

# Mystic Water Works at Capen Court

**Client**  
Somerville Housing Authority

**Historical Consultant**  
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**Landscape Consultant**  
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**Civil Engineer**  
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ARCHITECTURAL  
& STRUCTURAL DRAWINGS

**COMPREHENSIVE PERMIT SUBMISSION SET**

NOVEMBER 18, 2011



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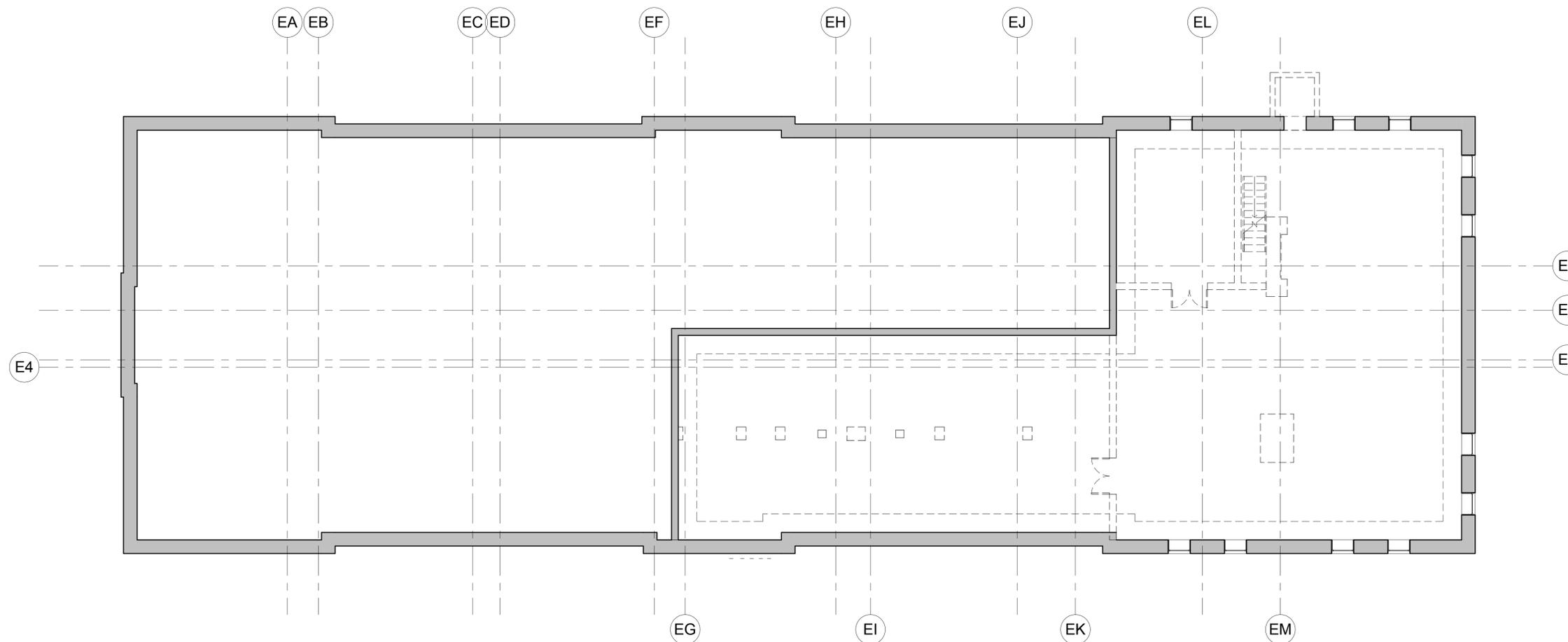
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4. IDENTIFY ALL EXISTING STRUCTURE WHICH IS DAMAGED OR UNSUITABLE FOR REUSE AND NOTIFY ARCHITECT IMMEDIATELY UPON DISCOVERY.



1 Basement Demo Plan (Pump House)  
1/8" = 1'-0"

**DEMOLITION LEGEND**

-  EXISTING WALL TO REMAIN
-  EXISTING CONSTRUCTION TO BE REMOVED OR MODIFIED (SEE NOTES)

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# D1.01

Issue Description	Date
Comprehensive Permit Submission	August 31, 2011

**Scale:**  
As indicated

**Drawn By:** Author    **Checked By:** Checker    **Reviewed By:**

**Project No.** 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

### BASEMENT DEMO PLAN (PUMP HOUSE)



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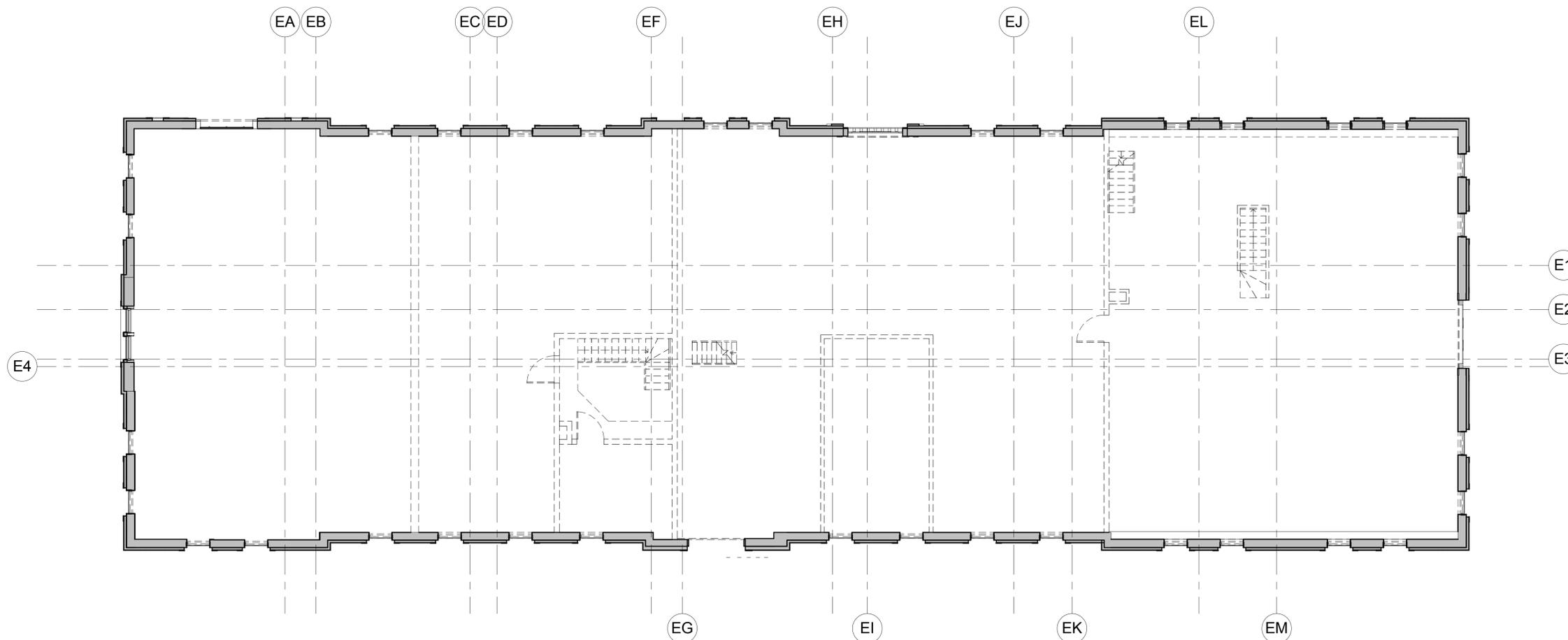
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Comprehensive Permit Submission	August 31, 2011

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Reviewed By:

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

### ATTIC DEMO PLAN (PUMP HOUSE)



# D1.03

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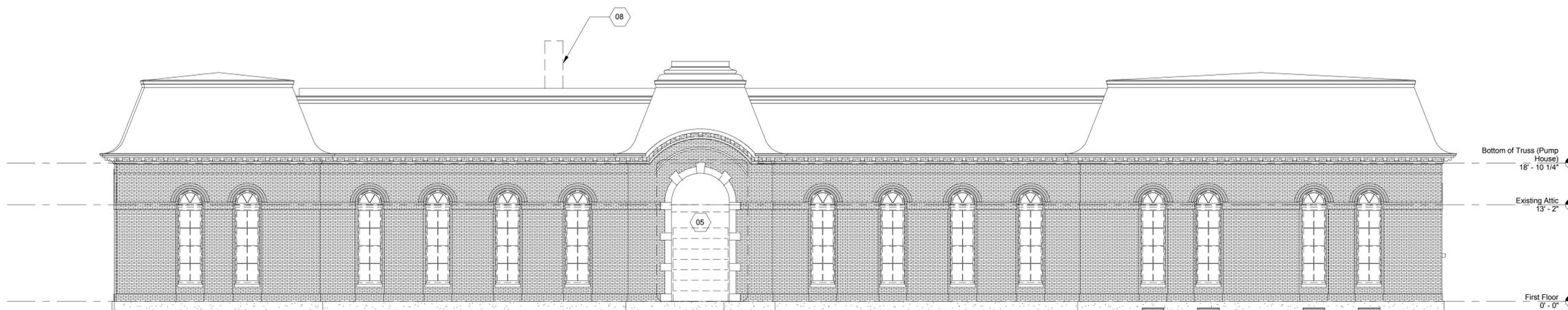
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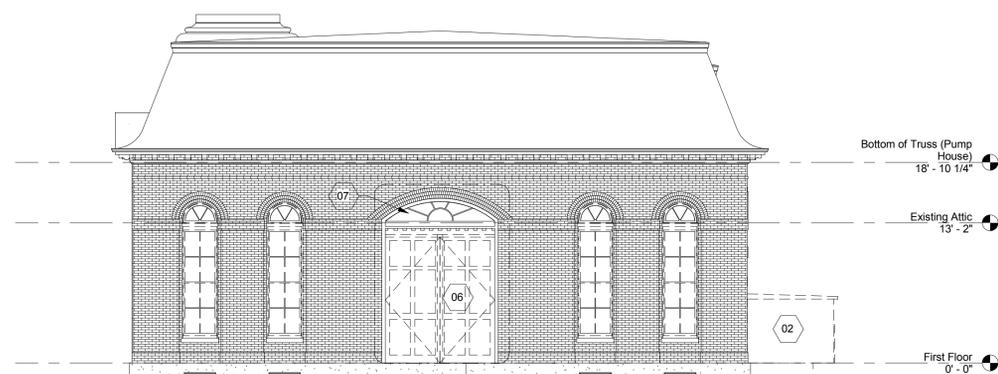
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1 Demo North Elevation (Pump House)  
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3 Demo West Elevation (Pump House)  
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Comprehensive Permit Submission August 31, 2011  
**Issue Description** **Date**

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Somerville, MA 02144

### NORTH AND WEST DEMO ELEVATIONS (PUMP HOUSE)



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## UNIT TYPE DATA (PUMP HOUSE)

UNIT TYPE	# UNITS	# BR's	UNIT AREA (SF)	ACCESSIBILITY
E1	6	1	583	GROUP 1
E1-A	7	1	560	GROUP 1
E1-B	2	1	551	GROUP 1
E1-C	4	1	575	GROUP 1
E1-D	2	1	531	GROUP 1
E2	2	1	617	GROUP 2A
E3	2	1	596	GROUP 1

1 BR. UNITS	25
2 BR. UNITS	0
ACC. UNITS	2
<b>TOTAL UNITS</b>	<b>25</b>

openings meet one of the exceptions in IBC 703.2.1. New vertical openings are required to comply with 780 CMR 708.2.

Both stairs connecting the first and second stories are permitted to be unenclosed in accordance with 780 CMR Section 1016.1 Ex. 4. These open stairs must be separated from the basement level by a one hour fire partition.

#### 8. Interior Finishes:

The existing interior finish of walls and ceilings in the work area and in all exits and corridors serving the work area must comply with the code requirements for new construction (IEBC 703.4, 803.3, & 912.3). All newly installed wall and ceiling finishes, and interior trim materials must also comply with 780 CMR Table 803.9 (IEBC 602.1, 602.2, 602.3). The requirements are summarized below.

#### Walls & Ceilings (IEBC Table 803.9)

Use Group	R-2
Exit Stair	Class C
Exit Access Corridor	Class C
Rooms & Enclosed Stairs	Class C

#### New Floor Finishes

Since the building will be equipped with an automatic sprinkler system, traditional floor coverings such as wood, vinyl, carpeting, and other resilient floor coverings passing the DOC FF-1 pill test are allowed throughout the building, including all exits, exit passageways and exit access corridors (IEBC Section 804.4.1).

#### 9. Means of Egress:

The means of egress including the number of exits and egress capacity must be sufficient for the number of occupants on all floors (IEBC MA Amendment Section 102.2.1). As shown in the following table and detailed calculations at the end of this report, the building is generally compliant with these egress requirements with the exception of the basement space.

Floor	Occupant Load	Number of Exits Required	Number of Exits Provided	Exit Capacity (persons)
1	13	2	2	2427
1	70	2	2	907
2	87	2	2	460

As shown above, the building is provided with sufficient egress capacity with the exception of the basement storage/laundry area. The basement is permitted to have one means of egress if the travel distance is less than 100 ft and there are fewer than 29 occupants (780

Floor Construction	0"	-
Roof Construction	0	-
Stair Enclosures, Shafts, Exit Enclosures < 4 stories (IEBC 912.2, 780 CMR 708.2)	1	1
Dwelling Unit Separation (780 CMR 420.2)	1	1/2
Residential Corridors (780 CMR Table 1016.1)	1/2	1/2
New Trash Rooms > 100 ft <sup>2</sup> in Area (780 CMR Table 508.2.5)	Smoke Partitions	Self-Closing
New Laundry Rooms > 100 ft <sup>2</sup> in Area (780 CMR Table 508.2.5)	Smoke Partitions	Self-Closing
Emergency Electrical Room (527 CMR 12.00 700-90(1))	2"	1/2

<sup>1</sup> Not less than the rating of the assembly supported.  
<sup>2</sup> No rating is required for the room when fully sprinkled; however, a 2-hr rating is still required for the emergency feeder-circuit wiring.

New fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions, or any other wall required to have protected openings or penetrations must be identified with signs or stenciling within concealed spaces (i.e. floor-ceiling, attic spaces) at 30 ft intervals (780 CMR 703.6).

The laundry room and trash room are both over 100 ft<sup>2</sup>, therefore they need to be enclosed with smoke partitions and provided with self-closing doors.

#### 6. Exterior Wall Rating:

Since the renovation includes a change in use from B and F-1 to R-2, the exterior walls of the building are permitted to remain unaltered since this is a change in use to an equal or lesser hazard category (IEBC 912.6.2).

The existing building is not required to comply with the exterior wall rating requirements due to the change in use, but it is required to do so based on the adjacent construction of a new building. Since this existing building and the new building will be located on the same lot an imaginary lot line must be drawn between the buildings to determine the fire separation distance of each wall and the required rating and opening limitations. The buildings are located 42 ft apart. Since the existing building is not required to comply with the exterior wall rating requirements the imaginary lot line can be placed 12 ft from the existing building and 30 ft from the new building, thereby not requiring ratings for the new building's exterior.

#### 7. Vertical Openings:

All existing vertical openings connecting two or more floors must be enclosed with 1-hour rated construction and approved opening protectives, unless the

#### 2. Occupancy Classification:

- R-2 (Apartments and Accessory Storage and Mechanical Spaces)

#### 3. Construction Type:

It is our understanding that the existing building is solid load bearing brick with wood beams. Since this includes combustible structural members, the construction type is likely either Type IA or VB. The minimum construction type of the overall building must be Type VB as shown in Section 4 of this report.

#### 4. Height and Area Limitations:

Since there is a change in use to a higher height and area hazard category and there is an addition planned as part of this renovation, the building is required to comply with the height and area limitations for the construction type of the building (IEBC 912.5.1 & 1002.1).

Code Reference	Type VB - R-2	
	Height	Area
780 CMR Table 903.1 Tabular Value	2 St. (40 ft)	7,000 ft <sup>2</sup>
780 CMR Section 508.3 Sprinkler height increase	1 St. (30 ft)	-
780 CMR Section 508.2 Frontage increase (100% Open) <sup>1</sup>	-	5,250 ft <sup>2</sup>
780 CMR Section 508.3 Sprinkler Area Increase	-	14,000 ft <sup>2</sup>
Total Height and Area Allowed	3 St. (60 ft)	35,250 ft <sup>2</sup>
Actual Height and Area	2 St. (30 ft)	9,750 ft <sup>2</sup>

As shown above, the building is permitted to remain as Type VB construction.

#### 5. Fire Resistance Ratings:

The following table summarizes the required fire resistance ratings for the building elements of Type VB construction, based on 780 CMR Table 601 and other applicable provisions.

Building Element	Fire Resistance Rating (hrs)	Opening Protectives (hrs)
Structural Frame	0"	-
Exterior Bearing Walls including columns along the exterior wall	0	-
Interior Bearing Walls	0"	-

#### Introduction

This existing historic building, located at 149 Capen Street in Somerville, Massachusetts, currently sits vacant after serving as a public waterworks building. This project includes creating apartment housing through the conversion of the existing Mystic Waterworks building and the construction of an adjacent new apartment building. This report covers the code compliance for the conversion of the existing waterworks building into new residential units. There will be a change in use as part of this renovation from Use Group B and F-1 to Use Group R-2. This code summary is based on architectural drawings received July 22, 2011. Following is a list of applicable codes:

Code Type	Applicable Code (Model Code Basis)
Building	780 CMR: Massachusetts State Building Code, 8 <sup>th</sup> Edition (2009 International Building Code)
Fire Prevention	527 CMR: Massachusetts Fire Prevention Regulations
Accessibility	521 CMR: Massachusetts Architectural Access Board Regulations
Electrical	527 CMR 12.00: Massachusetts Electrical Code (2011 National Electrical Code)
Elevators	524 CMR: Massachusetts Elevator Code (2004 ASME A17.1)
Mechanical	2009 International Mechanical Code (IMC)
Plumbing	248 CMR: Massachusetts Plumbing Code
Energy Conservation	2009 International Energy Conservation Code & Stretch Energy Code

<sup>1</sup> The City of Somerville has adopted the Stretch Energy Code (780 CMR Appendix AA) which will become effective on January 1, 2012.

#### International Existing Building Code

The 2009 International Existing Building Code with Massachusetts amendments allows for a separate compliance method, the Prescriptive Method (in general, altered areas must comply with the code for new construction), Work Area Method (level of compliance is based on the classification of work), and Compliance Alternative Method (numerical method that allows tradeoffs for deficiencies). This report is based on the Work Area Method.

#### 1. Work Area and Classification of Work:

The proposed work includes a change in use, and alterations to the existing building. For the purposes of this report the renovations in the existing building will be classified as Level 3 alterations, which includes the reconfiguration of spaces, the addition or elimination of doors and windows, the reconfiguration or extension of systems, and/or the installation of additional equipment in more than 50% of the aggregate area of the building. Therefore, the work must comply with IEBC Chapters 6, 7, 8 & 9.

Comprehensive Permit Submission Sept. 16, 2011

Issue Description Date

Scale:

1/4" = 1'-0"

Drawn By: Checked By: Reviewed By:  
Author Checker

Project No. 2010080.00

# Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

## UNIT DATA AND CODE SUMMARY - PUMP HOUSE BUILDING

**CMR Table 1021.2.** As designed, the travel distance from the furthest storage unit to the exit stair is 105 ft. Since two means of egress are required they must be remotely located (minimum separation of 39'-4"). The proposed service exits are not remotely spaced therefore it cannot be considered a second means of egress. Therefore the second means of egress must be relocated or the maximum travel distance reduced to 100 ft.

#### General Egress Requirements

The means of egress throughout the building is required to comply with the code for new construction due to an increase in hazard category, including some of the following requirements (IEBC 912.4.1).

9.1 Maximum exit access travel distance must be less than 250 feet (780 CMR Table 1016.1).

9.2 Maximum Dead End Corridor Length must be < 50 feet or 2.5 times the least width of space (780 CMR 1018.4 Exception 2).

The basement storage area contains a dead end corridor measuring 80 ft. A door should be installed within 50 ft of the end of the corridor to eliminate this non-compliant condition.

9.3 All rooms or spaces with an occupant load greater than 50 people must be provided with two egress doors swinging in the direction of egress and illuminated exit signs at each exit (780 CMR Sections 1015.1, 1008.1.2, & 1011.1). Boiler rooms require two means of egress if the room is greater than 500 sqft and includes individual fuel-fired equipment greater than 400,000 Btu/h input capacity (780 CMR 1015.3).

9.4 The clear width of all doors must be at least 32" (780 CMR 1008.1.1).

All egress doors measured 32" minimum in clear width.

9.5 Horizontal sliding doors are permitted to be used as a means of egress in areas serving less than 10 occupants (780 CMR 1008.1.2 Ex 9).

The horizontal sliding doors in the dwelling units are compliant as designed.

9.6 Egress doors must swing in the direction of egress travel where serving an occupant load of 50 or more people (780 CMR 1008.1.2).

Door swings throughout the building are compliant.

9.7 All rooms or spaces with a travel distance of over 125 feet (100 ft for basement areas) must be provided with two egress doors and

or will be removed, added or altered, as well as areas such as mezzanines, penthouses, roof structures and in-filled courts and shafts.

3. Where a permit is issued for renovating more than 25 percent of the roof area of a building assigned to Seismic Design Category B, C, D, E or F with a structural system consisting of concrete or reinforced masonry walls with a flexible roof diaphragm or unreinforced masonry walls with any type of roof diaphragms, the work shall include installation of wall anchors at the roof line to resist the reduced 780 CMR level seismic forces as specified in Section 1015.4.2 of this code and design procedures of Section 101.5.4, unless an evaluation demonstrates compliance of existing wall anchorage (IEBC 606.2.1 MA Amendment).

4. Where a permit is issued for renovating for more than 25 percent of the roof area of a building assigned to Seismic Design Category B, C, D, E or F that has parapets constructed of unreinforced masonry, the work shall include installation of parapet bracing to resist the reduced 780 CMR seismic forces specified in Section 1015.4.2 of this code, unless an evaluation demonstrates compliance of such items (IEBC 606.3.1 MA Amendment).

5. Where roofing materials are removed from more than 100 percent of the roof diaphragm of a building, and the basic wind speed is greater than 90 mph and the occupancy category is type III or type IV or the basic wind speed is 100 or greater, the roof diaphragms and connections that are part of the main wind-force resisting system shall be evaluated for the wind loads specified in the 780 CMR, including wind uplift (IEBC 606.3.2 MA Amendment).

#### Massachusetts Architectural Access Board Regulations

Alterations to the building must comply with the requirements of the Massachusetts Architectural Access Board Regulations (521 CMR). For existing building alterations the requirements of 521 CMR are based on the cost of the proposed work:

A. If the cost of the proposed work is less than \$100,000, only the new work must comply.

B. If the cost of the proposed work is greater than \$100,000 then all new work must comply and the existing building must include an accessible public entrance, toilet room, telephone and drinking fountain (if public phones and drinking fountains are provided) (521 CMR Section 3.3 (b)). Exempt work when calculating the cost of work includes roof repair or replacement, window repair or replacement, and repointing and masonry repair work.

C. If the cost of the proposed work is greater than 30% of the full and fair cash value of the existing building a required to fully comply with 521 CMR (521 CMR Section 3.3.2). There is no exempt

- Fire extinguishers (780 CMR 906.1)
- Carbon monoxide detection throughout (780 CMR 916.1)

If required, fire pumps must be located in a dedicated room protected with 2 hour fire rated construction and accessed by directly from the exterior or through a 2-hour fire rated enclosure (780 CMR 913.2.1 & 913.2.2).

The fire pump room must have direct access to the exterior of the building or be provided with a 2-hour rated enclosure to the exterior.

#### 11. Energy Code Provisions for Existing Buildings

The building must comply with the 2009 International Energy Conservation Code (IECC) with Massachusetts Amendments. Massachusetts Energy Conservation Code. Alternatively, the provisions of ASHRAE 90.1-2007 can be used in lieu of the IECC. The IECC 101.4.3 also requires all new or altered systems or portions thereof within the existing building to comply with the code requirements applicable to new construction without requiring the unaltered portions to be upgraded.

Additionally, the City of Somerville has adopted the Stretch Energy Code (780 CMR Appendix AA) which goes into effect on January 1, 2012. Renovations in a 2 story building for residential occupancy is required to meet a HERS rating of 85 (780 CMR Appendix AA 401.6.2) or the prescriptive option for alterations or repairs (Appendix AA 401.6).

#### 12. Structural Provisions for Existing Buildings

Alterations to buildings must be evaluated by a registered structural engineer to determine compliance with the IEBC; however, for a Level 3 alteration, some of the major thresholds for seismic and wind load compliance are as follows:

1. Where not more than 30 percent of the total floor and roof areas of the building are involved in structural alteration within a 12-month period, the evaluation and analysis shall demonstrate that the altered building or structure complies with the loads applicable at the time of the original construction or of the most recent substantial structural alteration as defined by Section 807.4.2 (IEBC 807.4.3).

2. Where more than 30 percent of the total floor and roof areas of the building or structure have been or are proposed to be involved in structural alteration within a 12-month period, the evaluation and analysis shall demonstrate that the altered building or structure complies with the 780 CMR for wind loading and with reduced 780 CMR level seismic forces as specified in Section 1015.4.2 for seismic loading (IEBC 807.4.2). The areas to be counted toward the 30 percent shall be those areas tributary to the vertical load-carrying components, such as joists, beams, columns, walls and other structural components that have been

illuminated exit signs at each exit (780 CMR Sections 1015.1 & 1011.1).

If the travel distance in the basement is not reduced to less than 100 ft two remote means of egress are required.

9.8 All dwelling units that contain over 4000 square feet (20 occupants) or have a level distance over 125 feet must be provided with two means of egress (780 CMR 1015.1, 104.3 Ex 4).

9.9 Remote means of egress must be separated by 75% of the diagonal dimension of the room or space they serve (780 CMR 1015.2.1). The distance between exits may be measured along 1-hour fire resistance rated corridors complying with 780 CMR 1016 but must otherwise be measured in a straight line between exit doors.

9.10 All exits must discharge to the exterior of the building except that a maximum of 50% of the number and capacity of the exit enclosures are allowed to exit through areas on the level of discharge if the egress path fully conforms with the requirements of 780 CMR 1027.1.

As designed 50% of the exits discharge directly to the exterior, if both stairs will be open they are permitted to discharge through the first floor in accordance with 780 CMR 1016.1 Ex 4.

9.11 Doors into exit stairs must be self closing or automatically closing by listed closing devices (IEBC 704.4.3, 780 CMR 1023.3).

9.12 All means of egress lighting and exit signs throughout the building must be provided with an emergency power supply to assure continued illumination for not less than 1.5 hours in case of primary power loss (IEBC 805.2 & 805.3; and 780 CMR 1006.1 & 1011.1).

9.13 A stairway in an exit enclosure is not permitted to continue below its level of exit discharge unless an approved barrier is provided at the level of exit discharge (780 CMR 1022.7).

The enclosed stair continues below the level of exit discharge, therefore a barrier is required.

#### 10. Required Fire Protection Systems:

The following fire protection systems are required in the areas noted:

- Automatic sprinkler system throughout entire building (IEBC 704.2.2, 912.2.1)
- Fire alarm system (780 CMR 907.2.9)
- Single and multiple station smoke detectors in the R-2 areas (780 CMR 907.2.11.2)

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## UNIT TYPE DATA (NEW BUILDING)

UNIT TYPE	# UNITS	# BR's	UNIT AREA (SF)	ACCESSIBILITY
1	28	1	611	GROUP 1
2	5	1	538	GROUP 1
2-A	2	1	538	GROUP 2A

1 BR. UNITS	35
2 BR. UNITS	0
ACC. UNITS	2
<b>TOTAL UNITS</b>	<b>35</b>

### 6. Vertical Floor Openings

Vertical openings are required to comply with 780 CMR 708.2. Vertical openings connecting all four floors must be enclosed with 2-hour rated construction and opening protectives of 1.5 hours. Openings connecting three or less floors are required to be enclosed with one hour rated construction and opening protectives of 3/4 hours (1 hour for stair shafts).

All vertical openings are enclosed with the exception of the exterior stair which is permitted to be open.

### 7. Interior Finishes:

The interior finish of walls and ceilings in exits and corridors must comply with the code for new construction as shown in the table below.

#### Walls & Ceilings (IBC Table 803.9)

Building Component	Use Group A-3	Use Group R-2
Exit Stair	Class B	Class C
Exit Access Corridors	Class B	Class C
Rooms & Enclosed Spaces	Class C	Class C

Note that where exit stairs and exit access corridors serve all use groups, the most restrictive interior finish is required.

#### New Floor Finishes

Since the buildings will be equipped with an automatic sprinkler system, traditional floor coverings such as wood, vinyl, carpeting, and other resilient floor coverings passing the DCC FF-1 pill test are allowed throughout the buildings, including all exits, exit passageways and exit access corridors (780 CMR Section 804.4.1).

### 8. Means of Egress:

The calculated occupant load for the proposed floor plans, the corresponding required number of exits, the provided number of exits, and the provided egress capacity are summarized below (780 CMR Table 1004.1.1, Table 1021.1, and 1005.1). See the appendix of this report for detailed egress calculations.

#### Means of Egress

Floor	Occupant Load	Number of Exits Required	Number of Exits Provided	Exit Capacity (persons)
1	72	2	2	592
2	72	2	3	633
3	113	3	3	440
4	35	2	2	250

Stair Shafts (780 CMR 1022.1)	2	1%
Other Shafts (780 CMR 708.4)	2	1%
Dwelling Unit Separation (780 CMR 709.3, 420.2 & 420.3)	1	1/2
Fire Pump Room (780 CMR 913.2.1)	2 <sup>a</sup>	1%
Elevator Machine Room (780 CMR 708.4)	2	1%
Trash Room: Greater than 100 ft <sup>2</sup> in Area (780 CMR Table 508.2.5)	Smoke Resistant	Self Closing
Rooms With Equipment Greater than 400,000 Btu/h Input Capacity (780 CMR Table 508.2.5)	Smoke Resistant	Self Closing
Emergency Electrical Room (527 CMR 12.00 780-10(D)(2))	2 <sup>a</sup>	1%

<sup>a</sup> Not less than the rating supported (780 CMR 707.5, 709.4, and 712.4).

<sup>b</sup> 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.

<sup>c</sup> Smoke and draft control doors per UL 1784 are required (780 CMR 715.4.3).

<sup>d</sup> Location and access to the fire pump room shall be pre-determined with the fire department (NFPA 20 Section 5.12.1.1.3).

<sup>e</sup> No rating is required for the room when fully sprinklered, however a 2-hr rating is still required for the emergency feeder-circuit wiring.

Fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions, or any other wall required to have protected openings or penetrations must be identified with signs or stenciling within concealed spaces (i.e., floor-ceiling, attic spaces) at 30 ft intervals (780 CMR 703.6).

### 5. Exterior Wall Openings & Fire Resistance Rating:

The exterior wall rating requirements and opening limitations are based on the fire separation distance for each wall. The fire separation distance is measured perpendicular to the exterior wall to the centerline of a public street, an interior lot line, or an imaginary lot line between two buildings on the same lot (780 CMR 702.0). Where the fire separation distance is more than 20 ft, the wall is not required to be rated. Where the fire separation distance exceeds 20 ft, the allowable area of openings is not limited (780 CMR Table 602 and Table 705.9). Note that openings are not permitted where the fire separation distance is less than 3 ft. Also, where the fire separation distance is 10 ft or less, the exterior walls must be rated for exposure to fire from both sides (780 CMR 705.5).

An imaginary lot line must be drawn between the buildings to determine the fire separation distance of each wall and the required rating and opening limitations. The buildings are located 42 ft apart. If the imaginary lot line is drawn directly in the middle of the two buildings the exterior wall of the new building will need to be one-hour rated and can have unlimited unprotected openings. The fire can also be viewed towards the existing building thereby not requiring a fire rating for other building.

### 3. Height and Area Limitations:

The following table summarizes the height and area limitations for Use Group A-3 and R-2 based on Type VA construction:

Code Reference	Use Group A-3		Use Group R-2	
	Height	Area	Height	Area
780 CMR Table 503	2 St. (50 Ft)	11,500 ft <sup>2</sup>	3 St. (50 Ft)	12,000 ft <sup>2</sup>
780 CMR Section 504.2	1 St. (20 Ft)	-	1 St. (20 Ft)	-
780 CMR Section 508.2	-	6,750 ft <sup>2</sup>	-	6,000 ft <sup>2</sup>
780 CMR Section 508.2	-	23,000 ft <sup>2</sup>	-	24,000 ft <sup>2</sup>
780 CMR Section 508.3	1 St. (70 Ft)	40,250 ft <sup>2</sup>	1 St. (70 Ft)	42,000 ft <sup>2</sup>
Actual Height and Area	3 St. (40 Ft)	1,369 ft <sup>2</sup>	4 St. (50 Ft)	4,190 ft <sup>2</sup>

As the occupancies will be separated, the building area must be such that the sum of the ratios of the floor area of each use group divided by the allowable area for each use group does not exceed one. This calculation is shown below:

$$\frac{\text{Actual Area}}{\text{Allowed Area}} = \frac{1,369}{40,250} + \frac{4,190}{42,000} = 0.23 < 1 \text{ as required by 780 CMR 508.4.2}$$

### 4. Fire Resistance Ratings:

The following fire resistance ratings are required in accordance with 780 CMR Table 601 and various sections of the code.

