

MASSACHUSETTS WATER RESOURCES AUTHORITY

PERMIT

8m Permit # 2507

10-Jul-20

The Gutierrez Company c/o Northborough  
Land Realty Trust  
200 Summit Drive  
Burlington, MA 01803

Pursuant to Section 8 (m) of Chapter 372 of the Acts of 1984 you are hereby granted permission to use a certain portion of land presently under the jurisdiction and control of the Massachusetts Water Resources Authority for the purpose set forth below.

**The land is described as follows:**

Wachusett Aqueduct - 0 & 301 Bartlett Street - Northborough, Massachusetts. The Wachusett Aqueduct at this location is subject to certain rights of way across said aqueduct pursuant to Taking No. 5 (dated May 25, 1896) recorded May 27, 1896 with the Worcester Registry of Deeds at Book 1509, Page 142 (see sections 51 and 52 and Plan No. 6 of said taking for this location).

**You may use the land for the purpose of:**

Installation of an Access Driveway and Utility Service Lines in Accordance with Plans Titled: MWRA Crossing Profile Plan - Parcel H Development Bartlett St. Northborough, MA (Map 51 Lot 3 & Map 66, Lot 16) - Prepared for: The Gutierrez Company - Prepared by: Allen & Majors Assoc. - Rev. Date: 06/25/20 - Sheet C109 -&- Evaluation of Impact to Underlying MWRA Aqueduct Analysis - Prepared by: Langan Engineering - Dated: 6/19/20 - Copley Parcel H Northborough, MA - Pages 1 thru 4



Approved as to Form:

Massachusetts Water Resources Authority

Christopher John  
Law Division

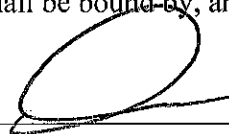
Approved

Massachusetts Water Resources Authority

Carolyn M. Fice 8/27/2020  
Deputy Chief OO, PP&P

This Permit is subject to the 8(m) Permit Terms and Conditions, and the 8(m) Permit Special Terms and Conditions, if any, attached hereto and made a part hereof. Permittee agrees that it shall be bound by, and shall comply with, said Terms and Conditions.

Permittee:



Signature

Arthur G. Brewer, Jr.  
Trustee  
Northridge Line Permit Trust

Print Name

This permit shall have no effect until such time as the Authority issues the fully executed original of this Permit.

**Massachusetts Water Resources Authority**

**2 Griffin Way**

**Chelsea, MA 02150**

**Attn: Water Operations - Permitting Department**

8(m) 20-2507

July 10, 2020



### **8(m) PERMIT TERMS AND CONDITIONS**

1. Permittee shall be responsible to stay apprised of and comply with all applicable federal, state and local laws, rules, orders, and guidelines concerning the coronavirus (COVID-19), including but not limited to guidelines and requirements for construction sites, and all supplements, amendments and/or changes thereto and notices thereof. In addition, this permit does not authorize Permittee to engage in any construction activities, which are temporarily suspended due to COVID-19. Prior to commencing work pursuant to this permit, Permittee shall have obtained all other required permits, written approval(s) and necessary authorizations to perform the work. Failure to comply with the terms stated herein shall render this permit null and void by the Authority, and Permittee shall bear all responsibility, liability, damages and costs arising from the Permittee's noncompliance.
2. Permittee's use of the land shall at no time interfere with the Authority's activities or operations on the land. The Authority has the right to review and approve all of the Permittee's work including such plans and specifications, as the Authority deems necessary. Any proposed future work beyond the scope of this permit shall have the prior written approval of the Authority.
3. To the fullest extent permitted by law, the Permittee shall indemnify, defend with counsel acceptable to the Authority, keep and save harmless the Authority and its board members, officers, representatives, contractors, agents, employees, successors, and assigns, in both their individual and official capacities, against all suits, claims, liabilities, damages, losses (including but not limited to loss of use resulting therefrom) and expenses, including but not limited to attorney's fees, caused by, arising out of or resulting from any work or activity under this Permit and/or act, omission, breach or default of the Permittee or of any contractor, subcontractor or vendor of the Permittee or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.
4. The granting of this permit shall in no way interfere with the rights of the Authority to exercise its existing rights in or over the permitted land. Permittee acknowledges that the Authority, within its sole discretion, may enter upon the permitted land at any time in order to carry out inspections, maintenance, repairs, replacements, or other activities.
5. The Authority may revoke this permit at any time. The sale or disposition of the land by its owner will cause this permit to terminate without further notice. Permittee shall give the Authority at least 72 hours notice before commencing the operations as pursuant herein. This permit shall not be assigned or transferred.
6. No blasting, drilling or other activity that could in any way affect the integrity or operability of the Authority's property or use of the Premises shall be permitted without express prior written approval of the Authority.
7. The Permittee shall remove, at its own expense, within six months of the date of written notice from the Authority, any or all conduits and appurtenances installed by the Permittee under this permit if, in the Authority's sole discretion, such removal is necessary for the operation, maintenance or replacement of the Authority's infrastructure.



