



**A Consulting Engineer's Guide for a  
Wastewater Collection/Transmission  
System Construction License  
Application**

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*NOTE: ITALICIZED PRINT DENOTES STAFF COMMENTS*

*This document has been prepared to be a guide for the consulting engineers*

*submitting applications for licensing construction of wastewater collection and transmission systems in Broward County, Florida. It is an interpretation of, and not meant to replace, the minimal sound principles of <sup>1,2</sup>Engineering, or the provisions of the <sup>3</sup>Florida Administrative Code, Chapter 62-604, or the <sup>4</sup>Broward County Code of Ordinances, Chapter 27.*

### **State of Florida Local Program Delegation**

The State of Florida Department of Environmental Protection (DEP) has delegated Broward County Environmental Protection Department (EPD), Water Resources Division (WRD), the local wastewater collection system licensing program. By submitting the appropriate DEP forms to EPD, you will also be fulfilling the requirements for the DEP Wastewater Collection/Transmission System permits.

### **Construction Projects Which Require Wastewater Licensing**

Each non-contiguous project requires a separate application and fee pursuant to <sup>3</sup>Florida Administrative Code, Rule 62-4.050(4)(s).

Pursuant to <sup>4</sup>Chapter 27, "prior to any person constructing, extending, or altering a gravity sanitary sewer, sanitary force main, or pump station, that person shall obtain a county license". This section of the Broward County Code applies to the following:

1. Construction of a new gravity sewer, force main, and/or reclaimed lines.
2. Construction of a new sanitary sewer pumping station.
3. Increase in capacity of an existing gravity sewer and/or force main.
4. Increase in capacity of an existing pump station.
5. Relocation of an existing pump station or any portion of the sanitary system.
6. Construction and development activity resulting in increased flow to the waste water treatment plant.

### **Construction Projects Which May NOT Require Wastewater Licensing**

Any other maintenance to a collection/transmission system may be exempt from licensing requirements. Some types of modifications require no changes in any existing permits and no evaluation by the EPD Water Resources Division. Examples of these include:

1. Construction of laterals from a single establishment.
2. Rehabilitation of an existing collection/transmission system as originally designed.
3. Activities associated with routine maintenance.

**Wastewater Collection/Transmission System  
Construction License Approval Package**

This package contains the directions and forms necessary to apply for approval to construct and certify completion of a wastewater collection/transmission system in Broward County, Florida. Available at: <http://www.broward.org/dni00800.htm>, Water/Wastewater.

Construction of a sanitary sewer system without a valid DEP Permit and an EPD License for Installation of Wastewater Collection/Transmission System is a violation of <sup>3</sup>Florida Administrative Code, Chapter 62-604, and by reference, the <sup>4</sup>Broward County Code of Ordinances, Chapter 27. This may result in civil penalties and/ or fines, depending on the severity of the resulting environmental pollution.

## **Directions for Project Submission**

*All project information submittals should be in conformance with <sup>1</sup>Chapter 10 of the 10-State Standards. Insufficient information will result in time delays while the required information is provided.*

*All forms, reports, plans, design data, etc., submitted for construction licensing requires the signature and seal of a Registered Professional Engineer in the State of Florida (referred to as the Engineer of Record or Engineer). All blanks MUST be completed as thoroughly as possible before submission. All information must be typed or printed in ink. All copies of the applications must to be signed by the applicant, project engineer, owner of the sewage treatment plant, and the public utility maintaining and operating the new collection system and the receiving system. All signatures and letters of authorization must be original, as copies cannot be accepted.*

**INCOMPLETE PROJECT SUBMISSIONS WILL PROMPT RETURN OF THE APPLICATIONS BY U.S. MAIL, WITH THE DRAWINGS BEING DISCARDED.**

### **1) General Permit (Public Maintenance)**

Construction project with public maintenance and is designed to all applicable standards and does not require a Request for Information for design clarification:

- One (1) copies of Florida DEP Form #62-604.300(8)(a) Notification/ Application for Constructing a Domestic Wastewater Collection/Transmission System indicating that you are applying for a general permit.
- Two (2) copies of BCEPD Form 212-0004 with the required 8 1/2" x 11" site plan attached.
- One (1) set of engineering drawings no larger than 24" x 36" (folded to 9" x 12" maximum size), specifications, along with any design data, as prepared, signed and sealed by the Engineer.
- The total fee made payable to the Broward County Board of County Commissioners.

