B'nai B'rith Housing 34 Washington Street | Brighton, MA 02135
Phone 617-731-5290 Fax 617-739-0124

B'NAI B'RITH HOUSING

January 25, 2017

Rebecca McEnroe, Superintendent
Sudbury Water District
199 Raymond Road
Sudbury, MA 01776

RE: Response to Letter Regarding Water Impact Report –
The Coolidge at Sudbury Phase 2

Dear Ms. McEnroe:

On behalf of Covenant Commonwealth Corporation[1], "CCC", we write to respond to the letter from you dated 10/24/2016. Thank for your input. It is our hope to clarify certain matters.

Enclosed here is a letter from Tata & Howard dated 1/4/2017 that includes additional information that you requested as well as results from a recently conducted flow test. We have also attached demand calculations prepared by Tata & Howard that are based on 12 months of actual water bills for The Coolidge at Sudbury. We hope that this information satisfies your concerns.

Below are responses to the specific numbered comments in your letter.

1. This request regarding outdoor watering restrictions is reasonable. Covenant Commonwealth Corporation would accept this restriction as a condition of a locally-issued Comprehensive Permit.
2. Our proposal is to create 100% affordable housing. We have a constrained development budget and rely on subsidy resources to fund construction. We are unable to implement water re-use in this development due to the financial limitations.
3. Our team is working to utilize landscaping that is hardy and drought-resistant, as well as native species. There is minimal lawn area.
4. Waste water treatment will be designed to meet all Title 5 requirements as mandated by the state.

Please feel free to contact Holly Grace of my staff, at (617) 731-5293 or by email at holly@bbhousing.org if you require additional information. Thank you for your consideration.

Sincerely,

Susan L. Gittelman, Executive Director

CC: Sudbury Zoning Board of Appeals
CC: Meagen Donoghue, Director of Planning & Community Development, Town of Sudbury

[1] Covenant Commonwealth Corporation is a non-profit development entity of B'nai B'rith Housing.

TATA & HOWARD

January 4, 2017

Ms. Susan Gittelman, Executive Director
Covenant Commonwealth Corporation
34 Washington Street
Brighton, MA 02135

Subject: Water System Impact Report – Additional Information
Coolidge at Sudbury Phase 2

Dear Ms. Gittelman:

A Water Impact Report was submitted to the Sudbury Water District (District) on October 3, 2016. The District reviewed the submittal and requested further information on the assumed usage calculation, a fire flow test at the proposed project site, calculations for the increased velocity during Average Day Demand (ADD) and Maximum Day Demand (MDD), and specification sheets for the low flow fixtures to be used in the development. A copy of the District's response letter is attached.

The projected demand for the proposed development has been estimated based on usage at Coolidge at Sudbury Phase 1 for the period from August 11, 2015 through August 12, 2016. During this period, the 64 units in Phase 1 used 1,253,000 gallons. The updated estimated water demand for the proposed project during ADD conditions is 54 gallons per day per unit. Based on the 56 units proposed, the estimated ADD for Phase 2 is 3,330 gallons per day with a multiplier of 1.1 to account for outdoor water irrigation. Using a multiplier of 2.0 for MDD, the proposed MDD for Phase 2 is 6,660 gallons per day.

Updated Estimated Water Demand (Based on Current Usage at Coolidge at Sudbury Phase 1:

Average Day	3,330 gal	
Maximum Day	6,660 gal	(2.0 x Average Day Demand)

A fire flow test was performed by Tata & Howard and Sudbury Water District personnel on November 9, 2016. The hydrant located at 189 Boston Post Road was used as the flowing hydrant and the hydrant located at 209 Boston Post Road was used as the residual hydrant. Static pressures were 105 psi and 102 psi at the residual and flowing hydrants, respectively. A flow of 1,350 gallons per minute (gpm) was recorded at the flowing

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25 YEARS 1992-2017

hydrant with a residual pressure of 96 psi. Based on the results of the flow test, approximately 4,500 gpm is available at the flowing hydrant while maintaining a residual pressure of 20 psi. A copy of the fire flow test results is attached.