## CONDITIONS (Cont'd)

8. To the fullest extent permitted by law, and in consideration of the issuance of this permit, Permittee hereby releases the Authority and its board members, officers, representatives, contractors, agents, employees, successors, and assigns, in both their individual and official capacities, from all suits, claims, liabilities, damages, losses (including but not limited to loss of use resulting therefrom) and expenses, including but not limited to attorney's fees, caused by, arising out of or resulting from any work or activity under this Permit and/or act, omission, breach or default of the Permittee or of any contractor, subcontractor or vendor of the Permittee or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. This release includes, but is not limited to, all suits, claims, liabilities, damages (including, but not limited to, direct, indirect, and consequential damages, economic loss, and loss of profits) and losses which are attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including the loss of use resulting therefrom, together with all attorneys' fees, costs and expenses.
9. The Permittee shall conduct design, construction, and excavation in accordance with all federal, state and local safety regulations, including but not limited to, federal OSHA regulations (29 CFR 1926) and Massachusetts Department of Public Safety regulations (520 CMR 14.00). During construction, Permittee shall take appropriate sheeting and shoring measures to protect the integrity of the Authority's water and/or sewer mains. Permittee shall submit design plans stamped by a professional engineer licensed in Massachusetts to the Authority for approval prior to the start of construction.
10. The Permittee shall adjust any or all Authority frames and covers to grade within the limits of work in accordance with the plans referenced in this permit. The Authority will provide the Permittee with new replacement Authority frames and covers that have been deemed unusable by the Authority.
11. If the Permittee is proposing to take borings and/or place test pits within the permitted area, the Permittee shall mark the proposed boring and test pit locations on the ground using paint and/or stakes and submit engineering documents to the Authority showing the proposed boring and test pit locations. Authority staff will review all boring and test pit locations at the site. Upon written clearance of the proposed boring and test pit locations by Authority staff and subject to Permittee providing the Authority with seventy-two (72) hours prior notice, Permittee may commence work at the site.

The Permittee shall be responsible for the locations of proposed borings and test pits regardless of any act or omission of the Authority. The Permittee shall be responsible for repairing and/or replacing, at the Authority's election, the Authority's property or infrastructure, which is damaged as a result of the Permittee's, its contractors, agents, representatives, employees, and/or invitees activities pursuant to this permit. The Permittee's obligations under this paragraph shall include payment to the Authority for all costs to repair all such damage caused to the Authority's property.



