI HY70 ANCHOR SYSTEM, 10"x3" HILTI THREADED RODS @ 16" O.C. AND STAGGERED AND SET 6" INTO BRICK (TYP.)

DOUBLE JOISTS UNDER SPIRAL STAIRCASE SUPPORT

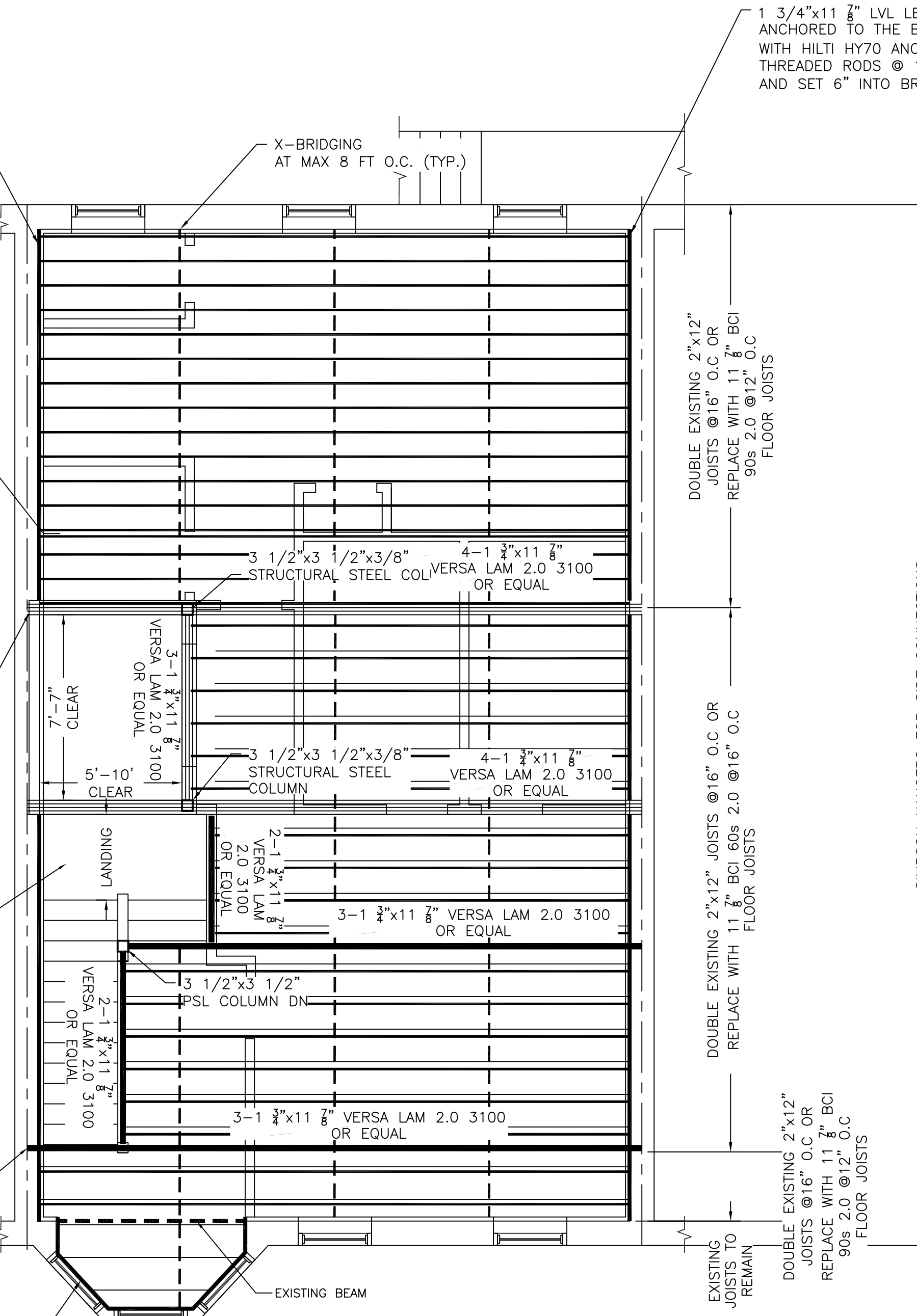
SEE DETAIL FOR TYPICAL BEAM TO WALL CONNECTION (TYP. FOR ALL BEAMS)

2 X 8 @ 16" O.C. LANDING FRAMING

WRAP BEAM END WITH BUILDING PAPER, INSERT INTO BRICK WALL PROVIDE FIRE CUT (TYPICAL FOR ALL BEAMS)

1 3/4"x11 7/8" LVL LEDGER ANCHORED TO THE BRICK WALL WITH HILTI HY70 ANCHOR SYSTEM, 10"x3" HILTI THREADED RODS @ 16" O.C. AND STAGGERED AND SET 6" INTO BRICK (TYP.)

### FOURTH FLOOR FRAMING



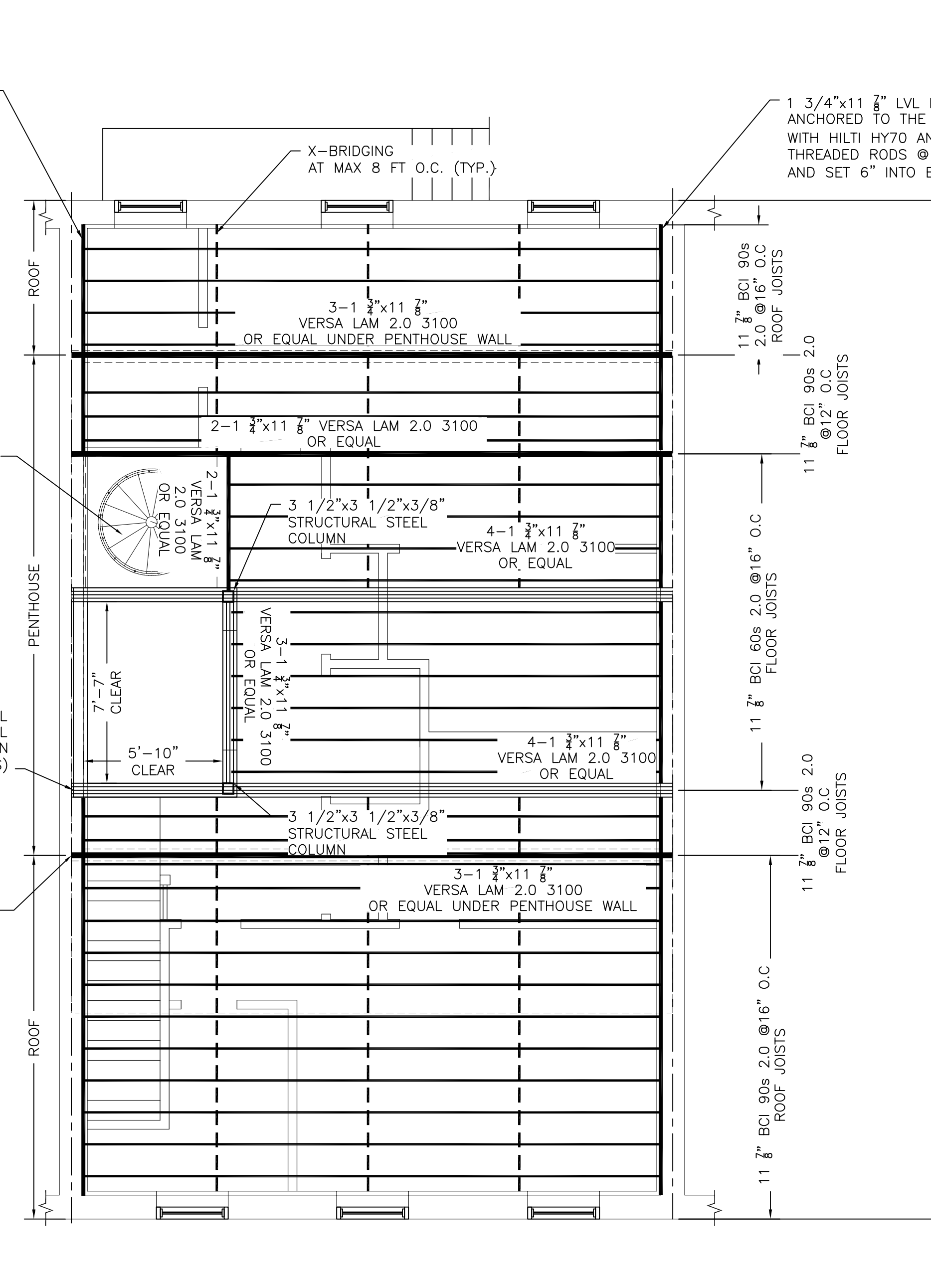
1 3/4"x11 7/8" LVL LEDGER ANCHORED TO THE BRICK WALL WITH HILTI HY70 ANCHOR SYSTEM, 10"x3" HILTI THREADED RODS @ 16" O.C. AND STAGGERED AND SET 6" INTO BRICK (TYP.)

CLEAR OPENING TO BE VERIFIED IN FIELD PRIOR TO ROUGH OPENING FRAMING BASED ON SPIRAL STAIR DIMENSIONS

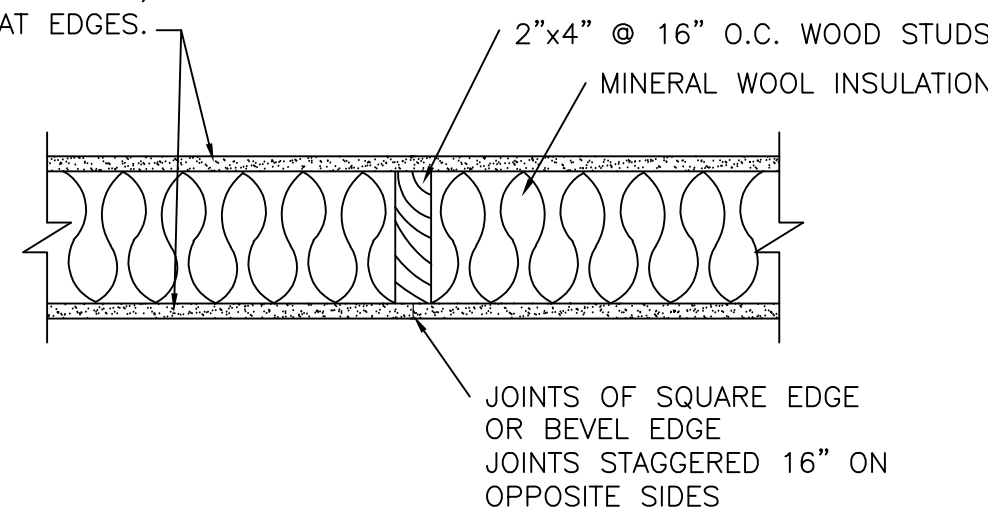
SEE DETAIL FOR TYPICAL BEAM TO WALL CONNECTION (TYP. FOR ALL BEAMS)

WRAP BEAM END WITH BUILDING PAPER, INSERT INTO BRICK WALL PROVIDE FIRE CUT (TYPICAL FOR ALL BEAMS)

### PENTHOUSE AND ROOF FRAMING



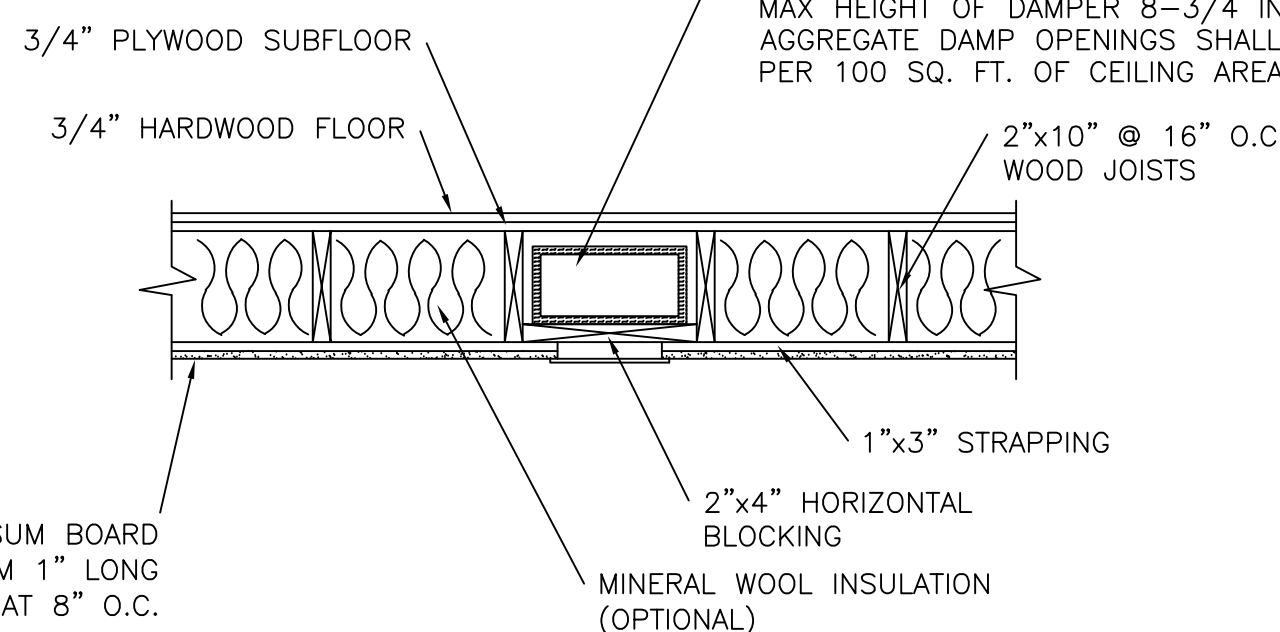
ONE LAYER OF 5/8" TYPE X GYPSUM BOARD APPLIED HORIZONTALLY OR VERTICALLY WITH 6d COATED NAILS, 1-7/8" LONG, 0.0915" SHANK, 1/4" HEADS, 7" O.C. AT EDGES.



### ONE HOUR FIRE SEPARATION WALL TYPICAL DETAIL UL U305

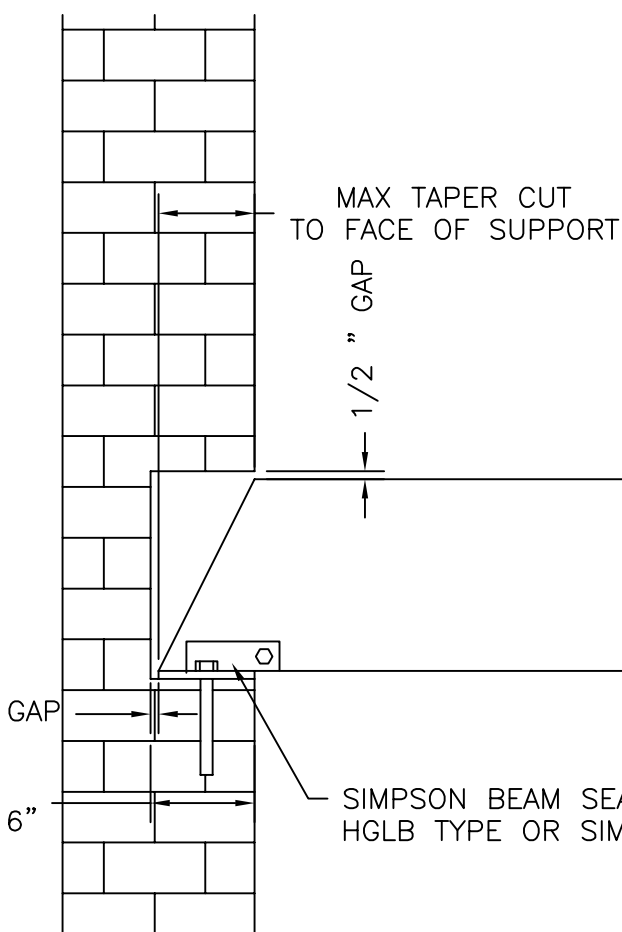
NOTE: ONE HOUR SEPARATION WALL MUST BE INSTALLED BETWEEN UNITS AND BETWEEN COMMON AREAS AND UNITS.