Building Element	Fire Resistance Rating (hrs)	Opening Protectives (hrs)
Structural Frame	1 <sup>a</sup>	-
Exterior Bearing Walls	1	-
Interior Bearing Walls	1	-
Exterior Non-Bearing Walls	Based on FSD	-
Interior Non-Bearing Walls	0	-
Floor Construction	1 <sup>a</sup>	-
Roof Construction	1 <sup>a</sup>	-
Exit Access Corridors (780 CMR 1018.1)	1/2	1/2 <sup>b</sup>

### Introduction

The Mystic Waterworks at Capen Court residential conversion project is located at 149 Capen Street in Somerville, Massachusetts. This project involves creating senior housing through the conversion of the existing Mystic Waterworks building and the construction of a new apartment building next to the existing building. This report covers the code compliance for the proposed new four story apartment building. Following is a list of applicable codes:

Code Type	Applicable Code (Most Code Basis)
Building	780 CMR Massachusetts State Building Code, 8 <sup>th</sup> Edition (2009 International Building Code) (2009 International Existing Building Code)
Fire Prevention	527 CMR Massachusetts Fire Prevention Regulations (NFPA Chapter 443 Section 200 - Sprinkler Protection)
Accessibility	521 CMR Massachusetts Architectural Access Board Regulations (2011 National Electrical Code)
Electrical	527 CMR Massachusetts Electrical Code (2011 National Electrical Code)
Elevators	524 CMR Massachusetts Elevator Code (2004 ASME A17.1)
Mechanical	2009 International Mechanical Code (IMC)
Plumbing	518 CMR Massachusetts Plumbing Code
Energy Conservation	2009 International Energy Conservation Code & Stretch Energy Code

The City of Somerville has adopted the Stretch Energy Code (780 CMR Appendix AA) which will become effective on January 1, 2012.

### 1. Occupancy Classification:

- Separated Mixed Uses:
  - Use Group R-2 (Apartments)
  - Use Group A-3 (Large Families)

### 2. Min. Construction Type:

- Type VA Construction (combustible, 1-hour rated)

Due to the size of the large patio it is considered a separate use group and individually governed by the height and area limitations of Use Group A-3. In order to have this use group on the third floor, the building must be one hour rated.

Comprehensive Permit Submission Sept. 16, 2011  
Issue Description Date

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

Drawn By: Checked By: Reviewed By:  
Author Checker

Project No. 2010080.00

# Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

## UNIT DATA AND CODE SUMMARY - NEW BUILDING

### General Egress Requirements:

- Maximum exit access travel distance must be less than 250 ft (780 CMR Table 1016.1).  
The building is compliant as designed.
- Maximum dead-end corridor length must be less than 20 ft in A-3 areas and 50 ft in residential areas, or 2.5 times the least width of space (780 CMR 1018.4).  
No dead-end corridors were noted.
- All rooms or spaces with an occupant load greater than 50 people or with a travel distance over 75 ft in A-3 areas and 125 ft in R-2 areas must be provided with two egress doors swinging in the direction of egress and illuminated exit signs at each exit (780 CMR Sections 1015.1, 1008.1.2, & 1011.1). Boiler rooms require two means of egress if the room is greater than 500 sq ft, and includes individual fuel-fired equipment greater than 400,000 Btu/h input capacity.  
All areas of the building, including the deck area, are provided with a sufficient number of exits.  
If the large mechanical room will contain equipment over the BTU limits two means of egress are required.
- The clear width of all doors must be at least 32" (780 CMR 1008.1.1).  
All egress doors were at least 32" in clear width.
- Horizontal sliding doors are permitted to be used as a means of egress in areas serving less than 10 occupants (780 CMR 1008.1.2 Ex 9).  
The horizontal sliding doors in the dwelling units are compliant as designed.
- Doors serving assembly areas with more than 50 people and doors along the path of egress travel from such rooms must be provided with panic hardware (780 CMR 1008.1.10).
- Panic hardware must be provided along the means of egress from the large deck to the exit discharge.
- All means of egress lighting and exit signs throughout the building must be provided with an emergency power supply to assure continued illumination for not less than 1.5 hours in case of primary power loss (780 CMR 1006.1 & 1011.1).

- All public and common use areas must be accessible and provided with an accessible route thereto (521 CMR Section 12.2.2 and 20.1).
- At least 5% of the total number of dwelling units must be Group 2A units. All other units must be Group 1 (521 CMR 9.3 and 9.4).
- In addition to the units required to be Group 2A, 2% of the total number of dwelling units in the complex must be designed for persons who are deaf or hard of hearing (521 CMR 9.7).
- In Group 1 units, the refrigerator door must open 180 degrees, if the door cannot open 180 degrees, a minimum of 30° of counter space must be provided next to the refrigerator (521 CMR 43.7).
- Group 2 kitchens require 60" turning circle clearance (521 CMR 45.3).
- Refrigerator doors in Group 2 units must open 180 degrees and have a minimum of 30° of counter space next to the refrigerator (521 CMR 45.10).
- The maximum ramp slope cannot exceed 1:12 (8.3%) in accordance with 521 CMR 24.2.1.

#### Americans with Disabilities Act

The ADA Guidelines are not enforced by the Commonwealth of Massachusetts, they can only be enforced through a civil lawsuit or complaint filed with the U.S. Department of Justice. All public and common use areas must be accessible. In general, the majority of the dimensional requirements in the ADA are equivalent to those in the 521 CMR. Although the provisions of the ADA do not apply to employee only areas, the ADAAG requires that employee only work spaces must be designed to allow employees to approach, enter, and exit the work area. However, the work areas are not required to be provided with accessible features (i.e. shelves, etc.).

It should be noted that the 2010 ADA standards were published September 15, 2010. There is currently a 1.5 year concurrency period where the project can comply with either the 2010 standards or the 1991 ADA standards. Mandatory compliance is required after March 15, 2012.

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- An elevator equipped with standby power is required.
- A stairway in an exit enclosure is not permitted to continue below its level of exit discharge unless an approved barrier is provided at the level of exit discharge (780 CMR 1022.7).  
Both stairs discharge on the lowest level.
- At least one passenger elevator must be sized to accommodate the loading and transportation of an ambulance gurney or stretcher sized 24" wide by 84" long with 5" radius corners (524 CMR 17.401(1)).

### 9. Required Fire Protection Systems:

- NFPA 13 sprinkler system (780 CMR Table 903.2 & M.G.L. c149 s26G)
- Fire alarm system (780 CMR 907.2.9)
- Single and multiple-station smoke alarms must be installed in each room used for sleeping purposes and outside each sleeping area in the immediate vicinity of bedrooms (780 CMR 907.2.9.2 & 907.2.11.2).
- Standpipe system (780 CMR 905.3.1)
- Fire extinguishers (780 CMR 906.1)
- Carbon monoxide detection throughout (780 CMR 916.1)

Fire pumps must be located in a dedicated room protected with 2 hour fire rated construction and accessed directly from the exterior or through a 2 hour fire rated enclosure (780 CMR 913.2.1 & 913.2.2).

The fire pump is located in the main mechanical room, this is not permitted. The pump must be in its own room separated from all other portions of the building and accessed through a rated corridor.

### 10. Energy Code Provisions

The project is subject to the provisions of the 2009 International Energy Conservation code with Massachusetts Amendments (Massachusetts Energy Code). Additionally, the City of Somerville has adopted the Stretch Energy Code (780 CMR Appendix AA) which goes into effect on January 1, 2012. In general the Stretch Energy Code requires 20% more energy conservation than the base Massachusetts Energy Code.

### 11. Accessibility for Persons with Disabilities

Massachusetts Architectural Access Board Regulations  
All areas open to the general public (residents, students, etc.) are required to comply with the requirements of the Massachusetts Architectural Access Board (521 CMR). This section includes the following major provisions:

- All public entrances must be accessible (521 CMR 25.1).

**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Structural Engineer**  
L.A. Fuess Partners Tel: 617-948-5700 Fax: 617-948-5710

**Civil Engineer**  
Nitsch Engineering Tel: 617-338-0063 Fax: 617-338-6472

**Landscape Consultant**  
Copley Wolf Design Group Tel: 617-654-9000 Fax: 617-654-9002

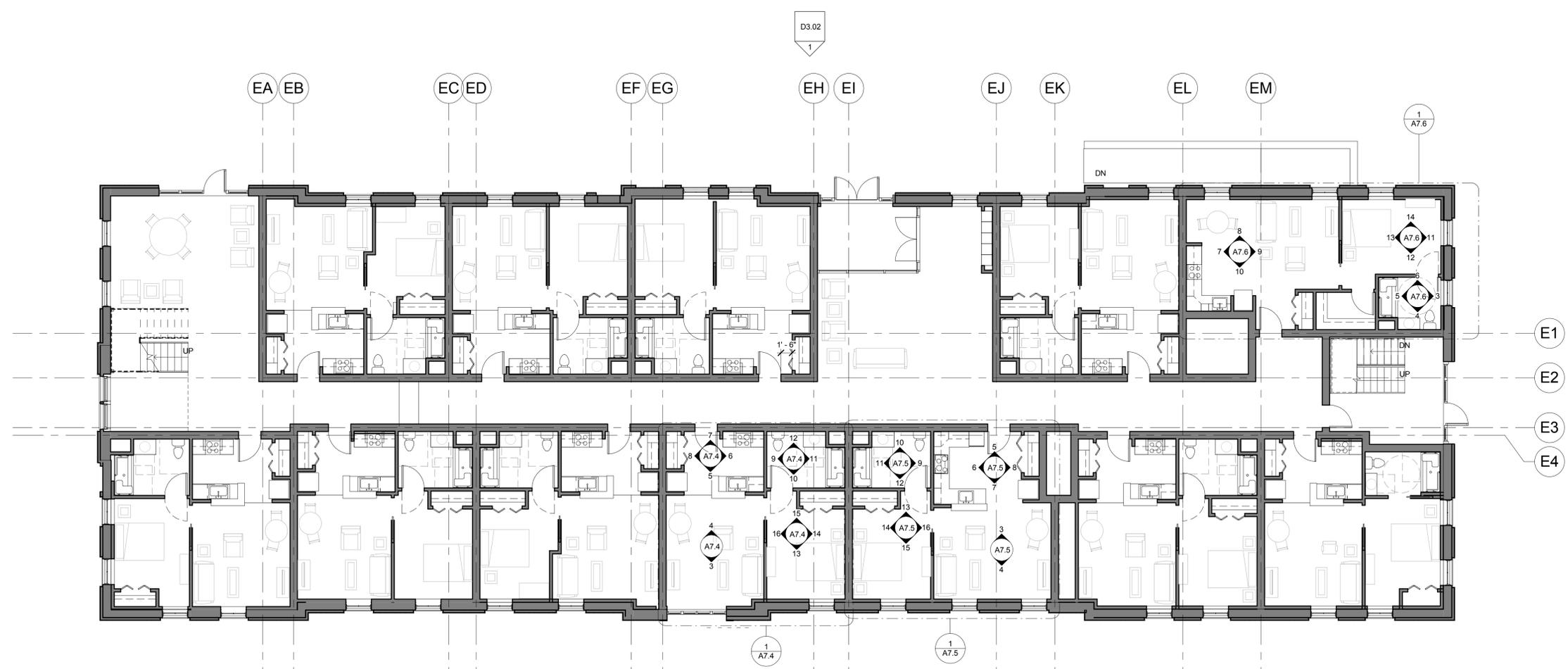
**Code Consultant**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Cost Estimator**  
VJ Associates Tel: 781-444-8200 Fax: 781-444-8242

**Historical Consultant**  
MacRostie Historic Advisors Tel: 617-499-4009 Fax: 617-499-4019

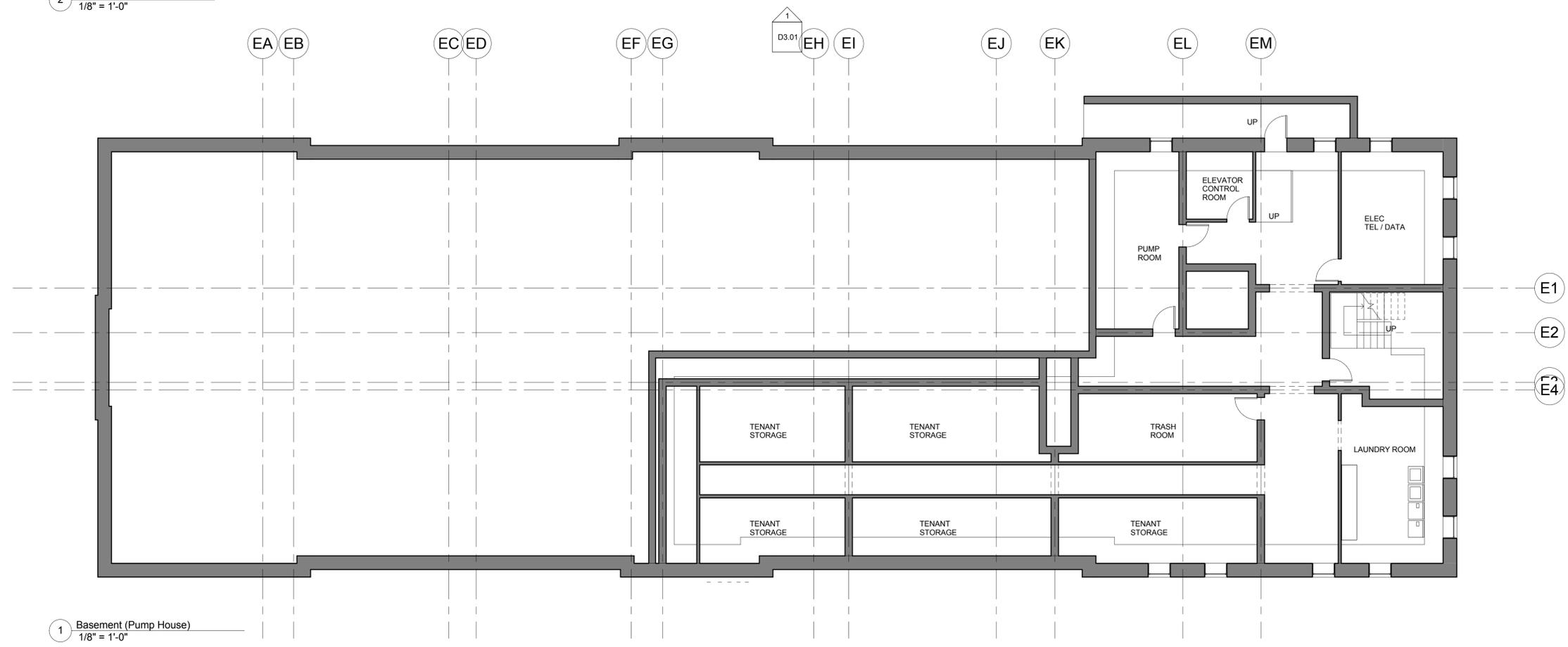
D3.02 2

2 First Floor (Pump House)  
1/8" = 1'-0"



D3.01 1

1 Basement (Pump House)  
1/8" = 1'-0"



Comprehensive Permit Submission Sept. 16, 2011  
**Issue Description** **Date**

Scale:  
1/8" = 1'-0"

**Drawn By:** Author **Checked By:** Checker **Reviewed By:**

**Project No. 2010080.00**

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

### BASEMENT & FIRST FLOOR PLAN - PUMP HOUSE BUILDING



# A1.00

**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Structural Engineer**  
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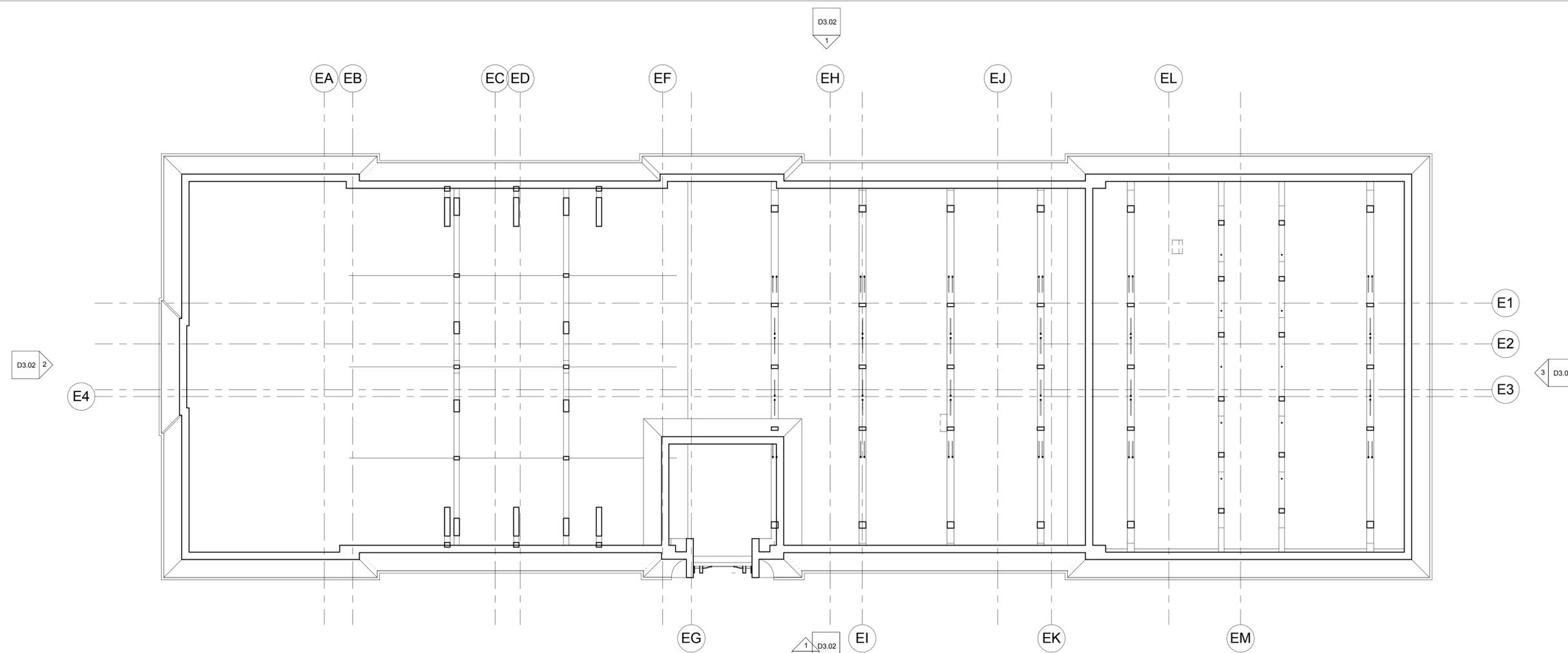
**Civil Engineer**  
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**Landscape Consultant**  
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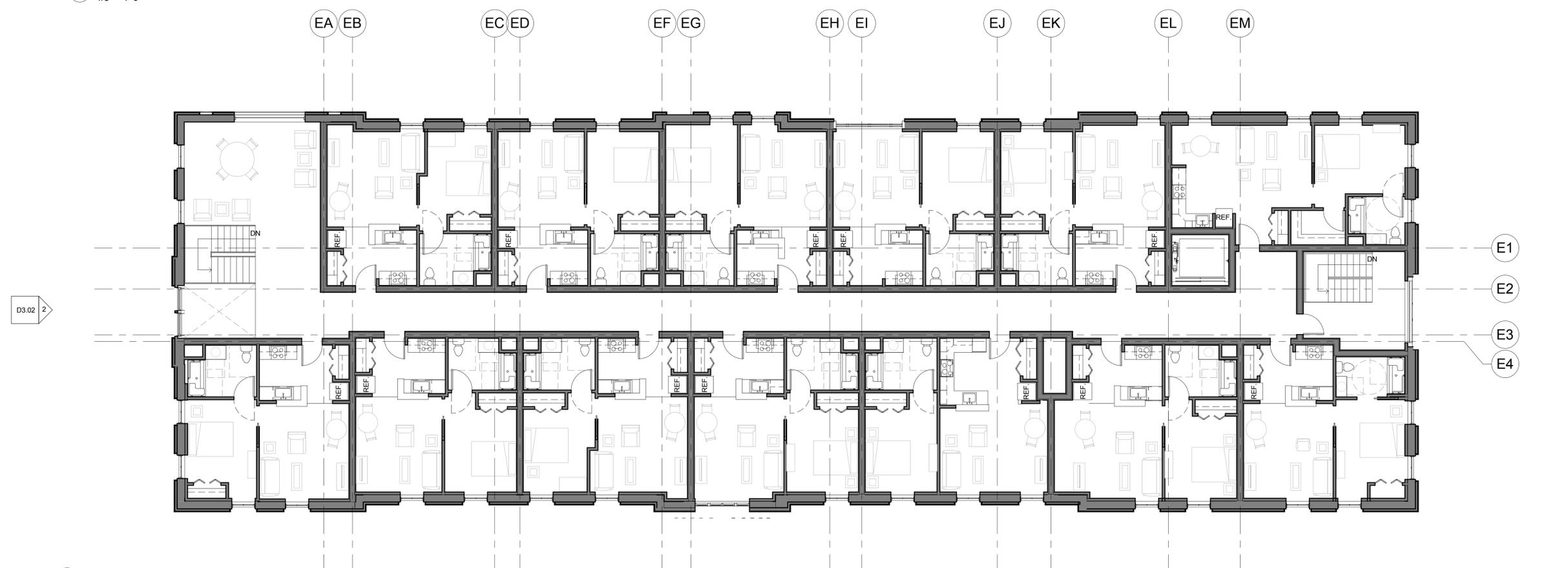
**Code Consultant**  
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**Cost Estimator**  
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**Historical Consultant**  
MacRostie Historic Advisors Tel: 617-499-4009 Fax: 617-499-4019



2 Attic (Pump House)  
1/8" = 1'-0"



1 Second Floor (Pump House)  
1/8" = 1'-0"

Issue Description	Date
Comprehensive Permit Submission	Sept. 16, 2011

Scale:  
1/8" = 1'-0"

Drawn By: Author  
Checked By: Checker  
Reviewed By:

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

### SECOND FLOOR & ATTIC PLANS - PUMP HOUSE BUILDING



# A1.01



**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Structural Engineer**  
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**Civil Engineer**  
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Issue Description	Date
Comprehensive Permit Submission	Nov. 18, 2011
Comprehensive Permit Submission	Sept. 16, 2011

Issue Description	Date
Comprehensive Permit Submission	Nov. 18, 2011
Comprehensive Permit Submission	Sept. 16, 2011

Scale:  
1/8" = 1'-0"

Drawn By: Author  
Checked By: Checker  
Reviewed By:

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

### FIRST & SECOND FLOOR PLANS - NEW

**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

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**Historical Consultant**  
MacRostie Historic Advisors Tel: 617-499-4009 Fax: 617-499-4019



2 Fourth Floor (New)  
1/8" = 1'-0"



1 Third Floor (New)  
1/8" = 1'-0"

Issue Description	Date
Comprehensive Permit Submission	Nov. 18, 2011
Comprehensive Permit Submission	Sept. 16, 2011

Scale:  
1/8" = 1'-0"  
Drawn By: Author  
Checked By: Checker  
Reviewed By:

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

### THIRD & FOURTH FLOOR PLANS - NEW



**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Structural Engineer**  
L.A. Fuess Partners Tel: 617-948-5700 Fax: 617-948-5710

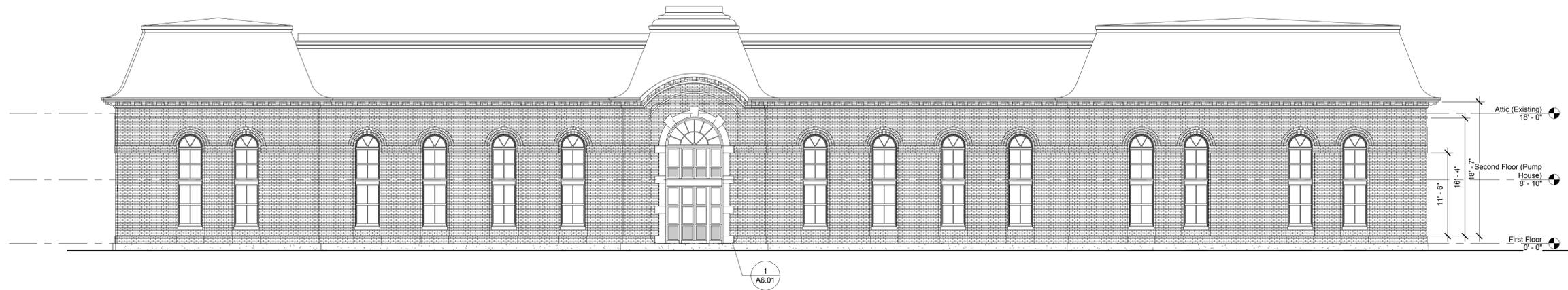
**Civil Engineer**  
Nitsch Engineering Tel: 617-338-0063 Fax: 617-338-6472

**Landscape Consultant**  
Copley Wolf Design Group Tel: 617-654-9000 Fax: 617-654-9002

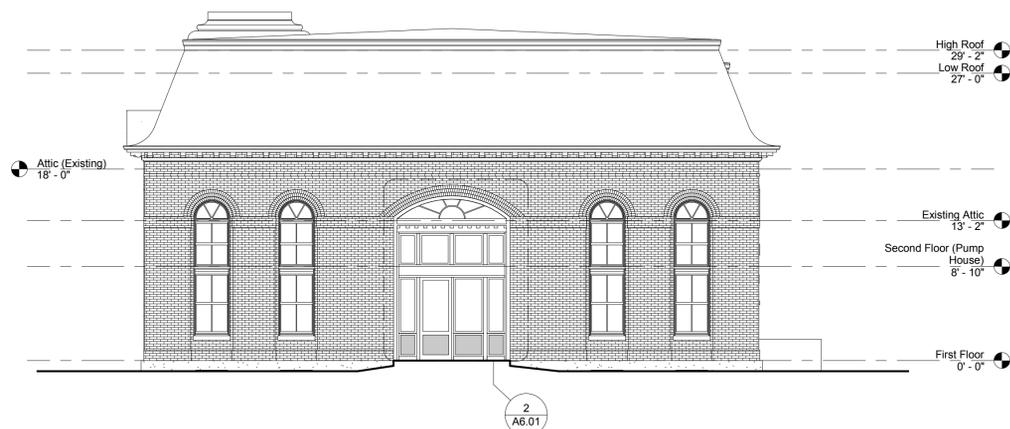
**Code Consultant**  
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**Cost Estimator**  
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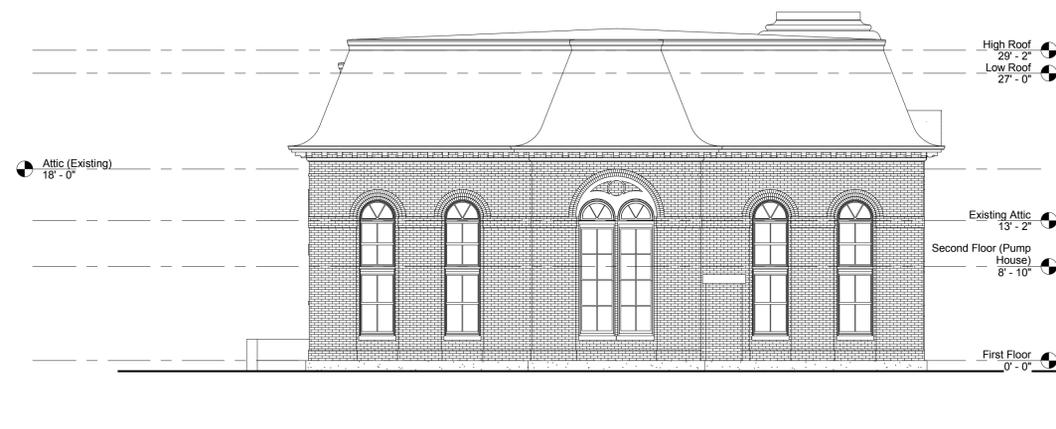
**Historical Consultant**  
MacRostie Historic Advisors Tel: 617-499-4009 Fax: 617-499-4019



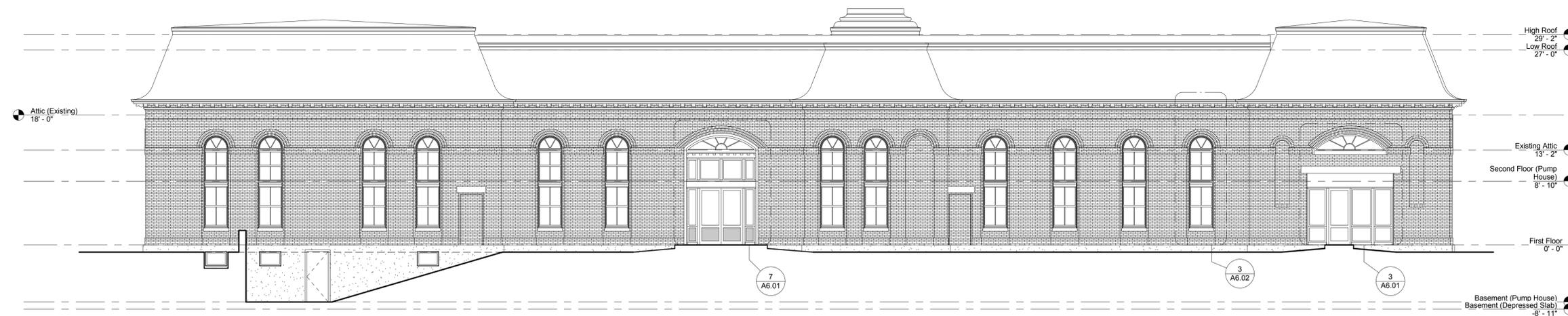
1 North Elevation (Pump House)  
1/8" = 1'-0"



2 West Elevation (Pump House)  
1/8" = 1'-0"



3 East (Pump House)  
1/8" = 1'-0"



4 South Elevation (Pump House)  
1/8" = 1'-0"

Comprehensive Permit Submission Sept. 16, 2011  
**Issue Description** **Date**

Scale:  
1/8" = 1'-0"

**Drawn By:** **Checked By:** **Reviewed By:**  
Author Checker

**Project No. 2010080.00**

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

### EXTERIOR ELEVATIONS - PUMP HOUSE BUILDING

# A3.01

**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Structural Engineer**  
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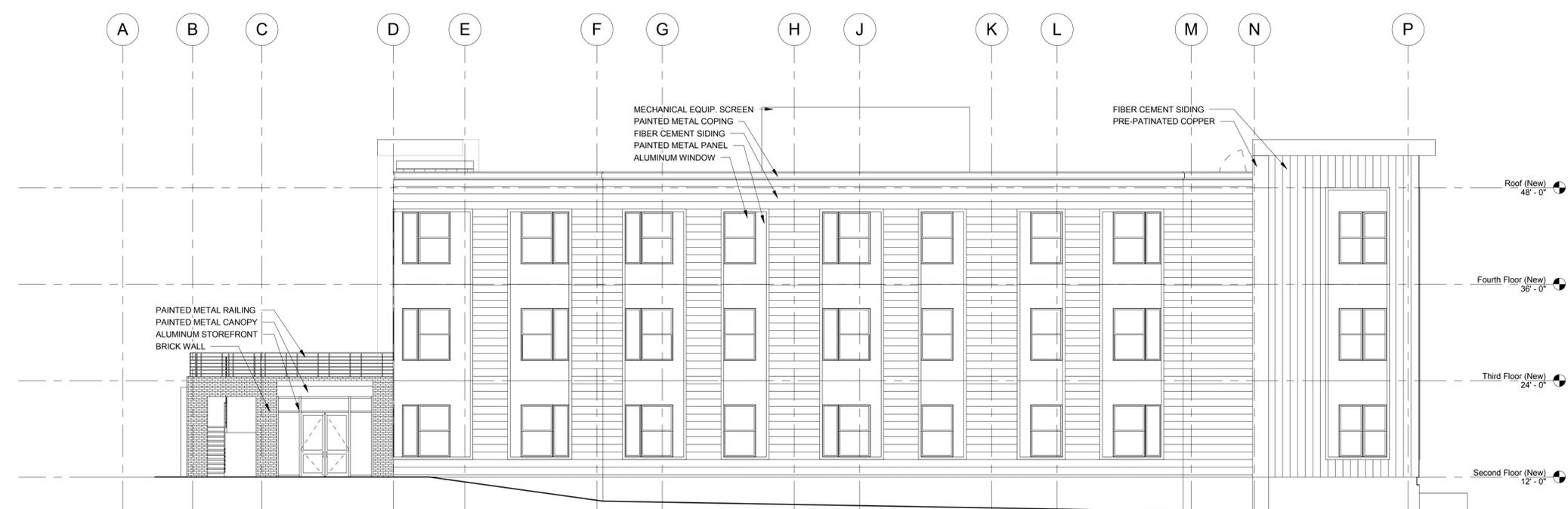
**Code Consultant**  
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**Historical Consultant**  
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1 North Elevation (New)  
1/8" = 1'-0"



3 South Elevation (New)  
1/8" = 1'-0"

Issue Description	Date
Comprehensive Permit Submission	Nov. 18, 2011
Comprehensive Permit Submission	Sept. 16, 2011

**Scale:**  
1/8" = 1'-0"

**Drawn By:** Author  
**Checked By:** Checker  
**Reviewed By:**

**Project No.** 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

### NEW BUILDING ELEVATIONS





TRAFFIC CIRCLE APPROACH



PARKING LOT APPROACH

- Client**  
Somerville Housing Authority Tel: 617-625-1125
- MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016
- Structural Engineer**  
L.A. Fuess Partners Tel: 617-948-5700 Fax: 617-948-5710
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Issue Description	Date
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Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

PERSPECTIVE VIEWS





AERIAL VIEW



COURTYARD VIEW

- Client**  
Somerville Housing Authority Tel: 617-625-1125
- MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016
- Structural Engineer**  
L.A. Fuess Partners Tel: 617-948-5700 Fax: 617-948-5710
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Issue Description	Date
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## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