## EXHIBIT A

### MWRA WESTERN TRANSMISSION OPERATIONS SPECIAL TERMS & CONDITIONS

1. **Permittee or its designee to provide at least 72-hour prior notice to Guy Foss (508) 424-3661 for Mark-outs and Inspection Services (266 Boston Post Road, Southborough, MA 01772).**
2. A minimum **vertical clearance of 18 inches** shall be maintained between the Authority's water mains and other utility crossings unless otherwise noted. However, water/gas and other utility service crossings with a pipe size diameter of 2-inches or less maybe permitted to cross the Authority's pipeline at a reduced clearance subject to MWRA review. (Except for special provisions, i.e. capped or plugged pipes, thrust blocks and or bends which would require a greater clearance separation)
3. A minimum of three-(3) feet to five-(5) feet horizontal clearance is required between adjacent utilities and the side (spring line) of any MWRA main. (Except for special provisions, i.e. capped or plugged pipes, thrust blocks and or pipe bends which would require a greater clearance separation)
4. Crossings of MWRA water mains shall be located a minimum horizontal distance of at least four (4) feet from any joints of the Authority's mains.
5. Proposed pipe/utility crossings of the Authority's water mains shall cross at a 90-degree angle to minimize interference.
6. For distances over four (4) feet of the Authority's mains which are to be undermined the method and type of pipe support plan shall be submitted and stamped by a Professional Engineer (P.E.) licensed in Massachusetts for prior approval by the Authority.
7. For distances under four (4) feet of the Authority's mains which are to be undermined, the on-site MWRA inspector shall review and approve the proposed support of the main. Under no circumstances shall the Authority's main be left in an unsupported, undermined position overnight.
8. During construction, appropriate sheeting measures must be taken to protect the integrity of the Authority's water mains. The sheeting design must be reviewed by the Authority prior to the start of the construction. The design shall be stamped by a Professional Engineer, licensed in Massachusetts. The use of a Trench Box is not permitted in this application.
9. Suitable compaction methods shall be employed in restoring the beds of the MWRA's mains backfilling around the MWRA's main shall be placed in maximum 6-inch lifts and compacted by hand vibratory compactors.
10. The MWRA pipeline must be protected at all times during construction. The Authority may require a professional engineer licensed in the State of Massachusetts to submit a construction plan and or **pipeline analysis** that is to be attached to this 8m Permit.
11. Screened gravel shall be uniformly graded with maximum size of a particle between 3/8 inch and ¾ inch. Screened gravel shall consist of clean, hard and durable particles free from an excess of soft, elongated and disintegrated pieces or other objectionable material. Crushed rock of suitable size and grading maybe used in place of screened gravel at the option of the MWRA Inspector.
12. For test pit excavations or unearthing of the Authority's water main the Permittee must excavate the last 2-feet, **before the top of pipe, by hand** or use a vacuum boring method and backfill with approved material within an easement or roadway area.