CEILING DAMPER  
MAX NOM AREA 198 SQ. IN.  
MAX RECTANGULAR SIZE 12 IN WIDE BY 16-1/2 IN LONG.  
MAX HEIGHT OF DAMPER 8-3/4 IN.  
AGGREGATE DAMP OPENINGS SHALL NOT EXCEED 99 SQ. IN. PER 100 SQ. FT. OF CEILING AREA.



### ONE HOUR FIRE SEPARATION FLOOR/CEILING ASSEMBLY TYPICAL DETAIL UL 263

NOTE: ONE HOUR SEPARATION ASSEMBLY MUST BE INSTALLED BETWEEN UNITS AND BETWEEN COMMON AREAS AND UNITS.

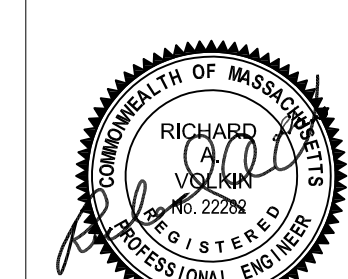


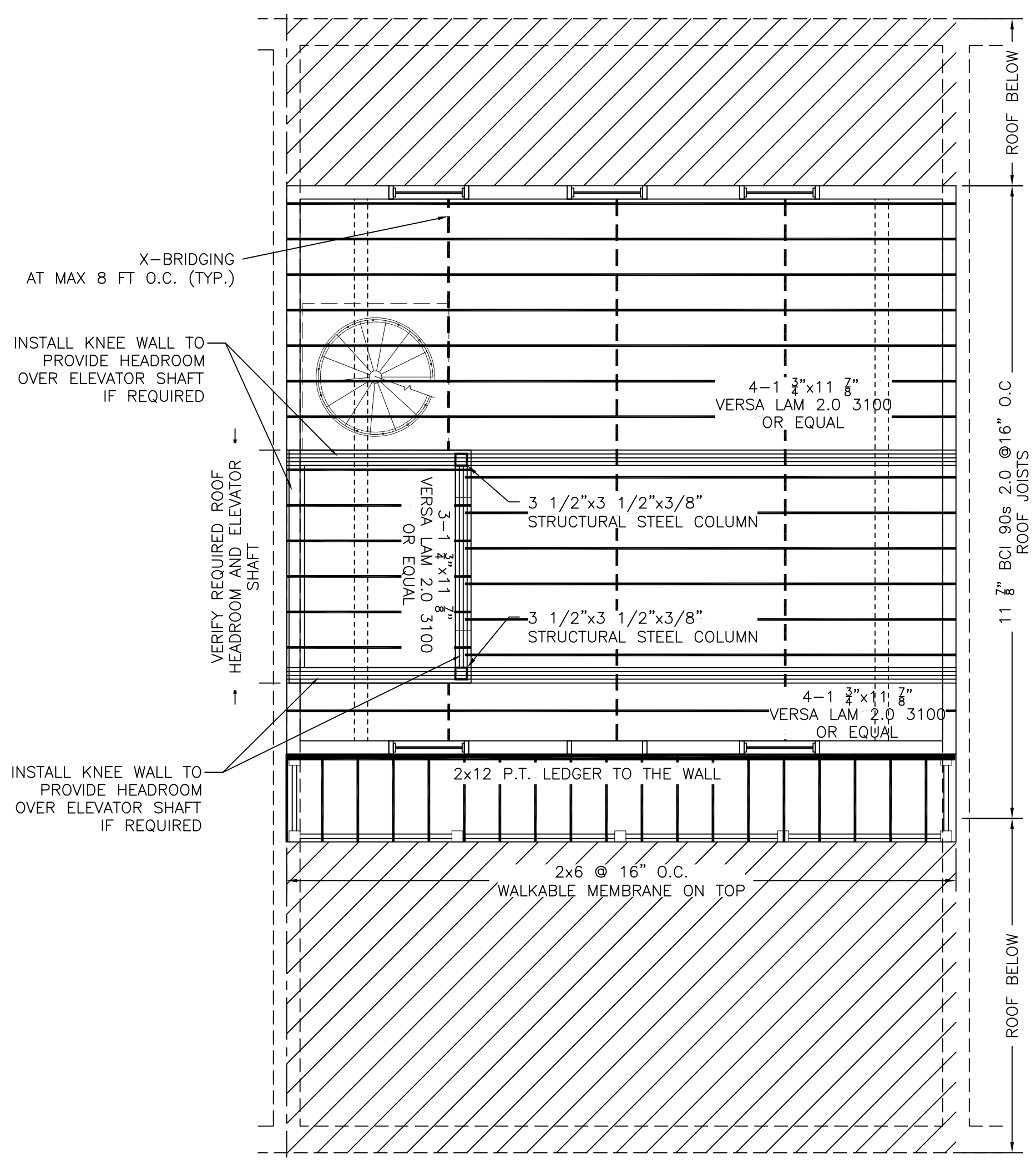
### TYPICAL BEAM TO WALL CONNECTION

SCALE: NTS

PERMIT SET

10/04/20	PENTHOUSE REVISED	REVISION
DATE		
<p>All legal rights including, but not limited to, copyright and design patent rights, in the designs, arrangements and plans shown on this document are the property of RAV&amp;Assoc., Inc. They may not be used or reused in whole or in part, except in connection with this project, without the prior written consent of RAV&amp;Assoc., Inc. Written dimensions on these drawings shall have precedence over scaled dimensions. Contractors shall verify and be responsible for all dimensions and conditions on this project, and RAV&amp;Assoc., Inc. must be notified of any variation from the dimensions and conditions shown by these drawings.</p>		
<p><b>FRAMING PLANS</b> <b>TYPICAL DETAILS</b></p> <p>30 CHESTNUT STREET, BOSTON, MASSACHUSETTS</p> <p><b>RAV &amp; Assoc., Inc.</b> 21 HIGHLAND AVENUE NEEDHAM, MASSACHUSETTS 02494 TELEPHONE: (781) 449-8200 FAX: (781) 449-8205</p>		
SCALE: 1/4"=1'-0"	APPROVED: R.A.V.	DESIGNED BY: I.M.
DATE: 06/28/2020	DRAWN BY: I.K.	CHECKED BY: R.A.V.
		DRAWING No. S-4





**PENTHOUSE ROOF FRAMING**

**NOTES:**

ALL EXPOSED WOOD AND WOOD IN DIRECT CONTACT WITH CONCRETE MUST BE PRESSURE TREATED.

THE PROPERTIES OF WOOD MUST BE AS DESIGNED OR BETTER.

SIMPSON CONNECTORS MUST BE USED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

CONTRACTOR MUST VERIFY ALL DIMENSIONS IN FIELD. IF ADJUSTMENTS ARE NECESSARY, CONTACT THE ENGINEER.

**NOTES:**

**CARPENTRY:**

ALL ROUGH CARPENTRY SHALL PRODUCE JOINTS TRUE, TIGHT, WITH ALL MEMBERS ASSEMBLED IN ACCORDANCE WITH THE DRAWINGS AND WITH ALL PERTINENT CODES AND REGULATIONS. CAREFULLY SELECT ALL MEMBERS. SELECT INDIVIDUAL PIECES SO THAT KNOTS AND DEFECTS WILL NOT INTERFERE WITH PLACING BOLTS OR PROPER NAILING OR MAKING CONNECTIONS. LUMBER MAY BE REJECTED BY THE ENGINEER, WHETHER OR NOT IT HAS BEEN INSTALLED, FOR EXCESSIVE WARP, TWIST, BOW, CROOK, MILDEW, FUNGUS, OR MOLD, AS WELL AS FOR IMPROPER CUTTING AND FITTING.

DO NOT SHIM SILLS, JOISTS, SHORT STUDS, TRIMMERS, HEADERS, LINTELS, OR OTHER FRAMING COMPONENTS. USE ONLY TREATED LUMBER FOR ALL WOOD BUCKS AND NAILING GROUNDS IN, OR IN CONTACT WITH CONCRETE.

TREAT ALL WOOD LESS THAN TWO FEET ABOVE FINISHED GRADE BY SPRAYING WITH THE PRESERVATIVE TO A MINIMUM DISTANCE OF SIX INCHES FROM THE ENDS. PERFORM ALL TREATMENT IN STRICT ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

IN ADDITION TO ALL FRAMING OPERATIONS NORMAL TO FABRICATION AND ERECTION INDICATED ON THE DRAWINGS, INSTALL ALL BACKING REQUIRED FOR WORK OF OTHER TRADES. MAKE ALL BEARINGS FULL. FINISH ALL BEARING SURFACES ON WHICH STRUCTURAL MEMBERS ARE TO REST SO AS TO GIVE SURE AND EVEN SUPPORT. WHERE FRAMING MEMBERS SLOPE, CUT OR NOTCH THE ENDS AS REQUIRED TO GIVE UNIFORM BEARING SURFACE.

INSTALL ALL BLOCKING REQUIRED TO SUPPORT ALL ITEMS OF FINISH AND TO CUT OFF ALL CONCEALED DRAFT OPENINGS, BOTH VERTICAL AND HORIZONTAL, BETWEEN CEILING AND FLOOR AREAS.

FIRE BLOCKS SHALL BE TWO INCHES IN THICKNESS (NOMINAL) BY THE FULL WIDTH OF THE OPENING BEING BLOCKED.

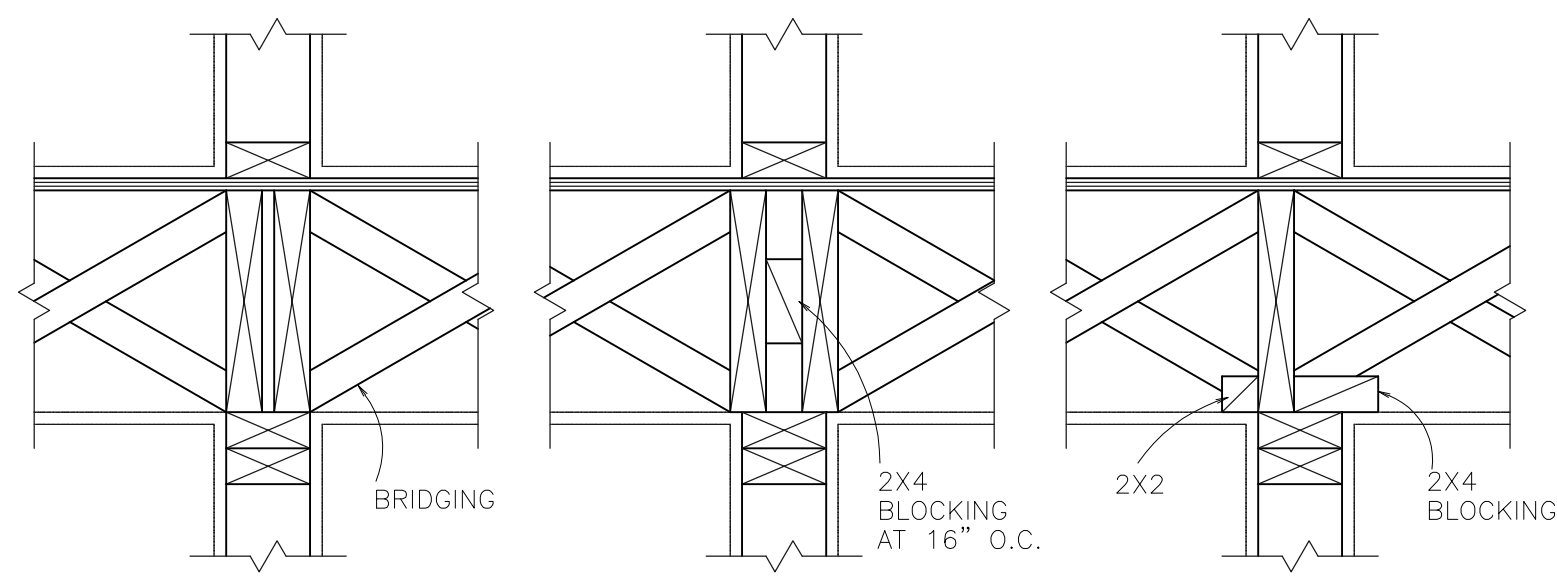
FIRE-BLOCK IN THE FOLLOWING SPECIFIC LOCATIONS:

- (1) IN ALL STUD WALLS AT CEILING AND FLOOR LEVELS;
- (2) IN ALL STUD WALLS, INCLUDING FURRED SPACES, SO THAT THE MAXIMUM DIMENSION OF EACH CONCEALED SPACE IS NOT MORE THAN EIGHT FEET;
- (3) ALL OTHER LOCATIONS WHERE OPENINGS COULD AFFORD PASSAGE FOR RODENTS OR FLAMES. INSTALL WOOD CROSS BRIDGING OF NOT LESS THAN TWO INCHES BY THREE INCHES NOMINAL, METAL CROSS BRIDGING OF EQUAL STRENGTH, OR SOLID BLOCKING BETWEEN JOISTS WHERE THE SPAN EXCEEDS EIGHT FEET.

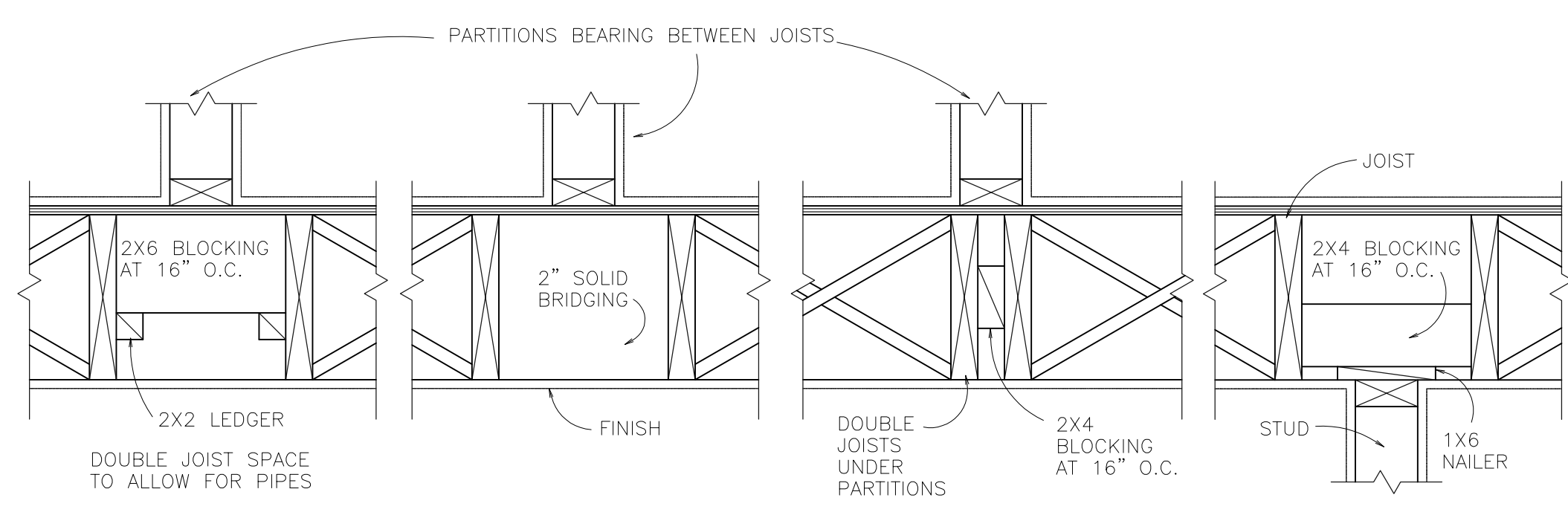
INSTALL SOLID BLOCKING BETWEEN JOISTS AT ALL POINTS OF SUPPORT AND WHEREVER SHEATHING OR FLOORING IS DISCONTINUOUS.

