

DERM^{2.0} FOG Plan Review Checklist

Updated 10/24/2018

Accepted	Not Accepted	N/A	Item / Criteria
1. General			
			Drawings are 11"X17" or larger, legible and include Facility Name, address (include unit/bay) and GDO permit No. (existing facilities with grease discharge operating permit).
			Architectural, Civil and Plumbing drawings match (where applicable).
			Drawings indicate Type of Food Service Establishment, i.e., full service restaurant, cafeteria, bakery, ice cream parlor, day care, etc.
			All seats (bar, table, booth, etc.) shown and counted.
			Drive-thru shown (for existing and/or proposed).
			List/include " daily maximum meals " for take-out and drive-thru.
			Existing Labeled " Existing " and Proposed labeled " Proposed ."
			Projects proposing to use Existing FOG Control Devices (FCDs) include Condition Assessment for each tank/unit. Condition Assessment Forms for Gravity and Hydromechanical tanks available at https://www.miamidade.gov/environment/fats-oils-grease.asp#4
2. Plumbing Sheets MDC Code Section 24-42.6(8)			
			Signed/sealed/dated by a Florida Registered-Professional Engineer . MDC Code Sections 24-42.6(8)(a), and 24-15.2.
			Floor plan and Isometric drawings show sanitary and grease drain lines and fixtures (Existing & Proposed).
			All appliances connected to plumbing shown and identified (Existing & Proposed).
			All drainage fixtures identified/labeled. DFUs, slope and diameter shown in plan and isometric (Existing & Proposed).
			Grease waste line labeled " GW " to distinguish it from the sanitary (bathroom) waste line. All GW lines connected to a FCD (Existing & Proposed).
			Sanitary line labeled "Sanitary" or " SS " to distinguish it from GW line (Existing & Proposed).
			All Drainage Fixtures located in food and beverage preparation areas (back of house) are connected to the grease waste line (GW), and routed through a FCD. Drainage fixtures include but are not limited to kitchen sinks (one, two, or three compartment), mop sinks, hand sinks, floor and trench drains, sink drains, dishwasher, pasta stations, etc.
			Sanitary (bathroom) waste line does not connect to GW lines or FCD.

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			FCD shown in plan and isometric drawings (Existing & Proposed). Label as Hydro mechanical or Gravity and indicate installation above ground or below ground.
			Locations and details for all wash-down areas shown and labeled. All wash-down areas are designed to prevent the release of wash-water and FOG to ground, groundwater, surface waters, or stormwater. Where mat and equipment wash-down is to be performed in a mop sink; the mop sink shall be properly sized and labeled.
			Locations and details for all stored waste, including yellow and brown grease , shown and labeled. Storage areas designed to prevent the release of FOG to ground, groundwater, surface waters or storm sewers. Storage containers are identified by waste type and capacity in gallons and sized to prevent overfilling. All storage containers have a lid that prevents rainwater inflow. Plans shall show quantity of yellow and brown grease generated, with cleaning/emptying of the storage container frequency at 90% capacity of the container or sooner.
			Where the horizontal run from the source of food waste and FOG is greater than 100 feet, provisions for preventing clogging by FOG and other waste is included.
			Where the horizontal run from the source of FOG is greater than 50 feet from the solids separator or FOG control device, plans show access points every 50 feet measured center-to-center. Details for access point provided in drawings.
			Where the FOG control device is located at a different floor or at a horizontal distance exceeding 100 feet from the back of the house area, an Interceptor Monitoring Alarm or Device is provided.
			Plan profiles and sections demonstrate how all labels and markings on FCDs remain visible during and after installation.
			<p>Gravity FCD</p> <p>Effective Volume, material of tank and all appurtenances (e.g., inlet/outlet, cover, etc.), Plan and Elevation Details and dimensions (e.g., length, width, depth, inlet/outlet dimensions), and DOH Number shown. http://ww10.doh.state.fl.us/pub/bos/Tanks/Tank-List.pdf</p> <p>Gravity FCDs located outside per FAC Rule 64E-6.</p> <p>Material of the interceptor compatible with the waste stored (pH of 3.0). Specifications for concrete protective liners mechanically anchored or coatings indicate that it is for wastewater immersion, approved for use in wastewater wet wells, pump stations, manholes, AND for corrosion/acid protection, not simply waterproofing or damp-proofing.</p> <p>Plans indicate that coating application will be by the manufacturer.</p> <p>For proposed concrete precast FCDs, the precast concrete plant name and precast concrete plant certifying agency accepted by the Florida Department of Transportation (NPCA, CCI and PCI^{*1}) is shown and labeled accordingly.</p> <p>^{*1} http://www.fdot.gov/materials/quality/programs/plantcertification/index.shtm</p>