### **SPECIAL TERMS and CONDITIONS (Cont'd)**

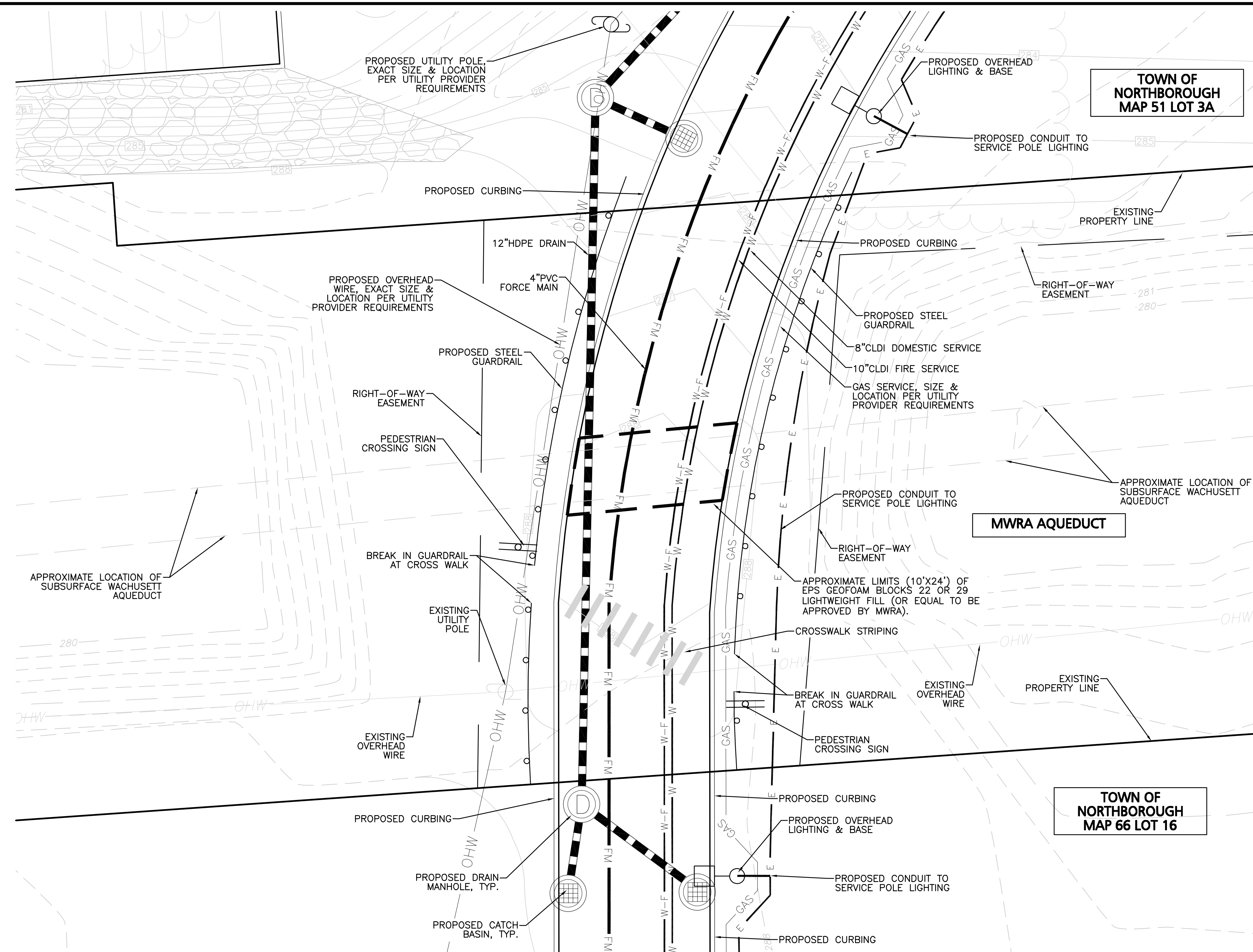
13. The Permittee is responsible to adjust any or all MWRA frames and covers to grade within their limits of work in accordance with the plans referenced in this permit. The Authority will provide the Permittee with new replacement MWRA frames and covers (at no expense to the Permittee) for any existing frames and covers that have been deemed unusable by Authority personnel.
14. All MWRA manhole openings that were covered during the binder course installation shall be made accessible within 48-hours. MWRA manhole frame and covers shall not be removed for grinding and or pulverizing. Pulverizing is not allowed over MWRA manhole structures.
15. The Permittee will provide a logistics construction schedule in writing, along with emergency contact information whenever MWRA valves (manhole covers) or facilities are covered or obstructed.
16. MWRA Inspection personnel must be on site whenever excavation, construction and hoisting or rigging occurs around an MWRA water main pipeline.
17. No construction equipment including cranes, backhoes or material may be parked, stationed, set up or stored on top of the MWRA's water mains or infrastructure.
18. Replacement (shutdown) of the MWRA's mains shall be coordinated with the Authority. Four-(4) weeks-advanced notice in writing is required for shutdowns.
19. The Permittee or its designee shall contact the Authority three (3) weeks in advance when an MWRA water main valve must be operated. **Only MWRA Personnel Will Operate MWRA Valves.** The Permittee or its designee shall not operate any MWRA valves. MWRA Valve Operations are limited during peak demand periods and may not be available between the dates of May 15th and September 15th of each calendar year.
20. **The Permittee will be responsible to protect and correct any damage(s) to the Authority's property or pipeline at no cost to the MWRA.**
21. As-built drawings shall be furnished to the Authority upon the completion of permitted work. A Professional Massachusetts Registered Land Surveyor or Engineer shall stamp as-built drawings.
22. MWRA Detail Records "field sketches" shall be updated (with accurate field ties) by the Permittee and shall be furnished to the Authority upon the completion of the permitted work.
23. The Permittee shall indemnify and hold harmless the Authority and its successors and assigns from any and all damages and/or claims for damage to the Permittee's conduits, facilities and/or property as a result of the Authority's operation, maintenance, repair, and/or replacement of Authority property, or as a result of the failure of an Authority water pipe.
24. This permit addresses only MWRA-owned and operated infrastructure. The Permittee is required to obtain needed separate approvals from the City, Town and other State Agencies.
25. The permitted work and location of installed facilities and appurtenances shall not deviate from the construction plan that is referenced in this permit. No field changes are allowed without prior review and written approval by the MWRA 8m Permit Project manager. An MWRA on site inspector shall review all field changes and coordinate with the Permittee regarding submitting a change of work plan to the Authority for review and comment. If MWRA field inspection indicates changes undertaken without approval, the Permittee may be issued a cease and desist order and be required to correct/reconstruct any completed work.



