



DEPARTMENT OF DEVELOPMENT
FLOODPLAIN MANAGEMENT

CITY OF BATON ROUGE
 PARISH OF EAST BATON ROUGE

P.O. Box 1471
 BATON ROUGE, LA 70821
 (225) 389-3196

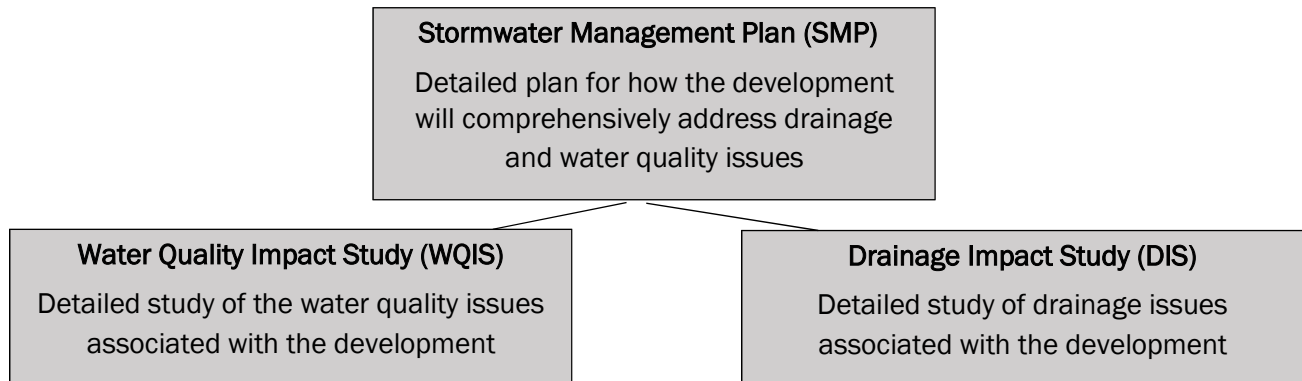
STORMWATER AND DRAINAGE DESIGN INFORMATION

Stormwater Management

Stormwater management is the planning, design and implementation of stormwater infrastructure that manages both the quantity and quality of stormwater runoff. This document provides a quick reference guide to the various stormwater management requirements of EBR. See UDC for detailed explanation of requirements.

When to submit the SMP, DIS and/or WQIS

No development application shall be approved until two copies of a SMP, DIS, and/or WQIS, when these are required, have been submitted to, reviewed, and approved by DOD.



Development Application Type	Stages in the development process		
	CPPC Application	Construction Plan Submittal	Building Permit Application
Concept Plans	<ul style="list-style-type: none"> • Prelim. SMP • Prelim. DIS & WQIS 		
Final Development Plans and others subject to CPPC approval	<ul style="list-style-type: none"> • Prelim SMP • Prelim. DIS & WQIS* 	<ul style="list-style-type: none"> • Final SMP • Final DIS & WQIS 	
Other subject to DOD Approval			<ul style="list-style-type: none"> • SMP • DIS • WQIS

- * CPPC – City Parish Planning Commission
- * DOD – Department of Development
- * DIS – Drainage Impact Study
- * PUD – Planned Unit Development

- * SMP – Stormwater Management Plan
- * TND – Traditional Neighborhood Development
- * WQIS – Water Quality Impact Study



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Stormwater Management Plan

A Stormwater Management Plan (SMP) must recommend specific drainage and stormwater runoff quality improvements and be consistent with the issues and recommendations presented in the DIS and/or WQIS, when either or both are required. The SMP must include the following, at a minimum:

- **Location:** Map showing location of property, adjacent developments, and infrastructure.
- **Existing Conditions:** Description and map of existing conditions, land cover, contours, soil types, estimated pollutant load
- **Proposed Development:** Description and site plan of land cover, contours, empirically expected pollutant load, proposed drainage and stormwater BMPs
- **Plan Implementation:** Detailed description the specific proposed drainage ways and stormwater BMPs and how they meet the requirements for drainage and water quality as described in Sections 15.14, Drainage, and 15.16, Water Quality, respectively. The SMP shall describe the types of BMPs that will be on the site after construction is complete with specific locations of each and estimated capacity for pollutant load reduction.
- **Maintenance:** Description of how the proposed improvements will be maintained, including a maintenance schedule

