

JOHNSON COUNTY WASTEWATER
WASH BAY APPLICATION

Project Name: _____
Address: _____

Owner Name: _____
Address: _____
Phone: _____
Fax: _____

Engineer Name: _____
Address: _____
Phone: _____
Fax: _____

Facility Description: _____

Number of Bays for each type: _____ Manual, _____ Automatic, _____ Pull Through Tunnel

1. GENERAL INFORMATION. Wastewater discharge from all types of washbay facilities (car or other) shall be controlled by means of an orifice that limits wastewater discharge to the peak allowable discharge rate applicable for the location of the wash bay facility within JCW's service area. **An orifice is required for all wash bay facilities.** The orifice must be installed in an orifice basin located on the exterior of the building. A sand-oil interceptor located on the exterior of the building upstream of the orifice basin is also required for all types of wash bay facilities. The following information is provided to aid in the determination of orifice size, orifice basin size and sand-oil interceptor size for wash bay facilities.

This application, all information and calculations required in this submittal shall be provided to Johnson County Wastewater (JCW) by the Engineer and shall be sealed by the Engineer licensed in the State of Kansas.

The following items are required with the first submittal:

- Fully completed Wash Bay Application
- Fully completed Application for Sanitary Sewer Commercial Connection Permit
- Site plan showing the site improvements (including the orifice basin, sand-oil interceptor, piping, and applicable details)
- Building drawings including architectural, plumbing (with riser diagrams), structural, and foundation
- Wash bay equipment drawings and information (see paragraph 8)
- Fully completed Prohibited Discharge Statement

The applications and other documents are available at www.jcw.org. For site plan requirements, please also refer to the JCW Commercial Connection Permit Application and Site Plan Information document, JCW Service Line Design and Construction Standards, and standard details available at www.jcw.org.

2. PEAK ALLOWABLE WASH BAY DISCHARGE. The peak allowable wash bay discharge rate is determined by subtracting the estimated peak wastewater discharge rate for the other improvements on the site from the site peak allowable discharge rate. The site allowable discharge rate is determined by multiplying the site's lot size (in acres) by the JCW peak allowable unit discharge rate per acre. One-half of the area of street right-of-way (ROW) contiguous to the site's lot may be used in calculating the site allowable discharge rate. Provide an exhibit showing the boundaries for the calculated site lot area and street ROW area with the calculations. An exhibit can easily be developed using the JCW AIMS mapping system. The JCW peak allowable unit discharge rate varies from 0.010 to 0.025 cfs/acre depending on the location of the site in the JCW system. Please contact JCW to obtain the allowable unit discharge rate for the site. Provide and include in any calculations the peak discharge calculations for all other wastewater discharges at the site. See Attachment A.

To increase the Site Peak Allowable Discharge, additional site area may be borrowed from a property adjacent to the wash bay site and served by the main serving the wash bay site. The borrowed area will be designated as a Restricted Tract. A Wash Bay Agreement executed between the wash bay owner and the Restricted Tract owner is required and shall be recorded against the Restricted Tract property. Structures may not be constructed on the Restricted Tract and may not discharge to the sanitary sewer. Contact JCW for additional information.

A. PROVIDE AN EXHIBIT SHOWING:

Area of Site: _____ Sq Ft X 1 Acre / 43,560 Sq Ft = _____ Acres

Area of Restricted Tract (if applic.): _____ Sq Ft X 1 Acre / 43,560 Sq Ft = _____ Acres

Area of Street ROW (if applic.): _____ Sq Ft X 1 Acre / 43,560 Sq Ft = _____ Acres

Site area _____ + Restricted Tract area _____ + ROW _____ = _____ Acres Total Area

B. SITE PEAK ALLOWABLE DISCHARGE _____ cfs = Total area _____ acres X
JCW Peak Allowable Unit Discharge Rate: _____ cfs/acre

C. WASH BAY PEAK ALLOWABLE DISCHARGE: _____ cfs, _____ gpm = Site Peak
Allowable Discharge: _____ cfs – Estimate for Other Peak Site Wastewater
Discharges: _____ cfs

3. PEAK ACTUAL WASH BAY DISCHARGE. The peak actual wash bay discharge rate and total volumes are determined based upon peak equipment discharge parameters, peak number of cars washed per hour, and number of hours of operation per day. Provide a peak actual wash bay discharge estimate summary listing flow rates for each piece of wash bay equipment and calculations for the peak hourly and daily discharge rates. The summary is to include peak water usage and cycle times for each piece of equipment and summarize the peak water usage for each type of wash cycle. See Attachment B for a summary example. Peak number of vehicles washed per hour must be included and data or calculations supporting the peak number must be provided. Facility hours of operation must be identified and included in the calculations.