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			<p>Hydromechanical FCD</p> <p>Make/Model No., PDI/ASME/CSA Certification, Flow Rate (gpm), FOG Capacity (lbs) at 99% grease removal efficiency shown in plumbing plans.</p> <p>Every Unit Must Show/Install Vented Flow Control/Air Inlet – Not Just First!</p> <p>Solids separation is provided prior to existing or proposed FOG control devices that require a flow control device or that are not certified to handle solids.</p> <p>FOG control devices installed below ground/grade to intersect the building grease waste drain.</p>
			<p>Sampling Point located after the point of no further treatment, shown in plan and isometric drawings and labeled.</p> <p>When more than one FCD, a compliance sampling point is required after the flow from all FCDs are combined (excluding sanitary lines).</p> <p>Sampling point detail shall be provided and be consistent with pipe sizes.</p> <p>The sampling point shall be directly accessible for visual inspection and sampling. Minimum diameter for the vertical axis is 4-inches. Minimum clearance for sampling port is 3 ft horizontal and 4 ft vertical and shall be shown in plans.</p> <p><u>Note that utilizing DERM’s retrofit sampling point detail is not mandatory.</u> The engineer of record shall design/select the most appropriate sampling point design to assure consistent and representative sampling results based on site-specific facility and operation conditions.</p> <p>Access to Sampling Point shown in plan and elevation Minimum 4-ft vertical and 3-ft horizontal clearance required.</p>
			<p>Access to FCD shown in plan and elevation. Minimum 4-ft vertical and 3-ft horizontal clearance required. Horizontal clearance may be equivalent to the width of the FCD but not less than 30-inches.</p>
			<p>Where the FOG control device will serve multiple users/tenants, each user/tenant shall be identified and their flows and loading rates shall also be included on the plans. Clearly detail capacity allocated to this project/facility, and capacity for other facilities. Provide address with bay/unit number of all the facilities.</p>
			<p>FCD sizing calculations shall be provided and include cleaning (pump-out) frequency. Refer to sizing requirements below. All assumptions, factors, variables and information used to size system shall be included. Minimum information is provided below.</p>

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			3. Gravity FCD Sizing [MDC Section 24-42.6(9)(a) and (b)]
			FCD(s) proposed shall comply with minimum and maximum size (effective volume) requirements of 64E6, FAC.
			The minimum volume for gravity FCDs shall be the largest of the following:
			i) FCD volume based on the Florida Building Code, latest edition.
			ii) FCD volume based on peak flow rate (QPEAK) and thirty (30)-minute hydraulic detention time. Total calculated volume shall be increased to account for the maximum volume of waste stored between cleaning cycles (POF method, or V _{FOG} method)
			<p>POF Method</p> <p>$V = Q_{peak} \times 30 \text{ min} \times \text{POF},$</p> <p style="margin-left: 150px;"> $\times 1.0$ For pump out frequency every 30 days $\times 1.15$ For pump out frequency every 60 days $\times 1.25$ For pump out frequency every 90 days </p> <p>Q_{PEAK} = peak flow rate, gpm (full pipe flow based on pipe diameter, slope & DFUs), or fixtures drain time.</p> <p>POF = Multiplication Factor to account for the volume of waste stored between cleaning cycles</p>
			<p>V_{FOG} Method</p> <p>$V = Q_{peak} \times 30 \text{ min} + V_{FOG}$</p> <p>V_{FOG} can be calculated as follows</p> <p>$V_{FOG} = [\text{meals/day} \times \text{Lbs. of FOG/meal} \times \text{days between Pump out Cycles}] / 6.8 \text{ Lbs./gal.}$</p>