MAKE ALL STUDS SINGLE LENGTH, UNSPLICED, AND PLATFORM FRAMED. FRAME ALL CORNERS AND INTERSECTIONS WITH THREE OR MORE STUDS AND ALL REQUIRED BEARING FOR WALL FINISH. ON ALL FRAMING MEMBERS TO RECEIVE A FINISHED WALL OR CEILING, ALIGN THE FINISH SUBSURFACE TO VARY NOT MORE THAN 1/8" FROM THE PLANE OF SURFACES OF ADJACENT FRAMING AND FURRING MEMBERS.

PLACE ALL PLYWOOD WITH FACE GRAIN PERPENDICULAR TO SUPPORTS AND CONTINUOUSLY OVER AT LEAST TWO SUPPORTS. ALL DOORS AND WINDOWS MUST BE INSTALLED WITH ALL NECESSARY APPURTENANCES AND TRIMS.



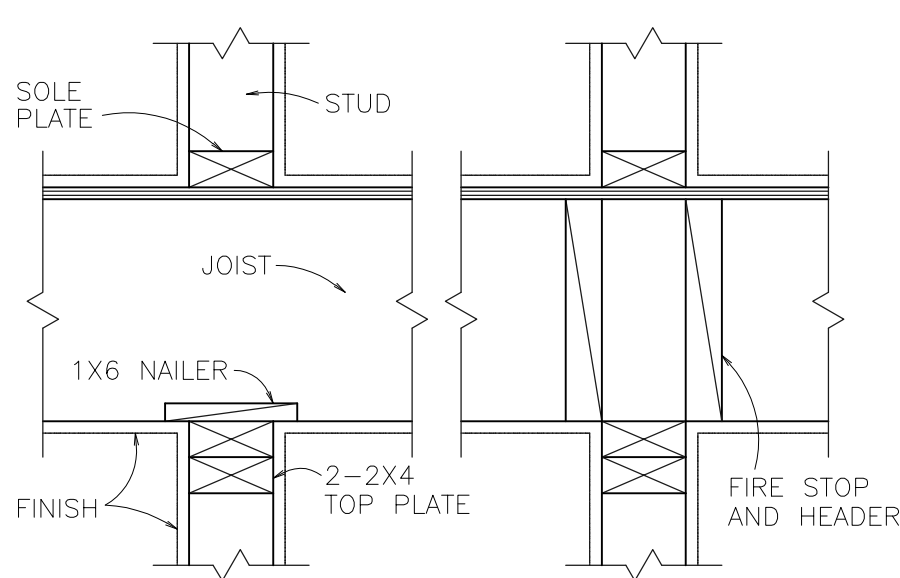
**PARTITIONS PARALLEL TO JOISTS**



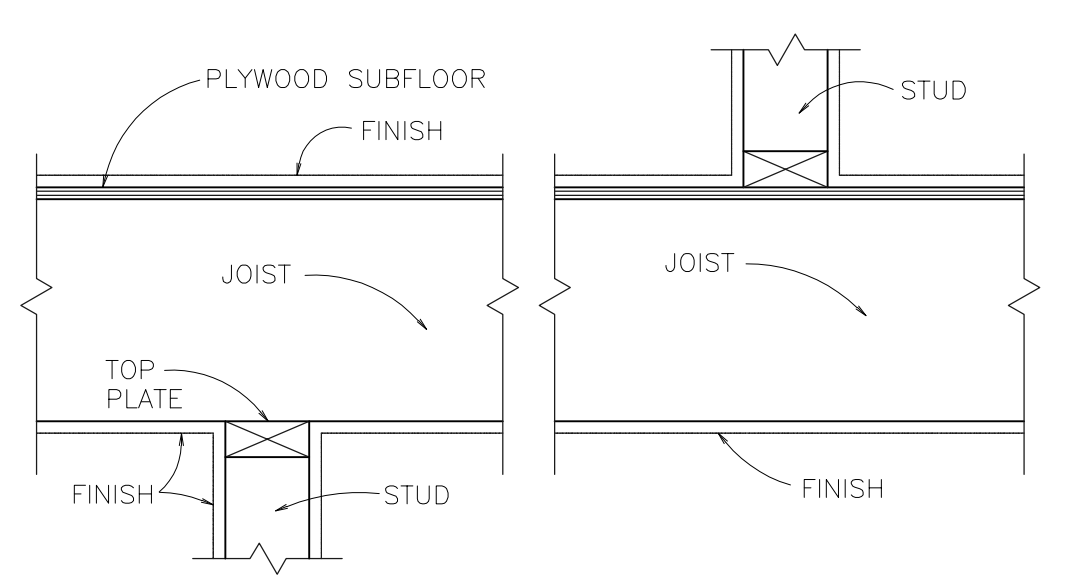
NO PARTITION BELOW

**PARTITIONS PARALLEL TO JOISTS**

NO PARTITION ABOVE

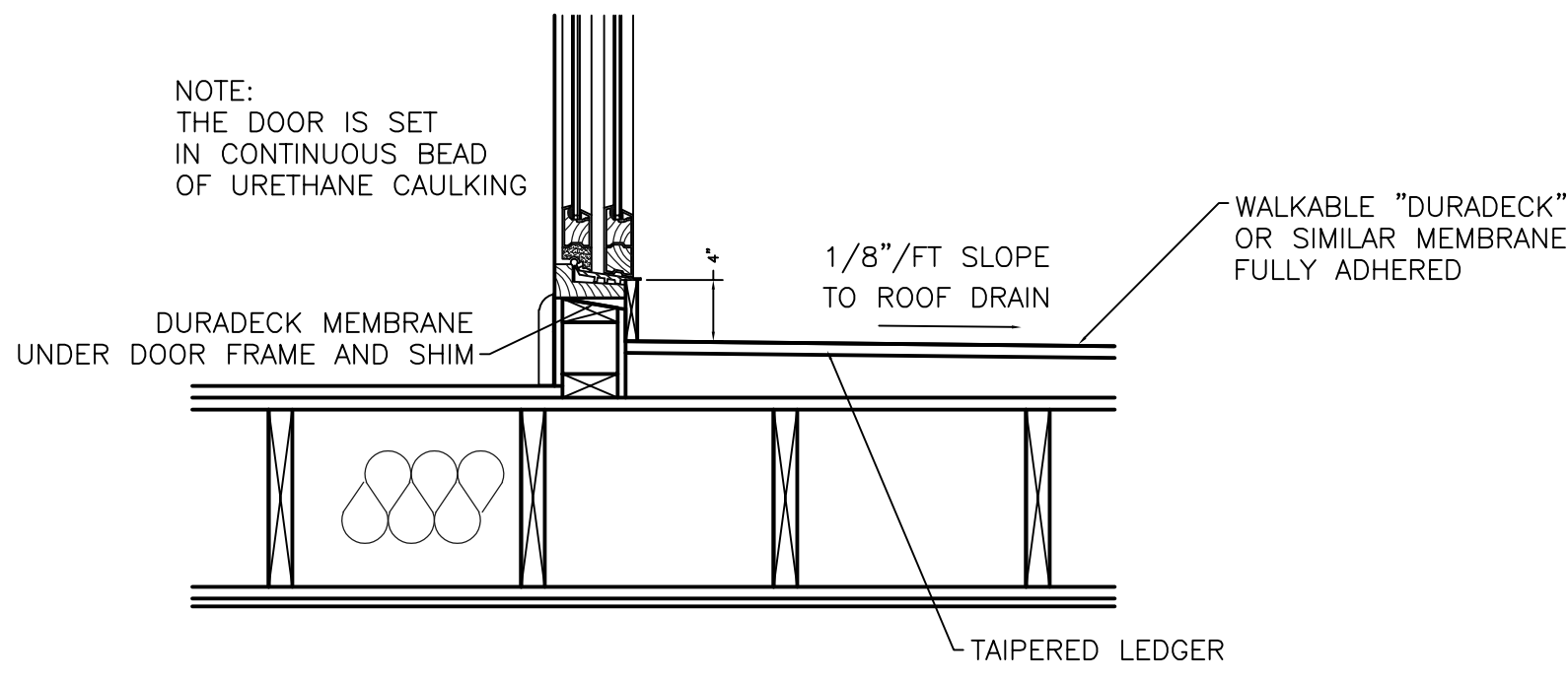


**PARTITIONS PERPENDICULAR TO JOISTS BEARING INTERIOR PARTITIONS TYPICAL DETAILS**



NO PARTITION ABOVE

**PARTITIONS PERPENDICULAR TO JOISTS NONBEARING INTERIOR PARTITIONS TYPICAL DETAILS**



**ROOF DECK ELEVATED DOOR DETAIL**

SCALE: NTS

NOTE: WHEN FASTENING THROUGH "DURADECK" MEMBRANE DRILL PILOT HOLE AND FILL WITH POLYURITHANE CAULK. FASTEN RAILING TO SOLID WOOD BLOCKING.

**NOTE:**

THE DOOR IS SET IN CONTINUOUS BEAD OF URETHANE CAULKING

PERMIT SET

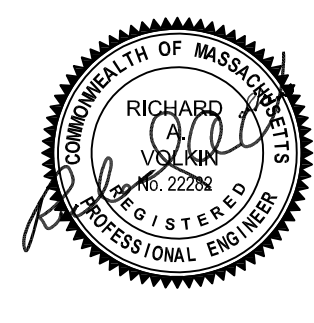
10/04/20	PENTHOUSE REVISED
DATE	REVISION

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**FRAMING PLANS**  
**TYPICAL DETAILS**  
30 CHESTNUT STREET,  
BOSTON, MASSACHUSETTS

**RAV & Assoc., Inc.**  
21 HIGHLAND AVENUE  
NEEDHAM, MASSACHUSETTS 02494  
TELEPHONE: (781) 449-8200 FAX: (781) 449-8205

SCALE: 1/4"=1'-0"	DESIGNED BY: I.M.	DRAWING No.
APPROVED: R.A.V.	DRAWN BY: I.K.	S-5
DATE: 06/28/2020	CHECKED BY: R.A.V.	





**NEW RESIDENTIAL SPRINKLER SYSTEM FOR  
THE RENOVATED TWO-UNIT RESIDENTIAL  
BUILDING**

**AT**

**30 CHESTNUT STREET  
BOSTON, MASSACHUSETTS**

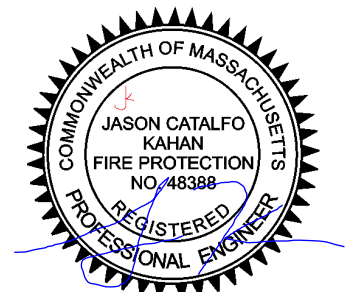
**FIRE PROTECTION DESIGN NARRATIVE**

June 29, 2020

Designed By:



P.O. Box 1234  
Lynnfield, MA 01940  
(781) 389-7999



06-29-2020



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ACCEPTANCE TESTING	3
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APPENDIX A	4
– HYDRAULIC CALCULATIONS	

## **INTRODUCTION AND BUILDING DESCRIPTION**

The purpose of this Fire Protection Design Narrative is to describe the proposed wet-pipe automatic sprinkler system for the renovated two-unit residential building located at 30 Chestnut Street in Boston, Massachusetts.

The building consist of a basement, ground, first, second, third, fourth and penthouse level as indicated on the associated architectural drawings. The basement level will contain mechanical space and storage area for the residential dwelling units. The first dwelling unit will occupy the ground, level and first level. The second level will occupy the second, third fourth and penthouse levels. The sprinkler room will be located in the basement level and will be accessible through the first dwelling unit.

This building is constructed of combustible and non-combustible materials throughout. Any concealed combustible spaces shall remain inaccessible. Such spaces are not permitted to be used for storage of any kind.

## **CODE REVIEW / HAZARD CLASSIFICATION**

The Massachusetts State Building Code (780 CMR, 9<sup>th</sup> Edition) classifies this building as Type R-3 construction (Section 310.1).

Section 903.2.8 (780 CMR, 9<sup>th</sup> Edition) requires buildings of Use Group R to be provided with an automatic sprinkler system designed and installed in accordance with 780 CMR 903.3.

Section 903.3.1.3 (780 CMR, 9<sup>th</sup> Edition) states that automatic sprinkler systems installed in one and two-family dwellings shall be permitted to be installed throughout in accordance with NFPA 13D.

Per these referenced code sections, the sprinkler system for this building has been designed in accordance with the requirements of NFPA 13D (2013 Edition). The system shall assume the hydraulically most demanding sprinklers in a single compartment up to two (2) residential sprinklers operating at the flow and pressures specified by the manufacturer (defined in the hydraulic calculation section).

System shall be monitored in accordance with the requirements of the 9<sup>th</sup> Edition of the Massachusetts State Building Code (780 CMR) (Fire Alarm Design by others).

## **SHOP DRAWING REQUIREMENTS**

This fire protection design narrative and associated sprinkler design and hydraulic calculations have been prepared in accordance with the Massachusetts State Building Code as part of the Tier 1 construction documents. Awarded sprinkler contractor shall be responsible for developing Tier 2 Shop Drawings and associated documents to JFP Solutions, Inc. for review prior to installation.

## **SPRINKLER SYSTEM DESCRIPTION**

This sprinkler system will be supplied by a new 2” copper fire service tied into the municipal water main on Chestnut Street. The new fire service shall be designed, installed, flushed and tested in accordance with the requirements of NFPA 24 (by others).

The sprinkler contractor will provide a 1-1/2” backflow preventer with monitored shutoff valves and a 1-1/2” straight-pipe riser including a flow switch, pressure gauge, combination test & drain with relief valve (see detail on associated fire protection drawing, FP-1). This system will automatically flow water through a fused sprinkler head due to heat from a fire.

All flow, tamper and pressure switches shall be tied into the Fire Alarm System which shall be connected to the Fire Alarm Control Panel (Alarm design by others).

