

**GC&P Development, LLC**

**Sanitary Sewage Flow and Water Demand Projections**

**Wheeling, Ohio County, WV**

**October 2, 2019**

Daily water usages have been taken from guidelines provided by WV DEP 47CSR31, except that domestic flows were reduced from DEP's 210 gpd to the Health Department's 150 gpd.

The Thrasher Group, Inc. (TTG) has researched, and have available, information on approximate restaurant seats, hotel rooms, bowling lanes, theater seats, and fitness members per square foot of building area. TTG is not familiar with what the institutional building will be used for but note that the parking spaces allotted for them is the same as for retail. We have used the same water usage for institutional buildings and the grocery store as for retail, which is 15 gpd (gallons per day) per 100 sq ft of building area.

Use and Water Usage Calculations	Water Usage
Bldg. No. 1 (Family Restaurant) 5,000 sq ft/12 sq ft per seat X 30 gpd per seat	12,500 gpd
Bldg. No. 2 (Hotel) 62,400 sq ft/330 sq ft per room X 80 gpd per room	15,125 gpd
Bldg. Nos. 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 16, 17, 18, 22, 23 (Retail, Institutional, and Grocery) 649,450 sq ft/100 sq ft X 15 gpd per 100 sq ft	97,415 gpd.
Bldg. Nos. 19, 20, 21 (Restaurant and Coffee Shop) 9,800 sq ft/12 sq ft per seat X 30 gpd per seat	24,500 gpd.
Bldg. No. 8. (Fitness Center and Bowling Alley) 21,500 sq ft. Break out 15 bowling lanes at 1000 sq ft per lane X 75 gpd per lane	1,125 gpd

