ASSOCIATED FIRE PROTECTION, INC
Post Office Box 28022 – Raleigh, NC 27611
O: 919-553-4021 | F: 919-553-2169 | www.afp-nc.com

## Fire Flow Test Report

# RockSolid Veneers

**Test Performed:**
**January 30, 2024**

**Test Location:**
**1267 Stewart Road**
**Dunn, NC**

# FIRE HYDRANT FLOW TEST RESULTS

**TEST LOCATION**
Address: 1267 Stewart Road, Angier
Proposed Tap Location: _____
Requested Flow Location: nearest hydrant to the proposed point of connection

**APPLICANT**
Name: RockSolid Veneers
Address: PO Box 817, Benson, NC 27504
Contact Person: Monte Ballard Phone: 910.759.9593 Fax: _____

**TESTING AGENT**
Firm Name: Associated Fire Protection, Inc.
Address: PO Box 28022, Raleigh, North Carolina 27611-28022
Phone: (919) 553-4021 Fax: (919) 553-2169

**SYSTEM ANALYSIS**
Main Size: 6" Elevation of Test Location: 238' +/-
Nearest Elevated Tank: EC1 Time of Test: 10:50 AM
Tank Elevation: 455.6'(27.6') Pressure Zone: 465'(37')

Theoretical Pressure: 94.2 psi
Calculated by: Drew King Witnessed by: David Allen

## RESULTS

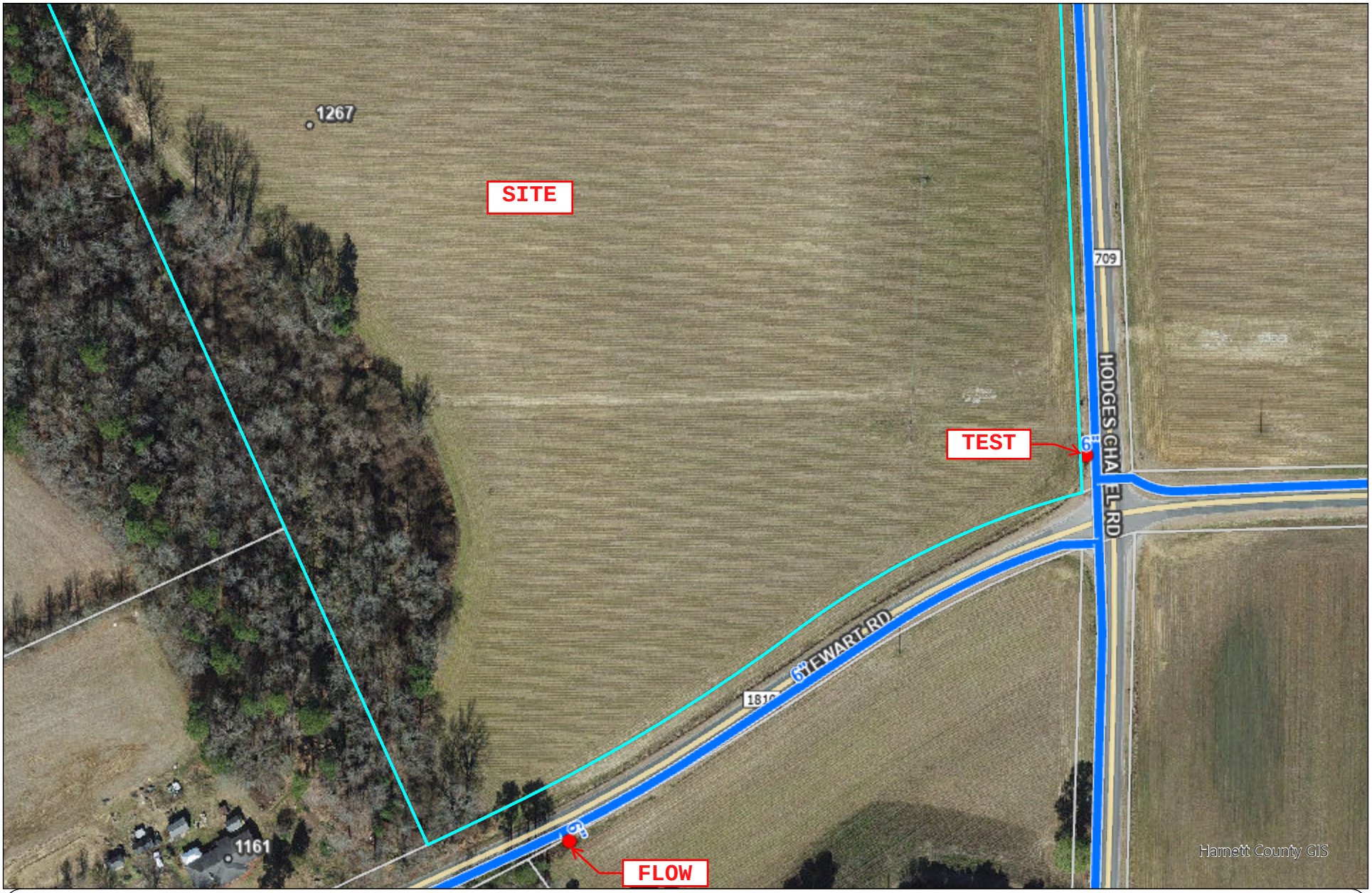
Static Pressure: 86 psi 2" Pitotless Nozzle Reading: 14 psi
Residual Pressure: 39 psi Volume: 617 gpm
Disclaimer: These results are an instantaneous snap-shot of the system. It is recommended that the designer allow adequate safety to include low tank level.
Comments: Flowed ( 1 ) 2-1/2" Hose Monster(s) with 2" Pitotless Nozzle(s). (2" Pitotless Nozzle C = 1.38)