The velocity increase during ADD and MDD was calculated. The demand during ADD is approximately 2.3 gpm. Assuming the flow is split evenly from the east and west, the increase in velocity is approximately 0.008 feet per second. The demand during MDD is approximately 4.6. The increase in velocity is approximately 0.015 feet per second, assuming the flow is split evenly from the east and west. The calculation sheet is attached.

The specification sheets for the low flow fixtures are attached for the District's reference.

The additional demand for the proposed development would have minimal effect on the District's overall demand and water velocity in the distribution system.

Sincerely,

TATA & HOWARD, INC.

Karen Gracey

Karen L. Gracey, P.E.
Co-President

Enclosures

Sudbury Water District of Sudbury, Massachusetts

October 24, 2016

Ms. Susan Gittelman, Executive Director
B'NAI B"RITH Housing New England Inc.
34 Washington St.
Brighton, MA 02135

Re: Sudbury Water District Comments regarding Coolidge at Sudbury Phase 2 Water Impact Report

Dear Ms. Gittelman,

The Sudbury Water District has reviewed the Water Impact Report (WIR) submitted by Tata & Howard. on behalf of CCC. And have the following comments:

- After a review of actual water use for the period May 10 – Aug. 11, 2016 for Coolidge Phase 1 it was determined that the per unit water use was 103 gpp/day. 50 gpp/day was assumed by Tata and Howard. Please revise your assumed usage calculations.
- Please plan to retest the fire flow near the proposed building site as the total water ban will be lifted on Oct. 30th. Please provide calculations for fire flow.
- Please provide calculations for increased velocity during ADD and MDD.
- Please provide specification sheets for the low flow fixtures that will be used in the development.

The District does not have an unlimited water supply and every large project brings us closer to limits imposed by the State. The problem is exacerbated by the conditions, such as the current drought, which further tax the Water District's flexibility and resources. Thus, the Water District requests that the following mitigation measures be required if this project is approved:

1. Although the irrigation water may come from on-site wells, it is nonetheless within the same watershed, and therefore should be subject to the same outdoor watering restrictions implemented by the Water District.
2. Water reuse should be required for all feasible purposes.
3. Landscaping vegetation should be drought resistance species and lawn area requiring irrigation should be minimized.
4. The waste water treatment should utilize Best Available Technology.

If you have any questions regarding this matter, kindly contact me at (978) 443-6602.

Sincerely,

Rebecca McEnroe, P.E.
Superintendent

Cc: Town of Sudbury Zoning Board of Appels
Megan Donoghue, Director of Planning, Town of Sudbury

Phone: (978) 443-6602 Fax: (978) 443-9587 199 Raymond Road • P.O. Box 111 • Sudbury, MA 01776 sudburywater.com

Tata & Howard, Inc.
Fire Flow Test

Community:Sudbury, MA

Client: Covenant Corparation

	Time:	Time
Date: 11/9/16	**9:18 AM**	

Weather: sunny **Inspector: AGC/SHD**

Tank level #1: 42 ft

Wells: on with unknown flow

Hydrant Location:	**Test No.** 1	**Test No.**
Flowing Hydrant:	189 Boston Post Rd	
Residual Hydrant:	209 Boston Post Rd	
Flowing Hydrant:		
Flow Opening (In.)	2.5	
No. Butts Flowing	1	
Static Pressure	102	
Pitot Reading		
Hydrant Coefficient	0.9	
Flow (GPM) (Qf)	1350	
Residual Hydrant:		
Static Pressure (Hs)	105	
Resid. Pressure (Hf)	96	

Test No. 1 Desired Residual Pressure: 20 PSI

Q = 4539 GPM @ 20 PSI

Calculated By: AGC

Checked By: SHD

TATA & HOWARD

JOB Coolidge at Sudbury

SHEET NO. 1 OF

CALCULATED BY SAO DATE

CHECKED BY DATE

SCALE

Velocity Increase

Average Day Demand

Pipe Diameter = 8-inches = 0.67 feet

Total Flow = 2.4 gpm

Flow from one direction = 1.2 gpm

Convert 1.2 gpm to cubic feet per second

$$\frac{1.2\ gal}{1\ min} \times \frac{1\ min}{60\ sec} \times \frac{0.1337\ ft^3}{1\ gal} = 0.0027\ \frac{ft^3}{sec}$$