***The General Permit will be denied unless all minimal standards are complied with. Additional <sup>3</sup>DEP fees and/or applications are then required.***

### **2) Individual Permit (Private Maintenance)**

For a plant moratorium, dry line, no manholes at terminus, project designs other than standard, etc., or which require a Request for Information for further Staff review.

- One (1) copies of Florida DEP Form #62-604.300(8)(a) Notification/ Application for Constructing a Domestic Wastewater Collection/Transmission System indicating that you are applying for an individual permit.
- Two (2) copies of BCEPD Form 212-0004 with the required 8 1/2" x 11" site plan attached.
- One (1) set of engineering drawings no larger than 24" x 36" (folded to 9" x 12" maximum size), specifications, along with any design data, as prepared, signed and sealed by the Engineer.
- The total fee made payable to the Broward County Board of County Commissioners.

### 3) Reclaimed Water

- Two (2) copies of BCEPD Form 212-0004 with the required 8 1/2" x 11" site plan attached.
- One (1) set of engineering drawings no larger than 24" x 36" (folded to 9" x 12" maximum size), specifications, along with any design data, as prepared, signed and sealed by the Engineer.
- The total fee made payable to the Broward County Board of County Commissioners.

NOTE: FDEP requires application directly to the WPB office along with the applicable fees. A copy of the DEP approval will be required for BCDRNP approval.

### Minimum design information requirements

- 1) Gravity sewers using anything less than standard slopes or larger than 8" pipe requires a site analysis study detailing the non-standard requirements for staff consideration.
- 2) A sewage pump station requires design calculations which consider superimposed pump curves, floatation calcs, and pipe sizes.
- 3) Any new project generating .01 MGD or larger flows into existing sanitary systems will require a study proving adequate system capacities through to the WWPT.
- 4) Existing sewage pump stations which have been in service for more than five years, or are approaching built-out condition, will require an operational assessment prior to new construction licensing.
- 5) All affected sewage pump stations shall be posted with a notice indicating the name and phone number of an emergency contact and other contact information as applicable for over flow clean up of the facility. This notice shall be displayed with the minimum of 1" high block letters on the outside of the electrical panel, fence enclosure, or other conspicuous location.

#### **This is to include the following statement:**

#### **"TO REPORT POLLUTION, CALL BROWARD COUNTY EPD"**

*Should the system be owned and maintained by a private entity, an addendum must be noted on the applications, prepared and signed/sealed by the Engineer of Record, and signed by the applicant. This addendum must address the agreement with the receiving public utility, and future maintenance of the system.*

## **Certification of Completion of Construction Procedure**

Upon completion of construction, and prior to usage of the system, DEP and EPD require:

- DEP Form #62-604.300(8)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System Into Operation. Any deviation to the original construction design must be noted under item (4) Page 3 of 3.
  
- Broward County EPD Page 4 Addendum to the above form.
  
- Gravity Sewer:
  - Information submitted should include, but is not limited to: lamping reports, leakage tests, etc...
  
- Lift Station
  - Information submitted should include, but is not limited to: equipment manuals, pressure tests, lift station start-up reports, signage photo, copy of contracts, etc...
  
- One full set of "as-built" record drawings submitted for approval, signed and sealed by the Engineer of Record. EPD may inspect projects prior to certification for compliance to standards. Therefore, these documents should be submitted prior to covering trenches. However, if paving of roads, pouring of sidewalks, planting and landscaping, etc., are done prior to EPD as-built approval, it shall not relieve the licensee from the responsibility for making any corrections to the sanitary sewer system as may be required by the county.
  
