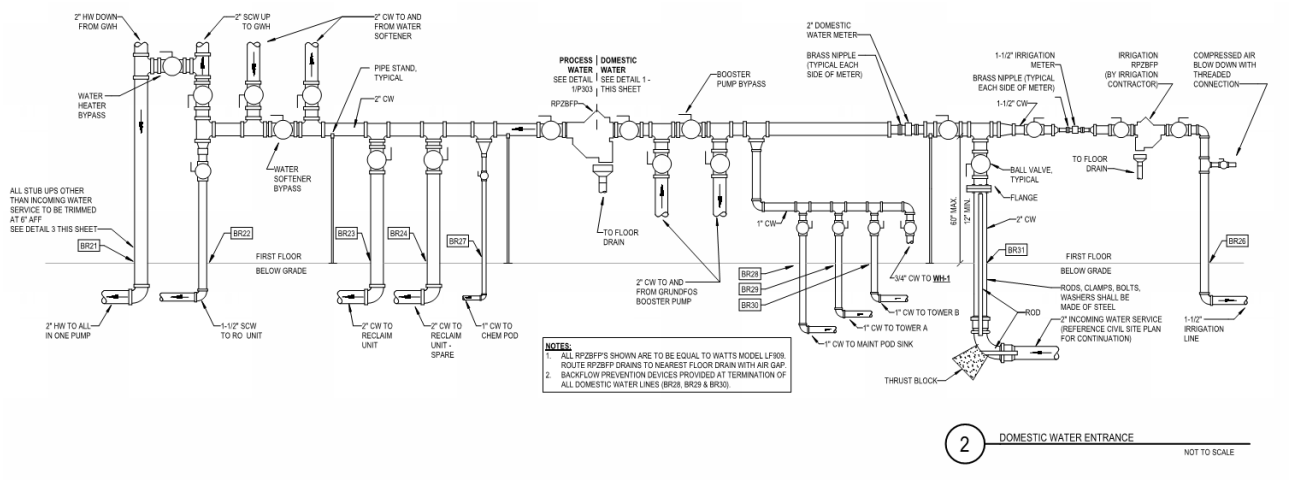
Tommy Car Wash Systems | 581 Ottawa Ave. | Holland, MI 49423 | tommycarwash.com

Tommy Car Wash Systems – Water Usage and Discharge Report

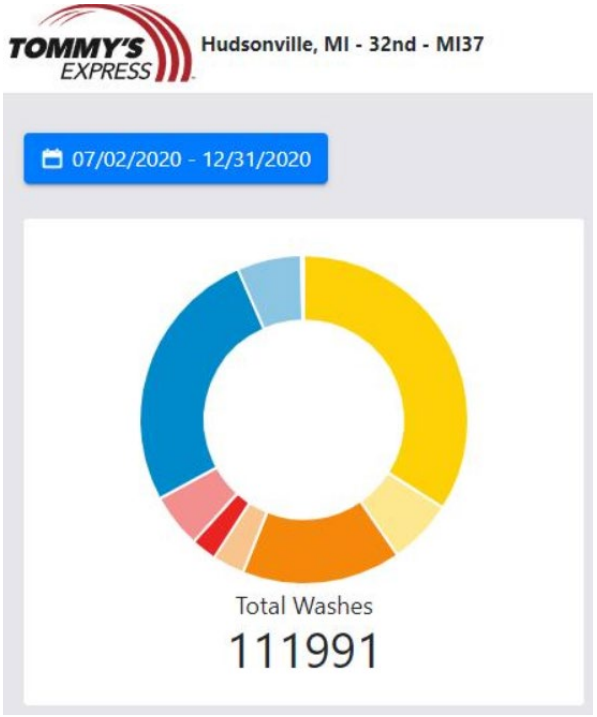
The following information is based on a study conducted at a standard 130' Tommy Express facility over the course of a six-month period from 7/1/20 to 12/31/20 at our Tommy's Express Hudsonville, MI location. This site uses the typical reverse osmosis water purification system and water reclamation system (reclaim) used in all our sites. The belt speed during this study was set to 72Hz which has the capacity to process 223 vehicles per hour. The test site is a "busier" site with high process speed.

Water used

The average gallons used at this site per month is 336,040. This information was recorded directly from the process water flow meter consistently over the six-month period from July 1 through December 31 of 2020. Our design isolates the irrigation system from car wash process water. Domestic water is included in the flow measurements.



The total cars washed



This report is directly from our site point of sale system on site. While showing several different wash packages, it projects the typical averages seen at other sites over the same period.

Reverse Osmosis & RO Reject Water Usage

City water is fed into our reverse osmosis system to remove contaminants and provide spot-free water with very low Total Dissolved Solids (TDS). This water is used for the final Spot-Free Rinse and is stored in a tank. Reject water from the RO system is used in the High-Pressure Rinse earlier in the Tommy Tunnel. This water is also stored in a tank.

Our per vehicle application volume factors these applications into total.

Reclaim Water Usage

The reclaim system in the Tommy Tunnel collects, treats, and reuses water that enters the pit below the tunnel. This water is reused in the Tommy Tunnel for Pre-Blasters, High Pressure Wheel Blasters, and Conveyor Flush. The Conveyor Flush reclaim water goes right back into the pit and reclaim system so is not included. The following table outlines reclaim usages in the tunnel with 13.81-gallons of reclaim water used per vehicle. The total number was verified with a flow meter.

			PLC Timing Information					
Function	Flow Rate (GPM)	START Front	STOP Rear	Application Length (inches)	Application Time (seconds)	Water Amount Used (Gallons)		
Pre-Blasters	24				10.9	4.36		
High Pressure Pump 1	15	29	30	281	19.2	4.81		
High Pressure Pump 2	15	24	23	271	18.6	4.64		
						13.81	**= Total Reclaim Water**	

Attrition – Carryout and Evaporation

Studies* have been done nationally on what the carwash industry calls carryout and evaporation (C&E). The consistent C&E average is 20% nationwide and is not shown to be environmentally biased. This factor is applied to the total water usage per vehicle.

Conclusions

Based on the previous data, the **average city water usage** per vehicle is **18 gallons per vehicle = 2,016,239 gallons / 111,991 vehicles**. This includes RO/Reject water due to these functions feeding from prefilled tanks which are filled in the first day of operation.

Additionally, we use 13.81 gallons per vehicle of **reclaim water**. This brings our **total water per vehicle** to **31.81 gallons per vehicle = 18 city water + 13.81 reclaim.** Reclaim water is used for 43% of our car washing.

Reclaim water is constantly in rotation in our system with tanks filled in first day of operation. The city water usage is higher than the reclaim so it is appropriate to conclude the city water is a proper pass-through volume per car less the effect of attrition. With attrition (C&E) applied to total water volume used per vehicle, the **reclaimed volume per vehicle** is then **25.45 gallons per vehicle = 18 city + 13.81 reclaim x 0.80 percent.** 13.81 gallons of the reclaimed water refills the tanks which leaves **total discharge per vehicle** at **11.59 gallons per vehicle = 24.45 reclaimed – 13.81 reclaim replaced.**

Summary

City water used per vehicle = **18 gallons**

Discharge water per vehicle **= 11.59 gallons**

*Brown, Chris. 2018. Water Use, Evaporation and Carryout – ICA 2018