PERSPECTIVE VIEWS





**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
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**Structural Engineer**  
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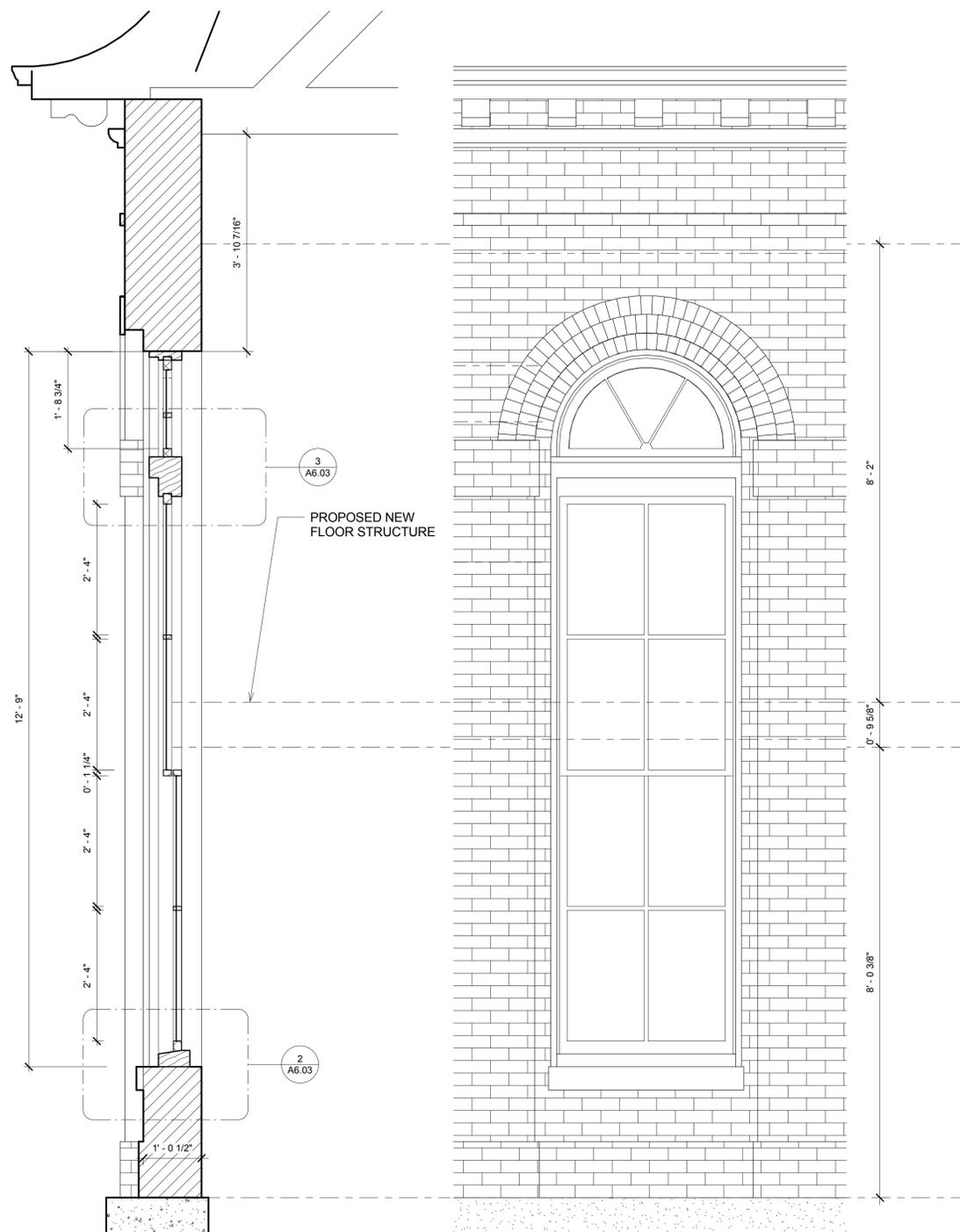
**Civil Engineer**  
Nitsch Engineering Tel: 617-338-0063 Fax: 617-338-6472

**Landscape Consultant**  
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**Code Consultant**  
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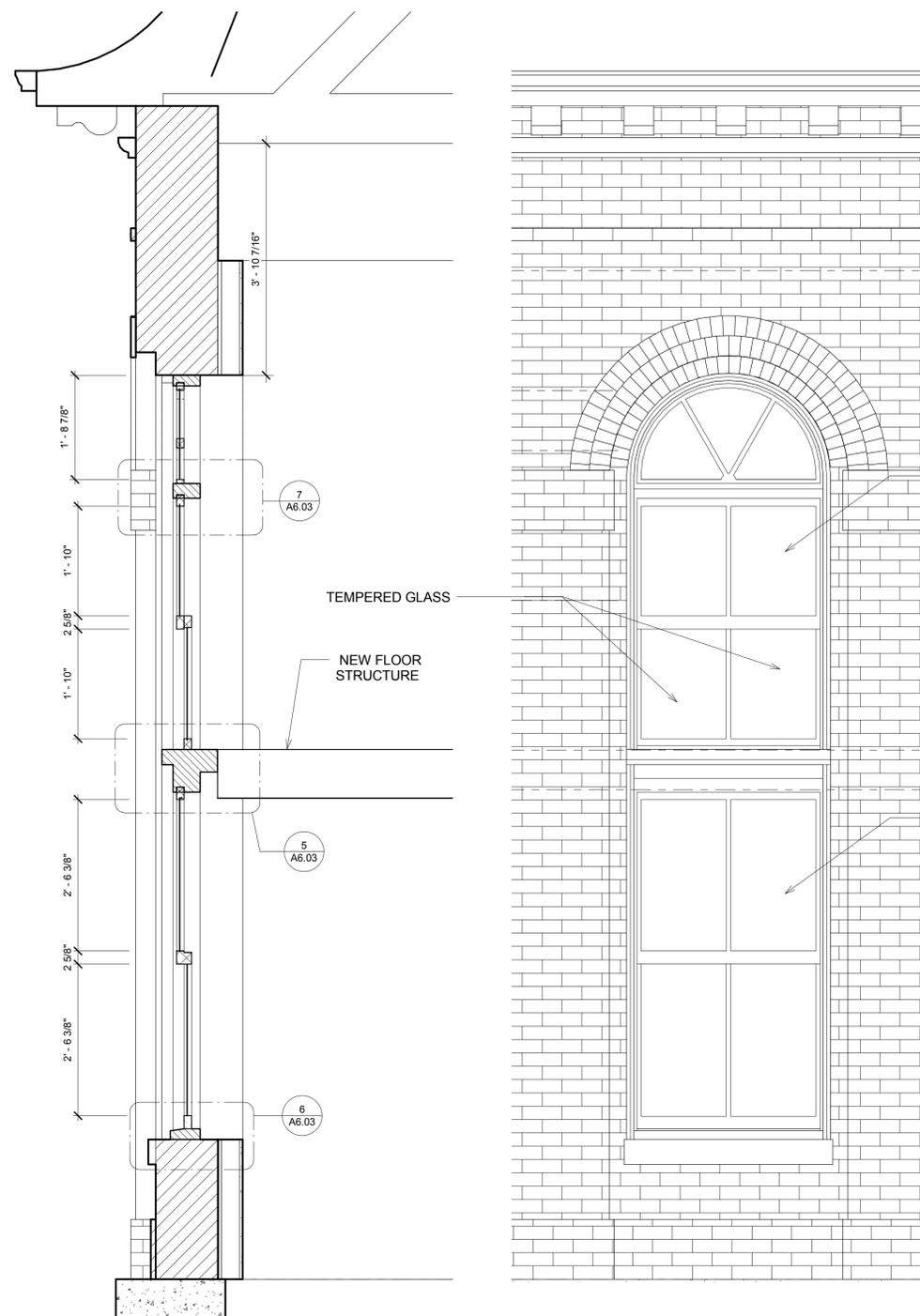
**Cost Estimator**  
VJ Associates Tel: 781-444-8200 Fax: 781-444-8242

**Historical Consultant**  
MacRostie Historic Advisors Tel: 617-499-4009 Fax: 617-499-4019



2 Window Section (Existing)  
3/4" = 1'-0"

1 Double-Hung Window Elevation (Existing)  
3/4" = 1'-0"



4 Window Section (Proposed)  
3/4" = 1'-0"

3 Double-Hung Window Elevation (Proposed)  
3/4" = 1'-0"

DOUBLE-HUNG WINDOW  
(UPPER SASH OPERABLE,  
LOWER SASH FIXED)

DOUBLE-HUNG WINDOW

Issue Description	Date
Comprehensive Permit Submission	Sept. 16, 2011

Scale:  
3/4" = 1'-0"

Drawn By: Author  
Checked By: Checker  
Reviewed By:

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

EXISTING AND  
PROPOSED WINDOW  
DETAILS

**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Structural Engineer**  
L.A. Fuess Partners Tel: 617-948-5700 Fax: 617-948-5710

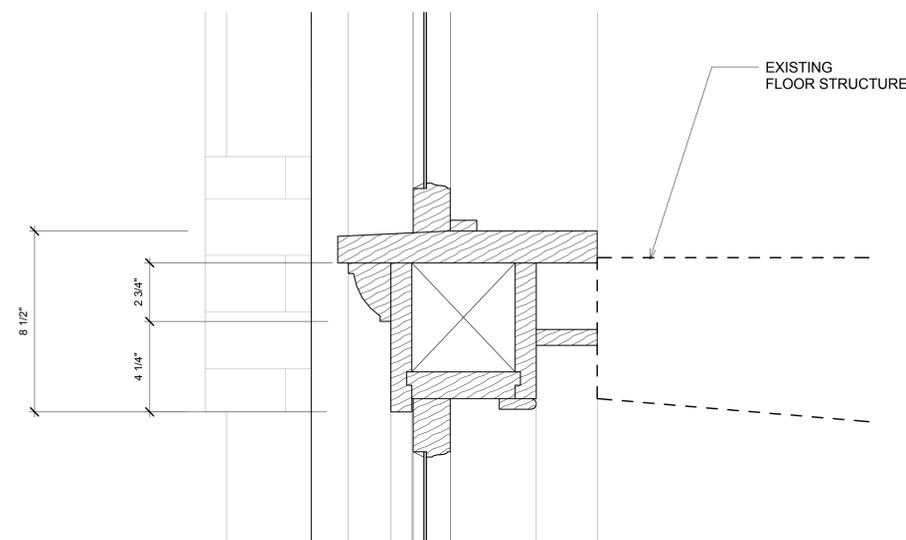
**Civil Engineer**  
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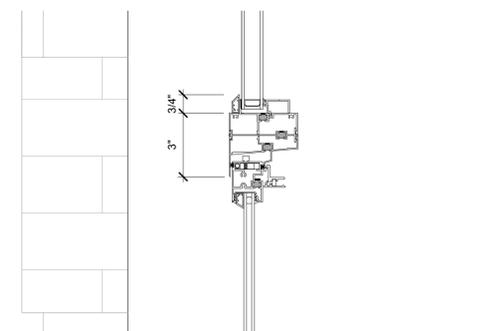
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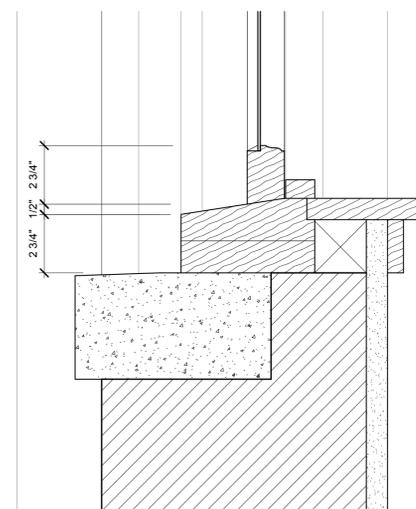
**Historical Consultant**  
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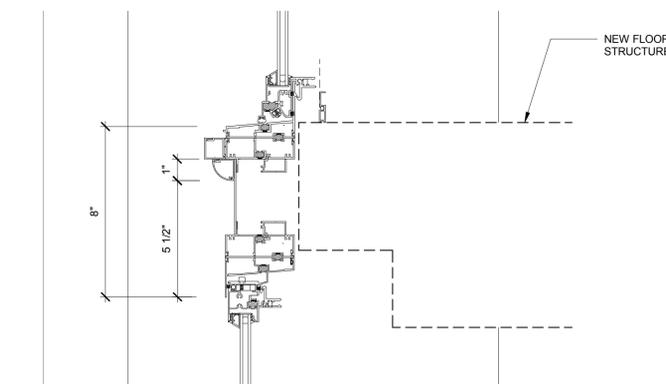
3 Detail at Floor (Existing)  
3" = 1'-0"



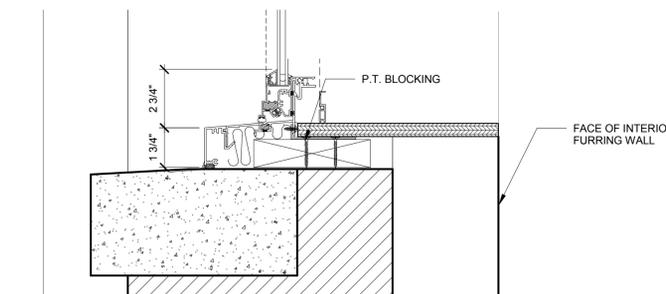
7 Detail at Fixed Sash (Proposed)  
3" = 1'-0"



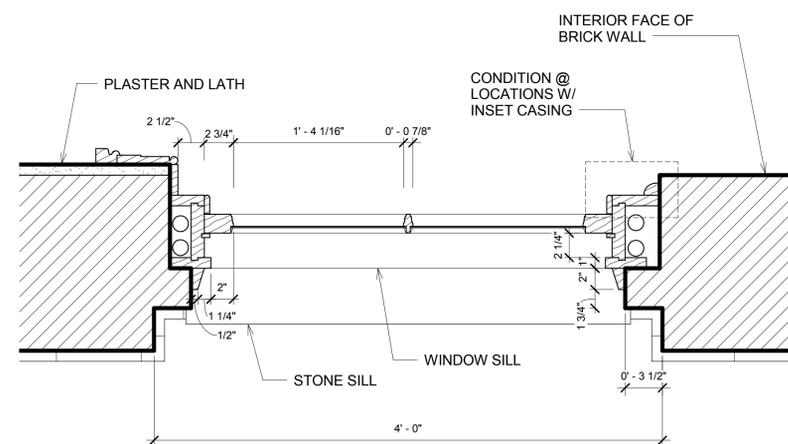
2 Detail at Window Sill (Existing)  
3" = 1'-0"



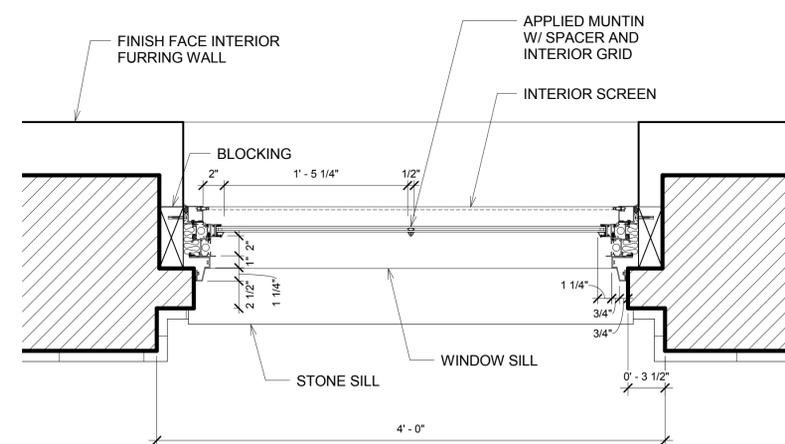
5 Detail at Floor (Proposed)  
3" = 1'-0"



6 Detail at Window Sill (Proposed)  
3" = 1'-0"



1 Horizontal Section at Lower Sash (Existing)  
1 1/2" = 1'-0"



4 Horizontal Section at Lower Sash (Proposed)  
1 1/2" = 1'-0"

Comprehensive Permit Submission Sept. 16, 2011  
Issue Description Date

Scale:  
As indicated  
Drawn By: Author  
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Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

EXISTING AND PROPOSED WINDOW DETAILS

# A6.03

**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Structural Engineer**  
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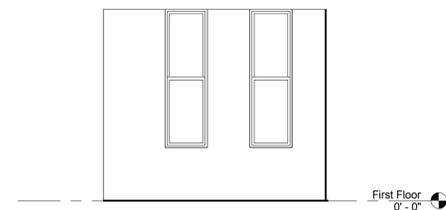
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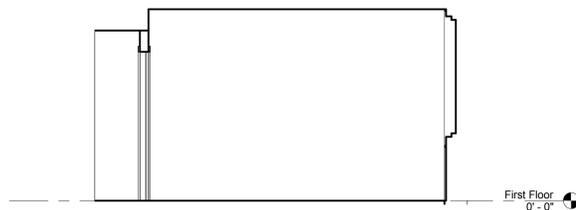
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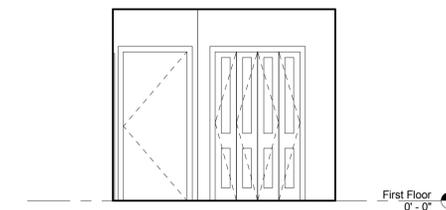
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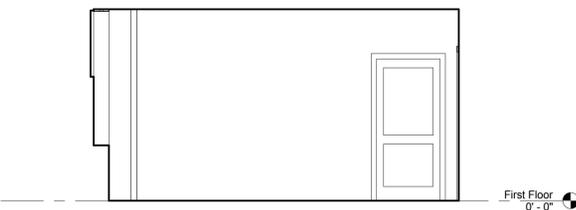
16 Unit Type 1 - Elevation D - Bedroom  
1/4" = 1'-0"



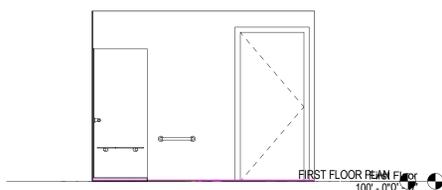
15 Unit Type 1 - Elevation C - Bedroom  
1/4" = 1'-0"



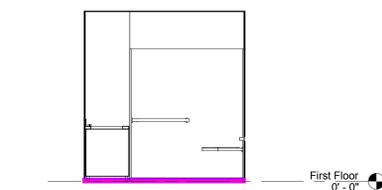
14 Unit Type 1 - Elevation B - Bedroom  
1/4" = 1'-0"



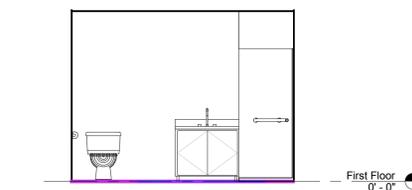
13 Unit Type 1 - Elevation A - Bedroom  
1/4" = 1'-0"



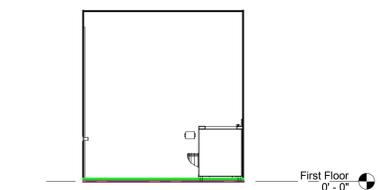
12 Unit Type 1 - Elevation D - Bath  
1/4" = 1'-0"



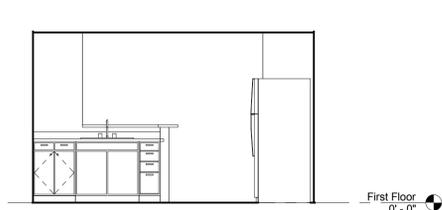
11 Unit Type 1 - Elevation C - Bath  
1/4" = 1'-0"



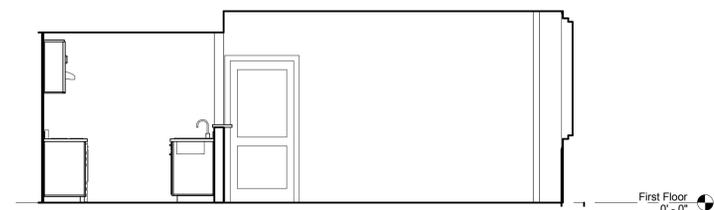
10 Unit Type 1 - Elevation B - Bath  
1/4" = 1'-0"



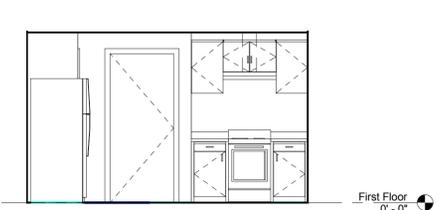
9 Unit Type 1 - Elevation A - Bath  
1/4" = 1'-0"



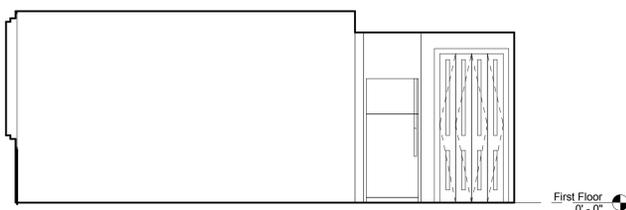
8 Unit Type 1 - Elevation D - Kitchen  
1/4" = 1'-0"



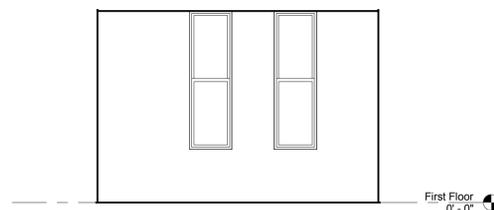
7 Unit Type 1 - Elevation C - Kitchen/Living  
1/4" = 1'-0"



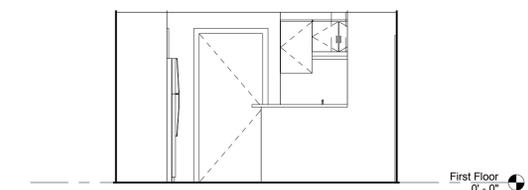
6 Unit Type 1 - Elevation B - Kitchen  
1/4" = 1'-0"



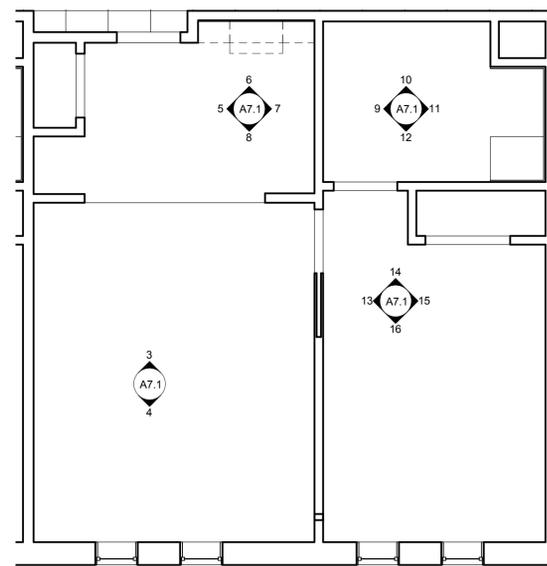
5 Unit Type 1 - Elevation A - Kitchen/Living  
1/4" = 1'-0"



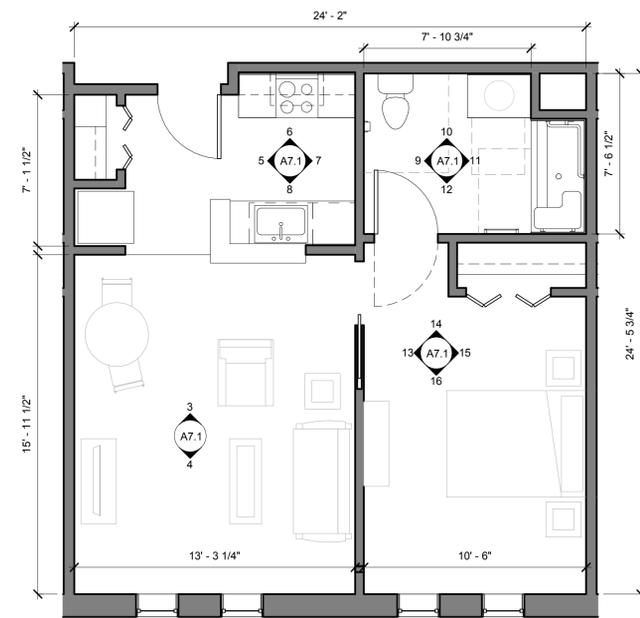
4 Unit Type 1 - Elevation D - Living  
1/4" = 1'-0"



3 Unit Type 1 - Elevation B - Living  
1/4" = 1'-0"



2 Unit Type 1  
1/4" = 1'-0"



1 Unit Type 1  
1/4" = 1'-0"

Issue Description	Date
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Scale:  
1/4" = 1'-0"  
Drawn By: Author  
Checked By: Checker  
Reviewed By:

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

ENLARGED UNIT PLAN  
- UNIT 1

# A7.1

**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Structural Engineer**  
L.A. Fuess Partners Tel: 617-948-5700 Fax: 617-948-5710

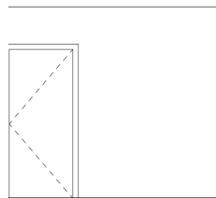
**Civil Engineer**  
Nitsch Engineering Tel: 617-338-0063 Fax: 617-338-6472

**Landscape Consultant**  
Copley Wolf Design Group Tel: 617-654-9000 Fax: 617-654-9002

**Code Consultant**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Cost Estimator**  
VJ Associates Tel: 781-444-8200 Fax: 781-444-8242

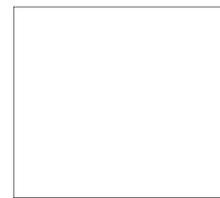
**Historical Consultant**  
MacRostie Historic Advisors Tel: 617-499-4009 Fax: 617-499-4019



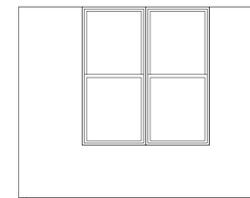
16 Unit Type 2 - Elevation D - Bedroom  
1/4" = 1'-0"



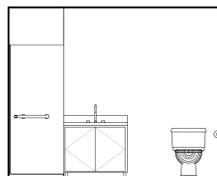
15 Unit Type 2 - Elevation C - Bedroom  
1/4" = 1'-0"



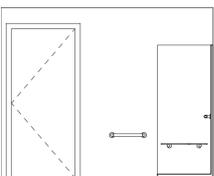
14 Unit Type 2 - Elevation B - Bedroom  
1/4" = 1'-0"



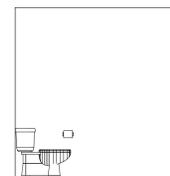
13 Unit Type 2 - Elevation A - Bedroom  
1/4" = 1'-0"



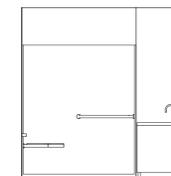
12 Unit Type 2 - Elevation D - Bath  
1/4" = 1'-0"



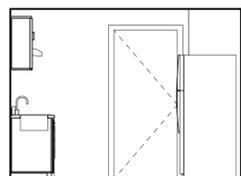
11 Unit Type 2 - Elevation C - Bath  
1/4" = 1'-0"



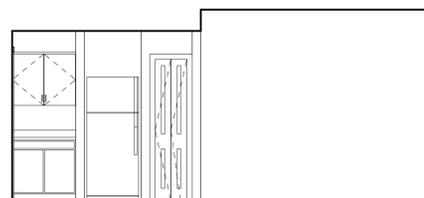
10 Unit Type 2 - Elevation B - Bath  
1/4" = 1'-0"



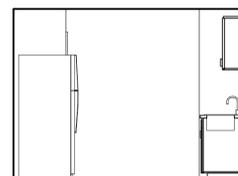
9 Unit Type 2 - Elevation A - Bath  
1/4" = 1'-0"



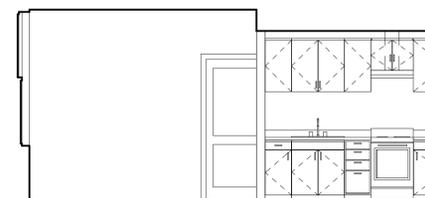
8 Unit Type 2 - Elevation D - Kitchen  
1/4" = 1'-0"



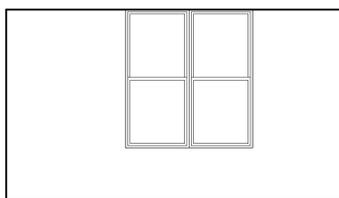
7 Unit Type 2 - Elevation C - Kitchen/Living  
1/4" = 1'-0"



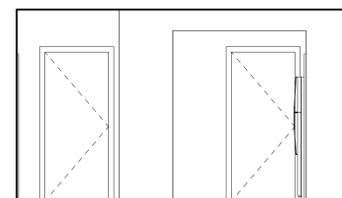
6 Unit Type 2 - Elevation B - Kitchen  
1/4" = 1'-0"



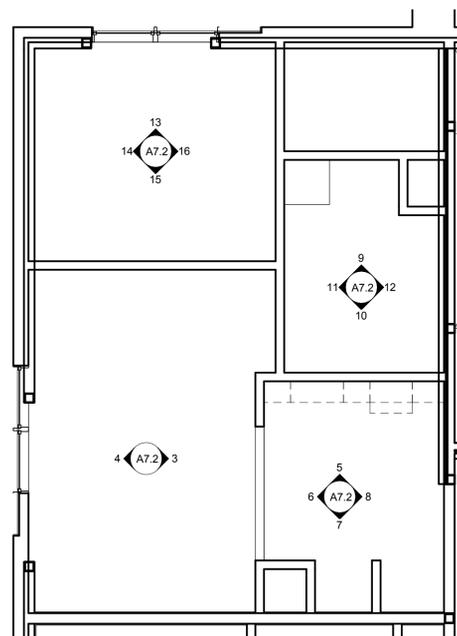
5 Unit Type 2 - Elevation A - Kitchen/Living  
1/4" = 1'-0"



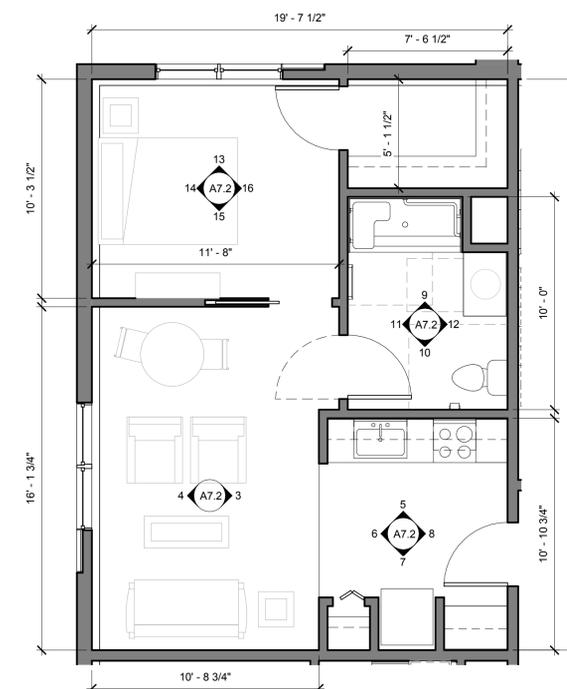
4 Unit Type 2 - Elevation B - Living  
1/4" = 1'-0"



3 Unit Type 2 - Elevation A - Living  
1/4" = 1'-0"



2 Unit Type 2 - Reflected Ceiling Plan  
1/4" = 1'-0"



1 Unit Type 2 - Floor Plan  
1/4" = 1'-0"

Issue Description	Date
Comprehensive Permit Submission	Sept. 16, 2011

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

Drawn By: Author  
Checked By: Checker  
Reviewed By:

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

ENLARGED UNIT PLAN  
- UNIT 2

# A7.2



**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Structural Engineer**  
L.A. Fuess Partners Tel: 617-948-5700 Fax: 617-948-5710

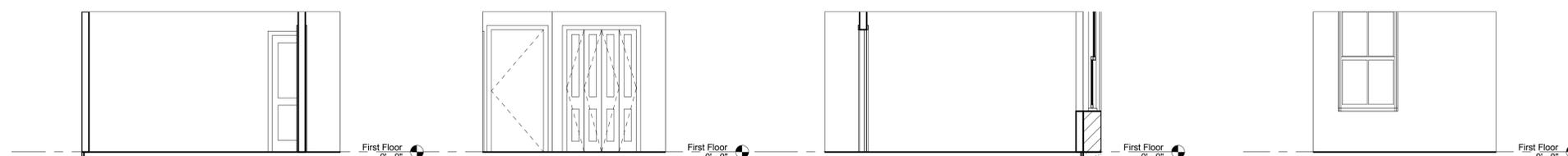
**Civil Engineer**  
Nitsch Engineering Tel: 617-338-0063 Fax: 617-338-6472

**Landscape Consultant**  
Copley Wolf Design Group Tel: 617-654-9000 Fax: 617-654-9002

**Code Consultant**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Cost Estimator**  
VJ Associates Tel: 781-444-8200 Fax: 781-444-8242

**Historical Consultant**  
MacRostie Historic Advisors Tel: 617-499-4009 Fax: 617-499-4019

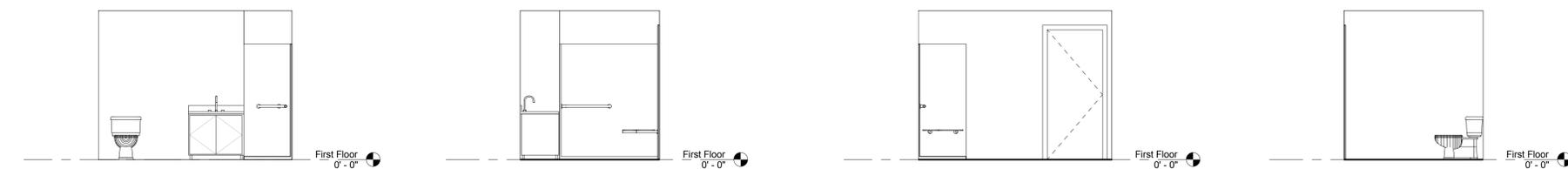


16 Unit Type E1 - Elevation A - Bedroom  
1/4" = 1'-0"

15 Unit Type E1 - Elevation B - Bedroom  
1/4" = 1'-0"

14 Unit Type E1 - Elevation C - Bedroom  
1/4" = 1'-0"

13 Unit Type E1 - Elevation D - Bedroom  
1/4" = 1'-0"

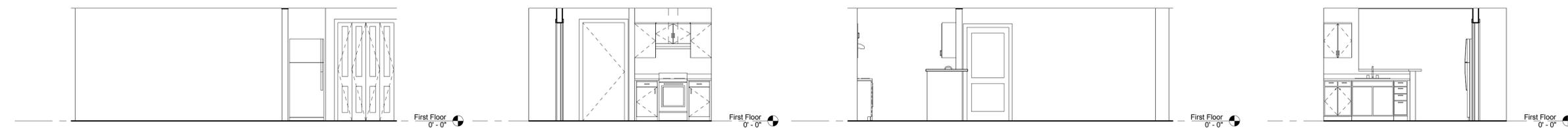


12 Unit Type E1 - Elevation A - Bath  
1/4" = 1'-0"

11 Unit Type E1 - Elevation B - Bath  
1/4" = 1'-0"

10 Unit Type E1 - Elevation C - Bath  
1/4" = 1'-0"

9 Unit Type E1 - Elevation D - Bath  
1/4" = 1'-0"



8 Unit Type E1 - Elevation A - Kitchen/Living  
1/4" = 1'-0"

7 Unit Type E1 - Elevation B - Kitchen  
1/4" = 1'-0"

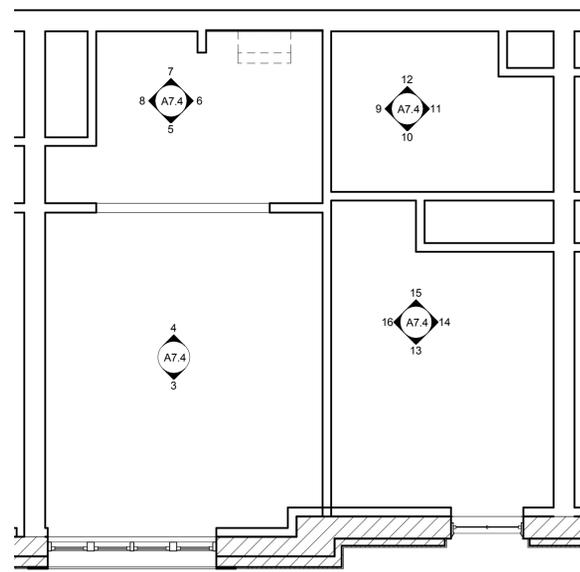
6 Unit Type E1 - Elevation C - Kitchen/Living  
1/4" = 1'-0"