An SMP is required for all development applications, with the following exemptions:

- All lots in duly authorized subdivisions created with an approved SMP, WQIS, and DIS (Individual lots must comply with SMP for the subdivision)
- Single-family residential developments on an existing lot within subdivisions approved on or before April 1, 2008

For all projects requiring a Stormwater Management Plan, a Stormwater BMP Maintenance Covenant and Private Stormwater Quality BMP Certification will be required prior to granting Final Occupancy:

1. **Stormwater BMP Maintenance Covenant:** A document signed by the property owner guaranteeing that all constructed stormwater BMP's will be continually maintained according to the recorded BMP maintenance description and schedule. A Schedule of Maintenance for the Permanent BMP's must be provided. The BMP Maintenance Covenant and Schedule of Maintenance for the Permanent BMP's must be filed with the East Baton Rouge Parish Clerk of Court prior to submittal to the Permit Office or Subdivision Engineering.
2. **Private Stormwater Quality BMP Certification:** A document signed and sealed by the professional of record who prepared the Stormwater Management Plan for the project is required, certifying that all components of the SMP were installed according to the approved building permit plans. Must be signed and stamped by the Licensed Professional of Record.

Drainage Impact Study (DIS)

A DIS must include the following, at a minimum (UDC Section 15.15):

- **Location:** Description and map of property, adjacent developments, outfalls, key physical features.
- **Land Use:** Description and maps of existing physical conditions; estimate of pre- and post-development percent impervious area; watershed slopes, soil types, vegetative cover, photos of existing drainage features.



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- **Watershed map:** Drainage boundaries; acreage and slope of basins; location of existing drainage features; entry and exit points
- **Hydrologic design:** Calculations, exhibits, and supporting information to show existing and future condition peak 10-yr, 25-yr, 50-yr, and 100-yr at entry and exit points.
- **Ponds and Sub-surface Detention:** Calculations, exhibits, and supporting information for design of pond capacity and routing of design flows.
- **Discharge Points:** Description confirming that appropriate servitudes are provided for any new point-source discharge or non-point source discharges onto adjacent properties.
- **Hydraulic capacities:** capacity of existing on-site drainage facilities; required type, size and capacity of proposed outfall facilities; inventory of existing off-site downstream outfall facilities including capacity, size, type, and invert and cover-topping elevations
- **Identification and description of special conditions:** Special conditions that may exist at the proposed development site should be clearly identified including but not limited to such items as: Special Flood Hazard Areas (Firm Zones A and AE), regulatory floodways, Community Defined Flood Hazard Areas, Stream Setbacks, Conveyance Zones, fill placement locations and mitigation requirements, potential wetland sites, churches, schools, cemeteries, landfills and hazardous waste sites and parks.
- **Conclusions and recommendations:** the DIS should clearly identify the results and conclusions of the study and provide recommendations of any required action(s) so that surrounding properties experience no adverse impact.

A DIS is required for all development applications, with the following exemptions:

- Area of impervious surface does not exceed 20% of the developed site area at the point of discharge from the site. The total impervious area shall include all buildings, driveways, sidewalks, streets, parking areas, lakes, ponds, and similar facilities. All undeveloped open space and common areas shall be clearly identified.
- Additions or modifications to existing developments which result in no more than a 10% increase in existing impervious area and which have existing engineered or subsurface (not natural) public storm drainage facilities designed to accommodate runoff from the existing site.