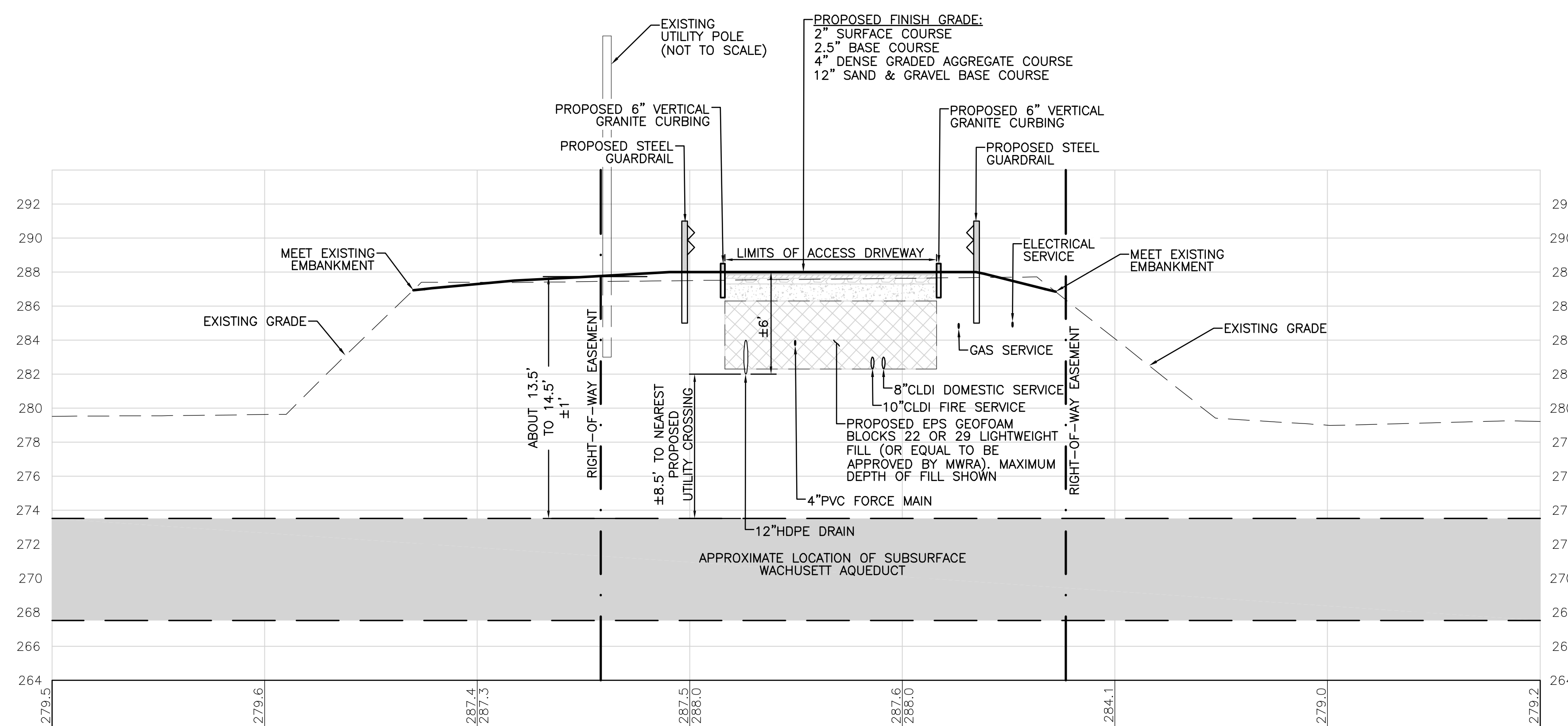
SPECIAL TERMS and CONDITIONS (Cont'd)