The system will be fed from a single sprinkler riser which will be located as close to the indicated location on the drawings. All piping will be UL Listed CPVC piping and shall be installed in accordance with the requirements of NFPA 13D (2013 Edition) and the requirements of the product manufacturer.

All residential pendent sprinklers shall be Globe Residential sprinklers with a K-Factor of 4.9. These sprinklers require a minimum flow of 13 GPM and a minimum pressure of 7.0 PSI and have an associated maximum spacing limitation of 16’x16’ (No more than 8’ off any wall). All residential sidewall sprinklers shall be Globe Residential sprinklers with a K-factor of 4.4. These sprinklers require a minimum flow rate of 14 GPM at 11.1 PSI and have an associated maximum spacing of 14’x14’.

The CPVC sprinkler main feeding the sprinklers on the upper floors will be run down the length of the building, adjacent to the main carrying wall as indicated on the associated drawings. The pendent sprinkler heads will be fed from 1” CPVC branchlines running through wood joists and walls as necessary. It is the general contractor’s responsibility to provide sufficient insulation above any water-filled sprinkler piping to prevent freezing.

*NOTE: Per the requirements of the Massachusetts State Fire Marshall, all sprinkler contractors installing CPVC piping for automatic sprinkler systems shall be certified by a CPVC representative.*

*NOTE: All sprinkler piping installed in this building shall be installed in conditioned spaces. The building owner is responsible for maintaining appropriate heat within all areas containing sprinkler piping to prevent freeze-ups. The sprinkler contractor shall be responsible for selecting the proper length of all dry-sidewall sprinklers based on the manufacturer’s requirements to prevent freeze-ups. JFP Solutions, Inc. and the engineer of record take no responsibility for any damages caused by freeze-ups on this sprinkler system.*

*NOTE: Sprinkler locations have been determined based on required maximum coverage areas of NFPA 13D (2013 Edition) and the spacing used in the design. Locations have not been coordinated with any ceiling-mounted fixtures, lights or soffits. Installing sprinkler contractor is responsible for coordinating sprinkler locations around any such obstructions in accordance with the requirements of NFPA 13D (2013 Edition).*

## **HYDRAULIC CALCULATIONS**

Per the requirements of NFPA 13D (2013 Edition), the hydraulically most demanding sprinklers contained within the hydraulically most remote compartment, up to two (2) sprinklers are required to be included in the hydraulic calculations.

The demand of this hydraulic calculation at the connection to the municipal water main in the street is 26.2 GPM @ 60.8 PSI. When compared to the recent flow test data obtained from the Boston Water & Sewer Department, there is a remaining safety margin of 25.1 PSI.

## **ACCEPTANCE TESTING**

- 1) This system must be hydrostatically tested to 200 psi for two hours.
- 2) Notification devices shall operate as intended.
- 3) A Contractor's Certificate for Above Ground Piping will be required.

NOTE: Any discrepancies or significant alterations to the indicated piping or head layout which may occur during construction shall be brought to the engineer's attention for review. It is not the responsibility of the engineer to develop as-built drawings depicting actual installation. The sprinkler contractor shall be responsible for providing as-built drawings if required.

## **MAINTENANCE TESTING**

A testing and maintenance program, which meets the requirements of NFPA Standard 25 shall be required to be under contract with a licensed sprinkler contractor. Test programs shall be in accordance with Table 5-1 and 12-1 of NFPA 25 and include the following:

- Weekly - Owner inspect to see that control valves are open, unobstructed and not leaking and all system gages are normal.
- Yearly - Conduct system drain test to verify that flow switch is operating as designed and pressure gauges are indicating appropriate static and residual pressures.

# **APPENDIX A**

## **– HYDRAULIC CALCULATIONS**



# CALCULATION SUMMARY

Project Name : RENOVATED TWO-UNIT RESIDENTIAL BUILDING

Project Location: 30 CHESTNUT ST

Drawing No. : 4917

City: BOSTON, MA 02108

## Design Areas

Design Area Name	Calc. Mode (Model)	Occupancy	Area of Application (ft <sup>2</sup> )	Total Water (gpm)	Pressure @ Source (psi)	Min. Density (gpm/ft <sup>2</sup> )	Min. Pressure (psi)	Min. Flow (gpm)	Calculated Heads #	Hose Streams (gpm)	Margin To Source (psi)
1	Demand (HW)	RES 13D	276	126.2	Required 60.8	0.051	7	13	2	100	25.1



06-29-2020

# HYDRAULIC CALCULATIONS for

---

## Job Information

Project Name : RENOVATED TWO-UNIT RESIDENTIAL BUILDING

Contract No. : 4917

City: BOSTON, MA 02108

Project Location: 30 CHESTNUT ST

Date: 6/29/2020

---

## Contractor Information

Name of Contractor: TO BE DETERMINED

Address:

City:

Phone Number:

E-mail:

Name of Designer: JFP SOLUTIONS, INC.

Authority Having Jurisdiction: BOSTON FD

---

## Design

Remote Area Name	1
Remote Area Location	PENTHOUSE UNIT
Occupancy Classification	RES 13D
Density (gpm/ft <sup>2</sup> )	0.051
Area of Application (ft <sup>2</sup> )	276
Coverage per Sprinkler (ft <sup>2</sup> )	256
Number of Calculated Sprinklers	2
In-Rack Demand (gpm)	0
Special Heads	
Hose Streams (gpm)	100
Total Water Required (incl. Hose Streams) (gpm)	126.2
Required Pressure at Source (psi)	60.8
Type of System	Wet
Volume - Entire System (gal)	161.6 gal

---

## Water Supply Information

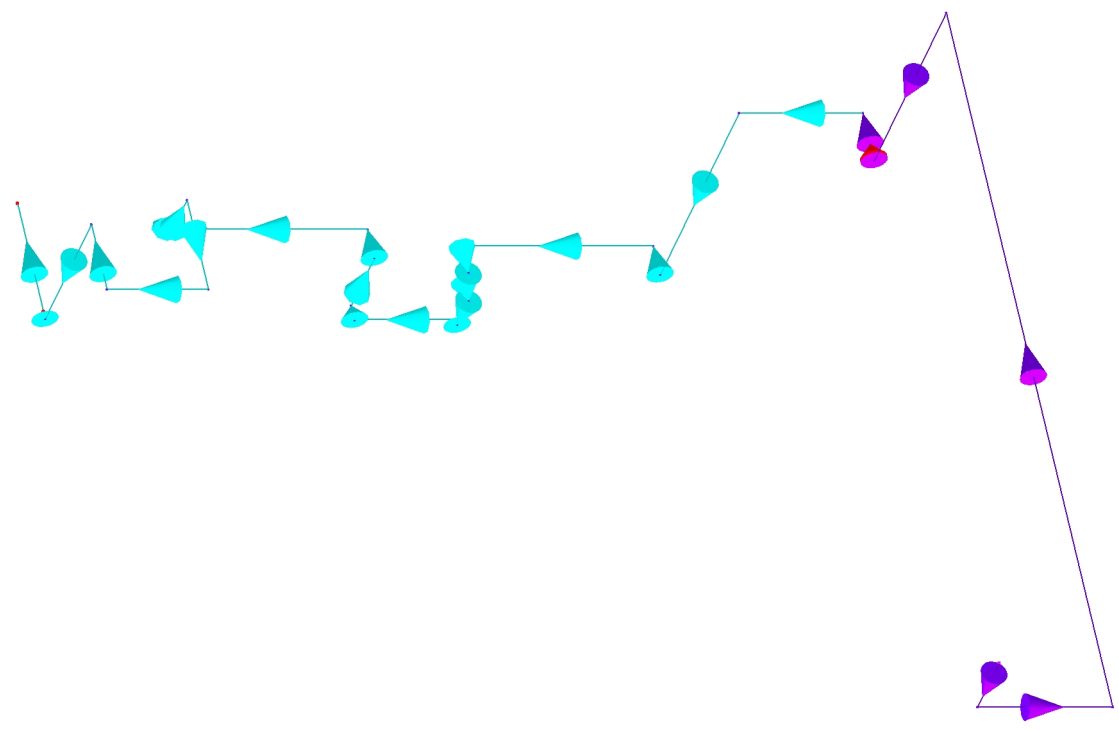
Date	09/22/2014
Location	21 CHESTNUT ST
Source	W1

---

## Notes

THIS CALCULATION INCLUDES THE HMD 2 RESIDENTIAL SPRINKLER HEADS ON THE PENTHOUSE LEVEL

### Diagram for Design Area : 1 (Optimized Hvdraulic Simplified)



## Hydraulic Analysis for : 1

### Calculation Info

Calculation Mode	Demand
Hydraulic Model	Hazen-Williams
Fluid Name	Water @ 60F (15.6C)
Fluid Weight, (lb/ft <sup>3</sup> )	N/A for Hazen-Williams calculation.
Fluid Dynamic Viscosity, (lb·s/ft <sup>2</sup> )	N/A for Hazen-Williams calculation.

### Water Supply Parameters

Supply 1 : W1

Flow (gpm)	Pressure (psi)
0	86
2004	78

### Supply Analysis

Node at Source	Static Pressure (psi)	Residual Pressure (psi)	Flow (gpm)	Available Pressure (psi)	Total Demand (gpm)	Required Pressure (psi)
W1	86	78	2004	86	126.2	60.8

### Hoses

Inside Hose Flow / Standpipe Demand (gpm)

Outside Hose Flow (gpm)

Additional Outside Hose Flow (gpm) 100

Other (custom defined) Hose Flow (gpm)

-----  
 Total Hose Flow (gpm) 100

### Sprinklers

Ovehead Sprinkler Flow (gpm) 26.2

InRack Sprinkler Flow (gpm) 0

Other (custom defined) Sprinkler Flow (gpm) 0

-----  
 Total Sprinkler Flow (gpm) 26.2

### Other

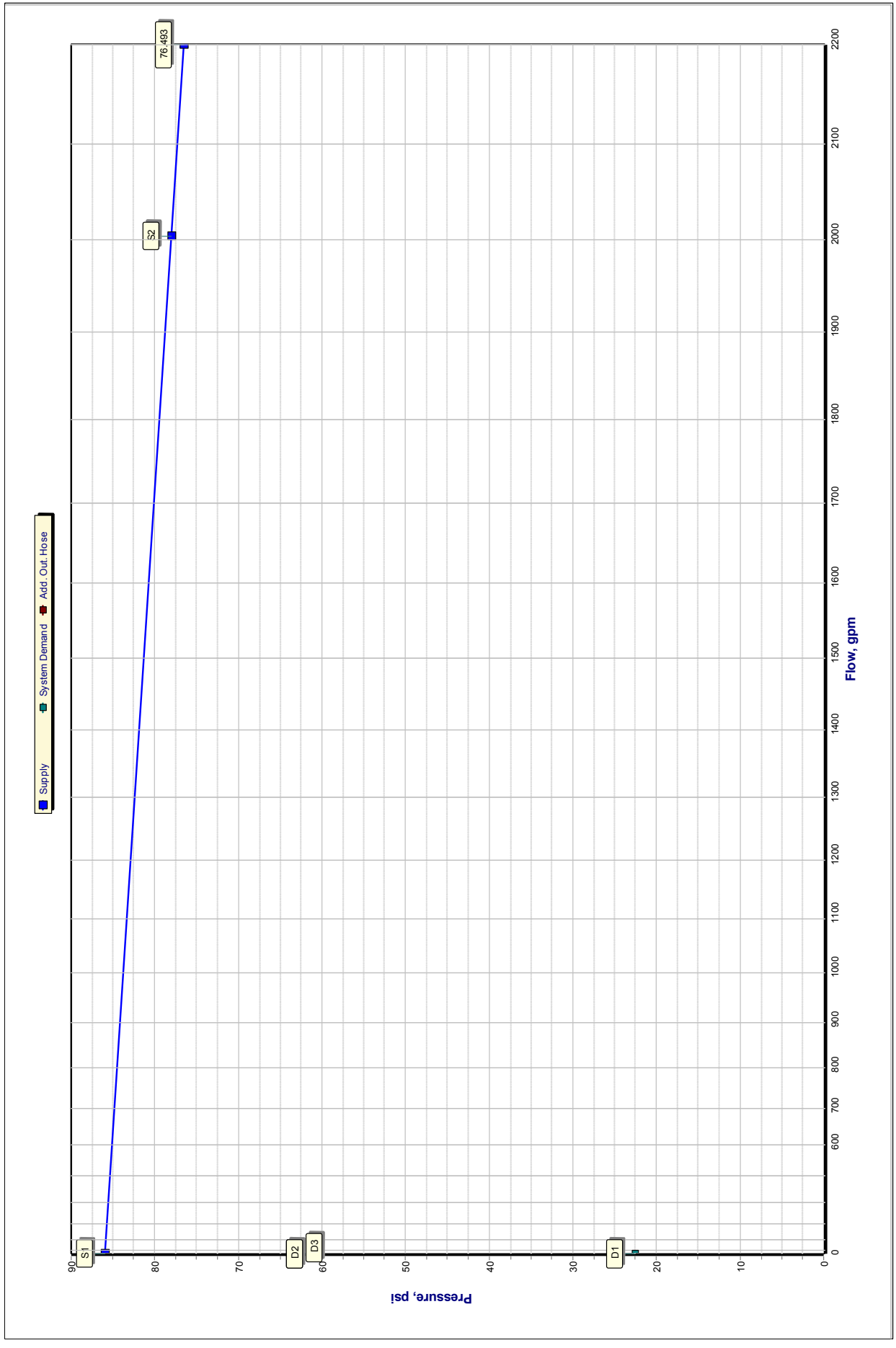
Required Margin of Safety (psi) 0

W1 - Pressure (psi) 60.8

W1 - Flow (gpm) 26.2

Demand w/o System Pump(s) N/A

### Hydraulic Analysis for : 1



### Hydraulic Analysis for : 1

#### Graph Labels

Label	Description	Values	
		Flow (gpm)	Pressure (psi)
S1	Supply point #1 - Static	0	86
S2	Supply point #2 - Residual	2004	78
D1	Elevation Pressure	0	22.5
D2	System Demand	26.2	60.8
D3	System Demand + Add.Out.Hose	126.2	60.8

#### Curve Intersections & Safety Margins

Curve Name	Intersection		Safety Margin	
	Pressure (psi)	Flow (gpm)	Pressure (psi)	@ Flow (gpm)
Supply	86	34.5	25.1	126.2

#### Open Heads

Head Ref.	Head Type	Coverage	K-Factor	Required			Calculated		
				Density	Flow	Pressure	Density	Flow	Pressure
		(ft <sup>2</sup> )	(gpm/psi <sup>1/2</sup> )	(gpm/ft <sup>2</sup> )	(gpm)	(psi)	(gpm/ft <sup>2</sup> )	(gpm)	(psi)
S1	Overhead Sprinkler	256	4.9	0.05	12.8	7	0.051	13	7
S2	Overhead Sprinkler	256	4.9	0.05	12.8	7	0.052	13.3	7.3