Development applications may request, in writing to the DOD, a waiver of the DIS (provided the development still meets the criteria outlined in 15.14) if the following criteria are met:

- Sufficient information is submitted to show that the runoff from the proposed development is consistent with and discharges to a previously approved development having adequate drainage facilities, is a part of an approved larger plan of development with an approved drainage study, or is served by a network of subsurface public storm drainage facilities engineered to accommodate the runoff from the developed site.

Water Quality Impact Study

A Water Quality Impact Study (WQIS) must include the following, at a minimum:

- **Existing Conditions:** Description and map of site location, watersheds and sub-watersheds for both on-site and off- site; TMDLs, soils and topography; contours, slopes, land cover, wetlands



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- **Proposed Development Conditions:** Description and map for impacts to watersheds and sub-watersheds both on-site and off-site; land cover, and pre- and post-development comparison table; empirically expected pollutants
- **Proposed Water Quality Treatment:** Description of stormwater treatment train; BMPs, sub-watershed flows, operations and maintenance, empirically expected pollutant reduction,
- **Study Conclusions & Recommendations:** Table of empirically expected pollutant removal, by type per BMP for expected impact to affected waters.

The following development activities shall be exempted from the requirements of preparing a WOIS, but shall comply with the stormwater BMPs described in an SMP:

- Residential sites with a developed area <1 acre
- Farming or agricultural activities

Hydrology and Hydraulics Design Criteria

This following is provided to note key design criteria that EBR has accepted for Stormwater Management Plans (SMP) and construction plan submittals.

Hydrology and Discharge

Discharge Calculations

Size of Drainage Area (acres)	Discharge Calculation
0 - 99	Accepted Methods ¹ or 2023 EBR Runoff Curves ²
100 - 1,999	SCS method ³
2,000 or more	HEC-HMS or USGS procedures

1. Any published and widely-used engineering calculation method.
2. Runoff Curves: [download here](#)
3. Use TR55 method for Time of Concentration, T_c.

Design Rainfall Events

Return Interval	Design for 24-hour Rainfall Event
10-year	8.5 inches
25-year	10.3 inches
50-year	12.1 inches
100-year	13.9 inches
500-year	20.8 inches

Drainage Design

Interior Drainage

- 10-year Hydraulic Grade Line (HGL) shall be below existing or proposed gutter elevation.
- When offsite adjacent areas contribute flow to the site proposed for development, accommodations for these areas must be considered.
- No sheet flow from paved parking areas on lots greater than one-third acre, shall be allowed to drain directly into the street or street catch basins.
- Sheet flow from paved parking areas on lots greater than five acres, shall be directed into a storm drain and catch basin system designed for this area.

Cross Drain Design Frequency

Size of Drainage Area (acres)	Design Frequency
Less than 50	25-year
50 or more	100-year