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			Gravity FCD Sizing (continuation)
			<p>iii) FCD Volume (V) calculated based on Chapter 64E-6, Florida Administrative Code. $V = [(S \times HR/12 \times GS \times RF) + (M \times GM \times LF)] \times POF$</p> <p>Or,</p> $V = [S \times HR/12 \times GS \times RF] + [M \times GM \times LF] + V_{FOG}$ <p>Where,</p> <ul style="list-style-type: none"> S = Number of seats (indoor and outdoor) HR = Hours of Operation, including prep time and closing GS = Gallons per seat <ul style="list-style-type: none"> 25 gallons for ordinary restaurants, and 10 gallons for single service article restaurant RF = Road factor: 2.0 interstate highways, <ul style="list-style-type: none"> 1.5 other freeways, 1.25 recreational areas, 1.0 main highway and 0.75 other roads. LF = Loading Factor: 0.75, no ware washer, <ul style="list-style-type: none"> 1, with ware washer (additional hydraulic detention time for surfactants and heat) M = Number of meals served per day, excluding sit-down restaurant meals (take out, drive-thru, banquet, room service, etc.). If no take-out meals, specify NO Take-Out Meals. If no drive-thru, specify NO Drive-Thru. GM = 5 gallons per meal LF = Loading Factor: 0.75, no ware washer, <ul style="list-style-type: none"> 1, with ware washer V_{FOG} = Volume of waste stored between cleaning cycles POF = Multiplication Factor to account for the volume of waste stored between cleaning cycles
			All Gravity FCDs shall be connected in series.