## Node Data

Node# Type	Hgroup Fitting	K-Fact. Stat. Pres.	Elev Coverage	X Y
		gpm/psi <sup>1/2</sup> psi	ft ft <sup>2</sup>	ft ft
S1 Overhead Sprinkler	HEAD	4.9 0	54 256	1172.46 454.32
S2 Overhead Sprinkler	HEAD	4.9 0	54 256	1161.46 454.32
152 Node	NODE BM.Tee	0	1	1161.23 448.62
W1 Supply	SUPPLY	0	2	1085.71 397.24
142-O Node	NODE coupling	0	-10	1158.09 425.15
142-I Node	NODE coupling	0	-10	1156.69 425.15
143 Node	NODE us.90	0	-10	1156.44 425.15
144 Node	NODE us.90	0	-10	1156.44 403.71

**PIPE INFORMATION**

Node 1 Node 2	Elev 1 Elev 2	K-Factor 1 K-Factor 2	Flow added (q) Total flow (Q)	Nominal ID Actual ID	Fittings quantity x (name) = length	L F T	C Factor Pf per ft	total (Pt) elev (Pe) frict (Pf)	NOTES
	(ft)	(gpm/psi <sup>1/2</sup> )	(gpm)	(in)	(ft)	(ft)	(psi)	(psi)	

**Path No: 1**

S1	54	4.9	13	1		11	150	7	
S2	54	4.9	13	1.101		0	0.0304	0	
						11		0.3	
S2	54	4.9	13.3	1	8x(BM.Tee-Br)=40	114.26	150	7.3	
152	1		26.2	1.101	3x(BM.Tee-Run)=3	103	0.112	23	
					12x(BM.90)=60	217.26		24.3	
152	1		0	1.25	1x(coupling)=1.59	37.62	150	54.6	
142-O	-10		26.2	1.394	2x(BM.90)=12	17.59	0.0355	4.8	
					4x(BM.Tee-Run)=4	55.21		2	
142-O	-10		0	1.5		1.4	0	61.4	Ames2000B
142-I	-10		26.2	0		0	3.0668	0	***
						1.4		4.3	
142-I	-10		0	1.25	1x(us.90)=4.76	0.25	150	65.6	
143	-10		26.2	1.394		4.76	0.0355	0	
						5.01		0.2	
143	-10		0	2	1x(us.90)=5.81	21.44	150	65.8	
144	-10		26.2	1.959		5.81	0.0068	0	
						27.25		0.2	
144	-10		0	6	2x(us.90)=48.39	89.2	140	66	
W1	2		26.2	6.4		48.39	0.0000	-5.2	
						137.58		0	
<b>W1</b>								<b>60.8</b>	

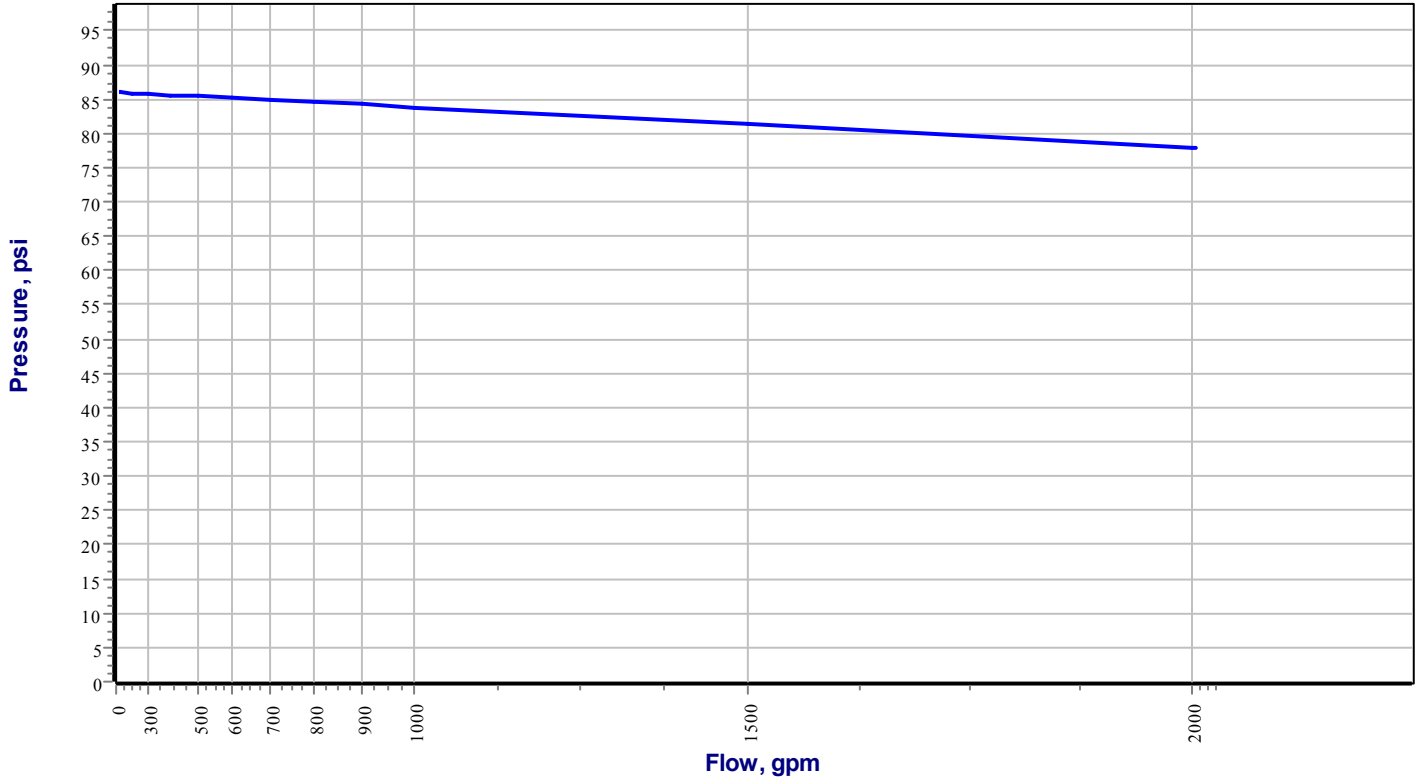
\* Pressures are balanced to a high degree of accuracy. Values may vary by 0.1 psi due to display rounding.

\* Maximum Velocity of 8.84 ft/s occurs in the following pipe(s): (152-S2)

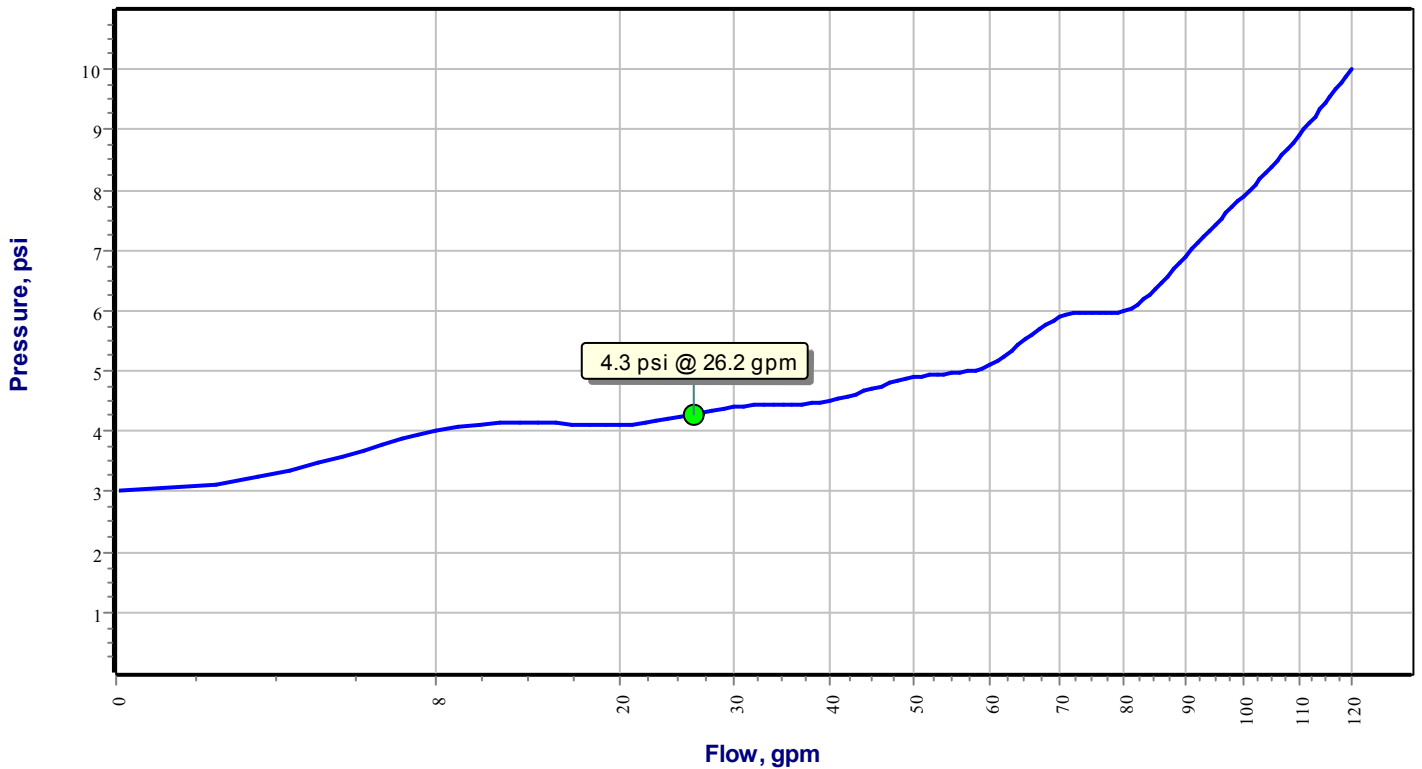
\*\*\* Device pressure loss (gain in the case of pumps) is calculated from the device's curve. If the device curve is printed with this report, it will appear below. The length of the device as shown in the table above comes from the CAD drawing. The friction loss per unit of length is calculated based upon the length and the curve-based loss/gain value. Internal ID and C Factor values are irrelevant as the device is not represented as an addition to any pipe, but is an individual item whose loss/gain is based solely on the curve data.



**Pressure vs. Flow Function**  
**Design Area: 1; Supply Ref.: W1; Supply Name:W1**



**Pressure Loss Function**  
**Design Area: 1; BFP Ref.: 194 (Ames2000B, Size = 1.5); Inlet Node: 142-I; Outlet Node: 142-O**





Job: RENOVATED TWO-UNIT RESIDENTIAL BUILDING  
 Address: 30 CHESTNUT ST City: BOSTON State: MA Zip/Postal Code: 02108  
 Contract #: 4917 Date: 6/29/2020  
 Contractor: TO BE DETERMINED Designer: JFP SOLUTIONS, INC.  
 Address: City: State: Zip/Postal Code:  
 Phone: Fax: Email:  
 Approving Authority: BOSTON FD  
 Design Defaults: Standards: NFPA 13D (2013 EDITION)  
 Default Sprig Size: 1 Default Drop Size: N/A  
 Default Sprig Material: CPVC Default Drop Material: CPVC  
 Default Sprig Elevation: 0 Default Drop Elevation: 0

Calculation results for Design Area 1 - PENTHOUSE UNIT  
 This system as shown on TO BE DETERMINED company print no. dated 6/29/2020 for RENOVATED TWO-UNIT RESIDENTIAL BUILDING 30 CHESTNUT ST contract no. 4917 is designed to discharge at a rate of 0.05 gpm/ft<sup>2</sup> (L/min/m<sup>2</sup>) of floor area over a maximum area of 278 ft<sup>2</sup> when supplied with water at a rate of 26.2 gpm at 60.8 psi at the base of the riser. Hose stream allowance of \_\_\_\_\_ is included in the above.  
 Occupancy classification: RES 13D Number of heads flowing: 2  
 Commonly classification: \_\_\_\_\_ System Type: \_\_\_\_\_  
 Maximum storage height: \_\_\_\_\_ Maximum velocity: 8.84 ft/s  
 Storage arrangement: \_\_\_\_\_  
 Flow from In-Rack sprinklers: 0 gpm Pressure Required at Source: 60.8 psi  
 Flow from Overhead sprinklers: 26.2 gpm Pressure Available at Source: 60 psi  
 Flow from Inside Hoses: 0 gpm Surplus Pressure at Source: 25.1 psi  
 Other fixed flows: 0 gpm  
 Flow from Outside Hoses: 0 gpm  
 Total flow in system piping: 26.2 gpm  
 Additional flow at highest source: 100 gpm  
 Total of all flows: 126.2 gpm

**FIRE PROTECTION NOTES:**  
 THE PURPOSE OF THIS FIRE PROTECTION DRAWING AND THE ASSOCIATED FIRE PROTECTION DESIGN NARRATIVE IS TO INDICATE THE PROPOSED RESIDENTIAL SPRINKLER SYSTEM TO BE INSTALLED WITHIN THE RENOVATED TWO-UNIT BUILDING LOCATED AT 30 CHESTNUT STREET IN BOSTON, MASSACHUSETTS.  
 THIS BUILDING IS COMPRISED OF A BASEMENT, GROUND, FIRST, SECOND, THIRD AND PENTHOUSE LEVELS AS INDICATED ON THE ASSOCIATED ARCHITECTURAL DRAWINGS.  
 AND THIRD FLOOR WHICH WILL UNDERGO A COMPLETE RENOVATION AS INDICATED ON THE ASSOCIATED ARCHITECTURAL DRAWINGS.  
 THIS RESIDENTIAL SPRINKLER SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13D (2013 EDITION) FOR A RESIDENTIAL BUILDING CONTAINING TWO DWELLING UNITS.  
 THE SPRINKLER CONTRACTOR SHALL FOLLOW THE LATEST REQUIREMENTS OF NFPA 13D (2013 EDITION), MASSACHUSETTS STATE BUILDING CODE AND BOSTON FIRE DEPARTMENT REQUIREMENTS.  
 THIS SYSTEM WILL BE SUPPLIED BY A NEW 2" COPPER SERVICE, TAPPED OFF THE EXISTING WATER MAIN ON CHESTNUT STREET. THE 2" SERVICE SHALL BE DESIGNED, INSTALLED, FLUSHED AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 24 BY A LICENSED UNDERGROUND CONTRACTOR AND WILL ENTER THE BASEMENT AS INDICATED ON THIS DRAWING.  
 THE SYSTEM HAS BEEN HYDRAULICALLY CALCULATED IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13D, INCLUDING THE TWO HYDRAULICALLY MOST DEMANDING HEADS IN A SINGLE COMPARTMENT BASED ON THE REQUIREMENTS OF THE SPECIFIC SPRINKLER HEAD AND THE SPACING USED IN THIS DESIGN (16x16" REQUIRING A MINIMUM OF 13 GPM @ 7.0 PSI), REMOVE AREAS, DENSITIES AND HOSE STREAM ALLOWANCES ARE INDICATED ON THIS DRAWING ALONG WITH SYSTEM DEMANDS AT CONNECTION TO STREET AND CALCULATION RESULTS. HAVE BEEN COMPARED TO RECENT HYDRANT FLOW TEST INFORMATION OBTAINED FROM THE BOSTON WATER & SEWER DEPARTMENT.