5 Unit Type E1 - Elevation D - Kitchen  
1/4" = 1'-0"

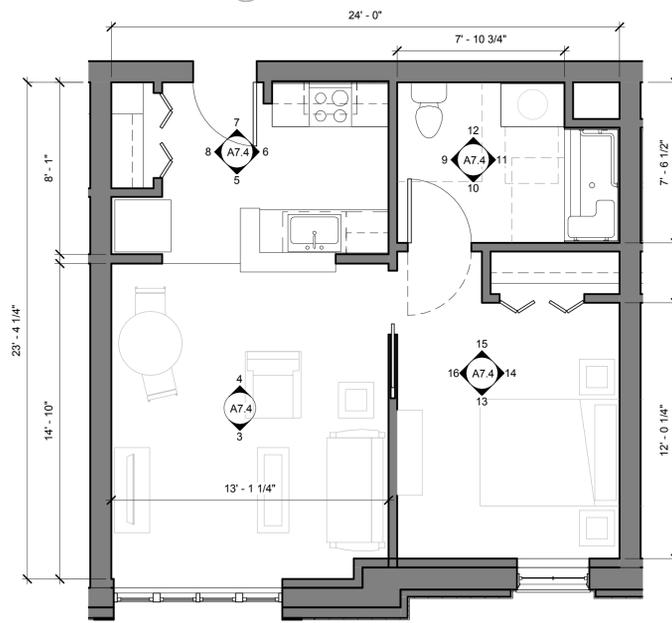


4 Unit Type E1 - Elevation B - Living  
1/4" = 1'-0"

3 Unit Type E1 - Elevation D - Living  
1/4" = 1'-0"



2 Unit Type E1  
1/4" = 1'-0"



1 Unit Type E1  
1/4" = 1'-0"

Issue Description	Date
Comprehensive Permit Submission	Sept. 16, 2011

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

Drawn By: Author  
Checked By: Checker  
Reviewed By:

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

ENLARGED UNIT PLAN  
- UNIT E1

# A7.4

**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Structural Engineer**  
L.A. Fuess Partners Tel: 617-948-5700 Fax: 617-948-5710

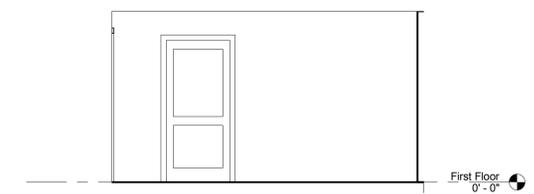
**Civil Engineer**  
Nitsch Engineering Tel: 617-338-0063 Fax: 617-338-6472

**Landscape Consultant**  
Copley Wolf Design Group Tel: 617-654-9000 Fax: 617-654-9002

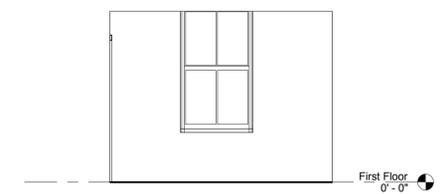
**Code Consultant**  
R.W. Sullivan Engineering Tel: 617-523-8227 Fax: 617-523-8016

**Cost Estimator**  
VJ Associates Tel: 781-444-8200 Fax: 781-444-8242

**Historical Consultant**  
MacRostie Historic Advisors Tel: 617-499-4009 Fax: 617-499-4019



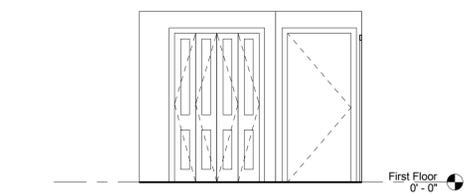
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1/4" = 1'-0"



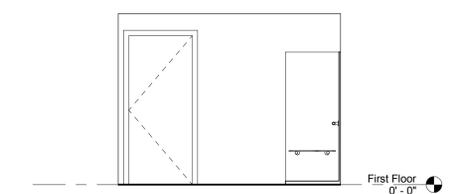
15 Unit Type E2 - Elevation B - Bedroom  
1/4" = 1'-0"



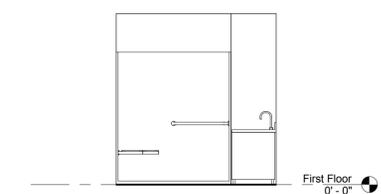
14 Unit Type E2 - Elevation C - Bedroom  
1/4" = 1'-0"



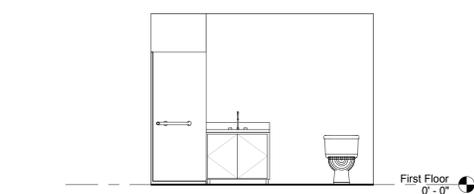
13 Unit Type E2 - Elevation D - Bedroom  
1/4" = 1'-0"



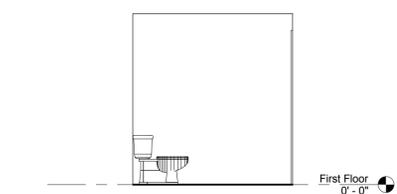
12 Unit Type E2 - Elevation A - Bath  
1/4" = 1'-0"



11 Unit Type E2 - Elevation B - Bath  
1/4" = 1'-0"



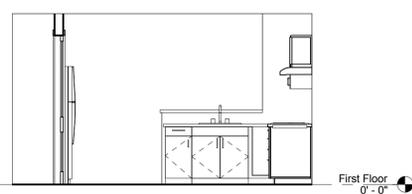
10 Unit Type E2 - Elevation C - Bath  
1/4" = 1'-0"



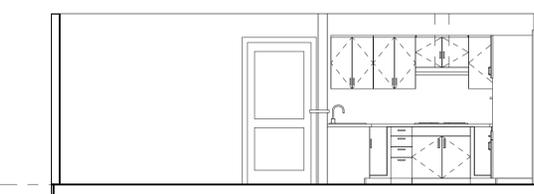
9 Unit Type E2 - Elevation D - Bath  
1/4" = 1'-0"



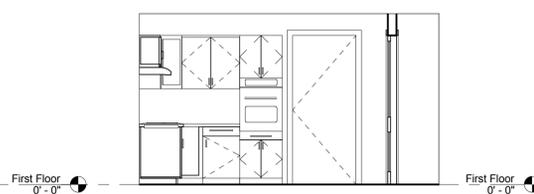
8 Unit Type E2 - Elevation A - Kitchen/Living  
1/4" = 1'-0"



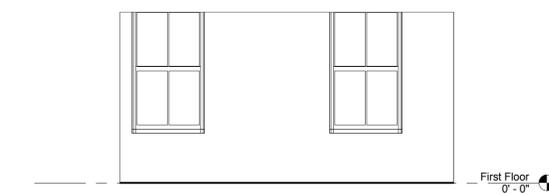
7 Unit Type E2 - Elevation B - Kitchen  
1/4" = 1'-0"



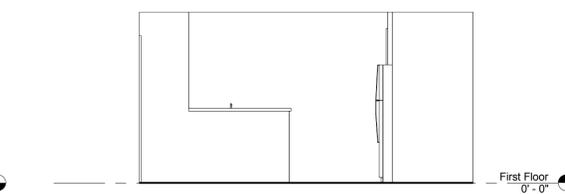
6 Unit Type E2 - Elevation C - Kitchen/Living  
1/4" = 1'-0"



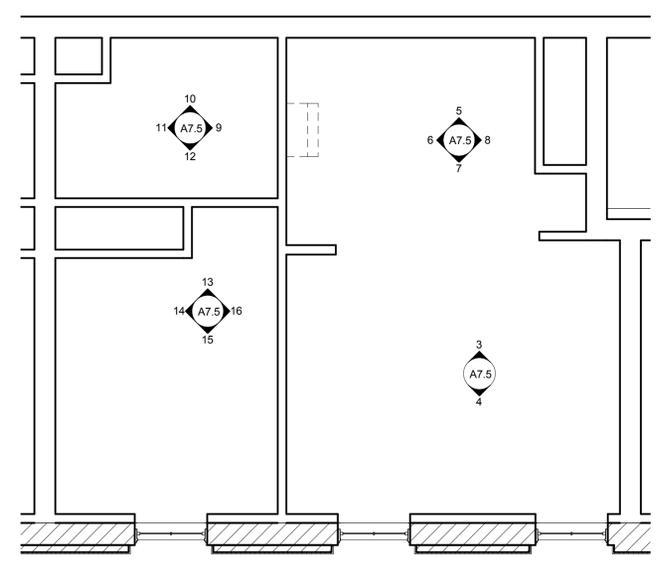
5 Unit Type E2 - Elevation D - Kitchen  
1/4" = 1'-0"



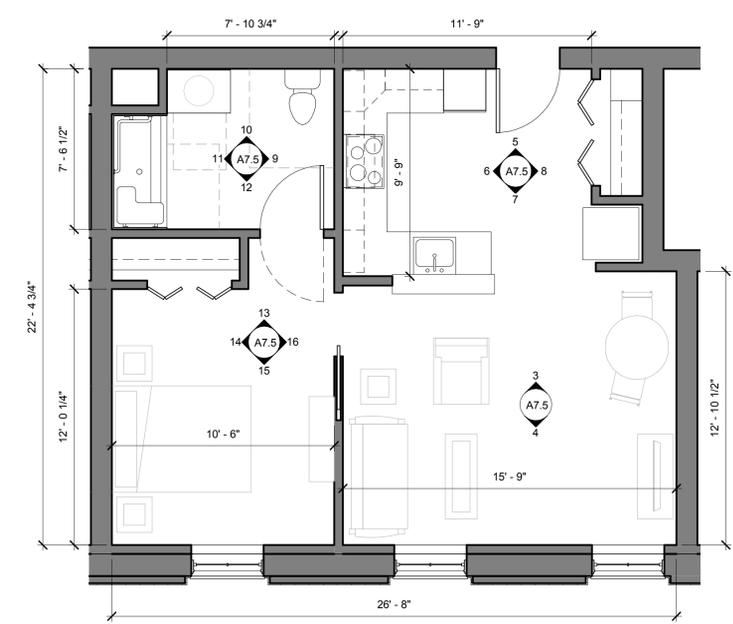
4 Unit Type E2 - Elevation B - Living  
1/4" = 1'-0"



3 Unit Type E2 - Elevation D - Living  
1/4" = 1'-0"



2 Unit Type E2  
1/4" = 1'-0"



1 Unit Type E2  
1/4" = 1'-0"

Issue Description	Date
Comprehensive Permit Submission	Sept. 16, 2011

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

Drawn By: Author  
Checked By: Checker  
Reviewed By:

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

ENLARGED UNIT PLAN  
- UNIT E2 (GROUP 2A ACCESSIBLE)

# A7.5

**Client**  
Somerville Housing Authority Tel: 617-625-1125

**MEP/FP Engineer**  
R.W. Sullivan Engineering Tel: 617-523-8227  
Fax: 617-523-8016

**Structural Engineer**  
L.A. Fuess Partners Tel: 617-948-5700  
Fax: 617-948-5710

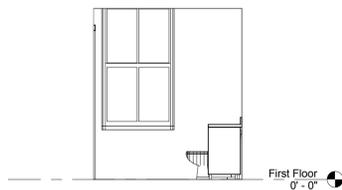
**Civil Engineer**  
Nitsch Engineering Tel: 617-338-0063  
Fax: 617-338-6472

**Landscape Consultant**  
Copley Wolf Design Group Tel: 617-654-9000  
Fax: 617-654-9002

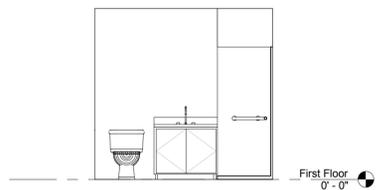
**Code Consultant**  
R.W. Sullivan Engineering Tel: 617-523-8227  
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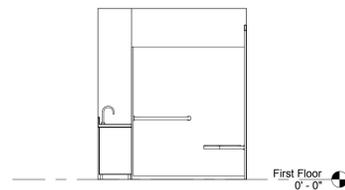
**Historical Consultant**  
MacRostie Historic Advisors Tel: 617-499-4009  
Fax: 617-499-4019



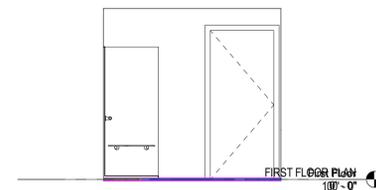
3 Elevation 1 - b  
1/4" = 1'-0"



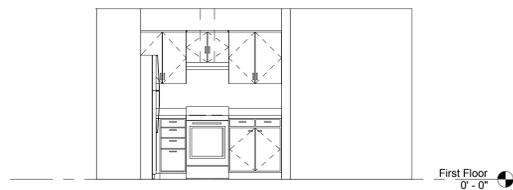
4 Elevation 1 - c  
1/4" = 1'-0"



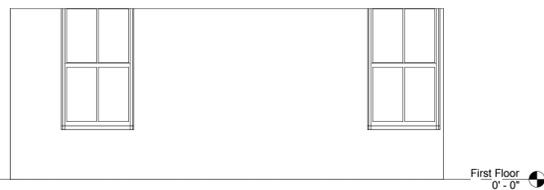
5 Elevation 1 - d  
1/4" = 1'-0"



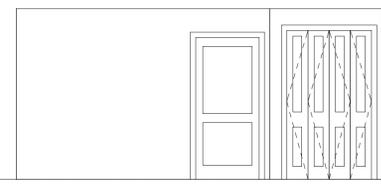
6 Elevation 4 - a  
1/4" = 1'-0"



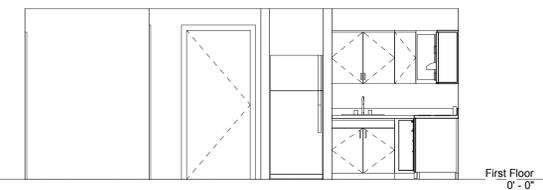
7 Elevation 2 - a  
1/4" = 1'-0"



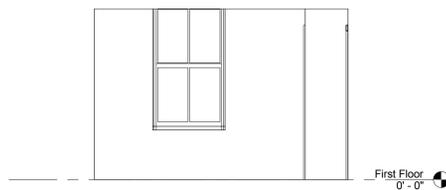
8 Elevation 2 - b  
1/4" = 1'-0"



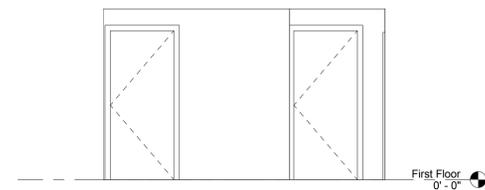
9 Elevation 2 - c  
1/4" = 1'-0"



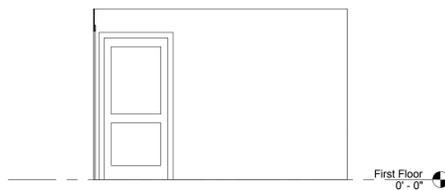
10 Elevation 2 - d  
1/4" = 1'-0"



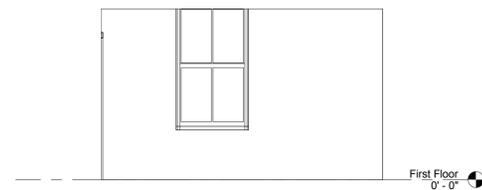
11 Elevation 3 - a  
1/4" = 1'-0"



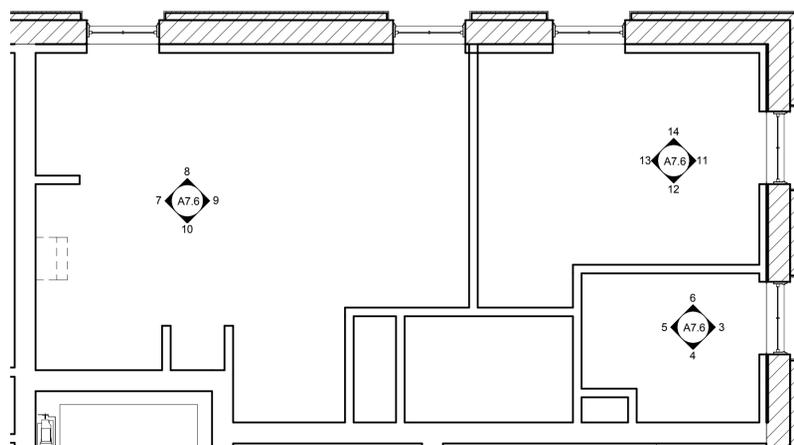
12 Elevation 3 - b  
1/4" = 1'-0"



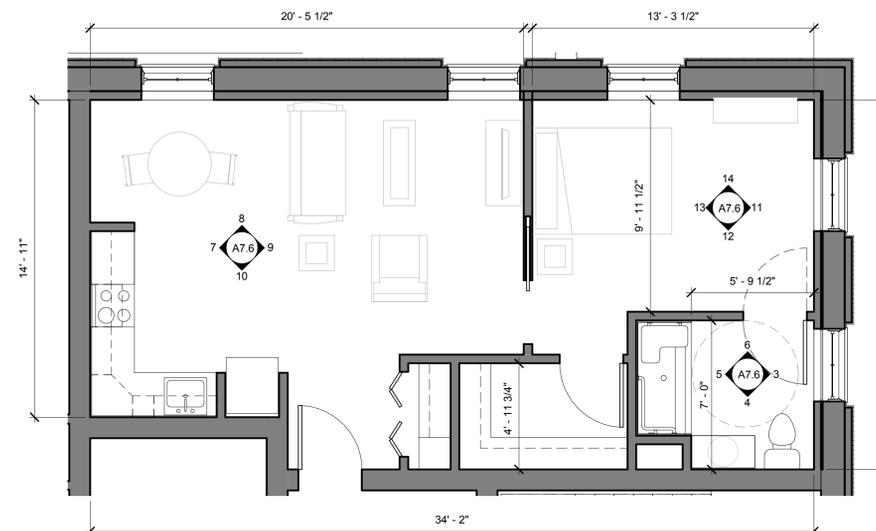
13 Elevation 3 - c  
1/4" = 1'-0"



14 Elevation 3 - d  
1/4" = 1'-0"



2 Callout of First Floor (Existing)  
1/4" = 1'-0"



1 UNIT TYPE E3  
1/4" = 1'-0"

Issue Description	Date
Comprehensive Permit Submission	Sept. 16, 2011

Scale:  
1/4" = 1'-0"  
Drawn By: Author  
Checked By: Checker  
Reviewed By:

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

ENLARGED UNIT PLAN  
- UNIT E3

# GENERAL NOTES

## SECTION 1 - GENERAL INFORMATION AND DESIGN CRITERIA

### SECTION 1.1 - DOCUMENTS

- 1.1.1 Structural Drawings are not stand-alone documents. They are augmented by technical specifications and must be coordinated with Architectural, Civil and Mechanical/Electrical/Plumbing/HVAC documents.
- 1.1.2 General Notes and Typical Details apply generally throughout the project wherever conditions similar to those depicted exist and are not necessarily referenced specifically in the documents.

- 1.1.3 Structural documents are protected by U.S.A. Copyright Laws, and shall not be used for any purpose other than construction of the building described in the Architectural documents and at the geographic location shown. The structural design described in these documents is not valid for any other purpose, use or location.

- 1.1.4 The Geotechnical Report referenced herein is not part of the Structural Documents, however, a copy should be obtained for reference during installation of foundations and subgrade preparation.

### COORDINATION

- 1.1.5 Contractor is responsible for coordinating Structural Documents with other trades and disciplines including; architectural, civil, mechanical, electrical, HVAC and fire protection. Some requirements are not known prior to issue and may change as layout and fabrication drawings are developed. Promptly report deviations and interferences with structural components for resolution by the Engineer.

- 1.1.6 Contractor shall verify dimensional location and depth of slab recesses and offsets with Architectural Drawings.

- 1.1.7 Contractor shall verify weights, location and details of structurally supported mechanical equipment prior to construction of the supporting structure. Report deviations from assumed conditions to the Engineer prior to fabricating materials.

- 1.1.8 Contractor shall verify the location, size and detail of roof openings and curbs for mechanical equipment prior to fabricating materials. Report deviations from assumed conditions to the Engineer before proceeding with work.

- 1.1.9 Contractor shall verify location and size of floor and roof penetrations and sleeves for mechanical and electrical components. Openings in beams, girders, columns and slabs are subject to prior approval of the Engineer.

- 1.1.10 Contractor shall verify elevator pit dimensions and depth, elevator shaft floor opening dimensions, over-run clearance requirements at top of shaft, and penthouse dimensions with requirements of purchased equipment. Promptly report discrepancies to Architect for resolution prior to construction.

- 1.1.11 Contractor shall verify dimensions, details, plumbness and squareness of existing structures meeting or tying into new construction.

- 1.1.12 Do not scale plans, details and sections for quantity, length or fit of materials.

### REFERENCE ELEVATIONS

- 1.1.13 Heights of floor and roof decks and various framing components are given on the drawings relative to a reference elevation of 0'-0". This reference elevation is equivalent to a Mean Sea Level Elevation of [refer civil].

### TEMPORARY BRACING

- 1.1.14 Structural systems are designed for in-place conditions only. Contractor shall provide temporary bracing of structural components (including but not limited to beams, purlins, joists, columns, walls, basement walls and structural frame) for conditions that will exist during construction and to meet all regulatory requirements for safety of workmen.

- 1.1.15 Backfilling of basement walls shall not commence until intersecting floor or roof structures are in place and have attained design strength. Refer to plan discussing construction sequence for the new building retaining wall.

- 1.1.16 Temporary frame bracing shall remain until installation of permanent structural bracing elements, member connections and floor or roof diaphragms are complete.

### SECTION 1.2 - CODES AND STANDARDS

- 1.2.1 Building Code of jurisdiction : Massachusetts State Building Code, 8th Edition

- 1.2.2 Structural Concrete Code - American Concrete Institute (ACI) 318

- 1.2.3 Structural Steel Code - American Institute of Steel Construction (AISC) 360

### SPECIAL INSPECTIONS

- 1.2.4 See Technical Specifications for other materials testing and inspection requirements.

## SECTION 1.3 - DESIGN CRITERIA

### 1.3.1 Live Loads

Balconies, Exterior	100 psf
Balconies, Residential	60 psf
Basement Walls, Surcharge	100 psf
Mechanical Room	150 psf (2)
Public Corridors	100 psf
Residential Floors	40 psf (1)
Roof	20 psf
Stair and Elevator Lobbies	100 psf
Surcharge on Retaining Walls	100 psf
Terraces, Pedestrian	100 psf

- Notes:
- (1) Plus partition loading (see Dead Loads)
- (2) Minimum load, or weight of equipment (the heavier)

1.3.2 Roof Snow Loads	
Ground Snow Load	45 psf
Flat Roof Snow Load	31.5 psf
Snow Exposure Factor (Ce)	1.0
Snow Importance Factor (I)	1.0

1.3.3 Dead Loads	
Flooring	3 psf
Ceilings	3 psf
Floor Collateral	5 psf (1)
Floor Sprinklers	3 psf (3)
Partition Loading	20 psf (5)
Roof Collateral	5 psf (1)
Roof Insulation	2 psf
Roof Sprinklers	3 psf (3)
Roofing System	10 psf (2)

- Notes:
- (1) Collateral loads include; lighting, ductwork, miscellaneous framing.
- (2) Roofing system weight is the maximum unit weight of roofing materials and ballast (where applicable) for which the roof structure is designed.
- (3) Sprinkler loads are for distribution lines and heads, exclusive of mains, which are included separately as concentrated dead loads.
- (4) Includes weight of wiring in access space.
- (5) Applied where noted under "Live Loads".

1.3.4 Wind Loads	
Base wind Speed (3 second gust)	105 mph
Wind Exposure Classification	C
Wind Importance Factor	1.0

1.3.5 Seismic Loads	
Seismic Importance Factor (Ie)	1.00
Occupancy Category	II
Mapped Spectral Response Accelerations	
Ss	0.28
S1	0.069
Site Class	D
Spectral Response Coefficients	
Sds	0.289
Sd1	0.11

1.3.6 Concentrated Loads			
Location	Load-pounds	Area	Note
Elevator Machine Room	300	4 sq.in.	
Stair Treads	300	4 sq.in.	

- Notes:
- (1) Concentrated loads apply to any location on supporting structure, separately from (not in addition to) uniform live loads, except as noted otherwise.
- (2) Applies to each structural component individually.
- (3) Load applied at any panel point along top or bottom chord.

1.3.7 Elevators - Design Loads for Elevator sheave beam and foundation supports are based on the following Manufacturer and Model No.:	
[tbd]	

- 1.3.8 Mechanical Units - Assumed weights and locations of roof-supported mechanical equipment are indicated on Roof Framing Plan. Notify Engineer of deviations in weight, location or detail prior to fabrication of materials.

1.3.9 Mechanical Units - Assumed weights and locations of roof-supported mechanical equipment are indicated on Roof Framing Plan. Notify Engineer of deviations in weight, location or detail prior to fabrication of materials.	
Report by	: tbd
Date of Report	: tbd
Report Number	: tbd

### SECTION 2 - FOUNDATIONS AND RELATED EARTHWORK

- 2.1 GEOTECHNICAL REPORT Design of foundations and structural components in contact with soil is based on the recommendations given in the following:

Report by	: tbd
Date of Report	: tbd
Report Number	: tbd

- 2.2 Refer to the soil report for subsoil conditions that may be encountered in the installation of foundations, and other information relevant to foundations and site preparation.

- 2.3 SOIL IMPROVEMENT UNDER BUILDING SLABS Design of soil-supported building slabs is based on a range of soil movement of 0 inches to 1 inch, based on the recommendations of Geotechnical Report.

- 2.4 Refer to Specifications for soil stabilization under soil-supported building slabs.

- 2.5 SUBGRADE UNDER BASEMENT SLABS Basement slabs shall be placed on coarse aggregate drainage fill, minimum of [thickness in inches] inches thick, consisting of coarse graded crushed rock to 1 1/2-inch size conforming to ASTM C33.

- 2.6 CONCRETE FOOTINGS Design Criteria: Bearing Material : Glacial Till (to be verified by soils report)

Spread Footing Bearing Capacity	: 4,000 psf (to be verified by soils report)
Continuous Footing Bearing Capacity	: 4,000 psf (to be verified by soils report)

- 2.7 Exterior footings shall bear a minimum of 4 feet below finish grade.

- 2.8 Footings shall bear minimum of 2 feet below existing grade on undisturbed native glacial till.

- 2.9 Required footing thickness is minimum and shall be adjusted as necessary to achieve required bearing conditions.

- 2.10 Steel dowels at tops of footings shall extend 30 bar diameters above and shall be hooked 3" above bottom of footing unless noted otherwise.

- 2.11 Top of footing elevations given are relative to reference elevation 0'-0"

- 2.12 DESIGN OF EARTH-RETAINING WALLS is based on equivalent hydrostatic pressure of 65 pounds per cubic foot as recommended in soil report, based on the following: (to be verified by soils report)

- a. Porous, free-draining backfill
- b. Perimeter drain

- 2.13 Do not backfill basement walls until lateral bracing structures at top and bottom of each wall between floors are constructed and have attained specified design strength. Refer to plan discussing construction sequence for the new building retaining wall.

### SECTION 3 - STRUCTURAL CONCRETE

- 3.1.1 CONCRETE FORMS Grade Beams - shall be formed both sides unless specifically shown or noted otherwise in the details.

### SECTION 3.2 - STEEL REINFORCING

- 3.2.1 STEEL REINFORCING All bars shall be deformed in accordance with ASTM A615. Reinforcing indicated to be welded shall conform to ASTM A706.

- 3.2.2 Strength of bars shall be as follows: All Bars Grade 60

- 3.2.3 SPLICING OF REINFORCING BARS Top bars in beams, slabs or joists shall be spliced at midspan between supports, unless noted otherwise.

- 3.2.4 Bottom bars in beams, slabs or joists shall be spliced at supports, unless noted otherwise.

- 3.2.5 Vertical bars in walls shall be spliced at top of concrete above floors, unless noted otherwise.

- 3.2.6 LAPPED SPLICE LENGTHS Lap reinforcing 24 bar diameters at splices unless noted or detailed otherwise.

- 3.2.7 Tension splice lengths shall be calculated in accordance with ACI 318. Use Class "B" splices unless noted otherwise

- 3.2.8 Welded wire fabric splice length (overlap), measured between outermost cross wires of each fabric sheet, shall be at least one spacing of cross wires plus 2 inches, but in no case less than 6 inches.

- 3.2.9 CONCRETE COVER TO REINFORCING Clearance from face of concrete to face of reinforcing: Footings 3" Formed Grade Beams 1-1/2" top, 2" sides, 3" bottom Walls 1" interior, 2" exterior exposure Slabs & Joists 3/4" Basement Walls 1" inside face, 2" outside face

- 3.2.10 PLACEMENT OF REINFORCING Offsets in reinforcing bars shall be bent at a ratio of 1 (normal to bar axis) to 6 (parallel to bar axis).

- 3.2.11 Provide corner bars at intersections of beams and walls in accordance with Typical Details.

- 3.2.12 Provide dowels from grade beams or foundation equal in size and spacing to vertical bars in walls or pilasters and extend one splice length above and below joint line, unless noted otherwise

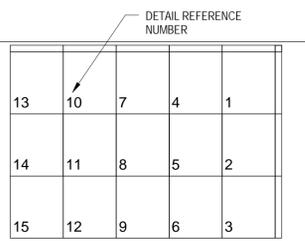
- 3.2.13 Start stirrup spacing in beams 2 inches outside of face of supports.

- 3.2.14 Place first bar of slab reinforcing parallel to side 2 inches from a free edge or half of required bar spacing from face of edge beam.

- 3.2.15 Single layer reinforcing in walls shall be placed at center of walls unless noted otherwise.

- 3.2.16 Place welded wire reinforcing in slabs poured on metal deck at center of slab unless noted otherwise.