- The current EPD "record drawing" review fee of \$100.00, made payable to the Broward County Board of County Commissioners. This fee is pursuant to <sup>4</sup>Broward County Code of Ordinances, Chapter 27.

*Once the system is approved for partial or final certification, a letter will be issued to the Engineer of Record, along with copies to the appropriate officials. A Certificate of Occupancy shall not be issued by the building permit authority unless the project "as-builts" have been approved by EPD, and approval letter issued. To do so is a violation of <sup>3</sup>State and <sup>4</sup>County Rules and Regulations, and may be subject to enforcement action resulting in civil penalties and/or fines to all parties.*

### **As-built Deviations**

In staff's review of as-built drawings, a deviation from design slopes of +/- 10% shall be considered. In addition, a tolerance of +/- 3/8" (.03') may be considered in manhole invert elevations where the slope deviation exceeds +/- 10%. Note that when this calculation is used, the resulting slope must be equal to or greater than the design slope. No further deviations from design slopes, regardless how slight, shall be considered.

## **Peaking Factors**

The appropriate peaking factor must be used to size all sewer systems. <sup>1</sup>Chapter 23 of the 10-State Standards serves as a good reference in determining this factor.

## **Design of Sanitary Sewer System Standards**

### **Slopes:**

Gravity sewers shall be designed at slopes not less than the minimum recommended by the <sup>1</sup>"Recommended Standards for Sewage Works," 1997 edition. Systems utilizing larger than 8" pipe require the following to be considered:

- Design calculations proving that the project flow generated requires the larger size pipe.
- Plans must show existing pipe to be of equal or larger pipe.

Following is the slope chart referenced:

<b><u>Sewer Size</u></b>	<b><u>Minimum Slope in Feet Per 100 Feet (m/100 m)</u></b>
8 inch (20 cm)	0.40
9 inch (23 cm)	0.33
10 inch (25 cm)	0.28
12 inch (30 cm)	0.22
14 inch (36 cm)	0.17
15 inch (38 cm)	0.15
16 inch (41 cm)	0.14
18 inch (46 cm)	0.12
21 inch (53 cm)	0.10
24 inch (61 cm)	0.08
27 inch (69 cm)	0.067
30 inch (76 cm)	0.058
36 inch (91 cm)	0.046

Slopes greater than these are preferable.

### **The following must be designed by these minimal standards:**

- The upper 400 lineal feet of any project.
- If drop manholes and/or excessive elevation drops within the manhole are utilized for the common trunk line, the entirety of the project. (This excludes the feeder systems which flow into a trunk line system.)
- Any specific site which, by staff review, does not require lesser slopes.

These requirements may be waived if site-specific conditions show them to be unattainable. A DEP Individual Permit will then be required.



**For the remaining slopes, the following requirements for velocity must be met.**

**Velocity:**

Pursuant to <sup>4</sup>Chapter 27, "gravity sewer design shall provide a minimum flow velocity of two (2) feet per second when the pipe is flowing full or half full". This velocity shall be computed based upon the Manning equation and a minimum n=0.012 (for PVC pipe). The design engineer may select another appropriate n factor, provided that adequate technical justification is submitted to EPD staff for approval. In no case shall an n value less than 0.012 be selected. The following table shows the slopes calculated in accordance with the previous stipulations:

<b><u>Pipe Size</u></b>	<b><u>VCP/DIP (n=0.013)</u></b>	<b><u>PVC (n=0.012)</u></b>
8"	0.33%	0.28%
10"	0.25%	0.21%
12"	0.20%	0.17%
15"	0.15%	0.12%
18"	0.11%	0.10%
21"	0.09%	0.08%
24"	0.08%	0.07%

**Design of Sewage Pumping Stations:**

Information is to be provided on each pump station serving the project. Each station shall be submitted on a separate application. A set of engineering design calculations for the stations shall be submitted. This should include an analysis of the flow generated by the project, the hydraulics of the system, an analysis of the buoyancy of the station, and a pump/system curve. Pump station information submittal shall be in conformance with <sup>1</sup>Chapter 10 of the 10-State Standards. Pump station design shall be in conformance with FAC 62-604, and <sup>1</sup>Chapter 30 of the 10-State Standards.