A. PROVIDE A PEAK ACTUAL WASH BAY DISCHARGE SUMMARY:

Peak hourly wash bay discharge total: _____ cfs, _____ gpm
 Peak daily wash bay discharge total: _____ cfs, _____ gpm
 Facility Days and Hours of Operation: Days _____ , Hours _____

4. ORIFICE. Discharge from all types of vehicle (or other) wash down facilities shall be controlled by means of an orifice installed in an orifice basin located on the exterior of the building. **An orifice is required for all wash bay facilities regardless of the size of the site.** The orifice shall be designed to limit flows to the Wash Bay Peak Allowable Discharge Rate. Provide the calculations for the orifice sizing. The head used in the orifice sizing calculation must be calculated by the difference in elevation between the finish grade at the orifice basin and the center line elevation of the orifice. One foot of freeboard from the basin cover elevation may be assumed in calculating the head on the orifice. The coefficient for a sharp edged orifice (0.61) shall be used in calculating the orifice size.

$$\text{ORIFICE EQUATION: } Q, \text{ cfs} = (0.61)(\text{Area, sf})[(64.4, \text{fps}^2)(\text{Head, ft})]^{1/2}$$

$$A, \text{ sf} = Q, \text{ cfs} / (0.61)[(64.4, \text{fps}^2)(\text{Head, ft})]^{1/2}$$

HEAD (H, ft) _____ = Finish Grade Elevation _____ ft – Orifice Centerline Elevation _____ ft – 1 ft freeboard

Q is the Wash Bay Peak Allowable Discharge in cfs.

Orifice Diameter: _____ inches

5. ORIFICE BASIN. The orifice is to be located inside an exterior orifice basin. The orifice basin must be shown and labeled on the site plan on the exterior of the building and downstream of the sand-oil interceptor. The orifice and orifice basin details are to be provided on the site plan (or, if applicable, on the plumbing site plan for tenant finish projects). Label the size of the orifice on the orifice detail and the center line elevation of the orifice and the finish-grade top elevation of the basin cover on the basin detail. A pre-cast sanitary sewer manhole, pre-cast concrete basin or cast-in-place concrete basin may be used for the orifice basin. The basin and access casting shall be watertight and meet

all applicable JCW standard details and specifications. The basin must also include a manhole access casting located immediately above the orifice. A cross-section detail for the actual basin type to be used is to be included on the site plan. Basin dimensions, basin capacity (in gallons), notes for ensuring a watertight basin and the testing method to field verify the constructed basin is watertight must be included on the detail. In addition, A-lok or Press-seal connectors are required for the basin inlet and outlet piping. For small diameter force main piping entering a basin, Link Seal Model "S316" connectors shall be used. All joints, plus those at the frame and cover and concrete adjustment rings shall be sealed with two rows of one (1) inch preformed bitumastic joint sealer and a six (6) inch butyl joint wrap around sleeve (EZ Wrap). The ends of the EZ Wrap shall overlap by 12 inches. Heavy duty cast iron manhole frame(s) and covers(s) (Clay & Baily 2008 BV or equal) shall be used for the orifice basin access location. The standard orifice basin detail is available in the Forms section at www.jcw.org.

Equalization volume must be provided in the orifice basin to equalize discharge when the peak actual wash bay discharge rate exceeds the peak allowable wash bay discharge rate. Provide the design information and calculations for the equalization volume required in the orifice basin (or showing that equalization volume is not required in the basin).

Orifice Basin Size: _____ gallons

Orifice Volume Calculations and Tank Dimensions:

6. SAND-OIL INTERCEPTOR. A sand-oil interceptor is required at all wash bay facilities to serve any sanitary sewer drain or cleanout in vehicle accessible areas in the building. A 1,000 gallon interceptor is the minimum allowable size. A minimum 30-minute detention time at peak flow is required. See Attachment C for interceptor sizing criteria. The standard interceptor detail is available in the Forms section at www.jcw.org. Calculations for the sand-oil interceptor sizing shall be sealed, signed and dated by a Kansas professional engineer.

A. Interceptor Inlet Size: _____ inches, Drainage Equivalent: _____ gpm

B. Drainage Equivalent: _____ gpm x 30 minute detention = Sand-Oil Interceptor Volume: _____ gallons

The interceptor must be shown and labeled (including the size in gallons) on the site plan (or plumbing site plan for tenant finish projects) on the exterior of the building upstream of the orifice basin. The JCW standard detail for the interceptor must be included on the site plan or included in the drawing set and referenced on the site plan (or plumbing site plan) drawing. Revise the interceptor dimensions shown on the detail as required for the specified volume.

