

DEVELOPMENT SEWAGE FLOW OFFSET MITIGATION PROGRAM

The Offset Mitigation Program was established to aid in protecting the health and safety of our community and environment by not allowing new development to exacerbate sewage collection system capacity issues or “MDEQ permitted” overflows of partially treated sewage by our treatment plant to the Huron River. The goal of the program is to offset sewage flow added to the sanitary sewer system by new development and to gradually gain back lost system capacity through applying a 20% System Recovery Factor as part of the requirement. Studies have shown that footing drain flows during rain events are the root cause of system capacity concerns and increase collection system flows by as much as 10-20 times the normal dry weather flow. Removing these footing drain flows has been the key method selected by developers to meet offset mitigation requirements.

Calculation Examples:

Site 1: 48-Apartment Units (each apartment is 900 sf ~ then from Table A Design Flow = 275gpd/unit)

48 units x 275 GPD/unit = 13200 GPD
Peak flow = 13200 GPD x 4 (peaking factor) x 1.2 (System Recovery Factor) = 63360 GPD
(63360 GPD x 1day/24hours x 1hour/60minutes = 44 GPM peak flow)

Using 4 GPM/home footing drain flow (Value based on sump pump flow monitoring)

Footing Drains to Disconnect = 44 GPM / 4 GPM per footing drain = 11 FDD:
This development would be required to disconnect eleven footing drains from the sanitary sewer system.

Site 2: Office Building (non-medical) 60,000 sf gross area ~ then from Table A Design Flow = 0.06 gpd/sf gr floor area

Proposed development has 60,000 sf x .06 gpd/sf = 3600 GPD
Peak flow = 3600 GPD x 4 (peaking factor) x 1.2 (System Recovery Factor) = 17280 GPD
(17280 GPD x 1day/24hours x 1hour/60minutes = 12 GPM peak flow)

Using 4 GPM/home footing drain flow (Value based on sump pump flow monitoring)

Footing Drains to Disconnect = 12 GPM / 4 GPM per footing drain = 3 FDD:
This development would be required to disconnect three footing drains from the sanitary sewer system.

TABLE A

TYPE OF FACILITY OR USE	DESIGN DRY WEATHER FLOW RATE
Single Family Residence	350 gpd
Two Family Residence	700 gpd
Apartment to a single family unit (up to 400 sq. ft)	200 gpd
Motels with kitchenettes, apartments, condos, mobile homes, trailers, coops, etc. up to 600 sq. ft. of gross floor area	200 gpd/unit
Motels with kitchenettes, apartments, condos, mobile homes, trailers, coops, etc. up to 601 – 1200 sq. ft. of gross floor area	275 gpd/unit
Motels with kitchenettes, apartments, condos, mobile homes, trailers, coops, etc. greater than 1200 sq. ft. of gross floor area	350 gpd/unit
Motel unit less than 400 sq. ft	100 gpd/unit
Motel unit greater than 400 sq. ft.	150 gpd/unit
Hospital (without laundry)	150 gpd/bed
Hospital	300 gpd/bed
University housing, rooming house, institutions	75 gpd/capita
Cafeteria (integral to an office or industrial building)	2.50 gpd/capita
Non-Medical Office space	0.06 gpd/sf gr. floor area
General Industrial Space	0.04 gpd/sf gr. floor area
Medical Arts (doctor, dentist, urgent care)	0.10 gpd/sf gr. floor area
Auditorium/Theater	5 gpd/seat
Bowling alley, tennis court	100 gpd/crt - alley + food
Nursing Home	150 gpd/bed
Church	1.50 gpd/capita
Restaurant (16 seat minimum or any size with dishwasher)	30 gpd/seat
Restaurant (fast food)	20 gpd/seat
Wet Store - Food processing	0.15 gpd/sf gr. floor area
Wet Store no food (barbershop, beauty salon, etc.)	0.10 gpd/sf gr. floor area
Dry Store (no process water discharge)	0.03 gpd/sf gr. floor area
Catering Hall	7.50 gpd/capita
Market	0.05 gpd/sf gr. floor area
Bar, Tavern, Disco	15 gpd/occupant + food
Bath House	5 gpd/occ. + 5gpd/shower
Swimming Pool	20 gpd/capita
Service Stations	300 gpd/double hose pump
Shopping Centers	0.02 gpd/sf gr. sales area
Warehouse	0.02 gpd/sf gr. area
Laundry	425 gpd/laundry machine
Schools, nursery and elementary	10 gpd/student
Schools, high and middle	20 gpd/student
Summer Camps	160 gpd/bed
Spa, Country Club	0.30 gpd.sf. gr. floor area
Industrial Facility, Large Research Facility	"Determined by Authority of
Others (car wash, etc.)	Water Utilities Director"

* **Values in Table A (above) are from or derived from the following sources:**

Michigan Guidelines for Subsurface Sewage Disposal, 1977 Schedule of Unit Assignment Factors, 1988, Oakland County Public Works (Michigan) Basis of Design, Scio Township (Michigan) Sewer Design, 1992, Los Angeles Bureau of Engineering Equivalent Residential Unit Determination, University of Central Florida Standard Handbook of Environmental Engineering, 1989, Robert Corbitt