**Design of Force Main:**

Force main velocities at design average flow must attain a velocity of 2 feet per second. An automatic air relief valve shall be placed at high points in the force main to prevent air locking. The force main and fittings including reaction blocking shall be designed to withstand normal pressure and water hammer (surges). Friction losses through force mains may be determined using the Hazen-Williams formula, or other acceptable methods.

Force mains connected to gravity sewer systems shall enter the receiving manhole at not more than 2 feet above the flow line. The force main effluent shall be directed at the manhole outlet.

**Design Flow Standard Chart:**

*The following is an excerpt from the <sup>4</sup>Broward County Code of Ordinances, Chapter 27, Section 27-201.*

The following unit flows shall be used in determining hydraulic loadings of sanitary sewers anticipated from proposed projects:

- (3) *Sanitary sewer connections estimated wastewater flows:* The unit flows as indicated below shall be used in determining hydraulic loadings of sewers and wastewater treatment plants anticipated from proposed projects. For purposes of this code an equivalent residential connection (ERC) shall be 300 gallons per day. For special purpose structures not included in these categories, EPD shall apply good engineering judgement in estimating flow.

<b>Type of Structure</b>	<b>DESIGN FLOW Specific Condition</b>	<b>Per unit in Gallons per day</b>
Airports, bus terminals, train stations, port & dock facilities:	(a) per passenger (b) add per employee per 8 hour shift	5 20
Assembly Halls	(a) per seat	2
Barber and beauty shops	(a) per dry service chair (b) per wet service chair	100 200
Bar and cocktail lounges (No food service)	(a) per seat	20
Bowling alleys	(a) per lane (no food operation)	100
Camps	(a) day, no food service (b) luxury resort, per person (c) labor, per person	25 100 100
Camper or RV trailer park	(a) per space	150

Type of Structure	DESIGN FLOW	
	Specific Condition	Per unit in Gallons per day
Car wash (a) automatic type		3500
	(b) automatic type (recycled water)	350
	(c) Hand wash	1750
Churches (a) per sanctuary seat	3	
Dance halls	(a) per person	2
Dentist offices:	(a) per dentist	250
	(b) plus per wet service chair	200
Doctor offices:	(a) per physician	250
	(b) plus per square foot of office space	0. 20
Drive-in theater	(a) per car space	5
Fire station	(a) per bed	100
Health spa	(a) per square foot (Does not include food service)	0.35
Hospitals and nursing homes	(a) per bed space (Does not include public food service areas and offices)	210
Institutions	(a) per person (including resident staff)	100
Kennels (a) per animal space		30
	(b) per veterinarian	250
Laundries(a) per coin operated machine		400
	(b) per commercial non-coin operated machine	650

Type of Structure	<b>DESIGN FLOW Specific Condition</b>	<b>Per unit in Gallons per day</b>
Marinas	(a) per boat slip (Does not include office, repair & leisure facilities)	40
Office Building	(a) per square foot of floor space	0.20
Parks, public with comfort stations	(a) per visitor	10
Pet grooming parlors	(a) per wash basin (Does not include retail sales)	200
Recreation/pool buildings	(a) per person (300 gallon minimum)	2
Residences	(a) Single family, detached each	300
	(b) Multiple family per dwelling unit	250
	(c) Motel/hotel units, per bedroom	150
	(d) Bedroom additions to single family residence	150
	(e) Mobil homes, each	300
Restaurants	(a) open 24 hours, per seat including bar	50
	(b) open less than 24 hours, per seat including bar	30
	(c) open less than 24 hours, with drive-thru window, per seat including bar	35
	(d) drive-ins, per space	50
	(e) carry out food service only per 100 square feet	50