Completed by: Drew King

Date: 1/30/2024

# 1267 Stewart Road, Dunn

NOT FOR LEGAL USE




Harnett COUNTY NORTH CAROLINA

GIS/E-911 Addressing

*January 30, 2024*

N
W E
S

0 80 160 320 Feet

# Hydrant Flow Test Report

**Test Date** 1/30/2024 **Test Time** 10:50 AM

## Location

RockSolid Veneers
1267 Stewart Road
Dunn, NC

## Tested by

Associated Fire Protection
P.O. Box 28022
Raleigh, NC 27611
DKing@afp-nc.com
919.906.5236

## Notes

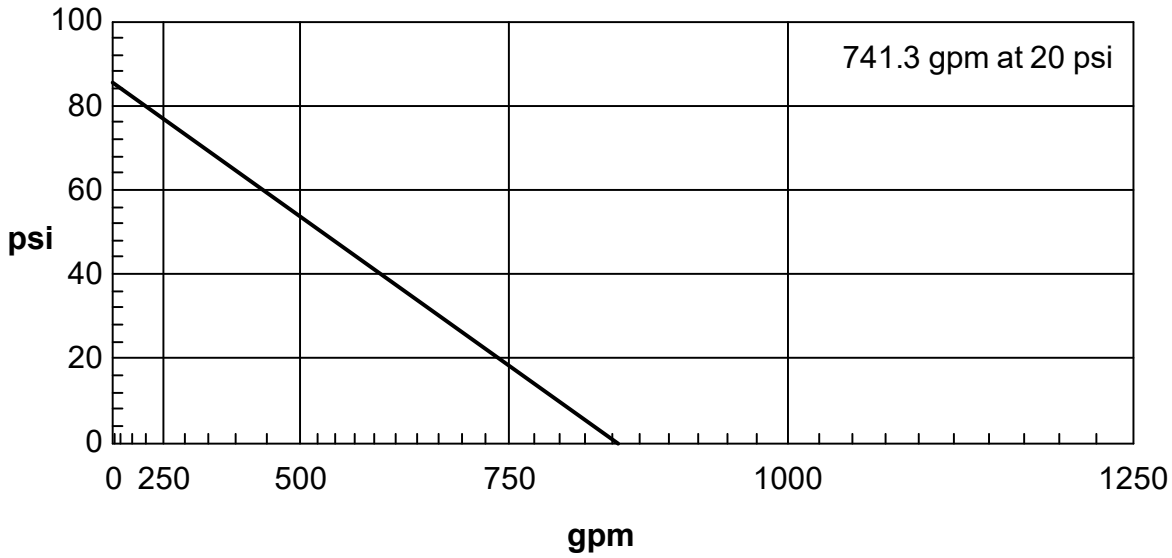
## Read Hydrant

86 psi **static pressure**
39 psi **residual pressure**
238 ft **hydrant elevation**

## Flow Hydrant(s)

| Outlet | Elev | Size | C | Pitot Pressure | Flow |
|---|---|---|---|---|---|
| #1 | 236 | 2 | 1.38 | 14 | 617 gpm |