**INSTALLATION NOTES:**  
 ALL WORK SHALL BE PERFORMED BY A MASSACHUSETTS LICENSED SPRINKLER CONTRACTOR. THE SPRINKLER CONTRACTOR SHALL FOLLOW THE LATEST REQUIREMENTS OF NFPA 13D (2013 EDITION), MASSACHUSETTS STATE BUILDING CODE (9TH EDITION) AND THE BOSTON FIRE DEPARTMENTS.  
 THE ARCHITECTURAL BACKGROUND OF BUILDING MAY DIFFER SLIGHTLY FROM ACTUAL LAYOUT. DRAWINGS ARE NOT INTENDED TO SHOW ALL OFFSETS AND PIPING ELEVATION CHANGES. CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS PRIOR TO FABRICATION.  
 CONTRACTOR SHALL HYDROSTATICALLY TEST ALL SPRINKLER PIPING AT 200 PSI FOR 2 HOURS AND IS RESPONSIBLE FOR THE COMPLETION OF ALL ABOVE GROUND TEST CERTIFICATES, SUPPLIED TO THE OWNER.  
 ALL PIPING INSTALLED THROUGHOUT THE RESIDENTIAL AREAS OF THE BUILDING SHALL BE UL LISTED CPVC SPRINKLER PIPING AND SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13 (2013 EDITION) AND ALL MANUFACTURERS INSTALLATION RECOMMENDATIONS. ALL PIPING SHALL BE PITCHED TO DRAIN WITH LOW-POINT DRAINS AT SECTIONS OF PIPING SUBJECT TO WATER TRAPPING. SPRINKLER CONTRACTOR SHALL PROVIDE PROTECTIVE PLATES WHERE CPVC PIPING IS RUN THROUGH STUDS TO PREVENT PUNCTURING OF THE SPRINKLER PIPING DURING DRYWALL INSTALLATION AS REQUIRED BY NFPA STANDARDS.  
 ALL SPRINKLER HEADS SHALL BE RESIDENTIAL PENDENT SPRINKLERS. ALL HEADS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AND THE REQUIREMENTS OF NFPA 13 (2013 EDITION).  
 THE BUILDING OWNER IS RESPONSIBLE FOR MAINTAINING THIS SPRINKLER SYSTEM IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 25, INCLUDING THE PROVISION OF HEAT IN ALL AREAS CONTAINING SPRINKLER PIPING AND HEADS TO PREVENT PIPE FROM FREEZING. JFP SOLUTIONS, INC. AND THE ENGINEER OF RECORD TAKE NO RESPONSIBILITY FOR ANY DAMAGES CAUSED BY FREEZE UPS. AWARDED SPRINKLER CONTRACTOR TAKES FULL RESPONSIBILITY FOR THE PROPER INSTALLATION OF ALL SYSTEM COMPONENTS ASSOCIATED WITH THIS SPRINKLER SYSTEM DESIGN.

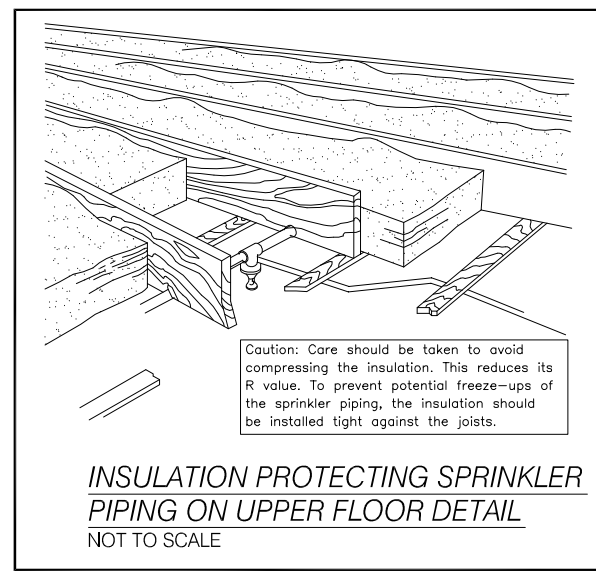
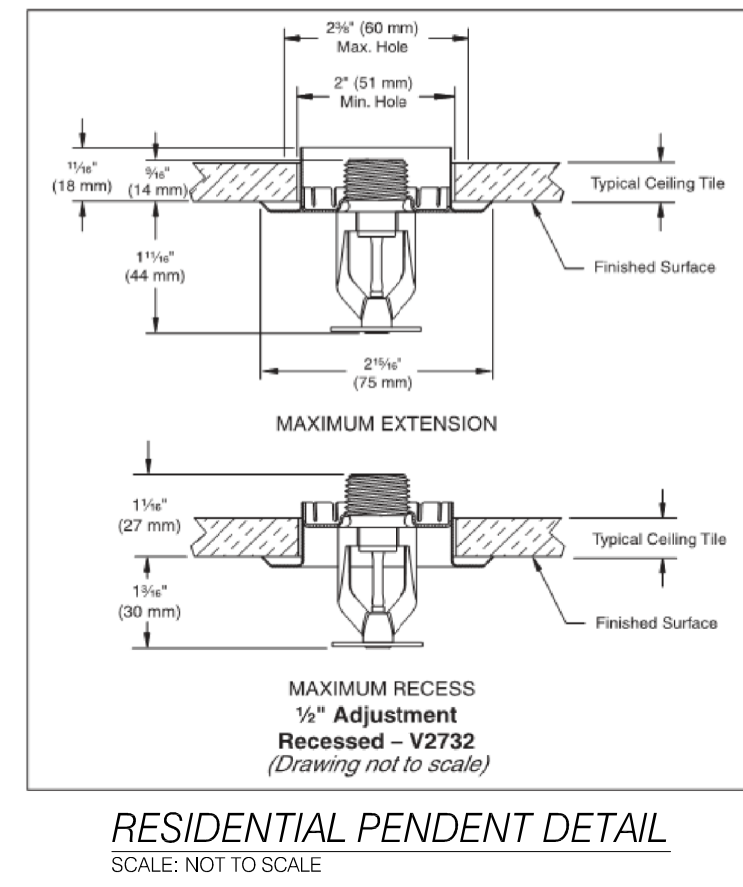
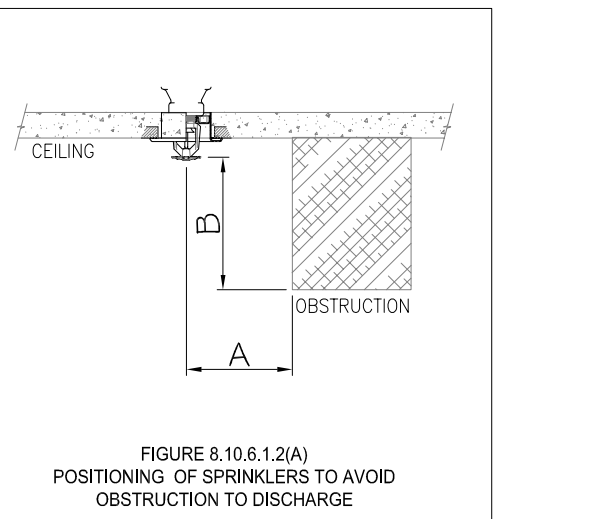
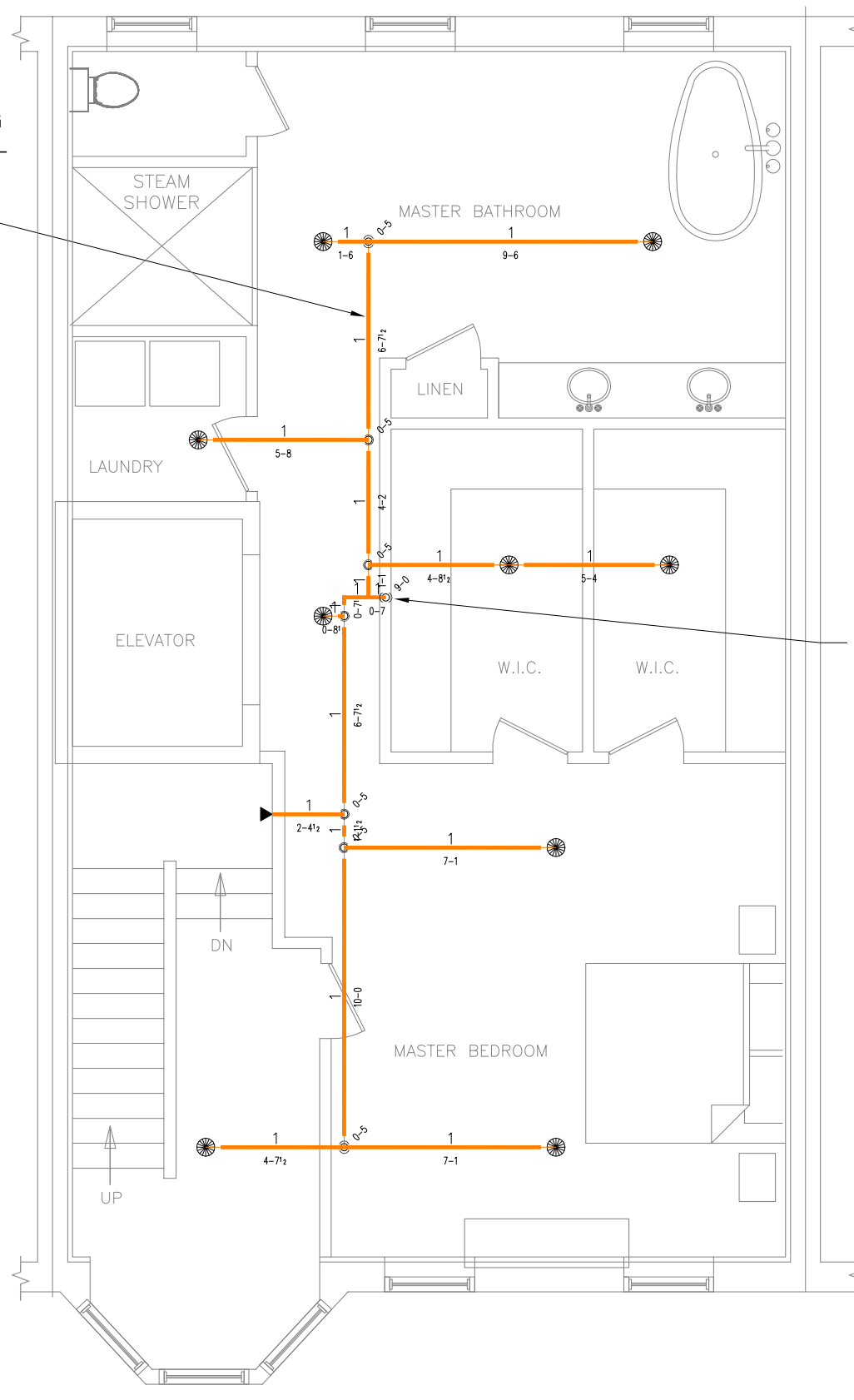


TABLE 8.10.6.1.2  
 POSITIONING OF SPRINKLER TO AVOID OBSTRUCTION TO DISCHARGE

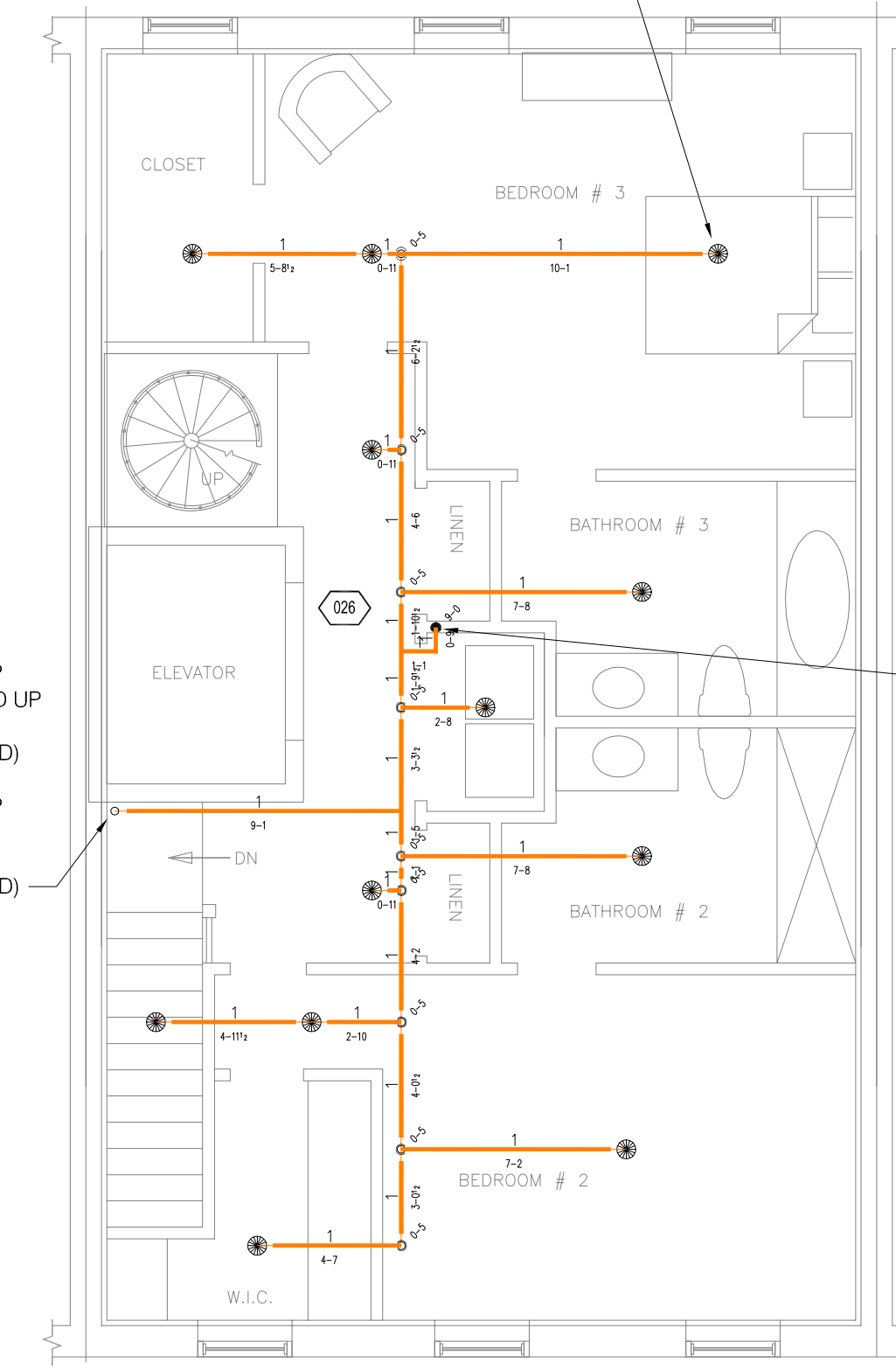
DISTANCE FROM SPRINKLER TO SIDE OF OBSTRUCTION (A)	MAXIMUM ALLOWABLE DISTANCE OF DEFLECTOR ABOVE BOTTOM OF OBSTRUCTION (INCHES) (B)
LESS THAN 1 FT	0"
1'-0" TO LESS THAN 1'-6"	0'-0"
1'-6" TO LESS THAN 2'-0"	0'-1"
2'-0" TO LESS THAN 2'-6"	0'-1"
2'-6" TO LESS THAN 3'-0"	0'-1"
3'-0" TO LESS THAN 3'-6"	0'-3"
3'-6" TO LESS THAN 4'-0"	0'-3"
4'-0" TO LESS THAN 4'-6"	0'-5"
4'-6" TO LESS THAN 5'-0"	0'-7"
5'-0" TO LESS THAN 5'-6"	0'-7"
5'-6" TO LESS THAN 6'-0"	0'-7"
6'-0" TO LESS THAN 6'-6"	0'-9"
6'-6" TO LESS THAN 7'-0"	0'-11"
7'-0" AND GREATER	1'-2"