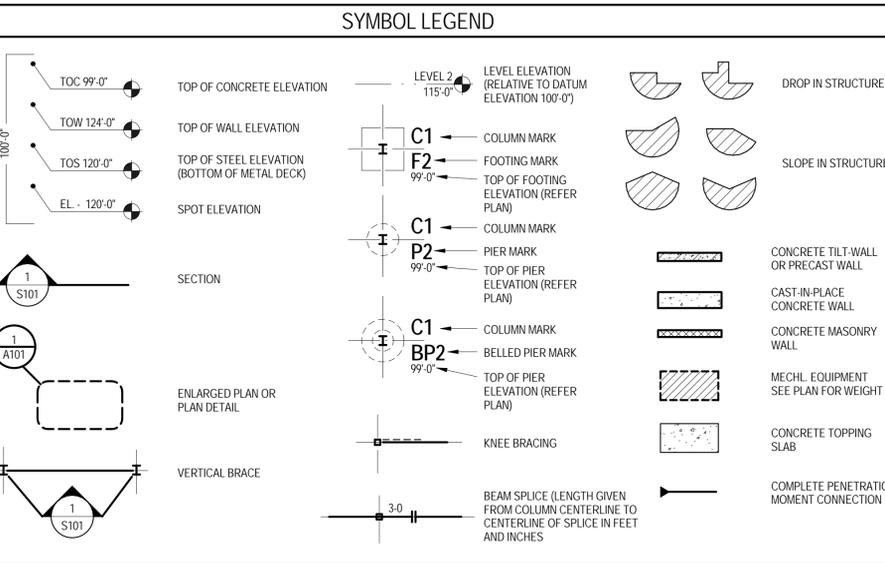
DRAWING LIST	
SHEET NUMBER	SHEET NAME
S0.1	GENERAL NOTES
S0.2	GENERAL NOTES
S1.00	BASEMENT & FIRST FLOOR PLAN - EXISTING
S1.01	SECOND FLOOR & ROOF PLANS - EXISTING
S1.02	FIRST & SECOND FLOOR PLANS - NEW
S1.03	THIRD AND FOURTH FLOOR PLANS
S1.04	ROOF PLANS
S3.01	TYPICAL CONCRETE DETAILS
S3.02	CONCRETE DETAILS
S4.01	TYPICAL MASONRY DETAILS
S5.01	TYPICAL STEEL DETAILS
S5.02	STEEL DETAILS
S7.01	TYPICAL WOOD DETAILS
S7.02	TYPICAL WOOD SHEAR WALL DETAILS
S7.03	WOOD DETAILS
SD1.00	BASEMENT & FIRST FLOOR DEMOLITION PLAN (EXISTING)
SD1.01	ATTIC & ROOF DEMOLITION PLAN - EXISTING



DETAIL SHEET LAYOUT

ARCHITECTURAL	STRUCTURAL	STEEL	MATERIAL
AESS	Above Finish Floor	AFF	Aggregate
ALT	Alternate	ANCHOR BOLT	ANCHOR BOLT
ARCH.	Architect	ARCH.	Architectural
ARCHL.	Architectural	BM.	Beam
BRG.	Bearing	BTWN.	Between
BLK.	Block	BOT.	Bottom
BLDG.	Building	B.L.	Building Line
C.L.	Center Line	CHNL.	Channel
COL.	Column	C.	Compression
CONC.	Concrete	CONC.	Concrete
CONN.	Connection	CONSTR.	Construction
CONTR.	Contractor	C.J.	Construction Joint
CONTR. JT.	Contraction Joint	CONT.	Continuous
CONTR.	Contractor	DBA	Deformed Bar Anchor
DET.	Detail	DET.	Detail
DIAM.	Diameter	DIAM. OR D.	Diameter
DIM.	Dimension	DWL.	Drawing
DWG.	Drawing	EA.	Each
E.F.	Each Face	E.W.	Elevation
EL.	Elevation	ENGR.	Engineer
EQ.	Equal	EQ.	Equal
EXIST.	Existing	EXP.	Expansion (bolt)
EXP.	Expansion (bolt)	E.J.	Expansion Joint
E.J.	Expansion Joint	EXT.	Exterior
FABR.	Fabricator	F.S.	Field Verify
F.F.	Finish Floor	FIN.	Finish
F.F.E.	Finish Floor El.	F.F.E.	Finish Floor El.
FLR.	Floor	F.L.R.	Field Verify
F.M.	Foot Kips (moment)	F.	Force (axial)
GR.	Grade	H.S.	Headed Stud
H.S.	Headed Stud	HT.	Height
HSS.	Hollow Structural Section	HORIZ.	Horizontal
INT.	Interior	INT.	Interior
JT.	Joint	JST. OR J.	Joist
K.	Kip (1,000 pounds)	MFR.	Manufacturer
MARK.	Mark	MAX.	Maximum
MATL.	Material	MECH.	Mechanical
MEP.	Mech/Elec/Plumbing	MIN.	Minimum
MTL.	Metal	MOM.	Moment
NSG.	Non-Shrink Grout	NIC.	Not in Contract
NIS.	Not to Scale	NO.	Number
O.C.	On Center	O.C.	On Center
OPNG.	Open Hole	OPNG.	Opening
OP.HD.	Opposite Hand	P.	Panel
P.	Panel	PENET.	Penetration
PENET.	Penetration	P.L.	Plaster
P.L.	Plaster	PL.	Plate
PT.	Point	P.T.	Point
P.SF.	Pounds per Sq. Ft	PSF.	Pounds per Sq. Ft
PSI.	Pounds per Sq. Inch	PSI.	Pounds per Sq. Inch
P/C.	Precast Concrete	P/C.	Precast Concrete
P.L.	Property Line	R.	Radius
R.	Radius	RECT.	Rectangle(ular)
RECT.	Rectangle(ular)	REINF.	Reinforcing
REINF.	Reinforcing	RECD.	Required
RECD.	Required	SCHED.	Schedule
SCHED.	Schedule	SECT.	Section
SECT.	Section	SHT.	Sheet
SHT.	Sheet	SIM.	Similar
SIM.	Similar	SO.	Skip-Critical
SO.	Skip-Critical	SQ.	Square
SQ.	Square	STD.	Standard
STD.	Standard	STL.	Steel
STL.	Steel	STIFF.	Stiffener
STIFF.	Stiffener	STRUCT.	Structural
STRUCT.	Structural	STRUCT.	Structural
STRUCT.	Structural	SUPT.	Support
SUPT.	Support	SYMM.	Symmetry
SYMM.	Symmetry	TEMP.	Temperature
TEMP.	Temperature	T.	Tension
T.	Tension	T & B	Top and Bottom
T & B	Top and Bottom	TOC	Top of Concrete
TOC	Top of Concrete	TOF	Top of Footing
TOF	Top of Footing	TOJ	Top of Joist
TOJ	Top of Joist	TOP	Top of Pier
TOP	Top of Pier	TOS	Top of Steel
TOS	Top of Steel	TOW	Top of Wall
TOW	Top of Wall	TYP.	Typical
TYP.	Typical	UNO	Unless Noted Otherwise
UNO	Unless Noted Otherwise	VERT.	Vertical
VERT.	Vertical	WD.	Wood
WD.	Wood	W.P.	Work Point
W.P.	Work Point		

STANDARD ABBREVIATIONS



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LAFP Project No. B1139

## Project Status

Comprehensive Permit Submission Sept. 16, 2011  
Issue Description Date

Scale: AS NOTED  
Drawn By: RS Checked By: RS Reviewed By: AF

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St. Somerville, MA 02144

# GENERAL NOTES

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## Mystic Water Works at Capen Court

Capen St. Somerville, MA 02144

## GENERAL NOTES

**S0.2**

### SECTION 3.3 - CONCRETE MIX DESIGNS

#### 3.3.1 Concrete Mix Schedule:

- "HRC" refers to hardrock concrete having air dry unit weight of approximately 145 PCF.
- "LWC" refers to sand lightweight concrete having an air dry unit weight not to exceed 120 PCF.
- Where w/c ratio is not indicated in the Concrete Mix Schedule, it shall be as necessary to meet strength requirements.
- Where the w/c ratio is shown, it shall be adhered to regardless of strength requirements.
- "Strength" is required compressive cylinder strength at an age of 28 days.

Conc. Class	Strength psi	Agg. Type	Agg. Size	Slump Inches	Max w/c	Notes
A	3000	HRC	1-1/2"	5-7	---	
C	3500	HRC	1"	3-5	---	
D	4000	HRC	1"	3-5	---	
E	3000	HRC	3/4"	2-4	---	

#### 3.3.2 Mix Usage Schedule:

Description of Use	Concrete Class	Air Content
Footings	A	-----
Interior Slab-on-Grade	C	-----
Basement Slab	C	-----
Stem/Basement Walls	D	3-6%
Retaining Walls	D	3-6%
Elevator Pit Walls	B	-----
Slab on Metal Form Deck	E	-----
Slab on Composite Metal Deck	E	-----

### SECTION 3.7 - CONCRETE SLABS

#### 3.7.1 Slabs Placed on Grade

Location	Thickness	Reinforcing
All	5 inches	#3 @ 18 EW

- Reinforcement shall be placed 2 inches from top of slab, unless detailed otherwise.
- Provide construction joints in slabs where indicated on Plans. Allow minimum of 4 days interval between placing adjacent sections of slab.

#### 3.7.2 Slabs on Composite Metal Deck

Composite Slab Schedule:	Notes/
Mark	Overall Typ Slab T-inches Reinf Addnl Top Reinf
A	5.0 6x6-W2.1xW2.1 WMM #4(6-0)@12 over girders

"Girders" refers to interior beams oriented parallel to deck.  
Slab types correspond to deck type (see Composite Metal Deck).  
Locate Typ Slab Reinf at center of slab above deck.  
Top Cover for Addnl Top Reinf: 1".

#### 3.7.3 Slabs on Deep-Dek Composite Metal Deck

- Floor framing shall be Deep-Dek Composite Floor System manufactured by Metal Dek Group (a unit of CSI). Slab thickness shall be 5" normal weight concrete on 4 1/2" deck (9 1/2" nominal total thickness).
- Deep-Dek Composite Deck shall have a yield strength of 40 ksi and shall have the following minimum properties:  
18 Gauge  
I = 3.903 in<sup>4</sup>  
Sp = 1.534 in<sup>3</sup>  
Sn = 1.599 in<sup>3</sup>  
NOM. SLAB DEPTH = 9.5 in  
MAX. UNSHORED CLEAR SPAN (shoring required at deck mid-span)  
Single span = 15'-6"  
Double span = 17'-9"  
Triple span = 18'-2"
- Slab shall be reinforced with WWF 6x6-W2.9xW2.9 centered in the slab. Refer to plan for additional top reinforcing.
- Composite deck system shall be shored in accordance with manufacturers requirements. Shoring is to remain in place until concrete has reached 75% of specified compressive strength. In addition, shoring is to remain in place until all levels have been placed and have reached 75% of specified compressive strength.
- At support points and edge of deck locations, composite deck shall be attached to load bearing walls and structural steel support beams with Hilti Flex Screws. Type 12-14x7/8 HHW #3 at 12" o.c. unless noted otherwise.
- Deck shall span between supports. No midspan splicing of the deck is permitted. Clinch side laps with DEK LOK HSL AT 18" O.C. and with 1/2" puddle welds at 12" o.c. at beam supports

#### 3.7.4 Sawjoints

- Sawjoint layout plan shall be submitted for approval prior to pouring concrete slab. Layout of the sawjoints shall be based on the following:
- A maximum center to center spacing of sawjoints in both directions of 20 feet.
  - Sawjoints shall be located on column grid lines whenever possible.
  - The ratio of sawjoints spacing in each direction shall not exceed 1.5 to 1. Example: with sawjoints in the N-S direction spaced at 13 feet on center the E-W direction shall be spaced at a maximum of 19.5 feet on center.
  - Sawjoints shall be located at each interior corner of the building.

### SECTION 3.8 - POST-INSTALLED ANCHORS

- Drill holes with rotary impact hammer drills using carbide tipped bits or matched tolerance diamond core bits. Drill bits shall be of diameter as specified by the anchor manufacturer. All holes shall be drilled perpendicular to the concrete or masonry surface.
- Embedded items: Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Exercise care in drilling to avoid damaging existing reinforcing or embedded items. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling. Take precautions as necessary to avoid damaging gas lines and electrical and telecommunications conduit.

- Base Material Strength: Unless otherwise specified, do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.

#### TESTING

- Continuous Special Inspection is required for all post-installed anchors. Remove and replace misplaced or malfunctioning anchors. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, non-metallic grout. Anchors that fail to meet proof load or installation torque requirements shall be regarded as malfunctioning.

- EXPANSION, UNDERCUT, SCREW AND ADHESIVE ANCHORS  
Concrete base material: provide anchors of size and type shown with ICC-ES compliance required, or approved equal.

Expansion Anchors: Hilti Kwik Bolt TZ (ICC-ES ESR-1917)  
Simpson Strong-Bolt 2 (ICC-ES ESR-3037)  
Simpson Strong-Bolt (ICC-ES ESR-1771)

Undercut Anchors: Hilti HDA (ICC-ES ESR-1546)  
Simpson Torq-Cut (ICC-ES Pending)

Screw Anchors: Hilti Kwik HUS-EZ (ICC-ES ESR-3027)  
Simpson Titen HD (ICC-ES ESR-2713)

Adhesive Anchors: Hilti HIT-RE 500-SD (ICC-ES ESR-2322)  
Simpson SET-XP (ICC-ES ESR-2508)

- CMU or Masonry base materials: provide anchors of size and type shown with ICC-ES compliance required, or approved equal.

Screw Anchors: Hilti HUS-H (ICC-ES ESR-2369)  
Simpson Titen HD (ICC-ES ESR-1056)

Adhesive Anchors: Hilti HIT-HY 150-MAX (ICC-ES ESR-1967)  
Simpson SET (ICC-ES ESR-1772)

#### INSTALLATION

- Perform anchor installation in accordance with manufacturer's instructions.
- Protect threads from damage during anchor installation.
- Installing contractor shall complete Anchor Manufacturer Installation Training prior to installation of anchors.

### SECTION 4 - STRUCTURAL MASONRY

#### GENERAL

- Refer to Architectural layout and Drawings and Specifications for details and exact dimensions of brick masonry work including rustications, corbels, coursing, reglets, weep holes, waterproofing and flashing.
- Grout lifts at reinforced masonry walls shall not exceed five feet.

#### STRUCTURAL PROPERTIES

- Required prism strength of structural assembly = 1350 psi
  - Required 28-day compressive strength of mortar = 1800 psi
  - Required 28-day compressive strength of grout = 2000 psi
- REINFORCING**
- Horizontal joint reinforcing shall be "Truss Type" 9 ga. welded wire spaced [spacing \*16] inches on center vertically.
  - Provide special "L" and "T" shaped sections at wall intersections. Lap horizontal wires at least 12" at splices.
  - Horizontal reinforcing in trough tiles shall be lapped 30 bar diameters at splices. Stagger splices in adjacent bars at least 4'-0". See details for reinforcing.
  - Provide corner bars at intersections of reinforced trough tiles equal in size and number to horizontal reinforcing lapped 30 bar diameters each way.
  - Typical wall reinforcing for load bearing CMU walls shall be #5 bars vertical spaced at 24 inches on center in grout filled cells.
  - The first cell at corners, ends of walls, and each side of openings shall be grouted and reinforced with 1 #5 vertical.
  - Vertical reinforcing in grouted cells and pilasters shall be lapped 48 bar diameters and wire tied at splices, unless otherwise noted.

### SECTION 5 - STRUCTURAL STEEL

#### SECTION 5.1 - STRUCTURAL FRAME

- Structural Steel Properties:  
High Strength Steel Use High Strength Steel for W Shapes and WT's, u.n.o.  
Structural Steel (Normal Strength) ASTM A36 Use for Angles, Channels, and Plates, u.n.o.  
Steel Pipes ASTM A53, Grade B  
Hollow Structural Sections (HSS) ASTM A500, Grade B  
Erection Bolts ASTM A307  
High Strength Bolts ASTM A325N  
Anchor Bolts ASTM F1554 Grade 36  
High Strength Anchor Bolts ASTM F1554 Grade 105

- Continuity Plates (Full Depth column stiffeners aligned with beam flanges, or Full Depth beam stiffeners aligned with column flanges) shall match the steel grade of the base member.

#### WELDING

- Unless otherwise noted, angles, plates, rods, and miscellaneous framing shall be welded at contact joints and supports. Weld sizes shall conform to AWS D1.1 minimums, except where noted otherwise.

- Where fillet weld sizes are not indicated on weld symbols, fillet size shall be 1/16th inch smaller than thickness of thinner of materials being joined.

- Complete penetration welds are indicated by notation "CP" on weld symbols, partial penetration by "PP".

#### STRUCTURAL BOLTS

- Bolts indicated on details shall be 3/4 inch diameter, unless noted otherwise.
- Bolts shall be tightened by the AISC "Snug Tight" method unless noted otherwise.

#### MISCELLANEOUS

- Edge angles supporting floor or roof deck shall be spliced only over supports.
- COMPOSITE STEEL BEAMS  
Beams shall have shear studs spaced at 2 feet maximum on center, whether shown or not.

- Composite steel beams do not require shoring during placement of concrete slab, unless noted otherwise.

#### SHEAR STUDS

- Shear studs shall be fusion-welded, headed studs of high strength steel.
- Unless noted otherwise, studs shall have a shank diameter of 3/4-inch.
- Rated shear connector capacity, for use with metal decks, shall be a minimum of 11.1 kips per connector.

### SECTION 5.3 - COMPOSITE METAL DECK

- Contractor shall provide composite metal decking to meet the following criteria:  
1. Decking alone shall be capable of supporting the wet weight of concrete plus construction loads without requiring intermediate shoring for all span conditions on the project, unless noted otherwise.  
2. Composite slab and deck system shall be capable of supporting design loads indicated on the drawings for all span conditions on the project.

Deck thickness, indicated by gauge in Composite Steel Deck Schedule, is a minimum and shall be increased as necessary to meet these requirements, at no additional cost to the Contract.

#### 3.5.2 Composite Steel Deck Schedule:

Mark	Deck Type	Minimum Height	Minimum Gauge	Minimum Ix-in <sup>4</sup>	Minimum Sx-in <sup>3</sup>
A	3.0"	20	.993	.583	
B	4.5" (nom)	18		See Section 3.7	

(See framing plans for location of deck types)

- Composite floor system minimum load capacity requirements:

Type	Superimposed Uniform Load (psf)	Concentrated Load (lbs) *
A	150	2,000

\* Concentrated load acting on area 2.5 ft x 2.5 ft; not acting simultaneously with uniform load.

- Required shear connector efficiency of deck profile (wr/hr) = 2, where:  
wr = average width of concrete rib, inches.  
hr = nominal rib height, inches.

- Trench headers shall be located only where indicated on the structural plans, unless approved in writing by the engineer.

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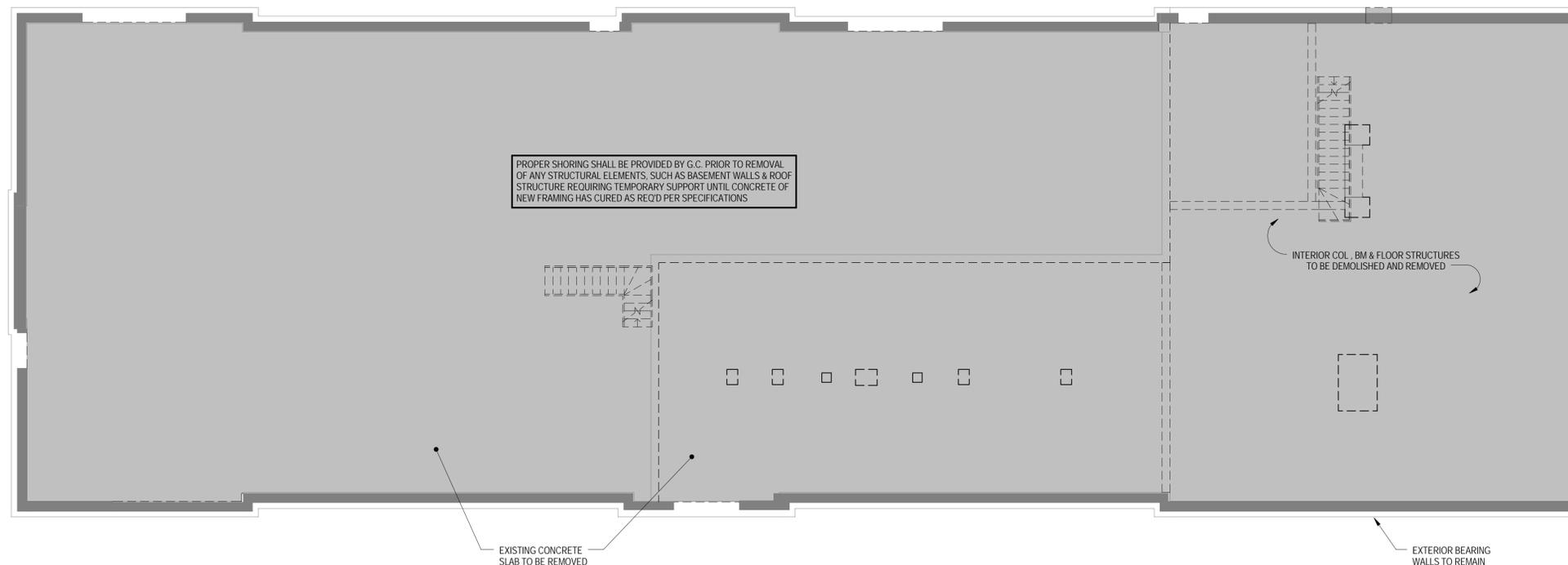
## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

## BASEMENT & FIRST FLOOR DEMOLITION PLAN (EXISTING)

This drawing is released for the purpose of SCHEMATIC DESIGN under the authority of AARON A. FORD P.E. Number 46393 on AUGUST 12, 2011

**SD1.00**



## 2 First Floor Demolition Plan (Existing)

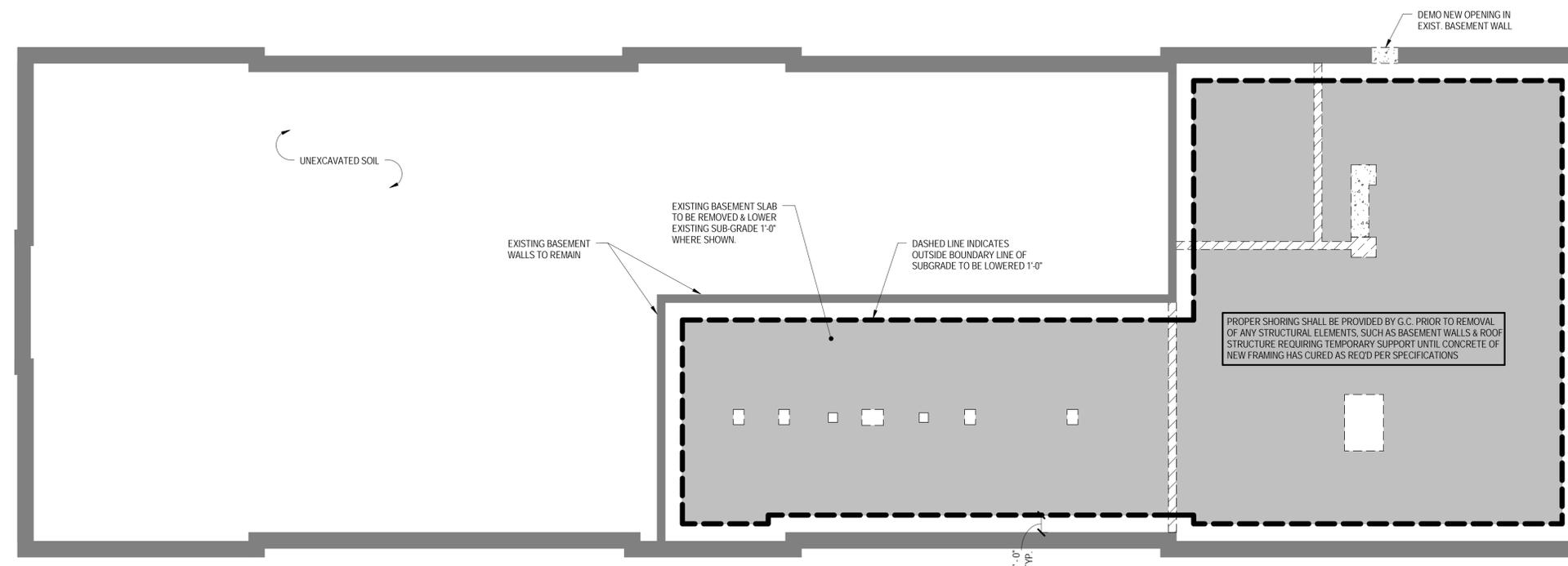
1/8" = 1'-0"

### PLAN NOTES AND DEMOLITION NOTES

1. FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION OF MATERIALS AND CONSTRUCTION
2. ANY MEMBER FOUND TO BE GREATER THAN 15% DETERIORATED SHALL BE REPLACED OR REINFORCED TO ORIGINAL CAPACITY.
3. REMEDIAL STRUCTURAL DESIGN IS BASED VISUAL OBSERVATIONS. G.C. SHALL NOTIFY ARCHITECT OF ANY DEVIATIONS FROM PRESUMED CONDITIONS THAT AFFECT CURRENT DETAILS.
4. G.C. SHALL CORE CORNERS OF ALL AREAS TO BE SAWCUT TO AVOID OVERRUN AND DAMAGE TO EXISTING CONCRETE REINFORCING OR CUTTING EXISTING BEAMS AND JOISTS.
5. PROPER SHORING SHALL BE PROVIDED BY G.C. PRIOR TO REMOVAL OF ANY STRUCTURAL ELEMENTS REQUIRING TEMPORARY SUPPORT UNTIL CONCRETE OF NEW FRAMING HAS CURED AS REQUIRED PER SPECIFICATIONS.
6. CORING REQUIRED BY MEP SHALL BE DONE THROUGH SLABS OR DECKING. CORING OVER EXISTING PRIMARY STRUCTURAL MEMBERS (I.E. GIRDERS, BEAMS, JOISTS) IS NOT ACCEPTABLE UNLESS SPECIFICALLY APPROVED BY ARCHITECT.
7. OPENINGS SHALL NOT BE OVERCUT.

### FLOOR PLAN LEGEND

- DEMOLISH EXISTING STRUCTURE
- NEW PENETRATION IN EXISTING STRUCTURE
- 3/4" D X 3-3/8" TR-AA
- ADHESIVE ANCHOR
- THREADED ROD
- EMBED LENGTH
- THREADED ROD DIAMETER



## 1 Basement Demolition Plan (Existing)

1/8" = 1'-0"

**Client**  
 Somerville Housing Authority Tel 617-625-1125

**MEP/FP Engineer**  
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**Civil Engineer**  
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LAFP Project No. B1139

## Project Status

Comprehensive Permit Submission Issue Description	Sept. 16, 2011 Date

Scale: AS NOTED  
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 Reviewed By: Approver

Project No. 2010080.00

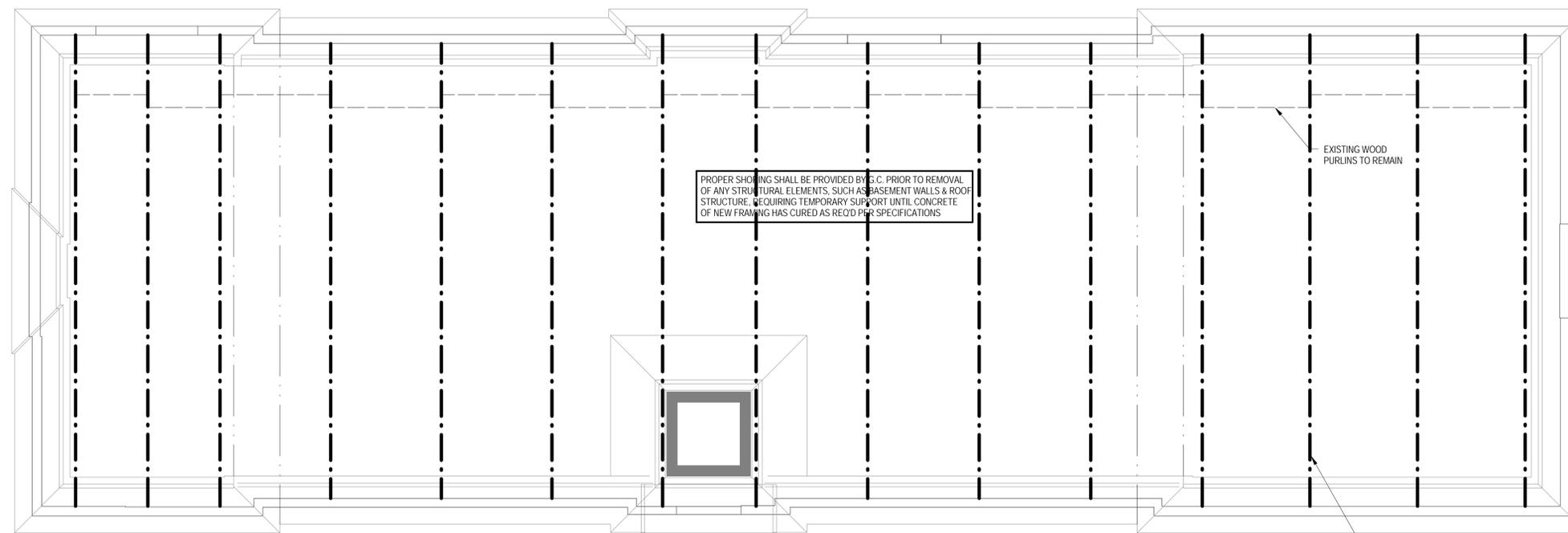
## Mystic Water Works at Capen Court

Capen St.  
 Somerville, MA 02144

## ATTIC & ROOF DEMOLITION PLAN - EXISTING

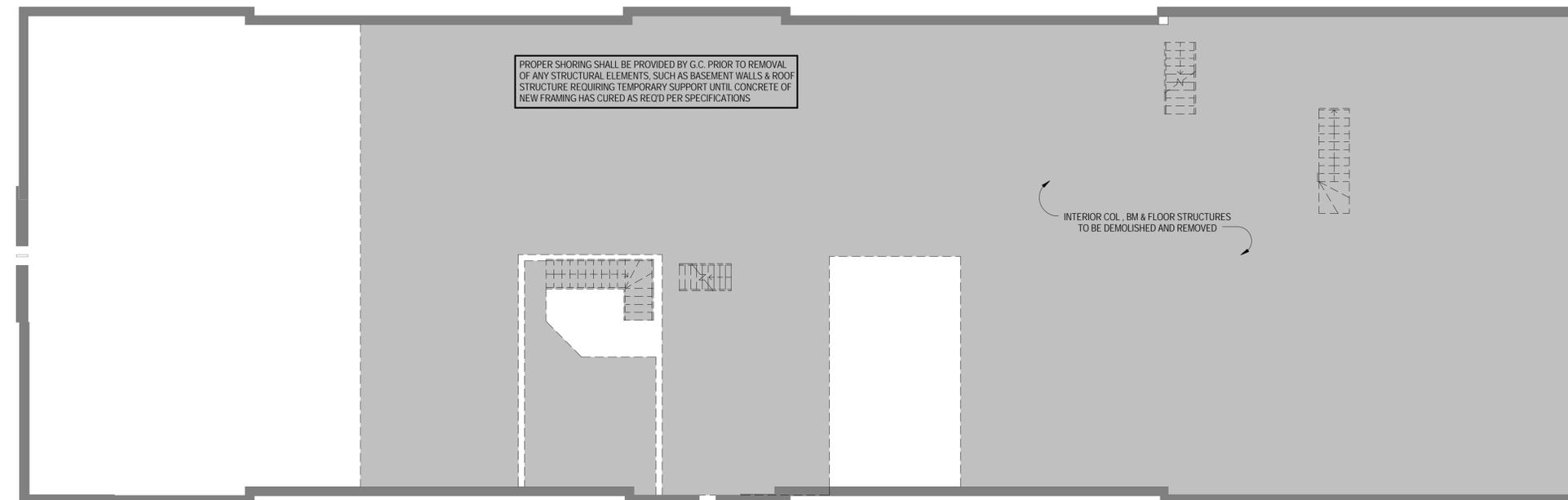
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 P.E. Number 46393 on  
 AUGUST 12, 2011

**SD1.01**



**2** Roof Demolition Plan (Existing)

1/8" = 1'-0"



**1** Attic Demolition Plan (Existing)

1/8" = 1'-0"

**Client**  
Somerville Housing Authority Tel 617-625-1125

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## Mystic Water Works at Capen Court

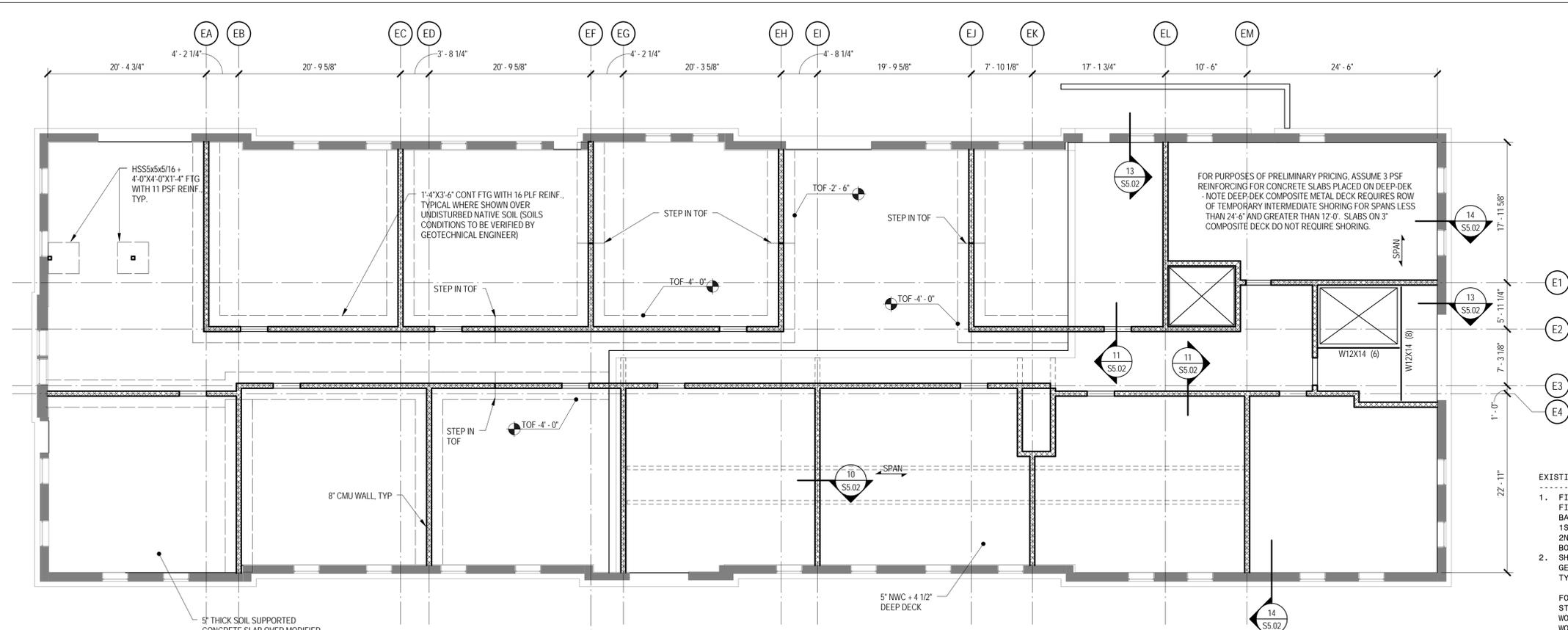
Capen St.  
Somerville, MA 02144

## BASEMENT & FIRST FLOOR PLAN - EXISTING

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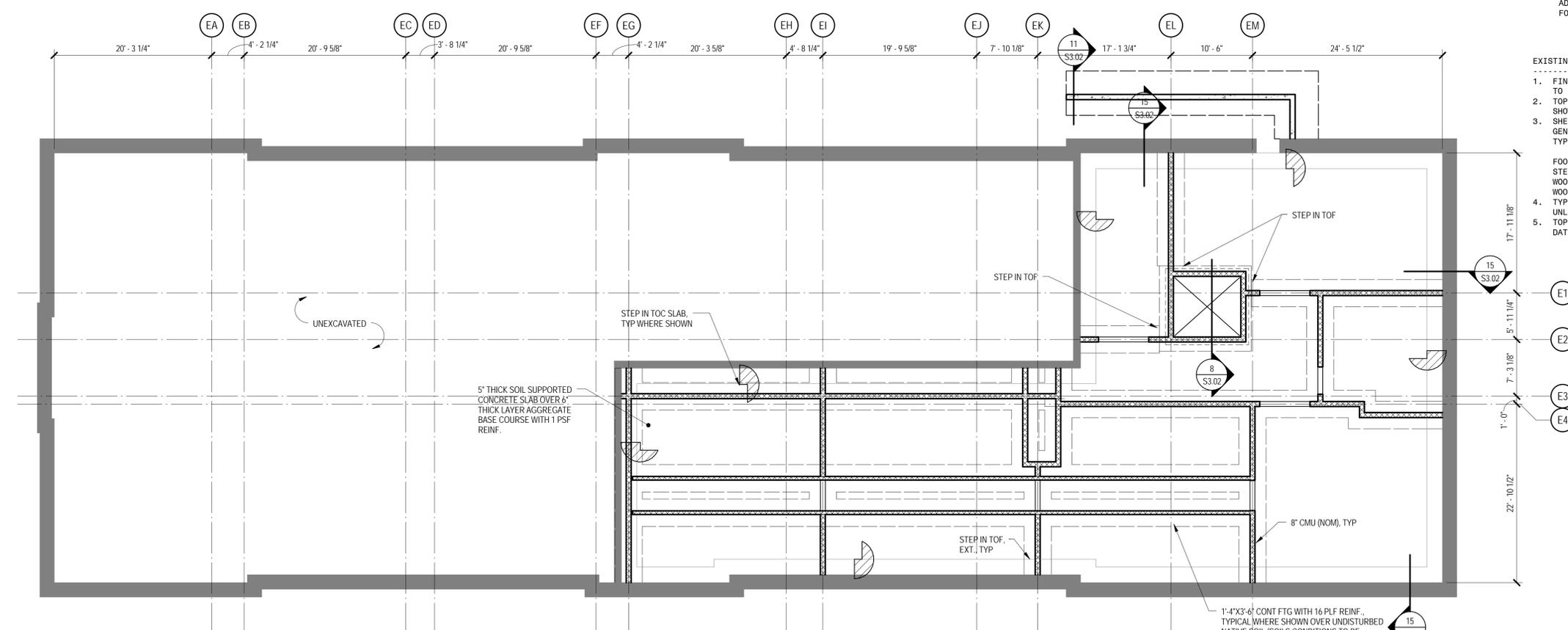