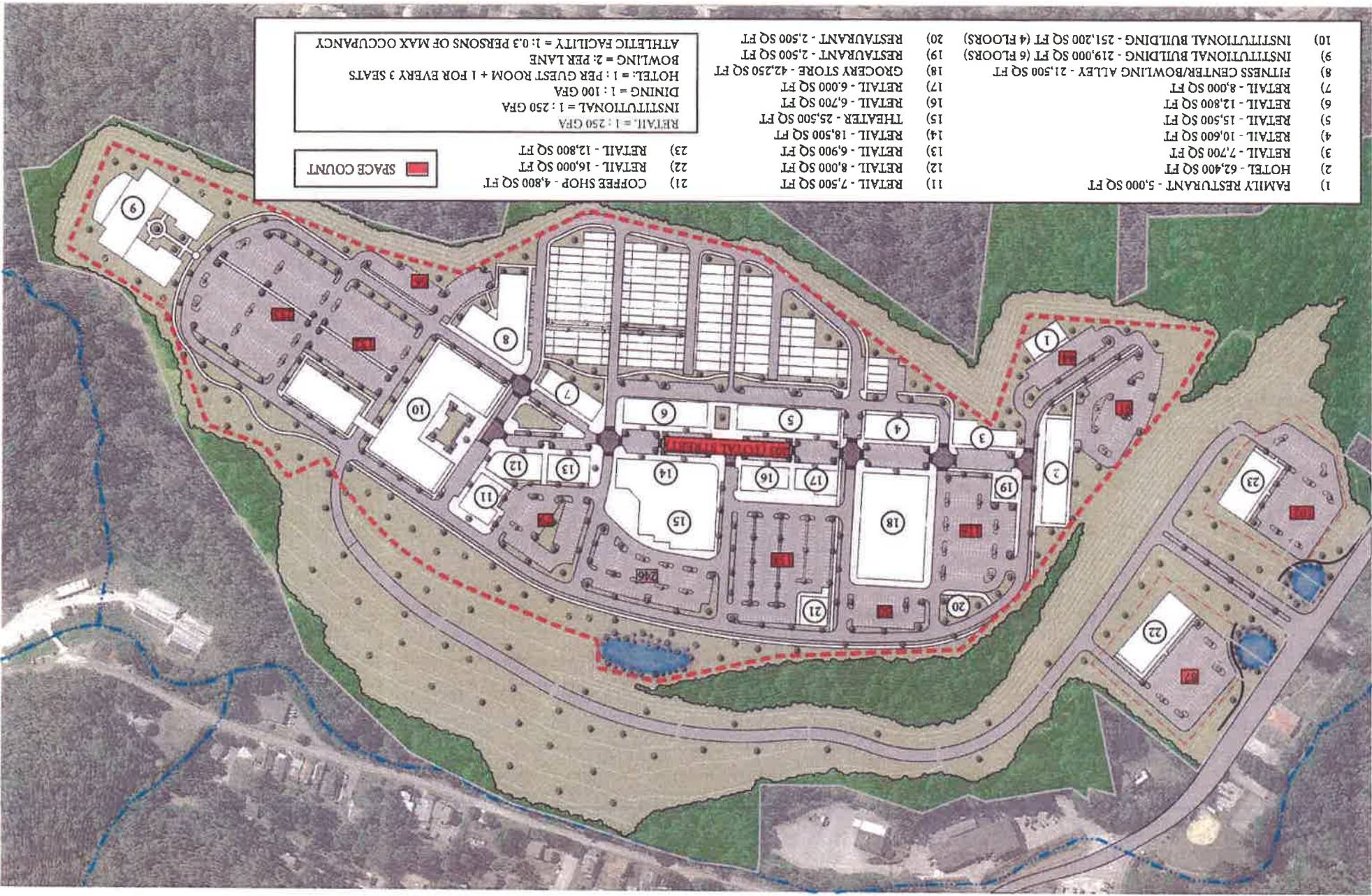


6,500 sq ft for fitness center/10 sq ft per member = 650 members X 7 gpd per member	4,550 gpd
Bldg. No. 15. (Theater) 25,500 sq ft/9 sq ft per seat = 2,800 seats. Seem too high, use 1,400 seats at 2 gpd per seat	2,800 gpd.
(Townhomes) 88 each two bedroom at 150 gpd	13,200 gpd
<b>Total Water Usage</b>	<b>171,215 gpd</b>

Summary:

Total Water Use = **171,215 gpd**. Average flow 119 gpm (gallons per minute) X 1.75 = **208 gpm** peak flow.

Estimated sewer flow using 210 gpd for residential = **176,495 gpd**.



- 1) FAMILY RESTURANT - 5,000 SQ FT
- 2) HOTEL - 62,400 SQ FT
- 3) RETAIL - 7,700 SQ FT
- 4) RETAIL - 10,600 SQ FT
- 5) RETAIL - 15,500 SQ FT
- 6) RETAIL - 12,800 SQ FT
- 7) RETAIL - 8,000 SQ FT
- 8) FITNESS CENTER/BOWLING ALLEY - 21,500 SQ FT
- 9) INSTITUTIONAL BUILDING - 219,000 SQ FT (6 FLOORS)
- 10) INSTITUTIONAL BUILDING - 251,200 SQ FT (4 FLOORS)

- 11) RETAIL - 7,500 SQ FT
- 12) RETAIL - 8,000 SQ FT
- 13) RETAIL - 6,900 SQ FT
- 14) RETAIL - 18,500 SQ FT
- 15) THEATER - 25,500 SQ FT
- 16) RETAIL - 6,700 SQ FT
- 17) RETAIL - 6,000 SQ FT
- 18) GROCERY STORE - 42,250 SQ FT
- 19) RESTAURANT - 2,500 SQ FT
- 20) RESTAURANT - 2,500 SQ FT

- 21) COFFEE SHOP - 4,800 SQ FT
- 22) RETAIL - 16,000 SQ FT
- 23) RETAIL - 12,800 SQ FT

RETAIL = 1 : 250 GFA  
 INSTITUTIONAL = 1 : 250 GFA  
 DINING = 1 : 100 GFA  
 HOTEL = 1 : PER GUEST ROOM + 1 FOR EVERY 3 SEATS  
 BOWLING = 2 : PER LANE  
 ATHLETIC FACILITY = 1 : 0.3 PERSONS OF MAX OCCUPANCY

■ SPACE COUNT