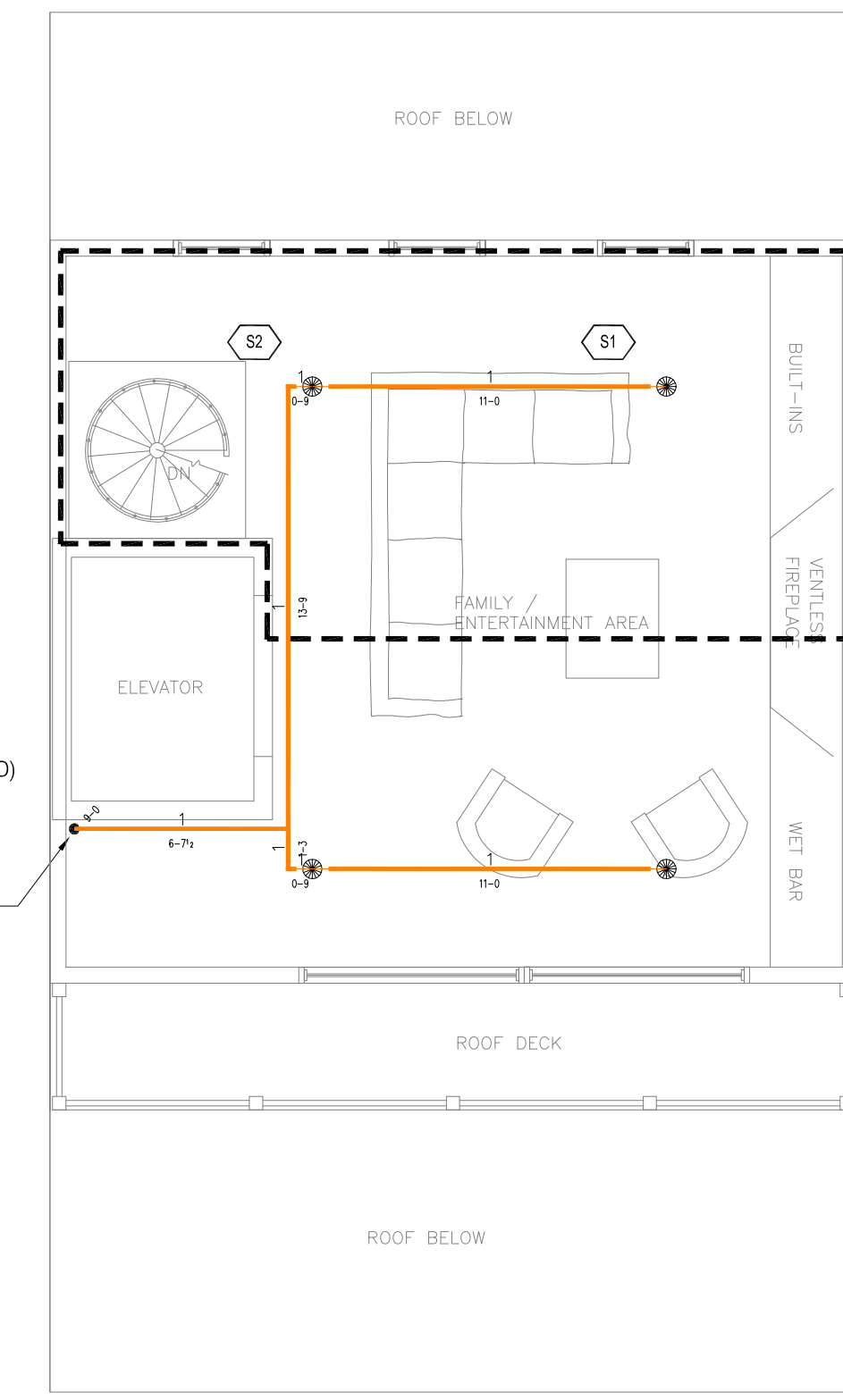
NFPA 13 TABLE 8.10.6.1.2 + FIGURE 8.10.6.1.2(A) RESIDENTIAL PENDENT AND UPRIGHT SPRAY SPRINKLERS



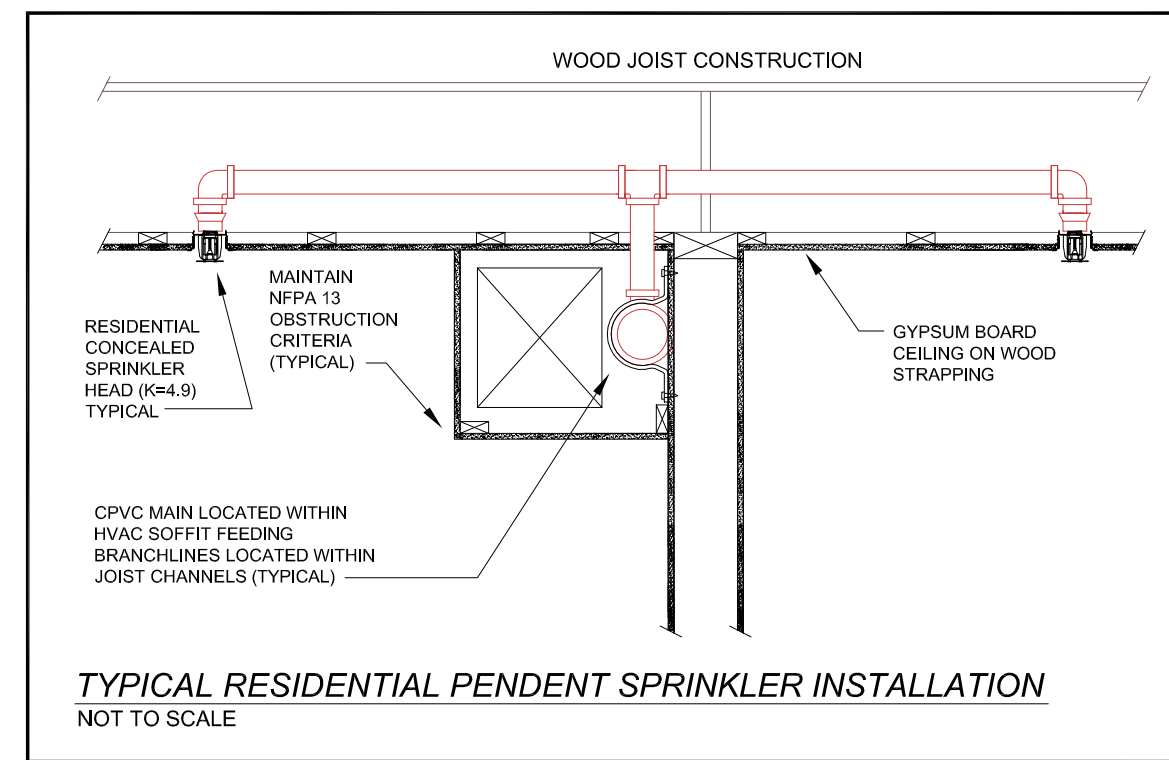
THIRD LEVEL SPRINKLER LAYOUT  
 SCALE: 3/8" = 1'-0"



FOURTH LEVEL SPRINKLER LAYOUT  
 SCALE: 3/8" = 1'-0"



PENTHOUSE LEVEL SPRINKLER LAYOUT  
 SCALE: 3/8" = 1'-0"

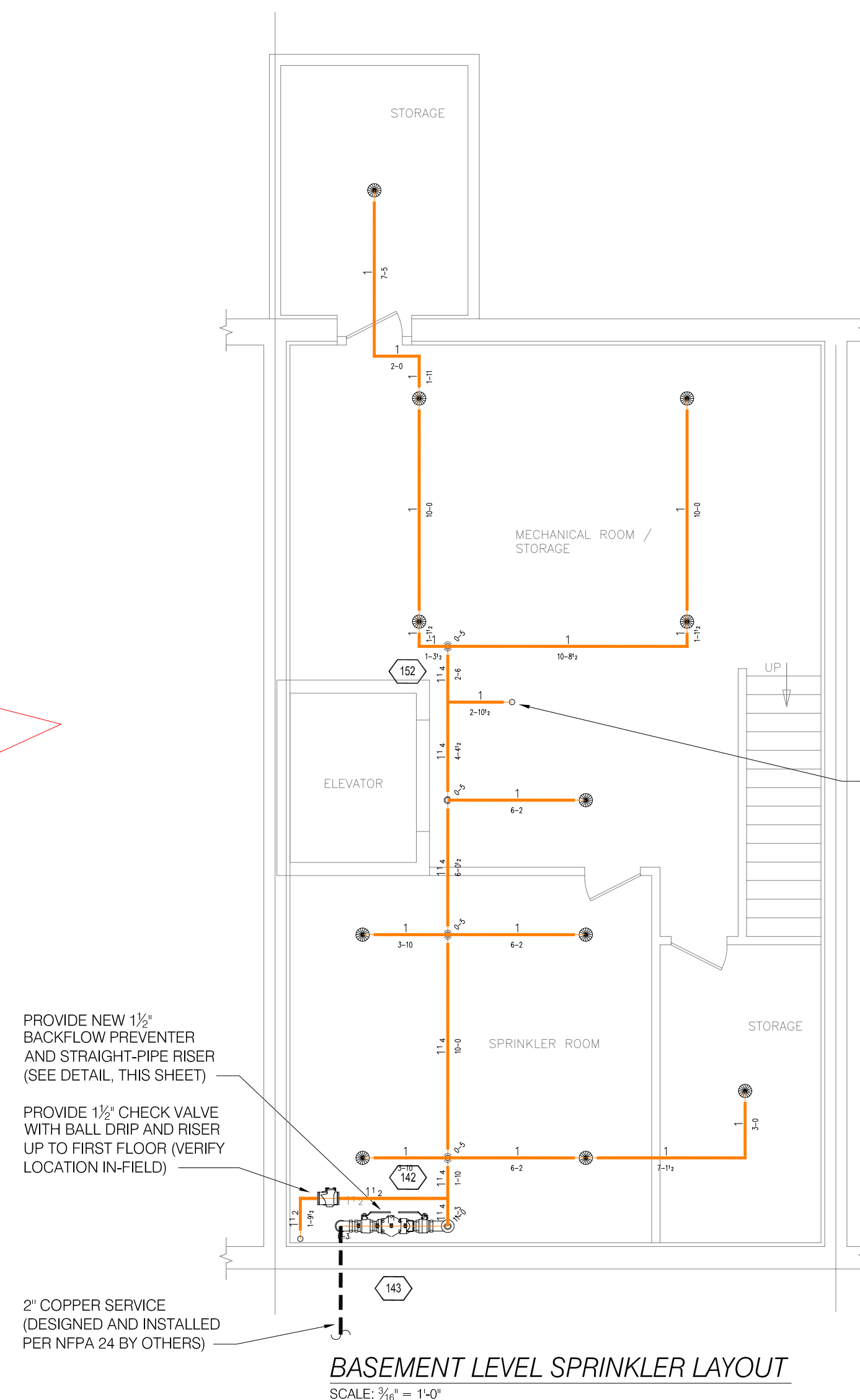
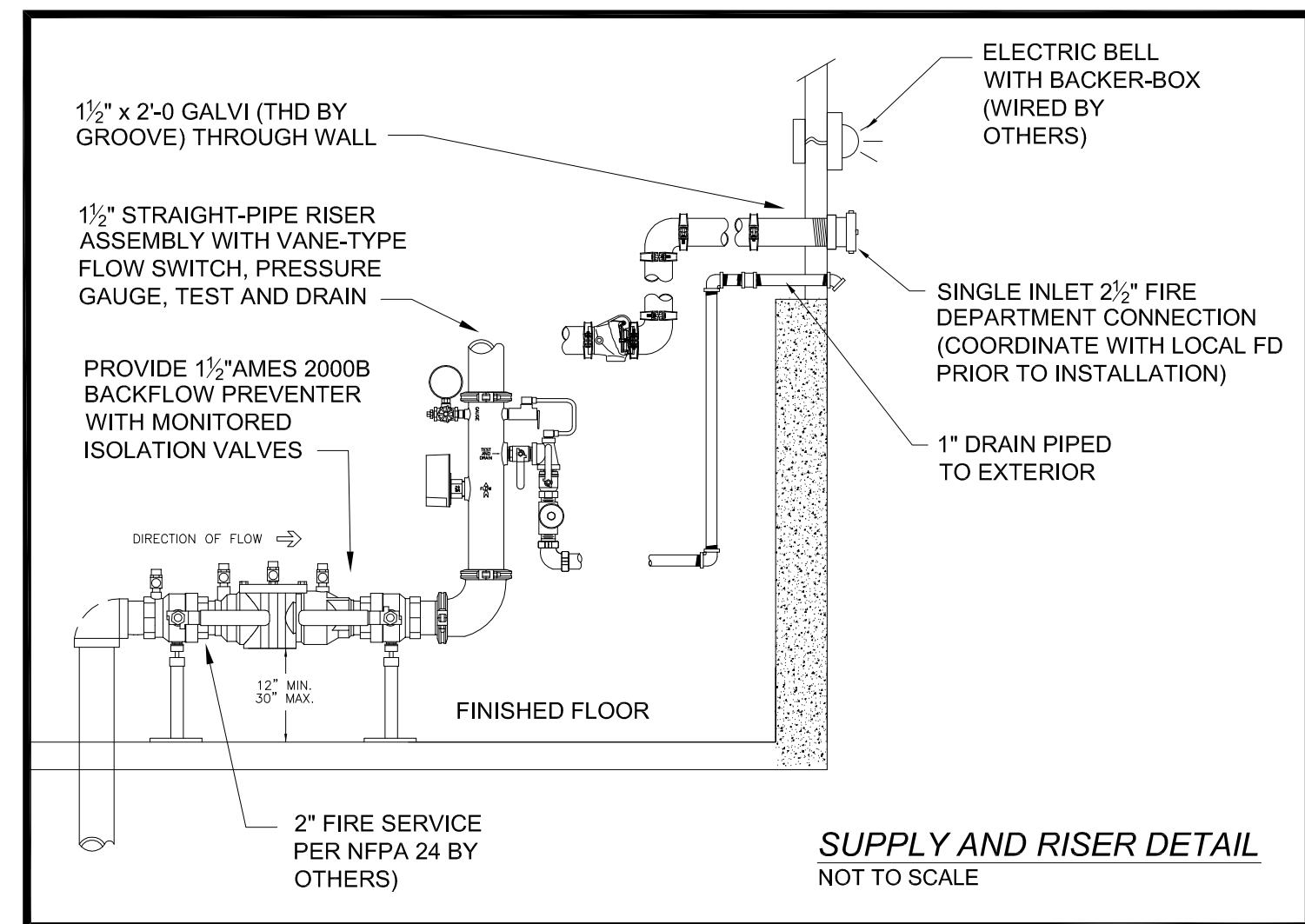


**CLOSETS (TYPICAL)**  
 EXCEPT WHERE SPECIFIED IN SECTION 6.6.4 (NFPA 13D, 2013 EDITION), SPRINKLERS SHALL NOT BE REQUIRED IN CLOSETS, LINEN CLOSETS, AND PANTRIES THAT MEET ALL OF THE FOLLOWING CONDITIONS:  
 1) THE AREA OF THE SPACE DOES NOT EXCEED 24 SF  
 2) THE LEAST DIMENSION DOES NOT EXCEED 4 FT  
 3) THE WALLS AND CEILINGS ARE SURFACED WITH NONCOMBUSTIBLE OR LIMITED-COMBUSTIBLE MATERIALS AS DEFINED IN NFPA 220.  
 NOTE: WHEN MECHANICAL EQUIPMENT OR LAUNDRY MACHINES ARE PLACED IN THE CLOSET, THE CLOSET IS NO LONGER CONSIDERED A CLOSET. CLOSET, LINEN CLOSET OR PANTRY. SO THE EXCEPTION OF 6.6.3 IS NO LONGER VALID AND SPRINKLERS MUST BE INSTALLED.