Area of Pipe

$$\pi r^2 = \pi (0.33)^2 = 0.34\ ft^2$$

Velocity

$$\frac{0.0027\ \frac{ft^3}{sec}}{0.34\ ft^2} = 0.008\ ft/sec$$

Maximum Day Demand

Total Flow = 4.8 gpm

Flow from one direction: 2.4 gpm

Convert to cubic feet per second

$$\frac{2.4\ gal}{1\ min} \times \frac{1\ min}{60\ sec} \times \frac{0.1337\ ft^3}{1\ gal} = 0.0053\ \frac{ft^3}{sec}$$

Velocity

$$\frac{0.0053\ \frac{ft^3}{sec}}{0.34\ ft^2} = 0.016\ ft/sec$$

EcoLogic™ Niagara Flapperless® Toilet

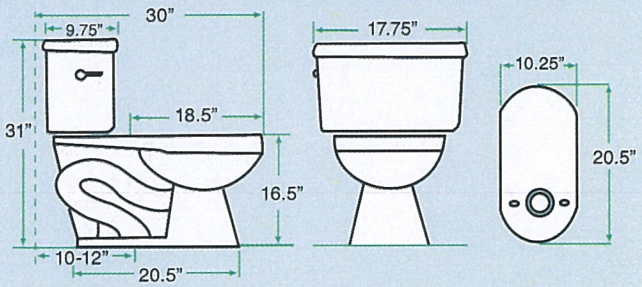
High-Efficiency
1.28 GPF (4.8 LPF)

The EcoLogic™ Niagara Flapperless® toilet features revolutionary tip-bucket technology, creating a high-performance flush at only 1.28 GPF—providing water and utility bill savings without sacrificing performance.

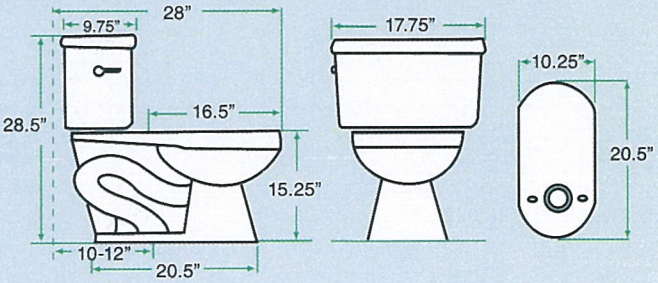
- 1.28 gallon per flush (4.8 LPF)
- 40psi inlet water pressure with fill time at approximately 28 seconds
- Flapperless tank with Fluidmaster® fill valve
- Gravity flush with tip-bucket technology
- *MaP Score: 1,000g (round) 800g (elongated)
- Sweat-free tank
- Fully glazed trapway, 2" (51 mm)
- Adjustable 10–12" rough-in
- Floor mounted, floor outlet
- Opposable handle positioning
- Elongated model meets ADA standard, 17" height with seat
- Oversized tank and footprint to cover unsightly wall or floor exposure
- Maintenance-free, leak-free, no double-flushing
- 10-year limited warranty on Niagara parts

Certification: ASME A112.19.2 / CSA B45.1
WaterSense Certified

N2225E/N2225T Elongated Bowl Specs



N2225R/N2225T Round Bowl Specs



WaterSense Meets EPA Criteria
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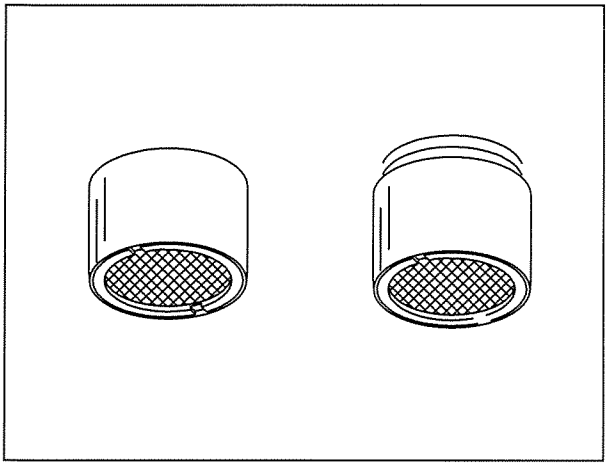
REV.01/12