**DESIGN FLOW**

<b>Type of Structure</b>	<b>Specific Condition</b>	<b>Per unit in Gallons per day</b>
Schools:		
Elementary/Middle	(a) per pupil per day	10
	(b) add for shower/pupil	5
	(c) add for cafeteria/pupil	5
High School	(a) per pupil per day	15
	(b) add for shower/pupil	5
	(c) add for cafeteria/pupil	5
Boarding School	(a) per pupil	100
Service stations and auto repair shops	(a) per water closet	250
	(b) plus per service bay	100
Shopping centers and retail shops	(a) per square foot of floor space (Does not include food service or laundry)	0.10
Theaters and auditoriums	(a) per seat	5
Warehouse, mini-storage, with resident manager	(a) per square foot of floor space	0.01
	(b) plus residence	250
Warehouses	(a) per square foot of floor space	0.10

## **POTABLE WATER-SANITARY SEWER-Reclaimed WATER SEPARATION NOTES**

The following statements must be included on all plans for sewage collection/transmission systems and/or reclaimed water mains to meet the minimum requirements of the Florida Department of Environmental Protection (FAC Rule 62-555.314) and the Broward County Department of Planning and Environmental Protection.

1) **VERTICAL CROSSINGS**

Sanitary sewer systems and/or reclaimed water mains shall cross under potable water mains whenever physically possible. Sanitary sewer systems and/or reclaimed water mains crossing below potable water mains shall be laid to provide a preferred vertical separation distance of 12 inches (minimum 6" for gravity/reclaimed main) between the invert of the potable water main and the crown of the lower pipe.

2) **HORIZONTAL SEPARATIONS**

Wherever it is physically possible:

Sanitary sewer systems require a preferred 10-foot horizontal separation distance (minimum 6-foot) outside to outside of pipe between any potable water main parallel installations.

Reclaimed water mains require a minimum of a 3 foot outside to outside of pipe horizontal separation distance between any potable water main and/or a sanitary sewer system parallel installations.

Wherever either are not physically possible, then the potable water main shall be laid at the maximum physical horizontal separation distance possible, and either laid:

A) in a separate trench;

B) on an undisturbed earth shelf;

and conforming to the minimum Vertical Crossings in paragraph 1).

3) **CONFLICTS**

Wherever it is not possible to maintain the minimum standards in 1) and 2), then all piping material shall be ductile iron pipe (DIP). All DIP shall be class 50 or higher. Adequate protective measures against corrosion shall be used as determined by the design and site conditions. Additionally, the potable water main shall a full joint centered on the conflict and mechanically restrained. An absolute minimum vertical separation distance of 6 inches shall be provided between the invert of the upper pipe and the crown of the lower pipe.

## References:

<sup>1</sup> Great Lakes/Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997 edition. Recommended Standards for Wastewater Facilities. *Commonly referred to as the "10 State Standards"*  
*A PDF version is available at:*<http://www.dec.state.ny.us/website/dow/10states.pdf>

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<sup>2</sup> Water Pollution Control Federation, 1970 (fourth printing). Manual of Practice No. 9. Design and Construction of Sanitary and Storm Sewers. W.P.C.F.  
601 Wythe Street  
Alexandria, Virginia  
22314-1994

<sup>3</sup>Florida Administrative Code, Chapter 62-604

<sup>4</sup>Broward County Code of Ordinances, Chapter 27

## General Information:

The following is a courtesy list of other Divisions within EPD and other State Agencies which may have plan review and licensing requirements for land use and civil engineering construction projects.

- 1) Land Use and Permitting Division should be consulted on the first round of platting.
- 2) Odor Control - Air Division
- 3) Parking Areas - Water Resources Division, Surface Water Management
- 4) Dredge and Fill - Biological Resource Division
- 5) Trees - Biological Resource Division
- 6) Water Distribution System - Broward County Health Department (State)
- 7) Septic Tanks - Broward County Health Department (State)
- 8) Industrial Wastewater - Water Resources Division, Non-Domestic and NPDES Programs, Wastewater Treatment Plant pretreatment program serving the address (NOTE: No septic tanks are allowed)

*Additionally, almost all levels of local government will have specific permitting, licensing and construction requirements.*