# S1.00



**2** First Floor Framing Plan (Existing)

1/8" = 1'-0"



**1** Basement Floor Plan (Existing)

1/8" = 1'-0"

**Client**  
Somerville Housing Authority Tel 617-625-1125

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## Mystic Water Works at Capen Court

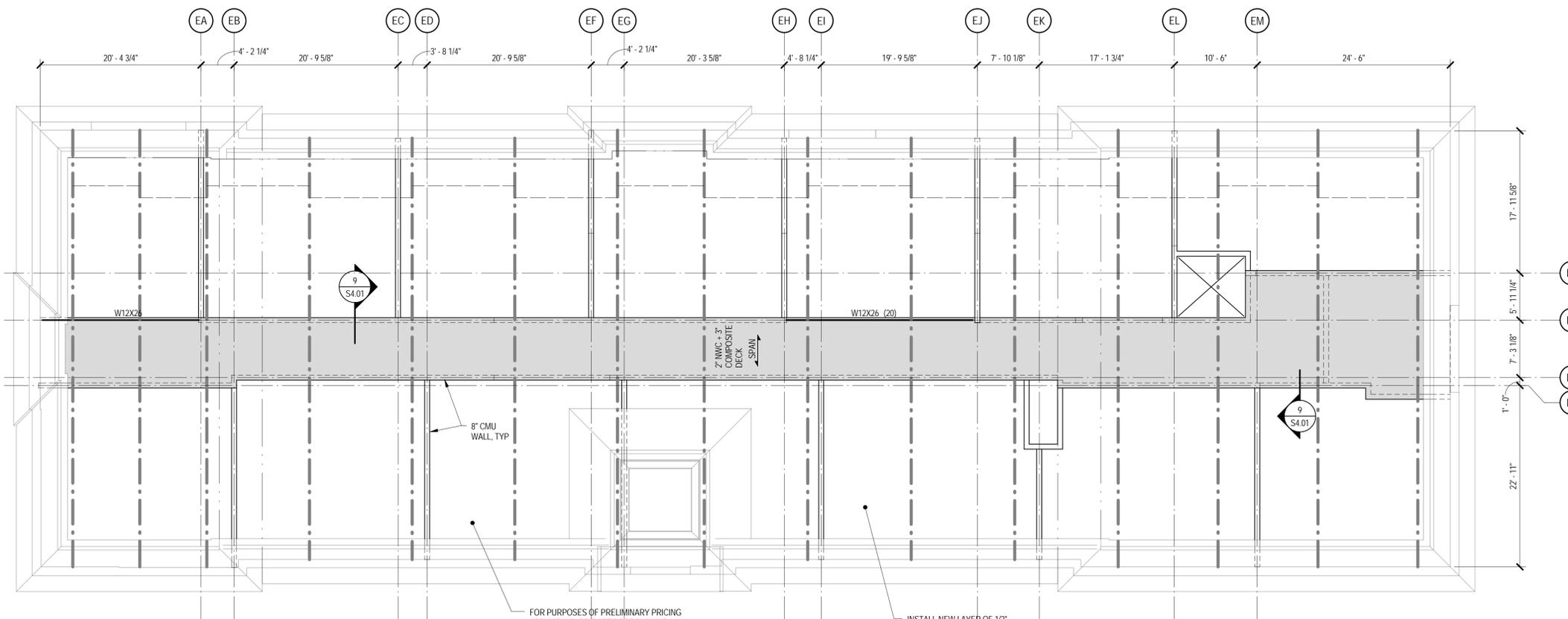
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## SECOND FLOOR & ROOF PLANS - EXISTING

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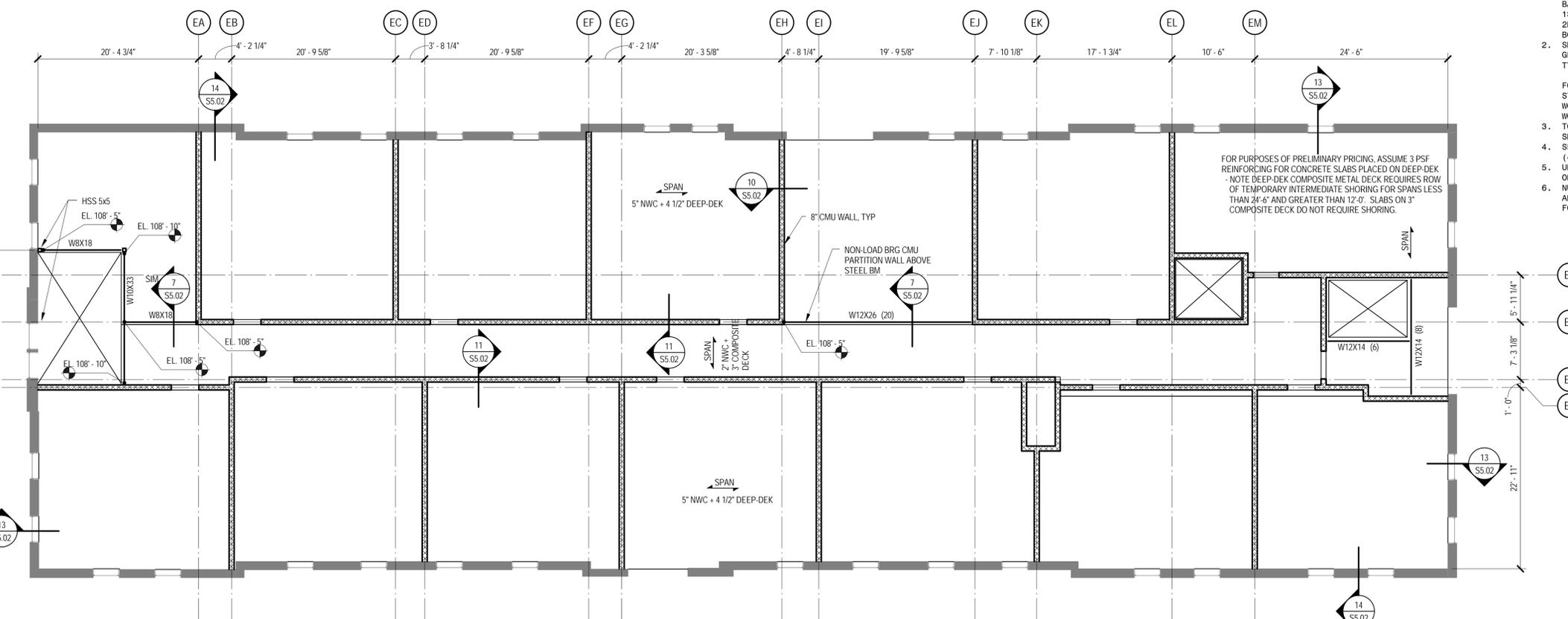


# S1.01



### 2 Roof Truss Framing Plan (Existing)

1/8" = 1'-0"



### 1 Second Floor Framing Plan (Existing)

1/8" = 1'-0"

- EXISTING BLDG / ELEVATED FLOOR PLAN NOTES
- FINISH FLOOR ELEVATION IS RELATIVE TO FIRST FLOOR DATUM 0'-0"  
BASEMENT FLOOR = -7'-11"  
1ST FLOOR = 0'-0"  
2ND FLOOR = 8'-10"  
BOTTOM OF TRUSS = 18'-10 1/4"
  - SHEET INDEX:  
GENERAL NOTES - S0.1, S0.2  
TYPICAL DETAILS - S3.01, S4.01, S5.01, S7.01 and S7.02  
FOOTING SCHEDULE - S3.01  
STEEL COLUMN SCHEDULE - S5.01  
WOOD BEARING WALLS - S7.01  
WOOD SHEAR WALLS - S7.02
  - TOP OF CONCRETE SLAB IS FINISH FLOOR UNLESS SHOWN OTHERWISE.
  - SLAB THICKNESS VARIES IS 9 1/2" OVERALL, NOMINAL (4 1/2" COMPOSITE DECK + 5" THICK SLAB)
  - UNLESS SHOWN OTHERWISE, STEEL BEAMS ARE CENTERED ON AND EQUALLY SPACED BETWEEN COLUMN CENTERLINES.
  - NUMBER OF SHEAR STUDS IS NOTED IN PARENTHESES ( ) ADJACENT TO BEAM SIZES. SEE TYPICAL DETAILS FOR LAYOUT REQUIREMENTS OF STUDS.

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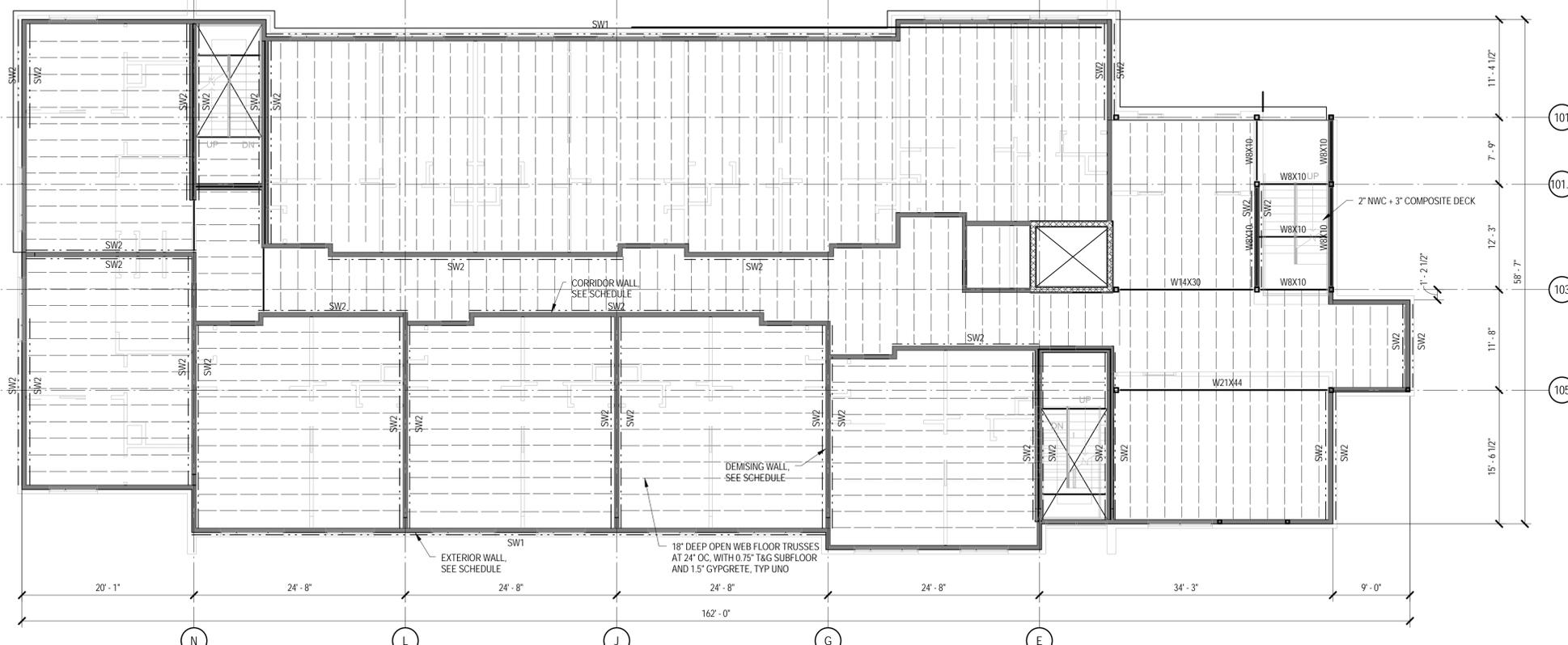
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## Mystic Water Works at Capen Court

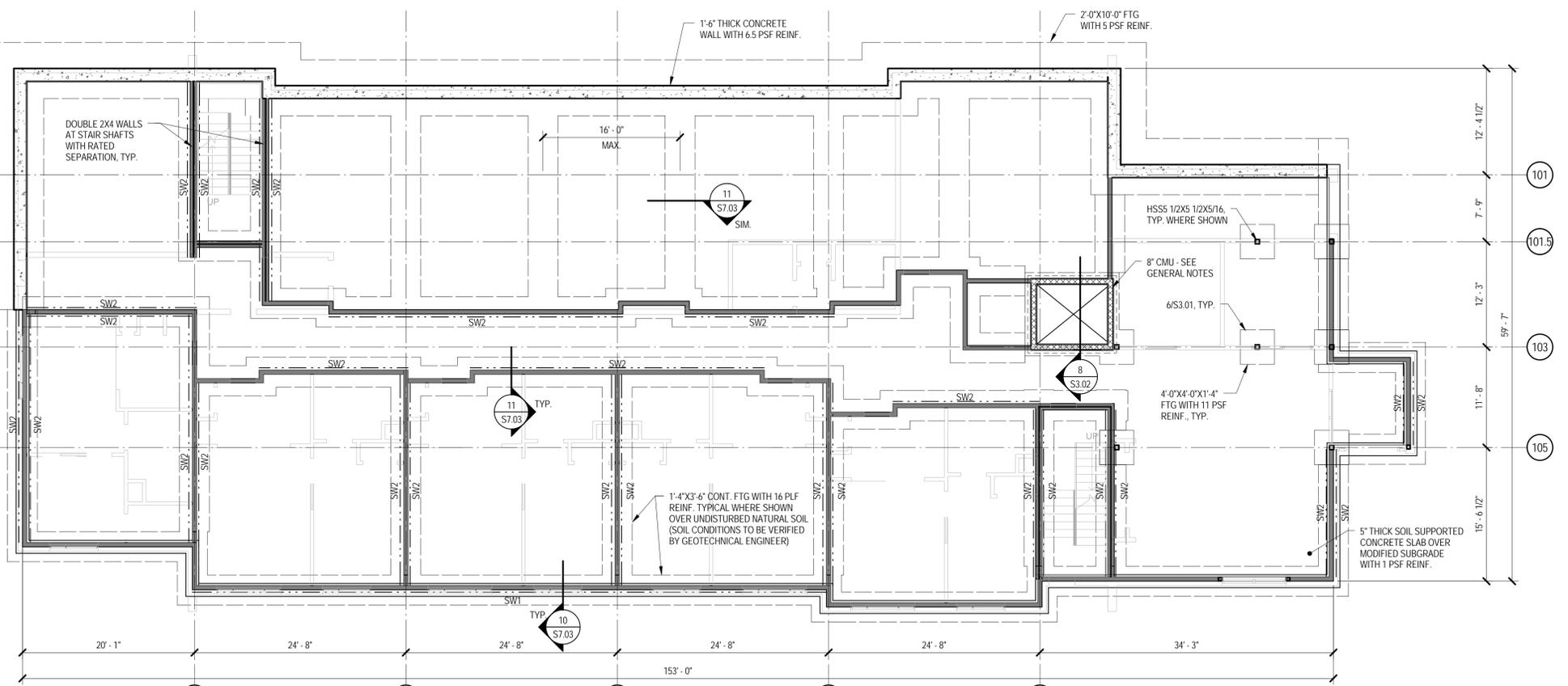
Capen St.  
Somerville, MA 02144

## FIRST & SECOND FLOOR PLANS - NEW



**2 Second Floor Framing Plan (New)**  
1/8" = 1'-0"

- NEW BUILDING / UPPER FLOOR PLAN NOTES**
- FINISH FLOOR ELEVATION IS RELATIVE TO FIRST FLOOR DATUM 0'-0"  
1ST FLOOR = 0'-0"  
2ND FLOOR = 12'-0"  
3RD FLOOR = 24'-0"  
4TH FLOOR = 36'-0"
  - TOP OF CONCRETE SLAB IS FINISH FLOOR UNLESS SHOWN OTHERWISE.
  - SHEET INDEX:  
GENERAL NOTES - S0.1, S0.2  
TYPICAL DETAILS - S3.01, S4.01, S5.01, S7.01 and S7.02  
FOOTING SCHEDULE - S3.01  
STEEL COLUMN SCHEDULE - S5.01  
WOOD BEARING WALLS - S7.01  
WOOD SHEAR WALLS - S7.02
  - TYPICAL WOOD FLOOR CONSTRUCTION:  
1 1/2" GYPCRETE  
3/4" T&G SUBFLOOR  
18" DEEP FLOOR TRUSSES,  
24" O.C., U.N.O.
  - TRUSSES ARE SHOWN ON PLANS TO INDICATE DIRECTION OF FRAMING - LAYOUT TO BE DETERMINED BY TRUSS SUPPLIER
  - SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS.



**1 First Floor Framing Plan (New)**  
1/8" = 1'-0"

- NEW BUILDING / GROUND FLOOR PLAN NOTES**
- FINISH FLOOR ELEVATION IS 0'-0" (RELATIVE TO DATUM 0-0).
  - TOP OF CONCRETE SLAB IS FINISH FLOOR UNLESS SHOWN OTHERWISE.
  - SHEET INDEX:  
GENERAL NOTES - S0.1, S0.2  
TYPICAL DETAILS - S3.01, S4.01, S5.01, S7.01 and S7.02  
FOOTING SCHEDULE - S3.01  
STEEL COLUMN SCHEDULE - S5.01  
WOOD BEARING WALLS - S7.01  
WOOD SHEAR WALLS - S7.02
  - TYPICAL CONCRETE SLAB THICKNESS IS 5" (OVERALL) UNLESS NOTED OTHERWISE.
  - TOP OF FOOTING ELEVATION RELATIVE TO DATUM 0-0, IS SHOWN ON PLAN

- BUILDING RETAINING WALL CONSTRUCTION SEQUENCE:**
- INSTALL FOOTINGS, CONC. WALL AND GROUND FLOOR SLAB WITHIN 20 FT OF WALL
  - INSTALL WALL BACKFILL
  - INSTALL FLOOR AND WALL FRAMING

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AUGUST 12, 2011

**S1.02**

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LAFP Project No. B1139

## Project Status

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Issue Description Date

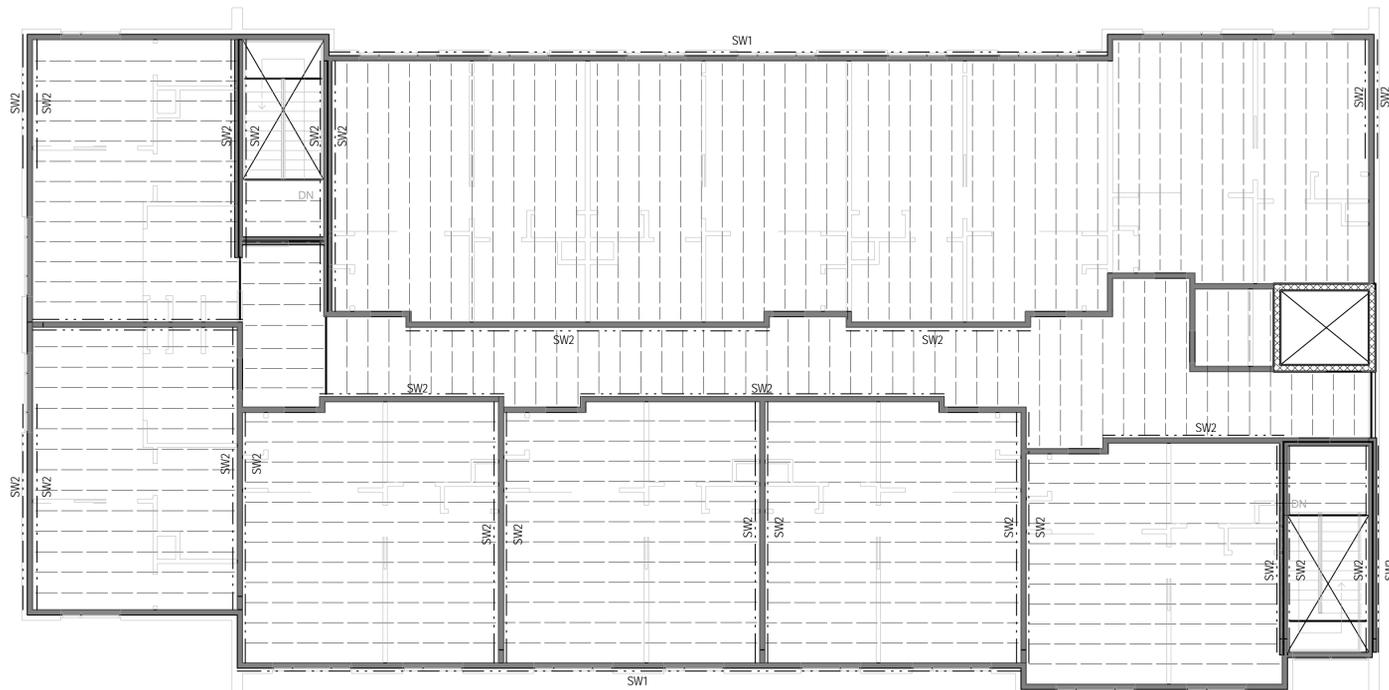
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Reviewed By: Approver

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

## THIRD AND FOURTH FLOOR PLANS



**2** Fourth Floor Framing Plan (New)

1/8" = 1'-0"



**1** Third Floor Framing Plan (New)

1/8" = 1'-0"

### NEW BUILDING / UPPER FLOOR PLAN NOTES

- FINISH FLOOR ELEVATION IS RELATIVE TO FIRST FLOOR DATUM 0'-0"  
1ST FLOOR = 0'-0"  
2ND FLOOR = 12'-0"  
3RD FLOOR = 24'-0"  
4TH FLOOR = 36'-0"
- TOP OF CONCRETE SLAB IS FINISH FLOOR UNLESS SHOWN OTHERWISE.
- SHEET INDEX:  
GENERAL NOTES - S0.1, S0.2  
TYPICAL DETAILS - S3.01, S4.01, S5.01  
S7.01 and S7.02  
FOOTING SCHEDULE - S9.01  
STEEL COLUMN SCHEDULE - S5.01  
WOOD BEARING WALLS - S7.01  
WOOD SHEAR WALLS - S7.02
- TYPICAL WOOD FLOOR CONSTRUCTION:  
1 1/2" GYPCRETE  
3/4" T&G SUBFLOOR  
18" DEEP FLOOR TRUSSES,  
24" O.C., U.N.O.
- TRUSSES ARE SHOWN ON PLANS TO INDICATE DIRECTION OF FRAMING - LAYOUT TO BE DETERMINED BY TRUSS SUPPLIER
- SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS.

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P.E. Number 46393 on  
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# S1.03



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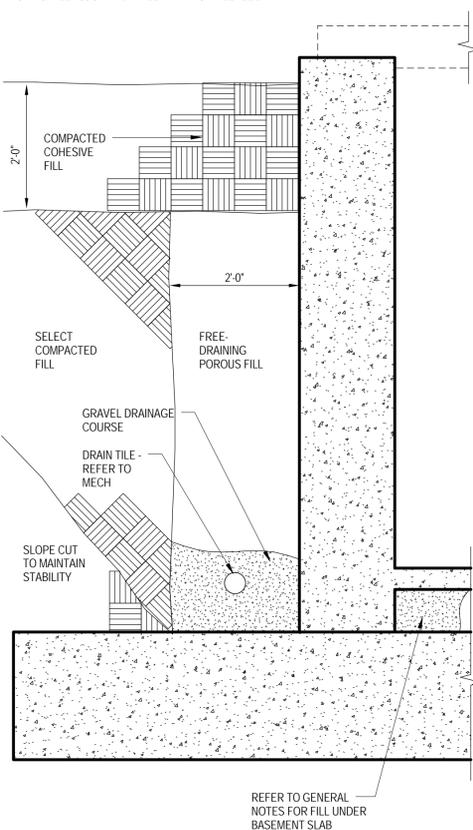
Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

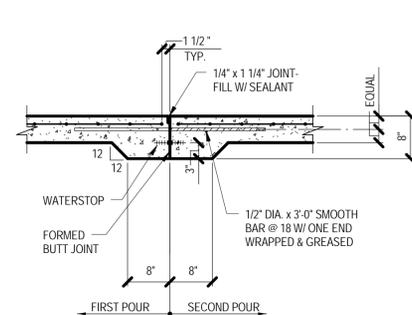
## TYPICAL CONCRETE DETAILS

- CONSTRUCTION SEQUENCE:**  
1. INSTALL FOOTINGS, CONC. WALL AND GROUND FLOOR SLAB WITHIN 20'-0" OF CONC. WALL.  
2. INSTALL BASEMENT WALL BACKFILL.  
3. INSTALL FLOOR AND WALL FRAMING AT LEVEL 2.



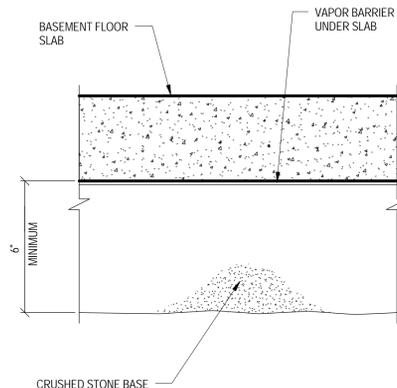
**14** BASEMENT WALL BACKFILL  
TYPICAL DETAIL

NO SCALE TD02401



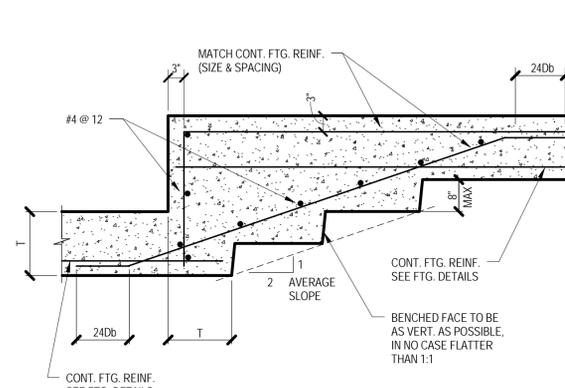
**10** BASEMENT SLAB CONSTRUCTION JOINT  
TYPICAL DETAIL

NO SCALE TD03023



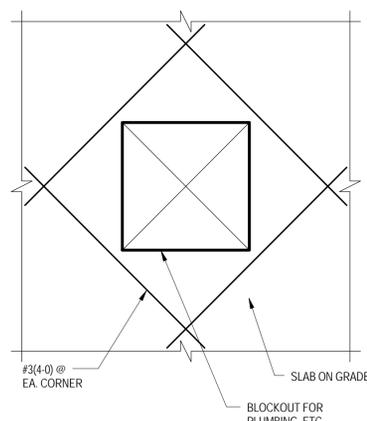
**7** BASEMENT FLOOR SLAB  
TYPICAL DETAIL

NO SCALE TD02431



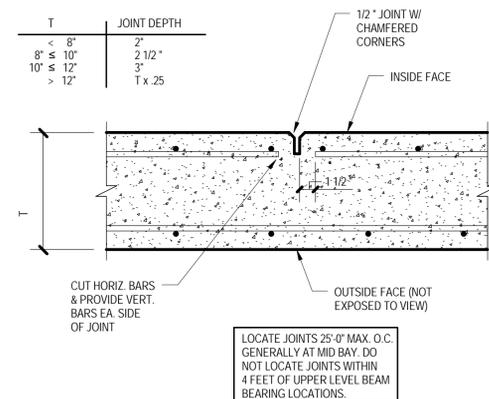
**4** STEP IN CONTINUOUS FOOTING  
TYPICAL DETAIL

NO SCALE TD02240



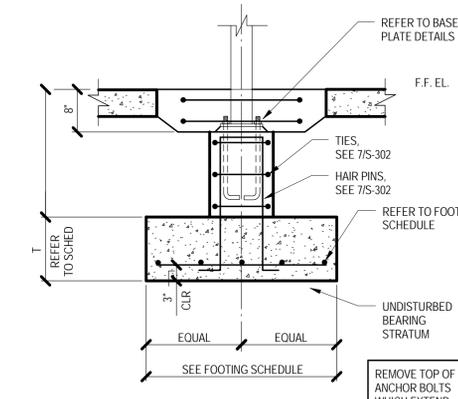
**11** REINFORCING AT SLAB-ON-GRADE BLOCKOUT  
TYPICAL DETAIL

NO SCALE TD03042



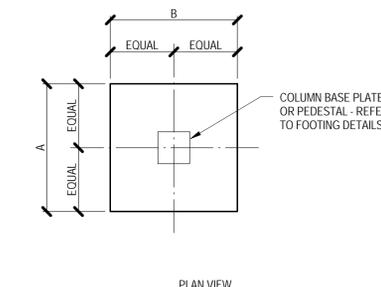
**8** VERTICAL CONTROL JOINT IN BASEMENT / RETAINING WALL  
TYPICAL DETAIL

NO SCALE TD02440



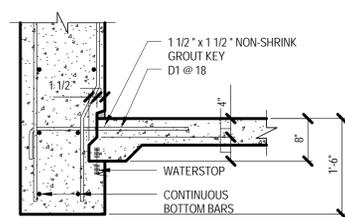
**5** SPREAD FOOTING WITH PEDESTAL  
TYPICAL DETAIL

NO SCALE TD02212



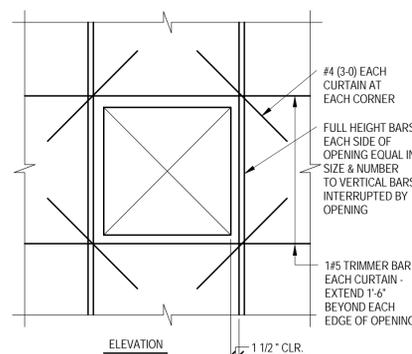
**2** SPREAD FOOTING  
TYPICAL DETAIL

NO SCALE TD02210



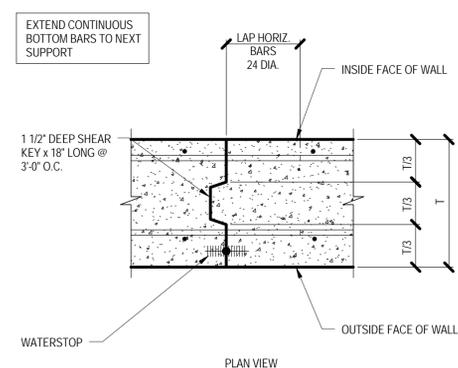
**15** BASEMENT FLOOR/WALL JOINT  
TYPICAL DETAIL

NO SCALE TD03021



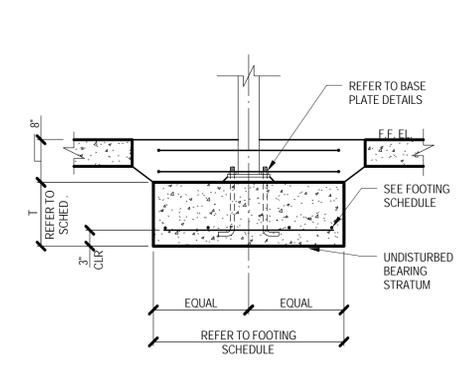
**12** OPENING IN CONCRETE WALL  
TYPICAL DETAIL

NO SCALE TD03041



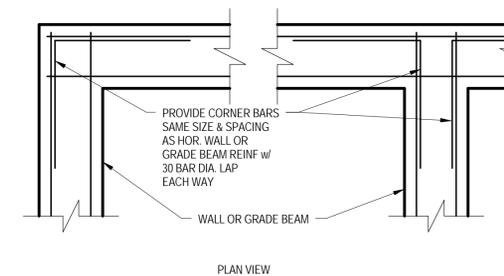
**9** VERTICAL JOINT IN BASMENT WALL  
TYPICAL DETAIL

NO SCALE TD03024



**6** SPREAD FOOTING  
TYPICAL DETAIL

NO SCALE TD02232



**3** CORNER BARS  
TYPICAL DETAIL

NO SCALE TD03026

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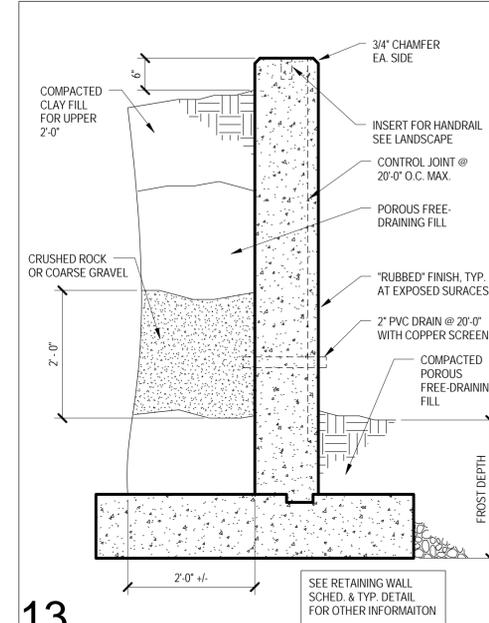
## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