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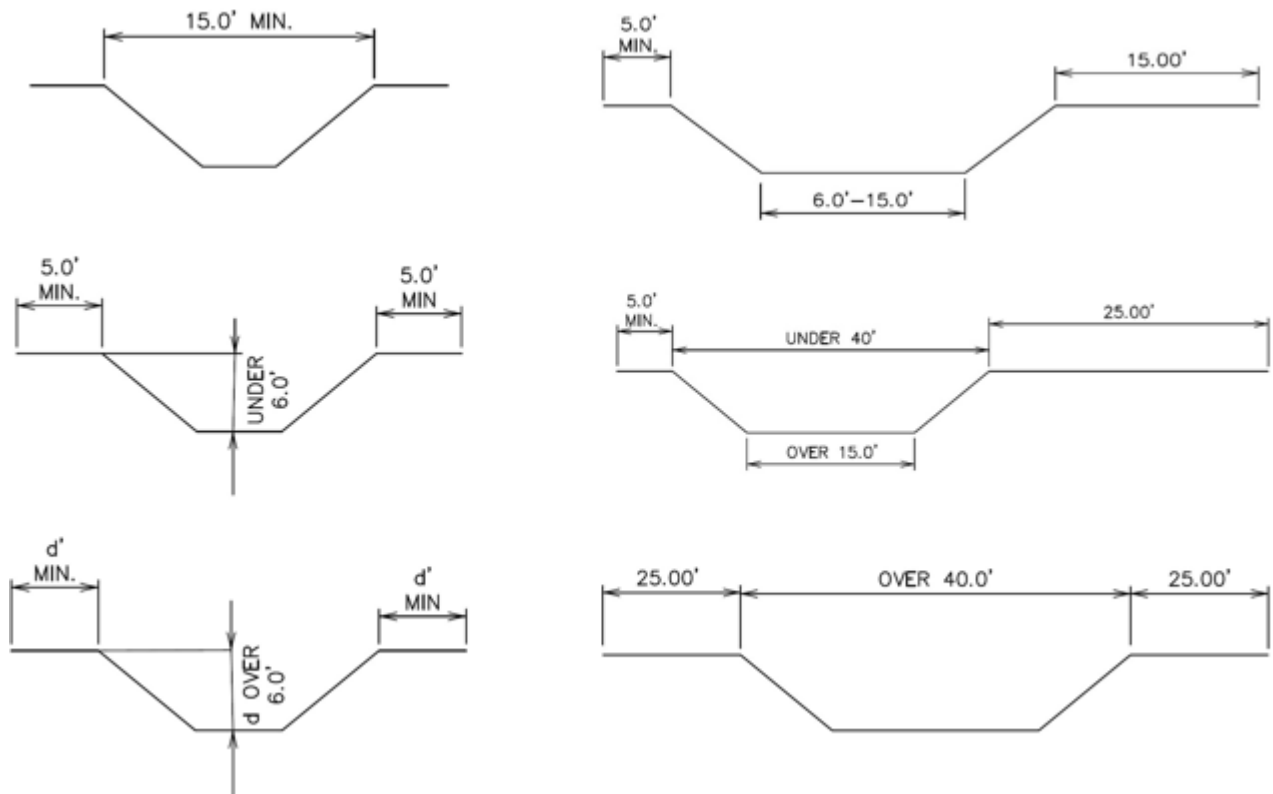
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Detention System

- Detention systems, if required, shall be designed for staged detention for the 10-yr, 25-yr, 50-yr and 100-year storms.
- Stormwater overflow from detention ponds shall maintain a sheet flow condition.

Servitude Requirements

- For piped storm sewers the width of servitude shall be a minimum of fifteen feet. Servitude adequacy to be determined by Department of Development.
- For open ditches and/or canals, the minimum servitudes shall conform to the following sections. Servitude adequacy to be determined by Department of Development and will require approval from Department of Transportation and Drainage for all ditch bottoms greater than 15 ft.



Stream Setbacks

- Section 15.25(B)(2) refers to minor or major utility projects as part of a public City-Parish project.
- Section 15.25(B)(3), "Activities" refers to "Allowable Improvements" listed in Section 15.25(C)(1).
- Section 15.25(C)(1)(f), DoD policy refers to the "Allowable Streambank Improvements" section



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Implementation and Policy Notes

General Provisions & Previously Approved / Grandfathering

- Effective date of April 1, 2023. Items submitted for PC deadline on 3/30/23 would be required to comply with the proposed changes.
- In general, developments that have been approved by planning commission prior to the effective date will not be required to comply with the new Offsite Drainage Analysis (ODA), Through-Site Overland Flow Check (OFC), Stream Setbacks. Mitigation will utilize the FEMA BFE and not the new Community Determined Flood Elevation.
- The use of off-site fill mitigation will not be grandfathered, and an ODA will be required where applicable. This includes the use of existing mitigation credits. (Do not want blanket grandfather or abuse of old chapter 15).
- Options are being discussed with Planning for more staff level changes when Stormwater/ODA/OFC/etc requires modifications.