## Flow Graph



# 2" PITOTLESS NOZZLE™

## PN2THD

## FLOW CHART

| 10 - 40 PSI | 2 1/2" Hose Monster Model II | Open Atmosphere | | 41 - 70 PSI | 2 1/2" Hose Monster Model II | Open Atmosphere | | | Key Flow Test Points | 2 1/2" Hose Monster Model II | Open Atmosphere | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSI | GPM | GPM | | PSI | GPM | GPM | | | GPM | PSI | PSI | |
| 10 | 521 | 529 | | 41 | 1055 | 1071 | | | 500 | 9.5 | 9.1 | |
| 11 | 547 | 555 | | 42 | 1068 | 1084 | | | 562.5 | 11.7 | 11.3 | |
| 12 | 571 | 579 | | 43 | 1081 | 1096 | | | 750 | 20.7 | 20.1 | |
| 13 | 594 | 603 | | 44 | 1093 | 1109 | | | 1000 | 36.8 | 35.8 | |
| 14 | 617 | 626 | | 45 | 1106 | 1122 | | | 1125 | 46.6 | 45.3 | |
| 15 | 638 | 648 | | 46 | 1118 | 1134 | | | 1500 | 82.8 | 80.5 | |
| 16 | 659 | 669 | | 47 | 1130 | 1146 | | | | | | |
| 17 | 679 | 689 | | 48 | 1142 | 1158 | | | | | | |
| 18 | 699 | 709 | | 49 | 1154 | 1170 | | | | | | |
| 19 | 718 | 729 | | 50 | 1165 | 1182 | | | | | | |
| 20 | 737 | 748 | | 51 | 1177 | 1194 | | | | | | |
| 21 | 755 | 766 | | 52 | 1188 | 1206 | | | | | | |
| 22 | 773 | 784 | | 53 | 1200 | 1217 | | | | | | |
| 23 | 790 | 802 | | 54 | 1211 | 1229 | | | | | | |
| 24 | 807 | 819 | | 55 | 1222 | 1240 | | | | | | |
| 25 | 824 | 836 | | 56 | 1233 | 1251 | | | | | | |
| 26 | 840 | 853 | | 57 | 1244 | 1262 | | | | | | |
| 27 | 856 | 869 | | 58 | 1255 | 1273 | | | | | | |
| 28 | 872 | 885 | | 59 | 1266 | 1284 | | | | | | |
| 29 | 887 | 900 | | 60 | 1277 | 1295 | | | | | | |
| 30 | 903 | 916 | | 61 | 1287 | 1306 | | | | | | |
| 31 | 918 | 931 | | 62 | 1298 | 1317 | | | | | | |
| 32 | 932 | 946 | | 63 | 1308 | 1327 | | | | | | |
| 33 | 947 | 960 | | 64 | 1318 | 1338 | | | | | | |
| 34 | 961 | 975 | | 65 | 1329 | 1348 | | | | | | |
| 35 | 975 | 989 | | 66 | 1339 | 1358 | | | | | | |
| 36 | 989 | 1003 | | 67 | 1349 | 1369 | | | | | | |
| 37 | 1002 | 1017 | | 68 | 1359 | 1379 | | | | | | |
| 38 | 1016 | 1031 | | 69 | 1369 | 1389 | | | | | | |
| 39 | 1029 | 1044 | | 70 | 1379 | 1399 | | | | | | |
| 40 | 1042 | 1057 | | | | | | | | | | |

**The readings on this chart are based on which device the Pitotless Nozzle is connected to.**

It is the user's responsibility to verify that the correct chart and column is being used.

- **2 ½" Hose Monster Model II or Flusher with flow splitter (HM2H, HM2HF).** Use this column if the Pitotless Nozzle is connected to the 2 ½" Hose Monster or Flusher. The built-in pitot or flow splitter must be installed for accuracy. If you do not have the built-in pitot or flow splitter, please contact us.
- **Open Atmosphere.** Use this column when the Pitotless Nozzle is connected directly to a test header or hydrant flowing openly to atmosphere.

This chart is FM Approved for flow rate accuracy. Please call us or instruct the Authority Having Jurisdiction to call us if there are any questions. Additional copies of flow charts are available at:
www.hosemonster.com/literature.html


FM APPROVED

The HOSE MONSTER COMPANY
Division of Hydro Flow Products, Inc.

Updated Jun. 2015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**www.HoseMonster.com**



**U. S. Patent # 6,874,375**

# Calculating Flow-rates

The flow charts we provide with the Pitotless Nozzle™, Hose Monster® and Nozzle Inserts are correct and should be referred to first. Our flow charts are calculated using K-Factors derived from testing performed at FM Approvals. It is common for third-party software to use the pitot formula to compute flow-rate. The 2½" Hose Monster uses a pitot to measure velocity pressure. The Pitotless Nozzle and 4" and 4½" Hose Monsters do not use a pitot, and the pitot formula has to be tricked into calculating correct flow-rates. Entering the coefficients into a program that uses orifice diameter, coefficient and velocity pressure should give relatively accurate flow-rates. Check results against our flow charts.