AERATORS & OUTLETS
1.5 GPM PRESSURE COMPENSATING



M922880-0020A & M922881-0020A Shown

FEATURES & BENIFITS:

- **Less Water:** 1.5 gpm maximum flow rate delivers 32% water savings (when compared to standard 2.2 gpm).
- **Superior Performance:** Pressure compensation provides a constant flow throughout the entire pressure range.
- **Lead Free:** Complies with CA AB1953 and VT S152

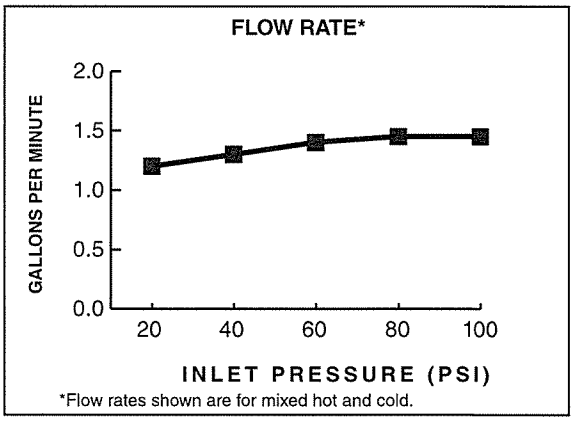
MODEL NUMBER:

❑ **1.5 gpm / 5.7 L/min Pressure Compensating Aerators**
- M922881-0020A: 15/16" Male
- M922880-0020A: 55/64" Female

❑ **1.5 gpm / 5.7 L/min Pressure Compensating Vandal-Resistant Aerators (with Key) - Used in V15 modifications**
- M922887-0020A: 15/16" Male
- M922888-0020A: 55/64" Female

❑ **1.5 gpm / 5.7 L/min Pressure Compensating Non-Aerated Laminar Flow Outlet - Used in L15 modifications**
- M922883-0020A: 15/16" Male
- M922884-0020A: 55/64" Female

❑ **1.5 gpm / 5.7 L/min Pressure Compensating Vandal-Resistant Non-Aerated Laminar Flow Outlet (with Key) - Used in LV15 modifications**
- M922885-0020A: 15/16" Male
- M922886-0020A: 55/64" Female



*Flow rates shown are for mixed hot and cold.

TATA & HOWARD

JOB Coolidge at Sudbury Phase 2
SHEET NO. 1 OF 1
CALCULATED BY AGC DATE
CHECKED BY SHO DATE
SCALE

Coolidge At Sudbury Phase 2

Phase 1 (Actual)

Bill Date	Start Service	End Service	Gallons used
11/30/15	8/11/15	11/9/15	312,000
2/29/16	11/9/15	2/9/16	230,000
5/27/16	2/9/16	5/10/16	231,000
8/31/16	5/10/16	8/12/16	480,000

1,253,000 gallons/year

# of days in bills = 367 → $\frac{1{,}253{,}000 \text{ gal}}{367 \text{ days}} = 3{,}414.17 \text{ gal/day}$ (Phase 1)

units in Phase 1 = 64 → $\frac{3{,}414.17 \text{ gal/day}}{64 \text{ units}} \approx 54 \frac{\text{gal/day}}{\text{unit}}$

Phase 2 Projection

units → 56
multiplier → 1.10

$54 \frac{\text{gal/day}}{\text{unit}} \cdot 56 \text{ units} \cdot 1.1 \approx 3{,}326 \text{ gal/day}$ (round ↓) $\approx 3{,}330$ gal/day (56-unit)

Maximum Day

multiplier → 2.0

MDD → 6,660 gal/day from → $3{,}330 \text{ gal/day} \cdot 2.0 = 6{,}660 \frac{\text{gal}}{\text{day}}$