Community Determined Flood Elevation (CD FE)

- For detailed methodology on creation of the EBR CD FE see the *Development of EBR Community Defined Flood Elevations and Special Flood Hazard Areas* document.
(<https://www.brla.gov/DocumentCenter/View/16880/Development-of-EBR-CDFE>)
- CD-FE shall be publically available on the GIS webpage.
<https://experience.arcgis.com/experience/fde8aa3162ea4518b429a7d183f72d46>
- Any new CD BFE maps will have a viewing/buy-in period before they are adopted.
- Sunset period on CD BFE exemption for developments approved prior to the effective date: April 1, 2024 or 12-months from the date on which the final plat is signed (whichever is later).
- Staff level appeal for CD FE variance for infill type situations that may adversely affect existing neighboring lots/houses.

Design, Hydrology and Discharge

- Any widely accepted engineering discharge calculation method shall be used to determine peak runoff rates for drainage areas under 100-acres, while the SCS based hydrograph methods will be used for detention calculations.
- Minimum TOC shall be 30-minutes for Unimproved, rural, and Low-Density Residential areas. Minimum TOC for Medium to High Density Residential Areas shall be 20-minutes. Minimum TOC for Business/Commercial Areas shall be 10-minutes.
- Drainage systems shall be less than 25% submerged in the static condition. This excludes the last run of pipe (outfall pipe) to allow for tie-ins to existing submerged systems and outfalls below the static water surface for pipe material requirements. No Submerged system design shall be allowed where the street subsurface drainage system is fully submerged in the static condition.



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- DoD, at their discretion, will require previously approved *PHASED* projects less than 50% complete (complete means approved construction plans from subdivision) to attempt to achieve a detention design storm in excess of the 25-year storm. DoD's intent is to try to push what can "feasibly" be accomplished without major redesigns of the unapproved phases or modifications to previously constructed/approved phases/filings, which would necessitate having to go back to public hearing for approval. The idea is to ask developers/engineers to help the parish by making reasonable attempts to increase the level of storage/detention beyond the 25-yr storm but still being understanding of the process. *PHASED* projects would not typically include Site Plans, CUPs, SPUDS or ISPUDS. It would typically include TNDs, PUDs, multi-phased Subdivisions.

Floodplain Conveyance Zones (Section 15.24)

- Floodplain Conveyance Zones do not necessarily follow the Special Flood Hazard Area. The presence of Conveyance Zones will be publically available on the GIS webpage.
<https://experience.arcgis.com/experience/fde8aa3162ea4518b429a7d183f72d46>
- Offsite (imported) fill within the Community Developed Flood Elevation (CD-FE) shall require an Offsite Drainage Analysis (ODA).
- Conveyance channel cross section improvements/changes are allowed in order to maintain 100-yr water surface elevations. See *Allowable Streambank Improvements*.
- At Planning Commission submittal, an allowance of approximately 0.15-ft will be allowed with the ODA check, however the development will have to meet the 0.00 (no-rise) condition prior to construction plan approval, which will be re-checked at either Subdivision or Permits. Approvals will be "at risk" at Planning phase if not at 0.00, which is the reasoning behind making the model public.
- Conveyance Zone Types:
 - Type 1: Normal Conveyance Zones. Areas were calculated using a combination of depth and velocity. (See *Development of EBR Floodplain Conveyance Zones* document for detailed methodology. (<https://www.brla.gov/DocumentCenter/View/16881/Development-of-EBR-Floodplain-Conveyance-Zones>)
 - Type 2: Areas where the Type 1 conveyance zones overlap existing developed residential subdivisions. In these areas, conveyance checks will be waived for minor improvements to existing structures.
 - Type 3: Areas where there is an absence of reliable velocity data, so the depth boundary was predominantly used to define the conveyance zone areas. (Typically in Flood Zone A areas)

Overland Flow Checks

- Proposed developments are required to ensure that water from contributing watershed can be conveyed adequately. Including that new drainage ways are constructed to meet current drainage needs and have adequate servitudes to account for the future needs of contributing watersheds.
- To ensure that new drainage features do not cause an increase in peak water surface elevations at all inflow locations, the City-Parish may require an overland flow check performed.
- Through-Site Overland flow check (OFC) compliance will be checked during construction plan review phase. It is doubtful that developments would be able to provide enough detail at the Planning Commission stage.