26. The Authority may require a construction plan along with an analysis of the MWRA's pipeline (prepared by a professional engineer licensed in the State of Massachusetts). The pipeline analysis shall take into consideration the construction equipment, which would be used over the Authority's pipeline in instances where the existing roadway surface will be completely excavated away removing the protection of the HS-20 surface loading barrier. This Plan and supporting calculations will need to be submitted to the MWRA for review.
27. The Authority requires the submittal of "Cut Sheets and or Shop Drawings" for review of all newly proposed materials that will come under the ownership of the MWRA.
28. Where pipe jacking is required, for work that is in close proximity to the Authority's water mains, submittals prepared by a professional engineer and reviewed by the MWRA are required.
29. Permittee shall not expose the spring line or undermine the MWRA's pipeline. The Permittee or its designee shall cease excavation operations and secure the open trench by backfilling the open trench to secure the MWRA's pipeline whenever the spring line is exposed.
30. The Permittee shall mark the proposed boring and test pit locations on the ground using paint and/or stakes and submit engineering documents to the Authority showing the proposed boring and test pit locations. Authority operations staff will review all boring and test pit locations at the site.
31. Upon written clearance of the proposed boring and test pit locations by Authority operations staff and subject to Permittee providing the Authority with seventy-two (72) hours prior notice, Permittee may commence work at the site.
32. The Permittee shall be responsible for the locations of the proposed borings and test pits regardless of any act or omission of the Authority. The Permittee shall be responsible for repairing and/or replacing, at the Authority's election, the Authority's property or infrastructure, which is damaged as a result of the Permittee's, its contractors, agents, representatives, employees, and/or invitees activities pursuant to this permit. The Permittee's obligations under this paragraph shall include payment to the Authority for all costs to repair all such damage caused to the Authority's property.





**AQUEDUCT CROSSING - PLAN VIEW**  
SCALE - 1"=10'



**AQUEDUCT CENTERLINE PROFILE**  
HORIZONTAL - 1"=10'  
VERTICAL - 1"=5'

- NOTES:**
1. THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. ITS INTENDED USE IS TO PROVIDE INFORMATION. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.
  2. THIS PLAN WAS PREPARED USING AVAILABLE SITE INFORMATION FROM SEVERAL SOURCES, SOME OF WHICH IS UNCONFIRMED. THE EXISTING CONDITIONS SURVEY BASE WAS TAKEN FROM A PLAN ENTITLED "EXISTING CONDITIONS" PREPARED BY ALLEN & MAJOR ASSOCIATES, INC. DATED DECEMBER 24, 2019, ORIGINAL SCALE 1"=80'.
  3. ALL ELEVATIONS REFER TO NAVD 88.



PROFESSIONAL ENGINEER FOR  
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
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1 2020-06-25 REVISED PER MWRA COMMENTS

APPLICANT/OWNER:

THE GUTIERREZ COMPANY  
200 SUMMIT DRIVE, SUITE 400  
BURLINGTON, MA 01803

PROJECT:  
PARCEL H DEVELOPMENT  
BARTLETT STREET  
MAP 51 LOT 3 &  
MAP 66 LOT 16  
NORTHBOROUGH, MA

PROJECT NO. 1145-09 DATE: 2019-12-24

SCALE: AS NOTED DWG. NAME: C-1145-09

DESIGNED BY: DMR CHECKED BY: CMQ

PREPARED BY:

**ALLEN & MAJOR ASSOCIATES, INC.**  
civil & structural engineering • land surveying  
environmental consulting • landscape architecture  
www.allenmajor.com  
100 COMMERCE WAY  
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DRAWING TITLE: MWRA CROSSING PROFILE PLAN SHEET No. C-109

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Project Number:	151011301		
Project:	Copley Parcel H		
Location:	Northborough, MA		
Calculated by:	A. Blomeke	Date:	6/19/2020
Reviewed by:	C. Patterson	Date:	6/22/2020

Objective:

Evaluate the impact of the Parcel H development to the underlying aqueduct structure, and provide recommendations for aqueduct crossing design.