## CONCRETE DETAILS

# S3.02

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13

3/4" = 1'-0"

RETAINING WALL SCHEDULE													TD03001
H	T1	T2	A	B	V1	V2	L1	L2	H1	H2	H3		
0 TO 4'-0"	12"	2'-0"	1'-6"		#4 @ 12 (0-4H-2")	#4@12	#4@12	#4@12	#4@16	#5@14	#5@14		
4'-0" TO 6'-0"	12"	2'-9"	1'-9"		#5 @ 12 (0-6I3-0)	#5@12	#5@12	#5@12	#4@16	#5@14	#5@14		
6'-0" TO 8'-0"	12"	3'-6"	2'-0"		#5 @ 6 (0-6I4-3)	#5@12	#5@8	#5@8	#4@16	#5@14	#5@14		

### 7 PILASTER REINFORCING TYPICAL DETAIL

NO SCALE TD03150

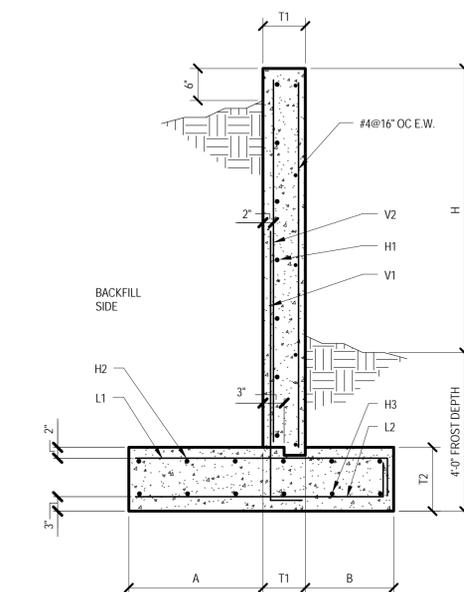
### 4 SLAB-ON-GRADE CONSTRUCTION JOINT TYPICAL DETAIL

NO SCALE TD03111

### 1 SLAB-ON-GRADE RECESSES TYPICAL DETAIL

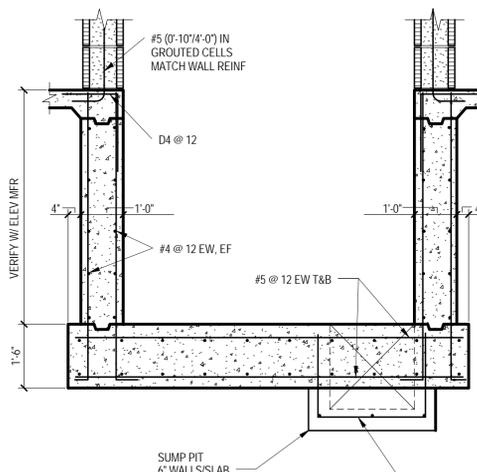
NO SCALE TD03101

DOWEL BENDING DIAGRAM					TD03680
LEGEND					
D1 @ 18					
SPACING IN INCHES					
MARK	BAR SIZE	A	B	C	
D1	#4	0-6	2-6	0	
D2	#4	0	4-0	0	
D3	#4	3-0	3-0	0	
D4	#4	1-6	2-6	0	
D5	#3	0-6	2-6	0	
D6					
D7					
D8					
D9					



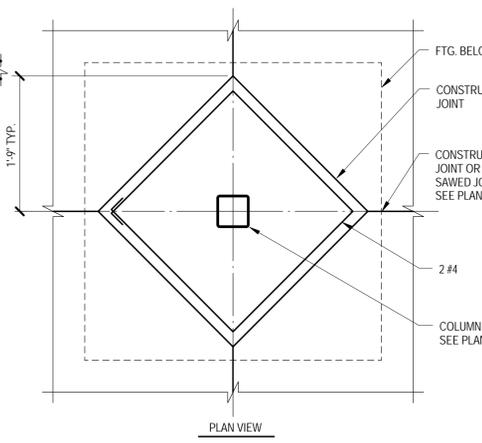
### 11 RETAINING WALL TYPICAL DETAIL

NO SCALE TD03002



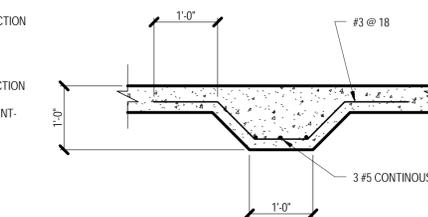
### 8 ELEVATOR PIT TYPICAL DETAIL

NO SCALE TD03604



### 5 SLAB LEAVE-OUT AT COLUMNS TYPICAL DETAIL

NO SCALE



### 2 THICKENED SLAB TYPICAL DETAIL

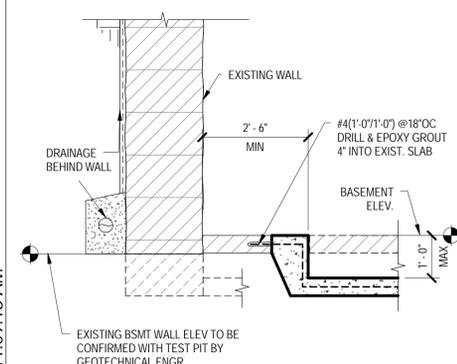
NO SCALE TD03102

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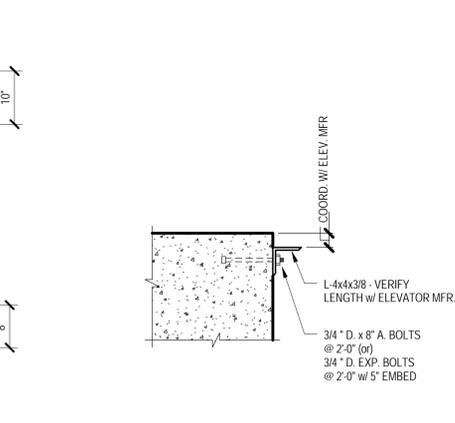
15

1/2" = 1'-0"



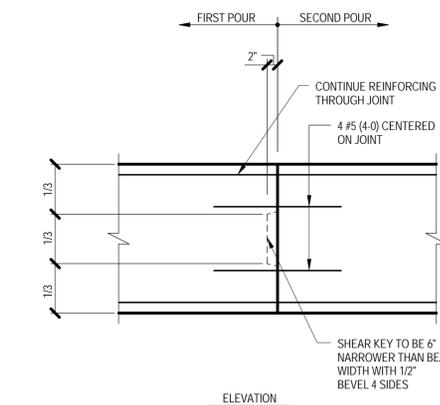
### 12 EMBEDDED PLATES TYPICAL DETAIL

NO SCALE TD03691



### 9 ELEVATOR SILL ANGLE TYPICAL DETAIL

NO SCALE TD03602



### 6 GRADE BM CONSTRUCTION JT TYPICAL DETAIL

NO SCALE TD03140

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LAFP Project No. B1139

## Project Status

Comprehensive Permit Submission Sept. 16, 2011  
Issue Description Date

Scale: AS NOTED  
 Drawn By: Author  
 Checked By: Checker  
 Reviewed By: Approver

Project No. 2010080.00

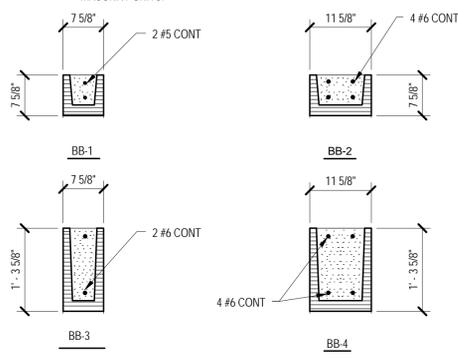
## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

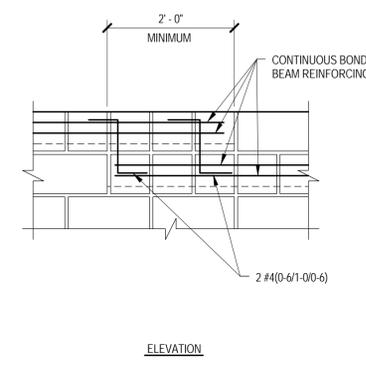
## TYPICAL MASONRY DETAILS

CMU LINTEL SCHEDULE				
WALL THICKNESS	MAX SPAN OR MARK	LINTEL DEPTH	TOP REINF	BOT REINF
8"	4'-0"	8"	1 #4	1 #4
8"	6'-0"	8"	1 #4	2 #4
8"	8'-0"	16"	2 #4	2 #4
8"	10'-0"	16"	2 #4	2 #4
12"	4'-0"	8"	2 #4	2 #4
12"	6'-0"	8"	2 #4	2 #5
12"	8'-0"	16"	2 #4	2 #5
12"	10'-0"	16"	2 #4	2 #5

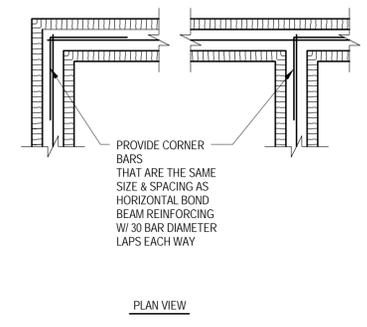
- NOTES:  
 1. THESE BOND BEAMS APPLY TO WALLS WHERE BOND BEAMS ARE NOT SPECIFICALLY REFERENCED. REFER TO SECTIONS & DETAILS FOR SPECIAL BOND BEAMS THAT ARE REQUIRED.  
 2. FILL FOR BOND BEAMS SHALL BE COARSE GROUT-REFER TO GENERAL NOTES FOR INFORMATION.  
 3. LINTELS SHALL BE CONSTRUCTED USING SOLID BOTTOM MASONRY UNITS.



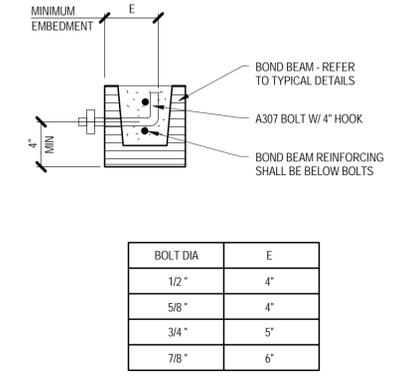
**10 MASONRY BOND BEAMS TYPICAL DETAIL**  
NO SCALE TD04102



**7 STEP IN BOND BEAM TYPICAL DETAIL**  
NO SCALE TD04103

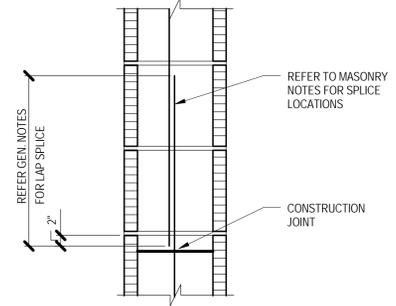


**4 BOND BEAM INTERSECTIONS TYPICAL DETAIL**  
NO SCALE TD04104

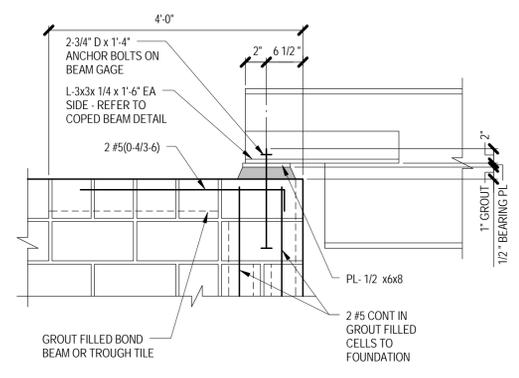


**1 MASONRY ANCHOR BOLTS TYPICAL DETAIL**  
NO SCALE TD04105

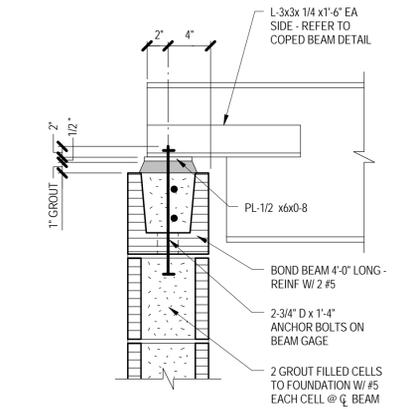
BOLT DIA	E
1/2"	4"
5/8"	4"
3/4"	5"
7/8"	6"



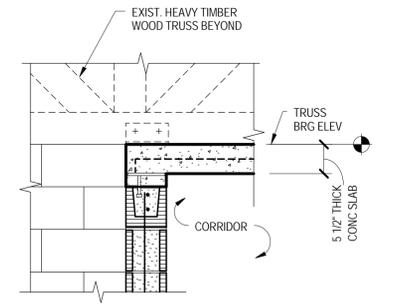
**8 PILASTER CONSTRUCTION JOINT TYPICAL DETAIL**  
NO SCALE TD04130



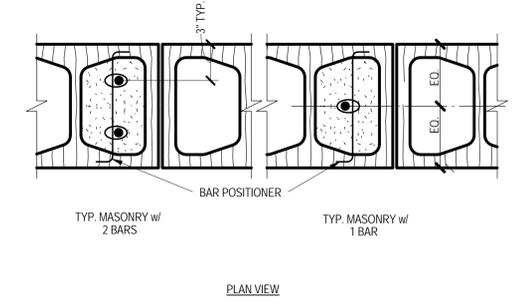
**5 BEAM CONNECTION TYPICAL DETAIL**  
NO SCALE TD04150



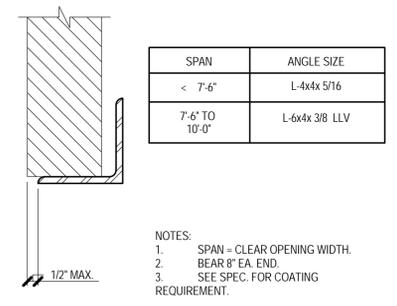
**2 BEAM BEARING SEAT TYPICAL DETAIL**  
NO SCALE TD04151



**9**  
3/4" = 1'-0"



**6 CMU REINF. PLACEMENT TYPICAL DETAIL**  
NO SCALE 6/54.01



**3 LOOSE LINTEL SCHEDULE TYPICAL DETAIL**  
NO SCALE TD04110

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# S4.01

**Client**  
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## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

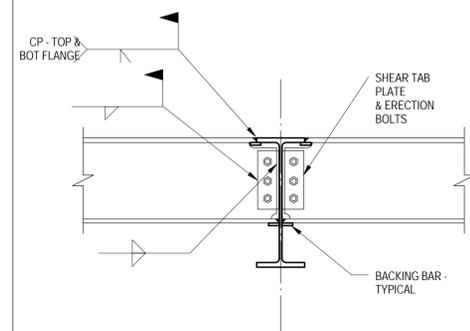
## TYPICAL STEEL DETAILS

# S5.01

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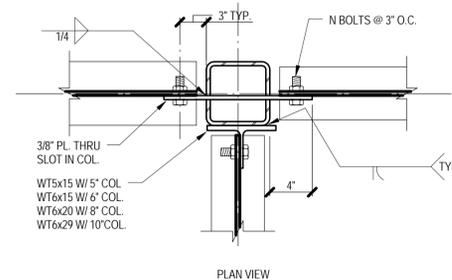
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**15** BEAM TO BEAM COLUMN CONN. TYPICAL DETAIL

NO SCALE TD05211



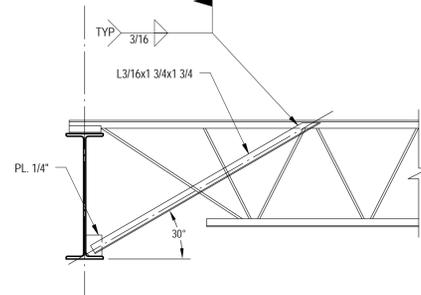
NOTES:

- IN THE CASE OF A CORNER (2 BEAM) CONDITION, ORIENT THRU PL TO SUPPORT DEEPER BEAM.
- PROVIDE ADDL. BOLTS AS REQD. WHERE REACTIONS ARE GIVEN ON PLAN.

BM. SIZE	N BOLTS
W8, W10	2
W12, W14	3
W16, W18	4
W21	5
W24	6

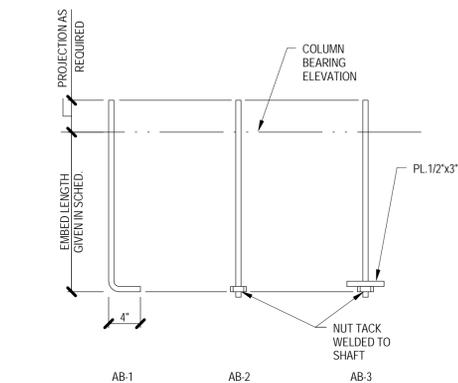
**10** BEAM TO COLUMN CONNECTION TYPICAL DETAIL

NO SCALE TD05206



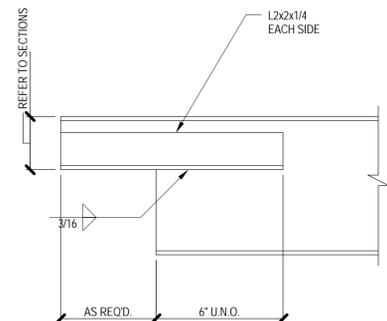
**7** BOTTOM FLANGE BRACE TYPICAL DETAIL

NO SCALE TD05181



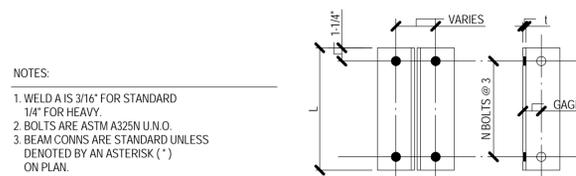
**4** ANCHOR BOLT TYPES TYPICAL DETAIL

NO SCALE TD05102



**14** COPED CHANNEL OR BEAM TYPICAL DETAIL

NO SCALE TD05210

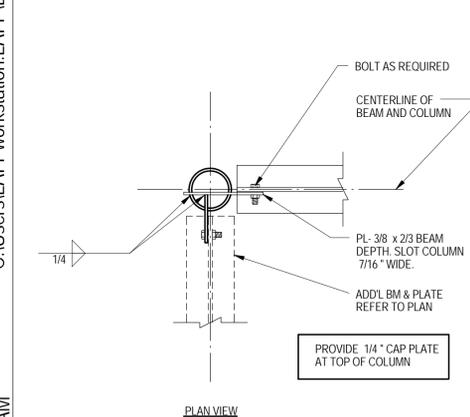


**11** STEEL BM. CONN. - DOUBLE ANGLE TYPICAL DETAIL

NO SCALE TD05200

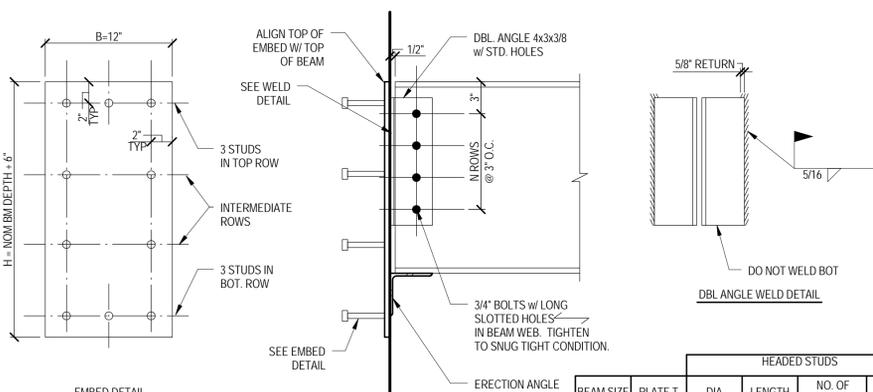
BEAM SIZE	STANDARD		HEAVY	
	ANGLE LENGTH (L)	NO OF ROWS OF BOLTS (N)	ANGLE LENGTH (L)	NO OF ROWS OF BOLTS (N)
W8, W10	5-1/2"	2	8-1/2"	3
W12	5-1/2"	2	11-1/2"	4
W14, W16	8-1/2"	3	14-1/2"	5
W18	11-1/2"	4	17-1/2"	6
W21	11-1/2"	4	20-1/2"	7
W24	14-1/2"	5	23-1/2"	8
W27	14-1/2"	5	26-1/2"	9
W30	20-1/2"	7	29-1/2"	10
W33	23-1/2"	8	29-1/2"	10
W40	26-1/2"	9		
W44	29-1/2"	10		

REFER TO ALSO TABLE II-A, BEARING TYPE CONNECTIONS



**15** BEAM TO BEAM COLUMN CONN. TYPICAL DETAIL

NO SCALE TD05233



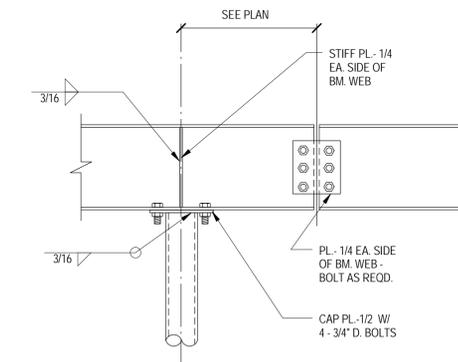
**12** STEEL BEAM TO CONCRETE CONN. TYPICAL DETAIL

NO SCALE TD05205

BEAM SIZE	PLATE T	DIA	LENGTH	NO. OF INT ROWS	TOTAL NO. OF STUDS
W8-W10	3/8"	1/2"	6"	0	6
W12-W16	3/8"	1/2"	6"	1	8
W18-W21	1/2"	3/4"	6"	2	10
W24-W30	1/2"	3/4"	6"	3	12
W33	3/4"	3/4"	6"	4	14
W36	3/4"	3/4"	6"	5	16

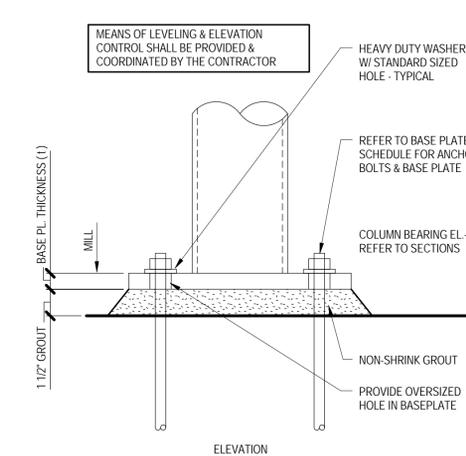
**5** COLUMN BASE PLATE TYPICAL DETAIL

NO SCALE TD05120



**6** BEAM SPLICE CONNECTION TYPICAL DETAIL

NO SCALE TD05170



**2** COLUMN BASE PLATE TYPICAL DETAIL

NO SCALE TD05121

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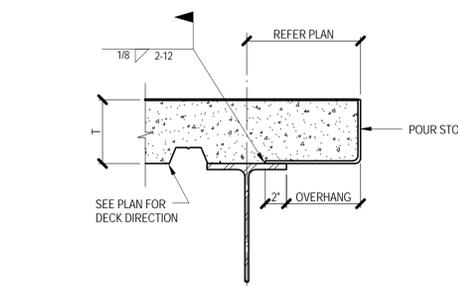
## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

## STEEL DETAILS

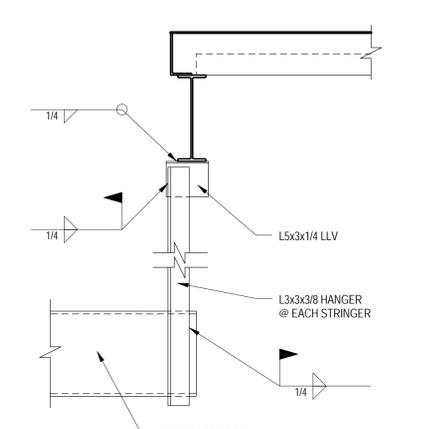
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# S5.02

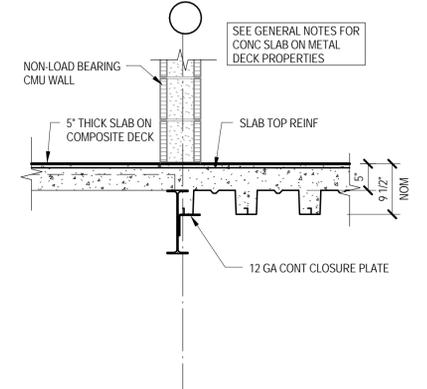


OVERHANG	T ≤ 6 1/2"	T = 7 1/2"
≤ 5"	14 GA	12 GA
5 < 8"	12 GA	10 GA
8" ≤ 11"	10 GA	3/16" BENT PL
> 11"	3/16" BENT PL	3/16" BENT PL

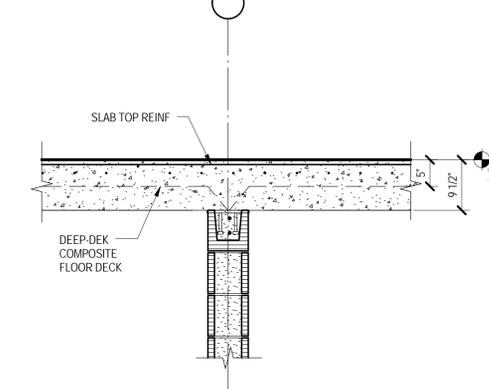
**1 SLAB EDGE - COMPOSITE DECK TYPICAL DETAIL**  
NO SCALE TD05323



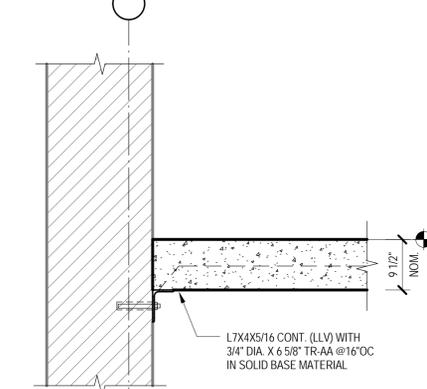
**4 STAIR HANGER TYPICAL DETAIL**  
NO SCALE TD05650



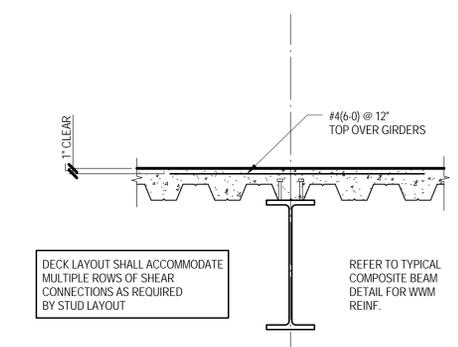
**7 TYPICAL DETAIL**  
3/4" = 1'-0"



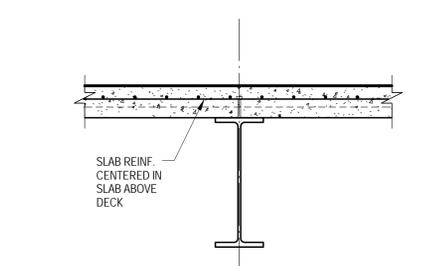
**10 TYPICAL DETAIL**  
3/4" = 1'-0"



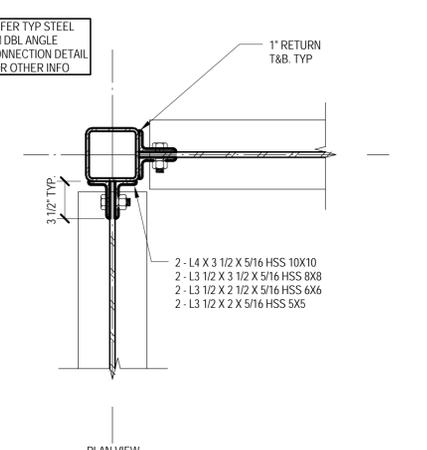
**13 TYPICAL DETAIL**  
3/4" = 1'-0"



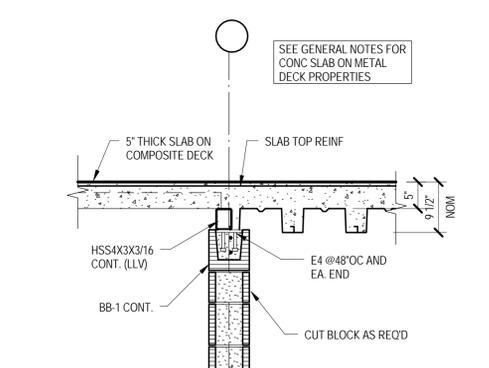
**2 COMPOSITE GIRDER TYPICAL DETAIL**  
NO SCALE TD05351



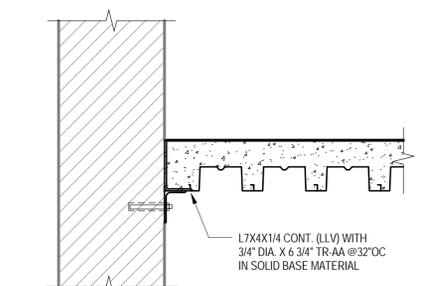
**5 COMPOSITE BEAM TYPICAL DETAIL**  
NO SCALE TD05350



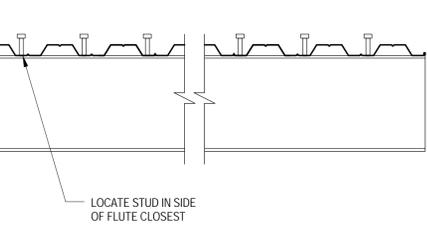
**8 BEAM TO TUBE COL. CONNECTION AT FLOORS TYPICAL DETAIL**  
NO SCALE



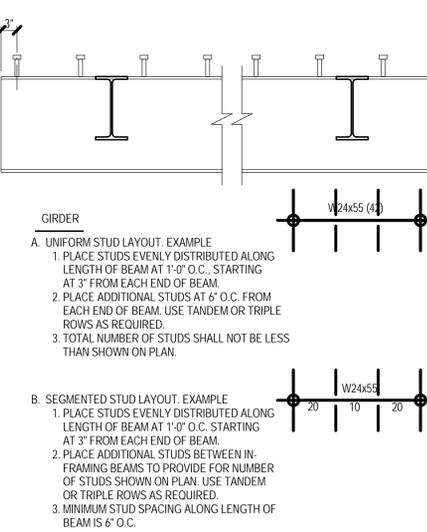
**11 TYPICAL DETAIL**  
NO SCALE



**14 TYPICAL DETAIL**  
3/4" = 1'-0"



**9 STUD LAYOUT - COMPOSITE BEAMS TYPICAL DETAIL**  
NO SCALE TD05356



**15 STUD WELDING DETAILS TYPICAL DETAIL**  
NO SCALE TD05355

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**Client**  
Somerville Housing Authority

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## Mystic Water Works at Capen Court

Capen St. Somerville, MA 02144

## TYPICAL WOOD DETAILS

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# S7.01

### HEADER SCHEDULE

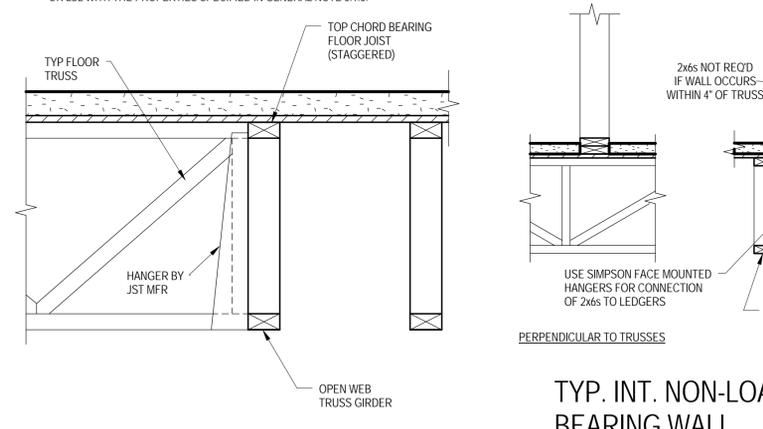
LOCATION	MAXIMUM SPAN	SIZE	KING STUD POST EACH END WALLS BELOW			
			ROOF	4th FLOOR	3rd FLOOR	2nd FLOOR
TYPICAL INTERIOR	3-6	2-2x12	2-2x4	2-2x4	3-2x4	4-2x4 OR WP2
TYPICAL INTERIOR	3-6	2-2x12	2-2x4	3-2x4	4-2x4 OR WP2	WP3
TYPICAL EXTERIOR	3-6	3-2x12	2x6	2-2x6	2-2x6	3-2x6
TYPICAL EXTERIOR	6-0	3-2x12	2x6	2-2x6	3-2x6	3-2x6
TYPICAL EXTERIOR	11-0	5.25"x11.25" SCL	2-2x6	3-2x6	4-2x6	4-2x6
TYPICAL CORRIDOR	3-6	3-2x10	2x6	2x6	3-2x6	3-2x6

NOTES:  
1) STRUCTURAL COMPOSITE LUMBER (SCL) IS APPROVED TO BE LVL, PSL, OR LSL WITH THE PROPERTIES SPECIFIED IN GENERAL NOTE 6.1.3.