Here are the equations used for calculating flow-rates and predicting flow-rates. Use the orifice diameter, coefficient or K-factor found on the next page.

## K-factor Formula

**Computes a flow-rate in GPM given a psi and a K-factor of the flow device.**

$$Q = \sqrt{P} \times K$$

Q = flow-rate in GPM, P = velocity pressure in psi, K = K-factor of flow device

## Pitot Formula

**Computes a flow-rate in GPM given a psi and coefficient of the flow device.**

$$Q = 29.84 \times \sqrt{P} \times D^2 \times C$$

Q = flow-rate in GPM, P = velocity pressure in psi, D = orifice diameter in inches
C = coefficient of flow device

## Equation for Determining Rated Capacity

**Computes the flow-rate available at a specified residual pressure (a.k.a. Rated Capacity).**

The example below enables you to find the predicted flow-rate at 20 psi residual pressure.

$$Q_R = Q_F \times (H_R^{0.54} / H_F^{0.54})$$

$Q_R$ = Flow-rate predicted at the desired residual pressure in GPM

$Q_F$ = Total test flow-rate measured during test in GPM
(GPM measured from Hose Monster or Pitotless Nozzle)

$H_R$ = Pressure drop from static pressure to desired residual pressure
(Static – 20 psi [if 20 psi is the desired residual pressure])

$H_F$ = Actual pressure drop measured during the test (Static – Actual Residual)

*(Source: NFPA 291, 2010)*

# Conversion Factors

**Here are some conversion factors for switching between US and metric units:**

### Flow-rate:

US Gallons per Minute x 3.785 = Liters per Minute
Liters per Minute x 0.264 = US Gallons per Minute

US Gallons per Minute x 0.1337 = Cubic Feet per Minute
Cubic Feet per Minute x 7.481 = US Gallons per Minute

### Volume:

US Gallons x 3.785 = Liters
Liters x 0.264 = US Gallons

US Gallons x 0.8327 = Imperial Gallons
Imperial Gallons x 1.201 = US Gallons

Cubic Feet x 7.48051945 = US Gallons
US Gallons x 0.1337 = Cubic Feet

### Pressure:

psi x 0.0689 = Bars
Bars x 14.5038 = psi

psi x 6894.757 = Pascals
Pascals x 0.000145 = psi

Bars x 100,000 = Pascals
Pascals x 0.00001 = Bars

### Weight of Water:

US Gallons of Water x 8.3454 = Pounds
Cubic Feet of Water x 62.42796 = Pounds

### Length:

Meters x 3.2808 = Feet
Feet x 0.3048 = Meters

# Coefficient and K-Factor Table for Various Flow Devices

*last update: 2/14/2012*

## Pitotless Nozzle™

| Device | K-factor | Coefficient | Orifice Diameter | psi Range | Flow Range (GPM) |
|---|---|---|---|---|---|
| 2" Pitotless Nozzle + Little Hose Monster™ | 156.0 | 1.31 | 2" | 10–70 | 490–1300 |
| 2" Pitotless Nozzle + 2½" Hose Monster Steel | 164.8 | 1.38 | 2" | 10–80 | 520–1380 |
| 2" Pitotless Nozzle + Open Atmosphere | 167.2 | 1.40 | 2" | 10–70 | 530–1400 |
| 1¾" Pitotless Nozzle + Little Hose Monster | 104.7 | 1.15 | 1.75" | 10–90 | 330–1000 |
| 1¾" Pitotless Nozzle + 2½" Hose Monster Steel | 106.6 | 1.17 | 1.75" | 10–90 | 340–1010 |
| 1¾" Pitotless Nozzle + Open Atmosphere | 109.7 | 1.20 | 1.75" | 10–90 | 350–1040 |
| 1⅛" Pitotless Nozzle + Little Hose Monster | 37.2 | 0.98 | 1.125" | 5–90 | 80–350 |
| 1⅛" Pitotless Nozzle + 2½" Hose Monster Steel | 37.4 | 0.99 | 1.125" | 5–90 | 80–350 |
| 1⅛" Pitotless Nozzle + Open Atmosphere | 37.0 | 0.98 | 1.125" | 5–90 | 80–350 |
| 1" Pitotless Nozzle + Little Hose Monster | 27.2 | 0.91 | 1" | 3–90 | 50–260 |
| 1" Pitotless Nozzle + 2½" Hose Monster Steel | 27.6 | 0.93 | 1" | 3–90 | 50–260 |
| 1" Pitotless Nozzle + Open Atmosphere | 27.7 | 0.93 | 1" | 3–90 | 50–260 |