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- Any site with an offsite drainage area larger than 5 acres flowing onto or through the developed site area will automatically be required to complete and overland flow check.

Allowable Streambank Improvements ~ Mitigation Criteria

- In an attempt to establish detailed policy to allow more hydraulically connected mitigation inside of the drainage servitude, and revising the current/previous policy of prohibiting mitigation within the drainage servitude. The policy limitations are based around preventing improvements/excavations that would inhibit maintenance of the drainage ways. Allowable stream bank improvements pertains to mitigation outside of the channel itself.
- Lowest excavation shall be at or above the 50-year water surface elevation of the subject indexed stream or lateral. (The normal peak flow/surface could be utilized here)
- Created mitigation volume shall be solely used for the subject site for which is taken. There shall be no mitigation credit allowed to be provided to others through the improvement.
- Excavation improvements shall begin and terminate no less than 20-ft from the property lines within the subject property. If excavations are within the public servitude or right-of-way, this beginning and terminating point shall be a theoretical projection of the property line to the existing top bank.
- Excavated banks shall be at a minimum of 3:1 and tapered away from and back into the stream or lateral at a minimum of 45-degrees to provide a more hydraulically effective section less prone to scour from high flow and high velocity events.
- Excavated slopes shall be stabilized with permanent erosion control measures.
- Bottom of excavated improvements shall be sloped at a minimum of 3% back to the stream or lateral to maintain positive drainage to discourage wet mud flats.
- Private mitigation servitude shall be dedicated where the mitigation improvement leaves the existing public servitude or right-of-way.

Submittals / Scheduling / Timeline

- ODA and OFC modeling submittal requirements:
 1. Complete plan set in PDF format. Please ensure the plan set includes the following items:
 - A detailed description of proposed development.
 - Proposed location of the subject development and adjacent developments and infrastructure.
 - Proposed drainage feature dimensions:
 - For detention, ensure all dimensions (area, depth, and slopes) are provided.
 - For subsurface systems and culverts, ensure entire pipe network layout is provided, including all pipe lengths and dimensions.
 2. Shapefile and/or CADD file of proposed drainage features,
 - If subsurface system or culverts are proposed, please ensure that entire drainage network within the development area is included.
 - If detention is proposed, please ensure that surface and contour files are provided.
- Planning Commission submittal requirements list in order to complete/receive ODA approval in time before PC recommendations are sent out (see PC Agenda Package Posting date on P&Z calendar/schedule).



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- PC meeting is generally 3rd Monday of the month. Submittal deadline is 6wks + 4days before PC mtg. Deadline day is roughly 5wks before PC Agenda Posting date.
- Revised drawings due date is 3wks before PC mtg date and 10 days before PC Agenda Posting.
- PC Agenda Posting deadline is important because it is the last date that the APPLICANT can request for a deferral. After that, only council members can request an item to be deferred.

Fill Requirements within the Floodplain

Fill placed within the floodplain must meet the following restrictions:

- Unless otherwise provided, no fill shall be permitted in special flood hazard areas unless the fill is mitigated by excavation. The source of the fill volume compensation (offset) should be onsite and should be identified and approved prior to construction plan approval or issuance of a building permit.
- Offsite excavation for onsite fill may be considered if all criteria from 15.21 F in the East Baton Rouge Unified Development Codes are met.
- No fill may be placed in a manner that would cause a burden or hardship on adjoining properties.
- All residential and nonresidential development shall have the lowest floor elevation at least one foot above the highest FIRM BFE, record inundation, Community Defined FE, the center line of the street, or the top of the lowest first upstream or downstream sanitary sewer manholes to the service connection, whichever is highest.
- The surface of parking lots and streets in subdivisions of more than five lots shall not be constructed lower than two feet below the FIRM base flood elevation or record inundation, whichever is greater.