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4. Hydromechanical FCD Sizing [MDC Section 24-42.6(9)(c)(d)]																						
			Peak Flow Rate shall be calculated based on Fixture Drain Time (1 or 2 minutes)/Flow Rate or pipe diameter/DFUs.																			
			FCD(s) shall be sized based on FOG production and proposed cleaning frequency and matched to Peak Flow Rate (gpm). Minimum size accepted 20 gpm.																			
			FOG production shall be based on total number of meals and FOG per meal (FOG lbs/meal).																			
			<p>The minimum size and number of FCDs shall be the greatest of the following:</p> <ul style="list-style-type: none"> i) 20 gallons per minute ii) Calculations based on the Florida Building Code, latest edition. iii) Calculations based on peak flow rate <p>AND</p> <p>FCD FOG Storage Capacity at 99% efficiency > $M(\text{meals/day}) \times \text{FOG/MEAL (lbs/meal)} \times T (\text{Cleaning Frequency})$</p> <p>Where, M = maximum number of meals served per day FOG/MEAL* = average grease production value per meal</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Restaurant Type</th> <th>Grease Production Values</th> <th>Food Service Establishment (FSE) Type</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Low Grease Producer</td> <td>0.005 lbs/meal (no flatware)</td> <td rowspan="2">Elementary Cafeteria, grocery meat department, hotel breakfast bar, sub shop, sushi, take-and-bake pizza</td> </tr> <tr> <td>0.0065 lbs/meal (with flatware)</td> </tr> <tr> <td rowspan="2">Medium Grease Producer</td> <td>0.025 lbs/meal (no flatware)</td> <td rowspan="2">Café, coffee shop, convenience store, grocery deli, Greek, Indian, Japanese, Korean, Thai, Vietnamese</td> </tr> <tr> <td>0.0325 lbs/meal (with flatware)</td> </tr> <tr> <td rowspan="2">High Grease Producer</td> <td>0.035 lbs/meal (no flatware)</td> <td rowspan="2">Full-fare family, fast-food, hamburger bar and grill, German, Italian, fast-food Mexican</td> </tr> <tr> <td>0.0455 lbs/meal (with flatware)</td> </tr> <tr> <td rowspan="2">Very High Grease Producer</td> <td>0.058 lbs/meal (no flatware)</td> <td rowspan="2">Full-fare BBQ, Fast-food fried chicken, full-fare Mexican, steak and seafood, Chinese, Hawaiian</td> </tr> <tr> <td>0.0075 lbs/meal (with flatware)</td> </tr> </tbody> </table> <p>* Refer to ASPE Plumbing Engineer Design Handbook Volume 4, Chapter 8, Table 8-3</p> <p>Other FOG/MEAL values accepted with appropriate study reference.</p>	Restaurant Type	Grease Production Values	Food Service Establishment (FSE) Type	Low Grease Producer	0.005 lbs/meal (no flatware)	Elementary Cafeteria, grocery meat department, hotel breakfast bar, sub shop, sushi, take-and-bake pizza	0.0065 lbs/meal (with flatware)	Medium Grease Producer	0.025 lbs/meal (no flatware)	Café, coffee shop, convenience store, grocery deli, Greek, Indian, Japanese, Korean, Thai, Vietnamese	0.0325 lbs/meal (with flatware)	High Grease Producer	0.035 lbs/meal (no flatware)	Full-fare family, fast-food, hamburger bar and grill, German, Italian, fast-food Mexican	0.0455 lbs/meal (with flatware)	Very High Grease Producer	0.058 lbs/meal (no flatware)	Full-fare BBQ, Fast-food fried chicken, full-fare Mexican, steak and seafood, Chinese, Hawaiian	0.0075 lbs/meal (with flatware)
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			<p>Where more than one (1) hydromechanical FCD is required, installation shall be proposed in series and removal efficiency based on third party testing of the proposed configuration and number of FCDs proposed.</p> <p>The test configuration, including flow control, air entrainment and other appurtenances, shall match the proposed field installation.</p>																			

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			5. Peak Flow Rate [MDC Section 24-42.6(9)(g)]																
			<p>Peak flow Rate shall be estimated as follows:</p> <ol style="list-style-type: none"> 1. Full Pipe Flow (diameter and slope) Calculated using Manning’s Formula for full pipe flow for the grease waste drain nominal diameter and slope and a roughness coefficient of 0.0113. <p>Or,</p> <ol style="list-style-type: none"> 2. Drain Time Based on total fixture flow rate using one (1) or two minutes (2) drain time <p>Or,</p> <ol style="list-style-type: none"> 3. Drainage Fixture Units (DFUs) Based on drainage fixture units (DFUs) by multiplying the proposed DFUs by the flow rate calculated using Manning’s Formula for full pipe flow and a roughness coefficient of 0.0113 and divided by the maximum number of DFUs allowed under the Florida Building Code, latest edition, for the grease waste drain diameter and slope. <p>Calculated flow shall not be less than the minimum peak flow in the table below. (Section 24-42.6(9)(g) of the Code).</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Nominal pipe size (inches)</th> <th>Minimum Total Flow Rate at FCD Influent</th> </tr> </thead> <tbody> <tr> <td>1.25 – 2.5</td> <td>20 gpm</td> </tr> <tr> <td>3</td> <td>23 gpm</td> </tr> <tr> <td>4</td> <td>50 gpm</td> </tr> <tr> <td>5</td> <td>91 gpm</td> </tr> <tr> <td>6</td> <td>147 gpm</td> </tr> <tr> <td>8</td> <td>317 gpm</td> </tr> <tr> <td>10</td> <td>576 gpm</td> </tr> </tbody> </table>	Nominal pipe size (inches)	Minimum Total Flow Rate at FCD Influent	1.25 – 2.5	20 gpm	3	23 gpm	4	50 gpm	5	91 gpm	6	147 gpm	8	317 gpm	10	576 gpm
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