7. PIPING. The site plan must indicate the location and orientation of the orifice basin, sand-oil interceptor and all associated piping. The tanks and all piping for reclamation systems

shall also be shown on the site plan. All piping on the exterior of the building from the building through the interceptor and the orifice basin to the building service line, existing connection point on the main, or back into interior building plumbing must be shown and labeled in accordance with the JCW Commercial Permit Plan Requirements document and the JCW Service Line Design and Construction Standards. These documents are available in the Form section at www.jcw.org. All exterior pipe lengths shall be minimized to the greatest extent possible. Total exterior pipe length shall not exceed 200 feet. Pipe routing and basin locations and orientations must be coordinated between the site, plumbing and building plans. The number of clean-outs is to be limited to the greatest extent possible. The location of all cleanouts must be shown, labeled on the site plan and coordinated with the other plan sheets. The JCW standard cleanout detail must be included on the site plan or included in the drawing set and referenced on the site plan (or plumbing site plan).

8. WASH BAY EQUIPMENT INFORMATION. Provide information on all wash bay equipment, including pumps and pump curves, in the form of an Operations and Maintenance manual. This information must support the peak actual wash bay discharge estimate summary and peak hourly and daily discharge calculations. The actual piece(s) of equipment used at the wash bay shall be clearly identified, when several equipment types are listed in the manual.

Wash Bay Equipment Manufacturer: _____

Equipment Model Number(s) (attach separate sheet(s) as needed): _____

ATTACHMENT A

EXAMPLE

B. PROVIDE AN EXHIBIT SHOWING:

Area of Site: 73,641 Sq Ft X 1 Acre / 43,560 Sq Ft = 3.13 Acres

Area of Restricted Tract (if applic.): 182,952 Sq Ft X 1 Acre / 43,560 Sq Ft = 4.20 Acres

Area of Street ROW (if applic.): 17,878 Sq Ft X 1 Acre / 43,560 Sq Ft = 0.41 Acres

Site area 3.13 + Restricted Tract area 4.20 + ROW 0.41 = 7.74 Acres Total Area

B. SITE PEAK ALLOWABLE DISCHARGE 0.1935 cfs = Total area 7.74 acres X JCW Peak Allowable Unit Discharge Rate: 0.025 cfs/acre

C. WASH BAY PEAK ALLOWABLE DISCHARGE: 0.1925 cfs, 86.39 gpm = Site Peak Allowable Discharge: 0.1935 cfs – Estimate for Other Peak Site Wastewater Discharges: 0.001 cfs

ATTACHMENT B

EXAMPLE

Project Name: JOHN DOE'S ULTIMATE CAR WASH

Prepared by: _____

Date: _____

APPLICATION NUMBER	FUNCTION	FLOW RATE (GPM)	CYCLE TIME / SEC	PEAK FLOW / CAR	PEAK CARS / HR	OPERATING HOURS
1	BUG ARCH	1.5	20	0.50	160	10
2	FOAM APP ARCH	3.6	20	1.20	160	10
3	FOAM APP ARCH	3.6	20	1.20	160	10
4	FOAMY CTA #1	5.2	20	1.73	160	10
5	FOAMY CTA #2	1.3	20	0.43	160	10
6	FLOOR APP	0.72	20	0.24	160	10
7	WRAP FOAMER 1	1.6	20	0.53	160	10
8	WRAP FOAMER 2	1.6	20	0.53	160	10
9	TRIPLE FOAMER	2.25	20	0.75	160	10
10	TOP BRUSH	1.8	20	0.60	160	10
11	ROCKER PANEL	4	20	1.33	160	10
12	PREMIUM WAX	0.9	20	0.30	160	10
13	RAIN DRY AGENT	4	20	1.33	160	10
14	RAIN SEALER WAX	1.2	20	0.40	160	10
15	MIRROR RINSE	6	20	2.00	160	10
16	RO ARCH	8	20	2.67	160	10
TOTALS		47.27		15.76		

PEAK GAL/HR = (PEAK FLOW / CAR) X (PEAK CARS / HR) = 2,521.07 GAL/HR

PEAK GAL/DAY = (PEAK GAL/HR) X (OPERATING HOURS) = 25,210.67 GAL/DAY

ATTACHMENT C

JOHNSON COUNTY UNIFIED WASTEWATER DISTRICTS

SAND-OIL INTERCEPTOR

Sand-oil interceptors should be sized for a 30 minute detention of peak flow. Peak flow should be determined by fixture units rather than some estimating method. Generally, we use the following table to determine fixture units:

WASH BAY APPLICATION

SIZING TABLE

Fixture-Equipment Drain Outlet or Trap Size (inches)	Drainage Fixture-Unit Value	Drainage G.P.M. Equivalent
1 1/4	1	7.5
1 1/2	2	15.0
2	3	22.5
2 1/2	4	30.0
3	5	37.5
4	6	45.0