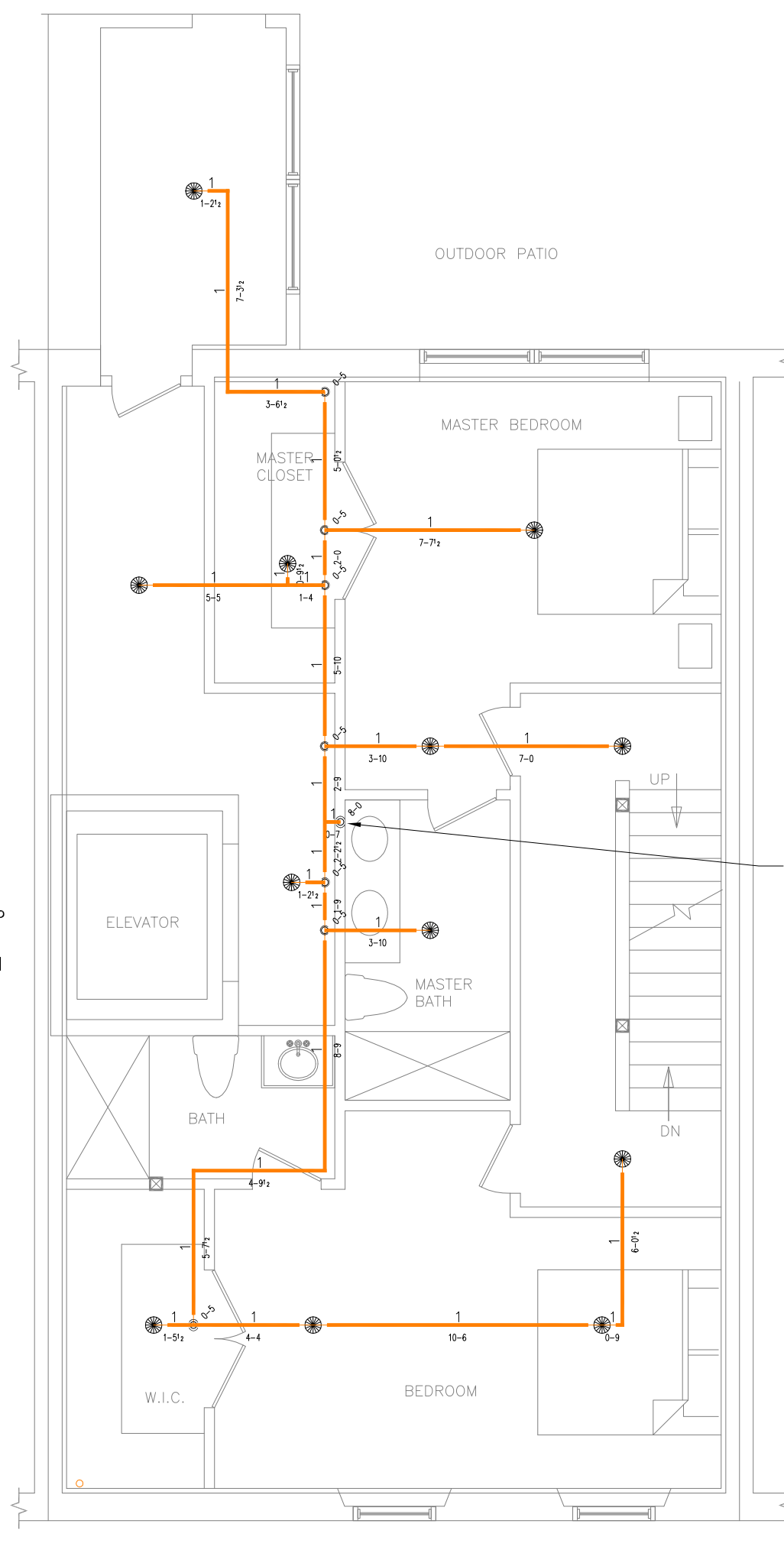
**FLOW TEST DATA** (W1)

Source Information	
Date of Flow Test / Info:	06/22/2014
Location of flow test data:	21 CHESTNUT ST
Source of flow test data:	BOSTON WATER & SEWER
Source Data Points	Pump Data Points
Pressure / Flow	Pressure / Flow
68 / 0.00	78 / 2004

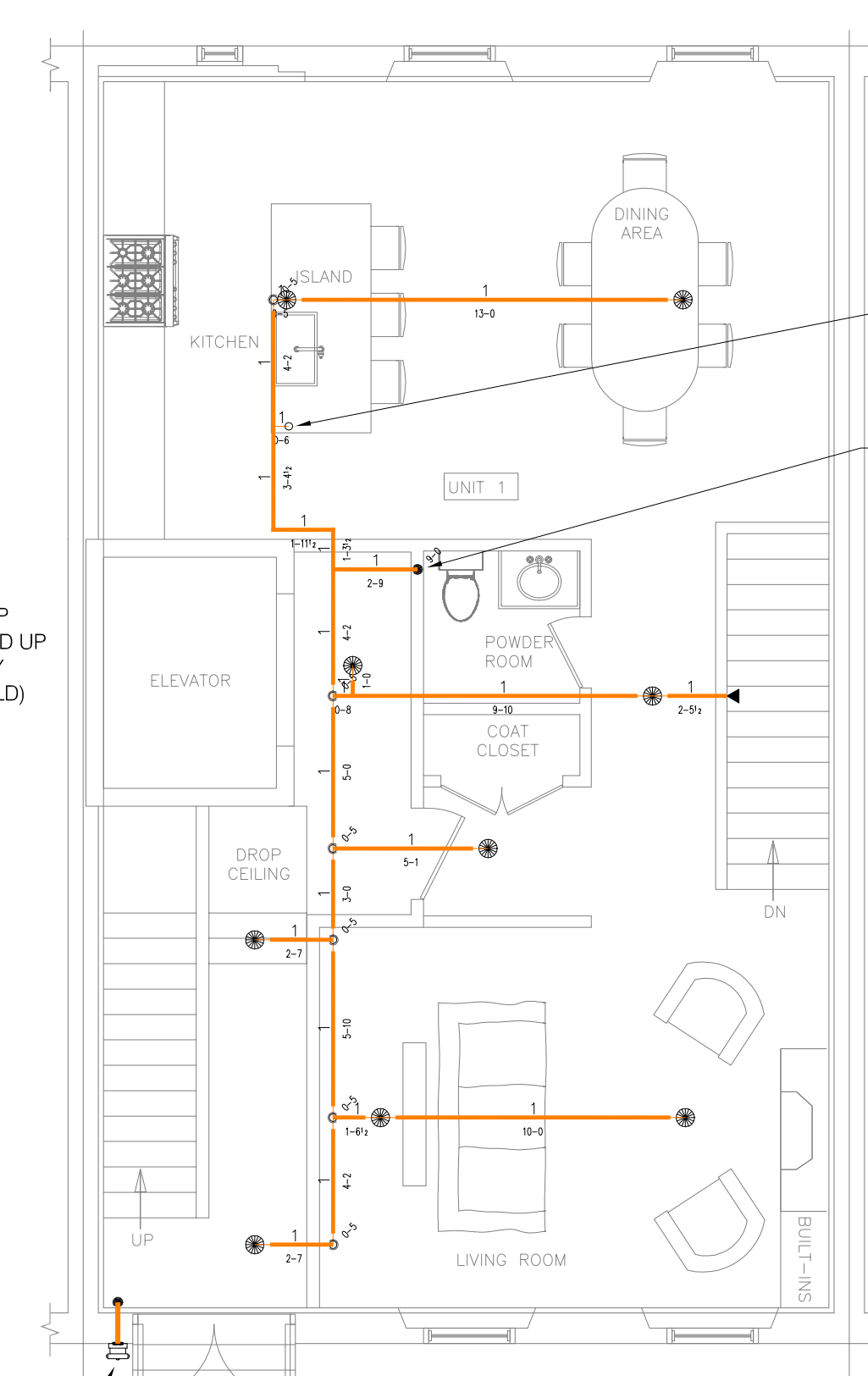
SYSTEM ISOMETRIC  
 SCALE: NOT TO SCALE



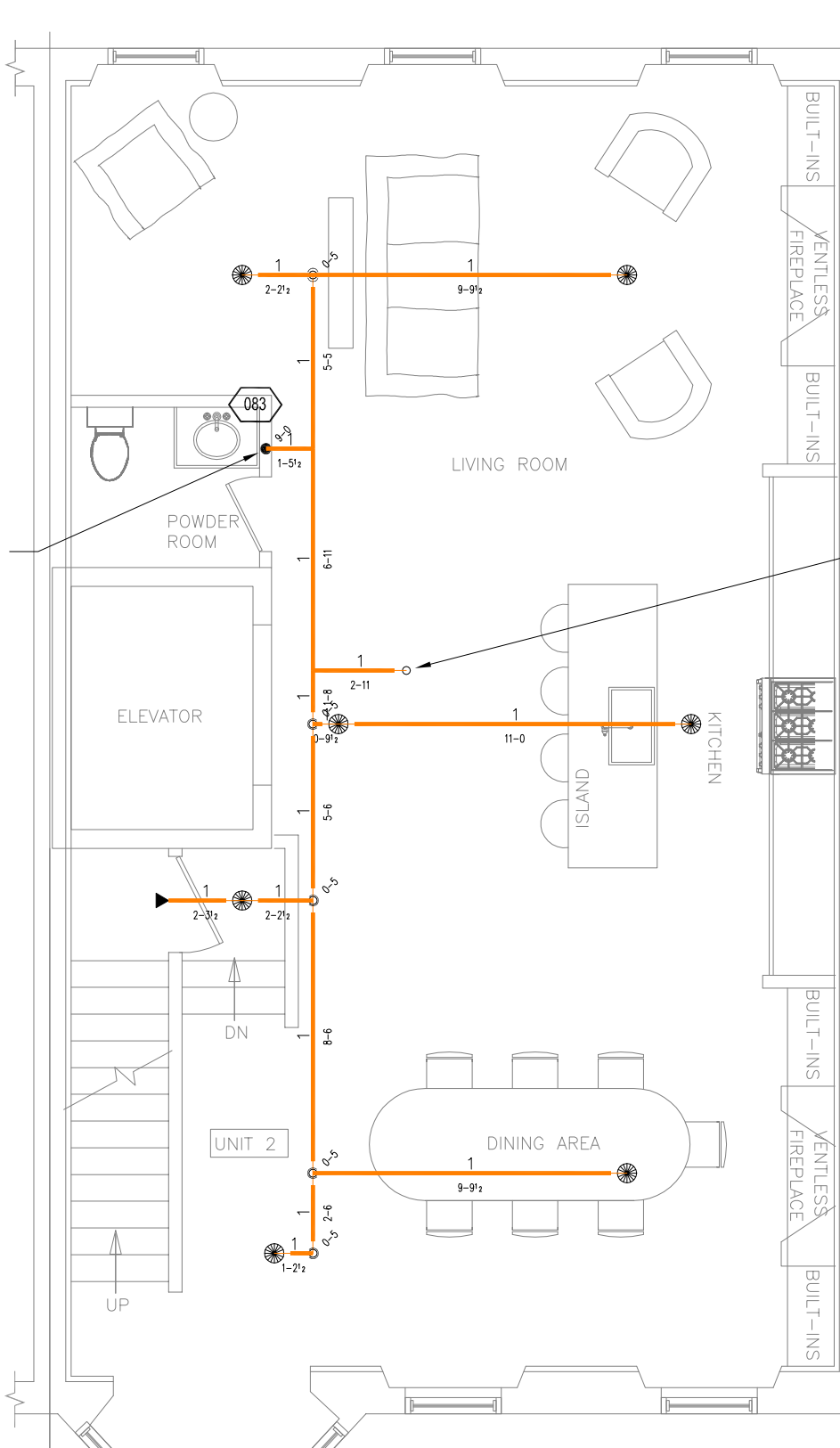
BASEMENT LEVEL SPRINKLER LAYOUT  
 SCALE: 3/8" = 1'-0"



GROUND LEVEL SPRINKLER LAYOUT  
 SCALE: 3/8" = 1'-0"



FIRST LEVEL SPRINKLER LAYOUT  
 SCALE: 3/8" = 1'-0"

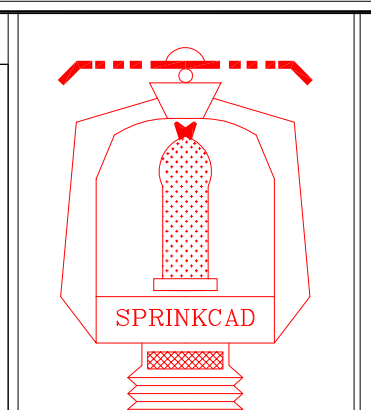


SECOND LEVEL SPRINKLER LAYOUT  
 SCALE: 3/8" = 1'-0"

DESIGNED BY:  
**JFP SOLUTIONS, INC.**  
 FIRE PROTECTION CONSULTING SERVICES  
 P.O. Box 1234  
 Lynnfield, Massachusetts 01940  
 Telephone: (781) 389-7999  
 E-Mail: TDJFP1@yahoo.com

DATE	REVISIONS DESCRIPTION	BY

HEAD BLOCK						
SYM	CNT	POSITION	FINISH	TEMP	K	MODEL#
RES	PEND	WHITE	155	4.90	1/2"	GLOBE GL4910
RES	SW	WHITE	155	4.40	1/2"	GLOBE GL4431
STEEL SPRINKLER PIPING						
CPVC SPRINKLER PIPING						



SPRINKLER CONTRACTOR  
 TO BE DETERMINED

NEW AUTOMATIC 13D SPRINKLER SYSTEM  
 RENOVATED TWO-UNIT RESIDENTIAL BUILDING  
 30 CHESTNUT ST  
 BOSTON, MA 02108

**SPRINKLER SYSTEM PERMIT SET**  
 PERMIT NO.:  
 CONTRACT NO.: 4917  
 APPROVAL: BOSTON FD  
 DRAWN BY: T. JENKINS  
 SCALE: 3/16" = 1'-0"  
 DATE: 6/29/2020  
 REVISIONS:  
 PLOTTED: FP 1 of 1