## In-Line Pitotless Nozzle™

| Device | K-factor | Coefficient | Orifice Diameter | psi Range | Flow Range (GPM) |
|---|---|---|---|---|---|
| 2" In-line Pitotless Nozzle | 165.3 | 1.38 | 2" | 10–75 | 530–1430 |
| 1¾" In-line Pitotless Nozzle | 109.9 | 1.20 | 1.75" | 5–80 | 250–980 |
| 1⅛" In-line Pitotless Nozzle | 38.4 | 1.02 | 1.125" | 5–70 | 90–320 |

## BigBoy Hose Monster™

| Device | K-factor | Coefficient | Orifice Diameter | psi Range | Flow Range (GPM) |
|---|---|---|---|---|---|
| 4 to 10 psi (BigBoy Hose Monster) | 382.9 | 1.38 | 3.05" | 4–10 | 766–1211 |
| 11 to 36 psi (BigBoy Hose Monster) | 376.0 | 1.35 | 3.05" | 11–36 | 1247–2256 |
| 37 to 53 psi (BigBoy Hose Monster) | 372.0 | 1.34 | 3.05" | 37–53 | 2263–2708 |

*Note: Due to the shape and size of the BigBoy Pitotless Nozzle, the BigBoy Hose Monster uses three different k-factors over its operating range.*

## 2½" Hose Monster®

| Device | K-factor | Coefficient | Orifice Diameter | psi Range | Flow Range (GPM) |
|---|---|---|---|---|---|
| 2½" Hose Monster | 168.67 | 0.906 | 2.5" | 10–75 | 530–1460 |
| 1¾" Nozzle Insert | 89.04 | 0.975 | 1.75" | 10–75 | 280–770 |
| 1⅛" Nozzle Insert | 37.36 | 0.99 | 1.125" | 10–75 | 120–320 |

## 4" and 4½" Hose Monster®

| Device | K-factor | Coefficient | Orifice Diameter | psi Range | Flow Range (GPM) |
|---|---|---|---|---|---|
| 4½" Hose Monster | 331.07 | 0.548 | 4.5" | 10–75 | 1050–2870 |
| 4" Hose Monster | 339.65 | 0.712 | 4" | 10–75 | 1070–2940 |

## Using Software

Use the table below if you are using software that requires the coefficient input to be less than '1.0'. Notice that the orifice diameter must be changed from its true diameter in order to accommodate the lower coefficient. This is necessary only for the 2" Pitotless Nozzle and the ¾" Pitotless Nozzle.

| Device | Coefficient | Orifice Diameter |
|---|---|---|
| 2" Pitotless Nozzle + Little Hose Monster | 0.99 | 2.30" |
| 2" Pitotless Nozzle + 2½" Hose Monster Steel | 0.99 | 2.36" |
| 2" Pitotless Nozzle + Open Atmosphere | 0.99 | 2.38" |
| 1¾" Pitotless Nozzle + Little Hose Monster | 0.99 | 1.88" |
| 1¾" Pitotless Nozzle + 2½" Hose Monster Steel | 0.99 | 1.90" |
| 1¾" Pitotless Nozzle + Open Atmosphere | 0.99 | 1.93" |

*Note: If your software uses the Theoretical Discharge Formula, found in NFPA 291, 4.7.3, the coefficient of discharge can be used to produce flow rates that will match our flow charts.*

## A hand-held pitot directly at a hydrant outlet

| Outlet Type | Coefficient |
|---|---|
| Outlet smooth and rounded | 0.9 |
| Outlet square and sharp | 0.8 |
| Outlet square and projecting into barrel | 0.7 |
| If a stream straightener is used | 0.95 |

## Classifying and Marking of Hydrants

| Rated Capacity at 20 psi | Class | Marking Color of Hydrant Tops and Nozzles |
|---|---|---|
| ≥1500 GPM | AA | Light Blue |
| 1000–1499 GPM | A | Green |
| 500–999 GPM | B | Orange |
| ≤499 GPM | C | Red |

*The above are the NFPA hydrant classifications and color markings for various rated capacities. Source: NFPA 291, 5.1, 2010.*

# 1267 Stewart Road, Dunn flow test - Tuesday, January 30, 2024