References:

1. Topographic information obtained from a plan entitled "Existing Conditions" prepared by Allen & Major Associates, Inc. (A&M) dated 24 December 2019.
2. Site plan information obtained from a plan entitled "Layout & Materials Plan" prepared by A&M dated 24 December 2020.
3. Earthen berm cross-section obtained from a plan entitled "MWRA Crossing Profile Plan" prepared by A&M dated 16 June 2020.
4. Hager-Richter Geoscience, Inc. (HRGS) geophysical survey conducted on 21 February 2020.
5. Wachusett Aqueduct Crossing Evaluation report prepared by Langan dated 13 April 2020.

Existing Conditions:

Top of aqueduct below existing earthen berm:

13.5 +/-1 feet to 14.5 +/-1 feet

Top of aqueduct within recessed cut (either side of earthen berm):

5 +/-1 feet to 6 +/-1 feet

Estimated aqueduct diameter:

8 feet

Soil conditions:

Earthen berm fill: 130 pcf

Groundwater: 15 feet below grade

Existing Soil Loads Over Aqueduct:

Existing earthen berm = unit weight of soil \* height of existing soil  
= 130 pcf \* 13.5 feet \*conservative  
= 1755 psf

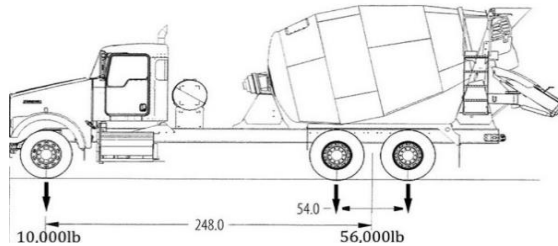
Proposed Loading:

1. Static and transient temporary construction loads (i.e., heavy equipment and fully loaded concrete trucks)
2. Static and transient development design loads (i.e., tractor trailer trucks and fire emergency vehicles)

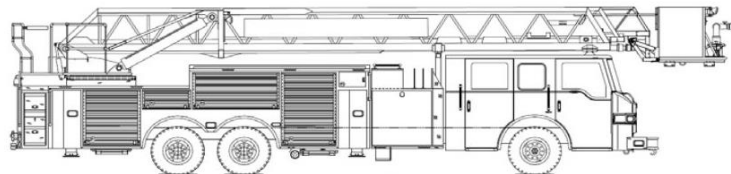


Project Number: 151011301  
Project: Copley Parcel H  
Location: Northborough, MA  
Calculated by: A. Blomeke Date: 6/19/2020  
Reviewed by: C. Patterson Date: 6/22/2020

### Concrete Truck



### Fire Truck



	<u>Min</u>	<u>Max</u>
Front GAWR	21,500	24,000
Rear GAWR	46,000	62,000
Width (in.)	98	100
Height (ft.)	11.5	13
Length (ft.)	46	48

Note: static point loads induce a greater load distribution with depth and transient dynamic loads are surficial, as such, our analysis below is for the worst case: point load applied at the top of the aqueduct. The worst case is observed during construction prior to placement of the heavy duty asphalt pavement section.

Our analysis was performed using a computer-based program, Zee-Stress, to compute vertical stress increases with depth due to applied surface loads. The load output is summarized in Graph 1.

As outlined in Graph 1, the highest loads are observed about 6 feet below grade and the load increase observed at the top of the aqueduct ranges from about 225 to 250 psf.