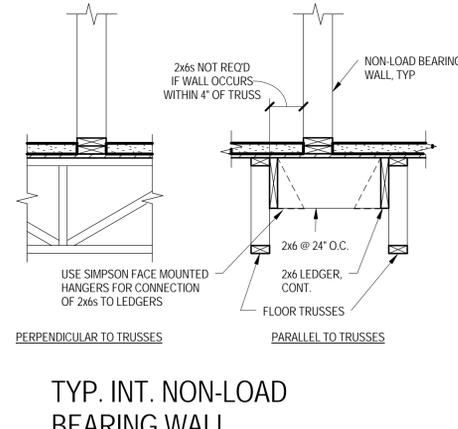
### STUD BEARING WALL SCHEDULE

LOCATION	DEMISING WALL	INTERIOR PARTITION	EXTERIOR WALL	CORRIDOR WALL
WALL BELOW LEVEL ROOF	2x4 @ 16"	2x4 @ 16"	2x6 @ 16"	2x6 @ 16"
WALL BELOW LEVEL 4	2x4 @ 12"	2x6 @ 12"	2x6 @ 16"	2x6 @ 16"
WALL BELOW LEVEL 3	2 - 2x4 @ 16"	2x4 @ 12"	2x6 @ 16"	2x6 @ 16"
WALL BELOW LEVEL 2	3 - 2x4 @ 12"	1 - 11/2"x3 1/2" SCL @ 12"	2x6 @ 12"	2x6 @ 12"

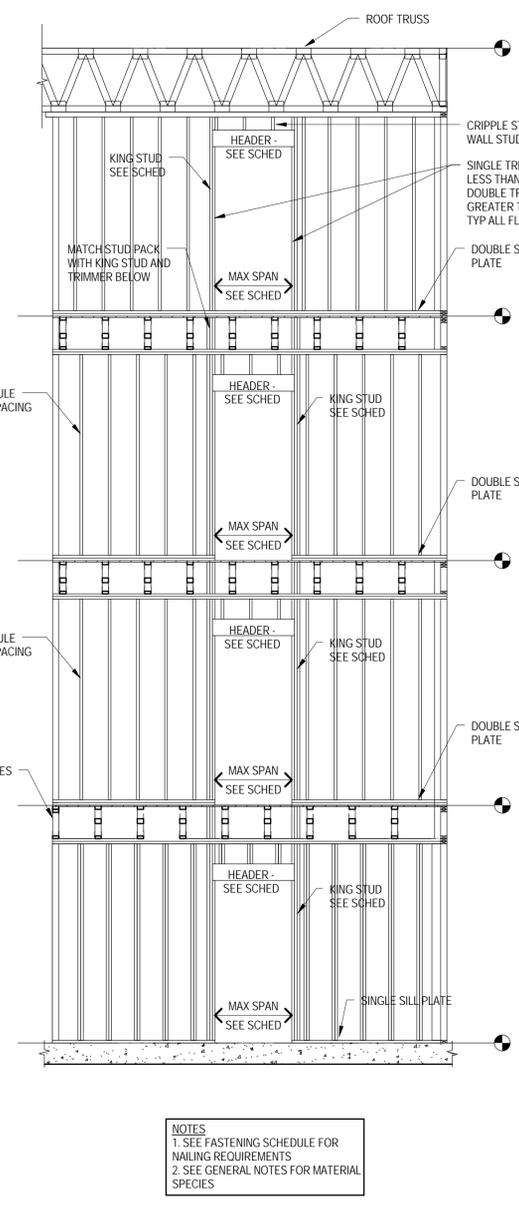
NOTES:  
1) STRUCTURAL COMPOSITE LUMBER (SCL) IS APPROVED TO BE LVL, PSL, OR LSL WITH THE PROPERTIES SPECIFIED IN GENERAL NOTE 6.1.3.



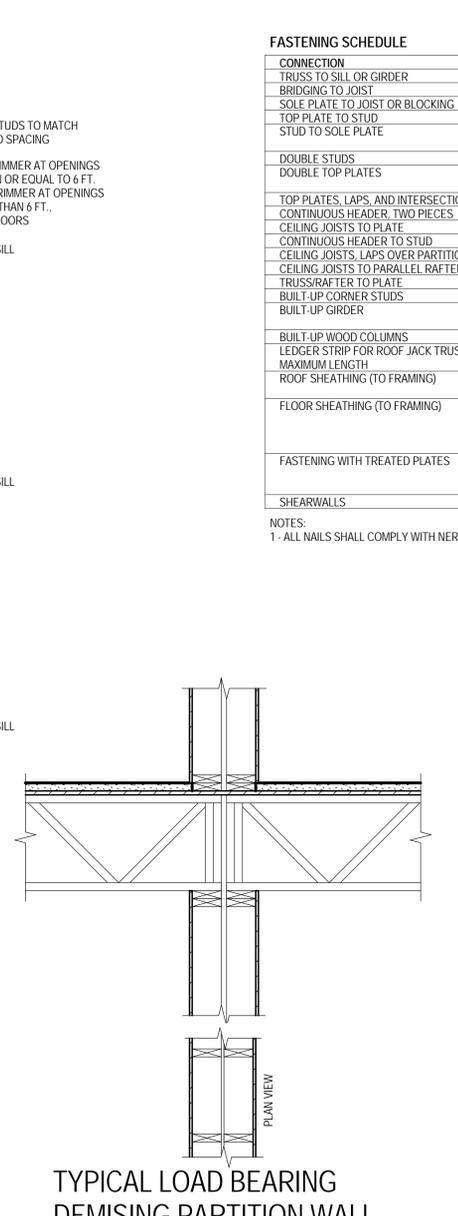
**14 TYPICAL DETAIL**  
NO SCALE 8/57.1



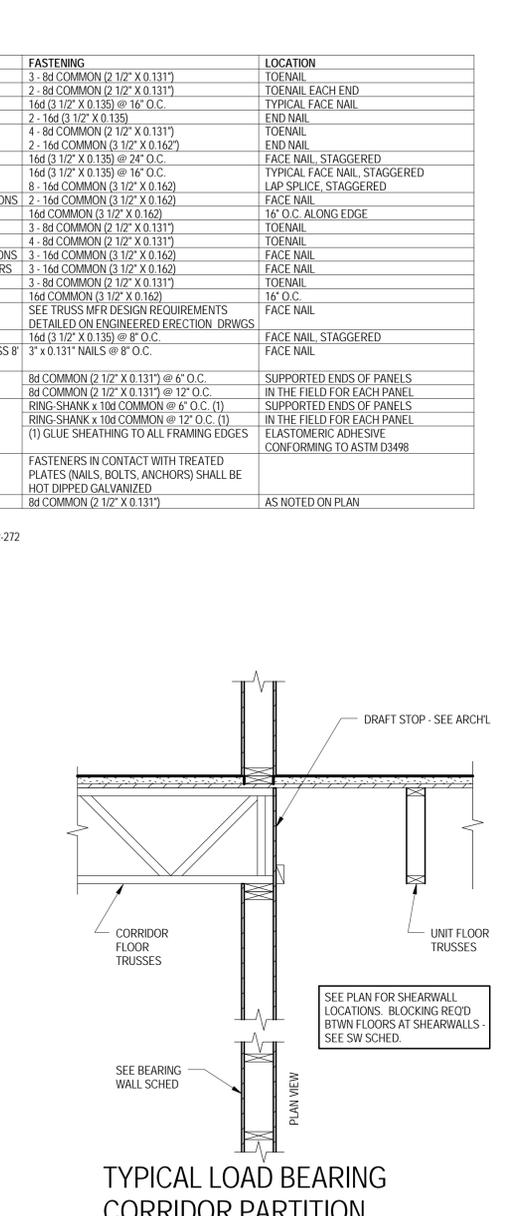
**11 TYPICAL DETAIL**  
NO SCALE TD06504



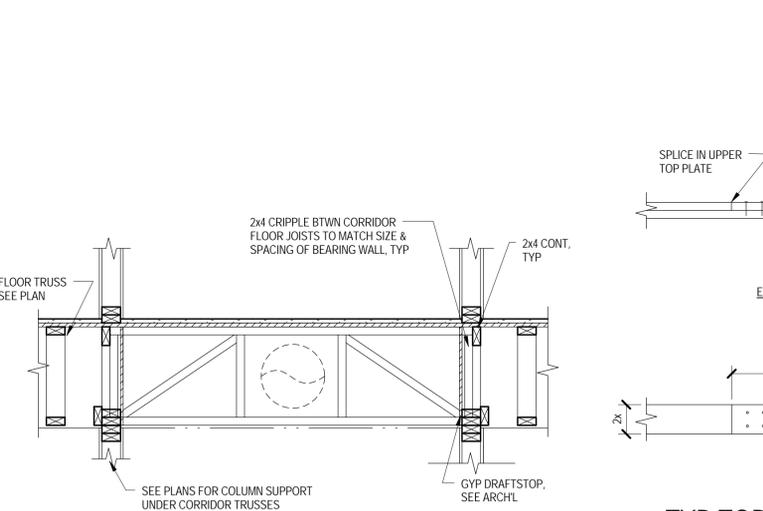
**8 TYPICAL OPENING FRAMING**  
1/4" = 1'-0"



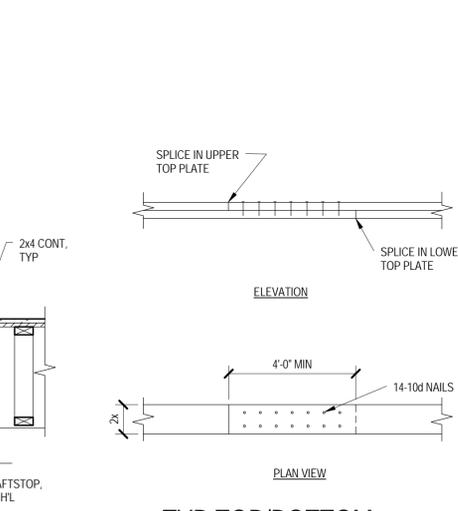
**5 TYPICAL DETAIL**  
NO SCALE 12/57.1



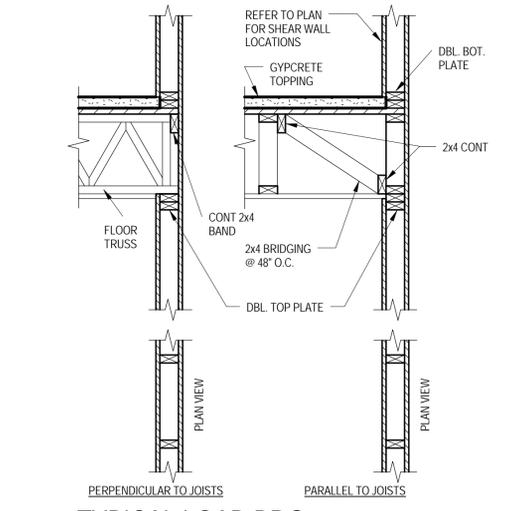
**2 TYPICAL DETAIL**  
NO SCALE 11/57.1



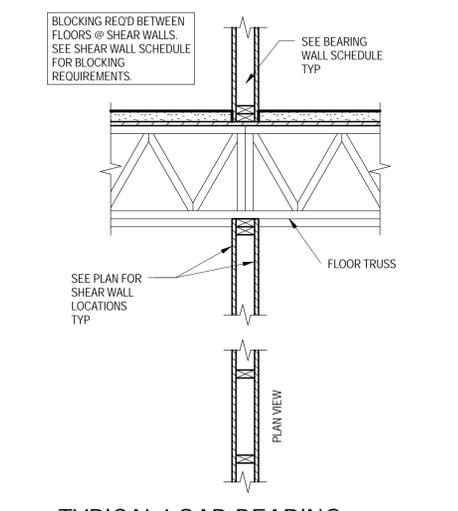
**15 TYPICAL DETAIL**  
NO SCALE 24/57.1



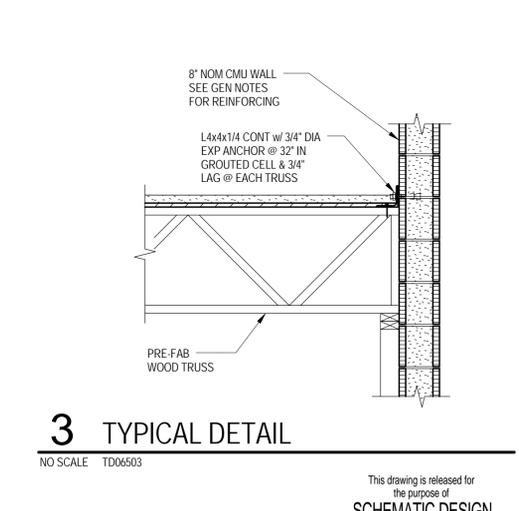
**12 TYPICAL DETAIL**  
NO SCALE TD06507



**9 TYPICAL DETAIL**  
NO SCALE TD06508



**6 TYPICAL DETAIL**  
NO SCALE TD06506



**3 TYPICAL DETAIL**  
NO SCALE TD06503

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617.948.5700 • www.lafp.com  
LAFP Project No. B1139

## Project Status

Comprehensive Permit Submission Sept. 16, 2011  
Issue Description Date

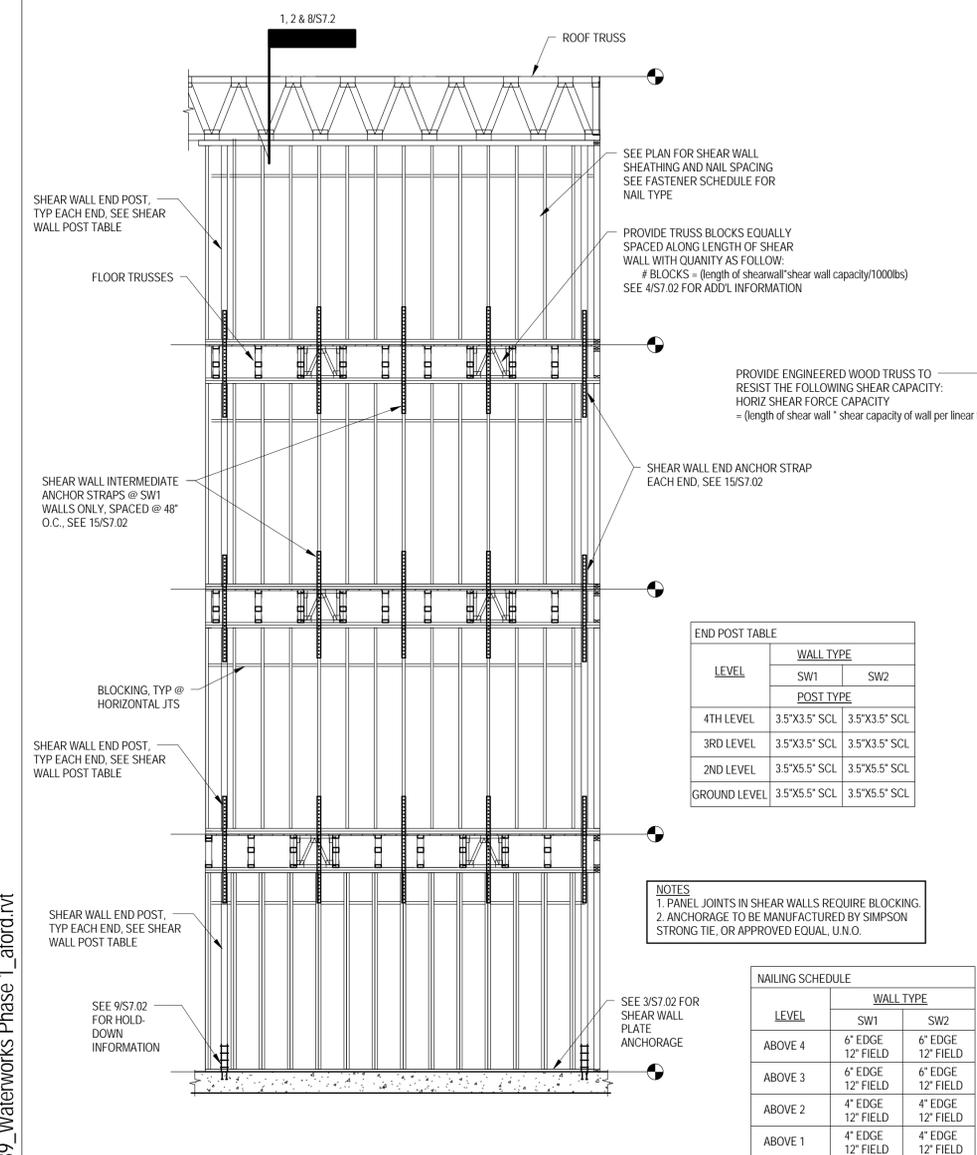
Scale: AS NOTED  
Drawn By: Author  
Checked By: Checker  
Reviewed By: Approver

Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
Somerville, MA 02144

## TYPICAL WOOD SHEAR WALL DETAILS



SEE PLAN FOR SHEAR WALL SHEATHING AND NAIL SPACING SEE FASTENER SCHEDULE FOR NAIL TYPE

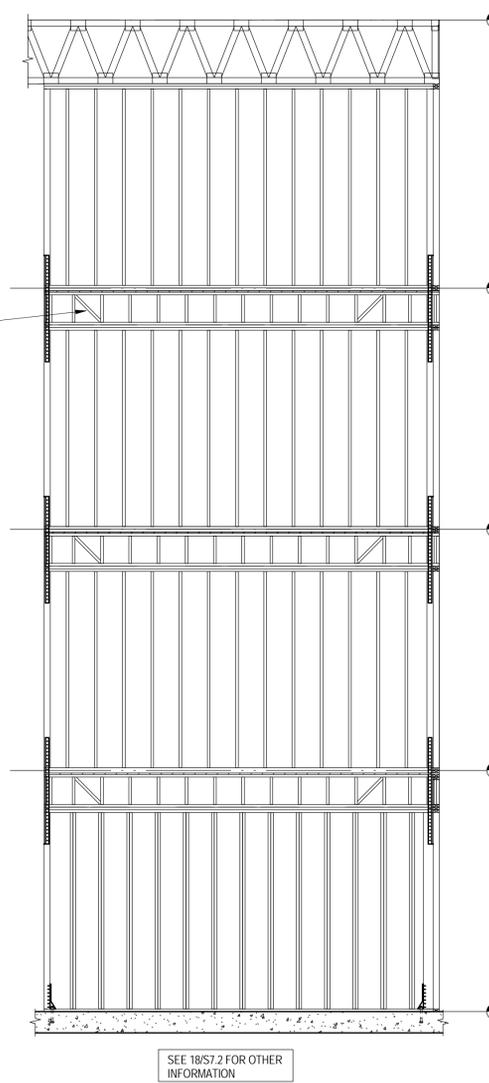
PROVIDE TRUSS BLOCKS EQUALLY SPACED ALONG LENGTH OF SHEAR WALL WITH QUANTITY AS FOLLOWS:  
# BLOCKS = (length of shear wall \* shear wall capacity/1000lbs)  
SEE 4/S7.02 FOR ADDL INFORMATION

PROVIDE ENGINEERED WOOD TRUSS TO RESIST THE FOLLOWING SHEAR CAPACITY:  
HORIZ SHEAR FORCE CAPACITY = (length of shear wall \* shear capacity of wall per linear ft)

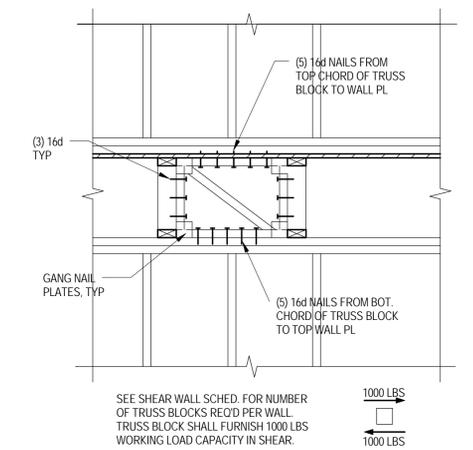
LEVEL	WALL TYPE	
	SW1	SW2
4TH LEVEL	3.5"x3.5" SCL	3.5"x3.5" SCL
3RD LEVEL	3.5"x3.5" SCL	3.5"x3.5" SCL
2ND LEVEL	3.5"x5.5" SCL	3.5"x5.5" SCL
GROUND LEVEL	3.5"x5.5" SCL	3.5"x5.5" SCL

**NOTES**  
1. PANEL JOINTS IN SHEAR WALLS REQUIRE BLOCKING.  
2. ANCHORAGE TO BE MANUFACTURED BY SIMPSON STRONG TIE, OR APPROVED EQUAL, U.N.O.

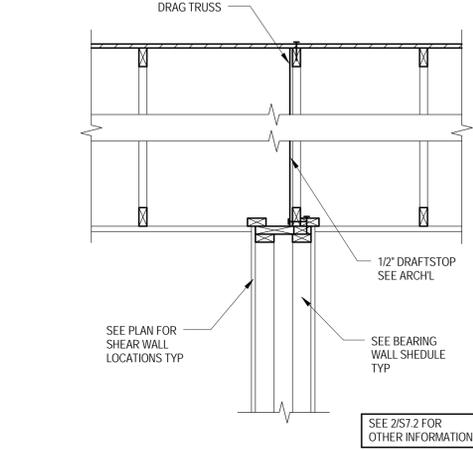
LEVEL	WALL TYPE	
	SW1	SW2
ABOVE 4	6" EDGE 12" FIELD	6" EDGE 12" FIELD
ABOVE 3	6" EDGE 12" FIELD	6" EDGE 12" FIELD
ABOVE 2	4" EDGE 12" FIELD	4" EDGE 12" FIELD
ABOVE 1	4" EDGE 12" FIELD	4" EDGE 12" FIELD



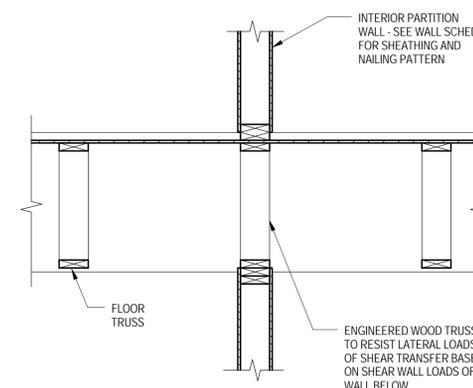
SEE 18/S7.2 FOR OTHER INFORMATION



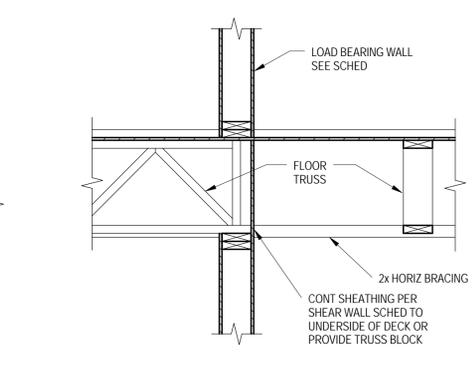
**4 TRUSSES PERP TO SHEAR WALL TYPICAL DETAIL**  
NO SCALE TD06515



**1 TYPICAL TENANT WALL AT ROOF TYPICAL DETAIL**  
NO SCALE TD06513



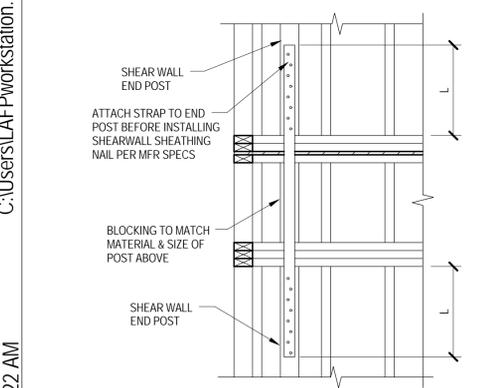
**5 INTERIOR PARTITION WALLS TYPICAL DETAIL**  
NO SCALE TD06521



**2 CHANGE IN TRUSS SPAN DIRECTION TYPICAL DETAIL**  
NO SCALE TD06519

**14 SHEAR WALL WITH FLOOR TRUSSES PERPENDICULAR TO SHEAR WALL**  
1/4" = 1'-0"

**8 SHEAR WALL WITH FLOOR TRUSSES PARALLEL TO SHEAR WALL**  
1/4" = 1'-0"



SW1 SHEAR WALLS: END STRAP TABLE			
LEVEL	STRAP	L (IN)	FASTENERS
4TH	CS14	15"	26-10d
3RD	CMST14	30"	66-10d
2ND	CMST12	39"	86-10d

SW1 SHEAR WALLS: INTERMEDIATE STRAP TABLE			
LEVEL	STRAP	L (IN)	FASTENERS
ALL	CS14	15"	26-10d

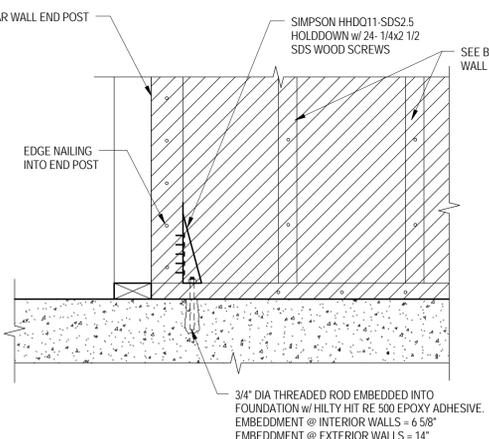
SW2 SHEAR WALLS: END STRAP TABLE			
LEVEL	STRAP	L (IN)	FASTENERS
4TH	CS14	15"	26-10d
3RD	CMST14	30"	66-10d
2ND	CMST12	39"	86-10d

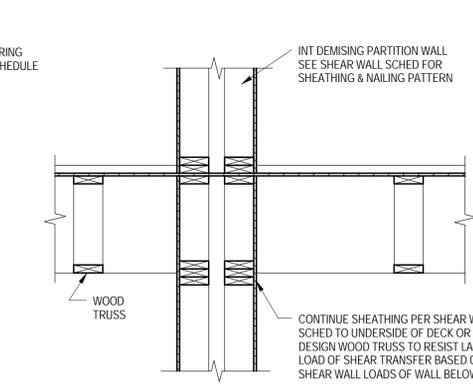
SW2 SHEAR WALLS: INTERMEDIATE STRAP TABLE			
LEVEL	STRAP	L (IN)	FASTENERS
ALL	NONE REQUIRED		

**NOTE:**  
THE NUMBER OF FASTENERS PROVIDED IS THE TOTAL NUMBER REQUIRED. PROVIDE HALF AT EACH END OF STRAP.

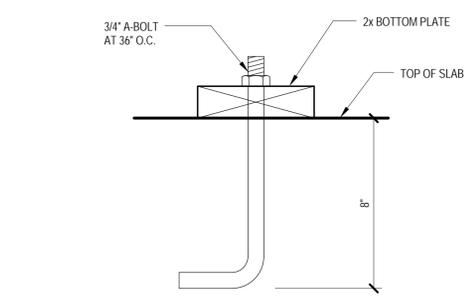
**15 SHEAR WALL END AT UPPER LEVELS TYPICAL DETAIL**  
NO SCALE TD06520



**9 SHEAR WALL HOLD DOWN TYPICAL DETAIL**  
NO SCALE TD06517



**6 DEMISING PARTITION WALL TYPICAL DETAIL**  
NO SCALE TD06517



**3 SHEAR WALL PLATE ANCHORAGE TYPICAL DETAIL**  
NO SCALE TD06522

The drawings are prepared for the purpose of SCHEMATIC DESIGN under the authority of AARON A. FORD P.E. Number 46393 on AUGUST 12, 2011

# S7.02

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LAFP Project No. B1139

## Project Status

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 Issue Description Date

Scale: AS NOTED  
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 Checked By: Checker  
 Reviewed By: Approver

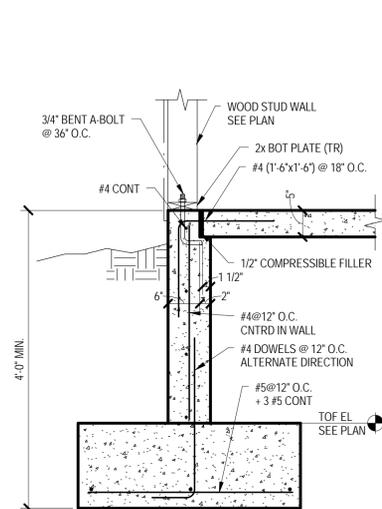
Project No. 2010080.00

## Mystic Water Works at Capen Court

Capen St.  
 Somerville, MA 02144

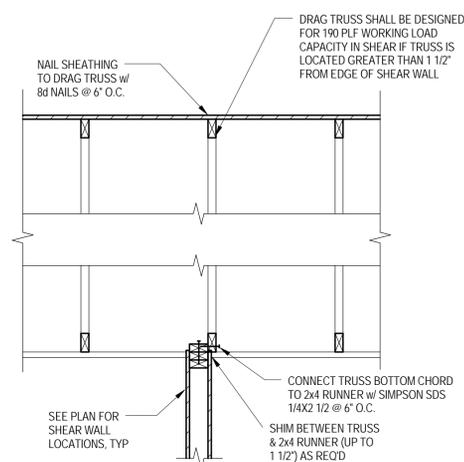
## WOOD DETAILS

# S7.03



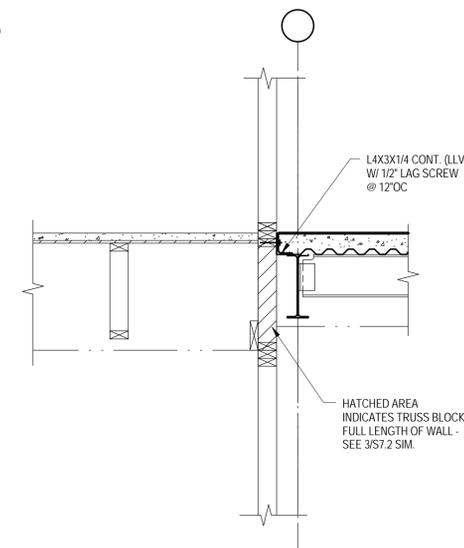
10

3/4" = 1'-0"



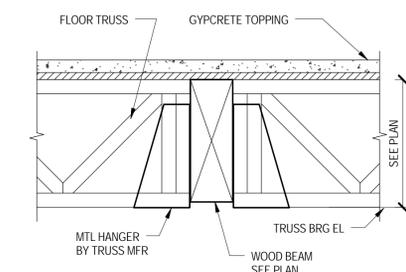
7  
 DRAG TRUSS TO SHEAR WALL CONN  
 TYPICAL DETAIL

NO SCALE TD06514



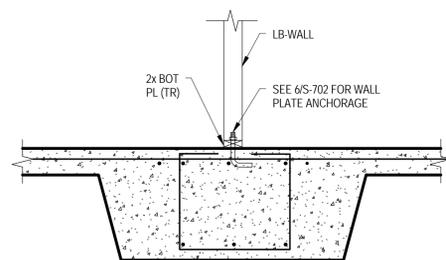
4

3/4" = 1'-0"



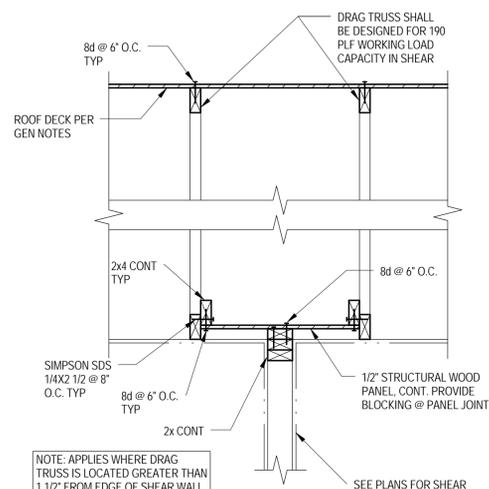
1  
 FACE MOUNTED TRUSS @ FLUSH BM  
 TYPICAL DETAIL

NO SCALE



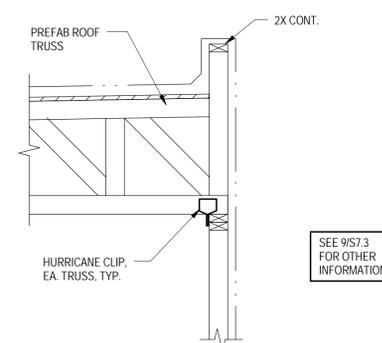
11

3/4" = 1'-0"



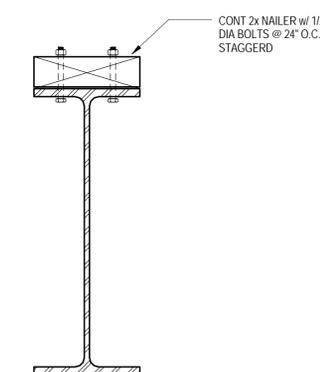
8  
 DRAG TRUSS TO SHEAR WALL CONN  
 TYPICAL DETAIL

NO SCALE TD06518



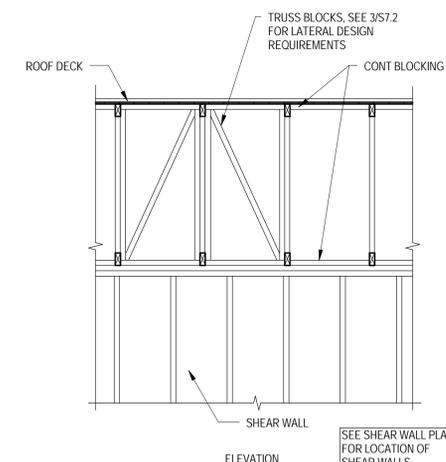
5

3/4" = 1'-0"



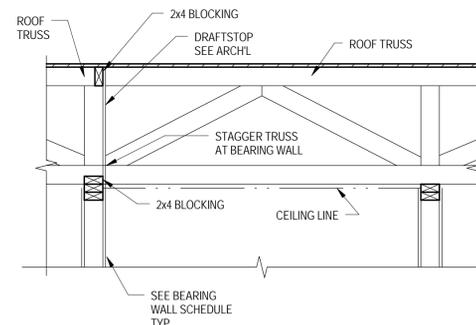
2  
 NAILER ANCHORAGE  
 TYPICAL DETAIL

NO SCALE TD06512



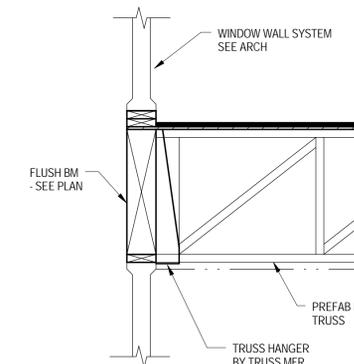
9  
 ROOF TRUSSES PERP. TO SW ALONG CORRIDOR  
 TYPICAL DETAIL

NO SCALE TD06523



6  
 ROOF FRAMING OVER CORRIDOR  
 TYPICAL DETAIL

NO SCALE TD06505



3  
 TYPICAL DETAIL

NO SCALE

The drawing is released for the purpose of SCHEMATIC DESIGN under the authority of AARON A. FORD P.E. Number 46393 on AUGUST 12, 2011