Load increase from concrete truck:

$$P(\text{delta}) = 225$$

or an ~13% increase in stress from the existing soil loads

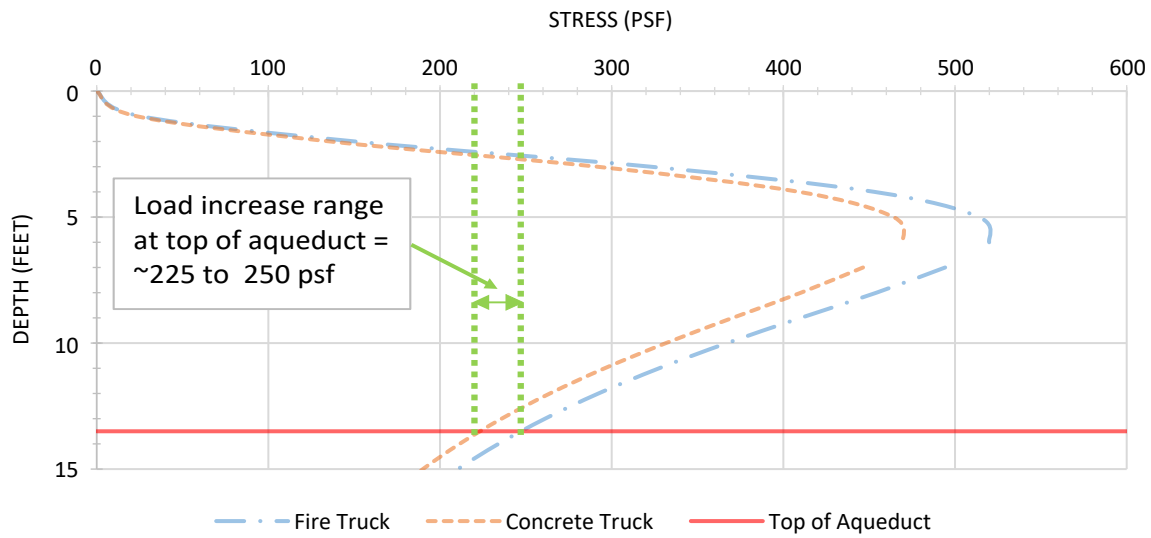
Load increase from fire truck:

$$P(\text{delta}) = 250$$

or an ~15% increase in stress from the existing soil loads



Graph 1: Stress Increase Due to Point Load



Recommendations for Proposed Redevelopment:

Remove existing fill within earthen berm and replace soil with lightweight fill over the aqueduct alignment.

Typical Lightweight Fill Properties:

EPS Geofoam Blocks

Length	4 feet	
Width	8 feet	
Height	3 feet	
Unit Weight	2 pcf	Typical EPS 22 or 29 block

AeroAggregates UL-FGA G15 Ultra-Lightweight Foam Glass Aggregate

Unit Weight	15 pcf
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Project Number:	151011301		
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Location:	Northborough, MA		
Calculated by:	A. Blomeke	Date:	6/19/2020
Reviewed by:	C. Patterson	Date:	6/22/2020

Net Reduction Due To EPS Geofoam Blocks:

Assume one layer of EPS 22 or 29 block, or ~3 feet of replacement  
=  $130\text{pcf} \times 10.5\text{ ft} + 2\text{pcf} \times 3\text{ feet}$   
= 1371 psf  
or an ~22% decrease in stress from the existing soil loads

Net Reduction Due To Ultra-Lightweight Fill:

Assume 4-feet of replacement  
=  $130\text{pcf} \times 9.5\text{ ft} + 15\text{pcf} \times 4\text{ feet}$   
= 1295 psf  
or an ~26% decrease in stress from the existing soil loads

Summary:

Our analysis is for the worst case scenario: static point load acting at the top of the aqueduct.

We recommend a removal and replacement program consisting of lightweight fill over the aqueduct alignment to create a net reduction in existing loading conditions to accommodate anticipated development traffic loading.

Anticipated traffic loading will increase the stress at the top of the aqueduct by about 15%.

Replacing about 3 feet of existing soil with EPS Geofoam Blocks or about 4 feet of existing soil with Ultra-Lightweight Fill will reduce the existing loads on the aqueduct by about 20 to 25%.

EPS Geofoam Blocks are structurally adequate and appropriate for the on-site soil conditions.

The proposed replacement program will off-set the anticipated traffic load increase.

Calculated by: A. Blomeke

Seal:

