



ST. TAMMANY PARISH, LA
CODE OF ORDINANCES
PART II: UNIFIED DEVELOPMENT CODE

Ch. 900 – Infrastructure

DRAFT for Public Comment

March 31, 2023



• Environmental Consulting
• Zoning/Planning
• Land Use Law



DISCLAIMER: Content herein is not representative of the final Draft UDC deliverable.

Chapter 900 Infrastructure

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SEC. 900-1 GENERALLY.**A. Authority.**

The authority of this chapter is as established in **Chapter 900: Subdivision Process and Submittal Requirements, Sec. 900-1 (B).**

B. Purpose.

The infrastructure standards contained within this chapter are designated for the establishment of minimum requirements for property located within the Parish of St. Tammany and to provide the necessary facilities and services demanded by new development.

C. Applicability.

All subdividers shall prepare proposed subdivision plats in accordance with procedures and submittal requirements in Chapter 900 of this UDC and in conformance with the development standards and criteria described in this chapter.

SEC. 900-2 LOT AND BLOCK STANDARDS.**SEC. 900-2.1 GENERALLY.****A. Compliance Required.**

All lots and blocks created or re-subdivided must meet the minimum lot and block size and dimension standards of this section and the zoning district in which the site is located. If requirements conflict, the more restrictive shall apply.

SEC. 900-2.2 BLOCK STANDARDS**A. Adequate Building Sites Required.**

Provisions of adequate building sites suitable to the special needs of the type of land use (residential, commercial, or other) proposed for development shall comply with the minimum standards established in this UDC.

B. Block Lengths.

No residential block shall be longer than 1,500 feet, unless it abuts Lake Pontchartrain, a waterway, an interstate or major arterial, or some other feature that prohibits street connectivity.

SEC 900-2.3 LOT STANDARDS.**A. Remnants Not Allowed.**

All lots and blocks created or reconstructed must meet the minimum lot and block size and dimension standards of this section and the zoning district in which the site is located. If requirements conflict, the more restrictive shall apply.

B. Lot and Dimension Requirements.

Lots shall comply with the minimum dimensions established in this UDC in accordance with **Chapter 400 – Zoning** and be calculated exclusive of any public street right-of-way or private drive. Where minimum dimensions are not established in a zoning district, lots shall connect to central water systems and central sewer systems when available and shall comply with the following:

1. Lots with central sewerage shall have a minimum lot area of 12,500 square feet with a minimum lot frontage of 90 feet and depth of 120 feet.
2. Lots without central sewerage shall have a minimum lot area of 40,000 square feet and a minimum lot frontage of 150 feet and depth of 120 feet.
3. All lots or development sites shall be at least 1 acre in area.

Exhibit 900-2-1 Lot area and dimension requirements.

Criteria	<u>Lot Standards</u>		
	Area	Frontage	Depth
Zoning District	<i>In accordance with Ch. 400 - Zoning</i>		
Central Sewerage Provided	12,500	90	120
Central Sewerage Not Provided	40,000	150	120

C. Lot Frontage.

All lots shall front on a public street or private street constructed to or improved to parish standards.

D. Lots Fronting a Cul-de-Sac or Road Having a Curve.

1. Lots fronting a cul – de – sac or a road having a curve shall comply with the following requirements for frontage.

Sewerage Type	Minimum Required Frontage, Lot on Cul – de – Sac	Minimum Required Frontage, Lot on Curve with Radius 180 feet or less	Minimum Required Frontage, Lot on Curve with Radius Greater than 180 feet
Having Central Sewerage	60	90	80
Not Having Central Sewerage	190	240	120

E. Variation in front yard.

1. Except as permitted elsewhere in this UDC, where the average depth of existing front yards on lots improved with buildings located within 100 feet, measured from the outer corners of the front property line of the subject property on both sides of the property and of the street, within the same zoning district, is less than the minimum required front yard, the front yard on the subject property may be the average of the of the existing yards; however, no front yard shall be less than 10 feet. The front yard setbacks of the properties within 100 feet, as measured from the outer corners of the subject property's front property line, shall be provided by the subject property owner or applicant.

F. Lot lines.

1. All lots, so far as practical, shall have side lot lines at right angles to straight street lines or radial to curved street lines. Unusual or odd-shaped lots having boundary lines that intersect at extreme angles shall be avoided.
 - a. For interior lots, the lot line common to the street right-of-way line shall be the front line. All lots shall be arranged so that the rear line does not abut the side of an adjacent lot.

G. Lot Orientation.

1. *General*: For interior lots, the lot line common to the street right-of-way line shall be the front line. All lots shall be arranged so that the rear line does not abut the side of an adjacent lot.
2. *Corner lots*. The lot frontage shall bear the official municipal address in accordance with provisions for survey and street address in this UDC.
3. *Through lots or double frontage lots*. Lots with double frontage should be avoided. Both lot frontages shall be front lines for setback purposes. The 911 Communications District shall determine which frontage must bear the official municipal address, and the address shall be posted on the building elevation that corresponds to the frontage that is assigned the official address, in accordance with provisions for survey and street address in this UDC.
4. *Lot remnants*. No lot or parcel shall be created that fails to meet the minimum standards of the applicable zoning district and this UDC, except pursuant to a PUD or Planned Development that provides for the perpetual maintenance of such remnants.

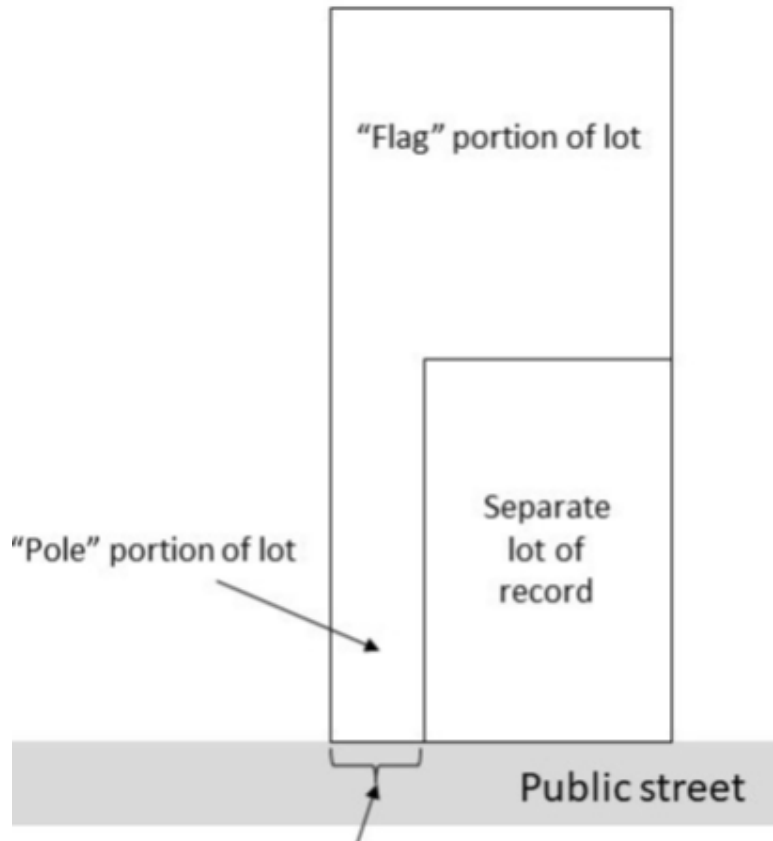
H. Resident number, mailing address.

1. All lots, in addition to a lot number, will be assigned a resident number which shall become the permanent mailing address. The applicant shall coordinate addresses with the parish 911 addressing office.

I. Flag Lots

A flag lot refers to a lot configuration where a standard lot is connected to the public right-of-way by a strip of land that fulfills minimum requirements for access and utilities, as illustrated in **Exhibit 900-1**.

Exhibit 900-2-2:



1. *Minimum area, open space, and dimension requirements of the 'flag' portion of the lot.* The minimum area, open space, and dimension requirements (including but not limited to minimum lot width, setbacks, front and rear lot line requirements) of the 'flag' or standard lot, not including the area of the access strip or driveway, shall be consistent with the minimum lot size requirements for the zoning district in which the property is located.
2. *Requirements for the 'pole' portion of the flag lot.* The minimum lot width on the "pole" portion of the lot is 30 feet. The maximum lot width on the "pole" portion of the lot is 60 feet..

SEC. 900-3 STREETS, ROADS, AND ACCESS STANDARDS.

SEC. 900-3.1 TRAFFIC IMPACT ANALYSIS.

A. Purpose and Intent.

1. The purpose and intent of this section is to protect the health, safety and welfare of the citizens and visitors of St. Tammany Parish by ensuring the provision of safe and adequate roadway facilities. The provisions of this article establish requirements for transportation studies that provide information on traffic projected to be generated by proposed developments. It is the further intent of this article to establish requirements for the identification of any potential traffic operational problems or concerns, and to establish requirements for the identification of mitigation measures and requirements for the implementation of those mitigation measures.
 - a. Developments seeking access to state roadways where a review of a traffic impact study is performed by Louisiana Department of Transportation and Development (LaDOTD) are not exempt from the requirements in this policy.
 - b. Applicants seeking direct access to a state highway, or local road with an access point within 0.25 mile of a state highway, shall comply with the requirements of this section and the requirements of Louisiana Administrative Code Title 70, Chapter 11 – Traffic Impact Policy for New Access Requests Affecting State Highways.

B. When Required.

2. A transportation impact analysis (TIA) shall be required for all changes of use, subdivisions or developments when the following projected peak hour trip threshold levels are met or exceeded. In the event that alternative threshold levels are specified, the more restrictive shall prevail.
3. The parish has the right in the administrative review process to exempt a development from the required TIA if any of the following conditions are satisfied, unless required pursuant to Sec. 130-1674(a)(14):
 - a. For developments with access connection to only right-of-way controlled by the State of Louisiana Department of Transportation and Development (LADOTD) and an access permit has been approved by LADOTD. Applicant shall be responsible for requesting the waiver from the Department of Engineering through written request and for providing a copy of the approved LADOTD access permit.
 - b. If the change in use or expansion of an existing development has a trip generation less than or equal to the existing use. Applicant shall be responsible for requesting the waiver from the Department of Engineering through written request and for providing documentation demonstrating current and proposed trips generated from development.
 - c. For developments where use of property generates less than 50 peak hour trips. Applicant shall be responsible for requesting the waiver from the Department of Engineering through written request and for providing documentation demonstrating current and proposed trips generated from development.

Exhibit 900-3-1 – Traffic Impact Analysis Thresholds.

Peak Hour Trips Generated by Development at Full Development	TIA Threshold
The Proposed Development Generates less than 100 (<100) peak hour trips, either AM or PM, whichever is greater	Threshold 1
The Proposed Development results in greater than 100 (>100) and less than 400 (<400) peak hour trips, either AM or PM, whichever is greater	Threshold 2
The Proposed development results in greater than 400 (>400) and/or including drive – through operations	Threshold 3

2. The peak hour trips shall not be the only factor in the determination of the analysis that will be required. At the discretion of the Department of Engineering, or the Planning and Zoning Commission, other items which significantly influence the traffic movements or safety may require a higher level of study. These include but are not limited to the following:
 - a. Areas with a high amount of traffic accidents;
 - b. Areas with inadequate sight distance;
 - c. Areas where there are currently high traffic volumes on surrounding roads that may affect movement to and from the proposed development;
 - d. The development will be located in an area that is currently undergoing substantial growth; or
 - e. The development will be located in an area that is currently experiencing extreme problems with traffic congestion.
3. Expansion of an existing project shall also be subject to the requirements of this section. When determining whether the project meets the threshold, trips from the existing land use shall be included in the trips that are considered "produced" by the project. If the sum of previous and projected trips is more than the threshold identified in Table 900-2 above then the Department of Engineering shall require the Applicant to prepare a TIA.
 - a. Based on the results of the administrative review of the proposed project the Department of Engineering has the authority to require traffic mitigation measures, even if a formal TIA is not required.
4. The applicant shall meet all applicable requirements found in this UDC. Additionally, the Department of Engineering shall have the authority to require additional improvements or ingress/egress points above the current parish standards if the Director determines based on the TIA or the administrative review that such measures are necessary for health and safety.

C. Procedures.

1. The Applicant shall submit as a part of the application the number of trips to be generated by the proposed development, calculated as per the requirements of this section.

- a. If a TIA is required for a project pursuant to the provisions of this UDC the Applicant shall employ a licensed professional engineer registered in the State of Louisiana with experience in traffic engineering submitted by the Applicant to prepare, sign, and seal the TIA in conformance with these regulations.
2. The Applicant shall be solely responsible to bear all costs of employing said engineer and payment of all fees per the parish fee schedule.
3. The TIA shall be submitted along with the Tentative Subdivision Plan application. In the event that a TIA is required but a Tentative Subdivision Plan application is not required, the TIA shall be submitted along with the building permit application.
4. In no instance shall a building permit be issued for a development that is subject to the TIA requirements of this article prior to the submission and approval of the TIA.

D. Fees.

A review fee will be assessed on every applicant that is required to submit a TIA for this service. This fee shall consist of:

1. \$500.00 submittal fee;
2. \$50.00 per mile of roadway to be studied (prorated per mile);
3. \$50.00 per intersection in study area; and
4. \$50.000 per proposed development in study area that have submitted a Tentative Subdivision Plan or building permit application.

E. Building Permit.

1. When applicable, a building permit or work order will not be issued until:
 - a. Until an approved TIA considering all proposed development shows little or no impact on existing traffic conditions.
 - b. A mitigation proposal developed based upon an approved TIA has been accepted by the Department of Engineering and the Planning and Zoning Commission.

F. Mitigation, General.

1. When applicable, A certificate of occupancy will not be issued until all mitigation measures identified in the approved TIA have been constructed and accepted by the Department of Engineering and the Planning and Zoning Commission.
2. Mitigation shall also be in coordination with the most recent 2040 Comprehensive Plan to benefit the area affected, as well as the parish's ten-year infrastructure plan.
3. Prior to approval, the applicant shall verify with the Department of Engineering whether a 2040 Comprehensive Plan or ten-year infrastructure plan proposed route or improvement will affect the subject property. If so, access through the property along with any right-of-way needed shall be provided to the parish as part of the applicant's mitigation efforts. The most recent map outlining the 2040 Comprehensive Plan and the ten-year infrastructure plan can be obtained from the Department of Engineering.

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4. When applicable, Construction of mitigation shall not begin until the TIA and mitigation proposals contained within have been accepted by the Department of Engineering and the Planning and Zoning Commission.

G. Documentation.

The TIA report shall be prepared documenting the study, the data used, the findings, and the recommendations of the study. The TIA will be reviewed by both the Department of Engineering and the Planning and Zoning Commission. If either the Department of Engineering or the Planning and Zoning Commission determines that the TIA is inadequate or not in accordance with this section, the applicant shall be required to supplement or modify the TIA to address any deficiencies.

H. TIA Contents and Format.

1. The contents of a TIA, as well as the TIA study area radius shall vary depending on the site and prevailing conditions. Content requirements, including the study area radius, shall be established by the applicant and approved by the Department of Engineering prior to the submission of the TIA. The applicants licensed professional engineer registered in the State of Louisiana, prior to initiation of the study, shall determine the study area radius for the TIA. Such radius shall be subject to the approval of the Department of Engineering. Such requirements shall address site, project, and corridor level traffic and transportation issues. Each TIA submitted must take into account all other proposed developments in the study area (all developments for which a Tentative Subdivision Plan application or a PUD application has been submitted). This information shall be obtained from the Department of Engineering.
2. TIA's shall include the following information:
 - a. Threshold 1: When the proposed development results in less than 100 peak hour trips, either AM or PM (whichever is greater) the Applicant shall include in the TIA:
 - i. Proposed trip generation and distribution with source of information
 - ii. Sight distance evaluation at proposed driveway locations
 - b. Threshold 2: When the proposed development results in greater than one hundred (>100) and less than four hundred (<400) peak hour trips, either AM or PM (whichever is greater) the APPLICANT shall submit:
 - i. Proposed trip generation and distribution with source of information:
 - ii. Sight distance evaluation at proposed driveway locations:
 - iii. Capacity analysis for existing and proposed conditions at intersections within the study area,
 - iv. Capacity analysis for proposed conditions at the development driveways;
 - v. Left turn lane, right turn lane and signal warrants at the development driveways; and
 - vi. Recommendations for mitigating improvements to maintain or improve the existing Level-of-Service, as well as recommendations for driveway locations and configurations.
 - c. Threshold 3: When the proposed development results in greater than four hundred (>400) peak hour trips, either AM or PM the APPLICANT shall submit:

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- i. Proposed trip generation and distribution with source of information
 - ii. Sight distance evaluation at proposed driveway locations
 - iii. Capacity analysis for existing and proposed conditions at intersections within the study area established during the Traffic Scoping Meeting;
 - iv. Capacity analysis for proposed conditions at the development driveways;
 - v. Left turn lane, right turn lane and signal warrants at the development driveways;
 - vi. Recommendations for mitigating improvements to maintain or improve the existing Level-of- Service, as well as recommendations for driveway locations and configurations.
 - vii. Summary of the crash history within the study area;
 - viii. Review of crash reports and provide recommendations to improve safety. lots and blocks created or reconstructed must meet the minimum lot and block size and dimension standards of this section and the zoning district in which the site is located. If requirements conflict, the more restrictive shall apply.
 3. Each TIA study shall be prepared in the following format:
 - a. Description of TIA study area, specifying boundary of study area and count and analysis sites. A site location map shall be provided. The map shall include roadways that allow access to the site and are included in the study area.
 - b. *Description of the project.* This description shall include the size of the parcel, general terrain features, access to the site, anticipated completion date, and the existing and proposed uses of the site (including phasing). In addition, the square footage of each use or number and size of units proposed shall be specified. A figure (Site Plan) that shows the site development as proposed shall also be included in the report.
 - c. *Existing conditions.* The existing conditions in the vicinity of the project shall be discussed, including a description of the area to be affected by the development. A field inventory of the site and study area shall be conducted. Existing traffic volumes, traffic controls, and geometrics (number of lanes, intersection configurations, etc.) shall be described in detail. This data shall be depicted graphically.
 - d. *Existing traffic volumes within TIA study area.* Average daily traffic counts shall be current (less than one year old from the T.I.A. submittal date). The applicant shall contact the Department of Engineering to obtain current available counts. If current data is not available, the applicant will be required to perform the counts. Peak hour counts shall be conducted at study area intersections during peak hours as determined by the existing roadway counts and approved by the Department of Engineering. These counts shall show all turning movements. The counts shall be conducted during the school year (September through May) and during weeks that have no major school holidays. (These holidays shall include, but not be exclusive to, Thanksgiving, Christmas Break, Spring Break, Mardi Gras, Labor Day, and exam weeks.) The Department of Engineering may be contacted for approval of the planned count dates.
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- e. *Trip generation estimates and design hour traffic volumes.* The calculation of traffic volumes used to determine impacts of the development shall be based on the maximum land use intensity allowed under the existing (or proposed) zoning ordinance.
 - f. *Trip distribution and traffic assignments.* Traffic generated by the site must be distributed and assigned to the roadway network in order to determine the project's impact. The direction a vehicle will take to access or leave the project site is known as trip distribution. Traffic assignment refers to the actual routes taken by project traffic to and from the site. The methodology and assumptions which are used in the determination of trip distribution and traffic assignments shall be described. In the case of projects with several phases to take place over several years, the trip distribution and traffic assignment shall be estimated for the completion of each phase.
 - g. *Projected traffic volumes within the TIA study area.* Project generated and distributed traffic shall be estimated for all intersections in the study area, including any proposed site access driveways and must include a section outlining where turn lane warrants are required. The projected counts will represent the same peak hours that were used for the existing traffic volume counts and will show all turning movements. The trip generations from all other proposed developments in the study area shall also be taken into account. This information shall be obtained by the Department of Engineering. The growth rate percentage to be used for the study area shall also be established by the Department of Engineering.
 - h. *Capacity analysis.* Capacity analyses provide an indication of how well the study area intersections serve existing and future traffic demands. A description of the methodology and level of service (LOS) definitions shall be included within the TIA. For existing, background and future conditions, LOS at all study intersections, inclusive of the project driveway, shall be calculated for signalized and unsignalized intersections. The other proposed developments in the study area shall also be taken into account. An overall LOS "D" shall be considered acceptable for signalized intersections within the parish. For unsignalized intersections, the LOS for the critical movement shall be at LOS "D" or above. In the case where the existing level of service (LOS) is below "D", the mitigation efforts shall improve the LOS to "D" or above.
 - i. *Volume to capacity (V/C) and average stopped delay* must also be presented for both signalized and unsignalized intersections (including 95% queuing length and unserved demands). To assess quality of flow, roadway capacity analyses are required under the following conditions: existing, no build (per project phase), build (per project phase), and future(total build out).
 - j. *Traffic Accidents.* Three years of the most current accident data shall be obtained for intersections within the study area. This data shall be depicted in tabular form along with a brief description at each critical location. The applicant may contact the Department of Engineering to obtain contact information for the purpose of collecting this data.
 - k. *Traffic improvements.* Unsignalized intersections experiencing significant deficiencies (delays) shall be evaluated for potential signalization or roundabout improvements. Results of these analyses shall be discussed, and recommendations presented. Any planned mitigation, inclusive of roadway improvements, to be completed within the study area shall be identified and discussed.

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1. *Conclusions.* This section of the traffic study shall summarize the required improvements and the proposed mitigation measures. This shall include, but not limited to:
 - i. Existing and future LOS results;
 - ii. Proposed mitigation inclusive of all proposed roadway improvements; and
 - iii. Resultant LOS with proposed mitigation in place.
 - iv. Summary, Findings and Recommendations. Mitigation measures shall be discussed in this section. This includes identifying the improvement measures necessary to minimize the impact of the project/development on the transportation system. The study area intersections shall be mitigated at a minimum to operate better than or equal to the "No Build" case, based on the calculated V/C and average stopped delay. In the case where the existing level of service (LOS) is below "D," the mitigation efforts shall improve the LOS to "D" or above.

I. Trip Generation Rates.

To determine whether the requirements of this section are applicable to the proposed project and for the purpose of preparing required transportation impact analyses, applicants shall use the trip rates and methodology contained in the most recent edition of the Institute of Transportation Engineers' (ITE) trip generation manual.

J. Actions Based on the TIA.

1. A proposed development which is subject to the TIA requirements of this section shall be disapproved when the results of the required TIA demonstrate that the proposed project will overburden the roadway system or cause a reduction in service of affected roadways below the adopted level of service (LOS) "D." In the case where the existing level of service (LOS) is below "D", the mitigation efforts shall improve the LOS to "D" or above. An applicant, in coordination with the Department of Engineering, may modify the development proposal to minimize the identified traffic-related impacts. Mitigation may include, but shall not be limited to:
 - a. Dedication of additional right of way;
 - b. Rerouting of traffic and proposed access points serving the proposed project;
 - c. Participation in funding transportation facilities, including signals and intersection improvements;
 - d. Traffic signal timing and/or phasing adjustments (with coordination and approval from the owner of the signal);
 - e. Restriping or reconfiguration of intersections;
 - f. Adding additional intersection through or turn lanes;
 - g. Installation of a signal, installation of a roundabout; or
 - h. Any other recommendations by the Department of Engineering upon review and analysis of the TIA,

2. Applicants will assume the full and sole responsibility for the cost and implementation of all identified improvements which mitigate the traffic impact of their proposed development, unless funding can be provided through any grant mechanism.
3. If a traffic mitigation is part of an approved transportation impact study, all approved traffic improvements must be implemented prior to receipt of an occupancy Certificate or Final Subdivision Plat approval, whichever is appropriate, unless otherwise provided for as part of the approved TIA and coordinated with the parish.

SEC. 900-3.2 GENERAL PLANNING AND LAYOUT REQUIREMENTS FOR STREETS

A. Arrangement.

The arrangement of streets shall be structured to enable:

1. The continuation of the existing streets in adjoining areas.
2. All street intersections and street widths shall be safe for traffic.
3. Offset streets shall be avoided. Minimum offsets shall be at least 125 feet between the center lines of two opposing offset streets.
4. All lots within new subdivisions must have either a public or private street or road frontage constructed for the full lot frontage in accordance with the provisions as established within this section.
5. Any newly constructed drive, road or street located in a Critical Drainage Area shall be constructed at or above BFE. Exceptions may be granted by the Department of Engineering in Coastal Zoned areas when supported by engineering studies that constructing the road to BFE would cause adverse impacts to adjacent land.

B. Limited Access Roads.

In special cases, where in the opinion of the Planning Commission, the requirements of safety demand, especially where subdivisions front on heavily traveled thoroughfares; such thoroughfares may be designated as limited access roads. In such cases, local traffic streets shall be required adjoining and paralleling the thoroughfares with access thereto at specified intervals only. In no case will lots be positioned with direct access onto a limited access roadway or State Highway without the permission of the Louisiana Department of Transportation and Development.

C. Subdivision Entrances.

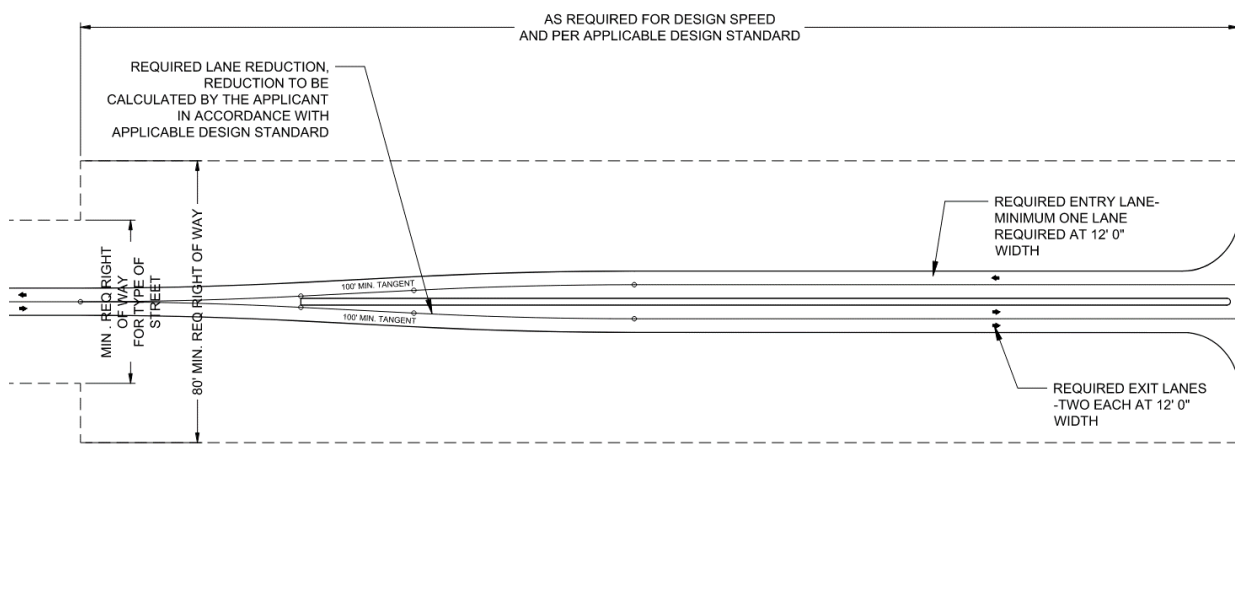
In the interest of public health and safety, to provide for efficient traffic flow at subdivision entrances, and to promote aesthetic qualities, all proposed subdivisions where only one entrance is provided shall be required to build the entrance to the following minimum standards:

1. *Right of way width.* An 80' wide right of way shall be reserved at the entrance of subdivisions.
 - a. *Median Required for Entrance.* For all single access subdivisions the applicant shall design and construct a median at the entrance to segregate traffic flow. The applicant shall provide one 12-foot-wide ingress travel lane on the entrance side of the median and a minimum of two 12-foot-wide each egress travel lanes on the exit side of the

median. This entrance shall contain directional arrows and be striped accordingly with materials as approved by The Department of Public Works and as provided for within this UDC. The transition from this boulevard section to other roadway section shall be constructed in accordance with the requirements set forth in **Exhibit 900-3-2**.

- b. *Minimum Median Width.* The minimum width of the median shall 6 feet wide with a minimum radius at both ends of 3 feet.
- c. *Median Design.* The median shall be of a curb and crowned design with a turf or vegetative cover.
- d. *Curbing.* The curbing shall have a minimum height of 8 inches and minimum width of 7 inches at the bottom of the curb face and a minimum width of 6 inches at the top of the curb face.
- e. *Curb material.* Curbing shall be constructed of Portland cement concrete.
- f. *Groundcover.* The turf or vegetative cover shall be made up of grass and/or any other combination of living landscape materials such as trees, bushes, shrubs and flower beds.
- g. *Maintenance.* Maintenance of the median shall be the responsibility of the applicant and/or homeowners association following acceptance of the work by the Department of Engineering and Planning and Zoning Commission.

Exhibit 900-3-2: Requirements for Subdivision Where One Entrance is Provided

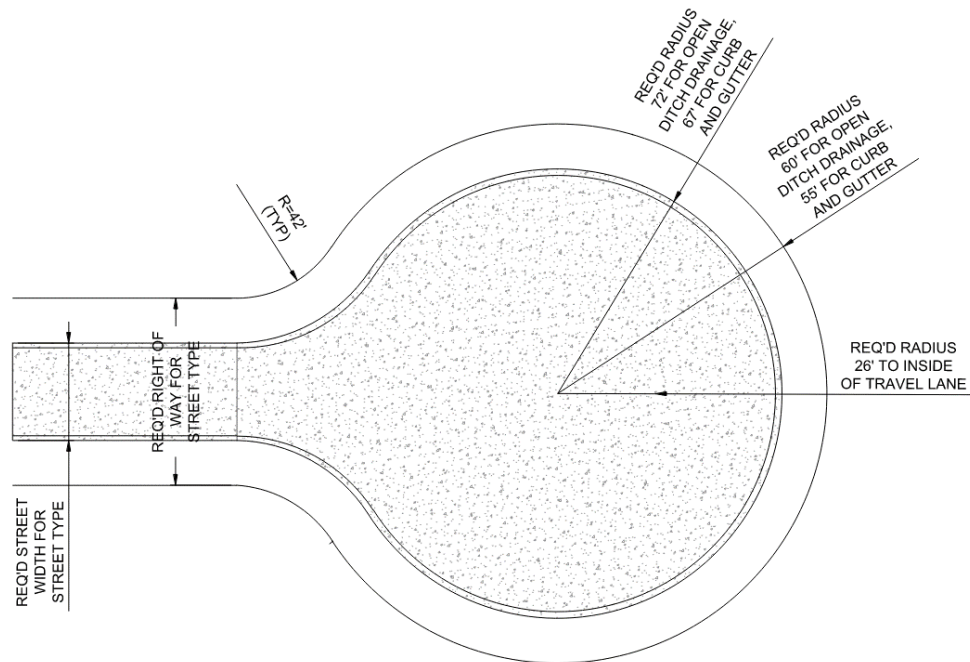


D. Dead End Streets.

Dead end streets are prohibited, however, cul-de-sacs or other approved turnarounds may be constructed, provided that the following minimum standards are met.

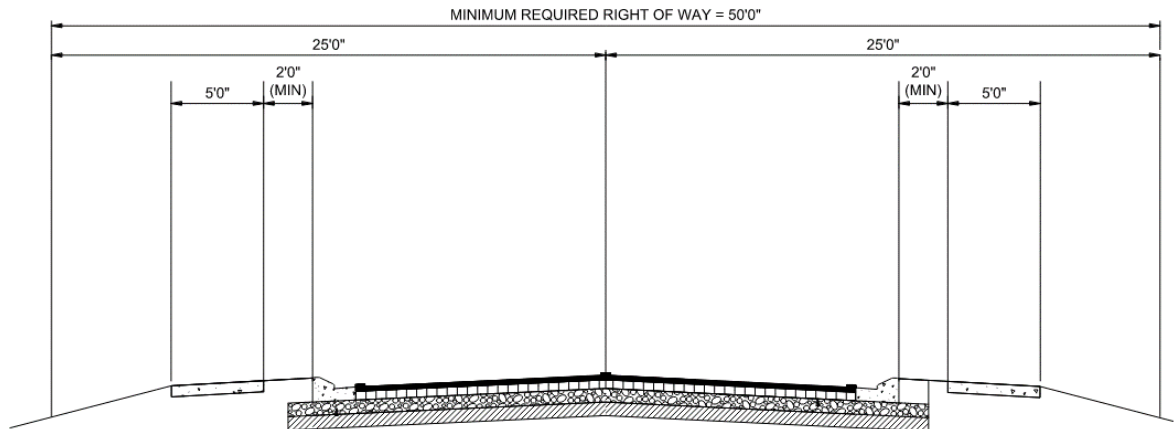
1. *Radius.* The radius of a cul-de-sac shall be 60 feet when the design employs open swale ditches and 55 feet when subsurface drainage is used. The inside turning radius shall be a minimum of 26 feet.
2. *Length.* A street terminated by a cul-de-sac shall be no longer than 700 feet in length.
3. *Signage.* The entrance to a street terminated by an approved turnaround shall be posted with a sign stating "No Outlet."
4. *Waiver.* The Planning Commission has the authority to waive the minimum design standards for streets terminated by a turnaround only when it is deemed reasonable and compatible with topography, aesthetics, planning, development, or need.
5. *Landscape Islands:* Curbed or uncurbed landscape islands shall not be permitted within any cul – de – sac.

Exhibit 900-3-3: Minimum Dimensional Requirement for Cul-De-Sac



E. Minimum Widths of the Right-of-Way.

1. *Minimum width.* The minimum width of right-of-way of public or private streets in any subdivision shall be 60 feet, except where concrete curb and gutter streets with subsurface drainage is provided. Streets having these features may be reduced to 50 feet in width.

Exhibit 900-3-4: Minimum Required Right-of-Way for Curb and Gutter Roadway

2. *Boulevards or Avenues.* Boulevards or avenues in any subdivision shall have a minimum right – of way not less than 80 feet wide.
3. *Connection to Existing Streets.* Streets that are obviously in alignment with others already existing shall bear the names of the existing streets.
4. *Street Names.* Duplication of street names must be avoided. In no case shall there be a duplication of a street or road name within a fire protection district or of new street names within any of the municipalities of the parish.
5. *Street Sign.* A uniform street sign system marking each street intersection must be installed by the applicant prior to obtaining Final Subdivision Plat approval, in accordance with the specifications referenced to within this article.
6. *Traffic Control Signs.* Traffic-control signs will be installed by the applicant, prior to obtaining Final Subdivision Plat approval and be in conformance with the requirements of this code. The applicant shall be responsible for the maintenance of all streets, drainage ditches and associated infrastructure until all improvements have been completed and until the associated Warranty Obligation is released.

SEC. 900-3.3 STREET DESIGN REQUIREMENTS.

A. Purpose.

The purpose of this section is to provide roadway design and construction standards to serve as a guide for acceptance of new roadways that will be private or dedicated to the public and placed into the parish roadway system for maintenance. It also provides guidelines for acceptance of existing private roadways into the roadway system.

B. Functional Classification.

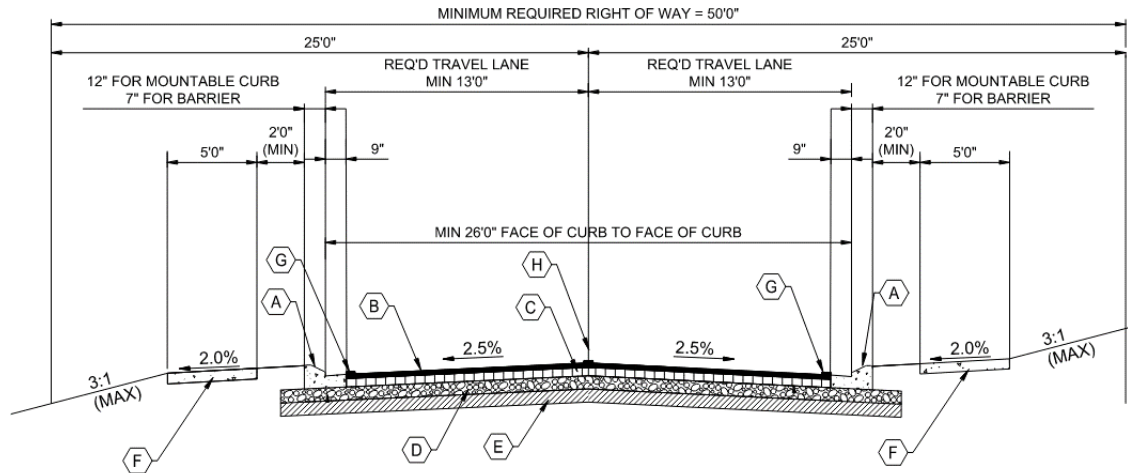
Unless otherwise provided for within this Code, the functional classification for existing roadways shall be determined by the Department of Engineering. The Department of Engineering shall utilize the latest version of the Statewide Highway Functional Classification Maps prepared by the Louisiana Department of Transportation and Development, Office of Multimodal Planning in cooperation with the U.S. Department of Transportation Federal Highway Administration.

C. Geometric Design.

1. *For Existing or Proposed Roadways with an AADT of 400 or Less:* All horizontal and vertical geometry for local streets with an AADT of 400 or less shall meet the American Association of State Highway and Transportation Officials (AASHTO) “Guidelines for Geometric Design of Very Low Volume Local Roads (ADT less than or equal to 400).
2. *For Existing or Proposed Roadways with AADT greater than 400.* All horizontal and vertical geometry for local streets shall meet the American Association of State Highway and Transportation Officials (AASHTO) “A Policy on Geometric Design of Highways and Streets,” latest edition, as modified by the Louisiana Department of Transportation and Development Road Design Manual.
3. *Design Speed.* The applicant shall utilize design criteria for a minimum design speed of 25 miles per hour. Horizontal and vertical geometry for collector streets shall meet the AASHTO “A Policy on Geometric Design of Highways and Streets,” latest edition, criteria for a design speed within the range of 30 mph to 45 mph as determined by the Department of Engineering.
4. *Minimum Requirements Horizontal Curves.* In no case shall a horizontal curve have a radius less than 200 feet. Tangent distance between reverse curves shall be 100 feet minimum. Horizontal curves shall be designed to provide for proper stopping sight and passing sight distance for the design speed of the roadway. Horizontal curves shall be circular curves. Compound and spiral curves shall be prohibited.
5. *Superelevation.* Superelevation is permitted for roadway design. Superelevation shall be limited to 4% for all roadways.
6. *Longitudinal Profile.*
 - a. *General.* Vertical curves shall be required when the algebraic difference in the change of grades is greater than 1%. Vertical curve shall be designed to meet the design values listed in American Association of State Highway and Transportation Officials (AASHTO) “A Policy on Geometric Design of Highways and Streets,” latest edition, criteria for the design speed of the roadway.

-
- i. *Curbed Roadways (Curb and gutter bottom).* Roadways with curb and gutter drainage shall have a minimum longitudinal grade of 0.35%.
 - ii. *Uncurbed Roadways.* Roadways with open ditch drainage shall not be required to maintain a minimum longitudinal slope. Ditch grades for all roadside ditches shall be greater than 0.1% in all cases.
 - iii. *Inlets.* Inlets shall be spaced as required to meet drainage design criteria specified within this code.
 - b. *Cross Slope.* Except where superelevation is required, the minimum cross slope shall be 1.5% towards the edge of the roadway and shall not exceed 2.5% from the edge of the roadway. Designs which provide drainage by providing a downhill slope from the edge of the roadway to the centerline to provide drainage shall be prohibited.
 - c. *Cross section elements and requirements.*
 - iv. The minimum width of all through travel lanes shall be 12'0".
 - v. The minimum width of all auxiliary lanes (such as turn lanes) shall be 11'0".
 - vi. Embankment foreslope and backslope shall not be steeper than 3H:1V.
 - vii. When open ditch drainage is provided, the minimum width of the ditch bottom shall not be less than 4'0". The bottom of the ditch shall be taken as the flow line (invert) of the ditch.
 - d. *Minimum width requirements.* The following figures illustrate minimum width requirements and embankment design requirements for various roadway types:

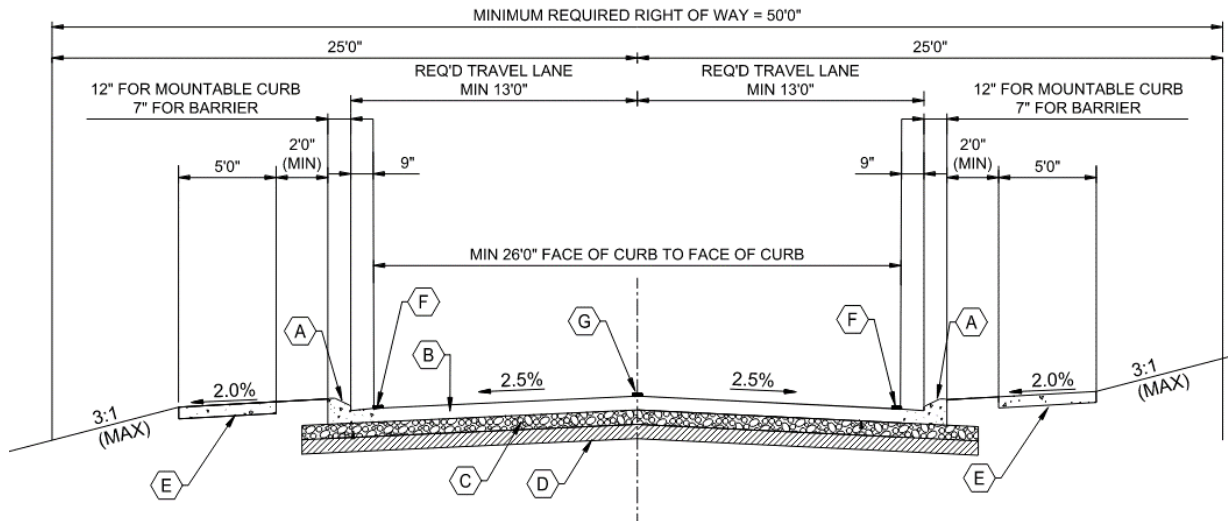
Exhibit 900-3-6: Cross Section Elements and Requirements for Curbed Roadway, 2-Lane, Asphalt Concrete Pavement



NOTES BY SYMBOL:

- A. PORTLAND CEMENT CONCRETE CURB AND GUTTER BOTTOM
- B. REQUIRED ASPHALT WEARING COURSE
- C. REQUIRED ASPHALT BINDER COURSE
- D. REQUIRED BASE COURSE
- E. REQUIRED GRANULAR MATERIAL OR STRUCTURAL FILL
- F. PORTLAND CEMENT CONCRETE SIDEWALK, IF PRESENT
- G. PAVEMENT EDGE MARKING (REQ'D FOR ROADS WITH AADT >500)
- H. PAVEMENT CENTERLINE MARKINGS (REQ'D FOR ROADS WITH AADT >500)

Exhibit 900-3-7: Cross Section Elements and Requirements for Curbed Roadway, 2-Lane, Portland Cement Concrete Pavement



NOTES BY SYMBOL:

- A. PORTLAND CEMENT CONCRETE CURB
- B. REQUIRED PLAIN JOINTED PORTLAND CEMENT CONCRETE PAVEMENT
- C. REQUIRED BASE COURSE
- D. REQUIRED GRANULAR MATERIAL OR STRUCTURAL FILL
- E. PORTLAND CEMENT CONCRETE SIDEWALK, IF PRESENT.
- F. PAVEMENT EDGE MARKING (REQ'D FOR ROADS WITH AADT >500)
- G. PAVEMENT CENTERLINE MARKINGS (REQ'D FOR ROADS WITH AADT >500)

Exhibit 900-3-8: Cross Section Elements and Requirements for Uncurbed Roadway, 2-Lane, Asphalt Concrete Pavement

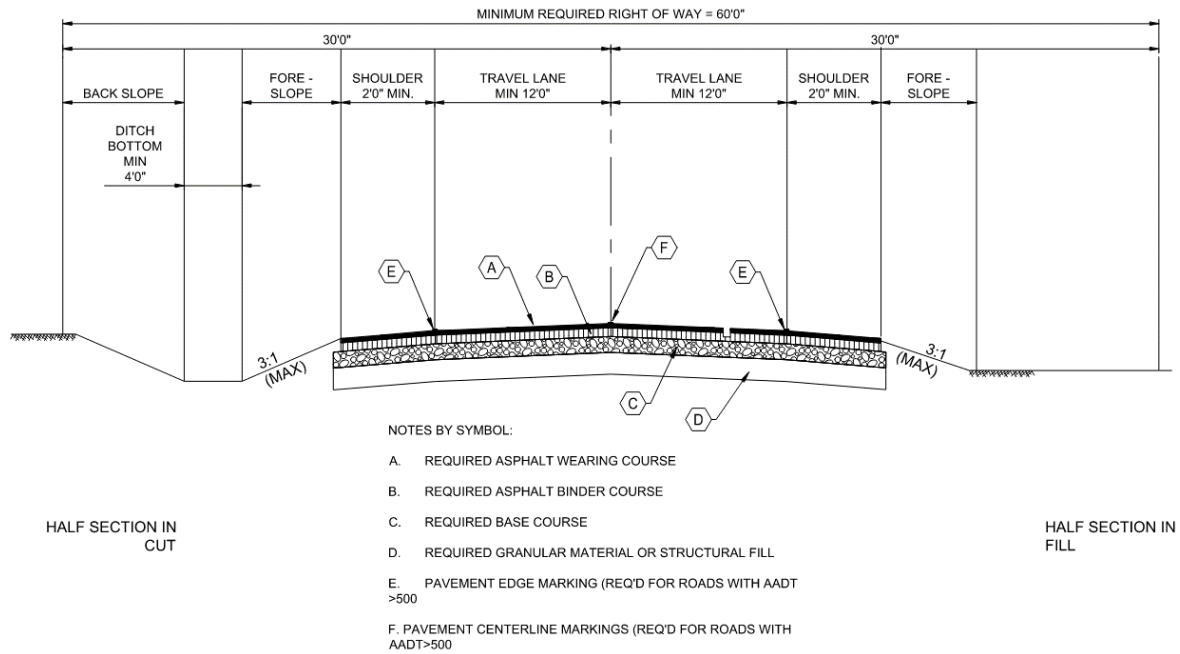


Exhibit 900-3-9: Cross Section Elements and Requirements for Uncurbed Roadway, 2-Lane, Portland Cement Concrete Pavement

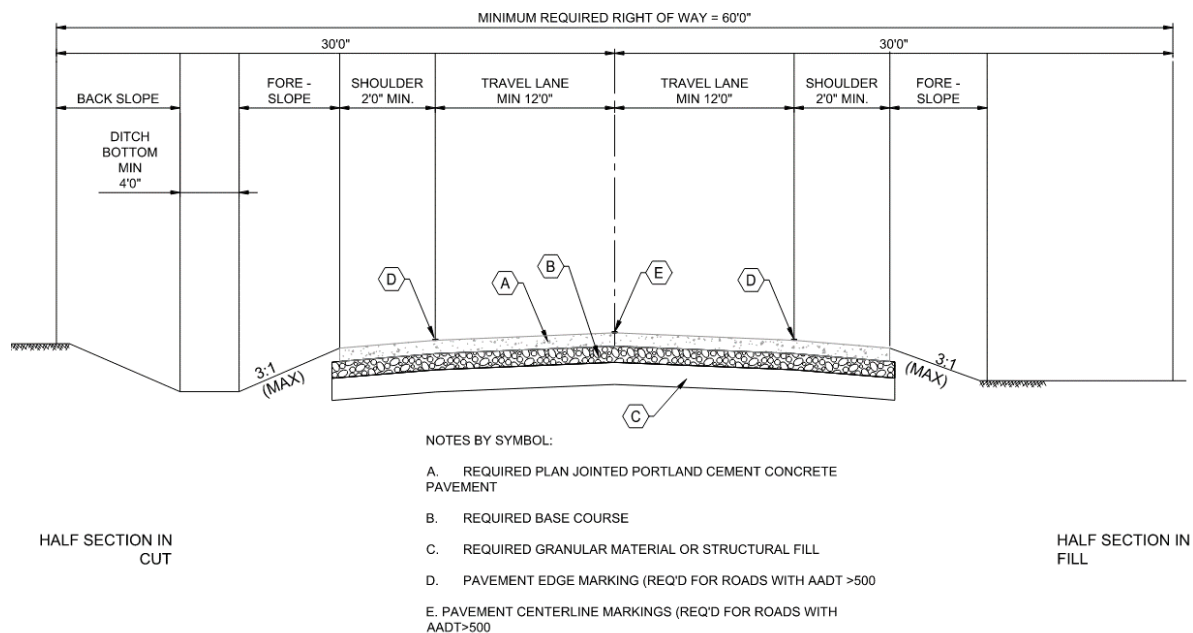


Exhibit 900-3-10: Cross Section Elements and Requirements for Uncurbed Roadway, 3-Lane Asphalt Concrete Pavement

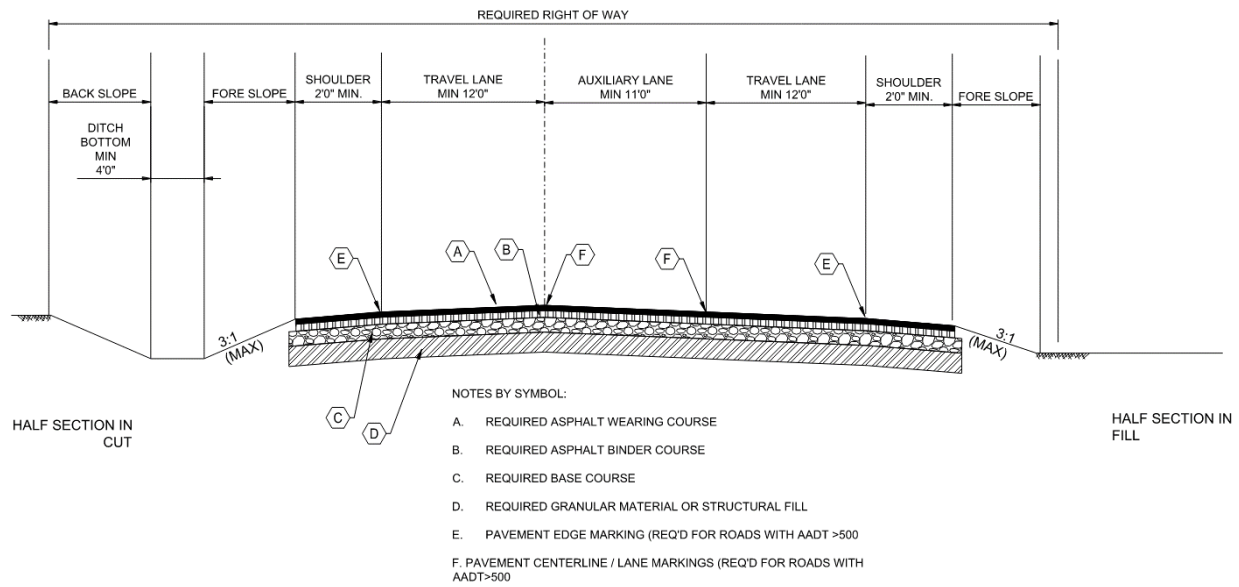


Exhibit 900-3-11: Cross Section Elements and Requirements for Uncurbed Roadway, 3-Lane Portland Cement Concrete Pavement

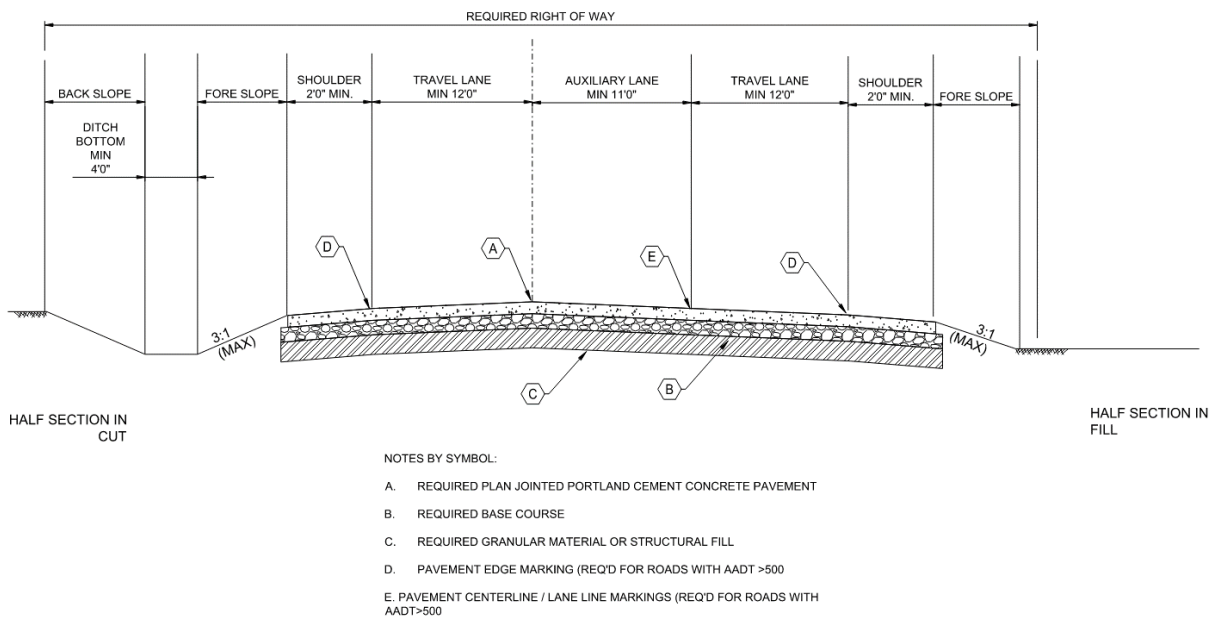
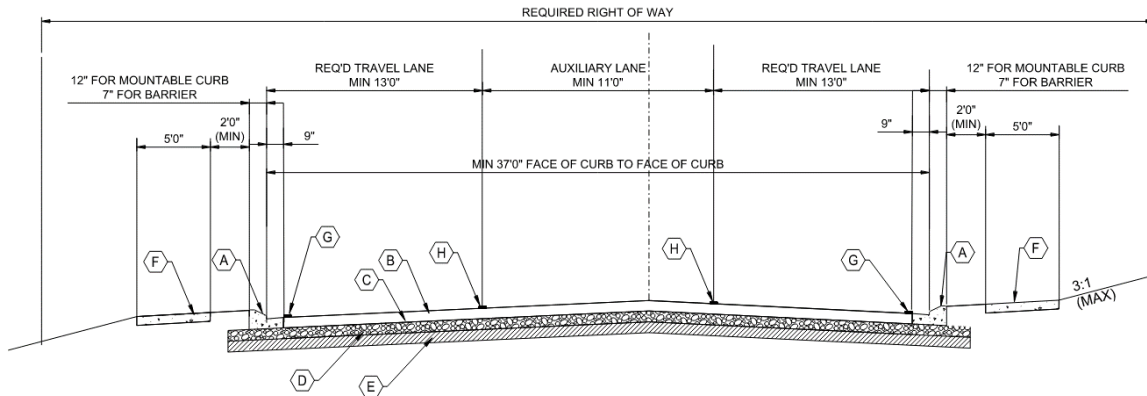


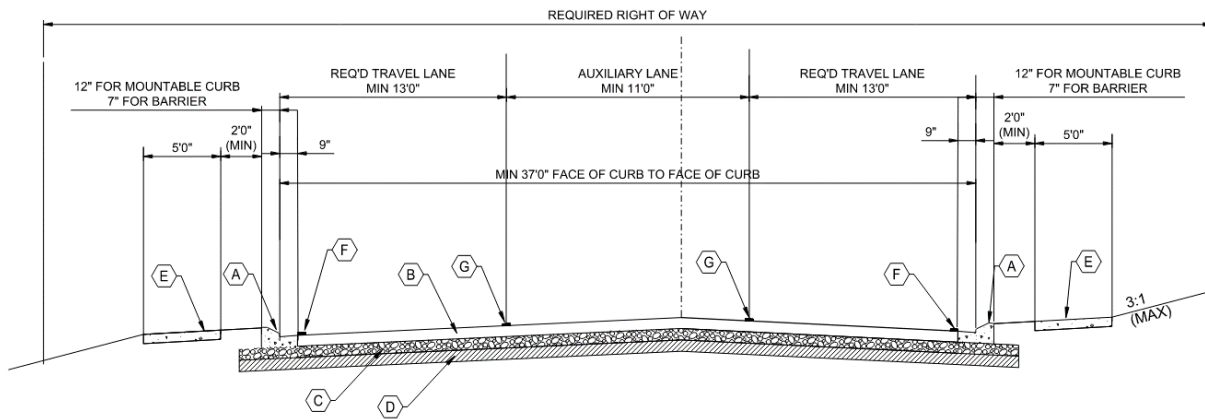
Exhibit 900-3-12: Cross Section Elements and Requirements for Curbed Roadway, 3-Lane Asphalt Concrete Pavement



NOTES BY SYMBOL:

- A. PORTLAND CEMENT CONCRETE CURB AND GUTTER BOTTOM
- B. REQUIRED ASPHALT WEARING COURSE
- C. REQUIRED ASPHALT BINDER COURSE
- D. REQUIRED BASE COURSE
- E. REQUIRED GRANULAR MATERIAL OR STRUCTURAL FILL
- F. PORTLAND CEMENT CONCRETE SIDEWALK, IF PRESENT.
- G. PAVEMENT EDGE MARKING (REQ'D FOR ROADS WITH AADT >500)
- H. PAVEMENT CENTERLINE MARKINGS (REQ'D FOR ROADS WITH AADT >500)

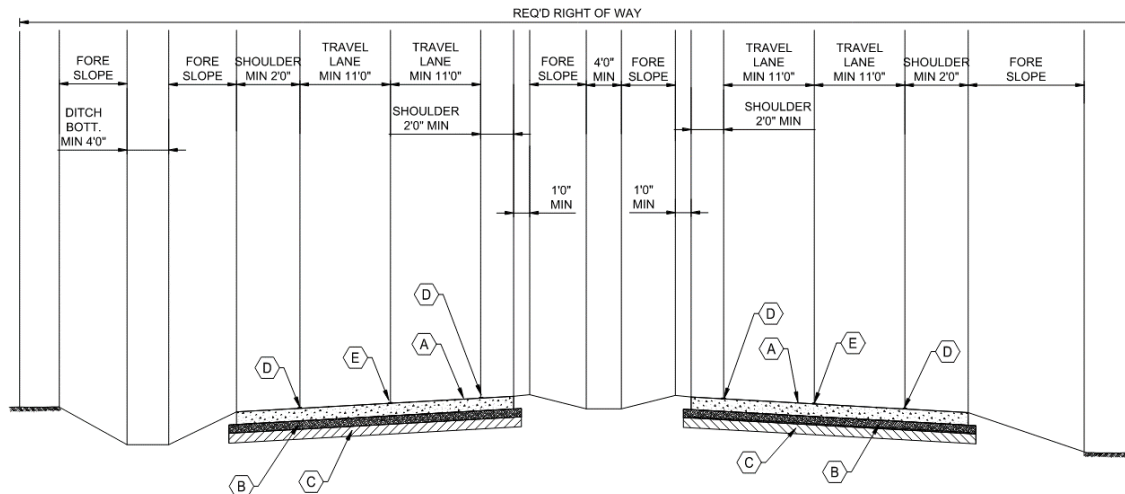
Exhibit 900-3-13: Cross Section Elements and Requirements for Curbed Roadway, 3-Lane Portland Cement Concrete Pavement



NOTES BY SYMBOL:

- A. PORTLAND CEMENT CONCRETE CURB
- B. REQUIRED PLAIN JOINTED PORTLAND CEMENT CONCRETE PAVEMENT
- C. REQUIRED BASE COURSE
- D. REQUIRED GRANULAR MATERIAL OR STRUCTURAL FILL
- E. PORTLAND CEMENT CONCRETE SIDEWALK, IF PRESENT.
- F. PAVEMENT EDGE MARKING (REQ'D FOR ROADS WITH AADT >500)
- G. PAVEMENT CENTERLINE MARKINGS (REQ'D FOR ROADS WITH AADT >500)

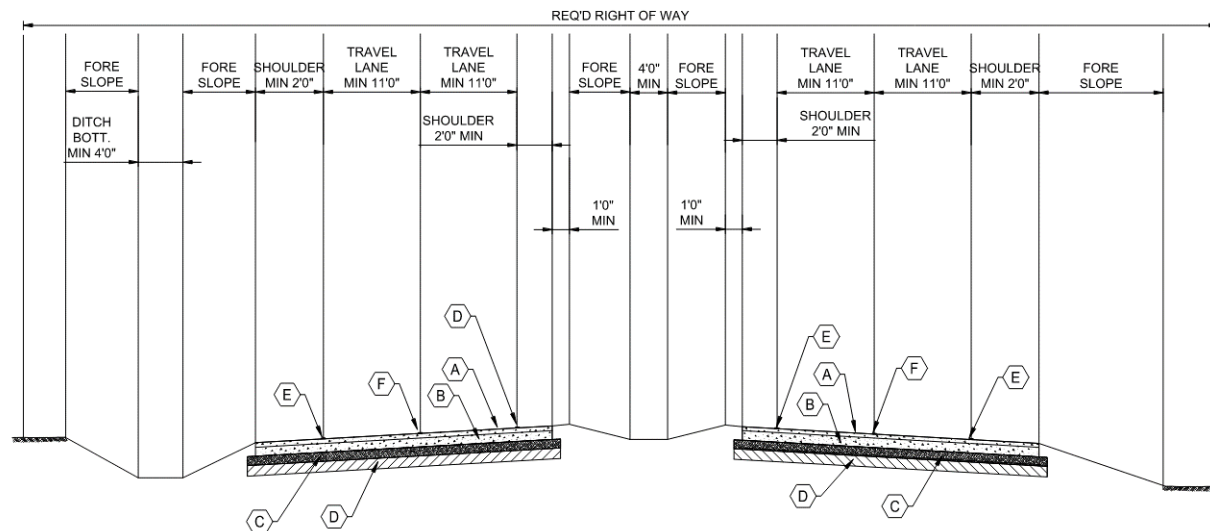
Exhibit 900-3-14: Cross-Section Elements and Requirements for Uncurbed Roadway, 4 Lanes, Portland Cement Concrete Pavement



NOTES BY SYMBOL:

- A. REQUIRED PLAN JOINTED PORTLAND CEMENT CONCRETE PAVEMENT
- B. REQUIRED BASE COURSE
- C. REQUIRED GRANULAR MATERIAL OR STRUCTURAL FILL
- D. PAVEMENT EDGE MARKING (REQ'D FOR ROADS WITH AADT >500)
- E. PAVEMENT CENTERLINE / LANE LINE MARKINGS (REQ'D FOR ROADS WITH AADT >500)

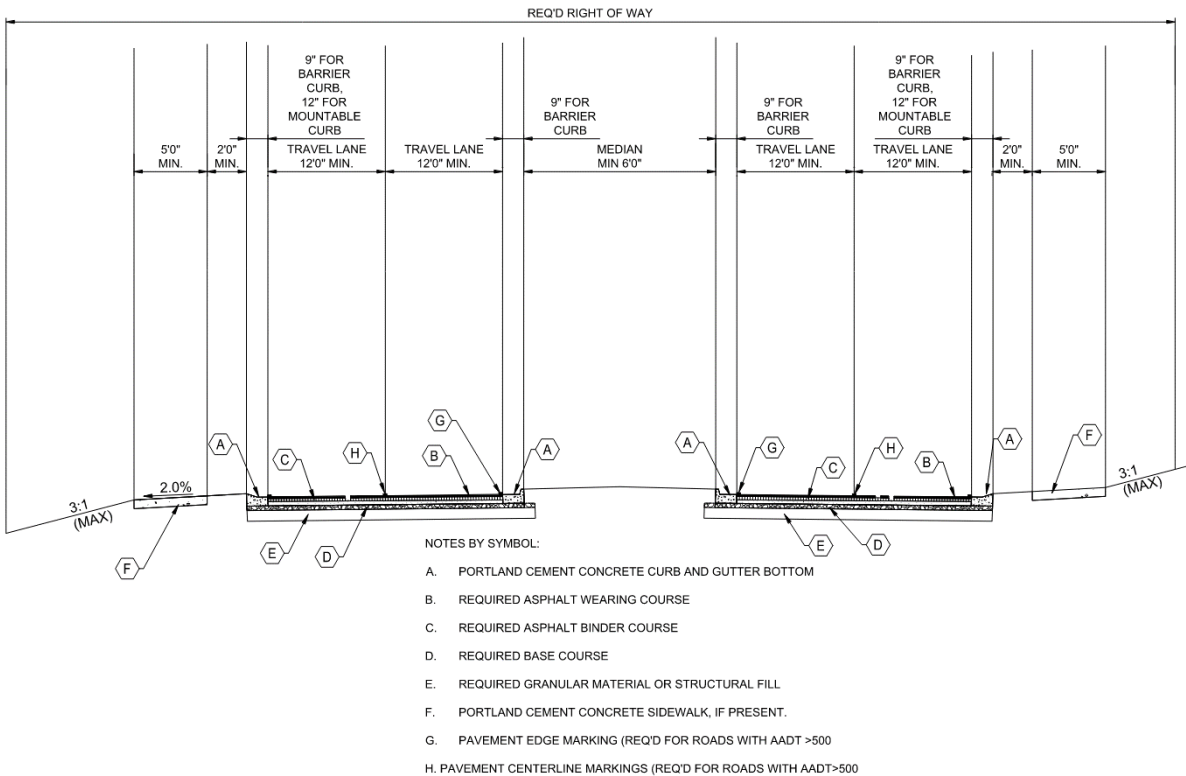
Exhibit 900-3-15: Cross Section Elements and Requirements for Uncurbed Roadway, 4 Lanes, Asphalt Concrete Pavement



NOTES BY SYMBOL:

- A. REQUIRED ASPHALT WEARING COURSE
- B. REQUIRED ASPHALT BINDER COURSE
- C. REQUIRED BASE COURSE
- D. REQUIRED GRANULAR MATERIAL OR STRUCTURAL FILL
- E. PAVEMENT EDGE MARKING (REQ'D FOR ROADS WITH AADT >500)
- F. PAVEMENT CENTERLINE / LANE MARKINGS (REQ'D FOR ROADS WITH AADT >500)

Exhibit 900-3-17: Typical Section Requirements for 4 Lane Roadway (with Curb and Gutter)



D. Pavement Design, General.

1. *Methodology.* Applicants shall design pavement sections utilizing the general methodology prescribed within this section. Applicants may provide Portland cement concrete (rigid) or asphaltic concrete (flexible) pavements designed and constructed in accordance with the requirements of this code.
2. *Design Period.* The design period is the time from the original construction to a terminal condition for a pavement. The design period for all roadways shall be 20 years.
3. *Traffic Forecasting for Pavement Design.* The applicant shall provide an estimate of the traffic volume for the design life of the proposed roadway prepared by a professional engineer registered in the State of Louisiana. The traffic forecast shall include:
 - a. Estimated Two Way Traffic (Average Daily Traffic)
 - b. Estimated Percent of Trucks in Design Direction.
 - c. Number of Lanes in Design Direction.
 - d. Percent of All Trucks in Design Lane.
 - e. Percent Trucks in Design Direction.
 - f. Estimate of Percent of ADT for FHWA Vehicle Classes 1 through 13, inclusive.

- g. Estimated Annual % Growth.
 - h. Estimated Annual % Growth for Trucks.
 - i. Accumulated 18 – kip ESALS for Performance Period for FHWA Vehicle Classes 1 through 13, inclusive.
4. Accumulated 18 – kip ESALS for Performance Period for each FHWA Vehicle Class shall be calculated from the following equation:

$$ESAL, Vehicle\ Class = (ADT_{Vehicle\ Class})(T)(A)(G)(D)(L)(365)(Y)$$

5. The total ESAL for the Performance Period shall be calculated from the following equation:

$$ESAL, Total = \sum_i^n ESAL, Vehicle\ Class, i + \dots + ESAL, Vehicle\ Class, n$$

6. *Minimum ESAL Loadings for Various Roadways and Pavements.* Pavement sections shall be designed for the accumulated ESALS calculated in the traffic forecast or the number of ESAL's contained below, whichever is greater.

Type of Roadway	Minimum Design ESAL for Pavement Loading
Parking Lots	10,000
Residential Streets, Rural Farm and Residential Roads	50,000
Urban Minor Collector Streets, Urban Minor Collector Roads	100,000
Urban Minor Arterial and Light Industrial Streets, Rural Major Collector and Minor Arterial Highways	1,000,000
Urban or Rural Principal Roads	3,000,000

Design Values: Values. The following design values are to be utilized for the determination of required ESALS for pavement design:

Design Variable	Required Value
Growth Factor, G	1.5, compounded annually for the period of analysis
Lane Distribution Factor, L	1.0 where traffic counts or forecasts are bi – directional, 0.5 where traffic counts are not bi – directional
Equivalency Factor, A	Per Tables

No. of Years for Analysis, Y		20 minimum	
Truck Factor, T		1	
Flexible Pavement Equivalency Factors – Flexible Pavement (Asphalt Concrete Pavement)			
FHWA Equivalency Class	Description	Required Factor	Equivalency
1	Motorcycles	0.0005	
2	Passenger Cars	0.0005	
3	Other Two Axle Single Unit Vehicles	0.0188	
4	Buses	0.1932	
5	Two Axle, Six – Tire Single Unit Trucks	0.1932	
6	Three Axle, Single Unit Trucks	0.4095	
7	Four or More Axle Single Unit Trucks	0.4095	
8	Four or Less Axle Single Trailer Trucks	0.8814	
9	Five Axle Single Trailer Trucks	1.1000	
10	Six or More Axle Single Trailer Trucks	1.4500	
11	Five or Less Axle Multi Trailer Trucks	1.8400	
12	Six Axle Multi Trailer Trucks	1.8400	
13	Seven or More Axle Multi Trailer Trucks	1.8400	

Rigid Pavement Equivalency Factors – Rigid Pavement (Portland Cement Concrete Pavement)		
FHWA Equivalency Class	Description	Required Equivalency Factor
1	Motorcycles	0.0004
2	Passenger Cars	0.0004
3	Other Two Axle Single Unit Vehicles	0.0173
4	Buses	0.1904

5	Two Axle, Six – Tire Single Unit Trucks	0.1904
6	Three Axle, Single Unit Trucks	0.5934
7	Four or More Axle Single Unit Trucks	0.5934
8	Four or Less Axle Single Trailer Trucks	1.022
9	Five Axle Single Trailer Trucks	1.7901
10	Six or More Axle Single Trailer Trucks	2.8730
11	Five or Less Axle Multi Trailer Trucks	1.8400
12	Six Axle Multi Trailer Trucks	1.8400
13	Seven or More Axle Multi Trailer Trucks	1.8400

E. Pavement Design, Flexible Pavement (Asphalt Concrete Pavement (ACP)).

1. All When providing flexible pavement, applicant shall design the pavement using the traffic forecast for pavement design and design the pavement utilizing the flexible pavement methodology contained within the Louisiana Department of Transportation and Development Pavement Design Guide (13), Chapter 6, Flexible Pavement Design.
2. *Methodology.* The applicant shall provide a pavement design with a design Structural Number which exceeds the required structural number as determined utilizing the equation below. Inputs required are depicted within the Table below:

$$\log_{10} W_{18} = Z_R S_o + 9.36 * \log_{10}(SN + 1) - 0.20 + \frac{\log_{10}\left(\frac{PSI}{4.2-1.5}\right)}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 * \log_{10} M_R - 8.07$$

Design Variable	Required Value
Performance/Design Period	20 Years
Traffic (Expressed in 18 Kip Equivalent Single Axle Loads, ESAL over design period)	Computed as prescribed by Code
Reliability Level, Z _r	97
Serviceability Index, Initial	4.0

Serviceability Index, Final	2.0
Delta PSI	2.0
Overall Standard Deviation, So	0.47
Effective Soil Resilient Modulus, Mr	As determined by applicant's geotechnical investigation.
Layer Coefficients, SN/Inch	As provided for further herein
Drainage Coefficient, Cd	0.90

3. Calculation of Structural Number of Proposed Pavement Section. Design Structural Number of the proposed pavement section shall be calculated utilizing the following equation:

$$SN = a_1D_1 + a_2D_2 + a_3D_3$$

4. *Acceptable Design Values*. Design values to be utilized for layer coefficients for design of Flexible Pavement are as follows:

Layer Material	Layer Coefficient, SN/Inch
Superpave Asphalt Concrete Pavement	0.44
Crushed Stone, Crushed Slag, or Recycled Portland Cement Concrete Base Course	0.14
Soil Cement (Stabilized) Base Course	0.14
Soil Cement (Treated) Base Course	0.10
Superpave Asphalt Concrete Base Course	0.33
Soil Cement or Crushed Stone Subbase Course	0.14

5. Minimum Typical Section. The minimum typical section for any asphaltic concrete street or roadway shall consist of 4 inches of Superpave asphaltic concrete with 8 inches of base course placed over 12" of AASTHO A-4 or better fill placed over a proof rolled subgrade, all furnished, placed, compacted, and finished in accordance with the requirements of this code.
6. Asphalt Mixture Requirements. Asphalt mixtures shall be a SUPERPAVE Asphaltic Concrete Mixture which shall be produced, transported, and placed in accordance with the requirements of the Louisiana Standard Specifications for Roads and Bridges and the Louisiana Department of Transportation and Development "Application of Quality Assurance Specifications for Asphalt Concrete Mixtures", and the requirements for street construction contained within this UDC.

F. Pavement Design, Rigid Pavement (Portland Cement Concrete Pavement (ACP)).

1. When providing rigid pavement, applicant shall design the pavement using the traffic forecast for pavement design and design the pavement utilizing the flexible pavement methodology contained

within the Louisiana Department of Transportation and Development Pavement Design Guide (13), Chapter 7, Rigid Pavement Design.

2. *Methodology.* The applicant shall provide a pavement design with a design thickness which exceeds the required thickness as determined utilizing the equation below. Inputs required are depicted within the Table below:

$$\log_{10} W_{18} = Z_R S_o + 7.35 * \log_{10}(D + 1) - 0.06 + \frac{\log_{10}\left(\frac{PSI}{4.2-1.5}\right)}{1 + \frac{1.634 * 10^7}{(D+1)^{8.46}}} + (4.22 - 0.32 P_t) * \log_{10} \frac{S'_c C_d [D^{0.75} - 1.132]}{215.63 * f * \left[D^{0.75} - \frac{18.42}{\left(\frac{E_c}{K}\right)^{0.25}} \right]}$$

Acceptable Design Values.

Design Variable	Required Value
Performance/Design Period	20 Years
Traffic (Expressed in 18 Kip Equivalent Single Axle Loads, ESAL over design period)	Computed as prescribed by Code
Reliability Level, Z _r	97
Serviceability Index, Initial	4.0
Serviceability Index, Final	2.0
Delta PSI	2.0
Overall Standard Deviation, S _o	0.37
Modulus of Rupture, S' _c	600 PSI
Elastic Modulus of Concrete	4.2 x 10 ⁶ PSI
Drainage Coefficient, C _d	0.9
Load Transfer Coefficient	2.5
Mean Effective k value	As determined by applicant's geotechnical investigation.

3. *Minimum Typical Section.* The minimum typical section for any Portland cement concrete pavement street or roadway shall be six inches of Portland cement concrete with 12 inches of AASHTO A-4 or better base material over a proof rolled subgrade, all furnished, placed, compacted, and finished in accordance with the requirements of this code.

- a. *Portland Cement Concrete Pavement Mixture Requirements.* Portland cement concrete mixtures shall be a Type B, D, or E Portland cement concrete mixture which shall be

produced, transported, and placed, finished, and cured in accordance with the requirements of the Louisiana Department of Transportation and Development “Application of Quality Assurance Specifications for Portland Cement Concrete Pavement and Structures” and the requirements of this code.

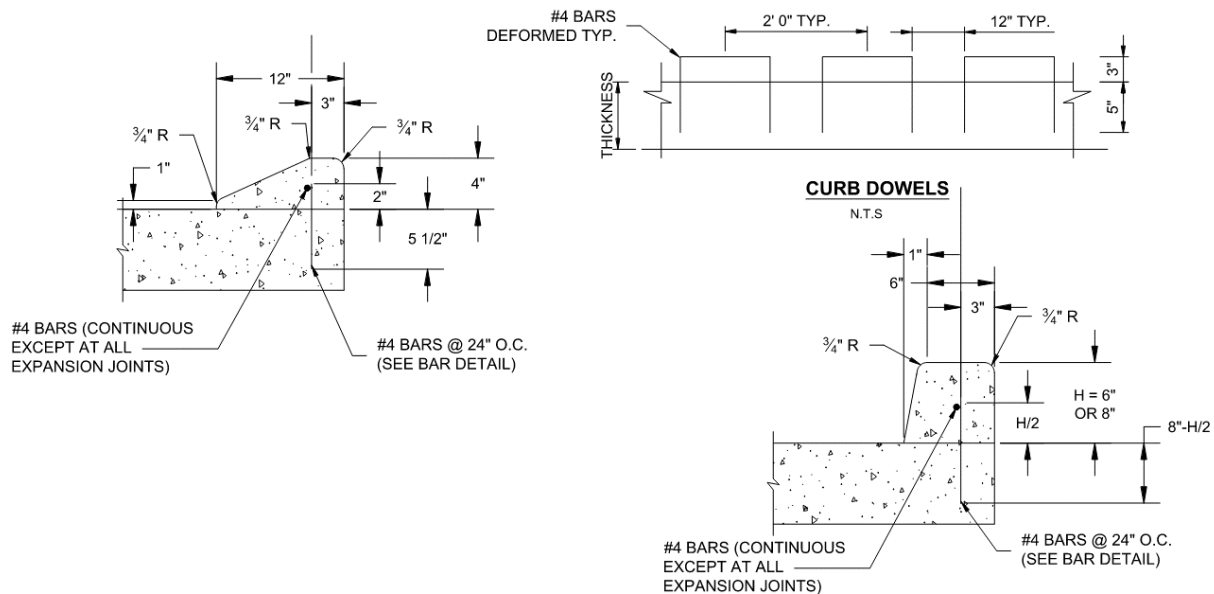
b. Jointing Requirements.

- i. *Expansion Joint.* At a minimum, concrete pavements shall be provided with doweled expansion joints at all intersections and headers and at intervals not to exceed 100 feet.
- ii. *Contraction Joints.* Contraction joints shall be provided at intervals not to exceed 20 feet but not less than 10 feet.
- iii. *Longitudinal Joints.* Longitudinal joints shall be provided at all split slab construction locations.
- iv. Jointing requirements shall be as illustrated on the current edition of the Louisiana Department of Transportation and Development Standard Plan CP-01.

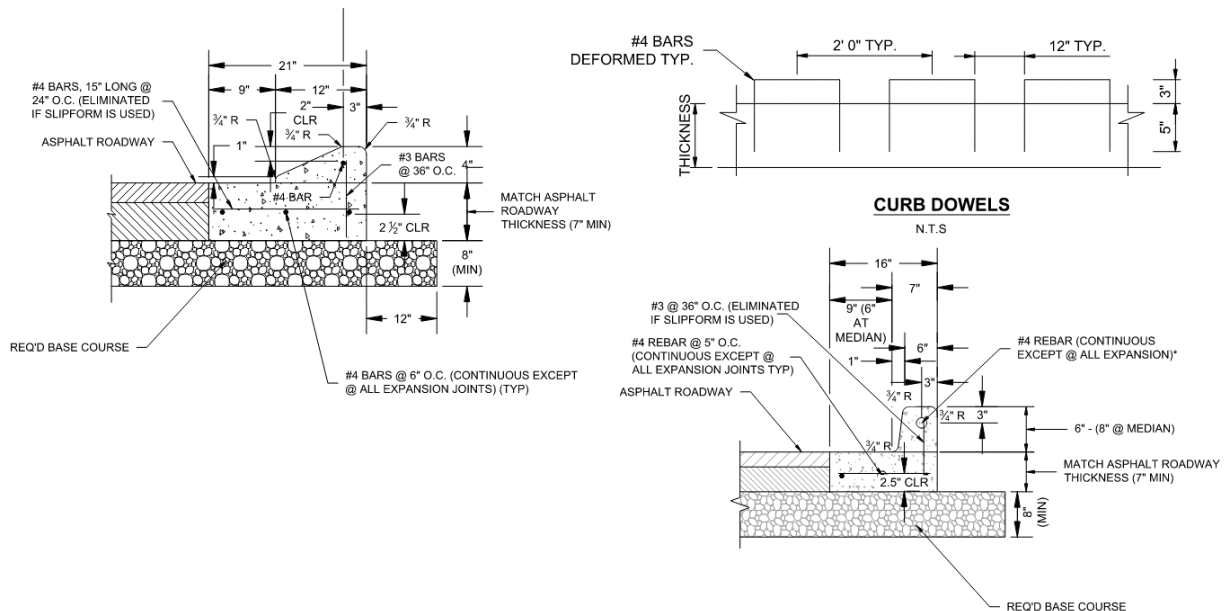
G. Curbs and Gutters for Streets.

1. *Rigid Pavement (Portland Cement Concrete Pavement).* Curb and gutter streets for asphalt concrete pavement streets shall be constructed of Portland cement concrete conforming to the dimensions illustrated in **Exhibit 900-3-18**.

Exhibit 900-3-18: Requirements for Curbs on Portland Cement Concrete Streets



2. *Flexible Pavement (Asphalt Concrete Streets).* Curb and gutter streets for asphalt concrete pavement streets shall be a combination curb and gutter bottom constructed of Portland cement concrete conforming to the dimensions illustrated in **Exhibit 900-3-19**.

Exhibit 900-3-19: Requirements for Curbs on Asphalt Concrete Streets

3. *Barrier Curb.* Barrier curbs shall be provided at all intersections and all medians.
4. *Depressed Curb.* The applicant may provide depressed curb or rollover/mountable curb at driveways.
5. *Rollover / Mountable Curb.* Rollover curb shall be provided on all streets except where barrier curb is required.

H. Procedure for Approval, New Roadways Built by Applicants and Remain Private or Accepted into the Parish Roadway System.

1. Upon approval of Final Proposed Subdivision Plat and Construction Plan by the parish Planning and Zoning Commission, a geotechnical investigation, including a pavement design, shall be conducted by a licensed engineering firm registered in the State of Louisiana and retained by the applicant. The geotechnical report shall be submitted to the Department of Engineering for review and approval.
2. The subsurface soil investigation shall have an adequate scope to sufficiently design the roadway embankment. The scope of the subsurface soil survey shall include, but not be limited to, the following:
 - v. Soil borings shall be drilled to a depth of 6 feet at 500-foot intervals and not less than three borings per roadway section. At a minimum, the borings shall indicate the various soil stratifications and groundwater elevation.
 - vi. Laboratory testing shall be conducted on selected samples, including, but not limited to, moisture content, unconfined compressive strength, Atterberg limits determination and percent fines. Other laboratory testing and analysis, such as consolidation tests and embankment stability analysis for high fill

areas, shall be performed, if necessary, at the discretion of the applicant's licensed professional engineer registered in the State of Louisiana and the Department of Engineering.

- vii. The pavement design shall be based on the geotechnical investigation field data and laboratory test results, as well as a projected average daily traffic which includes the traffic resulting from the complete development of all land to be served by the subject roadway, including traffic forecast to be generated by the development, both internal and external to the development under consideration and in accordance with the pavement design requirements of this UDC.

I. Procedure for Approval, Parish Acceptance of Private Roadway, Requirements for Accepting an Existing or Recently Constructed Private Roadway into the Parish Roadway System.

1. Should an existing or recently built private roadway be considered for inclusion in the parish roadway system, the following geotechnical investigation shall be conducted by the applicant's licensed professional engineer registered in the State of Louisiana to verify compliance with the parish roadway design standards. This includes, but is not limited to, verification of pavement thickness as well as type and thickness of roadway base and sub-base.
 - a. Roadway cores. Roadway cores shall be obtained at 500-foot intervals.
 - b. For rigid pavement. the thickness shall be recorded and the compressive strength of the concrete shall be tested on the pavement cores for compliance with the parish roadway design requirements.
 - c. For flexible pavement. the thickness and density of the pavement cores shall be verified for compliance with the roadway design requirements.
 - d. Soil borings. At the core locations, soil borings shall be conducted to a depth of at least three feet below the bottom of the pavement to verify the type and thickness of the pavement base and sub-base.
 - e. Laboratory testing. Laboratory testing shall be conducted on selected samples from the roadway borings to classify the fill used for compliance with the roadway design and parish requirements.
 - f. Testing and inspection reports. Available reports of testing and inspection, conducted during construction by the applicant, shall be provided to the Department of Engineering for review. This shall include testing and inspection reports of Portland cement concrete or asphaltic concrete, reports of field density tests conducted on the roadway base material and any underlying fill.
 - g. Geotechnical investigations. Analysis of the pavement design for the existing roadway shall be based on the findings from the geotechnical investigation as well as the anticipated average daily traffic in the area.
 - h. Acceptance. Acceptance of the roadway will be decided by the Department of Engineering based on the results of the pavement analysis. Furthermore, the parish may require funded

certification of conformance through the establishment of performance and/or warranty letters of credit, to ensure that the applicant's obligation to construct the roads to the required standards is accomplished.

2. Should the roadway be found not to be in compliance with the parish standards, the roadway may be rejected or recommendations may be provided by the Department of Engineering to bring it up to the parish roadway standards. Furthermore, the parish may require a minimum of two years and a maximum of five years funded warranty letters of credit to ensure the integrity and durability of the street. The parish reserves the right to accept or reject streets that are deemed not up to the parish standards.

J. Roadway Widening.

The design for a widened roadway, when a part of a mitigation proposal or when required to bring existing roadways up to Parish Standards, shall take into consideration the anticipated new traffic load the road will be subjected to. At a minimum, the widened section of the road shall have a pavement section that is equivalent to the existing road or better if additional traffic load is anticipated based upon the results of the Traffic Impact Analysis. A subsurface investigation shall be conducted along the new section of the road that will be widened. The width of the widening shall be as necessary to meet the minimum lane width and shoulder requirements of this code. The scope of the subsurface soil investigation shall include, but not be limited to, the following:

1. Soil borings shall be drilled to a depth of six feet at 500-foot intervals, but not less than three borings per roadway section. Pavement cores shall be obtained from the existing roadway alignment at 1,000-foot intervals with a minimum of two cores per roadway section. The existing thickness of the pavement and underlying base as well as the sub-base type shall be investigated and considered in the pavement design.
2. Laboratory testing shall be conducted on selected samples, including, but not limited to, moisture content, unconfined compressive strength, Atterberg limits and percent fines.
3. The pavement design shall be based on the geotechnical investigation field data and laboratory test results as well as a projected average daily traffic including the anticipated future traffic for the widened road.

K. Minimum Roadway Elevation.

The minimum elevation for any street as measured at the lowest point of the travel lanes shall be at least 6.0' NAVD 88 GEOID03. This requirement may be adjusted when site conditions make compliance unsafe or infeasible as determined by the Department of Engineering.

L. Private Drives Minimum Standards.

Apart from a private drive accessing one lot or parcel, the following minimum construction standards shall apply:

1. An owner who creates a private drive to access more than one lot or parcel, but no more than five, shall dedicate through title, deed and or covenant, a perpetual servitude of access with a minimum width of 35 feet.
2. The actual driving surface shall be a minimum of 20 feet in width with two-foot shoulders on each side of the drive and 5.5 feet on each side of the shoulder devoted to ditching/drainage and or utilities.

3. The drive shall be constructed with suitable compacted subbase materials and overlaid with an aggregate material (i.e., shell, gravel, limestone, three-course treatment, asphalt, concrete, etc.) that is acceptable to the Department of Engineering.
4. A ditch or ditches shall be constructed on either one or both sides of a drive-in accordance to standard practices adopted by the Department of Engineering in order to provide adequate drainage.
5. Any private drive created must be given a name and depicted on the Preliminary and Final Subdivision Plats, only after first obtaining approval for said name, in writing, from the St Tammany Parish Communications District 911 addressing officer.
6. Plans for the construction of the private drive and drainage must be performed by a licensed professional engineer registered in the State of Louisiana and submitted to the Department of Engineering for review and approval prior to the initiation of work.
7. After the private drive has been constructed and drainage improvements made, the responsible owner shall submit to the Department of Engineering an as – built plan showing conformance to the previously approved plans.
8. Following submittal of the as – built plan, the applicant shall contact the Department of Engineering to schedule an inspection.
9. Once the private drive has been constructed and all drainage improvements completed and approved by the Department of Engineering, then, and only then, can the minor subdivision be recorded for public record with the Clerk of Court's office and the lots sold or donated.
10. The owner selling or donating lots or parcels to others shall be solely responsible for establishing a maintenance agreement specifying the entity or entities whom shall provide maintenance and upkeep for the private drive. Copies of the agreement must be provided to the Departments of Engineering and Planning and Development for their files.
11. A private drive cannot under any circumstances be dedicated as a public right-of-way unless said drive is upgraded to meet the definition and standards of a "private street" or "public street" pursuant to this chapter.
12. Only one main private drive shall be permitted per each minor subdivision.

SEC. 900-3.4 CONSTRUCTION REQUIREMENTS FOR STREETS

A. Clearing and Grubbing for Street Construction.

1. The applicant shall provide for the clearing, grubbing, removing and disposing of vegetation and debris within the limits of the right-of-way and easement areas shown on the approved subdivision plans, except such items that are designated to remain.
2. This shall include but not be limited to cutting trees, logs, brush, stumps and debris; excavating and removing stumps, roots, submerged logs, snags and other vegetative or objectionable material; disposing of removed material in a legal manner and cleaning the area.
3. The subdivision plans shall indicate items to remain. The applicant shall preserve the items designated to remain.

4. Trees shall be removed without damaging items marked to remain. In case of damage to bark, trunks, limbs or roots of vegetation marked to remain, the applicant shall repair such damage by horticultural and tree surgery practices published by the American Association of Nurserymen (AAN).
5. Clearing and grubbing shall be done within the construction limits and to a point in fills 15 feet beyond the toes of fore slopes and in cuts 15 feet beyond the tops of backslopes, when width of right-of-way permits, or to the limits shown on the plans; also from areas required for outfall ditches and channel changes. Trees, stumps, roots and other protruding vegetative obstructions not designated to remain shall be cleared and grubbed.
6. Undisturbed stumps, roots and nonperishable solid objects which will be a minimum of one foot below the subgrade or slope of embankments will be permitted to remain provided they do not extend more than six inches above the original ground line or low water level.
7. Except in areas to be excavated, stump holes and other holes left from clearing and grubbing shall be backfilled with usable soil which shall be thoroughly compacted.

B. Removal of Structures and Obstructions.

The applicant shall provide for the removal and legal disposal of pavements, sidewalks, curbs, gutters and other obstructions not designated or permitted to remain.

C. Preparation of Subgrade.

1. The applicant shall provide all work to cause all roadway subgrade to conform to the lines and elevations shown on the approved plans.
2. The surface of the finished subgrade shall be parallel to and conform to the cross section of the roadway pavement.
3. Berms, ridges of earth, or other material that will interfere with the immediate discharge of water to the side of the crown shall not be left on the subgrade. The subgrade shall be maintained free from ruts so that it will, at all times, drain properly with no standing water.
4. Stumps and roots exposed in the preparation of the subgrade shall be either removed or excavated to a depth of not less than foot below the subgrade and the resultant excavation filled with usable soil and compacted.
5. When the subgrade strength is sufficiently strong to support construction traffic without rutting, heavy equipment may be used.
6. The subgrade shall be uniformly compacted by light weight roller (five tons). When the subgrade is in a wet condition, it shall be allowed to dry until the material is within reasonable limits of optimum moisture before compaction is attempted.
7. Upon completion of compaction by light weight roller the exposed subgrade areas shall be properly proof rolled to verify suitability of subgrade to receive the base course.
8. Proof roll shall consist of passing over the exposed surface with a 25 ton (+/- 1-ton) loaded tandem dump truck during dry weather and observed by the Department of Engineering. Result of observations shall be documented including horizontal limits of area rolled, approximate extent of vertical deflections, and any observed excessive rutting or pumping (soft spots). Excessive rutting

shall be considered prolonged deflection (rutting) in excess of 1-inch for new construction or ½-inch for reconstruction. Excessive pumping shall be considered temporary deflection with rebound (pumping) in excess of 1-inch for new construction or ½-inch for reconstruction.

9. Areas of surface soils that are observed to excessively rut or excessively pump under the truck load (unsuitable subgrade) shall be removed, replaced with embankment, and compacted.
10. When subgrade is approved as the subbase for the pavement base material, it shall be constructed to have, as nearly as practicable, a uniform density throughout its entire width. Wherever the subgrade extends beyond the lateral limits of an old roadway, or wherever an old gravel, or other hard compacted crust comes within 6 inches of the elevation of the finished subgrade, such old roadway or crust shall be plowed, loosened or scarified to a depth of at least 6 inches and the loosened material redistributed across the full width of the subgrade, adding suitable material when necessary, so that when compacted to the required elevation, alignment and cross section, the subgrade will approach as nearly as possible a condition of uniform density. Compaction of the subgrade material shall be accomplished with a self-propelled roller weighing not less than 5 tons.
11. Hand tamping portions of the subgrade, when necessary, may be utilized. In such cases where hand tamping is utilized, the tamper shall be of an approved pneumatic type. Berms, ridges of earth, or other material that will interfere with the immediate discharge of water to the side of the crown shall not be left on the subgrade. The subgrade shall be maintained free from ruts so that it will, at all times, drain properly with no standing water. All depressions developing under traffic on the subgrade, or in connection with rolling, shall be filled with suitable material. Rolling shall be continued until the subgrade is uniformly compacted, properly shaped, and true to grade and alignment. It is not intended that the rolling shall be continued beyond this point, as the purpose of rolling is not to produce a subgrade that cannot be further compacted, but to produce a uniformly compacted subgrade. All hauling shall be distributed over the width of the subgrade so far as practicable, so as to leave it in a uniformly compacted condition. After being prepared in the above manner, the subgrade shall be so maintained until the concrete pavement or pavement foundation has been placed thereon. When considered necessary or of assistance in producing a compact, solid surfacing, the subgrade shall be well-sprinkled with water before being rolled.

D. Base and Subbase Course.

1. The applicant shall place, shape, and compact a base or subbase course on a prepared subgrade in accordance with these specifications and in close uniformity with the lines, grades, thicknesses, typical cross sections and materials shown on the approved plans.
 - a. Subbase under asphaltic concrete pavements and base under Portland cement concrete pavements shall be required when the natural in situ subgrade soil, as determined by soil tests, is not an AASHTO A-4 or better material. When the subgrade natural ground is an A-4 material, the maximum liquid limit shall be 25 and the maximum plasticity index shall be 6, otherwise subbase material is required under asphaltic pavements and base material is required under concrete pavements.
 - b. Sand shall be natural or pumped sand with a maximum liquid limit of 25 and a maximum plasticity index of 6, free from trash, weeds or other foreign or deleterious material.
2. Recycled Portland Cement Concrete shall be 100 percent crushed Portland Cement Concrete and will be permitted in combination with an approved stone for base course. After being crushed, the

recycled Portland Cement Concrete or the combination of stone and recycled Portland Cement Concrete shall conform to the following gradation:

U.S. Sieve Size	Percent Passing by Weight
1-1/2 Inches	100
1 Inch	90-100
¾ Inch	70-100
No. 4	35-65
No. 40	12-32
No. 200	0-8

- a. Stone shall consist of 100 percent stone and shall conform to the following gradation:

U.S. Sieve Size	Percent Passing by Weight
1-1/2 Inches	100
1 Inch	90-100
¾ Inch	70-100
No. 4	35-65
No. 40	12-32
No. 200	5-12

- b. For material passing the No. 40 sieve, comply with the following requirements:

Liquid Limit, Maximum	25
Plasticity Index, Maximum	5

- c. The base and subbase shall be constructed so that contamination, segregation, soft spots, wet spots and other deficiencies are prevented.
- d. The applicant shall construct the finished base course with a smooth, uniform, closely knit surface, free from ridges, waves, laminations or loose material.

- e. The applicant shall roll the surface and finish to grade. Care shall be taken as to not damage the subgrade layer during compaction operations. Materials shall be compacted these materials using a sheepfoot-type roller and finish-rolled with an approved pneumatic tire roller or a smooth steel wheel roller.
- f. The surface of the base course shall be kept uniformly moist during compaction and final finishing.
- g. Subbase and base course shall be compacted to 95% of maximum dry density as determined by ASTM D698.

E. Asphaltic Concrete Pavement Production.

Asphaltic concrete pavement mixtures shall be produced in accordance with the requirements of this section. This section sets forth the requirements for certification of plant and paving equipment used in producing, placing and compacting asphaltic concrete mixtures. This section further includes methods and equipment for handling and storing materials and transporting asphaltic concrete to the jobsite.

1. *Certification of Plants.* Plants furnishing asphaltic concrete mixtures shall be certified in accordance with current LaDOTD procedures. The plant and laboratory equipment, meters, scales, and measuring devices, shall be tested, inspected and certified every 90 calendar days and more often when directed, by a qualified independent scale service or the Weights and Measures Division, Louisiana Department of Agriculture and Forestry.
 - a. *Mixing.* Asphaltic concrete shall be mixed at a central mixing plant by either the batch, continuous, or drum mixing process. Aggregates, additives and asphalt shall be proportioned in accordance with an approved Job Mix Formula.
 - b. *Laboratory Requirement.* Asphalt concrete plants shall have a plant site laboratory conforming to current LADOTD requirements as a part of the plant facilities.
 - c. *Tank Requirements.* The asphalt working tank shall be capable of uniformly heating the material by approved methods, under positive control, to the required temperature. The asphalt circulating system shall be of adequate size to ensure proper and continuous circulation (except while asphalt is being measured). Pipelines and fittings shall be heated or insulated. Proper mixing temperature of asphalt shall be maintained. A sampling spigot shall be provided in each tank or the supply line.
 - d. *Anti-Strip Additive Equipment.* Anti-strip additive shall be dispensed directly into the asphalt feed line at a location between the asphalt control valve and the end of the asphalt discharge line. The process for accomplishing this shall be approved and shall provide that the required quantity of anti-strip additive is uniformly proportional to the quantity of asphalt. The process shall have a means by which such uniformity can be easily verified. The equipment shall include a positive displacement accumulating meter which accumulates and displays materials used and reads to the nearest 0.25 gallon. The additive storage tank shall be a recirculating tank provided with uniform heat and an indicating thermometer at an approved location near the tank discharge point.
 - e. *Cold Aggregate Feeder.* The plant shall be provided with accurate mechanical means for uniformly feeding aggregate into the dryer. Feeders shall be capable of uniformly delivering the maximum number of required aggregate sizes in their proper proportion. When more than

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- one cold bin feeder is used, each shall operate as a separate unit. The individual controls shall be integrated with a master control for all materials.
- i. Cold aggregate bins shall be of sufficient size to store the amounts of aggregates required for continuous plant operation. Partitions between bins shall extend a minimum of 1 foot above the top of bins and be sufficient to eliminate contamination. The unit shall include a feeder mounted under bins with each bin compartment having an accurately controlled individual gate to form an orifice for measuring the material drawn from it. The orifice shall be rectangular, with one dimension adjustable by positive mechanized adjustment with locking system. Indicators shall be provided on each gate to show the gate opening in inches.
 - ii. The plant shall be modified as required to permit recycling operations in conformance with air pollution standards. A separate cold feed system, including weight indicating apparatus, shall be provided for reclaimed asphaltic pavement.
 - iii. Calibration of gate openings shall be based on the weight of samples taken from bin material. Material shall be fed from a bin through the individual orifice and bypassed to a container to be weighed. Material from each bin shall be calibrated separately. Weight calibration curves shall be developed and kept on file. The calibration process shall be part of the applicant's quality control and shall be shown as a function of belt speed and gate opening.
 - iv. When a cold feed system is the only system used to control the proportioning of aggregates, an automatic plant shutoff shall be provided to operate when any aggregate bin becomes empty, or flow is interrupted.
- f. *Hydrated Lime Additive Equipment.* When hydrated lime additive is mixed with aggregate on the belt feed, the hydrated lime additive equipment shall be interlocked and synchronized with cold feed controls to operate concurrently with the cold feed operation. A positive signal system which shall automatically shut the plant down when a malfunction causes an improper supply of additive, or water shall be installed. The plant shall not operate unless the entire additive system is functioning properly. The hydrated lime additive system shall consist of the following equipment.
- i. A separate bulk storage bin with a vane feeder or other approved feeding system which can be readily calibrated. The system shall provide a means for easy sampling of additive and verification of the quantity dispensed by weight. The feeder system shall require a totalizer.
 - ii. An approved spray bar or other approved system capable of spraying the composited aggregate with potable water before the addition of hydrated lime additive when the moisture content of the composited aggregate falls below 3 percent. An alternative system for spraying coarse aggregate stockpiles may be allowed when approved. The approved equipment and methods shall consistently maintain the aggregates in a uniform, surface wet condition. The moisture content of the aggregate-lime additive mixture following spraying and mixing shall be introduced into the automatic moisture controls of the plant.

- iii. An approved pugmill or other approved mixing device to uniformly coat the composited aggregates with the hydrated lime additive shall be located between the point at which the additive is placed on the composited aggregate and the dryer.
 - iv. The hydrated lime additive shall be dispensed directly onto the composited aggregate between the cold feed and the dryer. When cold feed control is used, the additive shall be introduced after the composited aggregate has passed through the vibrating scalping screen. The additive shall be uniformly blended with the composited aggregate before entry into the dryer. The process and equipment used for mixing the lime additive and aggregate shall be approved and shall provide that no less than the required amount of additive is continuously blended with the aggregate. When a belt scale is used on the composited aggregate feed belt, it shall be positioned to record the combined weight of the blended aggregate and hydrated lime additive.
- g. *Mineral Filler Equipment.* Mineral filler shall be proportioned separately from a hopper equipped with an adjustable feed which can be accurately and conveniently calibrated, and which shall be interlocked with the aggregate and asphalt feeds. The feeder shall accurately proportion the mineral filler and shall be designed to give a constant flow of material. For batch plants, the mineral filler shall be batched into the mix along with the aggregates. For continuous mix and drum mixer plants, the mineral filler shall be introduced to the mix at an approved location sufficiently in advance of the addition of the asphalt to give proper drying time.
- h. *Screening System.* Plant screens shall be provided as required for proportioning, capable of screening aggregates to the required sizes and having normal capacity in excess of the full capacity of the mixer or dryer. The screens shall be exposed for inspection as directed.
- i. The plant shall have a scalping system on the fine sand cold bin and other bins as necessary, to ensure removal of objectionable material.
 - ii. When a belt scale is used, an additional vibrating scalping screen will be required between the aggregate cold feed discharge and belt scale. Other processes will require a vibrating scalping screen between the cold feed discharge and mixing process. The screens shall be sized to remove all oversize aggregate and other objectionable material.
- i. *Dryer.* The plant shall include one or more dryers that shall continuously agitate aggregates during heating and drying. The equipment shall be capable of heating and drying aggregates in the necessary quantities to supply the mixing unit continuously at its operating capacity and at a specified temperature and acceptable moisture content. The dryer shall be equipped with automatic burner controls. Slope of dryers shall be in accordance with approved recommendations of the dryer manufacturer.
- j. *Hot Bins.* Bin sizes shall be adequate for continuous operation of the plant at rated capacity. Bins shall be arranged to ensure separate and adequate storage of appropriate fractions of aggregate. Adequate dry storage shall be provided with an overflow pipe or chute to prevent contamination of materials. Each size of aggregate shall be stored in separate bins when

screens are used. For screenless operation, aggregate shall be stored in one or more bins with adequate provisions to prevent segregation.

- b. *Thermometers.* The plant will not be permitted to operate with faulty or inadequate thermometers, and the thermometers listed herein shall be immediately repaired or replaced when faulty operation is detected. The plant shall be equipped with the following thermometers.
 - i. *Asphalt.* A thermometer graduated in 5 F increments and having an accuracy of +/- 5 F shall be fixed in the asphalt feed line at an approved location near the discharge valve at the mixer unit to indicate the temperature of asphalt from storage.
 - ii. *Anti-Stripping Additive.* A thermometer graduated in 5 F increments and having an accuracy of +/- 5F shall be placed near the anti-stripping tank discharge point prior to the meter.
 - iii. *Heated Aggregates for Asphaltic Mixture.* The plant shall be equipped with an approved recording thermometer graduated in maximum 10oF increments and having an accuracy of +/- 5 F and a sensitivity which will provide an indication of temperature change at a rate of at least 10 F per minute. It shall be placed at the dryer discharge chute to automatically register the temperature of heated aggregates for batch plants, and at an approved location for continuous or drum-mixer plants to register automatically the temperature of the asphaltic mixture at discharge.
- c. *Dust Collector.* When a dust collection system returns fines to the mixture, the fines shall be returned at a uniform and regulated rate and at an approved location. In the drum-mix process, baghouse fines shall be added near the asphalt discharge. Baghouse fines shall be dispensed into the aggregate mixture by an approved feed control device from a collector box, surge bin or filler silo. This provision does not apply to primary collectors.
- d. *Asphalt Measuring Equipment.* Asphalt may be measured either by weight or volumetric measurement.
 - i. *Weight Measurement.* Scales shall be calibrated as prescribed for by this section and shall read to the nearest pound.
 - ii. *Volumetric Measurement.* Measurement by volume shall be by means of a positive displacement pump and shall be recorded in digital form to the nearest gallon. Provisions shall be made to periodically check by weight the quantity of asphalt delivered. The rate of asphalt delivered shall be continuously displayed in digital form corrected to 60 F and the quantity totalized. The quantity of asphalt shall be corrected to the approved job mix temperature. Measurement shall be continuous and accurate to 1.0% of the required measurement.
- e. *Mixer Unit.* The mixer unit shall produce a uniform blend at the specified production rate, with rapid and complete asphalt coating of aggregate that will give a minimum coating of 95% of the coarse aggregate particles retained on the No. 4 sieve when tested in accordance with AASHTO T 195.

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- i. *Batch Plants.* Batch plants shall have an approved pugmill and spray bar. The pugmill shall have an approved rated capacity. It shall be operated at an approved capacity not to exceed the rated capacity. The mixer shall have an approved timing device to prevent entrance of additional material during mixing. The discharge gates shall be locked to ensure proper mixing. The device shall also lock the asphalt bucket throughout the dry mixing period.
 - ii. *Drum-Mixer Plants.* Drum-mixer plants shall have an approved drying and mixing operation. Aggregate and asphalt shall be fed into the drum-mixer so that aggregates are dried, uniformly mixed, and adequately coated with asphalt.
 - iii. *Continuous Mix Plants.* Continuous mix plants shall have an approved drying and mixing operation. The plant shall have an approved pugmill and spray bar. The pugmill shall be operated at an approved capacity not to exceed the rated capacity with the aggregates uniformly mixed and adequately coated with asphalt.
- f. *Weigh Hoppers.* Weigh hoppers used in weighing aggregates, asphalt and mixtures shall be constructed to prevent leakage and shall be suspended from scales conforming to **this Subsection.**
- i. In batch plants, asphalt and aggregate hoppers shall be of sufficient size to weigh the total batch in one operation.
 - ii. Hoppers for weighing a mixture from a storage or surge bin shall be constructed and used to prevent segregation of mixture loaded into the haul truck.
- g. *Scales.* Scales shall be accurate to +/- 0.5% of the indicated load. They shall be designed, constructed, and installed so that operations do not affect their accuracy.
- i. To determine the total weight of mix loaded in trucks, the Applicant shall provide springless dial scales or load cell scales for weigh hoppers. When weigh hoppers are not used, the Applicant shall provide truck platform scales. The Applicant shall provide belt scales for conveyor systems when the drum-mixer process is used.
 - ii. *Printer System for Batch Plants.* To determine percent asphalt cement for the mix, the plant shall provide an approved printer system which will print separately the weight of aggregates and asphalt. These weights shall be used for calculating the percent asphalt in the mixture. When a mixture is loaded directly into the haul truck, these weights shall be used for the purpose of determining pay weights for the mix. Printing equipment shall also print zero weight for each batch and total weight of mixture loaded in trucks.
- i. In the event of a breakdown of the printing mechanism, the plant may be permitted to operate during the 48-hour period immediately following the breakdown, provided an accurate weight of mixture can be determined and provided repeated breakdowns do not occur.
- iii. *Printer Systems for Plants Using Storage or Surge Bins.* When storage or surge bins are used, the applicant shall provide truck-platform scales or weigh hopper to determine pay weights for the mix.

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- i. The weigh hopper shall be equipped with an approved automatic printer system that will print zero weight, batch weight and total weight of mixture loaded into the truck.
 - ii. Truck-platform scales shall be of sufficient length to weigh the entire unit transporting the mix. Scales shall be equipped with an approved automatic printer system that will print the tare weight as well as the total weight of the unit and the mix.
 - iii. Scales with electronic digital readout displays, that do not automatically reset to zero after the tare weight is obtained, shall print the tare weight, zero weight and either the total weight of mix loaded into the unit or the total weight of the unit and mixture. Scales with electronic digital readout displays that automatically return to zero after the tare weight is obtained, shall print the tare weight and either the total weight of mix loaded into the unit or the total weight of the unit and mixture.
 - iv. When scales are located so that a truck leaves the scales between empty weighing and loaded weighing, the printer shall print the tare weight, zero weight before loaded weighing, and total weight of the unit and mix. In the event of a breakdown of the printing mechanism, the plant may be permitted to operate during the 48-hour period immediately following the breakdown provided an accurate weight of mixture can be determined and repeated breakdowns do not occur.
 - h. *Mix Release Agent Dispenser System.* The plant shall be equipped with an approved pressurized system capable of spraying a uniform coating of an approved asphalt mix release agent into the haul unit bed prior to loading. Diesel is not allowed as a mix release agent.
 - i. *Storage Silos and Surge Bins.* Storage silos or surge bins for storing asphaltic concrete mixtures may be used with approval of the Director of Department of Engineering.
 - i. Use of silos or bins shall conform to the limitations on retention time, type of mixture, heater operation, bin atmosphere, bin level or other characteristics set forth within this UDC and other requirements stated in granting approval of these facilities. An indicator device which is activated when material in the bin drops below the top of the sloped portion shall be affixed to each bin and be visible to the loading operator. Mixtures shall be maintained above this level during production, except for extended periods when the plant is not in operation.
 - i. *Heated Silos.* The storage silo heating system shall be capable or uniformly maintaining mix temperature without localized heating.
 - ii. Maximum allowable storage time for asphaltic concrete mixtures is 18 hours. The Department of Engineering may grant permission to exceed the storage time, provided test results and other data indicate that the additional storage time is not detrimental to the mix.
 - i. *Unheated Surge Bins.* The maximum allowable storage time for unheated surge bins is 2 hours.

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- j. *Loading and Unloading Mixtures.* The system shall be capable of conveying the mixture from plant to bin or silo by a drag slat enclosed conveyor system or other approved system. The conveyor shall be of an enclosed continuous type designed to prevent spillage and to remove the mix from the plant as fast as it is produced.
 - i. The mix shall be transported directly from plant to silos or bins by means of the conveyor system. The mixture from the silo or surge bin shall remain within +/- 15 F of plant discharge temperature
 - ii. When the mixture is placed into a silo or bins through a surge device, an automatic warning system shall be provided to audibly warn the operator of a gate malfunction.
 - iii. Silo or bin unloading gates shall be either clam shell gates operating under gravity feed or other approved gates that will not cause segregation or be detrimental to the mix.
 - iv. Equipment for transporting asphaltic mixtures shall have tight, clean, smooth metal beds, sprayed daily or otherwise as required with an approved asphalt mix release agent. Diesel fuel will not be allowed as a release agent.
 - i. Each vehicle shall have a cover of canvas or other suitable material large enough to completely cover the top and extend over the sides of the bed to protect the mixture from the weather or loss of heat due to excessive haul time. The cover shall have sufficient tie-downs to hold the cover to the bed during hauling.
 - v. The hauling unit shall discharge the mixture in a continuous manner so the spreader apron of the paver will not be overloaded. When the hauling unit/paver combination causes a surface deviation exceeding 1/8 inch, measured longitudinally with A10-foot metal static straightedge, or other surface defects, the use of such hauling unit or paver shall be immediately discontinued. When quality control results indicate surface deviations which result correction of bumps, the results will be analyzed to determine if the deviations are caused by the hauling unit/paver combination. If the hauling unit/paver combination is determined to be the cause, their combination shall be discontinued.
 - i. Equipment such as bottom dumps shall be capable of discharging the mixture in a uniform windrow longitudinally down the pavement. A maximum of one truck load shall be allowed on the pavement. The temperature of the material in the windrow shall not drop below 275 F. The maximum amount of windrowed material allowed will be reduced if temperature requirements cannot be met. Distortions in surface tolerance resulting from improper unloading of the mixture shall be corrected immediately.
 - ii. When size, speed and condition of trucks interfere with orderly paving operations, changes in equipment and/or operations shall be made.
 - vi. The Applicant shall comply with legal load restrictions in hauling of materials or equipment on completed bridge structures, bases and pavements. A special permit will not relieve the Applicant of liability for damage resulting from moving of material or equipment. In no case shall the legal load limits be exceeded.

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- i. Operation of equipment of such weight or height or so loaded as to cause damage or overstress to structures, roadways or other construction will not be permitted. Hauling of materials over the base or surface course under construction shall be limited as directed. The Applicant shall be responsible for all damage done by hauling equipment.
 - vii.** Pavers shall be equipped with screed and slope control devices.
 - i. Equipment that is pushed by the paver shall be of such size and capacity that the paver will push them without affecting surface smoothness or edge line of the mixture.
 - ii. Pavers shall be capable of placing mixtures within specified tolerances. A screed or strike-off assemble shall be used to distribute the mixture over the entire paving strip. The width of the paving strip will be approved. Assemblies, including extensions, shall place mixtures uniform in appearance and quality. The assembly shall be adjustable to provide the required cross section. The assembly shall be equipped with a heater and either a vibrator or tamping bars.
 - iii. In hilly terrain, when mix is discharged directly into the paver hopper, a positive connection shall be provided between paver and hauling unit. When the hauling unit discharges directly into the paver hopper, the paver shall be capable of pushing the hauling unit.
 - viii.** Pavers shall be equipped with hoppers adequately designed and maintained to prevent spillage. Pavers shall also be equipped with augers to place the mix evenly in front of the screed, including extensions. Pavers shall be equipped with a quick and efficient steering device and shall be capable of traveling both forward and in reverse. Pavers shall be capable of spreading mixes to required thickness without segregation or tearing.
 - ix.** For shoulder construction, modified pavers or widening machines may be used when permitted.
 - i. A screed extension shall consist of a screed plate or plates, which meet all requirements for the screed, set forth in these specifications. The bottom surface of the screed extension shall be in the same plane as the bottom surface of the screed plate. A screed extension shall be used when mix is being placed within the traveled way and the paving strip is wider than the screed. Auger assembly extensions shall be used when screed extension in excess of 1 foot on a side are to be consistently used in the pavement operation. Such auger extensions shall extend to within 1 foot of the end of the screed. With approval, the use of an auger extension with screed extensions in excess of 1 foot on one side may be waived for transitions, taper sections and similar short sections. The Department of Engineering may waive the requirement for auger extensions when hydraulically extended screeds, which trail the main screed assembly, are used, provided required density and surface texture are obtained.

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- ii. A strike-off assembly or boxed extension shall not be used for paving within the traveled way, except when approved for short irregular sections or sections which are exceptions to the typical.
 - k. Pavers shall be equipped with screed and adjustable slope control devices capable of placing the mixture to grade within the tolerances specified and distributing the mixture over the entire lane width and such partial lane widths as may be approved.
 - i. When a malfunction occurs in the automatic screed control device during laydown operations, work may continue for the balance of that day on any course other than the final wearing course. When a screed control device malfunctions during final wearing course paving operations, plant operations shall be immediately discontinued and shall not be resumed until the screed malfunction has been remedied. Material in transit may be placed; however, slope tolerance, surface tolerance and grade tolerance shall be met.
 - l. Compaction equipment shall be self-propelled and be capable of reversing without backlash. Compaction equipment shall be certified prior to use.
 - i. Poorly performing compaction equipment will be decertified and shall be replaced with suitable equipment or supplemented as necessary.
 - m. *Steel Wheel Rollers.* Steel wheel rollers may be either vibratory or nonvibratory. Wheels shall be true to round and equipped with suitable scrapers and watering devices. Vibratory rollers shall be designed for asphaltic concrete compaction and shall have separate controls for frequency, amplitude, and propulsion.
 - n. Power revolving brooms or power blowers and asphalt distributors shall be provided and maintained in a satisfactory working condition.
 - o. In areas that are inaccessible to conventional rollers, satisfactory mechanical compaction equipment, or hot hand tampers, shall be used. Tamping tools may be used for compacting edges.
 - p. The asphalt distributor shall be equipped with a suitable spray bar and nozzles designed to distribute material within the specified temperature range and shall be equipped with thermometers to indicate temperature of material in the tank. The distributor shall be designed to maintain a constant uniform pressure on asphaltic material as it passes through nozzles and to apply asphaltic material at the required rate. The distributor shall be equipped with a valve system that control the flow of asphaltic materials, a pump tachometer or pressure gauge that registers pump output, a bitumeter and odometer that indicates both the speed of the distributor in feet per minute and total distance traveled, and measuring devices, as necessary.
 - q. Charts shall be provided for an accurate, rapid determination and control of the amount of asphaltic materials being applied per square yard of surface under operating conditions. The bitumeter shall be calibrated to ensure accurate spraying operations and shall be kept clean of asphaltic buildup. The distributor shall be equipped with a hand-held spray attachment for applying asphaltic materials to areas inaccessible with the spray bar.

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- r. Aggregates shall be stored at the plant site so that no intermixing will occur. Material shall be stockpiled so that no detrimental degradation or segregation of aggregates will occur; no appreciable amount of foreign material will be incorporated into aggregates; and there will be no intermingling of stockpiled materials. Stockpiles shall be well drained.
 - s. Blending of aggregates shall be done from cold feed bins and not in stockpiles or on the ground at the plant site or the source.
 - t. Gradation and other properties of aggregate in stockpiles shall be such that when the aggregates are combined in proper proportions, the resulting combined gradation will meet the requirements of the approved job mix formula.
 - u. Proportioning of material at the cold feed shall be established to meet the approved job mix gradation requirements. Plants operating with only cold feed control shall not require additional manipulation to meet job mix requirements.
 - v. Drying: Aggregates shall be heated and dried to produce a mixture meeting specification requirements. The quantity of material fed through the dryer shall be held to an amount which can be adequately heated and dried. When proper drying is not achieved and the quality of the mix is impaired, the Applicant shall adjust the rate of production of the dryer to obtain satisfactory results. The burner fuel used shall be clean burning so there is no contamination of aggregates. Contaminated aggregates or mixtures will be rejected.
 - w. Hot Aggregate Storage: When batch plants are used, hot aggregates shall be stored in bins. Storage shall be accomplished to minimize segregation and loss of temperature of aggregates. When plant operation is interrupted and the temperature of material in hot storage cools to 25 F or more below the specified mixing temperature, bins shall be pulled and the material discarded. When a plant changes type of mix and the change requires a change of materials, bins shall be pulled, and the material discarded.
 - x. Aggregates shall be combined, either before or after drying, depending on the type of plant used, to meet the approved job mix formula. Asphalt shall be measured and introduced into the mixer or dryer in the quantities specified on the approved job mix formula.
 - y. The aggregate, asphalt and the mixture shall be processed at the temperature specified in the approved job mix formula. The temperature of the mixture at discharge from the mixer shall be within +/- 25 F of the optimum mixing temperature in the job mix formula. When the mixing, coating, placing or density requirements are not being met, the Department of Engineering may require that the job mix temperature be changed or that the foregoing temperature range be restricted.
 - z. The moisture content of the final mixture shall be minimized and uniformly controlled to ensure that placing and density requirements are met. The maximum allowable moisture content of the final mixture shall be 0.5% by weight when tested in accordance with DOTD TR 319.
 - aa. When the automatic adjustments or other critical control and shutoff devices are not functioning, the plant shall not operate.

- bb. Plants with Pugmills: Prior to adding asphalt, the combined aggregate shall be thoroughly mixed dry, after which the proper amount of asphalt shall be sprayed over aggregates and mixed to produce a homogeneous mixture in which all aggregate particles are uniformly coated. Mixing times shall be in accordance with the approved job mix formula.
- cc. Drum-mixer and Continuous Mix Plants: The system shall provide positive weight control of cold aggregates fed by a belt scale or other device interlocked with the asphalt measuring system to maintain required proportions of combined aggregates and asphalt. Aggregates shall be heated, dried and mixed with asphalt to produce a homogeneous mixture in which all aggregate particles are uniformly coated. Approved methods shall be provided to waste the first and last output of the plant after each interruption.
- dd. The plant's Certified Asphaltic Concrete Plant Technician shall measure the moisture content of the cold feed aggregates daily when starting the plant. Adequate scheduled tests during plant operations and adjustments to the plant shall be made to correct for moistures in the aggregate. The schedule for moisture content testing will be subject to approval.
- ee. Provisions shall be made for introducing the latest moisture content of the cold feed aggregates into the belt weighing system, thereby correcting wet aggregate weight to dry aggregate weight. Dry weight of the aggregate flow shall be displayed digitally in appropriate units of weight and time, and the quantity used totalized. The rate of flow of asphalt anti-strip, and lime (when used) shall also be digitally displayed, and the quantity used totalized.
- ff. For mineral filler, a separate bin and feeder in accordance with the requirements of this section shall be furnished with its drive interlocked with the aggregate feeders. Mineral filler shall be introduced directly into the drum near the asphalt discharge.
- gg. *Material Transfer Vehicle.* When placing the final two lifts of asphaltic concrete on the roadway travel lanes, an approved material transfer vehicle (MTV) will be required to deliver mixtures from the hauling equipment to the paving equipment, and to prevent segregation of the asphaltic concrete hot-mix. The MTV is required regardless of average daily traffic (ADT). The MTV shall perform additional mixing of the asphaltic concrete mixtures and then deposit the mixture in the paving equipment hopper to reduce segregation and facilitate continuous production. As a minimum, the MTV shall have a high capacity truck unloading system which will receive mixtures from the hauling equipment; a storage bin in the MTV to continuously mix the mixture prior to discharge to a conveyor system; a discharge conveyor, with the ability to swivel, deliver the mixture to a paving equipment hopper while allowing the MTV to operate from an adjacent lane; and a paver insert hopper with a minimum capacity of 18 tons which can be inserted into conventional paving equipment hoppers.

F. Asphaltic Concrete Pavement Placement.

1. The applicant shall furnish and construct one or more courses of Superpave asphaltic concrete mixture applied hot in conformance with these specifications and in conformity with the lines, grades, thicknesses, and typical sections shown on the approved plans. The mixture shall consist of

aggregates and asphalt with additives combined in proportions which meet the requirements of this section.

- i.** These requirements are applicable to asphaltic concrete wearing, binder and base course mixtures of the plant mix type.
 - ii.** Substitutions will be allowed for mixes without requiring approval of the Director of Department of Engineering only as follows:
 - i.** Changes in design level will not be allowed on the roadway.
 - ii.** Wearing course may be substituted for binder course.
 - iii.** Binder course may be substituted for base course.
 - iv.** 0.5” Wearing Course may be substituted for Incidental Paving, Level A.
 - b.** When any substitution is made, all specification requirements for the mixture used shall apply with the following exceptions. When wearing course is substituted for binder course, RAP will be allowed in accordance with binder course requirements. Design of mixtures shall comply with the following:

Asphalt Concrete General Criteria

Nominal Max. Size Aggregate	0.5 Inch			0.75 Inch			1.0 Inch	
Type of Mix	Incidental Paving (Minor Mix)	Wearing Course		Wearing Course	Binder Course		Binder Course	
Level	A	1	2	2	1	2	1	2
Coarse Agregate Angularity, % Crushed, (Double Faced), Minimum,	55	75	95	95	75	95	75	95
Fine Aggregate Angularity, Min. %	40	40	44	44	40	44	40	40
Flat and Elongated Particles (5:1), Max. %	10							
Sand Equivalent, Min. %	40	40	45	45	40	45	40	45
Natural Sand - Max. %	---	15						
Asphalt Binder	Optimum							
RAP, Max. % of Mix ³	25	20	20	20	25	25	25	25
Compacted Mix Volumetrics								
VMA @ N _{design} , % Min.	13.5	13.5	13.5	12.5	12.5	12.5	11.5	11.5
Air Voids @ N _{design} , % ⁴	(2.5 – 4.5)							
VFA @ N _{design} , % ⁵	(69-80)							

N _{initial} 90% max. ⁶ (Gyrations)	7	7	7	7	7	7	7	7
N _{design} 96.5±1 % (Gyrations)	55	55	65	65	55	65	55	65
N _{max} 98 % max. (Gyrations)	90	90	105	105	90	105	90	105
LWT, max. rut-design, mm @ # passes, @ 50°C	10 @ 10,000	10 @ 20,000	6 @ 20,000	6 @ 20,000	10 @ 20,000	6 @ 20,000	10 @ 20,000	6 @ 20,000
Dust/Effective Asphalt Ratio, %	0.6 – 1.6							
SCB, min, Jc, KJ/m ² @ 25°C	---	0.5	0.6	0.6	0.5	0.6	0.5	0.6
Design Lift Thickness, inch ⁸	≤2.0	1.5–2.0		1.5–2.0	2.0–3.0		2.5–4.0	

¹May be used for minor mix uses²Mixtures designated at Level 1F and 2F shall meet the requirements of Level 1 and 2, respectively. Additionally, Level 1F and 2F shall meet the friction rating requirements for travel lane wearing courses.³N/A.⁴Air voids mix design target is a 3.5 percent.⁵Mix design minimum VFA is 72.0%, Mix design minimum VFA for PG76-22rm is 75.0%, and 71% for 25 mm NMS mixtures.⁶For Level 1 mixtures, N_{initial} shall be 91.0% max. For Level A mixes, N_{initial} shall be 92.0% max.⁷N/A⁸Absolute minimum of lift thickness across width equal to 1/2 inch lower than minimum lift thickness.⁹Also must meet a maximum of 25 percent at a 3:1 ratio.

- c. Quality assurance requirements and design procedures shall be as specified in the latest edition of the LaDOTD's publication entitled "Application of Quality Assurance Specifications for Asphaltic Concrete Mixtures."
- d. The applicant shall keep accurate records, including proof of deliveries of materials for use in asphaltic concrete mixtures. Copies of these records shall be furnished to the Department of Engineering upon request. Material shall conform to the following requirements:
 - i. Asphalt cement shall be a product listed on the LADOTD AML at the time of the production of the mixture.
 - ii. Silicone and Anti – Strip Additives shall be products listed on the AML at the time of the production of the mixture.

- iii. Aggregates shall conform to the gradations established herein and shall be listed on the LADOTD AML at the time of the production of the mixture.

- e. *Mixture Levels.* Mixture levels shall comply with the following table:

	Wearing Course		Binder Course	
Level	1	2	1	2
20 Year ESALS	< 3 Million	>3 Million	<3 Million	>3 Million

- f. *Asphalt.* The asphalt cement grades used shall be as specified in the table below using the design traffic load levels determined in accordance with this UDC.

Asphalt Cement Usage

Location	Mix Level	Asphalt Grade Required ¹	Substitutions Allowed ²	
			Lower Grade	Higher Grade
Mainline Wearing & Binder	1	PG 70-22m	PG 67-22 with traffic volume < 3500 ADT	PG 76-22rm, PG 76-22m
Mainline Wearing & Binder	2	PG 76-22m PG 76-22rm	PG 70-22m with Hydrated Lime	
Base	1	PG 67-22	PG 58-28 ⁴	PG 76-22rm, PG 76-22m, PG 70-22m
Minor Mixes including Leveling	ALL	PG 67-22		PG 76-22rm, PG 76-22m, PG 70-22m

¹ For single lift overlay, match grade of overlay.

²Asphaltic mixtures using substitutions are required to meet all design requirements for the original design level

³Not Used

⁴When more than 25% RAP is used, PG 58-28 is required.

- g. Base course mixtures containing 20 to 30 percent RAP shall use PG 58- 28 asphalt cement.
- h. The applicant shall reduce the amount of asphalt cement in the plant's storage or working tanks to 20% or less before adding another grade of asphalt cement or asphalt cement from another source.
- i. *Silicone.* Silicone additives, when needed, shall be dispersed into the asphalt by methods and in concentrations given in the LaDOTD AML.
- ii. *Anti-Strip (AS).* An anti-strip additive shall be added at the minimum rate of 0.5 percent by weight (mass) of asphalt cement and thoroughly mixed in-line with the asphalt cement at the plant. Additional anti-strip shall be added up to 1.2 percent by weight.
- iii. *Hydrated Lime.* Hydrated lime additive may be incorporated into all asphaltic concrete mixtures at the rate specified in the approved job mix formula. The

minimum rate shall not be less than 1.5 percent by weight of the total mixture. Hydrated lime additive shall be added to and thoroughly mixed with aggregates.

- iv. *Aggregates.*** Aggregates shall meet the requirements of the tables below and shall be listed on the LaDOTD AML at the time of their incorporation into the mixture.

US Sieve Passing	1/2" Nominal Mix	3/4" Nominal Mix	1" Nominal Mix	Mix Tolerance
2 Inch	--	--	--	+/-6
1-1/2 inch	--	--	100	+/-6
1 inch	--	100	90-100	+/-6
3/4 Inch	100	90-100	89 Max	+/-6
1/2 Inch	90-100	89 Max	--	+/-6
3/8 Inch	89 Max	--	--	+/-6
No. 4	---	---	---	+/-6
No. 8	29-58	26-49	23-45	+/-6g
No. 16	---	---	---	+/-5
No. 30	---	---	---	+/-4
No. 50	---	---	---	+/-3
No. 100	---	--	---	+/-2
No. 200	4.0-10.0	3.0-8.0	2.0-7.0	+/-1
Extracted Asphalt %	---	---	---	+/-0.4
Mix Temperature	---	--	---	+/-25 F

- v. *Recycled Portland Cement Concrete.*** Recycled Portland Cement Concrete will be allowed in base courses with a maximum of 70% recycled Portland cement concrete by weight combined with new aggregates. Recycled concrete shall be crushed and screened into a minimum of two stockpiles composed of different sized aggregates separate from other materials at the plant. Recycled concrete shall be dried as required for new aggregates.

- vi. *Reclaimed Asphaltic Pavement (RAP)*. Reclaimed asphaltic pavement shall be stockpiled separate from other materials at the plant and will be subject to approval prior to use. Such stockpiles shall be uniform and free of soil, debris, foreign matter and other contaminants. Reclaimed materials that cannot be broken down during mixing or that adversely affect paving operations shall be screened or crushed to pass a 2-inch sieve prior to use.
- vii. *Mineral Filler*. Mineral filler listed on the LaDOTD AML may be used in all mixtures.
- viii. *Warm Mix Additives*. When used, add only warm mix chemical additives listed on the AML. Foaming is allowed.
 - i. Friction Ratings for coarse aggregates shall be determined in accordance with the requirements of this Code. Aggregates shall have a friction rating of I or II for all mixtures.
 - i. The applicant shall be responsible for design, production, transportation and laydown of mixtures. Work shall meet the requirements of this Section and be subject to acceptance by the Department of Engineering.
- j. The applicant shall exercise quality control over materials and their assembly, design, processing, production, hauling, laydown and associated equipment. Quality control is defined as the constant monitoring of equipment, materials and processes to ensure that mixtures produced and laid are uniform, are within control limits, and meet specification requirements. When these specifications are not being met and satisfactory control adjustments are not being made, operations shall be discontinued until proper adjustments and uniform operations are established. Control shall be accomplished by a program independent of, but correlated with, acceptance testing and shall ensure that the requirements of the job mix are being achieved and that necessary adjustments provide specification results.
 - k. The applicant shall conduct such tests as necessary, in addition to the required tests, to design, control and place mixtures within specifications.
 - i. The quality of mixtures will be evaluated during two phases, mixture produced at the plant, and mixture hauled, laid and compacted. Quality of both phases will be evaluated in series of lots. Plant quality control testing shall be conducted on each lot independent of delivery points. Project site quality control testing shall be conducted on each project for that portion of the lot placed on that project.
 - l. When the plant is in operation, the plant shall have a Certified Asphaltic Concrete Plant Technician at the plant that is capable of designing asphaltic concrete mixes, conducting any test or analysis necessary to put the plant into operation and producing a mixture meeting specifications. Daily plant operations shall not begin unless the Certified Asphaltic Concrete Plant Technician is at the plant. The Asphaltic Concrete Technician certification is awarded by LaDOTD upon satisfactory completion of LaDOTD's requirements.
 - m. *Job Mix Formula*. The applicant shall design all asphalt mixtures for optimum asphalt content in compliance with the mix design in accordance with AASHTO M323 At minimum, all design submittals must include the recommended materials proportions,

extracted gradation, recommended mix and compaction temperatures, and supporting design data. No mixture shall be produced until the proposed JMF has been accepted. Indicate the optimum mixing and compaction temperatures as suggested by the asphalt binder supplier on the JMF. Mix temperatures are recommended by the asphalt supplier as determined by rotational viscosity or other means.

- n. Validation. Validation will be based on the first lot test results. All Code criteria must be met for production to continue.
- o. Warm Mix Asphalt technology may be used to reduce this temperature and must be noted on the JMF. Warm mix asphalt may be substituted with a minimum production temperature of 275°F. Once a plant is producing an acceptable JMF, keep JMF production within the specified tolerances.
- p. The plant shall be operated to produce, on a continuing basis, a mixture uniformly conforming to the approved job mix formula. When this is not the case, the applicant shall make satisfactory adjustments or cease operations. The Department of Engineering applicant permit the applicant to submit a new Asphaltic Concrete Job Mix Formula for approval. The Applicant shall submit a new job mix formula whenever a plant begins initial operations in a specific location or whenever a plant experiences a change in materials or source of materials. A new job mix formula will also be required whenever there are significant changes in equipment, such as the introduction of a new crusher, drum mixer, burner, etc.
- q. *Weather Limitations.* Asphaltic concrete mixtures shall not be applied on a wet surface or when ambient temperature is below 40 F, except that material in transit, or a maximum of 50 tons in a surge bin or silo used as a surge bin at the time plant operation is discontinued may be laid; however, mixture laid shall perform satisfactorily and meet specification requirements. Inclement weather will be sufficient reason to terminate or not begin production.
 - i. When base course materials are placed in plan thicknesses of 2 3/4 inches or greater, these temperature limitations shall not apply provided all other code requirements are met.
- r. *Surface Preparation.* The surface to be covered shall be approved by the Director of Department of Engineering prior to placing mixtures. The applicant shall maintain the surface until it is covered.
- s. *Cleaning.* The surface to be covered shall be swept clean of dust, dirt, caked clay, caked material and loose material by revolving brooms or other mechanical sweepers supplemented with hand equipment as directed. When mixtures are to be placed on Portland cement concrete pavement or overlaid Portland cement concrete, the applicant shall remove excess joint filler from the surface by an approved burning method. The applicant shall remove any existing raised pavement markers prior to asphaltic concrete overlay operations.
 - i. When brooming does not adequately clean the surface, the applicant shall wash the surface with water in addition to brooming to clean the surface.

- t. When liquid asphalt is exposed to traffic for more than 2 calendar days, becomes contaminated, or degrades due to inclement weather, the liquid asphalt shall be reapplied at the initial recommended rate at the expense of the applicant.

G. Applying Asphaltic Materials.

1. *Existing Pavement Surfaces.* Before constructing each course, an approved asphaltic tack coat shall be applied in accordance with the requirements of this Code. The applicant shall protect the tack coat and spot patch as required.
2. *Raw Aggregate Base Course and Raw Embankment Surfaces.* The applicant shall apply an approved asphalt prime coat to unprimed surfaces or protect in-place prime coat and spot patch as required with asphaltic prime coat in accordance with the requirements of this Code.
3. *Other Surfaces:* Contact surfaces of curbs, gutters, manholes, edges of longitudinal and transverse joints, and other structures shall be covered with a uniform coating of an approved asphaltic tack coat conforming the requirements of this Code before placing asphalt mixtures.
4. *Longitudinal Joints.* Longitudinal joints shall be constructed by setting the screed to allow approximately 25% fluff and overlapping the paver approximately 2 inches onto the adjacent pass. Prior to rolling, the overlapped mix shall be pushed back to the uncompacted side, without scattering loose material over the uncompacted mat, to form a vertical edge above the joint. The vertical edge shall then be compacted by rolling to form a smooth, sealed joint. Longitudinal joints in one layer shall offset those in the layer below by a minimum of 3 inches; however, the joint in the top layer shall be offset 3 inches to 6 inches from the centerline of pavement when the roadway comprises two lanes of width or offset 3 inches to 6 inches from lane lines when the roadway is more than two lanes. The narrow strip shall be constructed first.
5. *Adjacent Paving Strips.* Where adjacent paving strips are to be placed, the longitudinal edge joint of the existing strip shall be tacked.
6. *Transverse Joints.* Transverse joints shall be butt joints formed by cutting back on the previously placed mixture to expose the full depth of the lift. An approved 10-foot static straightedge shall be used to identify the location at which the previously placed mixture is to be cut back to maintain no greater than a 1/8 inch deviation in grade. The cut face of the previously placed mat shall be lightly tacked before fresh material is placed. The screed shall rest on shims that are approximately 25% of plan thickness placed on the compacted mat or the screed shall be set at a distance that is 25% of plan thickness above the mat surface. Transverse joints shall be formed by an adequate crew. Transverse joints shall be checked by the applicant for surface tolerance using a stringline extended from a point 10 feet before the joint to a point approximately 40 feet beyond the joint. Any deviation in grade from the stringline in excess of 3/16 inch for roadway wearing courses and 1/4 inch for other courses shall be immediately corrected prior to the paving operation continuing beyond 100 feet of the transverse joint. Additionally, the transverse joint shall meet the surface tolerance requirements of this Code. The applicant shall make necessary corrections to the joint before continuing placement operations. Transverse joints in succeeding lifts shall be offset at least 2 feet.
7. *Sawing and sealing of joint in an asphaltic concrete overlay.* When new concrete pavement or existing concrete foundation is to be overlaid with asphaltic concrete, joints shall be sawed or formed and sealed.

8. *Sawed joints.* Saw cut shall be made in the overlay at the locations of all transverse and longitudinal joints in the concrete pavement. The sawed joints will have a minimum of 1/8" wide by 1" deep. The applicant shall clean and dry the saw cut before applying sealant in accordance with the requirements of this Code.
9. *Hauling, Paving, and Finishing.* Mixtures shall be transported from the plant and delivered to the paver at a temperature no cooler than 25 F below the lower limit of the accepted job mix formula. The temperature of the mix going through the paver shall not be cooler than 250F.
10. *Timing.* No loads shall be sent out so late in the day that completion of spreading and compaction of the mixture cannot be completed during daylight unless artificial lighting has been approved.
11. *Segregation.* When segregation occurs, haul trucks shall be loaded with a minimum of three drops of mix, the last of which shall be in the middle.
12. *Thickness.* Each lift of asphaltic mixture shall be placed in accordance with the lift thickness as shown on the approved plans. When no lift thickness is specified, binder and wearing course mixtures shall be placed in lifts not exceeding 2 inches plan thickness. Base course mixtures shall be placed in lifts of such thickness that all specification requirements are met.
13. *Depressions in initial layer.* With the approval of the Department of Engineering, motor patrols may be used to fill isolated depressions in the initial layer, provided this construction does not result in unsatisfactory subsequent lifts.
14. *Coordination of Production.* The applicant shall coordinate and manage plant production, transportation of mix and placement operations to achieve a high-quality pavement and shall have sufficient hauling vehicles to ensure continuous plant and roadway operations. The Department of Engineering shall have the authority to order a halt to operations when sufficient hauling vehicles are not available.
15. *Schedule.* On final wearing course construction under traffic with pavement layers of 2 inches compacted thickness or less, the applicant will be permitted to pave one travel lane for a full day. The applicant shall pave the adjacent lane the next workday. When the adjacent travel lane is not paved the next calendar day and the longitudinal joint is exposed to traffic for more than 3 calendar days, the entire length of exposed longitudinal joint shall be cut back to plan thickness to a vertical edge and heavily tacked. When pavement layers are greater than 2 inches compacted thickness, the applicant shall place approximately 1/2 of each day's production in one lane and the remainder in the adjacent lane.
16. *Protection from traffic.* Pavement shall be protected from traffic until it has sufficiently hardened to the extent the surface is not damaged.
17. *Paving Operations.* When placing the final two lifts of asphaltic concrete on the roadway travel lanes, a material transfer vehicle (MTV) will be required to deliver mixtures from the hauling equipment to the paving equipment, and to prevent segregation of the asphaltic concrete hot mix. The MTV is required regardless of ADT. All mixtures shall flow through the paver hopper. Mixtures dropped in front of the paver shall be either lifted into the hopper or rejected and cast aside. Delivery of material to the paver shall be at a uniform rate and in an amount within the capacity of paving and compacting equipment. The paver speed and number of trucks shall be adjusted to have one truck waiting in addition to the one at the paver in order to maintain continuous paving operations. The height of material in front of the screed shall remain uniform. During mixture transfer, the paver shall not be jarred or moved out of alignment. The level of mix in the

paver hopper shall not drop so low as to expose the hopper feed slats. Pavers shall be designed and operated to place mixtures to required line, grade and surface tolerance without resorting to hand finishing. Pavers shall be designed and operated to place mixtures to required line, grade, and surface tolerance without resorting to hand finishing.

18. *Longitudinal control.* An acceptable method of longitudinal control shall be placed by the applicant for the paver to follow. The paver shall be positioned and operated to closely follow the established line. Irregularities in alignment shall be corrected by trimming or filling directly behind the paver.
19. *Texture.* After each load of material has been placed, the texture of the unrolled surface shall be checked to determine its uniformity. The adjustment of screed, tamping bars, feed screws, hopper feed, etc., shall be checked frequently and adjusted as required to assure uniform spreading of the mix to proper line and grade and adequate compaction. When segregation of materials or other deficiencies occur, paving operations shall be suspended by the applicant until the cause is determined and corrected.
20. *Surface irregularities.* Surface irregularities shall be corrected directly behind the paver. Excess material forming high spots shall be removed. Indented areas shall be filled and finished smooth. Hand placement in accordance with the requirements of this Code for surface repair will be permitted. Material shall not be cast over the surface.
21. *Interruptions.* When paving and finishing operations are interrupted so that the mixture remaining in trucks, paver, paver hopper or on the pavement cools to such extent that it cannot be placed, finished, or compacted to the same degree of smoothness and with the same texture and density as the uncooled mixture, the cooled mixture shall be removed and replaced at the expense of the applicant.
22. *Slope control.* When additional mix is required to increase superelevation in curves, the use of automatic slope control will be optional.
23. *Hand Placement.* When the use of mechanical finishing equipment is not practical, the mix may be placed and finished by hand to the satisfaction of the Department of Engineering. No casting will be allowed including casting the mixture from the truck to the grade. During paving operations material shall be thoroughly loosened and uniformly distributed. Material that has formed into lumps and does not break down readily will be rejected. The surface shall be checked before rolling and irregularities corrected.
24. *Compaction.* After placement, mixtures shall be uniformly compacted by rolling while still hot, to at least 92% of Theoretical Maximum Specific Gravity (%Gmm) as determined by AASHTO T209 Method C. If continuous roller operation is discontinued, rollers shall be removed to cooler areas of the mat, where they will not leave surface indentations. The use of steel wheel rollers which result in excessive crushing of aggregate will not be permitted.
25. *Operation.* The rolling pattern established by the applicant shall be conducted by experienced operators in consistent sequences and by uniform methods that will obtain specified density and smoothness. Individual roller passes shall uniformly overlap preceding passes to ensure complete coverage of the paving area. The speed and operation of rollers shall not displace, tear or crack the mat. Non-vibrating steel wheel rollers shall be operated with drive wheels toward the paver. Any operations causing displacement, tearing or cracking of the mat shall be immediately corrected.
26. *Equipment.* Equipment which leaves tracks or indented areas which cannot be corrected in normal operations or fails to produce a satisfactory surface shall not be used. Operation of equipment

resulting in accumulation of material and subsequent shedding of accumulated material into the mixture or onto the mat will not be permitted.

27. *Roller wheels.* To prevent adhesion of mixture, wheels of steel wheel rollers shall be kept properly moistened, but excess water will not be permitted.
28. *Vibratory rollers.* Vibratory rollers may be used provided they do not impair the stability of the pavement structure or underlying layers.
29. *Surface.* The surface of mixtures after compaction shall be smooth and true to cross slope and grade within the tolerances specified. Mixtures that become loose, broken, contaminated or otherwise defective shall be removed and replaced with fresh hot mixture compacted to conform with the surrounding mixture.
30. *Ripples.* Ripples in the mat surface will not be accepted. Areas identified by testing as unacceptable shall be corrected at the expense of the applicant.
31. *Breakdown Rolling.* Breakdown or initial rolling shall be accomplished with a static or vibratory steel-wheel roller designed for initial compaction of hot asphaltic concrete mixtures.
32. *Finish Rolling.* Finish rolling shall be accomplished with an approved nonvibrating steel wheel roller until all roller marks have been eliminated.
33. After finish rolling, newly finished pavements shall have a uniform, tightly knit surface free of cracks, tears or other deficiencies. Deficiencies shall be corrected at the expense of the applicant and the applicant shall adjust operations to correct the problem. This may require the applicant to adjust the mix or furnish additional or different equipment.
34. *Hand Compaction.* Along forms, curbs, headers, walls and at other places inaccessible to rollers, mixture shall be uniformly compacted to the satisfaction of the Department of Engineering with approved hand tampers or mechanical tampers conforming to the requirements of this Code.

H. Roadway Acceptance.

1. *Density.* Acceptance testing for pavement density will be conducted by the Independent Testing Laboratory. One pavement core for each mix use shall be taken from each subplot within 72 hours after placement. Sampling shall be performed by the independent testing laboratory using the random number tables shown in DOTD TR 605. When the sampling location determined by random sampling falls within areas that are to be replaced, within 1 foot of the pavement edge, or within 5 feet of a transverse joint; another sampling location will be determined. Samples will be drilled by the Applicant at the locations determined by the Independent Testing Laboratory. The Applicant shall transport the cores to the asphalt plant for testing by the Independent Testing Laboratory. The Applicant's representative will inspect the cores upon delivery to the plant and before any testing is performed on the core. Any damaged cores or cores that are less than 1 3/8"; can be rejected at that time and a new sampling location must be determined and the core re-drilled. The removed pavement shall be replaced with hot or cold mixture and refinished during the workday the coring is performed. Cores less than 1 3/8" thick shall not be used as pavement samples for payment determination. The average density of all cores for each lot shall be greater than 92% of Maximum Theoretical Gravity (TR 327). Roadway density will be calculated using the lot average for Maximum Theoretical Gravity.

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2. *Lot sizes.* A lot is a segment of continuous production of asphaltic concrete mixture from the same job mix formula produced for a given job at an individual plant. A standard lot will be defined as:
 3. A lot is a segment of continuous production of asphaltic concrete mixture from the same job mix formula produced for a given job at an individual plant. A standard lot will be defined as:
 - a. 2000 tons production
 - b. Partial lots will require testing at the frequency of one test per 500 tons, and portion thereof.
 4. Each lot will be sub-divided into four equal sublots based on expected production. Testing will be conducted as follows:
 - a. *First Sublot.* Tests will be performed on aged specimens compacted to N-design as follows:
 - i. Percent Voids
 - ii. Percent VFA
 - iii. Percent VMA
 - b. Theoretical Maximum Specific Gravity (Gmm)
 - c. Gradation, AC Content and Percent Crushed
 - d. Aged or un-aged specimens compacted to N-maximum as follows:
 - i. Percent Gmm at N-initial
 - ii. Percent Gmm at N-Maximum
 5. *Second Sublot.*
 - a. Theoretical Maximum Specific Gravity (Gmm)
 - b. Aged or un-aged specimens compacted to N-maximum as follows:
 - i. Percent Gmm at N-initial
 - ii. Percent Gmm at N-Maximum
 6. *Third Sublot.*
 - a. Tests will be performed on aged specimens compacted to N-design as follows:
 - i. Percent Voids
 - ii. Percent VFA
 - iii. Percent VMA
 - b. Theoretical Maximum Specific Gravity (Gmm)
 - c. Gradation, AC Content and Percent Crushed
 - d. Aged or un-aged specimens compacted to N-maximum as follows:
 - i. Percent Gmm at N-initial
 - ii. Percent Gmm at N-Maximum
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7. *Fourth Sublot.*

- a. Theoretical Maximum Specific Gravity (Gmm)
 - b. Aged or un-aged specimens compacted to N-maximum as follows:
 - c. Percent Gmm at N-initial
 - d. Percent Gmm at N-Maximum
8. Tests for Theoretical Maximum Specific Gravity, Voids, VMA and VFA shall be conducted by the Independent Testing Laboratory. If lot averages (minimum two samples) exceed tolerances listed within this code, an adjustment must be made to the mix by the Applicant to bring the mix back within tolerance. If two consecutive lots are out on the same parameter, production must be halted and the mix re-designed.
9. Tests for Gradation, AC Content, and Percent Crushed and for aged or un-aged specimens compacted to N-maximum shall be conducted by the Applicant's Quality Control representative. If lot averages (minimum two samples) exceed tolerances listed in Table C502-2, an adjustment must be made to the mix by the Applicant to bring the mix back within tolerance. If two consecutive lots are out on the same parameter, production must be halted and the mix re-designed.
10. *Longitudinal Surface Tolerance:* The pavement surface will be tested by the Independent Testing Laboratory with an approved 10-foot rolling straightedge capable of marking the deficient areas by suitable means or an approved 10-foot static straight edge. The rolling straightedge shall be furnished by the applicant and shall be calibrated and used by the testing laboratory in accordance with DOTD Designations: TR 603 and TR 618. Surface tolerance measurements will be conducted for each pavement lot. If surface deviations in a lot exceed 6.0 percent, paving operations shall be discontinued and shall not be resumed until satisfactory corrective action is taken by the applicant. All testing will be made longitudinally for the full length of each traffic lane. Each section will be tested as early as possible in a longitudinal direction in both wheel paths of each travel lane. Pavement areas with surface deviations over 1 / 2 inch shall be satisfactorily removed and replaced by the applicant at his expense with pavement meeting these specifications. Areas with surface deviations of 1/ 4 to 1/ 2 inch will be isolated by the engineer and shall be corrected by the applicant at his expense by approved grinding methods to within a 1/8-inch deviation; except for ramps, turnouts and other irregular sections which shall be corrected by approved grinding methods to within a 1/ 4-inch deviation.

H. Asphaltic Tack Coat.

1. The applicant shall prepare and treat asphaltic or concrete surfaces with asphaltic material in accordance with these specifications and in conformity with the lines shown on the approved plans.
2. Tack coat shall be a modified asphalt emulsion (Grade SS-1, SS-1H or CMS-2) or a modified asphalt emulsion (Grade CRS-2P, CRS-2L, SS-1P or SS-1L) listed on the LaDOTD AML at the time of its application.
3. Asphaltic tack coat shall not be applied on a wet surface or when the ambient air temperature is below 40 F.
4. The Applicant shall provide equipment for applying asphaltic material and preparation of the surface to be tacked. Equipment shall conform to the requirements of this Code. A hand-held

pressure nozzle may be used for tack coat application in lieu of the spray bar/tachometer combination for irregular sections or short sections of 1500 feet or less.

5. The surface shall be cleaned by sweeping or other approved methods. Edges of existing pavements which will form joints with new pavement shall be satisfactorily cleaned before tack coat is applied. Asphalt shall be uniformly applied to a clean dry surface with no bare areas, streaks, or puddles with an asphaltic distributor at a rate in accordance with the table below.

Asphalt Tack Coats

Surface Type	Rate ^{1,2} ; Gal/Sq yd
Existing Surface Treatment	0.12
New Hot Mix	0.06
Existing Hot Mix	0.09
Portland Cement Concrete	0.09
Milled	0.08

¹Rates are minimum rates of undiluted asphalt emulsion.

²Minimum rate for hot applied non-tracking tack (NTHAP) is 0.08 gal/sq yd for all surface types

I. Asphaltic Prime Coat.

1. The applicant shall prepare and treat surfaces with asphaltic material in conformance with these requirements of this Code and in conformity with lines shown on the plans or established in the field.
2. Prime coat shall be cutback asphalt Grade MC-30, MC-70, or AEP Emulsified Asphalt listed on the LaDOTD AML at the time of its use.
3. Asphaltic materials shall not be applied on a wet surface or when ambient air temperature is less than 35 F in the shade.
4. The applicant shall provide the necessary equipment for proper construction of the work. Equipment shall be approved before construction begins and shall be maintained in satisfactory working condition. Equipment shall conform to the requirements of this Code.
5. The surface to be coated shall be shaped to required grade and section shall be free from ruts, corrugations, segregated material or other irregularities, and shall be compacted to required density. Delays in priming may necessitate reprocessing or reshaping to provide a smooth, compacted surface
6. Prime coat shall extend 6 inches beyond the width of surfacing shown on the approved plans. The prime coat shall not be applied until the surface has been satisfactorily prepared and is dry.
7. Prime coat shall be applied at the rates and temperatures shown in the table below. Quantities of prime coat shall not vary from that shown the table below.

	Application Rate (Gallon/square yard)		Application Temperature (°F)	
	Min.	Max.	Min.	Max.
Asphalt Grade				
MC-30	0.15	0.30	60	120
MC-70	0.15	0.30	100	180
AEP	0.15	0.30	60	120

8. After prime coat has been applied it shall cure for a minimum of 24 hours before the surfacing is placed. The applicant shall keep traffic off the surface until the prime coat has properly cured, unless otherwise permitted.
9. If traffic is permitted, the applicant may be required to spread approved granular material, as directed, over the prime coat at the expense of the applicant.
10. The prime coat shall be maintained intact. When required, the primed surface shall be thoroughly cleaned prior to the placement of surfacing.
11. Where the prime coat has failed, the failed area shall be cleaned and be recoated with prime coat at no direct pay. When the prime coat is generally unsatisfactory, the applicant shall reprime the unsatisfactory surface at the expense of the applicant.

J. Cold Planing/Milling of Asphalt Pavement.

1. Where required by the approved plans, the applicant shall remove asphalt pavement to the depth, width, grade, cross-slope and typical sections shown on the approved plans by milling.
2. Equipment for milling asphaltic surfacing shall be certified, self-propelled milling machines or grinders. They shall have sufficient power, traction and stability to remove the thickness of asphaltic concrete necessary to provide profile grade and cross slope uniformly across the surface. Milling equipment shall be capable of working from an erected string line, shoe device or a traveling reference plane that will accurately reflect, for a minimum length of 30 feet, the average grade of the surface on which it is to be operated and shall have an automatic system for controlling cross slope at a given rate. Adequate loading equipment shall be provided to immediately remove materials cut from the surface and discharge the cuttings into a truck or on the shoulder as specified or directed. When cuttings are placed directly on the shoulder or used in asphaltic concrete, surfacing with lightweight aggregate shall be removed separately. Adequate personnel shall be provided to ensure that the cuttings are removed from the surface daily. The drum shall be round and true with enough teeth to yield a uniform and fine textured surface for bonding of the subsequent overlay. The machine shall be equipped with means to control dust created by the cutting action and shall have a system providing for uniformly varying the depth of cut while the machine is in motion.
3. The maximum forward speed of the milling machine shall be 40 feet per minute. This speed shall be reduced as directed to provide a milled surface of uniform and fine texture with the specified grade and cross slope. Ridges left in the surface due to missing teeth shall be corrected by additional passes. The maximum depth of milling shall be 2 inches per pass when traffic is being maintained. Teeth lost during milling shall be immediately replaced.

4. Thirty foot (minimum) traveling reference plane shall be used on each pass of the milling machine. A shoe device to match the curb may be used when directed. The reference plane shall be placed on the best available adjacent surface.
5. When the entire roadway width has not been milled to a flush surface by the end of a work period resulting in a vertical or near vertical longitudinal face exceeding 2 inches in height, this longitudinal face shall be sloped. Transverse faces present at the end of a work period shall be beveled. Provisions shall be made at drives and turnouts to maintain local traffic.
6. Asphaltic concrete next to structures that cannot be removed by the milling machine shall be removed by other acceptable methods.
7. Pavement surfaces resulting from milling operations shall be of uniform texture, grade and cross-slope and free from loose material. Planed surfaces not meeting these requirements shall be re-milled at the expense of the applicant. No uneven, undulating surfaces will be accepted. The applicant shall provide drainage of planed areas by cutting through the shoulder to the ditch.
8. The milling operation shall not precede the subsequent paving operation by more than 10 calendar days. This time may be extended by the Department of Engineering upon request by the applicant if extensive joint repairs or patching is required. For single lift overlays requiring shoulder stabilization, the milling operation shall not precede the subsequent paving operation by more than 30 days.
9. On roadways that are open to traffic, pavement striping removed by milling shall be replaced with temporary pavement markings at the end of each day's milling operations in accordance with the requirements of this Code.
10. Unless otherwise provided for within the permit, surfacing material removed by milling shall become the property of the applicant and shall be disposed of in accordance with local, State, and Federal Law. When specified on the permit, a portion or all of the surfacing material removed by milling will be retained by the Parish and shall be hauled by the applicant to the specified location and stockpiled as directed. Excess material shall then become the property of the applicant and shall be disposed of in accordance with local, State, and Federal Law.
 - a. Required joint repairs shall be made after milling. Pavement patching shall be completed before milling. When additional areas requiring patching are exposed by milling operations, such additional patching shall be performed after milling. Pavement patching shall be in accordance with the requirements of this code.
11. Except when milling reaches an existing concrete base layer, the surface tolerance requirements of the milled surface shall meet the requirements for binder course as required by this Code.

K. Asphalt Pavement Patching, Widening, and Joint Repair

1. The applicant shall provide for patching, widening and joint repair of existing asphaltic concrete pavements in accordance with the requirements of this Code and in conformity with the lines, grades and typical sections shown on the approved plans or as directed. Asphaltic concrete shall be used for patching, widening, and joint repair.
2. Asphaltic concrete for patching and widening may be any type mixtures listed within this Code, except that 1/2 inch nominal maximum size mixtures shall not be used. Asphaltic concrete for joint repair shall be Superpave Asphaltic Concrete (Level A) complying with the requirements of this Code. Tack coat shall comply with the requirements of this Code.

3. The applicant shall remove existing surfacing and base materials and perform all required excavation for patching and widening. When through traffic is maintained, the applicant shall complete the replacement of pavement, place the widening material, or fill and compact open areas or trenches at the end of each day's operations. Excavation and compaction of the subgrade shall be in accordance with the approved plans. The subgrade shall be compacted uniformly.
4. Existing surfacing and excess excavation shall be disposed of beyond the right-of-way in accordance local, State, and Federal law.
5. Prior to joint repair, contact surfaces of existing pavement shall be cleaned and a thin, uniform asphalt tack coat applied prior to placing asphaltic mixture in the joint. Patching and widening with asphaltic concrete shall conform to the requirements of this Code, except that priming of the subgrade will not be required.
6. Contact surfaces of pavement shall be cleaned, and a uniform coat of asphalt tack coat applied before placement of asphaltic concrete.
7. Patches shall not be overlaid for a minimum of 5 calendar days Spreading, finishing and compaction of asphaltic concrete shall leave the surface smooth and level with, or slightly above, the edge of existing pavement.
8. To provide lateral support, the applicant will be permitted to construct temporary berms of excavated material against the outside edge of widening strips prior to rolling.

L. Portland Cement Concrete Pavement Production and Placement

1. The applicant shall construct Portland roadway pavement in substantial conformance with these requirements and in conformity with the locations, lines, grades, slopes, thickness, sections and strength shown on the approved plans and included herein.
2. The pavement thickness shall be dependent upon soil properties, traffic type and frequency as provided for by the requirements of this Code.
3. Portland cement shall be a product listed on the LaDOTD AML and conform to the requirements of ASTM C 150, Type I or Type II.
4. Aggregates: Fine aggregate shall be a clean natural sand conforming to the requirements of ASTM C 33. Coarse aggregate shall be clean, hard, durable gravel, crushed stone or crushed concrete conforming to the requirements of ASTM C 33, Gradation No. 467 or 57.
 - a. Admixtures: If used, air entraining admixtures shall conform to the requirements of ASTM CZ60 and shall be listed on the LaDOTD AML. Water reducing admixtures and water reducing, retarding admixtures shall conform to the requirements of ASTM C 494 and shall be listed on the LaDOTD AML. Super plasticizers shall conform to the requirements of ASTM C 494, Type F or G, and shall be listed on the LaDOTD AML.
 - b. Water used in mixing concrete shall be potable and fit for human consumption.
 - c. Fly ash shall meet the requirements of ASTM C 618, Class C. Fly ash is approved for use in pavements only and not in structures.
 - d. Ground granulated Blast Furnace slag shall meet the requirements of ASTM C 989.
5. Joint Fillers:

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- a. Preformed joint fillers may be any of the following type:
 - i. Resilient Bituminous Type: Comply with AASHTO M 213.
 - ii. Wood Fillers: Use clear heart redwood for bottom boards. Use any type of wood which is free from defects and meets dimensional requirements for top boards. Occasional medium surface checks will be permitted provided the board is free of defects that will impair its usefulness. Boards may not vary from specified dimensions in excess of the following tolerances: Thickness, -0", +1/16"; Depth, +/- 1/8"; Length, +/-1/4". The load required to compress the material in an oven-dry condition to 50 percent of its original thickness may not exceed 1750 psi.
 - iii. Bituminous Type: Comply with ASTM D994
 - iv. Asphalt Ribbon: Use filler consisting of preformed strips of bitumen and inert filler material conforming to the requirements in the table below. The tensile strength is determined by pulling a 25-by-150-mm sample at a 500-mm/min separation rate. Use material that is resistant to cracking, tearing, or permanent deformation under normal handling and installation procedures. Use material that is sufficiently rigid to enable it to form a straight joint. Use backer material of the appropriate size complying with ASTM D5249, Type 3.
 - b. Poured and extruded sealants shall be any of the following:
 - i. Hot Poured Rubberized Asphalt Type: Comply with ASTM D6690, Type II. Use material listed on the Approved Materials List. Use backer materials of the appropriate size complying with ASTM D5249, Type I.
 - ii. Polyurethane Sealant: Use either a 1- or 2-component, pourable or extrudable sealant, with required primers and backer material. Use material that cures to a solid rubber-like material able to withstand both tension and compression. Use material listed on the Approved Materials List. Use a backer material of the appropriate size complying with ASTM D5249, Type 2 without the heat resistant requirement or Type 3.
 - iii. Silicone Sealant, Single Component: Comply with ASTM D5893. Use a system listed on the Approved Materials List
 - iv. Silicone Sealant, Two Component – Rapid Cure: Comply with ASTM D5893 and meet the requirements for single component sealants when mixed and prepared in accordance with the manufacturer's recommendations. Use material listed on the Approved Materials List. Use a backer material of the appropriate size conforming to ASTM D5249, Type 3.
 - c. Preformed Elastomeric Compression Joint Sealers shall be material listed on the Approved Materials List. Use material with an uncompressed depth that is equal to or greater than the uncompressed width of the seal. The actual width of the seal may not be less than the nominal width of the seal. Use system complying with ASTM D2628, except that the ozone resistance may be determined by the bent loop test method.
 - d. Metal parting strips used to form keyed joints shall be 16-gauge galvanized steel.

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- e. Reinforcing bars shall conform to "Specifications for Billet-Steel Bars for Concrete Reinforcement" (ASTM A 615), "Specifications for Deformed Rail-Steel Bars for Concrete Reinforcement" (ASTM A 616), "Specifications for Deformed Rail-Steel Bars for Concrete Reinforcement with 60,000 psi Minimum Yield Strength," or "Specifications for Axle-Steel Bars for Concrete Reinforcement" (ASTM A 160). Deformations for deformed bars shall conform to "Specifications for Deformations for Deformed Steel Bars for Concrete Reinforcement" (ASTM A 305).
 - i. When placed, all reinforcement shall be free from dirt, oil, paint, grease, mill scale, loose or thick rust, or other deleterious substances. When bending is required, it shall be accurately done. All reinforcement shall be placed in the exact positions shown on the plans. Reinforcement shall be securely held in position by wiring and blocking it from the forms and by wiring it together at intersections so that it will not be displaced during depositing and compacting of the concrete.
 - f. Curing compound shall be a white pigmented, impervious membrane conforming to the requirements of ASTM C 309, Type 2
 - g. Tie bars shall be deformed concrete reinforcing steel conforming to ASTM A 615, Grade 40
 - h. Dowels and dowel assemblies shall be as shown on the approved plans. Load transfer devices shall consist of approved plastic-coated dowel bar assemblies.
 - i. Dowel Bars: Dowel bars shall be plain bars conforming to ASTM Designations A 615, A 616, A 617, and their supplementary requirements. Dowel bars shall be undercoated with an adhesive and given an outer coat of extruded polyethylene plastic in accordance with the coating requirements of AASHTO Designation M 254 and the following:
 - ii. Dowels shall have a uniformly round cross-section and shall be saw-cut, smooth and free of burrs, projections, and deformations. Dowels shall be coated with one coat of an approved paint and thoroughly coated with an approved lubricant. In lieu of painted and lubricated dowels, plastic-coated dowel bars may be used. Plastic-coated dowel bars may be placed by approved mechanical devices equipped with suitable means to control proper depth and alignment of the dowel bars. Bars shall be positioned parallel to the pavement centerline and surface. Bars shall be firmly held in position by the mechanical device until concrete has been thoroughly consolidated around the bars. Painted and greased dowel bars shall be placed in approved metal dowel assemblies. An approved sleeve shall be furnished with each dowel bar used in expansion joints. The sleeve shall fit the dowel bar tightly and the closed end shall be watertight.
- 6. Straight-sided forms shall be made of metal having a thickness of not less than 7/32" and shall be furnished in sections not less than 10' in length. On curves with a radius greater than 150', straight forms of shorter lengths will be permitted. Forms shall have a depth not less than the specified edge thickness of the pavement and a base width at least 0.8 of the depth.
 - 7. Flexible or curved forms of proper radius shall be used on curves of a 150' radius or less. Forms shall be provided with adequate devices for secure setting. Flange braces shall extend outward on the base not less than two-thirds the height of the forms. Forms with battered top surfaces and bent, twisted or broken forms shall be removed from the work. Repaired forms shall not be used until inspected and approved.
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8. Built-up forms may be used; however, the built-up forms shall not exceed 2". No limitation will be made on the use of built-up forms or the amount of build-up where the total area of pavement of any specified thickness on the development is less than 2,000 square yards. The top face of the form shall not vary from a true plane more than 1/8" in 10' and the upstanding leg shall not vary more than 1/4" from the vertical. The forms shall contain provisions for locking the ends of abutting form sections together tightly and for secure setting.
9. Alignment and grade elevation of forms shall be checked and corrections made by the applicant prior to placing concrete. When any form has been disturbed or any grade has become unstable, the form shall be reset and rechecked.
10. Form removal shall be done carefully without damage to green concrete and in no case less than 12 hours after placing concrete. Holes or voids in surfaces shall be immediately filled with 1:2 mortar and floated smooth. Formed edges shall be cured after removal of forms.
11. Expansion joints should be 3/4" in thickness and will have smooth dowel bar assemblies. Dowels should be sized and spaced in accordance with the approved plans. Expansion joints shall be placed at all intersections and points of curvature; joints shall not exceed 300' center to center spacings.
12. Contraction joints will have smooth dowel bar assemblies. Doweled contraction joint assemblies shall be placed at maximum 20' centers and at a minimum 10' centers. Dowels shall be sized and spaced according to the approved plans.
13. Longitudinal joints shall be spaced so that pavement widths do not exceed 14'. Joints shall be formed by parting strips and doweled with deformed tie bars in accordance with the standard plans.
14. Irregular slopes of pavement, cul de sacs and intersections shall be doweled in panels no larger than 14' on any side. They shall be formed by parting strips and doweled with the same deformed tie bars as above.

M. Concrete Properties and Proportions:

1. The applicant shall submit an appropriate mix design to the independent laboratory. The mix design shall be reviewed and forwarded to the applicant and the Director of Department of Engineering within 48 hours of receipt.
2. The 28-day compressive strength (f'c) shall be a minimum of 4,000 psi.
3. Concrete shall have a minimum cementitious content of 500 pounds per cubic yard, be designed with a water reducing admixture, and have a maximum slump of 4 inches.
4. High early strength concrete shall have a minimum cementitious content of seven sacks and be designed to provide a minimum strength of 3000 psi before the pavement can be opened to traffic where the pavement thickness exceeds nine inches, else a minimum strength of 4,000 psi before the pavement can be opened to traffic. Additional test cylinders shall be cast at the time of placement
5. Fly ash may be substituted for cement at the ratio of one pound of fly ash for each pound of cement up to a total of 150 pounds of fly ash per cubic yard of concrete in accordance with the approved mix design. Slag cement may be used to replace up to ½ of the total cementitious content.
6. Concrete with a temperature of 95 F or greater at the time of placement, or concrete not deposited within one-and-one-half hours after initial injection of the water to the mix, shall be rejected. Any

deviations from the above requirement shall be verified for strength by additional cylinders at the expense of the applicant.

7. Concrete mixing shall be in accordance with the requirements of ACI 304R-00.
8. Concrete delivery shall be in accordance with the requirements of ASTM C 94.
9. Concrete may be placed and finished by machine. Concrete shall be placed between the forms in such a manner as to avoid segregation, avoid damage to forms and joints, and avoid unnecessary movement once it has been placed.
10. The subgrade or base course shall be brought to a proper cross-section. High areas shall be trimmed to proper elevation. The finished grade shall be maintained in a smooth and compacted condition until the pavement is placed. No concrete shall be placed until the subgrade or base course has been approved by the Department of Engineering.
 - i. The subgrade or base course shall be uniformly moist when concrete is placed. If it becomes too dry, the subgrade or base course shall be sprinkled, but the method of sprinkling shall not be such as to form mud or pools of water.
11. Concrete shall be deposited on the grade in such a manner as to require as little rehandling as possible. All equipment shall be designed and operated so as to assure placement and spreading of concrete without segregation. Placement shall be continuous between transverse joints without the use of intermediate bulkheads. Necessary hand-spreading shall be done with shovels or other approved tools, excluding rakes.
12. Concrete shall be consolidated by use of a vibrating screed or internal vibrators.
13. Concrete shall not be placed on a frozen subgrade when the air temperature is below freezing, or when the air temperature is expected to go below 32 F within 12 hours with a minimum concrete temperature of 50 F.
14. The roadway pavement shall be of the size and shape shown on the approved plans. It shall consist of one course of concrete with joints, dowels, etc., as depicted in the approved plans.
15. Final strike-off, consolidation and finishing shall conform to the requirements of this Code. The surface texture shall be a broom finish or tined finish.
16. Tolerance for surface smoothness shall be 1/4" in 10', except at high and low points and utility structures in the street.
17. If split slab construction is used and not slip formed, forms on each side of the slab will be required. The side of the slab to be joined during a later placement will have tie bars. Caution shall be exercised in removing the form and in straightening the tie bars.

N. Final Strike Off, Consolidation and Finishing.

1. The sequence of operations shall be the strike off, consolidation floating and removal of laitance, straight edging, and final surface finish.
2. The addition of water to the surface of concrete to assist in finishing operations will not be permitted.
3. During final surface-finish operations, all areas that are improperly finished shall be refloated and refinished as required.

4. Concrete adjacent to joints shall be compacted or firmly placed, without voids or segregation, against the joint material. It shall also be compacted and firmly placed under and around load transfer devices, joint assembly units and other features designed to extend into the pavement. Concrete adjacent to joints shall be consolidated.
5. After concrete has been placed and vibrated adjacent to joints as required, the finishing machine shall be brought forward operating in a manner to avoid damage or misalignment of joints. The finishing machine shall be stopped when the front screed is approximately 8 inches from the joint. Segregated concrete shall be removed from in front of and off the joint. The front screed shall be lifted and set directly on top of the joint and the forward motion of the finishing machine resumed. When the second screed is close enough to permit excess mortar in front of it to flow over the joint, it shall be lifted and carried over the joint. Thereafter, the finishing machine may be run over the joint without lifting the screed or on top of the joint.
6. Machine-Finishing: Vibrators for full width vibration of concrete paving slabs shall not be operated longer than 15 seconds in one location. If uniform and satisfactory density of concrete is not obtained by the vibratory method at joints, along forms, at structures, and throughout the pavement, the applicant shall furnish equipment and use methods which will provide pavement conforming to the specifications.
7. Hand-Finishing: Unless otherwise specified, hand-finishing methods will not be permitted except in the event of a breakdown of the mechanical equipment. Hand methods may then be used to finish the concrete already deposited on grade. When a breakdown occurs in pavement areas not exceeding a width of 16' or irregular in dimension where operations of mechanical equipment are impractical, the pavement may be finished by hand methods.
8. Concrete, as soon as it is placed, shall be struck off and screeded.
9. The screed for the surface shall be at least 2 feet longer than the maximum width of slab to be struck off. It shall be of approved design, sufficiently rigid to retain its shape, and constructed of either metal or other suitable material shod with metal.
10. Consolidation shall be attained by the use of a suitable vibrator or other approved equipment.
11. In operation, the screed shall be moved forward on forms with a combined longitudinal and transverse shearing motion, moving always in the direction in which the work is progressing and so manipulated that neither end is raised from the side of the forms during the strike-off process. If necessary, this shall be repeated until the surface has a uniform texture, is true to grade and cross-section, and is free from porous areas.
12. Longitudinal Float Method: The mechanical longitudinal float shall be of a design approved by the Department of Engineering and shall be in good working condition. The tracks from which the float operates shall be accurately adjusted to the required crown. The float shall be accurately adjusted and coordinated with the adjustments of the transverse finishing machine so that a small amount of mortar is carried ahead of the float at all times. The forward speed shall be adjusted so that the float will lap the distance specified by the area of pavement at least twice. Excessive operation over a given area will not be permitted. Any excess water or soupy material shall be wasted over the side forms on each pass.
13. Pan Float Method: The applicant may use a machine composed of cutting and smoothing float or floats suspended from and guided by a rigid frame. The frame shall be carried by four or more visible wheels riding on and constantly in contact with the side forms.

14. If necessary, following one of the preceding methods of floating, long handled floats, having blades not less than 5' in length and 6" in width, may be used to smooth and fill in open-textured areas in the pavement. Long handled floats shall not be used to float the entire surface of the pavement in lieu of, or supplementing one of the preceding methods of floating. When strike-off and consolidation are done by hand methods and the crown of the pavement will not permit use of the longitudinal float, the surface shall be floated transversely by means of the long-handled float. Care shall be taken not to work the crown out of the pavement during the operation. After floating, any excess water and laitance shall be removed from the surface of the pavement by a straightedge, 10' or more in length. Successive drags shall be lapped one-half the length of the blade.
15. Straightedge Testing and Surface Correction: After floating has been completed and excess water removed, but while the concrete is still plastic, the surface of the concrete shall be tested for trueness with an accurate 10' straightedge swung from handles approximately 3' longer than one-half the width of the slab. The straightedge shall be furnished and used by the applicant. It shall be held with the surface in successive positions parallel to the road centerline and the whole area gone over from one side of the slab to the other as necessary. Advance along the road shall be in successive stages of not more than one-half the length of the straightedge.
16. Any depressions found shall be immediately filled with freshly mixed concrete, struck off, consolidated and refinished. High areas shall be cut down and refinished. Special attention shall be given to assure that the surface across the joints meets with requirements for smoothness. Straightedge testing and surface corrections shall continue until the entire surface is found to be free from observable departures from the straightedge and the slab conforms to the required grade and cross-section.
17. Final Finish and Texture: Unless otherwise specified, the final finish and texture shall be obtained using a broom in accordance with this subsection. The surface texture shall be a broom finish. It shall be applied when the water sheen has practically disappeared. The broom shall be drawn from the center to the edge of the pavement with adjacent strokes slightly overlapping. The brooming operation shall be so executed that the corrugation produced in the surface shall be uniform in appearance and not more than 1/16" in depth. Brooming shall be completed before the concrete is in such condition that the surface will be torn or unduly roughened by the operation. The surface, thus finished, shall be free from rough and porous areas, irregularities and depressions resulting from improper handling of the broom. Brooms shall be of such quality, size and construction and be so operated as to produce a surface finish meeting the approval of the Department of Engineering. Subject to satisfactory results being obtained, the applicant will be permitted to use mechanical brooming in lieu of manual brooming.
18. Edging at Forms and Joints: After the final finish, but before the concrete has taken its initial set, the edges of pavement along each side of transverse expansion joints, formed joints and transverse construction joints shall be worked with an approved tool and rounded to the radius specified. A well-defined, continuous radius shall be produced and a smooth, dense mortar finish obtained. The surface of the slab shall not be unduly disturbed by tilting the tool during use. Tool marks appearing on the slab adjacent to joints shall be eliminated by brooming the surface. In doing this, the rounding of the corner of the slab shall not be disturbed. All concrete on top of the joint filler shall be removed. All joints shall be tested with a straightedge before the concrete has set. Corrections shall be made if one side of the joints are higher than the other or if the joints are higher or lower than in adjacent slabs.

19. Immediately after completion of finishing operations and as soon as marring of concrete will not occur, the entire surface of newly placed concrete shall be covered and cured with a white pigmented impervious membrane.
20. The applicant shall have available at the job site, sufficient covering material to cover and properly protect the last hour's pour against the effects of rain. This covering material may be burlap mats, waterproof paper or combined burlap and white polyethylene sheeting. Failure to provide sufficient cover material or to adequately take care of curing requirements shall be cause for immediate suspension of concreting operations.
21. Curing compound shall be applied under pressure by mechanical sprayers at the rate recommended by the manufacturer. In no case should less than one gallon per 100 square feet of surface area be applied. The spraying equipment shall be the full atomizing type equipped with a tank agitator. At the time of use, the compound shall be stirred continuously by mechanical or other approved means. Hand-spraying odd widths or shapes and on surfaces exposed by the removal of forms will be permitted provided the curing compound has been thoroughly agitated prior to placing it in the hand sprayer. The curing compound shall be applied to the inside faces of joints to be sealed. In split-slab construction, the curing compound shall be applied in such a manner as to prevent the spraying of exposed reinforcing steel.
22. Upon removal of side forms, the sides of the slabs and curbs exposed shall be protected immediately in such a manner as to provide a curing treatment equal to that provided for the surface.
23. Curbs not cast integrally with the slab shall be cured in the manner specified above immediately after completion of finishing.
24. No street shall be opened until the compressive strength determined by testing reaches 75% of design strength or 3,000 psi.
25. No traffic shall be allowed on the pavement until all joints have been cleaned and sealed.
26. For the purpose of establishing the thickness of concrete pavements or foundation, either plain or reinforced, constructed or specified herein, cores taken by the testing laboratory will be used.
27. The average thickness of the concrete pavement to be used as a basis for acceptance of the pavement shall be the average thickness of the core drilling from the concrete, representing the area bounded between lines drawn at right angles to the center of the roadway and at a point halfway between any two consecutive cores. Cores will be taken at about the center of each 500 square yards (approximately) of paved lane or a major fraction thereof, with a minimum of one core per lane per block. No less than four cores shall be taken from the pavement or foundation built under any one development.
28. Should any core show a deficiency of more than 1" below the specified thickness, additional cores will be taken 5' on either side of the deficient core. If both of these cores are within the 1" tolerance, the procedure will be to cut cores in the following order: 25', 50', 100', the same to be measured from the location of the original core found to be deficient in thickness, then at 100' intervals until a thickness within the 1" tolerance is found in both directions.
29. Any cores required over those specified to establish the average thickness of the pavement or foundation shall be made at the expense of the applicant. Areas found to be deficient in thickness by more than 1" shall be evaluated by the Department of Engineering. If, in his judgement, the deficient areas warrant removal, they shall be removed and replaced with concrete of the thickness shown on the approved plans.

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30. *Longitudinal Surface Tolerance.* The pavement surface will be tested by the Independent Testing Laboratory with an approved 10-foot rolling straightedge capable of marking the deficient areas by suitable means or an approved 10-foot static straight edge. The rolling straightedge shall be furnished by the applicant and shall be calibrated and used by the testing laboratory in accordance with DOTD Designations: TR 603 and TR 618. Surface tolerance measurements will be conducted for each pavement lot. If surface deviations in a lot exceed 6.0 percent, paving operations shall be discontinued and shall not be resumed until satisfactory corrective action is taken by the applicant. All testing will be made longitudinally for the full length of each traffic lane. Each section will be tested as early as possible in a longitudinal direction in both wheel paths of each travel lane. Pavement areas with surface deviations over 1 / 2 inch shall be satisfactorily removed and replaced by the applicant at his expense with pavement meeting these specifications. Areas with surface deviations of 1/ 4 to 1/ 2 inch will be isolated by the engineer and shall be corrected by the applicant at his expense by approved grinding methods to within a 1/8-inch deviation; except for ramps, turnouts and other irregular sections which shall be corrected by approved grinding methods to within a 1/ 4-inch deviation.

O. Culverts and Storm Drains

1. Construction requirements for Culverts and Storm Drains are included in Section 900 – 6 of this UDC.

P. Manholes, Catch Basins, Drop Inlets, and Cleanouts

1. Construction requirements for Manholes, Catch Basins, Drop Inlets, and Cleanouts are included in Section 900 – 6 of this UDC.

Q. Drives and Incidental Paving

1. Driveways shall be constructed of such lengths and widths and at such points as shown on the approved plans.
2. Portland Cement Concrete Drives and Incidental Paving
 - a. Portland cement concrete pavement drives shall be a minimum of six inches thick and all commercial or industrial driveways shall be a minimum of eight inches in thickness. Driveways shall be constructed of Portland cement concrete having a minimum compressive strength of three thousand (3,000) psi. at twenty-eight (28) days. The minimum cement content shall be five and one-half (5-1/2) bags per cubic yard of concrete. The maximum water content, including free water in the aggregate, shall not be greater than six (6) gallons per bag of cement. The consistency of the concrete shall be such as to have a slump of from two (2") inches to four (4") inches.
 - b. Expansion joints shall be provided where shown on the approved plans.
 - c. Weakened planes shall be formed by a jointing tool or other acceptable means. Weakened planes shall extend into concrete for at least 1/4 of the depth and shall be approximately 1/8 inch wide.
 - d. A longitudinal weakened plane shall be formed along the centerline of drives more than 16 feet wide, and transverse weakened planes shall be formed at not more than 16-foot intervals.

- e. The subgrade on which the driveways are to rest shall be thoroughly rolled or tamped so as to be uniformly compacted and solidified. The finished grade shall be smooth, even, well-graded and exactly parallel to the finished surface of the driveway.
 - f. Immediately after placing and tamping the concrete in place, it will be brought to the established grade by means of a strike board. Finishing shall be completed by use of a soft-haired brush, moved lightly over the surface in the direction of the width of the driveway. Joints are to be straight and square, in good alignment and edges finished by a joiner, so as to avoid sharp corners.
3. Asphalt Concrete Drives and Incidental Paving: Asphalt concrete drives shall be constructed of Level A Minor Mix or Level 1 or Level 2 mix. Residential asphalt concrete drives shall be a minimum of 6" of minor mix compacted to a minimum of 89.0 of theoretical maximum density and shall be placed atop 6" of compacted aggregate base course. Commercial or industrial drives shall be a minimum of 8" of minor mix compacted to a minimum of 92.0 of theoretical maximum density and shall be placed atop 8" of compacted aggregate base course. Drives shall be placed and finished such that there are no deficiencies greater than 1/4" when tested with an approved 10' static straight edge.
4. Aggregate Surface Course Drives and Incidental Paving: Aggregate surface course drives shall be thoroughly compacted to a density acceptable to the Department of Engineering.

R. Curbs and Gutters

1. Curb shall be either mountable or barrier curb. Concrete curb and barrier curb shall be constructed monolithically with the same materials, having the same compressive strength and placed and cured in the same manner as the concrete in the roadway slab.
2. The curb forms shall provide for the dimensions specified and must be set to the established grades.
3. Pre-moulded joint filler shall be placed and extended through the entire curb section, at those points where joint filler is used in the roadway slab.
4. Where the concrete gutter is constructed as a part of combined curb and gutter bottom, it shall conform to the requirements of combined curb and gutter bottom. Jointing shall conform to the requirements of this code pertaining to Portland cement concrete pavement.
5. Where the concrete gutter is constructed in conjunction with roadway pavement, it shall, unless otherwise specified or directed, be poured monolithically with, become part of, be laid at the same time, in the same manner and have the same compressive strength as concrete roadway foundation, for such roadway pavements. It shall be of the same width indicated on the plans and of such depth as will be equal to the combined thickness of the roadway foundation and the roadway pavement wearing surface.
6. The subgrade shall meet the requirements for roadway pavement sub-grade.
7. Immediately after the concrete has been placed, it shall be tamped, struck off and worked with a wood float in a manner to provide a surface free from irregularities and depressions, bringing the mortar to the top. The surface shall then be broomed or brushed with a soft hand broom in the direction of the flow line of the gutter. Surface joints shall be made by a steel joining tool and premoulded joint filler shall be placed and extended through the entire gutter section at those joints where filler is used in the roadway slab or curb. Curing of the gutter shall be similar to that provided for roadway pavement.

S. Pavement Markers**1. Raised Pavement Markers**

- a. The applicant shall furnish and place raised pavement markers in accordance with the approved plans and the requirements of this Code.
- b. Raised pavement markers shall be products listed on the LaDOTD AML at the time of their installation.
- c. Markers shall be placed with bituminous adhesive on asphaltic surfaces and epoxy adhesive on Portland cement concrete surfaces.
- d. Bituminous adhesive shall be a product listed on the LaDOTD AML at the time of its use.
- e. Epoxy adhesive shall be Type V epoxy resin system listed on the LaDOTD at the time of its use. Epoxy components shall be mixed in accordance with the manufacturer's published instructions. Adhesive shall be mechanically mixed and dispensed.
- f. Weather Limitations: Markers shall not be applied when there is moisture on the surface.
- g. Epoxy Adhesive: When a normal set adhesive is used, application of markers will not be permitted at ambient air temperatures less than 50 F. When a rapid set adhesive is used, application of markers will be permitted at ambient air temperatures between 35 F and 50 F, provided adhesive is adequately heated to obtain proper viscosity for mixing and application, and provided adhesive is identified as a rapid set type on container labels.
- h. Bituminous Adhesive: Markers shall be applied when the ambient air temperature is 50 F or greater.
- i. Cleaning of Surfaces: Surfaces on which markers are to be applied shall be cleaned of all materials that may reduce the bond of adhesive. Surfaces shall be cleaned by blast cleaning or other approved methods which do not damage the surface; however, blast cleaning equipment shall be provided with positive cutoff controls. Surfaces shall be maintained in a clean, dry condition until placement of markers.
- j. Application of Markers: Surfaces on which markers are to be placed shall be blown dry immediately prior to marker placement. Markers shall be applied to surfaces with adhesive in accordance with the manufacturer's recommendations.
- k. Epoxy Adhesive: Voids in a cured undisturbed sample approximately 1/16 inch thick from the extrusion nozzle shall not exceed 4 percent by volume. Machine mixer and applicator shall be capable of accurately and uniformly proportioning the two components in a 1 to 1 ratio within five (5%) percent by volume of each component (i.e., within 47.5 to 52.5 percent for each component). Periodic checks of proportioning equipment shall be made to determine the actual ratio of components. This shall be done by placing containers in front of the mixing chamber and measuring the actual volume of each component. Equipment shall be arranged so it is possible to bypass the mixer to perform these periodic checks. Temperature of adhesive shall be maintained between 70 F and 110 F before mixing. The temperature shall be adjusted to prevent excessive flow of epoxy from the marker when installed. The area of the epoxy adhesive bed shall be equal to the bottom area of marker. Adhesive shall be applied in sufficient quantity to cause excess adhesive to be forced out around the perimeter of the marker. Voids

- in markers with an open grid pattern on bottom shall be filled with adhesive immediately prior to placement.
1. **Bituminous Adhesive:** The adhesive shall be heated and melted in either thermostatically controlled double boiler type units utilizing heat transfer oil or thermostatically controlled electric heating pots. The melter/applicator unit shall be suited for both melting and pumping application through heated applicator hoses. The adhesive shall be heated to between 375 F and 425 F and applied directly to the pavement surface from the melter/applicator by either pumping or pouring. The area of the bituminous adhesive bed shall be a minimum of 6 inches in diameter. Markers shall be applied to the adhesive within 10 seconds. The marker shall be placed in the adhesive bed by applying downward pressure until the marker is firmly seated. Adhesive on exposed surfaces of markers shall be immediately removed with soft rags moistened with mineral spirits or kerosene. Markers shall be protected against impact until the adhesive has hardened. The adhesive may be reheated and reused; however, the pot life at application temperatures shall not be exceeded.
 2. **Plastic Pavement Markings**
 - a. The applicant shall furnish and place reflective pavement markings of hot applied thermoplastic at the locations shown on the approved plans, in conformance with the MUTCD, plan details and these code requirements.
 - b. Thermoplastic marking material shall be a plastic compound reflectorized by internal and external application of glass beads, all listed on the LaDOTD AML at the time of their installation respectively. Width and color of markings shall be as indicated on the approved plans.
 - c. Thermoplastic material shall be delivered in containers of sufficient strength to permit normal handling during shipment and transportation without loss of material. Approved heat-degradable containers that can be placed in heating kettles along with the plastic material will be permitted. Each container shall be clearly marked to indicate color of material, process batch number, name of manufacturer and date of manufacture. Glass beads used in drop-on application to molten plastic shall be shipped in sacks of multi-ply paper or burlap, both with a polyethylene liner. The sacks shall be strong enough to permit handling without damage, and have a capacity of 50 pounds of beads. Sacks shall be sufficiently water-resistant so that beads will not become wet or caked in transit.
 - d. **Equipment for Thermoplastic Markings:** Material shall be applied to pavement by either spray or extrusion methods. Equipment shall provide continuous mixing and agitation of material. Conveying parts of equipment between main material reservoir and discharge mechanism shall prevent accumulation and clogging. Parts of equipment which come in contact with the material shall be easily accessible for cleaning and maintaining. Mixing and conveying parts shall maintain material at the application temperature. Equipment shall be capable of producing continuous uniformity in dimensions of stripes. Equipment shall be capable of producing various widths of traffic markings. Glass beads shall be applied to the molten surface of completed stripes by an automatic bead dispenser attached to the striping machine in such a manner that beads are dispensed simultaneously with the thermoplastic material at a controlled rate of flow on installed lines. The glass bead dispenser shall be equipped with an automatic cutoff control synchronized with cutoff of thermoplastic material. Kettles to hold a minimum of 1,000 pounds of material shall be provided for melting and heating thermoplastic material.

- Kettles shall be equipped with automatic temperature control devices so that heating can be done by controlled heat transfer liquid rather than direct flame, to provide positive temperature control and prevent overheating of material. Applicators and kettles shall be equipped and arranged to comply with requirements of the National Board of Fire Underwriters. Applicators shall be maneuverable to the extent that straight lines can be followed, and normal curves can be made in a true arc. Applicator equipment shall consist of a motorized mobile unit capable of installing traffic stripes either left or right of applying unit so that only one lane for traffic will be occupied during installation.
- e. Applicators shall produce sharply defined lines and provide means for cleanly cutting off stripe ends and applying broken lines. The applicator unit shall have a tachometer or other approved device to ensure uniform application at the required rate. It shall be adjustable for applying 1, 2, or 3 adjacent lines simultaneously at the specified spacing. The ribbon extrusion die or shaping die shall not be more than 2 inches above the roadway surface during application.
 - f. Weather Limitations: Application of markings will not be permitted when there is excessive pavement moisture or when the surface temperature or ambient temperature is below 50 F. The pavement shall be considered excessively moist when it is visibly wet or when a 1 square foot piece of polyethylene film condenses moisture after being placed on the pavement surface for 15 minutes.
 - g. Cleaning of Surfaces: Surfaces on which markings are to applied shall be cleaned of materials that may reduce adhesion of the thermoplastic marking materials to the pavement. Cleaning shall be done by blast cleaning or grinding. Surfaces shall be kept clean until placement of markings.
 - h. Existing thermoplastic markings on the roadway that are not flaking or peeling do not require removal prior to placement of new thermoplastic markings. When thermoplastic markings will replace the existing painted markings, the existing painted markings do not require removal prior to applying new thermoplastic markings, provided the existing painted markings are not flaking or peeling.
 - i. Existing lane line pavement markings on bridges shall be removed prior to applying new markings.
 - j. Removal shall be accomplished by methods which will not damage the pavement or bridge deck. Removal shall be to such extent that 75% of the pavement surface or bridge deck under the markings is exposed. At the end of each day's operations, temporary pavement markings designed as a part of the applicant's traffic control plan shall be placed in areas where existing markings have been removed and new markings not placed. Temporary pavement markings shall be satisfactorily removed prior to resuming plastic striping operations.
 - k. Application of Markings: Material shall be installed in specified widths from 4 inches to 24 inches. Finish lines shall have well defined edges and be free of waviness. Measurements shall be taken as an average through any 36-inch section of line. Longitudinal lines shall be offset approximately 2 inches from longitudinal joints. A tolerance of +1/2 inch and -1/8 inch from the specified width will be allowed, provided the variation is gradual. Segments shall square off at each end without mist or drip. Transverse variations from the control device up to 1 inch will be allowed provided the variation does not increase or decrease at the rate of

more than 1/2 inch in 25 feet. Lines not meeting these tolerances shall be removed and replaced at the expense of the applicant.

1. Thickness of material, not including drop-on beads, shall be not less than 90 mils for lane lines, edge lines and gore markings and not less than 125 mils for crosswalks, stop lines and word and symbol markings. A binder sealer material recommended by the thermoplastic marking manufacturer shall be applied to the pavement surface or bridge deck prior to application of the thermoplastic markings. Thermoplastic material shall be applied either by extrusion at 390 F to 450 F or by spray at 410 F to 450 F. Immediately after application of the markings, glass beads shall be applied at a minimum rate of 300 pounds per mile. Material shall not scorch or discolor when kept at this temperature range for four hours.

T. Bridge Structures

1. Structures shall be designed and constructed in accordance with the requirements of the Louisiana Bridge Design and Evaluation Manual, Latest Edition. All bridges shall be of steel – reinforced Portland cement concrete construction. Timber components shall only be permitted for foundation piles below the mud line. All columns and girders shall be of reinforced cast in place concrete, reinforced pre-cast concrete, or pre – stressed Portland cement concrete construction. Decks and railings shall be constructed of reinforced cast in place or pre – stressed concrete construction.

U. Traffic Signals.

1. Traffic signals shall be designed and constructed in accordance with the requirements of the Louisiana Department of Transportation and Development Traffic Signal Manual and Traffic Signal Standard Plans. Loop type vehicle detectors shall not be permitted on Parish roadways.

SEC. 900-3.5 PROCEDURES FOR MAINTENANCE OF TRAFFIC WITHIN THE PARISH RIGHT OF WAY.

A. Temporary Signs, Barricades, and Pavement Markings

1. The applicant shall be solely responsible for the design, development, and implementation of a temporary traffic control device plan for all phases and portions of developments which require work within or directly adjacent to the Parish Right – of – Way. The traffic control device plan shall provide for safe and expeditious movement of traffic and pedestrians through the area of construction.
2. The applicant shall furnish, install, maintain, and remove temporary construction barricades, lights, signals, pavement markings and signs, and flaggers as indicated in his plan and as prescribed by the requirements of this section.
3. Appropriate signs for special conditions shall be furnished and installed as required.
4. Requirements for proper signs, barricades, barriers, channelizing devices, or other safety precautions promulgated by the applicant’s insurers will not be negated by these specifications.
5. The applicant shall assign one or more authorized Traffic Control Supervisors (TCS) to provide traffic control management for work within or directly adjacent to the Parish Right – of - Way. If more than one TCS is assigned, then the applicant shall provide a weekly schedule identifying who will be in charge of providing traffic control management on a daily basis. If the applicant utilizes

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- a subcontractor to provide traffic control management, the subcontractor's TCS shall meet all requirements set forth herein.
6. All Category I, II, and III portable work zone traffic control devices shall be crashworthy as determined by evaluations through NCHRP 350 for Test Level 3.
- a. Category I devices are low mass, single piece traffic cones, tubular markers, single piece drums and flexible delineators and are, by definition, considered crashworthy devices meeting NCHRP 350 Criteria for Test Level III. Drum and light combinations with Type A or C warning lights and fastener hardware consisting of vandal-resistant ½ inch diameter cadmium plated steel bolts and nuts used with 1 1/2 inch diameter by ¾ cup washers are included as Category I devices. In lieu of testing for crashworthiness, acceptance of Category I devices for compliance with NCHRP 350 will be allowed based upon self – certification by the supplier. The supplier shall certify that the product is crashworthy in accordance with the evaluation criteria of NCHRP 350. Certification may be a one – page affidavit signed by the supplier, with supporting documentation kept on file to be furnished if requested.
 - b. Category II devices include other low mass traffic control devices such as portable barricades, either with or without lights and/or signs, portable sign stands, portable vertical panel assemblies, and drums with lights not meeting the drum and light combination requirements for Category I. Individual crash testing is required for Category II devices. FHWA letters of approval shall serve as verification that these devices comply with the crash testing requirements of NCHRP Report 350, Test Level III. The applicant shall provide to the Director of Department of Engineering a listing of all the Category II Devices to be used, including a reference to the FHWA Work Zone letter number for each device. The applicant shall certify that each device has been crash tested and meets the NCHRP 350 requirements.
 - c. Category III devices Category III devices include massive devices such as temporary concrete barriers, water filled barriers, and temporary attenuators. Individual crash testing is required for Category III devices. FHWA letters of approval shall serve as verification that these devices comply with the crash testing requirements of NCHRP Report 350 or MASH. Provide for the Department of Engineering a listing of all the Category III devices to be used on the project prior to installation including a reference to the FHWA Work Zone letter number for each device. Also certify that each device has been crash tested and meets the NCHRP 350 or MASH requirements.
7. Type A, B, and C barricade warning lights shall be in compliance with the MUTCD and shall be an approved product listed on the Louisiana Department of Transportation and Development Approved Materials List.
8. Drums and Super Cones: Plastic drums shall be an approved product listed on the LDOTD AML. The design of drums and super cones shall comply with LDOTD TTC-00 (C). Reflective sheeting for drums and super cones shall be a minimum of six inches wide and shall meet the requirements of ASTM D4956, Type III, and the Supplementary Requirement S2 for reboundable sheeting as specified in ASTM D4956. Sheeting for drums shall be an approved material listed on the LDOTD AML.
9. Traffic Cones: The design of plastic traffic cones shall comply with LDOTD TTC-00 (C). Reflective sheeting for cone collars shall be a minimum of six inches wide and shall meet the requirements of ASTM D4956, Type IV. Sheeting for plastic traffic cones shall be an approved material listed on the LDOTD AML. All traffic cones shall be a minimum of 36 inches in height.
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10. Tubular Markers: The design of tubular markers shall comply with LDOTD TTC-00 (C). Reflective sheeting for tubular markers shall meet the requirements of ASTM D4956, Type III. Sheeting for tubular markers shall be an approved material listed on the LDOTD AML. All tubular markers shall be a minimum of 28 inches in height.
11. All signs used for temporary traffic control shall comply with the MUTCD, the LDOTD Temporary Traffic Control Standards, and the applicant's traffic control device plan. The design of temporary barricades and vertical panels shall comply with LDOTD TTC – 00 (C). Only Type III barricades will be allowed. The design of vertical panels shall comply with LDOTD TTC – 00 (C).
12. Substrate: Substrate for barricade panels shall be either wood or rigid thermoplastic. Substrate for portable signs shall be aluminum, wood, or plastic. Substrate for post mounted signs shall be aluminum, wood, rigid thermoplastic, or aluminum clad low density polyethylene plastic.
13. Temporary signs, barricades, and related devices shall be required when the WORK is in progress or when work is suspended. During such times that temporary signs, barricades, and related devices are not in place, appropriate existing regulatory signs shall be maintained by the applicant. Work within the right – of – way shall not begin until signs, barricades, and other devices have been erected.
14. When signs to be furnished and erected by the applicant are in place, the applicant's Traffic Control Supervisor (TCS) shall cover any standard signs that are in conflict with the temporary signs.
15. When placing signs, the applicant shall coordinate with the Parish in covering the Parish's signs or signs owned by other entities so that all appropriate signs remain in place.
16. Signs shall remain in place and be maintained by the applicant, supplemented by other signs as required, throughout the execution of the WORK. When previously used signs are to be utilized on the project, the Department of Engineering will review and approve these signs prior to installation. The Director of Department of Engineering will require any sign with reduced reflectivity or excessive fading to be removed from the work zone. Signs that do not meet the minimum standards for new materials shall be replaced by the applicant at his expense.
17. Signs, barricades, and related devices furnished and placed by the applicant shall, upon removal, remain property of the applicant.
18. When a work area has been established on one side of the roadway only, there shall be no conflicted operations or parking on the opposite shoulder within 500 feet of the work area.
19. Parking of vehicles or unattended equipment, or storage of materials within the clear zone shall not be permitted. If the clear zone is not defined on the plans, the Department of Engineering will inform the applicant of the clear zone.
20. Sight distance shall be considered when placing traffic control devices. Advanced Warning Area and Flashing Arrow Board: When specified, advance warning arrow panels for temporary traffic control shall be provided. Panels shall be one of the specified types complying with the MUTCD. If none is specified, Type C panels shall be provided. Flashing arrow boards shall be 4 feet by 8 feet.
21. Minimum traffic control devices shown on reference standards shall be the minimum, and it shall be the applicant's responsibility to ensure that appropriate devices are employed and maintained during the duration of construction.

22. Minimum Traffic Control Device Layout for various construction situations shall be as indicated in the table below. These minimum requirements are the minimum required, and it shall be the applicant's responsibility to supplement the minimum arrangements as required. The use of these minimum layouts does not relieve the applicant from the responsibility of submitting a site – specific traffic control device plan prepared by a licensed professional engineer registered in the State of Louisiana.

Minimum Requirement	Reference Layout
Layout for Placement of Road Work Next "XX" Miles and End Road Work Signs	LDOTD TTC – 00 (D)
Layout for Work Less than 15 Feet from the Traveled Way	LDOTD TTC – 01
Layout for Work Less than 15 Feet from the Traveled Way	LDOTD TTC – 02
Layout for Lane Closures on Two Lane Roads with Two Way Traffic Less Than 1600 Feet from Intersection	LDOTD TTC – 03
Layout for Lane Closures on Two Lane Roads with Two Way Traffic Greater Than 1600 Feet from Intersection	LDOTD TTC – 04
Layout for On - Site Diversion with Two Lane Traffic	LDOTD TTC – 05
Layout for Lane Closure on Four – Lane Undivided Highways	LDOTD TTC – 06
Layout for Lane Closure of Two Adjacent Lanes on Four – Lane Undivided Highways	LDOTD TTC – 07
Layout for Median Crossover on Divided Highways	LDOTD TTC – 08
Layout for One Lane Closure on Divided Highways	LDOTD TTC – 09
Layout for Lane and Sidewalk Closures in Urban Areas with Speed Limit Less than or Equal to 40 Miles per Hour	LDOTD TTC – 10
Layout for Lane Closure Using Temporary Barrier Rail on Divided Highways	LDOTD TTC – 11
Layout for Lane Closures Through Ramp Entrance and Exit Tapers	LDOTD TTC – 12

Layout for Lane Closure of Two Lanes on a Multi – Lane Highway	LDOTD TTC – 13
Layout for “Louisiana Left” on Divided Highways	LDOTD TTC – 14
Layout for Short Duration Closure of Divided Highways	LDOTD TTC – 15
Layout for Temporary Road Closures	LDOTD TTC – 16
Layout for Moving Operations on Interstate or Other Multi – Lane Roadways	LDOTD TTC – 17
Layout for Moving Operations on Two – Way Two – Lane Roadways	LDOTD TTC – 18
Layout for Traffic Signal Installation and Maintenance at an Intersection	LDOTD TTC – 19
Layout for other situations not specifically prescribed	As Prescribed by the Manual on Uniform Traffic Control Devices

23. Minimum temporary traffic control devices for Drop – offs shall be as indicated on LDOTD TTC-00 (C)
24. Tubular markers, drums, super cones, vertical panels, and traffic cones may be utilized as channelizing devices. During nighttime operations, 36 – inch traffic cones will not be allowed.
25. Retroreflective material pattern used on super cones shall match that used on drums.
26. Tangent Areas:
 - a. Standard Spacing: Standard spacing shall be as indicated on LDOTD TTC – 00 (C).
 - b. Daylight Operations: Drums and super cones shall be spaced at standard spacing. All other devices shall be spaced at ½ of standard spacing.
 - c. Nighttime Operations: Drums and super cones at standard spacing shall be the only devices allowed.
27. Taper Areas
 - a. Standard Spacing: Standard spacing shall be as indicated on LDOTD TTC – 00 (C).
 - b. Daylight Operations: Drums and shall be spaced at standard spacing. All other devices shall be spaced at ½ of standard spacing.
 - c. Nighttime Operations: Drums at standard spacing shall be the only devices allowed.
 - d. Type C Steady Burn Lights shall be used on all channelizing devices in the taper and on the first two devices in the tangent at night.

28. Typical channelizing device lateral placement (do not include when it is used as a divider for opposing directions of traffic) shall be two feet off the lane line of the closed lane or two feet off the shoulder.
29. Devices may be adjusted laterally to accommodate ongoing work in the immediate vicinity but must be returned to the closed lane after work activity has moved.
30. Channelizing devices in the tangent area shall be of the same type.
31. Channelizing devices in the taper area shall be of the same type.

B. Barricades

1. Only Type III Barricades may be utilized.
2. When used for overnight closures, two Type B High Intensity lights shall supplement all barricades that are placed in a closed lane or that extend across a highway.
3. When signs and lights are mounted to a barricade, they must meet NCHRP Report 350 and MASH requirements.
4. A truck with a truck – mounted attenuator may be substituted for a barricade when workers are present.
5. Barricades, at a minimum, shall be placed:
 - a. At the beginning of a closed lane or shoulder and at 1,000 foot intervals where no active work is ongoing and the lane must remain closed. A minimum of two (2) barricades shall be placed if the lane or shoulder closure is less than 2,000 feet (One barricade shall be placed at the beginning of the lane closure after the buffer space and one shall be placed in the middle of the lane closure);
 - b. Before each or group of unfilled holes or holes filled with temporary material;
 - c. Before uncured concrete;
 - d. In the closed lane on each side of every intersection and crossover (do not block sight distance);
 - e. In front of piles of material (dirt, aggregate, broken concrete), culverts, and equipment which is near the work zone.

C. Signs.

1. At least one Type B high intensity light shall be used to supplement the first sign or pair of signs that gives a warning about a lane closure during nighttime operations.
2. The applicant shall use caution not to damage existing signs which remain in place. Any such signs damaged shall be replaced at the cost of the applicant.
3. All signs shall be covered with a strong, lightweight material when not applicable. Burlap will not be acceptable for covering signs.
4. When portable sign frames are used, they shall be moved to an area inaccessible to traffic and not visible to drivers.
5. Left side mounted signs will not be required for roadways with a center left turn lane and for undivided roadways.

6. Vinyl roll up signs may be used if work zone is in place for 12 hours or less, there are no more than 2 lanes in each direction, and if signs meet all size, color, retroreflectivity, and NHCPR 230 Report or MASH requirements.
7. One foot portable sign stands may be used if work zone is in place for 12 hours or less, the pre – construction posted speed limit is less than 45 miles per hour, and there are no more than 2 lanes in each direction.
8. Signs shall be visible to the drivers. No obstructions such as on – street parking or other traffic control devices shall block the sign.
9. On divided highways, signs shall be placed on the right and the left.
10. Sign Posts:
 - a. Signs measuring 10 square feet or less shall be mounted on 1 rigid post.
 - b. Signs measuring over 10 square feet shall be mounted on two (2) rigid posts.
 - c. Signs measuring over 20 square feet shall be mounted on at least three (3) rigid posts.
 - d. Allowable lap splices for U – channel posts shall be as indicated on LDOTD TTC -00 (C).
 - e. Sign height and offset from roadway shall be per LDOTD TTC – 00 (C).

D. Flagging.

1. All flaggers shall be qualified. The Applicant shall be responsible for training or assuring that all flaggers are qualified to perform flagging duties.
2. A qualified flagger is one that has completed courses such as those offered by ATSSA, Association of General Contractors, or other courses as approved by the LDOTD Work Zone Task Force.
3. When utilized, flaggers shall use a minimum 18-inch octagonal shape sign on minimum 6-foot stop/slow paddle and wear ANSI Class 2 Lime Green Vest during daytime operations and ANSI Class 3 Lime Green Ensemble during night operations.
4. In all flagging operations, the flagger must be visible from the flagger advance warning sign.

E. Flashing Arrow Boards.

1. Flashing arrow boards should be placed on the shoulder. When there is no shoulder or median area, the arrow board shall be placed within the closed lane behind the channelizing devices and as close to the beginning of the taper as practical.
2. Flashing arrow boards shall be delineated with retroreflective devices.
3. At no time shall the arrow board encroach upon the traveled way. When flashing arrow boards are not in use, they shall be shielded by a guard rail or barriers or removed.
4. Arrow boards shall only be used for lane reduction tapers and shall not be used for lane shifts.

F. Duties of the Traffic Control Supervisor.

1. The applicant's TCS's responsibility shall be traffic control management, and the TCS shall be available to the Director of Department of Engineering to address traffic control issues as required. The following duties shall be the primary responsibilities of the applicant's TCS:

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- a. The TCS shall personally provide traffic control management and supervision services at the site of the WORK. The TCS may have other duties, but shall be readily available at all times to provide TCS duties as required. A minimum of one TCT shall be required on site during all working hours.
 - b. The TCS shall be responsible for observing and evaluating both the day and night time performance of all traffic control devices installed on the project, in accordance with the traffic control plan to ensure that the devices are performing effectively as planned for both safety and traffic operations. This shall be done upon the initial installation of traffic control devices and when any modifications and/or changes are made, in addition to regular inspection requirements as specified herein.
 - c. The TCS shall be responsible for the training of flagging personnel. This training shall ensure that all flagging is in compliance with the MUTCD, Part VI and the Louisiana Work Zone Traffic Control Details.
 - d. The TCS shall coordinate all traffic control operations for the duration of the contract, including those of subcontractors, utility companies, and suppliers, to ensure that all traffic control is in place and fully operational prior to the commencement of any work. The Parish recognizes that the TCS does not have direct control over the traffic control operations of utility companies. The coordination required by the TCS when dealing with utility companies is specifically for the purpose of coordinating concurrent utility traffic control with any other construction traffic control to avoid conflicts.
 - e. The TCS shall coordinate, in writing, all project activities with the appropriate law enforcement, fire control agencies, and other appropriate public entities as determined at the pre – construction conference. The TCS shall also invite the above agencies to the pre – construction conference.
 - f. The TCS shall prepare and submit statements concerning road closures, delays, and other project activities to the Department of Engineering when directed by the Department of Engineering.
 - g. The TCS shall be responsible for notifying the Department of Engineering or all vehicular accidents and/or incidents related to the project traffic control. The time and date of the notification shall be documented in the traffic control diary. The TCS shall also monitor and document queues that occur.
 - h. The TCS assigned to the project shall attend the pre – construction conference and all project meetings.
 - i. The TCS shall be responsible for the maintenance, cleanliness, and removal of traffic control devices during working and non – working hours.
2. *Traffic Control Diary.* The TCS shall maintain a project traffic control diary in a bound book. The applicant shall obtain sufficient number of the diaries from the Louisiana Association of General Contractors (LAGC). Alternate forms may be utilized with the approval of the Department of Engineering. The TCS shall keep the traffic control diary on a daily basis and shall sign each daily entry. Entries shall be made in ink, and there shall be no erasures or white – outs. Incorrect entries shall be struck out and then replaced with the correct text. Photographs and videotapes may be used to supplement written text. The diary shall be available at all times to the Director of Department
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of Engineering and a copy shall be submitted to the Department of Engineering on a monthly basis. The traffic control diary shall become property of the Department of Engineering at the completion of the work within the Parish rights-of-way..

3. *Traffic Control Plan Revisions.* Where revisions are made to the traffic control plan, regardless of whether or not the changes were promulgated by the applicant, Director of Department of Engineering, or other party, a revised traffic control device plan shall be submitted by the applicant.
4. *Inspection of Traffic Control.*
 - a. The TCS shall be responsible for the inspection of all traffic control devices every calendar day that traffic control devices are in use. This inspection may be delegated to the TCT. The “Quality Guidelines for Work Zone Traffic Control Devices” shall be used to evaluate the condition of the traffic control devices to determine if acceptable for use. The TCS shall provide for the immediate repair, cleaning, or replacement of any traffic control devices not functioning as required to ensure the safety of motorists, pedestrians, and construction personnel and/or not meeting the ATSSA standard. Inspection of traffic control devices shall be conducted by the TCS at the beginning and end of each workday. The traffic control devices shall be inspected by the TCS on weekends, holidays, or other non – workdays at least once per day. Traffic control devices shall be inspected by the TCS at least once per week during nighttime periods and the same night after any modifications or changes have been made in the traffic control devices.
5. *Traffic Control Officer.*
 - a. In some cases, and with the agreement of the Director of Department of Engineering, a Traffic Control Officer (TCO) may be utilized onsite where equipment is in or near to a roadway to assist in alerting or directing traffic near the work area. If required by the Parish, responsibility of payment for the TCO shall be the responsibility of the applicant. If required by the applicant’s traffic control plan, responsibility of payment for the TCO shall be the responsibility of the applicant.
6. *Failure to Comply with the Traffic Control Plan.*
 - a. The Department of Engineering may suspend all or part of the applicant’s operation(s) for failure to comply with the reviewed traffic control plan or for failure to correct unsafe traffic conditions within a reasonable period after such notification is given to the applicant in writing.
 - b. If the applicant does not take appropriate action to bring the deficient traffic control into compliance with the traffic control plan or to correct unsafe traffic conditions, Director of Department of Engineering may employ others to correct the unsafe traffic conditions. Such costs will be reimbursed by the applicant.

SEC. 900-3.6 STREETS, SAMPLING AND TESTING REQUIREMENTS.

A. General.

1. The applicant shall retain and pay for a qualified testing laboratory to perform all required testing in accordance with the requirements of this **UDC**.
 - a. The materials testing laboratory shall be approved by the Department of Engineering. The testing and inspection firm must have a minimum of five years of experience and

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- operate under the direct supervision of a licensed professional engineer registered in the State of Louisiana.
- b. All testing and inspection reports performed by the independent testing laboratory employed by the applicant shall be submitted to the Department of Engineering within ten working days after the tests are conducted.
 - c. The Applicant and Applicant's contractors shall cooperate with the designated testing laboratory and shall:
 - i. Make available samples of all materials to be tested in accordance with applicable standard specifications and code requirements.
 - ii. Furnish such nominal labor and sheltered working space as is necessary for designated testing laboratory to obtain samples at the project site.
 - iii. Advise the designated testing laboratory of the identity of material sources and instruct the suppliers to allow tests or inspections by the designated testing laboratory.
 - iv. Notify the designated testing laboratory sufficiently in advance of operations to allow for completion of initial tests and assignment of inspection personnel.
 - v. Notify the designated testing laboratory sufficiently in advance of cancellation of required testing operations.
 - vi. Provide curing facilities for initial curing of concrete cylinders at the job site in accordance with the requirements ASTM C94.
 - d. *Test Methods.* Tests and inspections shall be conducted in accordance with the latest applicable ASTM, ACI, AASHTO, LaDOTD requirements, or the requirements of other recognized authorities.
 - e. *Authority and Responsibility of the Testing Laboratory.* The designated testing laboratory does not have the authority to accept or reject work for the Director of Department of Engineering. It is their duty to inform the applicant of any tests or conditions that do not meet the requirements of this Code.
 - f. *Test Reports.* The designated testing laboratory shall promptly submit written reports of each test and inspection made to the Applicant, the Director of Department of Engineering and to such other parties that the Department of Engineering.

V. Portland Cement Concrete.

1. *Mix Design.*

- i. The designated testing laboratory shall review the contract mix design submitted for compliance with the code requirements and ACI 318, Chapter 5 or latest revision.
- ii. Regardless of what method is employed, the following tests are required prior to use on a given project: ASTM Sieve Analysis for Fine & Coarse Aggregates

- iii. Review of Certificates of Delivery which include test results shall be submitted by the concrete producer for cement, fly ash and additives to the designated testing laboratory for review. These certificates must certify that the material conforms to the specifications.

W. Batch Plant Inspection.

- a. Prior to initial start-up of pavement operations for the project, the designated testing laboratory shall make themselves familiar with the concrete supplier's batch plant to determine if the operation substantially conforms to the requirements of ASTM C94. Any substandard conditions observed shall be immediately reported to the applicant and the Department of Engineering.
- b. Plant inspector is not required to be present at the plant during production. However, the Director may require an inspector be provided periodically at his discretion.
- c. The plant must be approved prior to beginning production for a given project. This approval will be given by the Department of Engineering. The testing laboratory shall be responsible to inform the Department of Engineering of any reasons or conditions that would adversely affect the plant's approval. Conditions for approval shall include but not be limited to the following:
 - i. Ability to comply with ASTM C94 (latest revision) Standard Specifications for Ready Mixed Concrete.
 - ii. Whenever fly ash is used, the plant shall have a separate silo or bin to store the fly ash.
 - iii. Whenever ground granulated blast-furnace GGBF slags are used, the plant shall have a separate silo or bin to store the slag.
- d. Prior to and periodically during construction, the designated testing laboratory shall sample and test aggregates proposed for use in concrete to determine their compliance with these code requirements.

X. Roadway Inspection.

- a. The designated testing laboratory shall provide a roadway technician at the job site during all times concrete is being placed. This roadway technician shall be responsible to perform the required field tests and promptly notify the Applicant and the Department of Engineering any sub-standard materials, workmanship or code violations being incorporated in the work.
- b. Samples of fresh concrete shall be gathered in accordance with ASTM C172 (latest revision).
- c. Tests for slump - ASTM C143 (latest revision) and air content - ASTM C173 or C231 (latest revisions) if applicable, must be performed whenever test cylinders are taken, and more frequently, when deemed necessary.
- d. The concrete temperature shall be measured and recorded when each set of cylinders are molded.

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- e. Test cylinders shall be cast in accordance with ASTM C31 (latest revision) as follows:
 - i. Pavements: One set consisting of four (4) cylinders shall be cast for each one hundred (100) cubic yards or fraction thereof. An additional two (2) cylinders per set shall be cast for early strength determination.
 - ii. Curbs, Driveways, and Sidewalks: One set of four (4) cylinders shall be cast in the a.m. (morning) and one set shall be cast in the p.m. (afternoon). A minimum of four (4) cylinders shall be cast per visit.
 - iii. Combination Curb & Gutters: One set of four (4) cylinders shall be cast for each fifty (50) cubic yards or any fraction thereof. A minimum of four (4) cylinders shall be cast per visit.
 - f. Test cylinders are to be tested in accordance with ASTM C39 (latest revision) as follows:
 - i. 2 @ 7 days of age.
 - ii. 2 @ 28 days of age.
 - iii. 1 @ 3 days of age (for verification of High Early Strength concrete).
 - iv. 1 @ 5 days of age (for verification of High Early Strength concrete).
 - g. During production, if any truck of ready-mixed concrete fails to conform to specifications, the designated testing laboratory will immediately notify the applicant and the Department of Engineering and this material shall not be incorporated in the work.
 - h. Re-tempering of concrete is not permitted.
 - i. *Cores for Thickness Verification.* Cores shall be taken by the designated testing laboratory in accordance with the requirements of this Code no later than 14 days after the conclusion of paving operations.
 - j. Final locations of the cores shall be reported in a manner that is acceptable to the Department of Engineering.

Y. Embankment.

- a. Field density tests shall be conducted in accordance with ASTM D2922 at 500-foot intervals along the roadway alignment.

Z. Subbase and Base Courses.

- a. Soil materials, whether from required excavation or borrow excavation, which are to be incorporated in the project as fill or backfill, shall have been tested and classified by the Testing Laboratory prior to their use. Tests shall be conducted in accordance with the latest applicable standards of ASTM, AASHTO, or LaDOTD.
- b. Tests:
 - i. Obtain a composite sample of base and sub-base material at source in accordance with ASTM D75 or AASHTO T2.

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- c. Perform Laboratory tests as follows:
 - i. ASTM C136 Sieve analysis of fine and coarse aggregates.
 - ii. ASTM D4318 Test for liquid limit and plasticity index of soils.
 - iii. ASTM D698, D1557, AASHTO T99, T180, LaDOTD TR-418E, TR 418G Moisture-Density relations of soils and soil-aggregate mixtures (Proctor).
 - iv. ASTM D2922, D1556, AASHTO T191, T238 Density of soils and soil aggregate mixtures in place by nuclear or sand-cone methods.
 - v. Field density tests shall be made on the completed base or sub-base courses and the depth of test recorded.
 - vi. Frequency for Soil tests shall be as follows: Trenches - 1 per 100 linear feet.
 - vii. Backfill is to be placed and tested in 12" lifts when sand is compacted with a mechanical device, and in 3 foot lifts when flooding method is used.
 - viii. Base Course - Six (6) tests per block.
 - ix. Concrete roadway - 3 per side evenly spaced Asphalt/Conc. Curb - 4 under curb (2/side) and 2 in the roadway (1/side).
 - x. Depth - One (1) at each density test

AA. Asphalt Concrete Mixtures.

- a. *Tests and Inspections.* The applicant will be required to design the mixtures for optimum asphalt content and comply with all requirements of LaDOTD designation TR 303, Method A, however, Method B may be used when approved by the Department of Engineering. Mixes which have been previously approved and are current within six (6) months may be submitted for approval subject to the same criteria as required by TR 303, Method A.
- b. The job mix formula shall be submitted for review by the designated testing laboratory and the Department of Engineering and supported by appropriate design data. No mixture shall be produced for the job until the applicant's job mix formula has been approved by the Department of Engineering. Approval or rejection of job mix formula shall be accomplished within seven (7) calendar days of submittal.
- c. *Preliminary Tests.* Prior to starting plant operations, the following materials will be sampled and/or tested by the designated testing laboratory:
 - i. Obtain La. D.O.T.D. Certificates of Delivery covering asphalt cement in working tank. (Also to be obtained on a daily basis during production.)
 - ii. Obtain the refinery test report covering chemical and physical properties of the asphalt cement.
 - iii. Verify that the Anti-Stripping agent is included in the La. D.O.T.D. Qualified Products List.
 - iv. Other admixtures - La. D.O.T.D. Qualified Products List.

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- v. Aggregates - Verify that the source of aggregates to be used are included in the La. D.O.T.D. Qualified Products List.
 - vi. Sample the Applicant's fine sand. Test in accordance with AASHTO. T-90 to determine if plasticity index is four (4) or less. Visually inspect Applicant's stockpile to verify absence of clay balls and excessive clay coating.
 - d. *Tests Conducted at the Asphalt Plant.* Tests to be conducted on the hot mix material at the asphalt plant will be conducted by the designated testing laboratory's plant technician. All tests will be conducted in accordance with LaDOTD requirements. A sampling plan will be utilized such that samples are taken and tested as follows:
 - i. In addition to the above, the temperature of the mix is to be taken at least once per hour, when the mix has been loaded into haul trucks and is ready to leave the plant.
 - e. If the test results during the production of a lot are outside the limits given in the Code, the representative of the designated testing laboratory shall immediately notify the Applicant's qualified asphaltic concrete plant technician. The applicant shall make necessary changes to the mixture design.
 - f. *Pavement Samples.* The Applicant shall furnish samples at locations determined by the designated testing laboratory's roadway technician. These operations shall be witnessed by the designated testing laboratory's roadway technician.
 - g. *Roadway Inspection.* Inspection of roadway asphaltic concrete work at the job site shall be performed by the roadway technician furnished by the designated testing laboratory. His duties will include, but not be limited to, the following:
 - i. Record locations, tonnage, type of mix, lot number, and other pertinent data in his daily report
 - ii. Temperatures will be checked and recorded in accordance with these specifications during the production of each lot.
 - iii. Observe the general operations of the applicant to assure compliance with all requirements.
 - iv. Observe and record the tack and prime coat operations. (Square yards covered number of gallons used.)
 - v. Determine the location of cores to be taken by the Applicant for thickness and density.
 - vi. Witness the drilling or cutting of the roadway samples and deliver same to designated testing laboratory for further testing.
 - vii. Witness the surface finish testing performed by the Applicant and report the findings of such testing.
 - viii. Inspect all mix hauled to the roadway for any obvious deficiencies which may include uncoated aggregate, segregated mixtures, mixtures with lumps, mix which is not of the proper temperature, excessive moisture, color and general appearance of the mixtures. Any loads found deficient shall be brought to the attention of the

Applicant and rejected by the Department of Engineering. Also, no trucks will be accepted without a haul ticket.

- ix. Observe weather conditions and advise the Applicant of weather limitations when they apply.

SEC. 900-3.7 ACCESS.

A. Purpose, General.

1. In the review and approval of all subdivision plats the Planning and Zoning Commission and/or Administrators shall ensure that these access standards are met when site plans for development are submitted. To the extent possible, the plats shall note where access standards are waived.
2. These standards apply to access to Parish owned and maintained arterial, collectors, and highways
3. Where the Louisiana Department of Transportation and Development has jurisdiction over all or portion of a road LaDOTD standards and rules shall apply.

B. Access Management Classification System

1. The following access classifications shall be used to guide application of these standards:
 - a. Access Class 1 - Limited Access Freeways designed for high-speed, high volume traffic movements. Access is permitted via interchanges.
 - b. Access Class 2 - Highly controlled access facilities distinguished by their ability to carry high speed, high volume traffic over long distances in a safe and efficient manner. These highways are distinguished by a system of existing or planned service roads, a highly controlled limited number of connections, medians openings and infrequent traffic signals.
 - c. Access Class 3 - These principal arterials are controlled access facilities where direct access to abutting land will be controlled to maximize the through movement of traffic. This class will be used where existing land use and roadway sections have not been built out to the maximum land use or roadway capacity, or where the probability of significant land use change in the near future is expected and likely. This type of roadway is distinguished by existing or planned restrictive medians and maximum distance between signals and driveway connections. Local land use planning, zoning and subdivision regulations should support the restrictive spacing of this designation.
 - d. Access class 4 -These facilities are controlled access highways where direct access to abutting land will be controlled to maximize the through movement of traffic. This class will be used where existing land use and roadway sections have not been built out to the maximum land use or roadway capacity or where the probability of significant land use change soon is high. These highways are distinguished by existing or planned non-restrictive median treatments.
 - e. Access Class 5 - This class will be used where existing land use and roadway sections have been built out to a greater extent than those roadway segments classified as Access Classes 3 and 4 and where the probability of a major land use change is not as high as those roadway segments classified Access Classes 3 and 4. These highways will be distinguished by existing or planned restrictive medians.

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- f. Access Class 6 - This class will be used where existing land use and roadway sections have been built out to a greater extent than those roadway segments classified as Access Classes 3 and 4, and where the probability of a major land use change is not as high as those roadway segments classified Access Classes 3 and 4. These highways will be distinguished by existing or planned non-restrictive medians or centers.
 - g. Access Class 7 - This class shall only be used in urbanized areas where existing land use and roadway sections are built out and where significant land use changes or roadway widening will be limited. This class shall be assigned only to roadway segments where there is little intended purpose to provide high speed travel. Access needs, though generally high along these roadway segments, will not compromise the public's health, safety or welfare. Exceptions to standards in this class will be considered if the applicant's design substantially reduces the number of connections compared to existing conditions. These highways can have either restrictive or non- restrictive medians.
- 2. All connections or facility segments that have been assigned an access classification shall meet or exceed the minimum connection spacing requirements specified in the Access Classification and Standards.

C. Access Connection and Driveway Design.

- 1. Separation between access connections on all collectors and arterials under local jurisdiction that have not been assigned an access classification shall be based upon the posted speed limit.
- 2. Driveway spacing shall be measured from the closest edge of the pavement to the next closest edge of the pavement. The projected future edge of the pavement of the intersecting road shall be used in measuring corner clearance, where widening, relocation, or other improvement is indicated in an adopted local thoroughfare plan.
- 3. The Planning Commission in approving a plat may reduce the connection spacing requirements in situations where they prove impractical. In no case shall the permitted spacing be less than eight (80) percent of the applicable standard.
- 4. If the connection spacing identified in these standards cannot be achieved, a system of joint use driveways and cross access easements may be required.
- 5. Variation from these standards shall be permitted at the discretion of the Planning Commission when the effect would enhance the safety or operation of the roadway. Examples include a pair of one-way driveways in lieu of one two-way driveway or alignment of median openings with existing access connections. Applicants may be required to submit a study, prepared by a licensed professional engineer registered in the State of Louisiana, to assist the Parish in determining whether the proposed change would meet the roadway safety or operational benefits of the prescribed standard.
- 6. *Driveway spacing for non-classified roadways.*
 - a. New connections shall not be permitted within the functional area of an intersection or interchange as defined by the connection spacing standards of this chapter, unless.
 - b. No other reasonable access to the property is available, and

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- c. The Planning Commission determines that the connection does not create a safety or operational problem upon review of a site-specific study of the proposed connection prepared by a licensed professional engineer registered in the State of Louisiana and submitted by the applicant.
 - d. Where no other alternatives exist, the Planning Commission may allow construction of an access connection along the property line farthest from the intersection. In such cases, directional connections (i.e., right in/out, right in only, or right out only) may be required.
7. *Joint and Cross Access and Shared Parking.* In order to reduce the volume of traffic on public streets and roads unified vehicle and pedestrian access, integrated vehicular and pedestrian circulation system, and shared parking between adjacent developments is encouraged.
- a. The Planning Commission may require new developments to provide joint or cross vehicular access for major commercial developments where commercial or office properties that are classified as major traffic generators (i.e., shopping plazas, office parks) are adjacent to each other.
 - b. When a plat reserves an easement to accommodate joint and cross access, the easement shall be recorded with the deed.
 - c. The Planning Commission may modify or waive the requirements of this section where the characteristics or layout of abutting properties would make development of a unified or shared access and circulation system impractical.
8. *Interchange Areas.* To protect the safety and operational efficiency of the limited access facility, Subdivisions, which include freeway or are adjacent to interchanges areas, will be designed to minimize impacts on the interchange.
- a. The plat shall address current and future connections and median openings within 1/4 mile of an interchange area (measured from the end of the taper of the ramp furthest from the interchange) or up to the first intersection with an arterial road, whichever is less.
 - b. The distance to the first connection shall be at least 660 feet where the posted speed limit is greater than 45 mph or 440 feet where the posted speed limit is 45 mph or less. This distance shall be measured from the end of the taper for that quadrant of the interchange.
 - c. The minimum distance to the first median opening shall be at least 1,320 feet as measured from the end of the taper of the egress ramp.
9. *Driveways.*
- a. Driveway grades shall conform to the requirements of the LaDOTD Road Design Manual.
 - b. Driveway approaches must be designed and located to provide an exiting vehicle with an unobstructed view.
 - c. Construction of driveways along acceleration or deceleration lanes and tapers is prohibited due to the potential for vehicular weaving conflicts.
 - d. Driveways with more than one entry and one exit lane shall incorporate channelization features to separate the entry and exit sides of the driveway. Double yellow lines may be considered instead of medians where truck off-tracking is a problem.
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- e. Driveways across from median openings shall be consolidated wherever feasible to coordinate access at the median opening.
 - f. Driveway width and flair shall be adequate to serve the volume of traffic and provide for rapid movement of vehicles off the major thoroughfare, but standards shall not be so excessive as to pose safety hazards for pedestrians, bicycles, or other vehicles.
 - g. The length of driveways or "Throat Length" for major developments shall be designed in accordance with the anticipated storage length for entering and exiting vehicles to prevent vehicles from backing into the flow of traffic on the public street or causing unsafe conflicts with on-site circulation.
 - h. It shall be prohibited for any lot within an approved subdivision to have rear access via a driveway to or from any street or road that is not dedicated within the boundaries of the approved subdivision plat.
 - i. Corner lots. Driveways on corner lots shall not be located any closer than 60 feet from a corner of said property closest to the intersection as measured from the property lines on the corner of the property where the said two street rights-of-way intersect.

10. Reverse Frontage Lots.

- a. Access to double frontage lots shall be required to be located on the street with the lower functional classification.
- b. When a residential subdivision is proposed that would abut an arterial, it shall be designed to provide through lots along the arterial with access onto a frontage road or an interior local road.
- c. No direct access rights to the arterial for these lots shall be permitted. In addition, the Planning Commission may require a berm or buffer area at the rear of through lots to buffer residences from traffic on the arterial. The berm or buffer yard shall not be located within the public right-of-way or located on any individual private lot or parcel.

D. Street Addressing.

- 1. The applicant shall be responsible for coordinating with the 911 addressing office for the purpose of obtaining street addresses for each lot within a subdivision after the Planning Commission has approved the final subdivision plat.
- 2. The applicant shall include street addresses on all approved final subdivision plat drawings and submit final subdivision plat drawings to the department of planning and development for recordation.
- 3. The 911 addressing office shall review the drawings for conformance to either a uniform numbering or lettering system prior to the recordation of the Final Subdivision Plat.

SEC. 900-3.8 STREET LIGHTING

A. General.

- 1. The applicant shall submit a street lighting plan upon application for preliminary plat approval for the purpose of providing ample lighting to protect the health and safety of the public during nighttime hours.

2. The street lighting plan shall be prepared under the supervision of and signed and sealed by a licensed professional engineer registered in the State of Louisiana. The street lighting plan shall include details of foundations, poles, mast arms, luminaires, wiring, pullboxes, conduits, fuses, and all other required features.
3. Poles, foundations, mast arms, and luminaires shall be designed for the wind pressure caused by the prevailing basic wind speed as prescribed for elsewhere in this Code.
4. Street light spacing shall be staggered and located at property lines when possible. Street light designs utilizing one side, median, or opposite configurations shall require specific approval of the Department of Engineering.
5. Electrical service shall conform to the requirements of the National Electrical Safety Code (NESC) and the requirements of the serving utility.
6. The Department of Engineering shall designate specific connection points for connecting new street lights into an existing street light system. The Parish will only authorize energization after Department of Engineering acceptance of the installation.
7. The applicant shall verify available capacity proposing to connect to an existing multiple street light system.
8. For new systems, or for systems on properties which will remain private, the applicant shall make arrangements with the serving utility for service points. Service points shall be shown on the improvement plans. The applicant shall be responsible for all costs associated therewith which shall be paid directly to the serving utility. The applicant shall verify the street light service point location(s) with the serving utility prior to installation. The Parish will authorize and request energization from the serving utility.
9. Street lighting poles shall be spaced accordingly to provide a consistent and even illumination pattern within the subdivision development.
10. Specific design and construction standards shall meet the standards of the public utility company serving the area. These standards can be obtained from the public utility company serving the area.
11. Maintenance and operation of the lighting facilities within each subdivision, once accepted by the Parish, shall be managed by the lighting district.

B. When Required:

1. A lighting plan shall be provided for all developments within the boundaries of Lighting District No. 4.
2. A lighting plan shall be provided for all developments where street lighting is proposed.

C. Design Conformity.

1. The design of all street light systems shall conform to the average maintained footcandle and uniformity ratio requirements of these specifications.
2. The minimum street light pole height shall be 20 feet measured from ground elevation to bracket and light fixture connection. Heights of over 26 feet must be reviewed and approved by the public utility company serving the area.

D. Area Classifications.

1. Area classifications shall be used when determining the required illuminance levels for street lighting systems. The area classification selected for designing the street light system shall be determined by the Department of Planning and Zoning.
2. “Commercial” shall mean that portion of the Parish in a business development where ordinarily there are large numbers of pedestrians and a heavy demand for parking space during periods of peak traffic or a sustained high pedestrian volume and a continuously heavy demand for off-street parking space during business hours. This definition applies to densely developed business areas.
3. “Intermediate” shall mean that portion of the Parish which is within the zone of influence of a business or industrial development, often characterized by a moderately heavy nighttime pedestrian traffic and a somewhat lower parking turnover than is found in a commercial area. This definition includes densely developed apartment areas, hospitals, public libraries, and neighborhood recreational centers.
4. “Residential” shall mean a residential development, or a mixture of residential and commercial establishments, characterized by few pedestrians and a low parking demand or turnover at night. This definition includes areas with single family homes, townhouses, and/or small apartments. Regional parks, cemeteries, and vacant lands are also included.

E. Average Maintained Footcandle Requirements.

1. The design of all street lighting systems shall conform to these illumination requirements. Evidence that demonstrates that the street lighting system conforms to these requirements shall be submitted to the Parish with the proposed design.
2. The below-listed chart shall be used for determining the average maintained footcandle (Average Maintained FC) and Uniformity Ratio (U/R) requirements for the specific roadway and area types:

Roadway Classification	Area Classification	Average Maintained Foot Candles	Uniformity Ratio
Arterial	Commercial	0.75	3:1
	Intermediate	0.75	3:1
	Residential	0.75	3:1
Collector	Commercial	0.3	5:1
	Intermediate	0.3	5:1
	Residential	0.3	5:1
Minor	Intermediate	0.2	4:1
	Residential	0.2	4:1

F. Lateral Light Distribution.

Lateral light distribution patterns shall conform to Illuminating Engineering Society of North America (I.E.S.) lateral light distribution patterns.

1. Type II lights shall be used on local roadways.

2. Type III lights shall be used on major arterials and major collectors.
3. Type IV lights shall be used at the terminus of cul-de-sacs.
4. Luminaires shall be full cutoff on all local roads and in all residential areas. Luminaires shall be cutoff or full cutoff in all other areas.

G. Street Lights.

1. Cobra Style Streetlights: Luminaires shall be luminaire shall be LED, produced by a manufacturer approved by the Parish. Color temperature shall be between 4000K and 4700K unless otherwise approved by the Department of Engineering. The luminaire shall have a minimum 5-year unconditional warranty on both the fixture and the bulb. Warranty shall be transferred to the Parish upon acceptance of the system.
2. Street light poles may be concrete (gray) or aluminum. Mast arms shall be aluminum.
3. Concrete footings shall be designed to resist live loads imparted by wind and by dead loads imparted by the pole and luminaire. Foundations shall be minimum 5' deep.
4. Provisions shall be made for leveling of all poles.
5. The wiring for the luminaire and driver shall be single phase and shall include a breakaway, waterproof fuse on the "hot" leg, rated for not less than 10 amperes.

H. Decorative Street Lighting.

1. All Decorative Street lighting in residential areas is generally discouraged due to glare and light spillage onto residential property. Decorative lighting in residential areas must be specifically approved by the Department of Engineering and Planning Director.
2. If decorative street lighting is to be installed, luminaire shields shall be required, unless waived by the Department of Engineering and Planning Director.

I. Wiring.

Except as noted, all wiring methods and equipment construction shall conform to the National Electric Code (NEC) and the requirements of the serving utility.

1. All splices shall be made with solderless and waterproof connectors.
2. Wiring shall be sized such that voltage drop on any one circuit does not exceed 5% of the service voltage. Unless authorized otherwise, all wiring shall be THW A.W.G. stranded, copper only. All wiring shall be of the following minimum sizes, unless larger wires are required to comply with voltage drop and ampacity requirements:
 - a. All field wiring: #8 minimum (NEC)
 - b. Pullbox to luminaire: #10 minimum (NEC)
 - c. All wire in pole: #10 minimum (NEC).

J. Photocells.

1. All street lights shall be equipped with photoelectric control. The photocell shall be Type IV consisting of a photoelectric unit which plugs into an EEI-NEMA twist lock receptacle integral

with the luminaire. The photoelectric controls shall be operable within a minimum voltage range between 105 and 280 volts. All photoelectric controls shall be oriented to the north.

2. Photocells shall have a screen to prevent artificial light from causing cycling and shall have a fail – on state.
3. Photocells shall turn on from 1 to 5 footcandles and turn off from 1.5 to 5 times the turn on level.

K. Conduit.

1. Conduit to be used shall be a minimum of 2-inch diameter, schedule 40 PVC, except from each street light to the adjacent pull box which shall be 1-1/2-inch diameter galvanized steel. All conduits shall have a 2-foot minimum cover from the top of conduit to the finished grade of the sidewalk, parkway, or roadway.
2. All steel conduit and other metal parts, including bonding bushing, shall be NEC- approved parts and shall be continuously bonded and grounded per NEC requirements.
3. All bends and/or offsets shall be made with factory sections using approved couplers per NEC requirements.

L. Pullboxes.

1. Unless specifically approved by the Department of Engineering by special request, a concrete pull box shall be installed within five feet of the base of all street light poles.
2. Pull boxes shall not be more than 250 feet apart on long runs.
3. Pull boxes shall not be placed where they will be subject to vehicular traffic. Exceptions shall require specific written approval of the Department of Engineering.
4. All pull box covers shall be inscribed with “Street Lighting” and be secured with 3/8-inch bolts, cap screws, or studs and nuts.

M. Pole Markings.

Poles shall be stenciled with “RP (Pole No.) W (Wattage)” with 2-inch black numbers at 8 feet above the ground to designate the assigned pole number and wattage. Numbers shall be on the street side of the pole.

SEC. 900-3.9 TRAFFIC SIGNS AND CONTROL DEVICES.

A. Purpose.

The intent of these provisions is to achieve the objectives of public safety and functionality of infrastructure parish-wide. Parish maintained traffic controls and signage will be updated in conformity with these regulations in accordance with a plan of the Parish Department of Public Works.

1. All privately maintained traffic controls and signage in Subdivisions and Planned Unit Developments (PUDs) receiving final subdivision approval prior to March 01, 2016, are generally exempt from the requirements of these regulations, except when and until the replacement of traffic controls, signage and mounting poles within the development is undertaken.
2. All applicants who wish to develop new Subdivisions and PUDs within St. Tammany Parish shall install uniform street name signs, stop signs, and any other regulatory signage in accordance with

the approved plans, the requirements of this Code, the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD), Association of State Highway and Transportation Officials (AASHTO) Roadside Design Guide, and Louisiana Law. In the event of a conflict Parish code requirements are to be followed.

B. General Sign and Mounting Hardware Requirements.

1. In general, the work and materials comply with the MUTCD as modified by these requirements and as shown on the approved plans.
2. Fabricate signs in an approved plant. The term “borders and legend” shall mean border strip, letters, numerals, and symbols which convey the message on signs. Other than recycled aluminum sign panels and blanks, all materials shall be new stock.
3. **Sign Substrate:** All signs substrate (panels) shall be fabricated of aluminum. New and recycled flat panels shall be aluminum sheets or plates complying with ASTM B209, Alloy 6061-T6 with a minimum thickness of 0.080 inches.
4. **Sign and Marker Sheeting:** Sign sheeting for all signs shall be a retroreflective, adhesive, flat surface reflective sheeting listed on the LaDOTD AML as “DOTD Type X at the time of fabrication of the sign. . Apply reflective sheeting with no horizontal splices. Reflective sheeting shall be applied directly to extruded panels with no more than two vertical splices per sign and no more than one vertical splice per individual panel. Sign faces comprised of two or more pieces of reflective sheeting shall be carefully spliced for color at the time of sign fabrication to provide uniform appearance and brilliance, both day and night.
5. **Sign Face and Design.** The applicant shall fabricate signs in accordance with the MUTCD, the requirements of this Code, and the signing detail sheets of the approved plans.
6. **Legend.** Legend may be direct applied, screened, or by use of an approved overlay film.
 - a. **Screening.** Apply legend to sign faces by an approved screening process in accordance with the reflective sheeting manufacturer’s recommendations. Completed screen surface shall be uniform in color, have sharp edges, be free of bubbles, show good workmanship, and be free of blemishes, streaks, or spotted areas. Screening on sheeting may be accomplished either before or after application of sheeting to panels.
 - b. **Overlay Film.** Apply legend to the sign faces by an approved transparent electronic cuttable overlay film compatible with the reflective sheeting to which it is applied. Apply in accordance with the recommendations of the manufacturer(s) of both the film and the reflective sheeting. Areas covered by film shall have sharp edges, be free of bubbles and blemishes, and show good workmanship
 - c. **Direct Application.** Legend shall be adhesive coated reflective sheeting as specified above. Apply legend to provide a wrinkle-free surface.
 - d. **Digital Printing:** Legend may be fabricated using digital printing. Digital printing systems shall be part of an integrated component system, using appropriate software and drivers and supported by a sheeting manufacturer listed on the Approved Materials List. Messages shall be processed prior to sheeting the base panel. Finished signs prepared by digital printing shall be protected by a UV – protective clear overla applied to the entire face of the sign. Overlay shall be part of the integrated component system as recommended by the retroreflective sheeting

manufacturer. Fluorescent orange work signs printed with black ink only shall not require an overlay. Completed signs shall have sharp edges, be free of bubbles, blemishes, streaks or spotted areas and show good workmanship.

7. *Fabrication.* The applicant shall complete metal fabrication including shearing, cutting, and punching of holes prior to surface treatment of metal and application of sheeting. Metal panels shall be cut to size and shape; free of buckles, warps, dents, cockles, burrs, and defects resulting from fabrication. Surface of sign panels shall be flat. The completed product shall have a surface free of cracks, blisters, blemishes, and wrinkles. Sheeting shall be applied to etched sign blanks treated in accordance with the recommendations of the sheeting supplier.
8. *Sign Location.* Sign support locations shall be as shown on the approved plans. Sign locations which are obviously improper because of topography, existing appurtenances, or other conflicting conditions shall be adjusted to the closest desirable location.
9. *Sign Positioning.* Signs shall be constructed and mounted so that the top edge of the sign face is tilted towards oncoming traffic 3 degrees (approximately 1:20) from vertical and at right angles to the road, unless otherwise directed. Road edge signs shall be constructed with the sign faces vertical. Sign faces located less than 30 feet from the edge of travel lane shall be placed at a 93-degree angle from the center of the travel lane. Sign faces located 30 feet or more from the edge of the travel lane shall be placed at an 87-degree angle from the center of the travel lane. Where the lanes divide or are on curves or grades, orient sign faces to be most effective both day and night avoiding specular reflection.
10. *Mounting Poles.* The standard mounting pole on signs dedicated to Parish shall comply with the following:
 - a. *U-Channel Standard.* Shall be rolled from high tensile steel galvanized with pre-punched holes three-eighths ($\frac{3}{8}$ ") of an inch on one (1) inch centers. Minimum post weight shall be 3 pounds per linear foot. Height and placement location requirements shall be in accordance with the most current MUTCD guidelines.
 - b. Signs with wood or specialty mounting poles will not be accepted into the Parish Road Maintenance System.
 - c. Signs with wood borders will not be accepted into the Parish Road Maintenance System.

C. Sign Information Decal.

1. Where signs are fabricated by the Applicant, an approved sign identification decal shall be affixed to all signs installed within the Parish right – of way. The sign identification decal shall be used to record sufficient information about the reflective sheeting to determine its origin in case of premature failure of the material. The decal shall identify:
 - a. The manufacturer of the background reflective sheeting
 - b. The manufacturer of the legend and border sheeting
 - c. The place and time (year and month) of sign fabrication, and
 - d. The date on which the sign was installed in the field.
 - e. The name of the applicant who provided the sign.

2. Sign decals shall be imprinted on a film which is flexible, conforms to contoured surfaces, has a minimum 60-degree glass value of 35 when tested in accordance with ASTM D523 and does not support fungus growth. The film shall have a pre-coat of a pressure-sensitive adhesive, which allows decal positioning, without bonding, to clean surfaces at temperatures up to 100°F. Bonding is to occur only after pressure is applied.
3. Completed decals shall not discolor, crack, craze, blister, delaminate, peel, chalk, or lose adhesion after 1,200 hr. exposure in accordance with ASTM G155 using Exposure Cycle 1 with a quartz inner filter glass and Type “S” Borosilicate outer filter glass. After exposure, the ink must not be faded or discolored.
4. The minimum permissible size is 3 in. wide by 5 in. high. The maximum permissible size is 3.75 in. wide by 7 in. high. Mark the decal to display the face design as shown in Figure 900-20. Face marking must not show any deterioration before the design life of the film material. The decal must be free from ragged edges, streaks, blisters, foreign matter, or other surface imperfections.
5. Following fabrication, the fabricator shall punch out the D in the top row and the date on the decal and affix the decal to the sign. Following installation, the installer shall scratch out the installation date on the decal.

D. Sign Warranty.

1. Sign face materials processed, applied, stored, and handled according to the manufacturers recommendations (or as required in this Specification when there is an exception to the producer’s recommendations) must perform satisfactorily for the number of years provided for herein for that sign face material. The performance period begins at the time a sign is fabricated, as indicated by the “Fabrication Date” on the sign identification decal. The warranty requirements go into effect upon final acceptance by the Department of Engineering. The Department of Engineering will adjust the performance period to deduct the time between the sign fabrication date and acceptance.
2. The sign face material is unsatisfactory if:
 - a. it deteriorates due to natural causes to the extent that the sign is ineffective for its intended purpose e.g., being viewed from a moving vehicle under normal day and night driving conditions), or;
 - b. Shows any of the following defects: cracks discernible with the unaided eye from the driver’s position while in an outside lane at a distance of 50 ft. or greater from the sign; peeling in excess of 1/4 in., or shrinkage in excess of 1/8 in. total per 48 in. of sheeting width, or;
 - c. Fading, loss of color, or loss of reflectivity to the extent that color or reflectivity fails to meet the requirements of DOTD Type X Sheeting.
3. All signs made with the type of sheeting indicated below and any other sign face materials used on each type of sheeting, except construction and maintenance work signs and barricades, must meet the minimum performance periods and replacement actions in the table below.

Type	Applicant shall restore the sign face in its field location to its original effectiveness at no cost to the Parish if failure occurs during the time period as specified below		Applicant shall replace the sheeting required to restore the sign face to its original effectiveness at no cost to the Parish if failure occurs during the time period as specified below
	Orange/Fluorescent Orange	All Colors Except Fluorescent Orange	All Colors Except Fluorescent Orange
DOTD Type X	<3 Years	<7 Years	7-10 Years

4. Where and when shown that retroreflective traffic signs processed in conformance with the sign face material producer's recommendations have not met the field performance requirements above, a developer's replacement obligation exists. The developer must cover the costs of replacement of the sign on the roadway or of restoring the sign surface to its original effectiveness as determined by and at no cost to the Parish for materials or labor.
5. Replacement sign face material shall:
 - a. Be the same type originally specified unless otherwise approved, and
 - b. Meet all the requirements of this Code.
6. The developer shall schedule with designated Parish personnel, within 30 days of notification of potential replacement obligation, an on-site investigation to determine if a replacement obligation exists. The developer shall fulfill all obligations within 120 days after determination of obligations. The Department of Engineering may replace signs where uncompleted obligations occur and may bill the developer for all costs in performing the developer's replacement obligation.

E. Specific Sign Requirements.

1. STOP Signs (R1-1).
 - a. STOP signs shall be an octagon with a white message and border on a red background.
 - b. STOP signs shall be a minimum of 30" x 30" on single lane conventional roadways, 36"x36" on multi lane roadways, and 36" x 36" or greater on freeways.
 - c. At intersections where all approaches are controlled by STOP signs, an ALL WAY supplemental plaque shall be mounted below each stop sign. The ALL WAY plaque shall have a white legend and border on a red background and shall have a standard size of eighteen (18") inches by six (6") inches. The message shall state ALL WAY. Supplemental plaques with legends such as 2-WAY, 3-WAY, 4-WAY or other numbers of ways shall not be used with stop signs.

2. Street Name Signs (D3-1).

- a. Street Name signs shall be erected at all street intersections regardless of other route markings that may be present. In business or commercial areas and on principal arteries, two complete sets of Street Name signs shall be placed at least on diagonally opposite corners. In residential areas, at least one complete set of Street Name signs shall be installed at each intersection. Signs shall be mounted with their faces parallel to the streets they name.
- b. Street Name signs may also be placed above a regulatory or STOP or YIELD sign with no vertical separation.
- c. The legend and background of the signs shall be contrasting colors. For roads that will be dedicated to and maintained by the Parish, and whose signs will be maintained by the Parish, the sign shall have white lettering (legend) on a blue background. For Street Name signs that will be privately maintained by the developer or homeowners' association after final subdivision approval, the legend and background shall be contrasting colors, but may have an alternative background color. The only acceptable alternative background colors for Street Name signs other than blue shall be green, brown, or white. Regardless of whether green, blue, or brown is used as the background color for Street Name signs, the legend (and border, if used) shall be white. For Street Name signs that use a white background, the legend (and border, if used) shall be black.

3. YIELD Signs (R1-2).

- a. Yield signs shall be a downward pointing equilateral triangle having a red border band and a white interior and the word yield in red inside the border band. Yield signs shall be a minimum of 36" x 36" x 36" on single lane conventional roadways, 48" x 48" x 48" on multi lane roadways, and 48" x 48" x 48" or greater on freeways.
- b. Yield signs may be used on a minor road at the entrance to an intersection where it is necessary to assign right-of-way to the major road, but where a STOP sign is not necessary at all times, and where the safe approach speed on the minor road exceeds ten (10) mile per hour.
- c. Yield signs shall be located in the same manner as a STOP sign.

4. SPEED LIMIT Signs (R2-1).

- a. Speed Limit signs shall display the limit established by law or by regulation. In accordance with the MUTCD, speed limits shown shall be in multiples of five (5) miles per hour.
- b. Speed limit signs shall be 24" x 30" on single lane conventional roads, 30" x 36" on multi – lane conventional roads, and 36" x 48" on expressways.

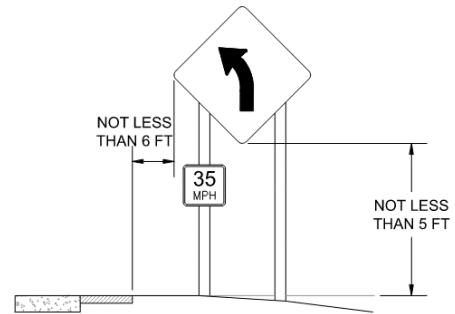
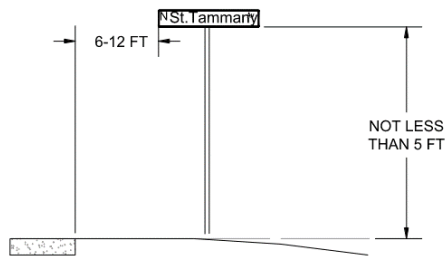
5. Movement Prohibition Signs (R3-1,2,3,4,18, 27).

- a. Movement Prohibition Signs shall be provided at or between intersections to indicate where certain movements are prohibited as prescribed for by the MUTCD.
- b. Movement Prohibition signs shall be 24" x 24" on single lane conventional roads, 36" x 36" on multi – lane conventional roads, and 36" x 36" on expressways.

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6. DO NOT ENTER Signs (R5-1).
 - a. To prohibit traffic from entering a restricted road section, Do Not Enter signs shall be conspicuously placed in the most appropriate position at the end of a One Way Roadway or Ramp.
 - b. DO NOT ENTER Signs shall be 24" x 24" on single lane conventional roads, 36" x 36" on multi – lane conventional roads, and 36" x 36" on expressways.
 7. WRONG WAY Signs (R5-1a).
 - a. Wrong Way signs shall be used as a supplement to the DO NOT ENTER signs on multi – lane roadways as prescribed for by the MUTCD. Wrong way signs shall not be used on single lane conventional roadways.
 - b. Wrong Way Signs shall be 24" x 30" on multi – lane conventional roads, and 36" x 48" on expressways.
 8. ONE WAY Signs (R6-1).
 - c. One Way signs shall be used when required to indicate streets or roadways upon which vehicular traffic is allowed to travel in a one way direction as prescribed for by the MUTCD.
 - d. One Way Signs shall be 36" x 12" on single lane conventional roads, 54" x 18" on multi – lane conventional roads, and 54" x 18" on expressways.
 9. NO OUTLET Signs (W14-2). No Outlet signs shall be provided to warn of a street or road which has no outlet and which terminates in a dead end or cul-de-sac. For single-entrance subdivisions, the No Outlet sign is to be placed at the entrance to the subdivision only.
 10. END OF ROADWAY Markers (OM4-1, OM3-L, OM3-R). End of Roadway markers in conjunction with Type III Object Markers are used to warn and alert road users of the end of a roadway in other than temporary traffic control zones. Type III Object Markers used on the right side of the end of road shall be right object markers (OM3-R). Type III Object Markers used on the left side of the end of road shall be left object markers (OM3-L). Where conditions warrant, more than one marker, or a larger marker with or without a Type III barricade may be used at the end of the roadway. Where barricades are required, they shall be built according to specifications set forth by the Department of Engineering.
 11. Other Signs: Other signs not listed above shall comply with the size and design requirements of the MUTCD and shall comply with sheeting requirements prescribed by this Code.

Exhibit 900-3-20 Requirements for Sign Placement.

RURAL



URBAN

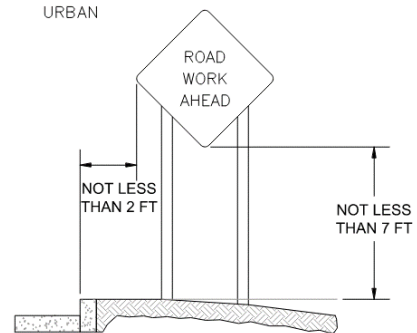
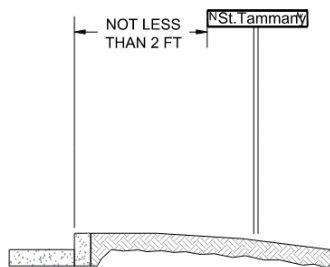
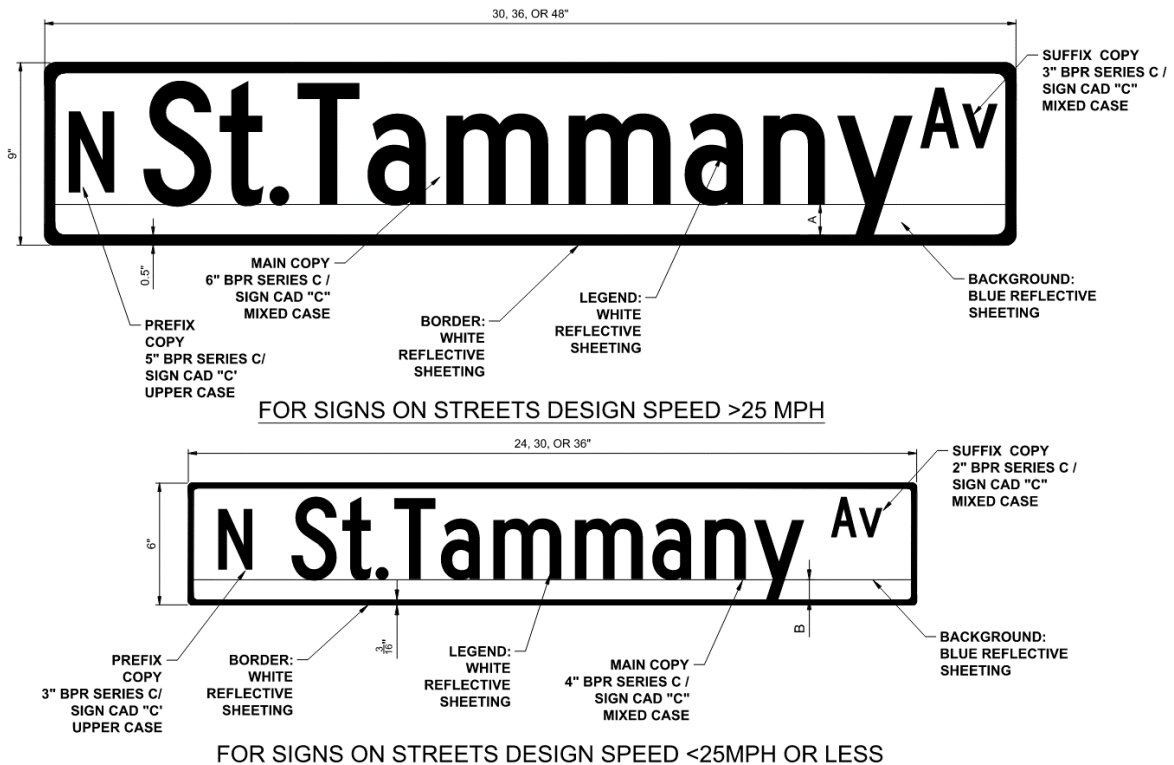
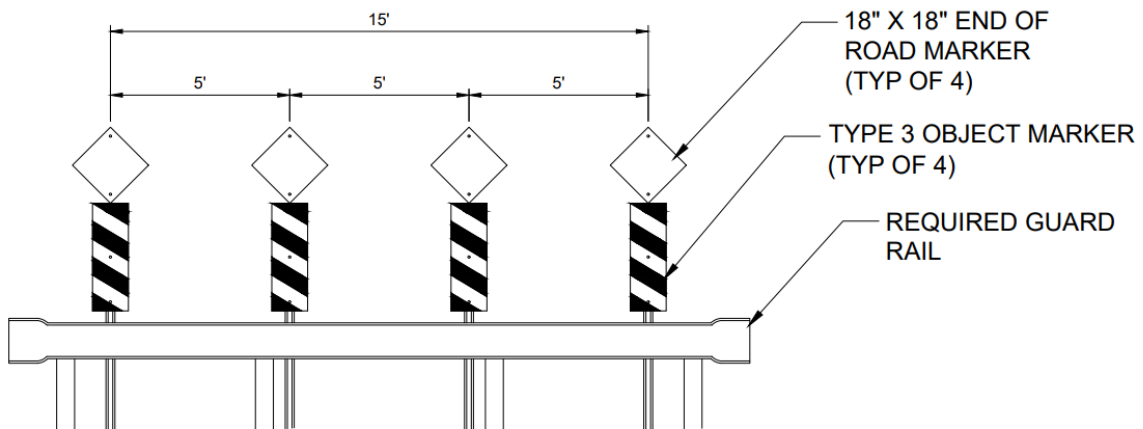


Exhibit 900-3-21: Requirements for Sign Decals.

ST TAMMANY PARISH GOVERNMENT											
D	FABRICATION DATE										P
J	F	M	A	M	J	J	A	S	O	N	D
	201		202		203		204		205		
	0	1	2	3	4	5	6	7	8	9	
SHEETING MFR - LEGEND											
SHEET MANUFACTURER - BACKGROUND											
NAME OF FABRICATOR											
INSTALLATION DATE											
				0	1	2	3				
	0	1	2	3	4	5	6	7	8	9	
J	F	M	A	M	J	J	A	S	O	N	D
	201		202		203		204		205		
	0	1	2	3	4	5	6	7	8	9	
NAME OF DEVELOPER PHYSICAL ADDRESS CITY, STATE, ZIP CODE											

Figure 900-3-22: Requirements for Street Name Signs.**Figure 900-22: Requirements for Dead End / End of Road Installation**

FOR END OF ROAD INSTALLATION OBJECT MARKER STRIPES SHALL SLOPE DOWNWARD TOWARD THE CENTER. GUARD RAIL TO BE INSTALLED IN ACCORDANCE WITH THE GUARD RAIL 'STANDARD PLANS'. TYPICAL INSTALLATION REQUIRED 25-FT OF RAIL WITH FLARED END SECTIONS.

F. Specialty Street Name Signs, Traffic Control Signs and Mounting Poles

1. New Subdivisions and Planned Unit Developments (PUDs) applying for Preliminary Subdivision Approval after March 01, 2016. The applicant for a new Subdivision or PUD who upon completion of the development intends to dedicate the roads to the Parish for acceptance into the Parish Road Maintenance System, shall be responsible for installing uniform Street Name and Traffic Control signage, including the associated mounting poles, in accordance with the requirements of this Code. A signage plan must be produced as part of the Final Proposed Subdivision Plat and Construction Plan Review and Approval and must be approved by the Department of Engineering. The signage plan shall include the GPS location of each Street Name and Traffic Control sign in the subdivision. The applicant must certify that the Street Name signs, Traffic Control signs, and associated mounting poles comply with the most current MUTCD and AASHTO guidelines, as well as the requirements of this Code, before being accepted into the Parish Road Maintenance System.
2. For Subdivisions and PUDs whose roads will be dedicated to the Parish for acceptance into the Parish Road Maintenance System upon completion of the subdivision, but whose Street Name signs, Traffic Control signs, and associated mounting poles will be privately maintained by the developer, or homeowners' association, or other stated owner, a signage plan must also be produced as part of the Final Proposed Subdivision Plat and Construction Plan Review and Approval reviews and must be approved by the Department of Engineering, but specialty mounting poles and sign borders are permitted as long as they meet the installation, crashworthiness and breakaway requirements set forth in the most current AASHTO and MUTCD guidelines as certified by the Applicant. The signage plan shall include the GPS location of each Street Name sign or Traffic Control sign in the subdivision.
 - a. Any variance from the provisions of these regulations regarding sign size, mounting height or mounting placement must be approved by the Department of Engineering and will be granted only in the event that engineering judgment determines that a variance is warranted.
 - b. A specialty mounting pole is defined as any Street Name sign or Traffic Control sign mounting pole other than the U-channel Standard pole described in this code above.
 - c. The material specification for the blades of the signs must comply with the material specifications of this Code, and any framing of the blade cannot alter the sign shape, minimum size, or color, or in any way obscure the blade of the sign, including its border. Privately maintained Street Name signs must also conform to one of the color schemes listed in Section (B) above.
 - d. In the event that any development elects to install and maintain more decorative signage, the responsibility for the ongoing maintenance must be clearly indicated on the final plats for that development.
 - e. All standards set forth in the most current MUTCD and AASHTO Roadside Design Guide must be met per federal Law.
 - f. The applicant, as part of the final subdivision approval, shall certify that all specialty mounting poles and their attendant Street Name or Traffic Control signs will be installed and maintained in perpetuity at the applicant's or homeowners' association's (or other stated owner's) expense. However, the Parish maintains the right to immediately replace any and all damaged or missing Street Name signs, Traffic Control signs, and specialty mounting poles with standard Parish signs and mounting poles described within this Code if the applicant or homeowners'

- association (or other stated owner) fails to repair or replace said Street Name sign, Traffic Control sign, and/or mounting pole and the Parish receives notification of the deficient condition. Furthermore, the Parish reserves the right to replace any privately maintained Street Name sign, Traffic Control sign, and mounting pole which poses any safety risk with standard Parish signs described within this Code. Under no circumstances will the Parish be responsible for installing, maintaining, or repairing specialty mounting poles. The Parish installed signs and mounting poles shall remain until replaced and returned to the Parish by the applicant or homeowners association (or other stated owner).
3. Subdivisions and Planned Unit Developments (PUDs) having received Final Subdivision Approval prior to March 01, 2016.
 - g. The provisions of these regulations shall not apply to Subdivisions, PUDs, and TNDs with privately maintained Street Name signs and Traffic Control signs which have received final subdivision approval prior to March 01, 2016. However, if the developer, homeowners' association, or other stated owner of an existing subdivision plans to replace all Street Name signs, Traffic Control signs, and attendant mounting poles within the subdivision, a signage plan shall be submitted to the Parish by a professional engineer, and shall comply with the provisions of Section 15.a.ii. above .
 - h. If any development exempt under this section requests that the parish assume maintenance of signage, it must first bring all existing signage up to the new standards described in 15.a. above.
 - i. For subdivisions that will privately maintain Street Name signs and Traffic Control signs, the Developer shall include on the final subdivision plat an affirmative declaration that the Street Name signs and Traffic Control signs within the subdivision shall be privately maintained by the applicant, homeowners association, or other owner for the subdivision as an affirmative obligation of that person or entity.

SEC. 900-4 SIDEWALK STANDARDS.

A. General Planning and Design Requirements.

1. Sidewalks and ramps shall comply with the most current regulations for Titles II and III of the Americans with Disabilities Act of 1990 (ADA) and applicable accessibility standards published by the Department of Justice (the 2010 ADA Standards for Accessible Design, "2010 Standards", or later).
2. An ADA curb ramp is a short ramp cutting through a curb or built up to it to provide an accessible path of travel.
3. On a curb ramp, the running slope is the slope in the direction of pedestrian travel on the ramp run and must be 8.33 percent (1:12) or less. Where provided, curb ramp flares shall not be steeper than 1:10.
4. On a curb ramp, the cross slope is the slope perpendicular to (across) the direction of pedestrian travel on the ramp run and the cross slope of the ramp run itself may not exceed 2 percent (1:50).
5. The ramp, or ramp run, must be at least 48 inches wide, not including the flared sides. The ramp run must have detectable warnings – i.e., dome-shaped bumps – that extend the full width and depth of the ramp.

6. Transitions from the ramp to the walkway, gutter, and street must be flush (level) and free of abrupt level changes. The gutter must have a slope of no more than 5 percent (1:20) toward the ramp.
7. Landings shall be provided at the tops of curb ramps. The minimum landing clear length shall be 48 inches. The landing clear width shall be at least as wide as the curb ramp, excluding flared sides, leading to the landing.
8. Diagonal or corner type curb ramps with returned curbs or other well-defined edges shall have the edges parallel to the direction of pedestrian flow. The bottom of diagonal curb ramps shall have a clear space of 48 inches minimum outside active traffic lanes of the roadway. Diagonal curb ramps provided at marked crossings shall provide the 48 inches minimum clear space within the markings. Diagonal curb ramps with flared sides shall have a segment of curb 24 inches long minimum, located on each side of the curb ramp and within the marked crossing.
9. Raised islands in crossings shall be cut through level with the street or have curb ramps at both sides. Each curb ramp shall have a level area 48 inches long minimum by 48 inches wide minimum at the top of the curb ramp in the part of the island intersected by the crossings. Each 48 inch minimum by 48 inch minimum area shall be oriented so that the 48 inch minimum length is in the direction of the running slope of the curb ramp it serves. The 48 inch minimum by 48 inch minimum areas and the accessible route shall be permitted to overlap.
10. The running slope of sidewalks shall be 5 percent (1:20) or less. The cross slope of sidewalks must be 2 percent (1:50) or less. The clear width of sidewalks shall be at least 60 inches and a sidewalk with a clear width of less than 60 inches shall provide a 60" x 60" passing space at intervals of 200 feet maximum. If the longitudinal slope of the sidewalk exceeds 1:20, it is considered a ramp and a level landing must be provided for every 30-inch change in elevation.
11. Vertical surface discontinuities along a sidewalk shall be ½" maximum. Discontinuities between ¼" and ½" shall be beveled at a 1:2 maximum slope.
12. The roadway side edge of the sidewalk shall be placed the sidewalk 2' or more from the back of the curb, with a grass berm separating the curb and walk when there is room within the existing right-of-way. If a sidewalk is placed adjacent to the curb, it must be at least 6' wide and a barrier curb shall be required. It is not advisable to have the path of the sidewalk in the driveway flares. This creates a tipping situation for someone in a wheelchair.
13. Where sidewalks intersect with streets and commercial driveways, detectable warning surfaces are required.
14. Traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items shall be located as to not obstruct an accessible route.
15. Handrails are not required on sidewalks within public right of way unless site specific conditions such as a vertical drop off dictate. When handrails are required, they shall be provided and shall comply with ADAAG 505.
16. To prevent the tracking of gravel onto a sidewalk or curb ramp, gravel drives shall be paved from the roadway edge to a point 10' behind the sidewalk or the right of way, whichever is less. The maximum allowable cross slope of curb ramp surfaces shall be 2%. The desired cross slope is 1.5%.
17. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run.

18. Where curb ramps are located adjacent to a walking surface, a flare must be provided. Otherwise, a curb shall be provided.
19. Drainage structures shall be located on the upstream side of curb ramps and shall be located to prevent ponding near the curb ramp. Drainage structures shall be placed outside of sidewalks, curb ramps, and crosswalks.
20. Curb ramps shall be aligned with the direction of pedestrian travel on a crosswalk or theoretical crosswalk.
21. Crosswalk markings shall be placed a distance of 24" from the flare on each side of a diagonal curb ramp
22. Curb ramps shall include detectable truncated domes warning surfaces.

B. Construction Requirements.

1. Portland cement concrete sidewalk pavement shall be of such widths and fixed at such elevations as indicated on the approved plans. Sidewalks shall consist of a one course Portland cement concrete pavement four (4") inches in thickness.
2. The concrete shall have a minimum compressive strength of three thousand (3,000) psi. at twenty-eight (28) days. The minimum cement content shall be five and one-half (5-1/2) bags per cubic yard of concrete. The maximum water content, including free water in the aggregate, shall not be greater than six (6) gallons per bag of cement. The consistency of concrete shall be such as to have a slump of from two (2") inches to four (4") inches.
3. In preparing the subgrade on which the Portland cement concrete sidewalk pavement will be placed, all soft and spongy places shall be removed and all depressions filled with suitable materials which shall be thoroughly compacted in layers not exceeding six (6") inches in thickness. The subgrade shall be thoroughly tamped until it is brought to a firm, unyielding surface. It shall have a slope in conformity with the slope of the finished surface of the Portland cement concrete sidewalk pavement.
4. When the Portland cement concrete sidewalk pavement is to be constructed over an old path composed of gravel or cinder, the old path shall be entirely loosened, the material spread for the full width of the subgrade and compacted as specified.
5. All fills shall be made in a manner satisfactory to the Department of Engineering. The use of muck, quicksand, soft clay, spongy or perishable material is prohibited. The top of all fills shall extend at least two (2') feet beyond the sidewalk pavement on each side and the sides shall have a maximum slope not greater than one (1) vertical to one and one-half (1-1/2) horizontal before any Portland cement concrete sidewalk pavement will be allowed to be placed thereon.
6. Concrete shall be of the strength and consistency herein before described. The method of mixing and placing shall be in conformance with the requirements for Portland cement concrete pavement. Concrete that does not flush readily shall be removed immediately from the grade and not re-used, except that the coarse aggregate can be salvaged by washing.
7. After mixing, the concrete shall be handled rapidly and the successive batches deposited in a continuous operation completing individual sections to the required depth and width. The forms shall be filled and the concrete struck off and tamped. The method of placing the various sections

shall be such as to produce a straight clean joint between them so as to make each section an independent unit. If dirt, dust or other foreign substances collect on the surface, they shall be removed before the trowelling is started.

8. After the concrete has been tamped, it will be brought to the established grade by means of a strike board, and it will then be worked with a wood float in a manner which will thoroughly compact it and provide a surface free from depressions or irregularities of any kind. Excessive working shall be avoided. In no case shall dry cement and sand be sprinkled on the surface. The surface edges of all slabs shall be rounded to a radius of one-half (1/2") inch.
9. Portland cement concrete sidewalk pavement shall be divided into blocks of such dimensions, by means of a joiner or grooves, as shown on the approved plans. Weakened planes shall be formed by a jointing tool or other acceptable means. Weakened planes shall extend into concrete for at least one-quarter (1/4") inch of the depth and shall be approximately one-eighth (1/8") inch wide. Spacing of weakened planes shall be equal to the width of the sidewalk. Transverse expansion joints shall be made at intervals of about ninety (90') feet and constructed in accordance with the standard plans.
10. All expansion joints shall be carefully made so as to be truly perpendicular to the surface of the sidewalk pavement and at right angles to the edge of same. The surface of the concrete adjacent to expansion joints shall be finished with a wood float, which is divided through the center and which will permit finishing on both sides of the joint at the same time. An expansion joint shall also be provided adjacent to solid walls of masonry, behind curbs, at intersections and at footlaps. Where posts or poles fall within the limit of the sidewalk pavement, an expansion joint not less than one-half (1/2") inch in width shall be placed around said posts or poles and filled with joint filler. In the case of expansion joints adjacent to masonry walls, at footlaps and around posts or poles, the joint filler shall not extend above the surfaces of the sidewalk pavement and any excess filler that so protrudes shall be cut off and made flush with the sidewalk pavement.
11. As soon as the finished work has hardened sufficiently to prevent damage, the surface of the walk shall be covered with curing compound. The freshly finished work shall be protected from hot sun and drying winds until it can be covered as above specified. Curing by application of chemicals or some other method of curing may be used upon the approval of the Department of Engineering. The concrete surface must not be damaged or pitted by raindrops and the applicant shall provide and use, where necessary, sufficient tarpaulins to completely cover all sections that have been placed within the preceding twelve (12) hours. The applicant shall erect and maintain suitable barriers to protect the walk from traffic, and any section damaged from traffic or other causes, shall be repaired or replaced by the applicant at his own expense, in a manner satisfactory to the Department of Engineering. The walk shall not be opened to traffic until the prescribed curing period has expired.
12. Portland cement concrete sidewalk or pavement at intersections, including ramps for the handicapped, shall be six (6") inches thick and placed as above specified.

C. Brick Sidewalks

1. Brick sidewalk pavement shall be of such width, grades or elevations as shown the approved plans and laid in the manner herein described and as shown on the approved plans.

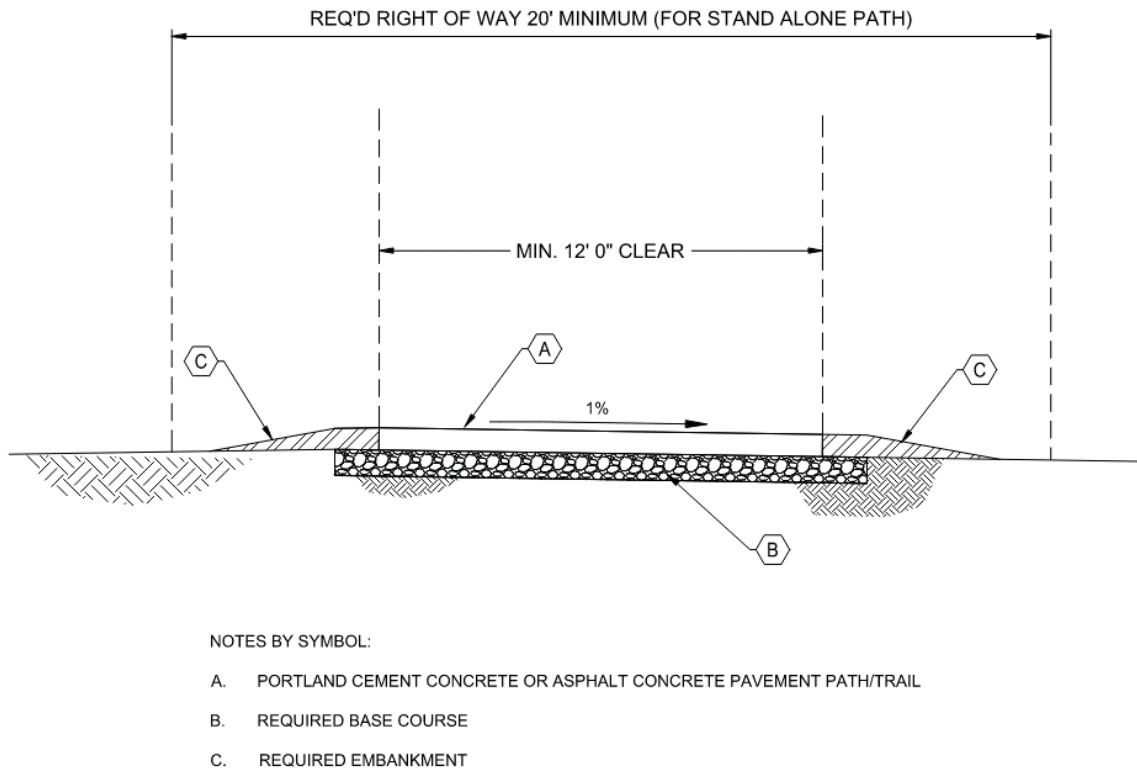
2. The surface of the earth upon which the brick sidewalk pavement will rest shall be first graded and tamped and otherwise prepared as specified for Portland cement concrete sidewalk pavement.
3. Brick shall be laid on a foundation of 5 inches of reinforced concrete foundation having a compressive strength of not less than three thousand (3,000) psi. in twenty-eight (28). The foundation shall be poured and tamped. The brick shall be laid on the foundation upon a prepared subgrade consisting of a minimum of a three-eighths (3/8") inch setting bed which is composed of one (1) part cement to three (3) parts sand. Bricks shall be in close contact with each other and thoroughly tamped. After tamping, they shall be thoroughly sprinkled and all joints shall at once be completely filled with grout formed of one (1) part Portland cement concrete to three (3) parts sand. Thereafter, clean, sharp sand shall be evenly spread on the surface to a thickness of approximately one-half (1/2") inch. When the grout has been in place for seventy-two (72) hours or longer, this sand shall be removed.
4. After completion, the brick sidewalk pavement shall be closed to traffic and not opened until approved by the Department of Engineering. The applicant shall be required to barricade and protect the walk in every way as prescribed and required for Portland cement concrete sidewalk pavement

SEC. 900-5 BIKEWAYS AND TRAILS.

A. General Planning and Design Requirements.

1. Design of Bikeways and Trails shall meet the requirements of the AASTHO Guide for Development of Bicycle Facilities, Latest Edition.
2. The minimum paved width for a two-directional bikeway/trail shall be 10 feet. Typical widths range from 10 to 14 feet, with the wider values applicable to areas with high use and/or a wider variety of user groups.
3. In very rare circumstances, a reduced width of 8 feet may be used where the following conditions prevail:
 - a. Bicycle traffic is expected to be low, even on peak days or during peak hours. Pedestrian use of the facility is not expected to be more than occasional.
 - b. Horizontal and vertical alignments provide frequent, well-designed passing and resting opportunities.
 - c. The path will not be regularly subjected to maintenance vehicle loading conditions that would cause pavement damage.
4. At a minimum, a 2-foot-wide graded area with a maximum 1V:6H horizontal slope shall be provided for clearance from lateral obstructions such as bushes, large rocks, bridge piers, abutments, and poles. A minimum of 2 feet clearance to post – mounted signs and other traffic controls shall be provided.
5. A 5-foot separation from the edge of the path pavement to the top of the slope is desirable. If the separation from the edge of the path pavement to the top of the slope is less than 5 feet, physical barriers or rails are recommended in the following situations:

-
- a. Slopes 1V:3H or steeper, with a drop of 6 feet or greater
 - b. Slopes 1V:3H or steeper, adjacent to a parallel body of water or other substantial obstacle
 - c. Slopes 1V:2H or steeper, with a drop of 4 feet or greater
 - d. Slopes 1V:1H or steeper, with a drop of 1 foot or greater
6. The following guidance and the consideration of various factors should guide in the selection of an appropriate design speed:
 - a. For most paths in relatively flat areas (grades less than 2 percent), a design speed of 18 mph is generally sufficient, except on inclines where higher speeds can occur.
 - b. In areas with hilly terrain and sustained steeper grades (6 percent or greater), the appropriate design speed should be selected based on the anticipated travel speeds of bicyclists going downhill. In all but the most extreme cases, 30mph is the maximum design speed that should be used.
 7. Cross Slope: Bicycle paths located adjacent to roadway essentially function as sidewalks, and therefore shall comply with the most current regulations for Titles II and III of the Americans with Disabilities Act of 1990 (ADA) and applicable accessibility standards published by the Department of Justice (the 2010 ADA Standards for Accessible Design, “2010 Standards”, or later).
 - a. One percent cross slopes are recommended on shared use paths, to better accommodate people with disabilities and to provide enough slope to convey surface drainage in most situations.
 - b. A cross-slope that provides a center crown with no more than 1 percent in each direction may also be used.
 - c. If cross slopes steeper than 2 percent are needed, they shall be sloped to the inside of horizontal curves regardless of drainage conditions.
 8. The maximum grade of a shared use path adjacent to a roadway shall be 5 percent, but the grade should generally match the grade of the adjacent roadway. Grades steeper than 5 percent are undesirable because the ascents are difficult for many path users, and the descents cause some users to exceed the speeds at which they are competent or comfortable.
 9. Where a shared use path runs along a roadway with a grade that exceeds 5 percent, the side path grade may exceed 5 percent but must be less than or equal to the roadway grade.
 10. Grades on shared use paths in independent rights of way should be kept to a minimum, especially on long inclines.
 11. Grades on paths in independent rights-of-way should also be limited to 5 percent maximum.
 12. Where a shared use path crosses an unpaved road or driveway, the road or driveway should be paved a minimum of 20 feet on each side of the crossing to reduce the amount of gravel scattered onto or along the path by motor vehicles.
 13. Bridges and Underpasses: railings, fences or barriers on either side of a shared use path on a stand-alone structure should be a minimum of 42 inches high.
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Figure 900-5-1: Requirements for Bikeway and Path Typical Structure**B. Construction Requirements**

1. Bicycle paths may be constructed of Portland cement concrete pavement complying with the requirements of this Section or using Level "A" Minor Asphalt Concrete complying with Section 900-3 of this Code.
2. Portland cement concrete path pavement shall be of such widths and fixed at such elevations as indicated on the approved plans. Paths shall consist of a one course Portland cement concrete pavement six (6") inches in thickness.
3. The concrete shall have a minimum compressive strength of three thousand (3,000) psi. at twenty-eight (28) days. The minimum cement content shall be five and one-half (5-1/2) bags per cubic yard of concrete. The maximum water content, including free water in the aggregate, shall not be greater than six (6) gallons per bag of cement. The consistency of concrete shall be such as to have a slump of from two (2") inches to four (4") inches.
4. In preparing the subgrade on which the Portland cement concrete path pavement will be placed, all soft and spongy places shall be removed and all depressions filled with suitable materials which shall be thoroughly compacted in layers not exceeding six (6") inches in thickness. The subgrade shall be thoroughly tamped until it is brought to a firm, unyielding surface. It shall have a slope in conformity with the slope of the finished surface of the Portland cement concrete path pavement.

5. When the Portland cement concrete path pavement is to be constructed over an old path composed of gravel or cinder, the old path shall be entirely loosened, the material spread for the full width of the subgrade and compacted as specified.
6. All fills shall be made in a manner satisfactory to the Department of Engineering. The use of muck, quicksand, soft clay, spongy or perishable material is prohibited. The top of all fills shall extend at least two (2') feet beyond the path pavement on each side and the sides shall have a maximum slope not greater than one (1) vertical to one and one-half (1-1/2) horizontal before any Portland cement concrete path pavement will be allowed to be placed thereon.
7. Concrete shall be of the strength and consistency herein before described. The method of mixing and placing shall be in conformance with the requirements for Portland cement concrete pavement. Concrete that does not flush readily shall be removed immediately from the grade and not re-used, except that the coarse aggregate can be salvaged by washing.
8. After mixing, the concrete shall be handled rapidly and the successive batches deposited in a continuous operation completing individual sections to the required depth and width. The forms shall be filled and the concrete struck off and tamped. The method of placing the various sections shall be such as to produce a straight clean joint between them so as to make each section an independent unit. If dirt, dust or other foreign substances collect on the surface, they shall be removed before the trowelling is started.
9. After the concrete has been tamped, it will be brought to the established grade by means of a strike board, and it will then be worked with a wood float in a manner which will thoroughly compact it and provide a surface free from depressions or irregularities of any kind. Excessive working shall be avoided. In no case shall dry cement and sand be sprinkled on the surface. The surface edges of all slabs shall be rounded to a radius of one-half (1/2") inch.
10. Portland cement concrete path pavement shall be divided into blocks of such dimensions, by means of a joiner or grooves, as shown on the approved plans. Weakened planes shall be formed by a jointing tool or other acceptable means. Weakened planes shall extend into concrete for at least one-quarter (1/4") inch of the depth and shall be approximately one-eighth (1/8") inch wide. Spacing of weakened planes shall be equal to the width of the path. Transverse expansion joints shall be made at intervals of about ninety (90') feet and constructed in accordance with the standard plans.
11. All expansion joints shall be carefully made so as to be truly perpendicular to the surface of the path pavement and at right angles to the edge of same. The surface of the concrete adjacent to expansion joints shall be finished with a wood float, which is divided through the center and which will permit finishing on both sides of the joint at the same time. An expansion joint shall also be provided adjacent to solid walls of masonry, behind curbs, at intersections and at footlaps. Where posts or poles fall within the limit of the path pavement, an expansion joint not less than one-half (1/2") inch in width shall be placed around said posts or poles and filled with joint filler. In the case of expansion joints adjacent to masonry walls, at footlaps and around posts or poles, the joint filler shall not extend above the surfaces of the path pavement and any excess filler that so protrudes shall be cut off and made flush with the path pavement.
12. As soon as the finished work has hardened sufficiently to prevent damage, the surface of the walk shall be covered with curing compound. The freshly finished work shall be protected from hot sun and drying winds until it can be covered as above specified. Curing by application of chemicals or

some other method of curing may be used upon the approval of the Department of Engineering. The concrete surface must not be damaged or pitted by raindrops and the applicant shall provide and use, where necessary, sufficient tarpaulins to completely cover all sections that have been placed within the preceding twelve (12) hours. The applicant shall erect and maintain suitable barriers to protect the walk from traffic, and any section damaged from traffic or other causes, shall be repaired or replaced by the applicant at his own expense, in a manner satisfactory to the Department of Engineering. The walk shall not be opened to traffic until the prescribed curing period has expired.

13. Portland cement concrete path or pavement at intersections, including ramps for the handicapped, shall be six (6") inches thick and placed as above specified.

SEC. 900-6 DRAINAGE AND FLOOD PREVENTION.

SEC. 900-6.1 GENERALLY.

A. Purpose

The purpose of the drainage and flood prevention regulations is to ensure the general health, safety, and welfare of the citizens of St. Tammany Parish. These provisions apply to all land and improvements within the unincorporated limits of St. Tammany Parish unless expressly exempted herein or by any other applicable law. The provisions for Water Management are incorporated herein and shall be applicable to the modification of existing drainage, placement of any fill material, and/or construction on any lot or parcel of property, in whole or in part.

Managing the movement of water across and within a development site involves a series of considerations including how flood prone the site is, how suited the site is to handle stormwater runoff internally, and how activities that create runoff on the site may affect the health of nearby waterbodies. Section addresses these considerations consecutively in support of more comprehensive site development approaches that can support both flood risk reduction and natural resource preservation.

This section includes requirements for properties located within FEMA-identified Special Flood Hazard Areas with the intent mitigate the impacts of flooding by regulating development practices in these flood hazard areas.

This section also outlines standards which promote low impact development in Sec. 900-6.8 which is a stormwater management strategy to maintain and restore the natural hydrologic character of a development site and prevent increases in downstream flooding by reducing site runoff, such as through the promotion of more sustainable, on-site stormwater management practices.

Water Quality aims to prevent pollution and mitigate adverse impacts to the health of nearby waterbodies, such as through standards for pre-construction site activities.

SEC. 900-6.2 DRAINAGE SYSTEM REQUIREMENTS.

A. General

1. A drainage system shall be provided and designed in accordance with the best modern engineering practices so as to adequately contain and carry off, to the point of ultimate disposal, such runoff as

can be expected in the area, taking into consideration the number and type of buildings or structures to be erected and certifying that the runoff will not be increased by the proposed development.

2. Permanent benchmarks shall be installed by the applicant at convenient locations as approved by the Department of Engineering in each subdivision or phase before final approval is granted. The location and elevation of each benchmark shall be clearly noted on the plat of the subdivision filed for record with the clerk of court. Whenever practical, the elevation of the benchmark shall accurately be related to mean sea level as established by the U.S. Coast and Geodetic Survey, the U.S. Army Corps of Engineers, or the LADOTD.
3. The elevation of the center of the completed streets shall also be noted on the as-built paving and drainage plan at intervals not to exceed five-hundred (500) feet and at all intersecting roadways, and said elevations are to be established from the benchmark after completion.

B. Direction of Flow of Surface Water for Individual Lots or Parcels.

1. Applicants shall indicate on the "as-built" paving and drainage plan the direction of flow of surface water for individual lots or parcels, where:
2. Surface drainage must be designed to flow toward the roadway or to a ditch which is adjacent to the lot or parcel, and the ditch must be located within a parish servitude when it is a public access subdivision or within a private servitude when it is a private subdivision.

C. Final plans.

1. Final as-built paving and drainage plans must indicate the invert elevation of the roadside ditch at each property line.
2. Any subdivision to be approved following adoption of the ordinance from which this subsection is derived shall be subject to the following procedures and requirements:
3. The Final Proposed Subdivision Plat and Construction Plan shall accurately depict the location of any open drainage ditch, channel, canal, or similar drainage feature, and any natural river or stream that is situated within the boundaries of the proposed subdivision.
4. Except as provided for "Boat houses and boat slips," no part of a permanent structure, including a driveway and/or fence, shall be located within twenty (20) feet of the top of bank of an open drainage ditch, channel, canal, or similar drainage feature, including a natural river or stream, unless subsurface drainage is installed. This requirement is not applicable to dry or wet retention ponds.
5. The Department of Engineering shall determine, based upon the data and information that is to be contained in the subdivision plan submitted, whether subsurface drainage is required. The determination is to be made based on considerations of the size of the parcel or lot; available building site (including driveway) on the parcel or lot in relation to the location of the open drainage ditch, channel, canal, or similar drainage feature; any restrictions on the size of the structure; and any other pertinent information or data deemed necessary by the Department of Engineering to ensure that no permanent structure, including a driveway and/or fence, is to be located within 20 feet of an open drainage ditch, channel, canal, or similar drainage feature. This requirement is not applicable to dry or wet retention ponds.
6. A building permit shall not be issued for the construction of any permanent structure, including a driveway and/or fence, where any part of said structure would be located within twenty (20) feet

of an open drainage ditch, channel, canal, or similar drainage feature. This requirement is not applicable to dry or wet retention ponds.

7. Subsurface drainage will be required on all newly created roadside ditches, that exceed a depth of three (3) feet as measured from the centerline of ditch to the crown of the adjacent road.
8. The requirements of subsurface drainage may be modified when plans are approved by the Department of Engineering.

SEC. 900-6.3 HYDROLOGIC AND HYDRAULIC ANALYSIS AND PAVING AND DRAINAGE PLAN.

A. General

The purpose and intent of this section is to require a drainage and paving plan to be stamped and certified by a licensed professional engineer registered in the State of Louisiana for construction of commercial, industrial, institutional and certain multifamily developments, with the goal of improving pre-development runoff and reducing post-development runoff based on a minimum 25-year storm event.

B. Applicability

All commercial, industrial, institutional and multifamily development for townhouses, apartments, condominiums and nursing home uses that require a building permit or site work permit shall submit a drainage and paving plan with the permit application. Said plan shall be forwarded to the Department of Engineering for review and approval before the issuance of a building permit.

C. Responsibility

It shall be the responsibility of the applicant to create a site development plan that will complement the drainage and paving plan utilizing site design criteria to result in the reduction of runoff from post-development.

D. Criteria

The drainage and paving plan shall be stamped and certified by a licensed professional engineer registered in the State of Louisiana and shall meet the following criteria:

1. Parcels zero to two acres in size shall be required to reduce pre-development peak runoff by at least ten percent for a 25-year storm event on-site.
2. Parcels two to five acres in size shall be required to reduce pre-development peak water runoff by at least 15 percent for a 25-year storm event on-site.
3. Parcels five acres and larger shall meet all drainage requirements for subdivisions, including a reduction of pre-development peak runoff by at least 25 percent for a 100-year storm event on-site.
4. Whenever a parcel that is greater than five acres is proposed to be developed in phases, or subdivided through the minor subdivision process, where any proposed phase or lot is less than five acres, such development shall meet the requirements of subsection (3) of this section. The drainage and paving plan must address drainage in terms of the development of the entire parcel, not just the phase currently being proposed to be developed, taking into consideration all of the regulations of the zoning district designation of the property that could be pertinent to drainage, including

maximum net density permitted, minimum area regulations, maximum lot coverage, and off-street parking and loading requirements.

5. A combination of detention methods may be utilized to meet the criteria as established in this section. Off-site detention facilities may be utilized if approved by the Department of Engineering.
6. At no time will the parking area be utilized as a detention area.

E. Documents Required

Documents required for drainage and paving plan review. In order to expedite the drainage plan review for all commercial, industrial, institutional and multifamily developments for townhouses, apartments, condominiums and nursing home uses, the Department of Engineering shall require at a minimum the following documents be provided:

1. A vicinity map indicating the location of the proposed project.
2. A pre-development drainage plan (existing conditions).
3. Identify fill area(s) and associated fill depth(s).
4. A post development paving and drainage plan and an as built paving and drainage plan.
5. If building has downspouts, an architect's drawing is required.
6. If the outfall needs to discharge to the ditch or pond, the invert elevations of associated culvert(s) and bottom elevation of accepted ditch or pond shall be provided.
7. If driveway culvert needs to be installed at the state highway ditch, an approval sheet from the state shall be provided prior to the parish approval.
8. Hydrological Analysis as provided for below.

F. Hydrological Analysis

A hydrological analysis of both pre-development and post-development runoff shall be provided. The applicant shall also provide a water surface profile for 100-year, 50-year, 25-year and ten-year storm events. The hydrological analysis shall meet all applicable parish ordinances and the following requirements:

1. The applicant shall also study the effect of any proposed development on existing downstream drainage facilities outside the area of development. Local drainage studies, together with any other appropriate study, shall serve as a guide to needed improvements as determined by the Department of Engineering.
2. No development may be constructed or maintained so that surface waters from such development are collected and channeled downstream at such locations or at such volumes or velocities as to cause degradation, alteration or damage to lower adjacent properties.
3. Where it is anticipated that the additional runoff incident to the development will increase the water surface profile downstream, the parish shall withhold approval of the development until provisions have been made for the detention of stormwater and resolution of such conditions in conformance with these requirements and the department of engineering. No development shall be approved unless the necessary drainage will be provided to a drainage watercourse or facility that is adequate to receive the proposed drainage without adverse impact on downstream properties.

4. No development may be constructed or maintained where such development would impede the flow of water from upstream properties across the property proposed to be developed. All drainage rights-of-way and culverts or other drainage facilities shall be large enough to accommodate runoff from the property proposed to be developed as well as upstream flow originating outside of the proposed development. All existing watercourses passing through the property of the proposed development shall be maintained to accommodate up to the 100-year storm events. Any proposed alteration or relocation of an existing watercourse or drainage facility may only be approved when the Department of Engineering has determined that any such proposal meets all applicable parish drainage requirements. The applicant determine the necessary size of the drainage facilities, assuming conditions of maximum potential watershed development permitted by these regulations.
5. If the site is located in an area where known drainage problems exist, a drainage basin study can be required to demonstrate if there will be adverse drainage impacts on surrounding properties.
6. The Department of Engineering reserves the right to hold the certificate of occupancy in order to allow for a final inspection.
7. In the event of a conflict between any provision within this section, or between a provision in this section and any other drainage or flood control ordinance, the more stringent provision shall be applicable.
8. All the above drawings and hydrological analysis shall be prepared and signed and sealed by licensed professional engineer registered in the State of Louisiana,
9. Design and Analysis Criteria. The following are recommended methods for analyzing the impacts of designed stormwater control measures (SCMs). The design of engineered facilities requires professional judgement and proper function of these facilities is the responsibility of the designer.
 - a. Allowable Methods – Hydrologic Analysis: The applicant may utilize the Rational Method, the Modified Rational Method, and the NRCS (SCS) Method for Hydrologic analyses subject to the following limitations:

Method	Limitations
Rational Method	Rational Method may be utilized for the determination of peak runoff for areas of 20 acres or less in size where only the peak discharge is of concern.
NRCS (SCS) Method	May be used for peak runoff calculations for areas greater than 20 acres and less than 2000 acres in size or for where storm volume must be determined. Method shall be used for design of retention facilities for developments of one acre in size or greater.
Modified Rational	Method may be used for estimating the optimum storage volume for developments of one acre or less in size only. Results shall be confirmed by reservoir routing.

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- b. Rational Method: For developments of 200 acres or less, the Rational Method (as prescribed within Chapter 3 – Part C of the Louisiana Department of Transportation and Development Hydraulics Manual, 2011 Edition) shall be used for determination of peak runoff and for the design of open channel and storm sewer systems. Computation of Time of Concentration (T_c) shall be computed as prescribed by the DOTD Hydraulics Manual or via TR-55.
 - c. Modified Rational Method: Retention facilities for developments less than 1 acres in size may be designed utilizing hydrographs developed by the modified rational method. Modified Rational Method recognizes that the duration of a storm can and will sometimes be longer than the time of concentration. This longer duration storm, even though it produces a lower peak Q , can produce a larger volume of runoff than the storm duration equal to the actual time of concentration of the drainage area. In order to ensure the proper design of stormwater management basins, the volume of runoff for the critical storm duration should be calculated. Hydrographs shall be calculated for at least the following durations: ($1.0 \times T_c$, $1.5 \times T_c$, $2 \times T_c$, and $3T_c$, or until reservoir routing calculations identify the critical storm duration. Retention ponds shall be sized such that the peak outflow from the retention facility at the critical storm duration complies with the hydraulic and hydrologic performance requirements of this code. Results developed by the modified rational method shall be confirmed by reservoir routing.
 - d. NRCS (SCS) Method and Unit Hydrograph: For developments greater than 1 acre and less than 2000 acres in size, the NRCS Method (as prescribed in Chapter 3 – Part B of the Louisiana Department of Transportation and Development Hydraulics Manual, 2011 Edition) shall be used for the determination of peak runoff and for the development of hydrographs for reservoir routing for developments. Where the NRCS method is used to develop hydrographs, a shape number of 256 shall be utilized. Hydrographs shall be developed using a Type III, 24 Hour Rainfall Distribution shown in the Technical Publications of the National Weather Service of the National Oceanic and Atmospheric Administration. Additionally, when using the NRCS method, modifications for ponding shall be made as provided for below:
 - i. Modification for Ponding Areas: Where a drainage area contains ponding areas or swampy areas, the peak runoff shall be adjusted as provided for in the equation below. The tables below indicate the appropriate adjustment factors to be utilized.

$$Q_{mod} = Q_{peak} \times Factor_{Ponding}$$

Adjustment Factors where Ponding and Swampy Areas Occur at Design Point (NRCS Method)							
Ration of Drainage Area / Pond and Swampy Area	Percent Pond/Swamp in Drainage Area	Return Period					
		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
500	0.2	0.92	0.94	0.95	0.96	0.97	0.98
200	0.5	0.86	0.87	0.88	0.90	0.92	0.93
100	1.0	0.80	0.81	0.83	0.85	0.87	0.89
50	2.0	0.74	0.75	0.76	0.79	0.82	0.86
40	2.5	0.69	0.70	0.72	0.75	0.78	0.82
30	3.3	0.64	0.65	0.67	0.71	0.75	0.78
20	5.0	0.59	0.61	0.63	0.67	0.71	0.75
15	6.7	0.57	0.58	0.60	0.64	0.67	0.71
10	10	0.53	0.54	0.56	0.60	0.63	0.68
5	20	0.48	0.49	0.51	0.55	0.59	0.64

Adjustment Factors where Ponding and Swampy Areas are Spread Throughout Watershed or Occur in Central Parts of Watershed (NRCS Method)							
Ration of Drainage Area / Pond and Swampy Area	Percent Pond/Swamp in Drainage Area	Return Period					
		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
500	0.2	0.94	0.95	0.96	0.97	0.98	0.99
200	0.5	0.88	0.89	0.90	0.91	0.92	0.94
100	1.0	0.83	0.84	0.86	0.87	0.88	0.90
50	2.0	0.78	0.79	0.81	0.83	0.85	0.87
40	2.5	0.73	0.74	0.76	0.78	0.81	0.84
30	3.3	0.69	0.70	0.71	0.74	0.77	0.81
20	5.0	0.65	0.66	0.68	0.72	0.75	0.78
15	6.7	0.62	0.63	0.65	0.69	0.72	0.75
10	10.0	0.58	0.59	0.61	0.65	0.68	0.71
5	20.0	0.53	0.54	0.56	0.60	0.63	0.68
4	25.0	0.50	0.51	0.53	0.57	0.61	0.66
3	33.3	0.47	0.49	0.50	0.54	0.59	0.64
2	50.0	0.45	0.47	0.48	0.52	0.57	0.62
1	100.0	0.43	0.45	0.486	0.50	0.55	0.61

Adjustment Factors where Ponding and Swampy Areas are Located in Upper Reaches of Watershed (NRCS Method)							
Ratio of Drainage Area / Pond and Swampy Area	Percent Pond/Swamp in Drainage Area	Return Period					
		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
500	0.2	0.96	0.97	0.98	0.98	0.99	0.99
200	0.5	0.93	0.94	0.94	0.95	0.96	0.97
100	1.0	0.90	0.91	0.92	0.93	0.94	0.95
50	2.0	0.87	0.88	0.88	0.90	0.91	0.93
40	2.5	0.85	0.85	0.86	0.88	0.89	0.91
30	3.3	0.82	0.83	0.84	0.86	0.88	0.89
20	5.0	0.80	0.81	0.82	0.84	0.86	0.88
15	6.7	0.78	0.79	0.80	0.82	0.84	0.86
10	10	0.77	0.77	0.78	0.80	0.82	0.84
5	20	0.74	0.75	0.76	0.78	0.80	0.82

- e. Allowable Factors for C and Curve Number: Allowable values for the runoff coefficient, “C” and Curve Numbers “CN” are as shown in the tables below. Hydrologic soil group shall be determined by a licensed geotechnical engineer or the United Soil Conservation Service Classification Maps.

Allowable Curve Numbers				
Land Use	Hydrologic Soil Group			
	A	B	C	D
Woods or Forest Land	37	61	74	80
Pasture or Range Land	52	70	80	85
Cultivated Land	67	76	83	86
Open Spaces, Lawns, Parks, Golf Courses, Cemeteries				
Good Condition (Grass Cover on 75% or more on the Area)	39	61	74	80
Fair Condition (Grass Cover on 50% to 75% of the area)	49	69	79	84
Poor Condition (Grass Cover on Less than 50% of the area)	68	79	86	89
Residential				
Average lot size 1/8	77	85	90	92
Average lot size 1/4 acre	61	75	83	87
Average Lot Size 1/3 acre	57	72	81	86
Average Lot Size 1/2 Acre	54	70	80	85
Average Lot Size 1 Acre	51	68	79	84
Average Lot Size 2 Acre	46	65	77	82
Commercial and Business Area	89	92	94	95
Industrial Districts	81	88	91	93
Parved Parking Lots	98	98	98	98
Paved Streets and Roads				
Streets with Curbs and Storm Drains (Excluding Right of Way)	98	98	98	98
Roads with Open Ditches (Including Right of Way)	83	89	92	93
Gravel (Including Right of Way)	76	85	89	91
Dirt (Including Right of Way)	72	82	87	89

Allowable Runoff Coefficients, C	
Land Use	Allowable C Factor
Downtown Areas	0.95
Neighborhood Areas	0.70
Single Family Areas, Average Lot Size 1/8 Acre	0.50
Single Family Areas, Average Lot Size 1/4 Acre	0.47
Single Family Areas, Average Lot Size 1/3 Acre	0.46
Single Family Areas, Average Lot Size 1/2 Acre	0.46
Single Family Areas, Average Lot Size 1 Acre	0.45
Single Family Areas, Average Lot Size 2 Acres	0.45
Multi – Family Units, Detached	0.60
Multi – Family Units, Attached	0.75
Apartment Dwelling Areas	0.85
Light Industrial	0.80
Heavy Industrial	0.90
Parks, Cemeteries	0.25
Playgrounds	0.35
Unimproved Areas	0.10

- f. Other Methods: Where acceptable to the Departments of Planning and Engineering, alternate methods may be utilized for the analysis and design of drainage facilities. Where proposed, the applicant shall submit all clarification and documentation to the satisfaction of the Department and Engineering.
 - g. Tailwater Conditions: Where available, the applicant shall utilize Flood Insurance Studies (FIS) promulgated by the Federal Emergency Management Agency (FEMA) for the determination of tailwater conditions at discharge.
10. Open Channel (Ditch) Analysis and Design: Open channels shall be analyzed and designed as prescribed in Chapter 4 of the Louisiana Department of Transportation and Development Hydraulics Manual, 2011 Edition.
 11. Culvert Drainage Design: Culverts shall be analyzed and designed as prescribed in Chapter 5 and 6 of the Louisiana Department of Transportation and Development Hydraulics Manual, 2011 Edition. Culverts shall be designed such that they meet the Urban case of Table 6.9-1 of the Louisiana Department of Transportation and Development Hydraulics Manual, 2011 Edition
 12. Storm Drain System Analysis and Design: Storm drain systems shall be analyzed and designed as prescribed in Chapter 8 of the Louisiana Department of Transportation and Development Hydraulics Manual, 2011 Edition. Storm drain systems shall be designed such that they will convey the peak runoff generated by the 25-year storm.

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13. Curb, Gutter, Grates and Inlets: Curb, gutter, grates and inlets shall be analyzed and designed as prescribed in Chapter 8 – Part A of the of the Louisiana Department of Transportation and Development Hydraulics Manual, 2011 Edition. Inlets shall be designed such that one half of the outer travel lane remains free of inundation during the 10 – year storm event.
 14. Storm Water Drainage Pumping Stations: Stormwater drainage pumping stations shall be analyzed and designed in accordance with Chapter 10 of the Louisiana Department of Transportation and Development Hydraulics Manual, 2011 Edition, Water Environment Federation Manual of Practice FD-4 and the applicable standards of the Hydraulics Institute (HI). Electrically powered drainage pumping station shall be provided generator capacity sufficient to run 100 percent of the capacity of the drainage pumping station for a minimum of 72 hours continuously without refueling.
 15. Detention Design. Detention design may be part of the Stormwater Management Plan (SMP) and shall include detention ponds and metering structures. Linear detention within roadside ditches is not acceptable and shall not be included as storage areas within any SMP.
 16. Dry Basins: Dry basins shall be designed such that the primary outlet devices restrict the flow and allow water to pond in a safe contained fashion. A properly designed emergency spillway shall be provided capable of passing the 100-year storm if the drainage area is greater than 25 acres. Side slopes shall be no steeper than 3:1 but if vegetative groundcover is to be used, flatter slopes are recommended. The basin shall be constructed to insure positive drainage with a concrete low flow swale.
 17. Wet Basins: Wet basins are preferred and shall be constructed where practical. Wet basins shall be designed such that the primary outlet devices restrict the flow and allow water to pond in a safe contained fashion. A properly designed emergency spillway shall be provided capable of passing the 100-year storm if the drainage area is greater than 25 acres. Side slopes shall be no steeper than 3:1 above the normal water surface elevation. If vegetative groundcover is to be used, flatter slopes are highly recommended. A minimum of 60” of standing water shall be maintained in all wet ponds, and that volume of the water permanently retained within the wet pond shall be excluded from the retention volume in reservoir routing computations.
 18. Pipe and Channel Storage: Linear detention within roadside ditches and storm drain pipe shall not be included as storage areas.
 19. Outlet Devices: Outlet devices may include weirs, orifices, and culvert controls. Outlet devices shall be modeled and analyzed using equations suitable for each application and subject to the approval of the Department of Engineering.
 20. Basin Routing Methodology: Impoundments shall be sized using the Storage indication Routing method (as prescribed in Ponce, V. M. 1989. Engineering Hydrology, Principles and Practices. Prentice Hall, pages 260-261) and hydrographs.
 21. On site detention requirements may be waived or modified based on hydrological analysis of existing conditions, location of the development within the drainage basin and analysis assuring no negative effect within the basin of the waiver. A waiver is expressly prohibited for developments located within the upper one- third of the drainage basin, unless the runoff resulting from the development can be routed to a regional detention facility. After technical review, the department of engineering shall accept or reject the proposed waiver. The waiver will be presented to the planning commission for preliminary approval.

22. If a waiver is accepted pursuant to the previous subsection, in lieu of on-site detention, the applicant shall be assessed a drainage fee. This fee shall be payable to the parish or designated drainage district for the sole purpose of making improvements to the affected drainage basin. The fee shall be due prior to the issuance of any work orders by the parish
23. All retention reservoirs and associated drainage structures shall be designed to provide for reductions in peak rate of runoff for all storm events up to the 100-year storm. The peak rate of runoff for the 25-, 50- and 100-year storm shall be reduced by 25 percent. At no time shall the peak rate of runoff exceed that of the pre-development conditions of the subject parcel. Calculations shall be provided for the 25-, 50- and 100-year storm events that display the effects of a two and 24-hour duration.

G. Drainage Rights of Way

1. Drainage ditches, channels, canals, and similar drainage features shall be located within a dedicated right-of-way and not located within an individual lot(s). Dedicated right-of-way may be located in greenspace or open space.
2. If direct access is not available, there shall be a dedicated right-of-way access that extends to a public or private road that is a minimum of twenty-five (25) feet wide.
3. A drainage ditch, channel, canal, or similar drainage feature right-of-way shall comply with the following criteria:
 - a. Provide a minimum of fifteen (15) foot wide working distance on one side of the ditch, channel, canal, or similar drainage feature and a five (5) foot wide distance on the opposite side of the ditch. Measurements for this subpart shall be taken from top of bank to boundary line of right-of-way.
 - b. The dimensions of the ditch, channel, canal, or similar drainage feature shall be determined by hydrologic calculations in accordance with criteria stated herein.
 - c. Side slopes shall be designed at a 3:1 ratio (three feet horizontal to one foot vertical). When a 3:1 design cannot be achieved, the proposed drainage ditch, channel, canal, or similar drainage feature shall be subsurface.
4. Drainage plans shall include cross-section(s) for each drainage ditch, channel, canal, or similar drainage feature clearly showing conformance to this subsection.
5. Alternate:
 - a. All subsurface drainage shall be located within a dedicated right-of-way and shall not be located within the boundaries of an individual lot(s). Dedicated right-of-way may be located in greenspace or open space; except for subsurface drainage installed on and serving a single lot or within a shared swale between two lots.
6. If direct access is not available, there shall be indicated on the Final Proposed Subdivision Plat and Construction Plan a dedicated access that is not located within an individual lot and that extends to a public or private road that is a minimum of twenty-five 25 feet wide. Dedicated access may be located in greenspace or open space.

7. All subsurface drainage rights-of-way shall be designed in accordance with all of the following criteria:
 - a. Provide a minimum twenty (20) foot wide right-of-way distance. Right-of-way shall be increased as required to allow for a minimum of five (5) feet from edge of pipe to right-of-way boundary at all locations. Additional right-of-way width may be required at the discretion of the Department of Engineering.
 - b. This right-of-way shall be exclusively for drainage, except when necessary for crossing by other utilities.
 - c. The subsurface drainage shall be sized for the capacity determined by hydrologic calculations in accordance with criteria stated within this code.

H. Design and Location of Drainage Structures

1. All lots and blocks created or reconstructed must meet the minimum lot and block size and dimension standards of this section and the zoning district in which the site is located. If requirements conflict, the more restrictive shall apply.

SEC. 900-6.3 RETENTION PONDS

A. Retention/Detention Pond: Retention/Detention Ponds shall comply with the following requirements:

1. Requirements for both wet and dry ponds:
 - a. Side slopes shall have a slopes must have a minimum 3H:1V slope.
 - b. Minimum access servitude width from pond to parish road must be twenty-five (25) feet.
 - c. Clear buffer around the periphery of pond must be twenty (20) feet; ten feet must be on a flat surface and not a pond side slope.
 - d. The applicant must furnish a copy of the title to the land.
 - e. An "act of dedication" with a legal description of the property to be dedicated to the parish must be furnished.
 - f. A minimum free board of 1'-0" shall be provided above the 100 – year design storm water surface elevation.
2. Requirements specific to wet ponds:
 - a. A minimum low stage depth of at least five feet.
3. Requirements specific to dry ponds:
 - a. Exit structure invert elevation must be 0.5 feet lower than the lowest elevation of the pond bottom.
 - b. A narrow low stage ditch shall be constructed through the pond to the exit structure invert elevation.

B. Acceptance into the Parish System The following procedures are hereby established for acceptance of retention/detention ponds, existing as of the date of the ordinance from which this article is derived, into the parish maintenance system:

1. The owner submits a petition requesting that the pond be taken into the Parish maintenance system. The petition must include copy of title and a survey.
2. The petition will be reviewed by the Department of Engineering and Department of Public Works to determine what is needed before the pond can be considered for acceptance.
3. The following requirements are hereby established for retention/detention ponds, constructed after the adoption of the ordinance from which this article is derived. Compliance with all standards as set forth below must be verified by Department of Engineering prior to acceptance. The detention
4. The petitioner will be advised of what is needed for acceptance and will be advised that acceptance by the parish is for maintenance purposes only and not for aesthetic purposes.

SEC. 900-6.4 PLACEMENT OF FILL

A. Placement of Fill on Lots Less than Ninety (90) Feet in Width for which No Drainage Plan Exists

1. Applicability. The purpose of this section is to restrict the placement of fill material on lots less than 90 feet width to prevent storm water from being displaced onto adjacent property thereby increasing the potential or actual flood damage to adjacent property. These restrictions are applicable only to the placement or relocation of fill on residential lots less than 90 feet in width which are located in a subdivision for which there is no drainage plan approved by the Department of Engineering.
2. The drainage and flood control provisions of the parish Code of Ordinances are incorporated herein and shall be applicable to the placement of any fill material and/or construction on any lot or parcel of property, or any part thereof, which property and/or activity is governed by the drainage and flood control provisions. In the event of any conflict between the drainage and flood control provisions and those contained within this section, the more stringent or restrictive provision shall apply.
3. General provisions (all lots).
 - a. Any applications to place fill on lots less than ninety (90) feet in width shall detail the existing, pre-construction, natural and man-made drainage features located on the lot in question.
 - b. All applications to place fill on lots less than ninety (90) feet in width must be reviewed for compliance with all other relevant parish regulations.
 - c. All fill/excavation activities within jurisdictional wetlands shall receive necessary authorization from the U.S. Army Corps of Engineers and any other applicable local, state, or federal agencies before such activities are commenced.
 - d. The placement of fill on any lot located within a flood hazard zone shall be permitted only when a development plan for the lot has been submitted and approved.
4. Flood Zone V and areas of shallow flooding.
 - a. Flood Zone V. The placement of fill on any lot located within Flood Zone V shall be exclusively governed, regulated and controlled by and shall in all ways be consistent with the

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- relevant provisions of the rules and regulations promulgated by the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program (NFIP).
- b. Areas of shallow flooding that are not flood zones V or A.
 - i. No off-site fill shall be allowed.
 - ii. Fill shall be limited to the roof-shed area of a lot's proposed primary structure.
 - i. A concrete slab shall be permitted under the primary structure provided that the finished surface slab or footing does not exceed an average of 12 inches above natural ground grade.
 - ii. Construction shall be accomplished using pier or piling construction according to applicable building codes for finished elevations in excess of 12 inches.
 - iii. Site improvements (structures, driveways, roadways, landscaping, etc.) shall not impede natural drainage pathways or parish drainage easements.
 - iv. There shall be no net change in the average elevation of the natural grade of the lot outside of the roof shed.
5. Flood Zones A, AE, B, C and X.
- a. Fill shall be limited to the roof shed area of the proposed primary structure and necessary access to the site.
 - b. The volume of fill on the site shall not exceed that which is necessary to prepare an adequate building footprint, as verified by the Department of Engineering.
 - c. Construction activities that involve the finished floor of a structure exceeding an average of twenty-four (24) inches above natural ground elevation shall utilize pier or piling construction or retainer type construction as provided for in applicable building codes. Fill for foundations resulting in a finished floor elevation with an average of twenty-four (24) inches or less above natural ground grade shall taper from the foundation edge at a slope of one vertical foot for every two (2) horizontal feet.
 - d. Fill for driveways must not exceed an average of twelve (12) inches above natural ground grade except where fill is part of the transition from the foundation for the primary structure, carport, or garage. Fill may also be placed adjacent to the driveway to soften the transition between elevations to a slope not steeper than one vertical foot for every four horizontal feet.
 - e. The placement of fill may not encroach into the required side yard setbacks, except as otherwise permitted in these regulations.
 - f. Fill for non-contiguous landscaping areas within the front and rear yards resulting in the finished ground elevation up to an average of six inches above natural ground grade for each such area is permitted, provided that an equal volume of fill is removed from the lot.
6. Administrative Waiver.
- a. The Department of Engineering shall review individual cases for waiver from the provisions of this section, upon written request by the property owner. The property owner must provide evidence that circumstances exist which warrant the requested waiver.
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- b. Upon documentation that such circumstances do exist, as determined by the Department of Engineering, an administrative waiver shall be granted. Upon the granting of said waiver a full report must be included in the permanent building permit file. That report shall include a detailed description of such circumstances, mitigation (if required), a copy of any written correspondence relative to the lot and the waiver request, and a detailed description of the waiver rationale and final determination.
- c. The decision of the Department of Engineering may be appealed to the legislative body of the governing authority within 14 calendar days of the written decision of the Department of Engineering. Appeals must be filed with the Department of Engineering at least seven calendar days prior to the regularly scheduled meeting of the governing authority. The Department of Engineering will cause the appeal to be placed upon the regular agenda of the Parish Council for consideration.

7. Processing.

- a. A permit shall be required for the placement of fill coming from off site for any lot less than 90 feet in width. In the case of new construction, this permit shall be in the form of an approval of the "culvert data sheet," the "permit data review sheet" or a general work order presently required for construction activity to occur. This section shall be administered by the Department of Engineering with the assistance of any other parish personnel that are deemed necessary by the Parish Council and/or its regulations.
- b. A detailed description of fill activity, including volume of fill to be brought in from off site, the footprint of the deposition of that fill material, volume and source location of fill being removed from the site, the ultimate disposition of the fill being removed (including flood zone of the deposition site), the direction of flow across the site, and a profile through the improvement footprints showing the natural and finished elevations of the construction site, as well as the proposed sediment retention measures, must accompany the building permit or development proposal and be reviewed by the Department of Engineering before approval of the culvert data sheet or the permit data tracking sheet or the issuance of a general work order.
- c. Enforcement. Violations will be processed by code enforcement, department of engineering or permit inspections personnel using standard code violation protocol.

B. Placement of Fill On Lots More Than 90 Feet in Width for which No Drainage Plan Exists.

- 1. Applicability. The purpose of this section is to regulate the placement of fill on lots 90 feet and greater in width, including undivided parcels of land, within the 100-year designated floodplains
- 2. These regulations are applicable to the placement or relocation of fill on residential lots 90 feet and greater in width which are located in a new or existing subdivision for which there is no drainage plan approved by the Department of Engineering and new subdivision not yet approved, as well as to undivided parcels of land.
- 3. The drainage and flood control provisions of the parish Code of Ordinances are incorporated herein and shall be applicable to the placement of any fill material and/or construction on any lot or parcel of property, or any part thereof, which property and/or activity is governed by the drainage and flood control provisions.

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4. In the event of any conflict between the drainage and flood control provisions and those contained within this section, the more stringent or restrictive provision shall apply.
 5. Flood Zone V and areas of shallow flooding.
 - a. Flood Zone V. The placement of fill on any lot or undivided parcel of land located within Flood Zone V shall be exclusively governed, regulated and controlled by and shall in all ways be consistent with the relevant provisions of the rules and regulations promulgated by the Federal Emergency Management Agency (FEMA) and National Flood Insurance Program (NFIP).
 - b. Areas of shallow flooding.
 - i. The placement of fill on any parcel located within an "AO/AH flood hazard zone" shall be permitted only when a development plan has been submitted and approved by the Department of Engineering.
 - ii. Fill shall be limited to the roof-shed area of a parcel's primary structure.
 - iii. A concrete slab shall be permitted under the primary structure provided that the finished surface slab or footing is no more than 12 inches above natural ground grade.
 - iv. There shall be no net change in the average elevation of the natural ground.
 - v. Construction shall be accomplished using pier or piling construction according to applicable building codes.
 - vi. Access roadways and other site improvements (buildings, driveways, roadways, landscaping, etc.) shall not impede natural drainage pathways or parish drainage easements.
 6. Flood Zones A1-A30.
 - a. The placement of fill on any parcel located within any "A" flood hazard zone shall be permitted only when a development plan has been submitted and approved.
 - b. Fill shall be limited to the roof shed area of the proposed structure and required access to the site.
 - c. The volume of fill on the site shall not exceed that which is necessary to prepare an adequate building footprint.
 7. At no time shall fill for any site improvements exceed 12 inches above natural ground grade.
 8. Fill for driveways must not exceed six inches above natural ground grade except where fill is part of the foundation for the main residence, carport, or garage. Fill may also be placed to soften the transition between elevations to a slope not steeper than one vertical foot for every four horizontal feet.
 9. Access roadways and other site improvements (buildings, driveways, roadways, parking areas, etc.) shall not impede upon natural drainage pathways or parish drainage easements.
 10. New subdivisions: Subdivisions approved after enactment of the ordinance from which this section is derived, which establish to the satisfaction of the Department of Engineering that, at the time of preliminary approval, such subdivision development will not result in a reduction in the 100-year flood-plain storage capacity, will be approved in total.
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11. Exemptions. Areas enclosed by levees from which the runoff is mechanically pumped shall be exempt from this section.
 12. Waiver
 - a. The Department of Engineering shall review individual cases for waiver from the provisions of this section, upon written request by the applicant. The applicant must provide evidence that circumstances exist which warrant the requested waiver.
 - b. Reference regional detention ordinance: If the applicant is granted a waiver they shall purchase storage space in regional detention equal to the volume of fill in excess of that which is allowed under this section.
 13. Processing.
 - a. This section shall be administered by the Department of Engineering with the assistance of any other parish personnel that are deemed necessary by the Parish Council and/or its regulations
 - b. A permit shall be required for the placement of fill coming from off site for any lot greater than 90 feet in width. In case of new construction, this permit shall be in the form of an approval of the "culvert data sheet," the "permit data review sheet" or a general work order presently required for construction activity to occur.
 - c. A detail of fill activity, prepared by a licensed professional engineer registered in the State of Louisiana, including volume of fill to be brought in from off site, the footprint of the deposition of that fill, volume and source location of fill being removed from the site, the ultimate deposition of the fill being removed (including flood zone of the deposition site), the direction of flow across the site, and a profile through the improvement footprints showing the natural and finished elevations of the construction site, as well as the proposed sediment retention measures must accompany the building permit or development proposal and be reviewed by the Department of Engineering before approval of the culvert data sheet or the permit data tracking sheet or the issuance of general work order.
 - d. Three submittals of confirmation of the elevation of the top of slab or the height of the lowest habitable floor are required during the construction process.
 - e. Initial Elevation Confirmation. The elevation in the initial plan must be submitted in accordance with the requirements of this section. The applicant shall submit a survey or plot plan that depicts the minimum elevations necessary to determine the average elevation of the construction area; for example the lot corners and maybe an intermediate elevation in between corners could be used. The survey must state the flood zone.
 - f. Top of Slab Elevation Confirmation. The applicant must submit the elevation of the slab form board or lowest habitable floor. This elevation must be submitted on the original detail of fill activity plan. This information must be submitted prior to the pre-pour slab inspection.
 - g. Final Elevation Confirmation. Prior to the granting of the Certificate of Occupancy the permit applicant must furnish a plot plan, certified by a licensed professional surveyor registered in the State of Louisiana, verifying that the property has been constructed in accordance with this section.
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- h. Enforcement. Violations will be processed by the Code Enforcement, Department of Engineering or permit inspections personnel using standard code violation protocol.

SEC. 900-6.5 CONSTRUCTION REQUIREMENTS FOR CULVERTS, OPEN DITCHES, AND STORM DRAIN SYSTEMS

A. Ditch Construction

1. Ditches shall be constructed by bringing the embankment or cut section to the line, grade, longitudinal slope and cross section shown on the approved plans and as prescribed for by the approved grading and drainage plan. Material removed shall be disposed of in accordance with local, state, and federal laws.
2. Open ditches shall be lined with an erosion control system as provided for by the requirements of the Louisiana Department of Development Hydraulics Manual, 2011 Edition. Erosion control systems shall be products listed on the LaDOTD Approved Materials List at the time of their installation.

B. Culverts and Storm Drains.

1. The applicant shall furnish, install, and clean pipe, pipe arch, storm drains, and sewers, also referred to as culverts or conduits, in accordance with these specifications and in conformity with the lines and grades shown on the approved plans.
 - a. *Excavation.* The bottom of the trench shall be excavated to a minimum width of 18 inches on each side for all pipe. Surplus material or excavated material shall be disposed of in accordance with local, state, and Federal Laws.
 - b. *Forming Pipe Bed.* A minimum of 6 inch bedding material shall be provided below all drainage pipes. Pipe shall be bedded, haunched and backfilled in accordance with the requirements of LaDOTD Standard Plan BM-01, latest edition, except that a minimum of 6” bedding material shall be provided below all culvert and storm drain pipe.
 - c. Pipe laying shall begin at the downstream end of the line. The pipe shall be in contact with the foundation throughout its length. Bell or groove ends of pipe and outside circumferential laps of riveted metal pipe shall be placed facing upstream. After pipe has been laid and before backfill is placed, the applicant shall inspect the pipe for alignment, grade, integrity of joints, and coating damage.
 - d. *Joining Pipe.*
 - i. Type 3 (T3) joints, as listed on the LaDOTD AML, latest edition, shall be used for all drain pipes.
 - ii. Concrete pipe may be either bell and spigot, or tongue and groove. The method of joining pipe sections shall be such that ends are fully entered and inner surfaces are flush and even. An approved mechanical pipe puller shall be used for joining pipes over 36 inches in diameter. For pipe 36 inches or less in diameter, any approved method for joining pipe may be used which does not damage the pipe. Joints shall be sealed with gasket material installed in accordance with the manufacturer's recommendations. Joints shall be wrapped with geotextile fabric for a minimum of 12 inches on each side

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- of joint for pipe 36 inches or less in diameter and a minimum of 18 inches on each side of the joint for pipe greater than 36 inches in diameter. Ends of the fabric shall be lapped at least 10 inches. The edges and ends of fabric shall be suitably secured for the entire circumference of the pipe.
- iii. Metal pipe shall be firmly joined by coupling bands. Bands shall be centered over the joint. Joining of metal pipe sections shall conform to the following provisions:
- (A) Band joints shall be sealed with gasket material. Gasket material shall be placed in accordance with the plan details. The joint shall be wrapped with geotextile fabric for a minimum of 12 inches on each side of the connecting band for pipe diameters 36 inches or less and a minimum of 18 inches on each side of the connecting band for pipe diameters greater than 36 inches. Ends of fabric shall be lapped at least 10 inches. The edges and ends of fabric shall be suitably secured for the entire circumference of the pipe.
- (1) *Circular Section*. Connecting bands shall be of an approved design and shall be installed in accordance with plan details.
- (2) Connecting bands shall be a minimum of 12 inches wide for pipe arch less than 36 inches round equivalent diameter, and a minimum of 21 inches wide for 36 inches round equivalent diameter pipe arch and greater. Bands shall be connected at the ends by approved angle or strap connections. Connecting bands used for 36 inches round equivalent diameter pipe arch and above shall be 2-piece bands.
- e. *Plastic Pipe*. Joints for plastic pipe shall be either bell and spigot or split coupling bands. Types 2 and 3 joints shall be wrapped with geotextile fabric for a minimum of 12 inches on each side of the joint for pipes 36 inches or less in diameter and for a minimum of 18 inches on each side of the joint for pipes greater than 36 inches in diameter. The ends of the fabric shall be lapped at least 10 inches. The edges and ends of the fabric shall be suitably secured for the entire circumference of the pipe.
- f. *Backfilling*. Prior to backfilling, pipes found to be damaged or out of alignment or grade shall be removed and reinstalled or replaced.
- g. Backfill Types:
- i. **Type A Backfill**: Type A Backfill shall be crushed stone, recycled Portland cement concrete, or recycled asphalt pavement (RAP).
- ii. **Type B Backfill**: Type B Backfill shall be structural fill, A-4 or better or granular material.
- iii. Type A backfill may be substituted for Type B backfill.
- iv. **Initial backfill**: Initial backfill shall be structural backfill encasing the pipe from the bottom of the pipe to the spring line for concrete pipe and to a point one foot above the top of the pipe for both metal and plastic pipe. Final backfill is not a structural backfill. Final backfill extends from the top of the initial backfill to the top of the natural ground or subgrade in cut areas or to the top of existing ground in fill areas.
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- v. **Pipe under Concrete Pavements:** Type B backfill may be used as initial and final backfill for all pipes, culverts, or drains under Portland cement concrete pavements.
 - vi. **Pipe under Flexible pavements:** All reaches of cross drains, exclusive of those portions of the pipe which are under shoulders, and all other culverts, pipes, or drains that cross the centerlines of new or existing flexible pavement roadways, including intersections that are under flexible pavements, shall receive an initial backfill of Type A material. Type B backfill materials may be used as final backfill for all pipes.
 - vii. **Other Areas:** All reaches of all culverts, pipes, or drains under flexible pavements that do not cross the centerlines of new or existing roadways, and exclusive of those portions of the pipe which are totally under shoulders, shall receive an initial and final backfill of Type B material.
- h. Compaction:**
- i. **Type A:** For all pipes, culverts, and conduits under paved and unpaved areas, where using Type A backfill material, thoroughly hand compact the Type A backfill under the pipe haunches and then dynamically compact in layers not exceeding 8 inches compacted thickness. Initially compact under the haunches of the pipe by hand tamping or other acceptable means, until reaching a level in which the dynamic tamping can commence. Compact each lift by applying at least eight passes of a hand operated, dynamic mechanical compaction device over the surface of each lift. The in-place density of Type A backfill materials and bedding materials will not be measured or calculated. Place Type A backfill, exclusive of RAP and flowable fill, at or near optimum moisture content in accordance with DOTD TR 415 or 418. Place and compact RAP materials in a slightly moist condition
 - ii. **Type B:** For all drainage pipes where Type B backfill is allowed, place the Type B material in layers not exceeding 8 inches compacted thickness. Compact with suitable mechanical equipment. Determine the maximum dry density of initial or final Type B backfill under all paved areas which are to be under traffic in accordance with DOTD TR 415 or TR 418. Determine in-place density in accordance with DOTD TR 401. Place initial and final Type B backfill under all paved areas under traffic, at or near optimum moisture content in accordance with DOTD TR 415 or TR 418. Compact each layer by approved methods prior to the placement of a subsequent layer to achieve at least 95 percent of maximum dry density in accordance with DOTD TR 401.
 - iii. **Unpaved Areas:** The Director of the Department of Engineering may approve the use of native soil in unpaved areas when it is apparent that the backfill will be suitable for unpaved areas.
- i. *Inspection of Pipes.* After completion of embankment and prior to roadway surfacing, the Department of Engineering shall inspect pipes for proper alignment and integrity of joints. Any misaligned pipe or defective joints shall be corrected by the applicant at his cost.
- i. Installed plastic pipe shall be tested to ensure that vertical deflections do not exceed 5.0 percent. Maximum allowable deflections shall be governed by the mandrel requirements stated herein. Deflection tests shall be performed no sooner than 30 calendar days after installation and compaction of backfill. The pipe shall be cleaned and inspected for offsets and obstructions prior to testing. For pipe 36 inches and

less in diameter, a mandrel shall be pulled through the pipe by hand to ensure that maximum allowable deflections have not been exceeded. Use of an unapproved mandrel or a mandrel altered or modified after approval will invalidate the test. If the mandrel fails to pass, the pipe is over-deflected. Unless otherwise permitted, over-deflected pipe shall be uncovered and, if not damaged, reinstalled. Damaged pipe shall not be reinstalled, but shall be removed and replaced with new pipe. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure any over-deflection, shall be removed and replaced with new pipe. The mandrel shall be a rigid, nonadjustable, odd-numbered legged (minimum 9 legs) mandrel having a length not less than its nominal diameter or 24 inches whichever is less. The minimum diameter at any point shall be 5.0 percent less than the base inside diameter of the pipe being tested. The mandrel shall be fabricated of steel, aluminum or other approved material fitted with pulling rings at each end. The nominal pipe size and outside diameter of the mandrel shall be stamped or engraved on some segment other than a runner. A suitable carrying case shall be furnished. For pipe larger than 36 inches in diameter, deflection shall be determined by a method approved by the Department of Engineering. If a mandrel is selected, the minimum diameter, length, and other requirements shall conform to the above requirements. Mandrel testing shall be conducted by the applicant in the presence of the Department of Engineering. Mandrel testing shall be at the cost of the applicant.

- ii. If the inside diameter of metal pipe or rise dimension of metal pipe arch deflects more than 5.0 percent from original dimensions, they shall be removed and reinstalled, unless they do not rebound or are damaged. Pipe or pipe arch which are damaged or do not rebound shall be removed and replaced at the expense of the applicant. Measurement of deflection will be made away from rerolled ends.
- j. Prior to final acceptance, pipes shall be cleaned of all debris and soil to the invert of the pipe at no direct pay. Removed soil, debris and other materials shall be disposed of in accordance with local, state and federal laws.

C. Manholes, Junction Boxes, Catch Basins and End Treatments.

The applicant shall provide for the construction, installation, and adjustment of manholes, junction boxes, catch basins, culvert end treatments and safety ends in accordance with these specifications, and in conformity with lines and grades shown on the approved plans.

1. Manholes and catch basins shall comply with the dimensional requirements and arrangements shown on LaDOTD Standard Plans CB-01 through CB-09.
2. Concrete construction shall conform to the requirement of this code and the approved plans. Joints shall be full mortar joints not more than 1/2 inchwide.
3. Outside faces of structures shall be plastered with 1/2 inch thick cement-sand mortar. Exposed surfaces of concrete and masonry shall be cured at least 48 hours.
4. Precast concrete units shall be cast with the required number and size of pipe openings required for the drainage system; however, if additional pipe is required during construction for which no openings have been provided, the applicant may make such openings provided any damaged units are replaced or satisfactorily repaired.

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- a. Precast units shall be set to established grade within $\pm 1/2$ inch. Joints for sectional precast units shall be sealed with flexible plastic gasket material listed on the LaDOTD AML installed as to form a watertight seal.
 - b. The joints of precast units shall be wrapped with geotextile fabric a minimum of 18 inches on each side of the joint. Ends of the fabric shall be lapped at least 10 inches. The edges and ends of the cloth shall be suitably secured.
 5. Metal frames shall be set in a full mortar bed. Conduit sections shall be flush on the inside of structure wall and project outside sufficiently for proper connection with the next conduit section.
 6. Masonry shall fit neatly and tightly around conduit. When grade adjustments of existing structures are specified, frames, covers and gratings shall be removed and walls reconstructed as required. Cleaned frames shall be reset at required elevation.
 7. Metal parts shall be thoroughly cleaned and placed in good repair. In lieu of adjusting structures, the applicant may adjust structures by means of approved metal adjustment rings. New structures shall be cleaned of silt, debris or other foreign matter, and nongalvanized metal parts of new or adjusted structures shall be coated with asphaltic varnish.

SEC. 900-6.6 FLOOD HAZARD AREA REQUIREMENTS.

A. Purpose.

1. Flood hazard area regulations described in this section aim to mitigate the impacts of the periodic inundation experienced in the flood hazard areas of the parish, to enhance public safety, and to minimize public and private losses due to flood conditions in certain areas. In so doing, flood hazard regulations are designed to achieve the following:
 - a. To protect human life and health.
 - b. To minimize expenditure of public money for costly flood control projects.
 - c. To reduce vulnerabilities and minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public.
 - d. To minimize prolonged business interruptions.
 - e. To minimize the impacts of obstructions in the floodplain that may cause an increase in flood heights and velocities.
 - f. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in floodplains.
 - g. To help maintain a stable tax base by providing for the sound use and development of flood prone areas.
 - h. To ensure that potential buyers are notified that property is in a flood area.

B. Methods of Reducing Flood Losses.

1. In order to accomplish its purposes, this section uses the following methods:

- a. Restricts or prohibits uses that are dangerous to health, safety or property in times of flood, or cause excessive increases in flood heights or velocities.
- b. Requires that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction.
- c. Controls the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of floodwaters.
- d. Control filling, grading, dredging and other development which may increase flood damage.
- e. Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands.

C. Applicability.

The flood hazard area regulations of this section apply to all areas of special flood hazard within the jurisdiction of the parish. To establish areas of special flood hazards, the parish shall use tools provided by the Federal Emergency Management Agency (FEMA), including but not limited to the "Flood Insurance Study for St. Tammany Parish, Louisiana (Unincorporated Areas)" dated October 17, 1989, with accompanying Flood Insurance Rate Maps and Flood Boundary Floodway Maps (FIRM and FBFM), as they may be amended from time to time by FEMA. The subsequent letters of map changes or amendments made by FEMA to the rate maps and Flood Boundary Floodway Maps or Flood Insurance Studies and reports shall be automatically assimilated and made part of this section without further promulgation or documentation.

D. Warning and Disclaimer of Liability.

The degree of flood protection required by this section is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. On rare occasions greater floods can and will occur and flood heights may be increased by manmade or natural causes. This section does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This section shall not create liability on the part of the community or any official or employee thereof for any flood damages that result from reliance on this section or any administrative decision lawfully made thereunder.

E. Floodplain Administration.

1. *Designation of the Floodplain Administrator.* The Department of Permits and Inspections is hereby appointed the floodplain administrator to administer and implement the provisions of this section and other appropriate sections of 44 Code of Federal Regulations (CFR) (National Flood Insurance Program regulations) pertaining to floodplain management.
2. *Duties and Responsibilities of the Floodplain Administrator.* Duties and responsibilities of the floodplain administrator include:
 - a. Maintain and hold open for public inspections all records pertaining to the provisions of this section.
 - i. Review all development permit applications to determine whether proposed building site will be reasonably safe from flooding.

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- ii. Review, approve or deny all applications for development permits based on their compliance with this section and the following relevant factors:
 - (A) The danger to life and property due to flooding or erosion damage;
 - (B) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
 - (C) The danger that materials may be swept onto other lands to the injury of others;
 - (D) The safety of access to the property in times of flood for ordinary and emergency vehicles;
 - (E) The costs of providing governmental services during and after flood conditions including maintenance and repair of streets and bridges, and public utilities and facilities such as sewer, gas, electrical and water systems;
 - (F) The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site;
 - (G) The necessity to the facility of a waterfront location, where applicable;
 - (H) The availability of alternative locations, not subject to flooding or erosion damage, for the proposed use.
 - b. Review permits for proposed development to assure that all necessary permits have been obtained from those federal, state or local governmental agencies (including section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 USC 1334) from which prior approval is required.
 - c. Maintain a record of all actions involving appeals of the enforcement of these requirements and report variances of these provisions by the Board of Adjustments to the Federal Emergency Management Agency upon request.
 - d. Where interpretation is needed as to the exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions), the floodplain administrator shall make the necessary interpretation.
 - e. Notify, in riverine situations, adjacent communities and the state coordinating agency, which is the Department of Urban and Community Affairs, prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency Management Agency.
 - f. Ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained.
 - g. When base flood elevation data is not available, the floodplain administrator shall obtain, review and reasonably utilize any base flood elevation data and floodway data available from a federal, state or other source, in order to administer the provisions of this section.
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- h.** When a regulatory floodway has not been designated, the floodplain administrator must require that no new construction, substantial improvements, or other development (including fill) shall be permitted within zones A1-30 and AE on the community's FIRM unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

E. Provisions for Flood Hazard Reduction.

1. General Standards. The following requirements apply to all special flood hazard areas:

- a.** Construction of any structures or alteration of land which occurs in the 100-year flood zone as established by the Federal Emergency Management Agency shall require approval from the Department of Engineering prior to issuance of a building permit.

 - i.** All new construction and substantial improvements shall be designed (or modified) and adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.
 - ii.** All new construction or substantial improvements shall be constructed by methods and practices that minimize flood damage.
 - iii.** All new and replacement electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding, such facilities shall be located a minimum of 12 inches or 1 foot above the Base Flood Elevation; or 12 inches above the centerline of the street or top of curb fronting the home, whichever is greater.
 - iv.** All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
 - v.** New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the system and discharge from the systems into floodwaters.
 - vi.** On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

2. Standards for Specific Uses

- a. Residential Construction.** New construction and substantial improvements of any residential structure shall have the lowest floor, including the basement, elevated to a minimum of 12 inches or 1 foot above the base flood elevation; or 12 inches above the centerline of the street or top of curb fronting the home, whichever is greater. A registered professional engineer, architect or land surveyor shall submit a certificate of elevation, documented on the Federal Emergency Management Agency Form 81-31 or subsequent agency form, indicating that the standards of this subsection have been satisfactorily met.
- b. Nonresidential Construction.** New construction and substantial improvements of any commercial, industrial or other nonresidential structure shall either have the lowest floor,

including basement, elevated to or above the base flood level or, together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is floodproofed or watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer and architect shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction are in accordance with accepted standards of practice as outlined in this subsection, in relation to mean sea level, to which such structures are floodproofed shall be maintained by the floodplain administrator.

- i. *Enclosures.* New construction and substantial improvements, with fully enclosed areas below the lowest floor that are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria:
 - (A) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.
 - (B) The bottom of all openings shall be no higher than one foot above grade.
 - (C) Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

c. *Manufactured Homes.*

- i. Manufactured homes, including those within existing mobile home parks, to be placed or substantially improved in any flood zones designated "A" on the community's FIRM shall be installed using methods and practices which minimize flood damage. For the purpose of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state and local anchoring requirements for resisting wind forces.
- ii. All manufactured homes shall comply with the residential construction requirements as outlined above.
- iii. Manufactured homes to be placed or substantially improved within flood zones designated A0, A1-30, AH or AE on the community's FIRM shall be elevated on a permanent foundation such that the lowest point of the lowest horizontal structural member of the manufactured home is at a minimum of 12 inches or 1 foot or above the base flood elevation, or 12 inches or 1 foot above the centerline of the street or top of curb fronting the home, whichever is greater; and be securely anchored to an adequately anchored foundation system.

d. *Low cost small accessory structures.*

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- i. The construction of accessory structures in flood zones designated "A" must satisfy the following standards:
 - (A) May be constructed with the floor below the design flood elevation (DFE). The DFE is a minimum of 12 inches or 1 foot above the base flood elevation (BFE); or 12 inches above the centerline of the street or top of curb fronting the home, whichever is greater; or the advisory base flood elevation (ABFE) for the site plus freeboard, if required by the Parish's Flood Hazard Prevention Ordinances.
 - (B) Shall be anchored to resist flotation, collapse, and lateral movement.
 - (C) Portions of structure located below the DFE shall be constructed of flood-resistant materials.
 - (D) Shall be designed for the automatic entry and exit of flood waters.
 - (E) Mechanical and utility equipment must be elevated or flood-proofed to or above the DFE.
 - (F) Shall comply with the floodway encroachment provisions of the NFIP regulations.
 - (G) Use shall be limited to parking and/or limited storage.
 - (1) Structure shall not be used for human habitation, including work, sleeping, living, cooking, or restroom facilities.
 - ii. Structure cannot be modified for a different use after permitting.
 - iii. Unless elevated on piles or columns, accessory structures V Zones are limited to low cost, small structures, such as metal, plastic or wooden sheds that are "disposable." They shall be less than or equal to 100 square feet in size, and not more than \$1,000.00 in value. If constructed, fill cannot be used for structural support and the areas below the DFE must remain free of obstruction or be constructed with non-supporting breakaway walls, open latticework, or insect screening. All accessory structures are to be located so as not to cause damage to adjacent and nearby structures.
 3. *Standards for Areas of Shallow Flooding (AO/AH Zones).* A registered professional engineer or architect shall submit a certificate of elevation, documented on the Federal Emergency Management Agency Form 81-31 or subsequent agency form, to the floodplain administrator that the standards of this section have been satisfactorily met.
 4. *Coastal High-Hazard Areas (VI-30, VE, and V Zones).* These areas have special flood hazards associated with high velocity waters from tidal surges and hurricane wave wash. The following additional standards apply to development in these zones:
 - a. Obtain the elevation (in relation to mean sea level) of the bottom of the lowest structural member of the lowest floor (excluding pilings and columns) of all new substantially improved structures, and whether or not such structures contain a basement. The floodplain administrator shall maintain a record of all such information.
 - b. All new construction shall be located landward of the reach of mean high tide.
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- c. All new construction and substantial improvements shall be elevated on pilings and columns so that:
- i. The bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to or a minimum of 12 inches or 1 foot above the base flood level;
 - ii. The pile or column foundation and structure attached thereto is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Wind and water loading values shall each have a one percent chance of being equaled or exceeded in any given year (100-year mean recurrence interval);
 - iii. A licensed professional engineer registered in the State of Louisiana or architect shall develop or review the structural design, specification and plans for the construction and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of this section.
- d. Provide that all new construction and substantial improvements have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood lattice work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement or other structural damage to the elevated portion of the building or supporting foundation system.
- e. A breakaway wall shall have a design safe loading resistance of not less than ten pounds and not more than 20 pounds per square foot. Use of breakaway walls which exceed a design safe loading resistance of 20 pounds per square foot (either by design or when so required by local or state codes) may be permitted only if a licensed professional engineer registered in the State of Louisiana or architect certifies that the designs proposed meet the following conditions:
- f. Breakaway wall collapse shall result from a water load less than that which would occur during the base flood; and
- g. The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and nonstructural). Maximum wind and water loading values to be used in this determination shall each have one percent chance of being equaled or exceeded in any given year (100-year mean recurrence interval).
- h. If breakaway walls are utilized, such enclosed space shall be usable solely for parking of vehicles, building access or storage. Such space shall not be used for human habitation.
- i. Prohibit the use of fill for structural support of buildings.
- j. Prohibit manmade alteration of sand dunes and mangrove stands which would increase potential flood damage.
- k. Any alteration, repair, reconstruction or improvements to a structure started after the enactment of the ordinance from which this article is derived shall not enclose the space below the lowest floor unless breakaway walls are used as provided for in division 3 of this article.

1. Prior to construction, plans for any structure that will have breakaway walls must be submitted to the floodplain administrator for approval.

SEC. 900-6.7 LOW IMPACT DEVELOPMENT STANDARDS

A. Generally.

St. Tammany Parish promotes the general welfare through sustainable, low impact development—which aims to mitigate the impacts of increased runoff and stormwater pollution by managing runoff as close to its source as possible—while also reducing the long-term capital and operational costs of public facilities, and minimizing adverse effects on the environment, public works infrastructure, and public health. To this effect, development shall be laid out to provide proper drainage, including facilities such as curb and gutter, catch basins, canals, culverts, bridges, natural waterways, and stormwater control measures (SCMs). Drainage improvements shall accommodate potential runoff from the entire upstream drainage area and shall be designed to reduce or prevent increases in downstream flooding. The Parish shall require the use of control methods such as retention or detention, and/or the construction of off-site drainage improvements to mitigate the impacts of the proposed development to achieve these purposes.

B. Purpose.

Stormwater management regulations provided for in this section aim to:

1. Reduce flooding, subsidence, stormwater runoff volume, peak discharge rates, sewer overflows, and the costs of stormwater and sewer treatment;
2. Mimic a site's predevelopment hydrology by infiltrating, filtering, storing, evaporating, and detaining stormwater runoff;
3. Add green space by preserving and re-creating natural landscape features including existing tree vegetation and canopy;
4. Use plants and soil to absorb, slow, filter, and cleanse runoff near the source;
5. Promote low maintenance landscaping that reduces the use of herbicides, fertilizers, and pesticides;
6. Minimize imperviousness to create functional and appealing internal site drainage;
7. Treat stormwater as a resource rather than a waste product and help meet National Pollutant Discharge Elimination System (NPDES) requirements;
8. Reduce the heat island effect by promoting evapotranspiration and mitigating the effects of development and the built environment;
9. Protect natural drainage features and emulate the functions of natural systems to increase recharge and reintegrate rainfall into the water cycle and watershed; and
10. Reduce energy and water use.

C. Department Coordination.

1. The Department of Engineering shall review and enforce the Stormwater Management Standards of this section in coordination with the Departments of Environmental Services, Permits and Inspections, and Planning and Development, as applicable.

2. Where site development work impacts stormwater or water quality, the Departments of Permits and Inspections, and Planning and Development shall coordinate project review with the departments of Engineering and Environmental Services, as applicable.
3. Prior to the issuance of a project approval via a site work permit, building permit or work order to proceed with a development request, applicants shall submit a Stormwater Management Plan (SMP) to the Department of Planning and Development or Permits and Inspections.
4. Where plan or application processes originate outside of the Department of Engineering, the applicable department accepting the application or request shall facilitate and support the Department of Engineering's review of Stormwater Management Standards and endeavor to enhance efficiency in application processes and review procedures.

D. Plan Differentiation.

1. In order to promote natural resource preservation and reduce runoff rates of proposed development, Stormwater Plans shall be implemented to support pre-construction and post construction site development conditions. This section addresses the review and approval of post-construction stormwater management plans or SMPs, while Section 800-4 Water Quality addresses the review and approval of construction site stormwater pollution prevention plans. Both plans are described at a high-level below for general context to support improved application of this UDC.
 - a. A Management Plan, or SMP, is a plan that describes and analyzes how rainwater runoff will be treated on site after construction of a project is complete in order to reduce and manage the rate of stormwater runoff into the parish drainage system.
 - b. A Construction Site Stormwater Pollution Prevention Plan is a temporary, pre-construction plan that describes how a construction site will be designed and what actions will be taken by the applicant to reduce pollution from stormwater runoff during construction, such as placing barriers around the site to prevent loose soils and sediment from being washed into nearby drainage facilities. The Construction Site Stormwater Pollution Prevention Plan is integral in maintaining the Parish's compliance with the Municipal Separate Storm Sewer System Permit (MS4 Permit).

E. Stormwater Management Plan – When Required.

1. Applicable Parish Departments must facilitate the Department of Engineering's review and approval of required Stormwater Management Plans (SMP) and proof of full compliance with stormwater management requirements in this section prior to issuance of a building permit, site work permit or subdivision work order approval for the following development requests:
 - a. *Planning and Development Department.* All major and minor subdivision requests of 5 acres or more;
 - b. *Planning and Development Department.* New construction (including all phases) on a site of 5 acres or more, or with more than 20,000 proposed square feet of impervious surface area;
 - c. *Permits and Inspections Department.* Substantial improvement of a site with more than 20,000 proposed square feet of impervious surface area; and

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- d.** Permits and Inspections Department - Site redevelopment of any non-residential development or multi-family development of 8 units or more that involves both demolition of a structure and removal of paved surfaces within 75 percent or more of the lot's total area.
 - 2. Compliance to the highest degree practicable is required and “to the highest degree practicable” shall be determined at the discretion of the Engineering Department.

F. Exemptions.

- 1. The following types of development are exempt from the Stormwater Management Standards:
 - a.** Maintenance activities, such as top-layer grinding (grind and overlay), repaving when aggregates or gravels are not exposed, or reroofing when the structure or existing roof drainage is not altered.
 - b.** Interior remodeling projects and tenant improvements that do not constitute a substantial improvement
 - c.** An applicant may apply for a full or partial exemption of the stormwater management regulations via the fee-in-lieu process.

G. Stormwater Control Measures.

- 1. St. Tammany Parish recognizes that in most cases, SCMs, or nonstructural practices, will need to be combined with engineered or structural approaches to meet requirements.
- 2. Acceptable stormwater management or Low Impact Development SCMs for development review and approval include:
 - a.** Minimal grading;
 - b.** Site features that enable natural filtration;
 - c.** The use of porous pavement or surfaces and/or conversion of conventionally paved areas to landscaped areas or porous surfaces, (refer to Section 800-3.G for additional detail);
 - d.** The use of native plants; and
 - e.** Preservation of existing vegetation or open forested or vegetated spaces.
 - f.** Recommended applicant approaches to site design using SCMs. The following are recommendations and methods for applicants to consider during site design, review, and permitting:
 - g.** Utilize SCMs appropriate to the scale and type of development and specific location, and design them for effective and efficient long-term maintenance;
 - h.** Consider the variation of conditions, existing engineered elements, character of the soil, topography, or site geometry, intensity of development, and other factors;
 - i.** Minimize the need for grading and use creative grading techniques to manage stormwater runoff and encourage more filtration;

- j. Reduce the amount of impervious surface and disconnect impervious surfaces by directing runoff from rooftops, sidewalks, driveways, or parking lots to landscaped areas or porous pavement;
- k. Scrutinize setbacks, parking spaces, travel aisles, driveways, and sidewalks or walkways to see if any of these elements can be reduced in scale;
- l. Choose native plants that are easy to maintain, adapted to the local climate and soil conditions, and possess the ability to intercept and hold rainwater and decrease water flow velocity; and
- m. Maximize natural lands or existing vegetation set aside for conservation or preservation and protect them from clearing, grading, and other construction-related impacts that may reduce absorption or filtration rates.

H. Stormwater Management Plan.

1. *Effect of noncompliance.* The design of a site or development's stormwater drainage system must be completed in accordance with the requirements of this section. No site work permit or building permit will be issued until such time as the SMP has been approved by the Department of Engineering.
2. *Plan intent.* The SMP shall indicate how stormwater runoff will be routed through Stormwater Control Measures (SCMs) designed to increase time of concentration, decrease velocity, increase infiltration, allow suspended solids to settle, and remove pollutants in accordance with the standards contained within this section to meet the requirements of this section.
3. *Licensure Requirement.* The SMP shall be prepared by or under the supervision of a professional engineer licensed by the State of Louisiana and shall be signed, sealed, and dated by such.
4. *Required Contents.* The SMP shall contain, at a minimum, the following components:
 - a. A summary description of the SMP, including a description of the proposed SCMs;
 - b. A vicinity map indicating the location of the proposed project;
 - c. A description of site conditions, including a description and topographic map of land cover, contours, description and map of soil types, and estimated stormwater pollutant load;
 - d. A description of the proposed fully developed conditions, including topographic map, proposed ground cover and developments and estimated stormwater pollutant load;
 - e. All required hydraulic and hydrologic calculations and specifications used in the design and construction of the permanent SCMs. Safeguards to prevent short-circuiting of permanent SCMs shall be designed into the system. Capacities of SCMs shall show surface and sub-surface volumes (in aggregate, chambers, cisterns, etc.) in gallons;
 - f. A plan showing site sub-catchment areas, all SCM areas and capacities, stormwater runoff treatment train of SCMs in which runoff is directed before leaving the site (surface or sub-surface), and final contours;
 - g. A description of the receiving stream, canal, pipe, culvert, ditch or other drainage structure into which the runoff from the property flows;

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- h.** Name of the of entity responsible for maintenance of SCMs in accordance with the manufacturer’s written recommendations or industry – accepted best management practices;
 - i.** Operations and maintenance plan for SCMs;
 - j.** A hydrologic and hydraulic analysis of the pre–development and post–development runoff and stormwater pollutant loadings, prepared in accordance with the requirements of this section.
 - k.** Hydraulic analysis of all culverts, storm drains, open ditches, retention ponds, and other SCM’s illustrating their ability to convey the required peak runoff from the site in accordance with the requirements herein.
 - 5. The SMP shall consider the effect of any proposed development on existing downstream drainage facilities outside the area of the development.
 - 6. The SMP shall demonstrate through drainage design how surface waters from proposed development will be collected and channeled downstream at such locations or at such volumes or velocities so as to prevent degradation, alteration or damage to lower adjacent properties.
 - 7. No SMP shall be approved unless the necessary drainage will be provided to a drainage watercourse or facility that is adequate to receive the proposed drainage without adverse impact on downstream properties.
 - 8. No SMP shall be designed, implemented, or maintained where such would impede the flow of water from upstream properties across the property proposed to be developed. All drainage rights-of-way and culverts or other drainage facilities shall be large enough to accommodate runoff from the property proposed to be developed as well as upstream flow originating outside of the proposed development.
 - 9. The SMP shall demonstrate that all water courses through the property of the proposed development shall be maintained to accommodate 100-year storm events. Any proposed alteration or relocation of an existing watercourse or drainage facility may only be approved when the Department of Engineering has determined that any such proposal meets all applicable parish drainage requirements.
 - 10. The SMP shall demonstrate the necessary size of the drainage facilities, assuming conditions of maximum potential watershed development permitted by this UDC.
 - 11. Whenever a parcel greater than 5 acres is proposed to be developed in phases, or subdivided through the minor subdivision process, where any proposed phase or lot is less than five acres, the SMP shall address drainage in terms of the development of the entire parcel, not just the phase currently being proposed to be developed, taking into consideration all of the regulations of the zoning district designation of the property that could be pertinent to drainage, including maximum net density permitted, minimum area regulations, maximum lot coverage, and off-street parking and loading requirements.
 - 12. For new construction, the SMP shall demonstrate that the first 1.25 inch rainfall event shall be retained and filtered through the utilization of SCMs; or, for substantial improvements, either filter the first 1.25 inch rainfall event through the utilization of SCMs, or reduce existing imperviousness by 50 percent.
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I. Pollution Reduction Performance Requirements.

For new development, the SMP shall demonstrate that the first one and 1.25 inches of rainfall leaving the site shall be treated such that total suspended solids load is decreased by 60 percent based on the average annual rainfall, as compared to no treatment by SCMs. For substantial improvements, the SMP shall demonstrated that the first one and 1.25 inches of rainfall leaving the site shall be treated such that total suspended solids load is decreased by 40 percent based on the average annual rainfall, as compared to no treatment by SCMs.

J. Stormwater Quality Management Analysis:

1. No fill shall be placed in any flood zones designated as AO/AH or A1-A30 for the purposes of providing detention or retention without an approved fill plan. All fill for residential home construction shall conform to Ordinance No. 2183-AA, adopted July 5, 2001. Finished floor elevation shall be at least six inches above nearest adjacent road and also conform to the rules and regulations promulgated by Federal Emergency Management Agency (FEMA) and National Flood Insurance Program (NFIP).
2. All subdivisions receiving tentative approval prior to the effective date of the ordinance from which this section is derived will be governed by the previous drainage requirements.

K. Standards for Fee-In-Lieu Application of SCMs.

1. The owner of of any site subject to the requirements for submittal of a stormwater management plan may request alternative compliance to the stormwater management requirements of this section only when design standards cannot be practically met under the following special circumstances:
2. Existing built out sites having limited available space for required improvements; and
3. Site conditions, such as soil permeability or depth to water table, limit the effectiveness of proposed SCMs and—upon implementation—SCMs fail to meet the full requirements of this UDC.
4. *Procedure.* The following procedure shall govern waivers for stormwater management requirements:
 - a. *Evidence of impracticality.* Requests for alternative compliance through a fee-in-lieu must include documentation of impracticality of on-site compliance including existing and proposed site and stormwater drainage plans.
 - b. *Approval.* The Department of Engineering has the authority to grant approval for special circumstances under this subsection section when evidence of impracticality is provided and the Department of Engineering has determined that SCMs would otherwise fail to provide the required 1.25” detention volume standard within these requirements.
5. *Payment-in-lieu.* Payment-in-lieu of compliance shall be calculated by the Department of Engineering at a rate of \$44.00 per cubic foot of required storage for properties that do not physically comply with this section.
6. *Fee schedule and rate.* This fee shall be assessed annually and may be amended as needed to account for inflation and any new data that provides for improved costs.

L. Permeable and Pervious Paving.

1. *Types of permeable pavement.* Permeable paving may be used in lieu of impervious paving material for any surface-level off-street parking space in accordance with **Table 800-3-1**. To the extent practicable, permeable paving should be used in place of impervious paving materials in all other permitted locations. The Department of Engineering may allow additional types of permeable pavement as new technologies or uses become available.
2. *Contributing drainage area.* The maximum contributing drainage area to permeable pavement surface area ratio is 4:1 unless otherwise approved by the Department of Engineering.
3. *Infiltration rates.* All permeable paving installations shall be subject to infiltration testing after installation. Testing shall be conducted according to the ASTM International C1 701 or C1 781 standards, as appropriate. All types of permeable pavement shall maintain a minimum infiltration rate of 200 inches per hour.
4. *Required depth.* All permeable paving installations shall have a minimum aggregate subbase of 24 inches measured from the base of the permeable pavement system. All aggregate shall be washed prior to installation.
5. *Biennial certification.* All permeable pavement installations over 800 square feet in total area are subject to an initial certification period of 24 months, starting from the date that the Department of Permits and Inspections issues a Certificate of Occupancy for the subject property. Recertification of all permeable pavement installations over 800 square feet in total area is required on a biennial basis. The property owner shall apply for recertification of the permeable pavement installation starting no more than two years but no less than 23 months from the date of the previous certification.
 - a. No more than 30 days prior to recertification, a landscape architect or professional engineer, as applicable and hired by the owner or developer and licensed in Louisiana shall conduct an inspection of all SCMs and associated infrastructure, and shall certify, under seal, that the SCMs and associated infrastructure are in compliance with the recorded as-built stormwater management plans and designs, and with all other applicable standards.
 - b. The property owner shall be eligible to apply for re-certification not more than three months prior to the expiration of the previous certification.
6. The property owner or operator shall retain detailed records of any maintenance performed on, or changes made to, SCMs and associated infrastructure for review on an as-needed basis.
7. The system must be capable of supporting an emergency vehicle (standard fire truck) without damage to the system as certified by a licensed engineer, noted on the plans, or as indicated in the system specifications issued by the manufacturer. The property owner and/or occupant shall indemnify and hold harmless the Parish from any loss or damage to the pavement system that may directly or indirectly be occasioned by the provision of emergency services or parking of emergency vehicles on the site.
8. If pavers are employed, there must be a minimum space between units of 0.25 inch. The system must maintain a minimum infiltration rate of 200 inches per hour as certified by a licensed engineer, noted on the plans, or as indicated in the system specifications issued by the manufacturer

9. The system must be adequately drained to eliminate standing water over 24 hours and prevent damage to adjacent property and/or public streets or alleys as certified by a licensed engineer, noted on the plans, or as indicated in the system specifications issued by the manufacturer.
10. All proposals for a permeable pavement system must include a maintenance plan and shall remain properly maintained by the property owner.

M. Stormwater Control Measure Maintenance.

1. Routine inspection and maintenance of permanent and/or structural SCMs is necessary to ensure proper functioning condition in accordance with the original design criteria.
2. It shall be the responsibility of the developer or Homeowner's Association to maintain the structural stormwater control in perpetuity, unless it is taken into the Parish Drainage System in accordance with 5.02. Parish Drainage System.
3. Inspections by the parish may be conducted to ensure maintenance is being performed. Failure to correct inadequacies following a failed inspection may result in enforcement action.

N. Development Flexibilities.

1. Flexibility in site design practices can promote low impact development while maintaining the safety, health, and welfare of the public. The parish encourages property owners and developers to apply low impact development techniques based on good land use planning and environmentally sound land use strategies. To achieve the purposes of this section, for any application for low impact development that demonstrates full compliance with the standards set forth above, the Planning Director may approve any or all of the following development flexibilities:
 - a. *Dimensional Requirements.* Increase or decrease in the maximum gross floor area or height of a building by up to 25 percent where a zoning district provides a maximum or minimum gross floor area or height.
 - b. *Parking Requirements.* Reduce the total parking requirement by up to 25 percent.

O. Drainage and Paving Plan Requirements.

The purpose and intent of this section is to require a drainage and paving plan to be stamped and certified by a licensed state-registered engineer for construction of commercial, industrial, institutional and certain multifamily developments, with the goal of improving pre-development runoff and reducing post-development runoff based on a minimum 25-year storm event.

1. All commercial, industrial, institutional and multifamily development for townhouses, apartments, condominiums and nursing home uses that require a building permit or site work permit shall submit a drainage and paving plan with the permit application. Said plan shall be forwarded to the Department of Engineering for review and approval before the issuance of a building permit.
2. It shall be the responsibility of the applicant and design engineer to create a site development plan that will complement the drainage and paving plan utilizing site design criteria so as to result in the reduction of runoff from post-development.
3. The drainage and paving plan shall be stamped and certified by a licensed state-registered engineer and shall meet the following criteria:
 - a. Parcels zero to two acres in size shall be required to reduce pre-development peak runoff by at least ten percent for a 25-year storm event on-site.

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- b. Parcels two to five acres in size shall be required to reduce pre-development peak water runoff by at least 15 percent for a 25-year storm event on-site.
 - c. Parcels five acres and larger shall meet all drainage requirements for subdivisions established by **this code**, including a reduction of pre-development peak runoff by at least 25 percent for a 100-year storm event on-site.
 - d. Whenever a parcel that is greater than five acres is proposed to be developed in phases, or subdivided through the minor subdivision process, where any proposed phase or lot is less than five acres, such development shall meet the requirements of subsection (3) of this section and the applicable provisions of Section 900-2.3. The drainage and paving plan must address drainage in terms of the development of the entire parcel, not just the phase currently being proposed to be developed, taking into consideration all of the regulations of the zoning district designation of the property that could be pertinent to drainage, including maximum net density permitted, minimum area regulations, maximum lot coverage, and off-street parking and loading requirements.
- 4. A combination of detention methods may be utilized to meet the criteria as established in this section. Off-site detention facilities may be utilized if approved by the parish engineer.
 - 5. At no time will the parking area be utilized as a detention area.
 - 6. *Documents required for drainage and paving plan review.* In order to expedite the drainage plan review for all commercial, industrial, institutional and multifamily developments for townhouses, apartments, condominiums and nursing home uses, the department of engineering, when applicable, requires the following documents be provided:
 - a. A vicinity map indicating the location of the proposed project.
 - b. A pre-development drainage plan (existing conditions).
 - c. Identify fill area(s) and associated fill depth(s).
 - d. A post development paving and drainage plan and an as built paving and drainage plan.
 - e. If building has downspouts, an architect's drawing is required.
 - f. If the outfall needs to discharge to the ditch or pond, the invert elevations of associated culvert(s) and bottom elevation of accepted ditch or pond shall be provided.
 - g. If driveway culvert needs to be installed at the state highway ditch, an approval sheet from the state shall be provided prior to the parish approval.
 - 7. A hydrological analysis of both pre-development and post-development runoff shall be provided. The applicant shall also provide a water surface profile for 100-year, 50-year, 25-year and ten-year storm events. The hydrological analysis shall meet all applicable parish ordinances and the following requirements:
 - a. The applicant's engineer shall also study the effect of any proposed development on existing downstream drainage facilities outside the area of development. Local drainage studies, together with any other appropriate study, shall serve as a guide to needed improvements as determined by the department of engineering.

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- b. No development may be constructed or maintained so that surface waters from such development are collected and channeled downstream at such locations or at such volumes or velocities as to cause degradation, alteration or damage to lower adjacent properties.
 - c. Where it is anticipated that the additional runoff incident to the development will increase the water surface profile downstream, the parish shall withhold approval of the development until provisions have been made for the detention of stormwater and resolution of such conditions in conformance with these requirements and the department of engineering. No development shall be approved unless the necessary drainage will be provided to a drainage watercourse or facility that is adequate to receive the proposed drainage without adverse impact on downstream properties.
 - d. No development may be constructed or maintained where such development would impede the flow of water from upstream properties across the property proposed to be developed. All drainage rights-of-way and culverts or other drainage facilities shall be large enough to accommodate runoff from the property proposed to be developed as well as upstream flow originating outside of the proposed development. All existing watercourses passing through the property of the proposed development shall be maintained to accommodate up to the 100-year storm events. Any proposed alteration or relocation of an existing watercourse or drainage facility may only be approved when the department of engineering has determined that any such proposal meets all applicable parish drainage requirements. The applicant's engineer shall determine the necessary size of the drainage facilities, assuming conditions of maximum potential watershed development permitted by these regulations.
 - e. If the site is located in an area where known drainage problems exist, a drainage basin study can be required to demonstrate adverse drainage impacts on surrounding properties.
- 8. The Department of Engineering reserves the right to hold the certificate of occupancy in order to allow for a final inspection.
 - 9. In the event of a conflict between any provision within this section, or between a provision in this section and any other drainage or flood control ordinance, the more stringent provision shall be applicable.
 - 10. All the above drawings and hydrological analysis need to be stamped and certified [signature and date] by a professional engineer registered in the state.

SEC. 900-6.8 STORMWATER QUALITY AND DISCHARGE MANAGEMENT (MS4).

A. General.

The purposes and objectives of this section are to establish pollution prevention policies and procedures for the permitting, monitoring, and/or enforcement regarding Illicit Discharge Detection and Elimination, and Construction Site Runoff Control. In doing so, the provisions will allow the Parish to:

- 1. Comply with the Municipal Separate Storm Sewer System Permit (MS4 Permit), and all federal, state, and local regulations applicable to stormwater and non-stormwater discharges.
- 2. Manage stormwater pollution impacts at their source and prevent contaminated stormwater and non-stormwater discharges into the MS4, drainage infrastructure, conveyances, and waterways within the Parish.

3. Provide for proper operations and maintenance of all permanent and non-permanent stormwater management SCMs that are implemented within the Parish in alignment with section 800-3 of this UDC.
4. Provide review procedures and performance standards for stormwater pollution prevention planning and management.
5. Facilitate compliance with federal and state water quality standards, limitations, and permits by owners and operators of commercial and industrial activities and construction sites within the Parish.

B. Administration.

1. The Parish MS4 Administrator shall administer, implement, and enforce the provisions of this section. Any powers granted to or duties imposed upon the MS4 Administrator shall be carried out by the Administrator or may be delegated to other authorized personnel.
2. The Parish may adopt, by Parish Council action, reasonable stormwater fees for reimbursement of costs related to administration of the stormwater management requirements, MS4 compliance, TMDL implementation, and costs related to the Stormwater Management Program (SWMP) as required by the EPA or LDEQ. Fees are provided in Chapter 2 of the Parish Code of Ordinances, Article I, Section 2-009.00 - Parish Fees and Service Charges.

C. Prohibited Non-Stormwater Illicit Discharge General Prohibition.

1. No person shall introduce or cause to be introduced into the MS4, drainage infrastructure, conveyances, or waterways of the Parish any illicit discharge, including non-stormwater discharges that are not composed entirely of stormwater, except as expressly provided for in this section.
2. No person shall introduce or cause to be introduced into the MS4, drainage infrastructure, conveyances, or waterways of the parish any discharge that causes or contributes to violation of a water quality standard.
3. No person shall connect an interior drain or any other source of wastewater to the MS4, drainage infrastructure, conveyances, or waterways of the parish, or allow such a connection to continue without an LDH or LDEQ permit.
4. Any person that causes a spill, release, or other discharge of a prohibited substance or other pollutant in the parish is solely responsible for the cleanup and removal of the substance.
5. Sanitary sewer overflows to the MS4, drainage infrastructure, conveyances, or waterways of the parish shall be prevented. In the event of an overflow the owner, operator, or person otherwise having control of the sanitary sewer, shall remove all sewage to the maximum extent practical.
6. Items that are stored for collection, disposal, recycling or reuse shall be stored in a manner that prevents contamination of stormwater. Drums shall be covered and/or in secondary containment where required, closed, not leaking, and in good condition.
7. Spills and leaks of hazardous substances or pollutants shall be cleaned up immediately after the spill occurs or the leak is detected. Any absorbent material used for clean-up must be disposed of properly and disposed of in accordance with solid waste regulations. Surface soil contaminated by the spill or leak must be removed or otherwise protected from contact with stormwater.

8. Drip pans, absorbent mats, or equivalent controls shall be used to collect and properly dispose of leaking fluids from motor vehicles that are parked outside during maintenance and repairs or while waiting for repairs at commercial repair facilities.
9. Used engines, transmissions, radiators, and other vehicle components that have automotive fluids in, or on them, shall be stored in a manner that prevents pollutants from contaminating stormwater runoff.
10. Any person or establishment that causes a spill, release, or other discharge of any prohibited substance or other pollutant to the MS4, drainage infrastructure, conveyances, or waterways of the parish is solely responsible for notifying the appropriate agency and/or permit authorities of the unauthorized release.
11. Trash, litter, grass clippings, leaves, and other debris shall not be discarded in drainage ditches or drainage inlets. Such material shall be disposed of as solid waste and shall not be allowed to enter the MS4, drainage infrastructure, conveyances, or waterways of the parish.

D. Specific Prohibitions.

1. No person shall dump, spill, leak, pump, pour, emit, empty, discharge, leach, dispose, or otherwise introduce or cause, allow, or permit to be introduced any of the following substances into the MS4, drainage infrastructure, conveyances, or waterways of the parish:
 - a. Any used motor oil, antifreeze, hydraulic fluid, fuel, or other motor vehicle fluid;
 - b. Any industrial or hazardous waste, including household hazardous waste;
 - c. Any untreated sanitary sewage or septic tank waste;
 - d. Any grease trap waste, or grit trap waste;
 - e. Any trash or other debris material;
 - f. Any untreated wastewater from a commercial car wash facility; or from any washing or cleaning of any commercial or public service vehicle, including heavy equipment;
 - g. Any contaminated wastewater or wash water from commercial cleaning, power, or pressure wash processes or wash racks;
 - h. Any wastewater from the clean-up following a release of hazardous waste or pollutants;
 - i. Any discharge from a commercial or industrial cooling tower, condenser, compressor, or boiler unless the discharge is in compliance with an LDH or LDEQ permit;
 - j. Any concrete, mortar, ceramic, or asphalt base material;
 - k. Any discharge or wash down water from an animal, fowl, or livestock containment area;
 - l. Any unpermitted stormwater discharge associated with a commercial or industrial activity;
 - m. Any substance or material that will damage, block, or clog the MS4, drainage infrastructure, conveyances, or waterways of the Parish;
 - n. Any construction debris or other waste building material resulting from construction or demolition;

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- o. Any uncontrolled sediment, silt, earth, soil, or other material associated with clearing, grading, excavation, filling, or other construction activities;
 - p. Any direct discharge of pesticide, herbicide, and/or fertilizer;
 - q. Any discharge that causes or contributes to a violation of a water quality standard.
2. The following restrictions apply to discharges associated with discharges from pools, hot tubs, spas, and filter backwash, which is a rinsate resulting from the cleaning of equipment, vehicles, tools, containers, cartridges, filters, etc. For uncontaminated discharge that cannot be retained on site for irrigation or other uses, a gradual, metered discharge is required;
- a. Discharge shall be dechlorinated with no detectable concentration of Total Residual Chlorine prior to discharge;
 - i. Discharge shall not drain or back-up onto adjacent properties;
 - ii. Discharge shall not cause erosion or sediment transport;
 - iii. Discharge shall not cause an accumulation of water in roadways or along curbs and shall not cause adverse impacts to drainage infrastructure, waterways, roadways, or adjacent properties.

D. Allowable Stormwater Discharges.

1. The following discharges have not been identified by the parish as significant contributors of pollutants to the MS4 or surface waters of the parish and therefore are allowable non-stormwater discharges:
- a. A discharge authorized by, and in full compliance with, an NPDES or LPDES permit;
 - i. Discharges from firefighting activities;
 - ii. An uncontaminated discharge of fire protection water;
 - iii. Agricultural stormwater runoff;
 - iv. Potable water sources including dechlorinated water line and fire hydrant flushing;
 - v. A discharge from lawn watering, or landscape irrigation;
 - vi. A discharge or flow from a diverted stream flow or natural spring;
 - vii. A discharge or flow from uncontaminated groundwater;
 - viii. Uncontaminated discharge from foundation drains, crawl spaces, or footing drains;
 - ix. A discharge or flow from a riparian habitat or wetland;
 - x. Wash water from individual residential and non-profit car washing;
 - xi. A discharge of air conditioning condensate; and
 - xii. A discharge or flow of water used in street, parking lot, or structure cleaning that is not contaminated with soaps, detergents, emulsifiers, dispersants, chemicals, or other pollutants.

2. In the event the parish determines that any of the discharges identified in B.2. Specific Prohibitions significantly contribute to pollution of surface waters of the parish, or is so notified by LDEQ, the parish will notify the responsible person to cease the discharge.
3. Nothing in this section shall affect a discharger's responsibility under federal or state law.

E. Stormwater Discharges from Construction Activities

1. No construction activity nor development shall degrade water quality in the receiving stream or adversely affect the MS4.
2. All construction projects involving site work of any kind, including but not limited to subdivision development, minor subdivision development, residential construction, commercial construction, and roadway construction shall comply with the stormwater pollution prevention requirements of this section.
3. All appropriate parish permits shall be obtained before the commencement of construction.
4. All operators of construction sites shall use appropriate Best Management Practices or BMPs to control discharge to waterways and conveyances of the parish. Pollutants such as silt, sediment, mud, clay, and other construction contaminant materials associated with site work of any kind shall be controlled to the maximum extent practicable.
5. Operators shall refer to the Best Management Practices (BMPs) for Coastal Louisiana Nonpoint Source Pollution Handbook for BMP definitions, selection, applicability, planning considerations, recommended specifications and maintenance. Applicability. It shall be the responsibility of the property owner or his designee to acquire and comply with any applicable LDEQ permits prior to the commencement of construction. A Construction Stormwater Site Plan and Stormwater Management Agreement shall be required upon building/site work permit application for the project types listed below.
 - a. New residential and commercial construction;
 - b. New construction of accessory buildings greater than or equal to 200 square feet in accordance with **Chapter 300** Buildings and Building Construction;
 - c. Site work construction;
 - d. Pool installation;
 - e. Pond excavation;
 - f. Subdivision development;
 - g. Minor subdivision development; or
 - h. Remodel permits that involve alteration to existing site drainage.
6. *Exemptions.* The following project types are exempt from the requirement for a Stormwater Agreement and Construction Stormwater Pollution Prevention Site Plan. These exemptions do not relieve the owner, operator, or other legal representative of the responsibility of installing and properly maintaining the erosion, sedimentation, or pollution control measures or any other liability resulting from such activities.

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7. Capital projects or infrastructure improvement projects by parish personnel (such projects shall comply with all other state, federal, and local stormwater permit requirements). This exemption does not apply to private contractors working on parish projects;
 - a. An activity that is determined by a St. Tammany Parish Government official to be immediately necessary for the protection of life, property, or natural resources;
 - b. Excavation of graves in cemeteries;
 - c. Agricultural practices such as plowing, cultivation, tree cutting, logging operations that leave the stump and root mat intact, and cultivated sod operations. Agricultural projects shall comply with all other state, federal, and local stormwater and water quality requirements.

F. Stormwater Agreement Requirements.

1. The Parish shall require an approved Stormwater Agreement for any development or improvement project that requires a building permit, site work permit or subdivision work order. This agreement, which is a document provided by Parish, will serve as a signed contract with the Parish stating that the property owner or his designee agrees to obtain an LDEQ permit for construction, if applicable, and comply with all applicable state, federal and local regulations during the term of the project.
2. For subdivisions developed in phases, a Stormwater Agreement shall be submitted at the preliminary approval phase for each phase of the development.
3. A copy of the Stormwater Agreement form is provided online and in the building permit packet.

G. Construction Stormwater Site Plan.

1. A Construction Stormwater Site Plan is a component of the SWPPP as required by LDEQ. In an effort to ensure the owner, applicant or contractor has a sufficient plan to address necessary stormwater controls before the commencement of construction.
2. An approved Construction Stormwater Site Plan is required with submittal of any applicable building permit, site work permit or drainage plan for a subdivision within unincorporated St. Tammany Parish.
3. When a Construction Stormwater Site Plan is required to obtain a Parish permit, it shall be submitted with the permit application for review. The Stormwater Site Plan, including any required revisions, is valid for the duration of the project.
4. For a subdivision development, a Construction Stormwater Site Plan shall be submitted at the tentative and/or preliminary review and will focus on erosion control, sediment control, stormwater management, water quality, and the receiving waters.

H. Construction Activity Requirements

1. The following requirements shall be implemented and maintained during the course of construction activities:
 - a. Existing vegetation shall be preserved, where feasible, and disturbed portions of the site shall be stabilized within 14 days of the temporary or permanent cessation of construction activities.

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- b. Structural BMPs shall be utilized, where feasible, to divert flow away from exposed soil, store stormwater, or otherwise reduce runoff and the discharge of pollutants from the construction site.
 - c. Installation, inspection, and maintenance of erosion and sediment BMPs shall be consistent with the effective operating conditions on the site. Operators are responsible for the installation and maintenance of stormwater BMPs until warranty obligations are met and/or occupancy certificates are issued.
 - i. Operators shall be responsible for overseeing self-inspections of all BMPs at construction sites.
 - ii. Based on the results of the inspections, BMPs shall be maintained, revised, repaired, or replaced as necessary but prior to a future storm event.
 - iii. After storm events, BMPs shall be inspected and replaced if needed.
 - iv. The SWPPP or Construction Stormwater Site Plan shall be updated with any BMP revisions.
 - v. Any BMP modifications shall be recorded in the SWPPP and/or Construction Stormwater Site Plan within 7 calendar days and implemented on site as soon as is practical.
 - vi. The owner, contractor, and/or operator of a construction site is responsible for compliance with the requirements of this section.
 - vii. The Parish may hold occupancy certificates related to a site until approval of the final stormwater inspection with a determination that any required stormwater controls are in place.
 - d. The SWPPP, which shall include the Construction Stormwater Site Plan, and stormwater self-inspection and BMP maintenance reports shall be available on site for inspections.
 - i. In accordance with LDEQ requirements, an NOI and SWPPP is required for large construction projects on 5 or more acres. This requirement includes any lot or parcel that is part of a larger common plan of development.
 - ii. In accordance with LDEQ requirements, a SWPPP is required (but not an NOI) for all construction projects 1 acre or greater, but less than 5 acres, if not part of a larger common plan of development.
 - e. A stabilized construction entrance/exit pad shall be utilized to minimize the tracking of mud, clay, sediment, and other construction materials onto roadways and streets.
 - f. The discharge of construction or building materials, including cement, concrete, lime, mortar, slurries, and paints is prohibited. On-site containment or off-site disposal is required.
 - g. Good housekeeping measures, such as covered storage, storm drain protection, secondary containment, etc., shall be employed to prevent, contain, and clean up spills of paints, solvents, fuel, sewage, and any hazardous substances and pollutants associated with construction.

- h. Proper waste disposal, such as covered waste containers and concrete disposal bins, shall be employed to manage construction materials, construction debris, paints, solvents, chemicals and construction waste, etc. shall be utilized to prevent stormwater contamination.
2. On phased subdivision developments, site disturbance shall be phased, when applicable, to limit soil erosion and sediment excursion. Final stabilization shall be accomplished prior to commencement of the next phase of development.

I. Stormwater Inspections.

1. Routine stormwater inspections will be performed by parish stormwater inspectors in accordance with the applicable permitting processes or as needed. Fees associated with inspections/re-inspections will be in accordance with Section 2-009.00 of the St. Tammany Parish Code of Ordinances.
2. The first stormwater inspection for each project shall be scheduled at the commencement of construction with the preliminary drainage inspection. The final stormwater inspection shall be scheduled at the completion of construction with the drainage final inspection.
3. Re-inspections will be scheduled and performed as required.
4. Unscheduled stormwater inspections and drainage inspections may be performed by the parish at any point during the construction process.
5. Failure to correct inadequacies following a failed drainage and/or stormwater inspection may result in enforcement action.
6. All stormwater inspections shall be performed in accordance with the Parish approved Construction Stormwater Site Plan and LDEQ SWMP.

J. Water Quality Impact Modeling.

1. Developments on lots or parcels 5 acres, or more, will be reviewed and modeled for water quality impacts by the Department of Planning and Development.
2. Modeled discharge impacts must meet USEPA/LDEQ dissolved oxygen discharge standards and the antidegradation standard whereby new discharges may not reduce dissolved oxygen in a receiving stream and/or watershed by more than 0.2 mg/L.
3. Failure to meet either the dissolved oxygen or antidegradation standard will require the applicant to modify on site conditions to improve water quality by providing additional stormwater controls, reducing discharge quantity, or changing the discharge location. The proposed changes will be modeled to confirm discharge standards will be accomplished.
4. For proposed developments that discharge into waterways or watersheds with no assimilative capacity to maintain the dissolved oxygen standard, the water quality model for the development shall not fail the antidegradation standard.
5. To minimize the impacts of development, stormwater shall be infiltrated on site to the maximum extent practicable. Runoff that cannot be infiltrated shall be managed such that the receiving stream is not significantly impacted when modeled for a 2-year/2-hour storm event.

6. Requests for Water Quality Certification response letters may be issued by the Parish for new developments only upon meeting dissolved oxygen standards during water quality impact modeling.
7. Water quality impact modeling shall be required for developments that disturb at least 5 acres and for Water Quality Certification response letters requested for proposed developments.
8. A fee shall be paid for Water Quality Impact Modeling, upon notice that a fee is due. Water Quality Impact Modeling fees shall be paid in accordance with Section 2-009.00 Parish Fess and Service Charges.

K. Public Participation and Involvement.

1. *Owner Operator Reporting Requirements.* The operator and/or the owner of any commercial or industrial activity shall report any prohibited discharges, spills, releases, illicit discharges, and unauthorized connections into the MS4, drainage infrastructure, conveyances, or waterways in the Parish and any other violation of this Division for which they are responsible.
2. A hazardous and/or toxic substance spill or release shall be immediately reported to the St. Tammany Parish Department of Homeland Security and Emergency Preparedness and to LDEQ.
3. Unless discharged under a LPDES permit, other instances where pollutants are discharged into the MS4, drainage infrastructure, conveyances, or waterways of the Parish by spill, release, illicit connections or other means shall be reported to LDEQ and the Parish Department of Environmental Services; and
4. The owner of any commercial or industrial facility with a spill or release of pollutants, hazardous substances, or toxins is responsible for proper notification of the incident to all appropriate local, state, and federal agencies.

L. Citizen Complaint Reports

1. Anyone may report any spills, releases, illicit connections, or other instances of anyone discharging pollutants into the MS4, drainage infrastructure, conveyances or waterways of the Parish and any other violation of this section to the MS4 Administrator or any person designated by the Parish to receive such citizen reports.
2. Citizen stormwater complaints may be made verbally or in writing. A written record of each citizen report to the Parish will be prepared and kept on file for a period of three years. Upon request, the Parish will inform the reporting citizen of any action taken in response to the citizen's report.
3. When applicable, the Parish will report citizen complaints to the appropriate local, state, or federal agencies if a violation is confirmed upon investigation by the Parish.

SEC. 900-7. WATER SYSTEMS

SEC. 900-7.1 CENTRAL WATER SYSTEMS.

A. General.

1. Any private person or political entity who/which owns, leases, or otherwise maintains or possesses control of any property which is situated in the unincorporated portion of the parish, and on which

there is located a residence, camp, trailer coach or any other building, structure or establishment wherein people customarily or occasionally live, work or congregate, shall connect any such premises to a potable water system as may be required for the premises by applicable law.

2. Any private person or political entity who/which owns, leases, or otherwise maintains or possesses control of any property which is situated in the unincorporated portion of the parish, and on which there is located a residence, camp, trailer coach, or any other building, structure, or establishment wherein people customarily or occasionally live, work or congregate, shall, at such person's sole expense, connect any such premises to a public water system if such public water line is situated within 300 feet of the boundary line of such premises. If such connection is not begun in the time prescribed by notice to the owner, the parish may connect the premises to the public water system in the manner prescribed by Section 40-332, and assess the connection costs and fees to each owner as also provided therein. The parish shall have all other remedies for enforcement and collection of connection costs and fees as is provided by applicable law.
3. No certificate of occupancy shall be issued before water systems are installed and operable or the development is otherwise connected to a public water system approved by the Department of Environmental Services.
4. Whenever a subdivision is served by a central water system, no private water supply may be drilled or otherwise constructed on any lot for the purpose of supplying potable water to any building or structure, except for the purpose of irrigation or fire protection, and in no event shall there be a physical connection between any such source and any element of any community water system.
5. Every governed sewerage system or governed water system shall be constructed or modified in accordance with the plans and specifications for installation which have been approved in advance by the department prior to the start of construction or modification.
6. Whenever any person commences any activity or action to connect to, or to otherwise construct or modify a sewerage or water system without first having complied with the applicable provisions of this article, then, in addition to all other remedies provided by applicable law, the department shall be entitled to collect a fee equal to 200 percent of the established fee otherwise due for said activity or action.

B. When Required.

1. A central water system shall be required as follows:
 - a. Any subdivision development which is to be in a residential or planned land use district shall have a central water system comprised of a water source, treatment (as may be required), storage, and distribution elements. The water source of any central water system shall be an existing Public Water System or a Central Water System designed, constructed, and operated in accordance with the requirements Louisiana Administrative Code, Title 51 (Sanitary Code), Louisiana Administrative Code, Title 56 (Public Works), and Recommended Standards for Water Works as promulgated by the Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, Latest Edition; except as otherwise provided for or modified herein.
 - b. Any development which is 300 linear feet from a Public Water System shall be connected to the Public Water System.

C. Construction or Modification of a Central Water System.

1. The Department of Environmental Services shall have authority over all construction necessary or incidental to the provision of water. Plans and specifications for a central water system to be constructed or modified shall be submitted to and approved by the Department of Environmental Services or designee prior to initiating such construction, and the conduct of such construction shall be subject to inspection by the Department of Environmental Services or designee. Copies of any amendments to said plans and specifications shall also be submitted to and approved the Department of Environmental Services prior to operation of the subject system.
2. Whenever an existing central water system is designated for connection to a proposed subdivision development, the detailed plans and specifications shall include the Public Water System identification number (PWS ID number) as established by the Louisiana Department of Health, Office of Public Health.

D. Approval by Department of Environmental Services.

1. Prior to the start of construction or modification of a governed sewerage system or governed water system, detailed plans and specifications shall be submitted by the responsible person for the system to be constructed or modified and shall be reviewed and, contingent upon any revisions to such plans and specifications as may be required to meet compliance, approved by the department in accordance and compliance with applicable law which shall include the Ten-State Standards and the Louisiana Water Well Rules, Regulations and Standards.
2. As such relates to the provisions of this Code, whenever there is a participatory and coordinated effort between the Department of Environmental Services and the District Engineer of the Louisiana Department of Health, Office of Public Health, the Department of Environmental Services shall affirm any approval granted by the said state entity when that subject plans and specifications are in accordance and compliance with the applicable law.
3. If after one year from the date on which such approval was granted and the proposed construction or modification is not complete, any approval or affirmation thereof by the Department of Environmental Services of the subject plans and specifications shall be void. Accordingly, prior to the conduct of any proposed or subsequent construction or modification, the responsible party shall be required to again comply with the provisions of this section.
4. Upon written application from the applicant, the Department of Environmental Services may approve a conditional or absolute waiver of the effect of the provisions of this section.
5. Any review and subsequent approval of the plans and specifications for the construction or modification of a central water system is for the use and benefit of the Department of Environmental Services and shall not be considered as an affirmation that the construction, modification, or operation of the central water system is or will be in accordance or compliance with applicable laws and the requirements of this Code.

E. Inspections.

1. To monitor the construction or modification of any central water system, the Department of Environmental Services may authorize any employee or agent of the Department of Environmental Services to inspect, at a reasonable time and in a reasonable manner, any such central water system in order to determine that the construction or modification of such system is conducted in

accordance and compliance with the plans and specifications for installation which have been approved in advance by the Department of Environmental Services. In carrying out this power, the authorized employee or agent of the Department of Environmental Services may enter private and public properties. As such relates to the provisions of subsection (a) of this section, whenever there is a participatory and coordinated effort between the department and the parish engineer, the department shall acknowledge the results of any inspection conducted by the Department of Environmental Services.

2. Any inspection of a central water system conducted pursuant to a provision of this section is for the use and benefit of the Department of Environmental Services and shall not be considered as an affirmation that the construction, modification, or operation of the inspected central water system is or will be in accordance or compliance with applicable law and the requirements of this Code.
3. The provision of water shall not occur until the constructed or modified central water system has been inspected by the Department of Environmental Services or their designee, or appropriate state authority and determined to be in accordance with the applicable and appropriate plans and specifications for installation. Prior to the granting of Final Subdivision Plat approval by the Planning Commission, three duplicate originals of the as-built drawings and detail sheets for the subject central water system, as prepared by a licensed professional engineer registered in the State of Louisiana, shall be submitted to the Department of Environmental Services. The Department of Environmental Services shall distribute copies of the plan to the Department of Engineering and the Chief of the fire district wherein the subdivision development is located for review and comment. When appropriate and applicable, said documents shall include the PWS ID number and/or a copy of the water well registration form issued by the Louisiana State Department of Transportation and Development (if applicable).

F. Certification of Connection to Water System

The department shall verify as reliable the certification issued by the entity responsible for the operation and/or administration of the subject central (community) water system (supply), whereby such certification includes:

1. The public water supply identification number designated by the state office of public health for the subject system (supply);
2. A declaration that the required capacity and distribution service connection is in place and available; and
3. A statement that the applicant has paid all fees due and owing said entity for connection to the subject system (supply).

SEC. 900-7.2 CONNECTIONS TO PARISH SYSTEM

A. Fees for Planning.

The fee assessed to review plans and specifications for the construction or modification of any sewerage or water system or systems, the construction or modification of which is associated with a subdivision development proposed for approval by the parish planning commission shall be in accordance with the provisions of the parish Ordinance No. 91-1470, to-wit: \$40.00 plus \$10.00 per lot upon application for tentative plan approval; \$20.00 per lot upon application for preliminary plan approval; and \$30.00 per lot upon application for final plan approval.

The fee assessed to review the plans and specifications for the construction or modification of a governed water system shall be:

1. Ten dollars plus \$0.04 per each linear foot of water distribution pipe to be constructed or modified, and/or \$0.06 per each linear foot of sewage collection pipe to be constructed or modified in addition to \$10.00 per water supply facility (e.g., well) to be constructed or modified, and/or per sewage collection or treatment facility (e.g., plant, pond, lift station) to be constructed or modified.
2. It is the intent of the provisions of this section that a water supply facility or a sewage collection or treatment facility shall mean the individual, distinct components, respectively of a governed water system or governed sewerage system. Hence, a sewage treatment system with one or more aerated lagoons and associated pumping and treatment infrastructure in immediate proximity thereto shall be considered one sewage treatment facility. However, an associated, but remote lift station shall be considered a separate sewage collection facility. Manhole access points shall not be considered a separate sewage collection facility, but merely an element of the linear footage of the sewage collection piping.
3. Any fee assessed pursuant to a provision of this section shall be due and payable in full to the department upon the ordinary application for subdivision plan approval by the parish planning commission, as provided by an ordinance of the parish, or otherwise upon the submittal of the detailed plans and specifications to the department by the responsible person for the governed sewerage system or governed water system to be constructed or modified. Upon collection of any fee assessed pursuant to a provision of this section, such fee shall be placed into a special fund, the use of which shall be for the administration of the provisions of this section which relate to the review of plans and specifications for the construction or modification of sewerage or water systems.

B. Fees for Inspections.

The fee assessed to inspect the construction or modification of a governed water system shall be:

1. \$0.12 per each linear foot of water distribution pipe to be constructed or modified, and/or \$0.22 per each linear foot of sewage collection pipe to be constructed or modified; in addition to \$60.00 per water supply facility (e.g., well) to be constructed or modified, and/or per sewage collection or treatment facility (e.g., plant, pond, lift station) to be constructed or modified.
2. Any fee assessed pursuant to a provision of this section shall be due and payable in full to the department upon application for preliminary plan approval by the parish planning commission, or otherwise, upon the submittal of the detailed plans and specifications to the department by the responsible person for the governed sewerage system or governed water system to be constructed or modified. Upon collection of any fee assessed pursuant to this section, such fee shall be placed into a special fund, the use of which shall be for the administration of the provisions of this section which relate to the inspection of sewerage or water systems to be constructed or modified.

SEC. 900-7.3 MONITORING.

A. General.

1. Every governed water system shall make available to the Department of Environmental Services for his review, upon the department's request, all monitoring data effected as a consequence of the system's sampling plan approved by the Louisiana Department of Health pursuant to the federal Safe Drinking Water Act, as amended, or any rules and regulations effective or promulgated under the authority of said Act or under such authority delegated to the Louisiana Department of Health by the U.S. Environmental Protection Agency.

2. Every governed water system shall make available to the Department of Engineering for his review, upon the department's request, all monitoring data affected as a consequence of the system's compliance with rules and regulations effective or promulgated under the authority of the parish or under any such authority as mandated by local, state or federal law.
3. For inspection purposes, copies of all such monitoring data provided shall be kept on-site at, or in reasonable proximity to the monitored facility for a period of at least three months from the date of the sample measurement or report of such measurement.

SEC. 900-7.4 FIRE WATER SERVICES

A. General.

4. Central Water Systems, Fire Suppression Capacity. Whenever a governed water system is to be constructed or modified, the construction and modification of such system shall provide for an adequate water flow for fire suppression purposes as outlined in the National Fire Protection Association Standard 1142 (Standard on Water Supplies for Suburban and Rural Fire Fighting, 2012 edition, chs. 1—5) and include fire hydrants which shall be located and installed as required by applicable law and these rules and regulations. A copy of National Fire Protection Association Standard 1142 (Standard on Water Supplies for Suburban and Rural Fire Fighting, 2012 edition, chs. 1—5) shall be appended to this section and made a part thereof.
5. For the purposes of the provisions of this section, a governed water system shall mean a public water supply as defined in part XII of the state sanitary code, the rates and tariffs for which are established by the state public service commission.

B. Flow Capacity.

1. There shall be established a mean water flow capacity classification for the fire hydrants connected to a governed water system, such to be determined initially and subsequently on an annual basis by a licensed professional engineer, an operator, as defined in R.S. 40:1141(D), who possesses a valid and current water distribution (Class IV) certification issued by the Louisiana Department of Health and Hospitals/Office of Public Health ("LA DHH/OPH), or appropriate personnel from the affected fire protection district, all in a manner consistent with the practices of the department which relate to the submittal of detailed plans and specifications and/or as-built drawings. Any such determination shall be made for the sole use and benefit of the department and water service provider, and shall not be considered in any manner whatsoever as a warranty or guarantee of the water flow capacity of a governed water system or its availability for connection thereto. To determine the mean water flow capacity classification for the fire hydrants connected to a governed water system, the water service provider shall submit to the department a detailed as-built drawing of said system which shall include an inventory and location of all fire hydrants that are connected thereto. Each fire hydrant shall be readily accessible for its intended use and in good operating order. The mean water flow capacity classification shall be determined by measuring the water flow of each fire hydrant connected to the governed water system and dividing the sum of such measurements by the total number of fire hydrants.
2. As such relates to the functionality of, and the approximation of the water flow capacity for each fire hydrant connected to the subject system, the governed water system shall maintain each fire hydrant in good operating order. The barrel of each fire hydrant shall be painted chrome yellow and the top and nozzle caps of each fire hydrant shall be painted to signify the classification of its relative water flow capacity according to the uniform color scheme for such as set forth below, and

affix a blue colored, raised reflective marker on the roadway in proximity to each fire hydrant; and the conduct of such action to its resolution shall be subject to inspection by the department.

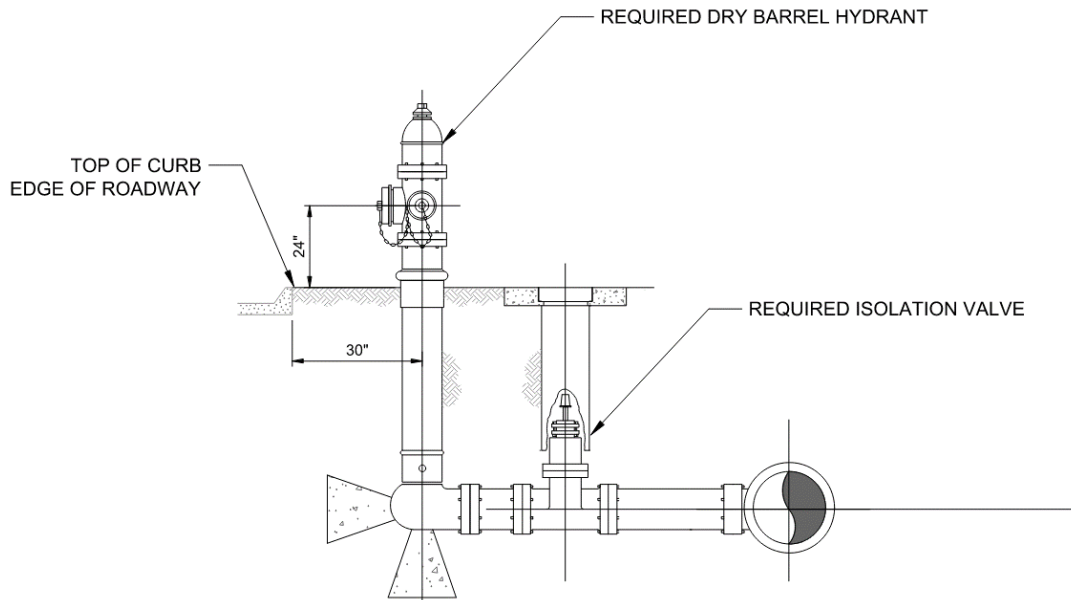
3. The procedure to measure the water flow capacity of a fire hydrant shall conform to the relevant instructions for such as set forth in appendix B of American Water Works Association (AWWA) Standard C502, as amended from time to time, and appendix B of American Water Works Association (AWWA) Standard C503, as amended from time to time.
 - a. The classification of a fire hydrant rated in terms of its relative capacity shall conform to the relevant provisions for such as set forth in appendix B of AWWA Standard C502 and appendix B of AWWA Standard C503.
 - b. The uniform color scheme of a fire hydrant to signify the approximate capacity of water flow shall conform to the relevant provisions for such as set forth in appendix B of AWWA Standard C502 and appendix B of AWWA Standard C503.
 - c. A copy each of appendix B of AWWA Standard C502 and appendix B of AWWA Standard C503 shall be appended to this section and made a part thereof.

C. Fire Hydrants.

1. Fire Hydrants are required in all developments having a central water system.
2. There shall be a fire hydrant at each street intersection unless intersections are less than 500 feet apart and all intermediate hydrants shall be located not more than 500 feet apart. All fire hydrants shall be located in a right-of-way or utility servitude.
3. Fire hydrants shall remain free of any and all manner of obstruction that could interfere with accessibility or visibility. All fire hydrants shall have a five-foot minimum clearance from the center of the hydrant outward in all directions.
4. Fire hydrants shall have at least three outlets per hydrant; one shall be a steamer connection to allow fire apparatus to provide water from the hydrant to the apparatus and there shall be at least two 2.5-inch outlets with National Standard Threads.
5. All fire hydrants shall conform to the provisions of the American Water Works Association Standards for Hydrants (AWWA C502).
6. *Classification and Paint Colors for Hydrants.* Fire hydrants, when tested in accordance with the said AWWA standards, are classified as follows:
 - a. *Class AA.* Fire Hydrants that on individual test have a flow capacity of 1,500 GPM or greater.
 - b. *Class A* Fire hydrants that on individual test have a flow capacity of 1,000 to 1,499 GPM.
 - c. *Class B.* Fire hydrants that on individual test have a flow capacity of 500 to 999 GPM.
 - d. *Class C.* Fire hydrants that on individual test usually have a flow capacity of less than 500 GPM.
7. The barrel of a fire hydrant shall be painted chrome yellow and the top and nozzle caps of a fire hydrant in the class outlined in **subsection (d)(4)a** of this section are to be painted as follows:
 - a. *Class AA:* Light Blue

- b. *Class A*: Green.
 - c. *Class B*: Orange.
 - d. *Class C*: Red.
8. To facilitate the location of a fire hydrant by emergency personnel, a blue colored, raised reflective marker shall be securely affixed on the roadway in proximity to the fire hydrant. Such markers, and their installation, shall comply with the requirements of this UDC.

Exhibit 900-7-1: Requirements for Hydrant Installation



SEC. 900-7.5 DESIGN CRITERIA FOR POTABLE WATER SYSTEMS

A. General.

Central water systems shall be designed, constructed, placed into service and operated per the requirements of Louisiana Administrative Code, Title 51 (Sanitary Code), Louisiana Administrative Code, Title 56 (Public Works), and Recommended Standards for Water Works as promulgated by the Great Leaks Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, Latest Edition; except as otherwise provided for or modified herein.

B. Layout of Water Utilities in the Right of Way.

1. Water utilities shall be located outside of streets for all new developments. Water utilities shall be located on the opposite side of the road as sewerage utilities. Water utilities may be located under bike paths and sidewalks, incidental paving, driveways, and parking areas.
2. In general, water mains and valves shall be located between the right-of-way line and top of ditch or subsurface drainage feature. A horizontal clearance of minimum three feet (3') shall be maintained between the top of ditch (or subsurface drainage feature) and edge of the main and/or valve.. Under no circumstances shall valves and their access be constructed in ditches or under subsurface drainage features.

C. Design Basis.

System production, storage, and distribution systems including the water source and treatment facilities shall be designed for maximum day demand at the design year. Other than surface water intakes, all water supply facilities and water treatment plant access roads shall be protected to at least the 100-year flood elevation or maximum flood of record.

D. General Considerations.

1. The water distribution network shall consist of pipes, fittings, and other appurtenances designed to convey potable water at adequate quality, pressure, and discharge. Water mains shall be designed, constructed and properly connected with the public water supply system in such a manner as to adequately serve all lots shown on the subdivision plat for both domestic and fire water service purposes and shall comply with the requirements of this code.
2. Water distribution systems shall be designed using the Hardy Cross Method. The Hazen-Williams formula shall be used in computing head losses. A “C” factor of 120 shall be utilized for all calculations. Other friction conditions which are necessary to evaluate the affect of lower friction on pumping systems to prevent cavitation due to runout shall be evaluated by the applicant.
3. Valves shall be installed at each intersection or change in pipe size and shall be placed so that no single case of pipe breakage shall require shutting off from service an artery, or more than 500 feet of pipe in high value districts, or more than 800 feet of pipe in any area.
4. Mains shall be a minimum 6” in diameter. Provisions shall be made at all dead ends for flushing of the system.
5. The water distribution system shall be designed so that the following range of dynamic pressures are provided: 50 psi to 60 psi for average daily flows; 40 psi to 60 psi for peak hour flows; 20 psi to 60 psi for maximum daily flow plus fire flow. The minimum dynamic pressure at any point shall be 20 psi.
6. The maximum design velocity shall not exceed 5 fps. Water distribution systems shall be designed for the peak hourly flow or the maximum daily flow plus fire flow, whichever is greater.
7. Treatment systems shall be designed and constructed to comply with the National Primary Drinking Water Regulations and Secondary Drinking Water Standards as promulgated by the United States Environmental Protection Agency in place at the time of approval of the plans and specifications for the system.
8. All materials used in treatment systems shall meet the requirements of and be listed as compliant with NSF 61. All materials shall be lead free.
9. Disinfection: Disinfection shall be provided by chlorine or chloramines and shall be designed to produce the required residual concentrations as promulgated within Louisiana Administrative Code, Title 51 (Sanitary Code). Ultraviolet disinfection shall not be utilized for Central Water Systems. Where free chlorine is used for disinfection, a secondary chemical feed point shall be included to allow for future use of chloramines. Chemical feed equipment for ammonia is not required for systems which employ free chlorine for disinfection.

SEC. 900-7.6 CONSTRUCTION CRITERIA POTABLE WATER SYSTEMS

A. Applicability

1. Water systems to be installed and dedicated to St. Tammany Parish shall comply with the approved plans and the requirements of this Section 900-7.6.
2. The Director of the Department of Engineering, with the concurrence of the Director of the Department of Utilities, may waive these construction criteria when alternate minimum standards are proposed which in their opinion will provide for acceptable quality of construction.
3. The Department of Utilities will witness testing performed for systems to be dedicated to St. Tammany Parish Department of Utilities. The Department of Engineering will observe testing for other systems.

B. General.

1. All materials used in potable water distribution shall meet the requirements of and listed as compliant with NSF 61. All materials shall be lead free.
2. The applicant shall provide a one-year warranty for all newly installed water infrastructure associated with the construction of the project, including but not limited to waterline extensions, new water mains, valves, and fire hydrants. The warranty shall extend for a period of one year from the date of final acceptance. The applicant shall furnish all materials and labor required to correct deficiencies in the system at the expense of the Applicant.
3. The applicant shall assume the responsibility for the layout of the work.
4. Parallel sewer lines and water lines shall be laid in separate trenches with a minimum horizontal clearance between all water lines and all sewer lines of 10 feet. The minimum horizontal clearance between gravity sewer lines and sewer force mains shall be 10 feet. In the event a water line crosses over a sewer line, the minimum vertical clearance shall be 18 inches between the water and sewer lines. All water lines shall be above sewer lines. Any clearances less than the above mentioned shall subject to approval of the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems).
5. Minimum horizontal clearances of 5 feet and minimum vertical clearance of 18 inches shall be maintained between water lines and other utilities, such as communication lines, subsurface electrical lines, and gas lines. If water lines and sewer lines are located on opposite sides of the street/road, the subsurface electrical line shall be located on the same side as the sewer line.
6. The cover between the top of pipe for all water mains and finished grade shall be at least 3' for landscaped/unimproved areas and 5' under roads.
7. Connections to Existing Water Mains. All connections to water mains in use shall be made by the applicant under the supervision of the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems). Connections to existing waterlines shall be made using an approved stainless steel tapping sleeve and valve.

C. Excavation, Bedding, and Backfilling.

1. The applicant shall provide all excavation required for the installation of water systems in accordance with the approved plans and the requirements of this code. Excavations for water lines

and structures shall be prepared, bedded, and backfilled in accordance with the requirements below and as shown on the approved plans.

2. **Trench Protection.** Trench excavations shall be protected in accordance with applicable Federal, State, and local regulations, laws, and rules; but shall not be less than the standards and regulations established by OSHA in 29 CFR Part 1926.
3. **Removal of Water.** The applicant shall provide and maintain ample means and devices with which to promptly remove and properly dispose of all water entering the excavation and other parts of the work until all work has been completed. No sanitary sewer shall be used for disposal of trench water, unless specifically approved by the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems). No water containing settleable solids shall be discharged into storm sewers.
4. **Bedding and Backfilling.** Water mains shall be bedded in a clean sand. The clean sand bedding material shall be placed in 8" lifts and compacted to 95% of optimal dry density as determined by ASTM D698.
 - a. The minimum thickness for pipe bedding material under all water mains shall be a minimum of 6 inches or as dictated by the recommendations outlined in the geotechnical report. The bedding material shall extend to the spring line of the pipe.
 - b. When a soft and/or wet excavation bottom has been encountered, the excavation bottom shall be stabilized in accordance with the recommendations outlined in the geotechnical report. A minimum of 6 inches of crushed limestone meeting the No. 57 gradation of ASTM C33 shall be used to stabilize a soft and/or wet excavation bottom. A minimum of 6 inches of the soft and/or wet native material shall be removed prior to placing the crushed limestone foundation. The crushed limestone foundation shall be placed on top of a combination of geotextile and bi-axial geogrid fabrics. The crushed limestone foundation shall be placed in 8 inch lifts and compacted to 75% of the relative dry density as determined by ASTM D4253. The geotextile fabric shall encase the limestone foundation.
 - c. Water valves and water structures (i.e. manholes, valve vaults, equipment pads) shall be constructed on a bed of crushed limestone meeting the No. 57 gradation of ASTM C33. The minimum thickness of the limestone base and the use of geo-synthetic fabrics shall be dictated by the recommendations outlined in the geotechnical report. At a minimum, the limestone base shall have a minimum thickness 12 inches under water structures and 6 inches under water valves. The limestone base shall be placed on top of a combination of geotextile and bi-axial geogrid fabrics. The crushed limestone material shall be placed in 8 inch lifts and compacted to 75% of the relative dry density as determined by ASTM D4253.
- d. **Backfill Types:**
 - i. **Type A Backfill:** Type A Backfill shall be crushed stone, recycled Portland cement concrete, or recycled asphalt pavement (RAP).
 - ii. **Type B Backfill:** Type B Backfill shall be structural fill, A-4 or better or granular material.
 - iii. Type A backfill may be substituted for Type B backfill.
 - iv. **Initial backfill:** Initial backfill shall be structural backfill encasing the pipe from the bottom of the pipe to the spring line for concrete pipe and to a point one foot above the top

of the pipe for both metal and plastic pipe. Final backfill is not a structural backfill. Final backfill extends from the top of the initial backfill to the top of the natural ground or subgrade in cut areas or to the top of existing ground in fill areas.

- v. Pipe under Concrete Pavements:** Type B backfill may be used as initial and final backfill for all pipes, culverts, or drains under Portland cement concrete pavements.
 - vi. Pipe under Flexible pavements:** All reaches of water mains, exclusive of those portions of the pipe which are under shoulders, and all other culverts, pipes, or drains that cross the centerlines of new or existing flexible pavement roadways, including intersections that are under flexible pavements, shall receive an initial backfill of Type A material. Type B backfill materials may be used as final backfill for all pipes.
 - vii. Other Areas:** All reaches of all culverts, pipes, or drains under flexible pavements that do not cross the centerlines of new or existing roadways, and exclusive of those portions of the pipe which are totally under shoulders, shall receive an initial and final backfill of Type B material.
- e. Compaction:**
 - i. Type A:** For all water pipes under paved and unpaved areas, where using Type A backfill material, thoroughly hand compact the Type A backfill under the pipe haunches and then dynamically compact in layers not exceeding 8 inches compacted thickness. Initially compact under the haunches of the pipe by hand tamping or other acceptable means, until reaching a level in which the dynamic tamping can commence. Compact each lift by applying at least eight passes of a hand operated, dynamic mechanical compaction device over the surface of each lift. The in-place density of Type A backfill materials and bedding materials will not be measured or calculated. Place Type A backfill, exclusive of RAP and flowable fill, at or near optimum moisture content in accordance with DOTD TR 415 or 418. Place and compact RAP materials in a slightly moist condition
 - ii. Type B:** For all water pipes where Type B backfill is allowed, place the Type B material in layers not exceeding 8 inches compacted thickness. Compact with suitable mechanical equipment. Determine the maximum dry density of initial or final Type B backfill under all paved areas which are to be under traffic in accordance with DOTD TR 415 or TR 418. Determine in-place density in accordance with DOTD TR 401. Place initial and final Type B backfill under all paved areas under traffic, at or near optimum moisture content in accordance with DOTD TR 415 or TR 418. Compact each layer by approved methods prior to the placement of a subsequent layer to achieve at least 95 percent of maximum dry density in accordance with DOTD TR 401.
 - iii. Unpaved Areas:** The Director of the Department of Engineering may approve the use of native soil in unpaved areas when it is apparent that the backfill will be suitable for unpaved areas.
- 5. Pipe and Fittings.** New water mains installed using an open cut/trench method shall be polyvinyl chloride (PVC) pipe conforming to AWWA C900. New water mains between 8” and 48” diameter shall have a pressure class of 235 psi (DR18). Connections between pipe lengths shall be of an integrated “bell and spigot” push-on design with a rubber gasket seal. Rubber seal shall conform to AWWA C111. New water mains shall be the blue and labeled as “water”. Tracer wire and

identification tape shall be installed along the entire length of the water main for all lines installed using the open cut method. The tracer wire and identification tape shall be installed simultaneously with the water main.

6. Joint restraints for PVC pipe bell joints shall be restrained with an approved harness. All water main joints shall be restrained. Fittings shall be restrained as prescribed by the requirements of this Code.
7. New water mains installed using Horizontal Directional Drilling (HDD) methods shall be high-density polyethylene (HDPE) pipe conforming to AWWA C906, ASTM D3035 and ASTM 714. New HDPE water mains between 8 inches and 48 inches diameter shall have a pressure class of 200 psi (dr11) and conform to Ductile Iron Pipe Size (DIPS). Connections between pipe lengths shall be fused in accordance with the manufacturer's directions and recommendations. New HDPE water mains shall be the color black with a blue stripe. Connections to other water mains, including those of different material, shall be made using restrained mechanical joint adapters with stainless steel stiffener rings.
8. Fusible polyvinyl chloride (PVC) pipe conforming to AWWA C900 shall be permitted for new water mains installed using horizontal directional drilling (HDD) methods. New water mains between 8" and 30" diameter shall have a pressure class of 235 psi (DR18). Connections between pipe lengths shall be fused by the pipe manufacturer's approved installer and in accordance with the pipe manufacturer's instructions. New water mains shall be blue and labeled as "water". Connections to other water mains, including those of different material, shall be made using mechanical joint restraints.
9. Fusible PVC pipe shall be used for uninterrupted segments of new water mains greater than 1,000 linear feet that are installed using an open cut trench method.
10. Upon completion of water main construction, the drilling logs for all HDD installed water mains shall be provided with the record drawings/as-built plans. The drilling logs shall contain, at minimum, the size of the water main, the depth of installation, and the length of the segment.
11. Fittings and Valves. New water main fittings shall be ductile iron fittings conforming to AWWA C110/A21.10 with fitting joints conforming to AWWA C111/A21.11. Fittings shall be epoxy coated inside and out. Buried fittings shall be mechanical joint (MJ) fittings. The connection between the PVC force main and the fitting shall be restrained with approved mechanical joint thrust restraints. Restraint nuts and bolts shall be Teflon coated Cor-ten fasteners. Above ground fittings shall be flanged, and fasteners shall be stainless steel.
 - a. Water valves 3 inches or larger shall be AWWA C509 or C515 resilient-seated gate valves for potable water supply service. Water valves shall be fusion bonded epoxy and lined per AWWA C550. Water valves shall be restrained joint and restrained with approved mechanical joint thrust restraints. Restraint nuts and bolts shall be Teflon coated Cor-ten fasteners.
 - b. Buried valves, including 2 inch valves, shall have a 3-piece cast iron box installed and adjusted to finished grade. Buried valves shall have an AWWA operating nut and a cover labelled "water". Each valve box shall have a precast or cast-in-place concrete pad measuring at least 4 inches thick by 24 inches by 24 inches square or 4 inches thick by 24 inches round.

- c. Brass fittings shall be lead free. Brass fittings shall be products approved by the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems).
12. Manhole and valve covers shall have diamond tread pattern and have word “WATER” cast on the cover.

D. Testing and Disinfection.

1. Testing and Disinfection. All new water mains shall undergo hydrostatic testing to verify leak tightness. New water mains shall be tested a 125 psi for 2 hours. There shall be no pressure drops during the test. In the event the water main fails the test, the water main pipes shall be checked and repaired accordingly. The water main shall be re-tested.
 - a. Sections of pipe to be disinfected shall first be flushed to remove any solids or contaminated material that may have become lodged in the pipe. If no hydrant is installed at the end of the main, then a tap should be provided large enough to develop a velocity of at least two and five-tenths (2.5) feet per second.
 - b. After successful pressure testing, waterlines and water mains shall be disinfected in accordance with AWWA C601. Before being placed into service, all new mains and repaired portions of, or extensions to, existing mains shall be chlorinated so that the initial chlorine residual is not less than 50 mg/L and that a chlorine residual of not less than 25 MG/L remains in the water after standing 24 hours in the pipe.
2. Chlorine shall be applied by one of the methods that follow subject to approval by the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems):
 - a. A chlorine gas-water mixture shall be applied by means of a solution-feed chlorinating device, or the dry gas may be fed directly through proper devices for regulating the rate of flow and providing effective diffusion of the gas into the water within the pipe being treated. Chlorinating devices for feeding solutions of the chlorine gas, or the gas itself, must provide means for preventing the backflow of water into the chlorine.
 - b. A mixture of water and high-test calcium hypochlorite (65-70% Chlorine) may be substituted for the chlorine gas water mixture. The dry powder shall first be mixed as a paste and then thinned to a 1 percent chlorine solution by adding water to give a total quantity of 7.2 gallons of water per pound of dry powder.
 - c. Tablet disinfection is best suited to short extensions (up to 2500 ft.) (762 meters) and smaller diameter mains (up to 12 inch). Since preliminary flushing must be eliminated in using this method, it should be utilized only when scrupulous cleanliness has been used in construction. It shall not be used if trench water or foreign material has entered the main or if the water is below 41° F (5° C). Tablets should be placed in each section of pipe, hydrants, hydrant branches, and other appurtenances. Tablets must be at the top of the main and shall be attached by an adhesive. Tablets in joints between pipe sections, hydrants, hydrant branches, and appurtenances are to be crushed and placed inside the annular space or rubbed like chalk in butt ends of sections to coat them if the type of assembly does not permit crushing.

3. The preferred point of application of the chlorinating agent is at the beginning of the pipeline extension or any valved section of it, and through a corporation stop inserted in the pipe. The water injector for delivering the chlorine-bearing water into the pipe should be supplied from a tap made on the pressure side of the gate valve controlling the flow into the pipeline extension.
4. Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. Check valves may be used if desired.
5. Treated water shall be retained in the pipe at least 24 hours. After this period, the chlorine residual at pipe extremities and at other representative points shall be at least 25 mg/L.
6. In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be operated while the pipe line is filled with the chlorinating agent and under normal operating pressure.
7. Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its lengths shows upon test a chlorine residual of less than 1 mg/L. In the event chlorine is normally used in the source of supply, then the tests shall show a residual not in excess of that carried in the system.
8. All water mains must be shown to be free of bacterial growth as measured by the membrane filter technique or no tubes positive as measured by presumptive test, fermentation tube method before being placed into service. All samples shall be analyzed for bacteriological contamination at a laboratory certified by Louisiana Department of Health.
9. Satisfactory disinfection is demonstrated when two consecutive water samples, collected at least 24 hours apart, indicate no bacterial contamination.
10. The requirement for two consecutive samples at representative locations may be modified at existing community water supplies which practice chlorination, and which maintain adequate chlorine residual at the point of connection to the new water main. For such situations, satisfactory disinfection is demonstrated by a single sample set which shows no bacterial contamination.
11. Should the initial treatment result in an unsatisfactory bacterial test, the original chlorination procedure shall be repeated by the applicant until satisfactory results are obtained on successive samples taken at least 24 hours apart.

E. Fire Hydrants.

1. Fire hydrants shall products approved by the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) with built-in check valve. All fire hydrants shall be of the dry barrel type complying with the requirements of AWWA C502. Fire hydrants shall have at least three outlets per hydrant, and all outlets shall have national standard threads. One outlet shall be a 5 ½ inch pumper connection, and two outlets shall be 2 ½ inch hose connections.
2. All fire hydrants shall have a minimum of 24 inches of clearance between finished grade and the bottom of the 2 ½ inch outlet. If the fire hydrant becomes buried or the clearance is less than the required 24", the applicant shall raise the fire hydrant at his expense to achieve the minimum required clearance. The Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) will not accept the development until all fire hydrants have the required ground clearance. If the fire hydrant becomes buried after the Department of Utilities (for systems to be dedicated to St. Tammany Parish

Department of Utilities) or the Department of Engineering (for other systems) accepts the water infrastructure as a result of the building construction, The Department of Utilities will not install a water meter to service the property until the fire hydrant is uncover or raised. The responsibility of uncovering or raising the fire hydrant shall be the responsibility of the applicant.

3. Fire hydrants shall have a 6 inch diameter ductile iron lead an approved 6 inch diameter gate valve for isolation from the water main.
4. Fire hydrants shall be located at least 6 feet, or greater as necessary by regulatory requirement, from the edge of roadway pavement.
5. A minimum of three fire hydrants in the development shall be tested to verify actual fire flow and to classify the fire hydrants by observed flow rates. The number and selection of hydrants shall be determined by the local fire protection district. Representatives of the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) and the local fire protection district shall be present to observe fire flow testing and results.
6. After fire flow testing, the applicant shall paint the top and the three outlet caps of each fire hydrant in accordance with the requirements of this UDC.

F. Water Service Connections.

1. Water service connections shall have a brass tapping saddle, brass corporation stop, and a minimum 1inch connection size. Service connection piping shall be AWWA C901 polyethylene tubing, PE3408, D9. Water service connection shall have maximum cover of 2 feet.
2. The location of the water service connections shall be stamped in the curb face or road surface using an approved “w↑” symbol and the symbol shall be at least 4 inches by 8 inches. The arrow shall point in the direction of the water service connection.
3. Upon installation of the water service, a 2 inches by 2 inches stake with a florescent blue flag/streamer or painted florescent blue shall denote the location of the water service. Florescent blue shall be used for ease of locating by Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) inspectors. The water service "whip" shall be tied to the stake as shown in the water service detail. The stake shall extend at least 3 feet from the existing ground surface. The stake must be maintained by the applicant until the residence or building has been connected to the service line.
4. A 2 inch waterline shall wrap around each cul-de-sac but shall not tie back into the water main. Each cul-de-sac shall have a 2 inch blow off located at the end of the 2 inch waterline. Lines shall stop at the blow-off point.
5. Representatives of the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) shall be present on-site for all testing required for the acceptance of the development. The applicant shall contact the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) at least 48-hours prior to testing.
6. All water service connection shall be located at the lot line. Water service connections shall not be located within the driveway.

7. One sample station shall be installed between valves on the water main or between a valve and dead-end or cul-de-sac.
8. All new sample stations shall be a product approved by the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems).

G. Record Drawings.

The applicant shall record horizontal and vertical location of all new water infrastructure. The applicant shall provide "red line drawings" to the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) upon completion of construction. The applicant shall verify and certify elevations, depths and location of water infrastructure when preparing the record drawings/as-built plans for the project.

The Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) will not accept the project until the applicant provides an accurate, verified set of record drawings/as-built plans for the project.

The record drawings/as-built plans shall contain the following sheets of information:

1. All sheets shall be stamped with the block "record drawings" or "as-built plans" and shall be dated.
2. Title sheet with an index of sheets. Additional sheets to capture changes via change-order/plan change shall be listed in the index of sheets and be added at the end of the plan set.
3. General notes and legend. Strike-through notes which do not apply.
4. Site vicinity map showing new water and sewer infrastructure and tie-in location to the existing system(s).
5. Overall water plan and site/street specific water plans shall be provided as needed to show additional information and clarity. Conflicts and offsets shall be called out on all water plans.
6. Summary of material quantities. Final quantities for all installed materials (i.e. pipe, all valves, fire hydrants, etc.) Shall be provided.
7. Summary of valves and fittings. Information regarding the valves and fittings shall be tabulated. The location of each valve, tee, cross, and bend shall be determined by measuring along the centerline of the water main from fitting to fitting or valve to fitting. Tabulations shall be from street intersection to street intersection. The size, type, manufacture and model of the valves and fittings shall be recorded in the summary tabulations as applicable. The top-of-casting elevation of the valve housing shall recorded and noted in the summary of valves and fittings.

The applicant's redline drawings shall not be substituted for or accepted by Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) as record drawings/as-built plans.

The applicant shall provide record drawings/as-built plans in the following formats and quantities:

1. Three full-size 22 inch by 34 inch hard copies,
2. One copy in pdf format, and
3. One copy in AutoCAD 2016 format. The Department of Utilities will not issue a letter of acceptance until record drawings/as-built plans have been provided.

SEC. 900-8. SANITARY SEWERAGE AND SEWERAGE TREATMENT FACILITIES

SEC. 900-8.1 GENERALLY.

A. General.

1. Any private person or political entity who/which owns, leases or otherwise maintains or possesses control of any property which is situated in the unincorporated portion of the parish, and on which there is located a residence, camp, trailer coach or any other building, structure or establishment wherein people customarily or occasionally live, work or congregate, shall connect any such premises to a sewerage system as may be required for the premises by applicable law.
2. Any private person or political entity who/which owns, leases, or otherwise maintains or possesses control of any property which is situated in the unincorporated portion of the parish and on which there is located a residence, camp, trailer coach or any other building, structure or establishment wherein people customarily or occasionally live, work or congregate, shall, at such person's sole expense, connect any such premises to a public sewerage system if such public sewer line is situated within 300 feet of the boundary line of such premises. Such construction to connect the premises shall commence within the time required by R.S. 33:4042, upon receipt of a notice to connect. If such connection is not begun in the time required, the parish may connect the premises to the public sewer in the manner prescribed by R.S. 33:4041 et seq., and apportion the connection costs and fees to each owner as also provided therein. The parish shall have all other remedies for enforcement and collection of connection costs and fees as is provided by applicable law.
3. No certificate of occupancy shall be issued before sewerage systems are installed and operable or until the development is otherwise connected to a community (central) sewerage system approved by the Department of Environmental Services or assignee.
4. General provisions. For the purpose of complying with R.S. 33:4064.6(A), the provision of sewage disposal by use of community sewerage systems is a best management practice which results in the protection of public health and the environment.
5. Every responsible person shall know, be familiar with, and comply with the provisions of these regulations.
6. Whenever facts and circumstances exist whereby the Department of Environmental Services determines that a responsible person has acted in a manner contrary to or inconsistent with the provisions and requirements set + the department (hereinafter referred to as the "deficiency"), the department shall cause to be issued to said responsible person a notice which cites the deficiency, directs compliance with the rules and regulations of the department, and prescribes a reasonable amount of time to accomplish such direction.
7. If no or insufficient action is taken after proper notice, the department, upon expiration of the time prescribed in said notice, shall be authorized to impose upon said responsible person, as defined in this section, a penalty not to exceed \$100.00 per day for each day the deficiency existed from date of said notice, however, the cumulative total of such penalty shall not exceed \$10,000.00. In addition thereto, the department may terminate or require the termination of any utility service to the subject premises.

8. As further provided by applicable law, the Department of Environmental Services shall be authorized to enforce the collection of an imposed penalty, such to include the filing of an affidavit of lien on the subject property or any property found or within the parish which is owned by the responsible party.
9. Any responsible person who has been assessed a penalty may appeal the imposition of the penalty in writing to the Parish Council within 30 days. The Parish Council shall thereafter hear the appeal at a public hearing at its next regular meeting. An appeal from the Council's decision shall be to the 22nd Judicial District Court for the parish within 30 days of the council's decision.
10. The Department of Environmental Services shall be authorized to recommend or prescribe additional procedures or practices he deems necessary and advisable to effect the provisions of this section.
11. For the purposes of this section, the term "community sewerage system" means any sewerage system which consists of a collection and/or transport system which serves multiple connections and/or a pumping facility and/or a treatment facility; and the term "facility" means any and all the apparatus and appurtenances which may be associated with the subject element of the community sewerage system and may mean more than one facility.
12. Every governed sewerage system or governed water system shall be constructed or modified in accordance with the plans and specifications for installation which have been approved in advance by the department prior to the start of construction or modification.
13. Whenever any person commences any activity or action to connect to, or to otherwise construct or modify a sewerage or water system without first having complied with the applicable provisions of this article, then, in addition to all other remedies provided by applicable law, the department shall be entitled to collect a fee equal to 200 percent of the established fee otherwise due for said activity or action.
14. The provisions of this article shall have force and effect within the unincorporated portion of the parish.
15. Nothing in these rules and regulations shall be construed to preclude, stay or otherwise preempt the state health officer or other such regulatory authority from imposing more stringent requirements which relate to the construction or discharge of sewage effluent from a non-community-type sewerage system.

B. When Required.

1. Community sewerage shall be provided for all developments for which the following criteria are met:
 - a. Sewage effluent cannot be disposed of on site in accordance with the requirements of LAC Title 51 (Sanitary Code)
 - b. Whenever a discharge permit for individual systems can be obtained from the Department of Environmental Quality (LDEQ).
2. Whenever the Department of Environmental Services determines that a subdivision or development which is subject to the provisions of this code is in proximity to the sewage collection or treatment facility of a qualified community sewerage system, said subdivision or development shall be required to connect thereto.

3. For the purposes of this subsection, the term "qualified community sewerage system" means a community sewerage system:
 - a. Which has the actual and/or anticipated capacity which will be required to realize the peak sewage demand of the subject subdivision or development; and
 - b. The operation and maintenance of which is likely to be in accordance and compliance with all regulatory requirements; all as determined by the Department of Environmental Services.

C. Construction or Modification of a Sewerage System.

1. The requirements set forth in R.S. 33:4064.1 et seq. and as further provided in the rules and regulations of the Department of Environmental Services of the Parish, the Department of Environmental Services shall have authority over all construction necessary or incidental to the provision of sewage disposal in the unincorporated portion of the parish. Plans and specifications for a community sewerage system to be constructed in said portion of the parish shall be submitted to and approved by the Department of Environmental Services prior to initiating such construction, and the conduct of such construction shall be subject to inspection by the Department of Environmental Services. Copies of any amendments to plans and specifications for such systems shall also be submitted to the Department of Environmental Services, and the Department of Environmental Services shall approve such amendments prior to operation of such systems.
2. Prior to the start of construction or modification of a community sewerage system, detailed plans and specifications shall be submitted by the applicant for the system to be constructed or modified and shall be reviewed and, contingent upon any revisions to such plans and specifications as may be required to meet compliance, approved by the Department of Environmental Services in accordance and compliance with applicable law which shall include the relevant provisions of Title 51 of the Louisiana Administrative Code (Sanitary Code).
3. Whenever an existing community sewerage system is designated for connection to a proposed subdivision or development, the detailed plans and specifications shall include the discharge permit number issued by the Louisiana State Department of Environmental Quality.

D. Approval by Department of Environmental Services.

1. As such relates to the provisions this Code, whenever there is a participatory and coordinated effort between the Department of Environmental Services and the District Engineer of the Louisiana Department of Health, Office of Public Health, the Department of Environmental Services shall affirm that the community sewerage system is in accordance and compliance with applicable laws.
2. If after one year from the date on which such approval was granted the proposed construction or modification is not complete, any approval or affirmation thereof by the Department of Environmental Services shall be void. Accordingly, prior to the conduct of any proposed or subsequent construction or modification, the responsible party shall again comply with the provisions of this Code
3. However, in response to a written application from the applicant, the Department of Environmental Services may approve a conditional or absolute waiver of the effect of the provisions of this section.
4. Any review and subsequent approval of the plans and specifications for the construction or modification of a community sewerage system is for the use and benefit of the Department of

Environmental Services and shall not be considered as an affirmation that the construction, modification, or operation of the system is or will be in accordance or compliance with applicable law which shall include the relevant provisions of which shall include the relevant provisions of Title 51 of the Louisiana Administrative Code (Sanitary Code).

5. Every community central sewerage system shall be constructed or modified in accordance with the plans and specifications for installation which have been approved in advance by the Department of Environmental Services prior to the start of construction or modification.

E. Inspections.

1. To monitor the construction or modification of any community sewerage system, the Department of Environmental Services may authorize any employee or agent of the Department of Environmental Services to inspect at a reasonable time and in a reasonable manner any such system in order to determine that its construction or modification is conducted in accordance and compliance with the plans and specifications for installation which have been approved in advance by the Department of Environmental Services. In carrying out this power, said authorized employee or agent may enter private and public properties. As such relates to the provisions of subsection (a) of this section, whenever there is a participatory and coordinated effort between the department and the parish engineer, the department shall acknowledge the results of any inspection conducted by the Department of Environmental Services.
2. Any inspection of a community sewerage system pursuant to a provision of this section is for the use and benefit of the Department of Environmental Services and shall not be considered as an affirmation that the construction, modification, or operation of the inspected system is or will be in accordance or compliance with applicable law.
3. The provision of sewage disposal shall not occur until the constructed or modified community sewerage system has been inspected by the Department of Environmental Services or their designee or by the appropriate state authority and determined to be constructed or modified in accordance with the applicable and appropriate plans and specifications which have been approved in advance by the Department of Environmental Services and/or appropriate state authority. Prior to the granting of Final Subdivision Plat approval by the parish Planning Commission, the as-built drawings and detail sheets for the system, as prepared by a licensed professional engineer, shall be submitted to the Department of Environmental Services for their review and comment.
4. Responsibility and authority of the Department of Environmental Services. As such relates to any or all of the provisions of this section and to the extent provided in R.S. 33:4064.1 et seq., the Department of Environmental Services is authorized to adopt rules and regulations, the purpose of which shall be to plan, adjust, and relocate community sewerage systems within the unincorporated portion of the parish to conform with this development plan and, to that end, the Department of Environmental Services shall establish rules and regulations, objective standards, guidelines, and practices which may be necessary to effect the provisions of this section or may avail themselves of the provisions of R.S. 33:4064.5(D), or both.

SEC. 900-8.2 CONNECTIONS TO PARISH SYSTEM.

A. Fees for Planning.

The fee assessed to review plans and specifications for the construction or modification of any sewerage or water system or systems, the construction or modification of which is associated with a subdivision

development proposed for approval by the parish planning commission shall be in accordance with the provisions of the parish Ordinance No. 91-1470, to-wit: \$40.00 plus \$10.00 per lot upon application for tentative plan approval; \$20.00 per lot upon application for preliminary plan approval; and \$30.00 per lot upon application for final plan approval.

The fee assessed to review the plans and specifications for the construction or modification of a governed water system shall be:

1. Ten dollars plus \$0.04 per each linear foot of water distribution pipe to be constructed or modified, and/or \$0.06 per each linear foot of sewage collection pipe to be constructed or modified in addition to \$10.00 per water supply facility (e.g., well) to be constructed or modified, and/or per sewage collection or treatment facility (e.g., plant, pond, lift station) to be constructed or modified.
2. It is the intent of the provisions of this section that a water supply facility or a sewage collection or treatment facility shall mean the individual, distinct components, respectively of a governed water system or governed sewerage system. Hence, a sewage treatment system with one or more aerated lagoons and associated pumping and treatment infrastructure in immediate proximity thereto shall be considered one sewage treatment facility. However, an associated, but remote lift station shall be considered a separate sewage collection facility. Manhole access points shall not be considered a separate sewage collection facility, but merely an element of the linear footage of the sewage collection piping.
3. Any fee assessed pursuant to a provision of this section shall be due and payable in full to the department upon the ordinary application for subdivision plan approval by the parish planning commission, as provided by an ordinance of the parish, or otherwise upon the submittal of the detailed plans and specifications to the department by the responsible person for the governed sewerage system or governed water system to be constructed or modified. Upon collection of any fee assessed pursuant to a provision of this section, such fee shall be placed into a special fund, the use of which shall be for the administration of the provisions of this section which relate to the review of plans and specifications for the construction or modification of sewerage or water systems.

B. Fees for Inspections.

The fee assessed to inspect the construction or modification of a governed water system shall be:

1. \$0.12 per each linear foot of water distribution pipe to be constructed or modified, and/or \$0.22 per each linear foot of sewage collection pipe to be constructed or modified; in addition to \$60.00 per water supply facility (e.g., well) to be constructed or modified, and/or per sewage collection or treatment facility (e.g., plant, pond, lift station) to be constructed or modified.
2. Any fee assessed pursuant to a provision of this section shall be due and payable in full to the department upon application for preliminary plan approval by the parish planning commission, or otherwise, upon the submittal of the detailed plans and specifications to the department by the responsible person for the governed sewerage system or governed water system to be constructed or modified. Upon collection of any fee assessed pursuant to this section, such fee shall be placed into a special fund, the use of which shall be for the administration of the provisions of this section which relate to the inspection of sewerage or water systems to be constructed or modified.

SEC. 900-8.3 MONITORING.

A. General.

1. Monitoring of Sanitary Sewerage System. Every governed sewerage system shall make available to the department for its review, upon the department's request, all monitoring data required to be furnished to the Louisiana Department of Environmental Quality (DEQ) as set forth in the discharge permit issued by the DEQ for the treatment works for the system. Such monitoring data shall be reported on a discharge monitoring report (DMR) form (EPA No. 3320-1 or an approved substitute). For inspection purposes, copies of all such monitoring reports shall be kept on-site at, or in reasonable proximity to, the permitted facility for a period of at least three months from the date of the sample measurement or report of such measurement.
2. Every sewerage system whose discharge of sanitary is subject to provisions of Louisiana Environmental Quality Act, as amended, or any rules and regulations effective or promulgated under authority of said Act shall obtain a Louisiana Pollution Discharge Elimination System (LPDES) permit in accordance and compliance with applicable law, and shall comply with the provisions set forth in the LPDES permit, or any order or directive issued by the DEQ which related to the/a LPDES permit.

SEC. 900-8.4 REQUIRED DISPOSAL OF SEWERAGE EFFLUENT.

A. General.

1. All new or existing premises, public or private, where people live, work or congregate shall be provided with approved toilet facilities, including hand washing facilities. Such plumbing facilities shall be properly connected to a community sewerage system, whenever available, or to an individual on-site sewage disposal system which is specifically approved for the premises by the state health officer or his duly authorized representative after determining that the installation and operation of an individual on-site sewage disposal system will not create a nuisance or public health hazard.
2. It shall be the duty of the owner, manager or agent of any occupied premises, public or private, where people live, work or congregate to provide the premises with an approved method of sewage disposal in compliance with the requirements of this code.
 - a. Whenever the DES determines that any building or structure to be constructed is in proximity to the sewage collection or treatment facility of a qualified community sewerage system, said building or structure shall be required to connect thereto. When a qualified community sewerage system is available, and there is an approved public water supply with adequate water capacity, all plumbing fixtures within any building or structure shall be connected to such approved public water supply and community sewerage system. For purposes of this section, the term "qualified community sewerage system" means a community sewerage system:
 - b. Which has the actual and/or anticipated capacity which will be required to realize the peak sewage demand of the subject building or structure; and
3. The operation and maintenance of which is likely to be in accordance and compliance with all regulatory requirements; all as determined by the DES.

4. Every non-community-type sewerage system to be installed in the unincorporated portion of the parish shall be so constructed that the disposal of its sewage effluent is realized essentially within the boundaries of the building site upon which the sewage effluent originated by means of an approved post-secondary treatment sewage effluent disposal method.

SEC. 900-8.5 WASTEWATER STANDARDS PRIOR TO ENTERING COLLECTION SYSTEMS OF ST TAMMANY PARISH.

A. General.

1. Pursuant to R. S. 33:4064.4(C), the Parish Department of Environmental Services "shall be authorized to adopt rules and regulations relative to the impact upon, and the construction, modification, perpetuation, sustenance, operation, maintenance, connection and inspection of sewerage systems and the provision and/or supervision of environmental services, all within the unincorporated portion of the parish..."
2. Wastewater generated from the industrial and light industrial customers shall not exceed the following standards prior to said wastewater entering the wastewater collection systems owned and operated by the parish:

Parameter	Limit
BOD5	200 mg/L
COD	300 mg/L
Oil and Grease	50 mg/L
TSS	200 mg/L
pH	not less than 5.8 S.U. and not more than 9.6 S.U.

3. Failure by any customer to provide this quality wastewater prior to treatment by the parish shall result in termination of wastewater treatment services and/or water service at the sole discretion of the parish.

SEC. 900-8.6 SEPTAGE AND SLUDGE DEVELOPMENT STANDARD

A. General.

1. Septage and sludge treatment facilities within the parish shall comply with all of the provisions of the state department of health and hospitals, hereinafter referred to as Department of Health and Hospitals or its successor agency, the sanitary code of the state and the department of environmental quality, hereinafter referred to as Louisiana Department of Environmental Quality or its successor agency, and the water quality control standards of the state.

B. Plans and Specifications.

1. Plans and specifications. The proposed applicant of a septage/sludge treatment facility shall be required to submit to Department of Environmental Services a complete set of plans and

specifications along with the completed "Design Summary Package," as required by Louisiana Department of Health, detailing the type of septage/sludge treatment facility to be installed.

2. Such plans and specifications shall be certified by a registered professional engineer of the state and submitted in triplicate.
3. Upon review and approval of the plans and specifications by the Department of Environmental Services, the plans and specifications will be forwarded to the Louisiana Department of Health for their approval.

C. Construction Time Limitations.

The applicant must comply with the time limitations as provided by LDH with respect to their approval, and those of Louisiana Department of Environmental Quality concerning the discharge permit.

D. Operations and Maintenance.

1. The applicant shall be responsible for the operation and maintenance at his expense, of the septage/sludge treatment facility and further compliance with all requirements of this article and with federal and state laws and regulations. This may include hiring of a certified operator, or a consultant that provides such a service, and adhering to the instructions and limits as laid out in the Louisiana Department of Environmental Quality discharge permit.
2. Initial start-up of operations at newly constructed facilities shall not commence until the Department of Environmental Services has been provided with as-built drawings certified by a licensed engineer and a copy of the final Louisiana Department of Environmental Quality discharge permit.

E. Management of Facilities and Transfer of Ownership.

1. The applicant for a septage/sludge treatment facility may transfer the ownership rights to another party if so desired. However, in any case, the applicant shall establish and submit to the department, a "Management Declaration" which shall establish the responsibility of the applicant or the transferee for the operation and maintenance and funding requirements for the septage/sludge treatment facility.
2. The applicant must satisfy the concerns of the parish and of Louisiana Department of Health for their approval that said transferee is valid, solvent and capable of meeting all applicable rules and regulations.

F. Posting of Bonds/Letter of Credit Required.

1. Once the septage/sludge treatment facility has been installed, the applicant and/or owner shall contact the department. An on-site inspection to ensure that the facility has been installed, and is operable, will be initiated.
2. If upon inspection, the department determines that such facility is not found to be built according to the plans and specifications, the applicant shall be required to make the appropriate corrections at its expense and shall not be allowed to continue any further commercial activities related to the facility until said corrections have been made and certified as being correct by the department.
3. The Engineering Department shall establish a warranty obligation in the form of a warranty bond/letter of credit for a period of not less than one year in order to ensure the adequate operation

and maintenance of the facility. The director shall submit his bond recommendation for approval to the Parish Council.

4. All warranty bonds/letters of credit shall be obtained from an accredited financial institution recognized in good standing by the parish. The release of warranty bonds/letters of credit shall follow established parish procedure.

SEC. 900-8.7 DESIGN CRITERIA FOR SEWERAGE SYSTEMS

A. General.

Central sewerage systems shall be designed, constructed, placed into service and operated per the requirements of Louisiana Administrative Code, Title 51 (Sanitary Code), and Recommended Standards for Wastewater Works as promulgated by the Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, Latest Edition; except as otherwise provided for or modified herein.

B. Layout of Utilities in the Rights of Way

1. Sewerage utilities shall be located outside of streets for all new developments. Water utilities shall be located on the opposite side of the road as sewerage utilities. Sewerage utilities may be located under bike paths, sidewalks, incidental paving, driveways, and parking areas.
2. In general, gravity sewerage mains and force mains and valves shall be located between the right-of-way line and top of ditch or subsurface drainage feature. A horizontal clearance of minimum 3 feet shall be maintained between the top of ditch (or subsurface drainage feature) and edge of the gravity main, force main and/or valve. If the clearance requirement cannot be met due to field conditions, the Applicant shall coordinate with the Department of Public Works to determine an acceptable location of the main and/or the valve. Under no circumstances shall valves and their access be constructed in ditches or under subsurface drainage features.

C. Design Basis.

System conveyance and treatment facilities shall be designed for maximum day demand at the design year. All wastewater treatment facilities shall be protected to at least the 100-year flood elevation or maximum flood of record.

D. General Design Considerations.

In addition to the requirements of Louisiana Administrative Code, Title 51 (Sanitary Code), and Recommended Standards for Wastewater Works as promulgated by the Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, Latest Edition; the applicant shall adhere to the following requirements:

1. *Loadings.* Sewerage loadings for plants and collection systems shall be determined by the Sewerage Loading Criteria of Louisiana Administrative Code, Title 51 (Sanitary Code) or the requirements of Louisiana Administrative Code, Title 51 (Sanitary Code), whichever provides the most stringent requirements.
2. *Design of Sewers.* Gravity sewer shall be designed in accordance with the requirements of Chapter 30 – Sewers contained within Recommended Standards for Wastewater Works as promulgated by the Great Lakes Upper Mississippi River Board of State and Provincial Public Health and

Environmental Managers, Latest Edition. Gravity sewers shall be designed for a minimum velocity of 2 feet per second and a maximum velocity of 8 feet per second.

3. *Minimum cover over gravity mains.* The minimum cover over gravity mains shall be 3 feet in unpaved areas and 5 feet under roadways. All manhole rim elevations shall be at finished grade in paved areas and 6 inches above finished grade in unpaved areas.
4. *Force Mains.* Gravity sewer shall be designed in accordance with the requirements of Chapter 40 – Force Mains contained within Recommended Standards for Wastewater Works as promulgated by the Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, Latest Edition. Force mains shall be designed for a minimum velocity of 3 feet per second with one pump operating at its lowest speed and a maximum velocity of 8 feet per second with all pumps operating at their maximum speed. Air release, air vacuum, and combination air valves shall be provided along all force mains to preclude hydraulic lock of the force main.
5. *Sewerage Pumping Stations.* The use of sewer lift stations should be minimized. However, when pump stations cannot be avoided, they shall be designed for ease of maintenance, consistent operation, and a long service life of continuous operation in a harsh operating environment. Sewerage pumping stations shall be designed in accordance with the requirements of Chapter 40 – Force Mains contained within Recommended Standards for Wastewater Works as promulgated by the Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, Latest Edition, NFPA 70 – National Electrical Code (Latest Edition), and NFPA 820 – Standard for Fire Protection in Wastewater and Collection Facilities (latest edition).
 - a. Sewerage pump stations shall be of the submersible type, inclusive of the following:
 - i. A minimum of 2 submersible pumps, each of which has capacity to handle the design flow;
 - ii. Rail system which allows for removal of the pumps without entry into the wet well;
 - iii. Check valves and isolation valves contained within a separate below grade vault;
 - iv. Adequate controls with overload and lightning protection and alternators.
 - v. Necessary servitudes, access roads, driveways, and security fencing.
 - vi. All conduits entering hazardous areas shall be sealed in accordance with the requirements of NFPA 70.
 - vii. Sufficient wet well storage such that no pump shall be required to start more than 12 times per hour at design flow.
 - b. Servitudes shall extend a minimum of 10 feet beyond any components of a sewer lift station in every direction. The parish may require additional servitudes if deemed necessary.
 - c. Sewer lift stations shall not be constructed on public right-of-way. Sewer lift stations shall be constructed on private property and within a sewer servitude dedicated to the parish.
6. *Control Panels.* Each sewerage pumping station shall be provided with a control panel to provide un-attended automatic operation of pumps. Panels shall be completely assembled, wired, and

tested. Panel manufacturers shall be certified by Underwriters Laboratories, (UL) to manufacture UL 508A and 698A control panels.

- a. The control panel shall be enclosed in a NEMA 4X Stainless Steel or Fiberglass enclosure with an inner safety door to isolate all power components and protect the operator. HOA selectors and run lights shall be provided for each pump.
 - b. An alternating relay shall be provided to alternate pumps on successive cycles of operation.
 - c. Provisions shall be made to provide simultaneous operation of both pumps on high demand.
 - d. A terminal strip shall be provided to connect all float switches and remote pilot devices. All electrical devices shall be finger safe or have finger safe covers to prevent incidental contact with energized components. Only control panels with high quality individual industrial components with high withstand capability to power surges will be acceptable. Unitized printed circuit board type control panels will not meet this specification.
 - e. All 480-volt control panels shall contain a control power transformer (CPT), with fused primary and secondary, to reduce the control voltage to 120 VAC and shall be sized to meet all control requirements. Transformers required to power receptacles or external devices shall be furnished by the electrical contractor and mounted outside of the control panel.
 - f. On 208 volt and 240 volt panels, a neutral wire shall be brought to the panel by the electrical contractor for connection to the control panel neutral block.
 - g. Furnish, when required by the pump manufacturer, all necessary start relay(s), start capacitor(s) and run capacitor(s) needed for the correct operation of single phase motors. All start/run components and circuits shall be compatible with the pump motor(s) being used. (Applies to single-phase control panels only.)
 - h. Where submersible pumps are utilized, a moisture detection circuit shall be provided to sense moisture in the pump seals. Provide moisture detection relays and other devices as recommended by the particular pump manufacturer. A warning light inside the panel shall illuminate upon this condition but shall not cause the pump to lockout. However, where the moisture detector is internally connected in series with the over temperature detector, it shall stop the pump. The panel shall be wired to connect an over temperature device in or on the pump that will activate on high temperature and stop the pump. The temperature device shall automatically reset when the temperature drops to normal. The accompanying high temp pilot light shall also auto reset.
 - i. The panel shall be installed such that sewer gasses cannot enter the panel.
7. *Sewer Pumps.* Sewer pumps shall of the submersible non clog or submersible grinder type, be of cast iron construction, suitable for long term immersion in and pumping of raw, unscreened sewerage. Pumps shall be suitable for operation in a Class I, Division 1 Classified area.
 8. *Wet Wells and Valve Pits.* Wet wells and valve pits shall be constructed of fiberglass reinforced plastic construction with a cast – in – place bottom and top slab. All stations shall be provided with an aluminum hatch rated for H-20 live loads. Top slabs shall be designed for H-20 live loads.

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- a. Gravity lines shall not directly enter the wet well. A sewerage collection manhole with adequate stub outs shall be provided. The collection manhole shall be connected to the wet well by an adequately sized conveyance pipe for any future expansion of the station.
 - b. All bolts, nuts, anchor bolts, guard rails and chains for submersible pumps shall be of 304 stainless steel with aluminum hatch and stainless steel frame and hardware.
 9. *Treatment Facilities.* Treatment facilities shall be designed and constructed in accordance with the of Louisiana Administrative Code, Title 51 (Sanitary Code), and Recommended Standards for Wastewater Works as promulgated by the Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, Latest Edition, and the site – specific discharge permit issued by the Louisiana Department of Environmental Quality. Treatment facilities shall also comply with the requirements of NFPA 70 – National Electrical Code (Latest Edition), and NFPA 820 – Standard for Fire Protection in Wastewater and Collection Facilities (latest edition).
 - a. Wastewater treatment facilities may employ any of the following technologies:
 - i. Activated Sludge;
 - ii. Trickling Filters;
 - iii. Partial Mix, Complete Mix Aerated Lagoons
 - iv. Moving Bed Biological Reactors
 - v. Fixed Growth Biological Reactors
 - vi. Sand or other media filtration.
 - b. The following treatment technologies may not be employed:
 - i. Facultative Lagoons
 - c. Gaseous chlorine and sodium hypochlorite, and ultraviolet disinfection shall be acceptable methods of disinfection.
 10. *Low Pressure Sewerage Systems.* The Department of Utilities will not accept ownership of low-pressure sewerage systems.

SEC. 900-8.8 CONSTRUCTION CRITERIA FOR SEWERAGE SYSTEMS

A. General.

1. The applicant shall provide all work necessary for the construction of sewerage collection and treatment systems to be installed.
2. The Director of the Department of Engineering, with the concurrence of the Director of the Department of Utilities, may waive these construction criteria when alternate minimum standards are proposed which in their opinion will provide for acceptable quality of construction.
3. The Department of Utilities will witness testing performed for systems to be dedicated to St. Tammany Parish Department of Utilities. The Department of Engineering will observe testing for other systems.

4. The applicant shall provide a one-year warranty for all newly installed sewerage infrastructure associated with the construction of the project, including but not limited to gravity sewer pipelines, manholes, force mains, sewerage pumping stations, valves, and treatment facilities. The warranty shall extend for a period of one year from the date of final acceptance. The applicant shall furnish all materials and labor required to correct deficiencies in the system at the expense of the Applicant.
5. The applicant shall assume the responsibility for the layout of the work.
6. Parallel sewer lines and water lines shall be laid in separate trenches with a minimum horizontal clearance between all water lines and all sewer lines of 10 feet. The minimum horizontal clearance between gravity sewer lines and sewer force mains shall be 10 feet. In the event a water line crosses over a sewer line, the minimum vertical clearance shall be 18 inches between the water and sewer lines. All water lines shall be above sewer lines. Any clearances less than the above mentioned shall subject to approval of the Department of Public Works.
7. Minimum horizontal clearances of 5 feet and minimum vertical clearance of 18 inches shall be maintained between water lines and other utilities, such as communication lines, subsurface electrical lines, and gas lines. If water lines and sewer lines are located on opposite sides of the street/road, the subsurface electrical line shall be located on the same side as the sewer line.

B. Excavation, Bedding, and Backfilling.

The applicant shall provide all excavation required for the installation of sewerage systems in accordance with the approved plans and the requirements of this code. Excavations for sewerage lines and structures shall be prepared, bedded, and backfilled in accordance with the requirements below and as shown on the approved plans.

1. *Trench Protection.* Trench excavations shall be protected in accordance with applicable Federal, State, and local regulations, laws, and rules; but shall not be less than the standards and regulations established by OSHA in 29 CFR Part 1926.
2. *Removal of Water.* The applicant shall provide and maintain ample means and devices with which to promptly remove and properly dispose of all water entering the excavation and other parts of the work until all work has been completed. No sanitary sewer shall be used for disposal of trench water, unless specifically approved by the Department of Public Works. No water containing settleable solids shall be discharged into storm sewers.
3. *Bedding and Backfilling.*
 - a. *Bedding.*
 - i. Sewer force mains shall be bedded in a clean sand. The clean sand bedding material shall be placed in 8 inch lifts and compacted to 95% of optimal dry density as determined by ASTM D698.
 - ii. The minimum thickness for pipe bedding material under all sewer force mains shall be a minimum 6 inches or as dictated by the recommendations outlined in the geotechnical report. The bedding material shall extend to the spring line of the pipe.
 - iii. When a soft and/or wet excavation bottom has been encountered, the excavation bottom shall be stabilized in accordance with the recommendations outlined in the geotechnical report. A minimum of 6 inches of crushed limestone meeting the No.

57 gradation of ASTM C33 shall be used to stabilize a soft and/or wet excavation bottom. A minimum of 6" of the soft and/or wet native material shall be removed prior to placing the crushed limestone foundation. The crushed limestone foundation shall be placed on top of a combination of geotextile and bi-axial geogrid fabrics. The crushed limestone foundation shall be placed in 8 inch lifts and compacted to 75% of the relative dry density as determined by ASTM D4253. The geotextile fabric shall encase the limestone foundation.

- iv. Sewer valves and sewer structures (i.e. manholes, valve vaults, equipment pads) shall be constructed on a bed of crushed limestone meeting the No. 57 gradation of ASTM C33. The minimum thickness of the limestone base and the use of geosynthetic fabrics shall be dictated by the recommendations outlined in the geotechnical report. At a minimum, the limestone base shall have a minimum thickness 12 inches under sewerage structures and 6 inches under sewerage valves. The limestone base shall be placed on top of a combination of geotextile and bi-axial geogrid fabrics. The crushed limestone material shall be placed in 8" lifts and compacted to 75% of the relative dry density as determined by ASTM D4253
- v. Gravity Sewer Mains shall be bedded in a minimum of 12 inches of crushed limestone meeting the No. 57 gradation of ASTM C33. The crushed limestone foundation shall be placed in 6" lifts and compacted to 75% of the relative dry density as determined by ASTM D4253. The geotextile fabric shall encase the limestone bedding. The bedding material shall extend to the spring line of the pipe.

b. Backfill Types:

- i. **Type A Backfill:** Type A Backfill shall be crushed stone, recycled Portland cement concrete, or recycled asphalt pavement (RAP). When
- ii. **Type B Backfill:** Type B Backfill shall be structural fill, A-4 or better or granular material.
- iii. Type A backfill may be substituted for Type B backfill.
- iv. **Pipe under Concrete Pavements:** Type B backfill may be used as initial and final backfill for all pipes, culverts, or drains under Portland cement concrete pavements.
- v. **Pipe under Flexible pavements:** All reaches of cross drains, exclusive of those portions of the pipe which are under shoulders, and all other culverts, pipes, or drains that cross the centerlines of new or existing flexible pavement roadways, including intersections that are under flexible pavements, shall receive an initial backfill of Type A material. Type B backfill materials may be used as final backfill for all pipes.
- vi. **Other Areas:** All reaches of all culverts, pipes, or drains under flexible pavements that do not cross the centerlines of new or existing roadways, and exclusive of those portions of the pipe which are totally under shoulders, shall receive an initial and final backfill of Type B material.

c. Compaction:

- i. **Type A:** For all sewer pipes under paved and unpaved areas, where using Type A backfill material, thoroughly hand compact the Type A backfill under the pipe haunches and then dynamically compact in layers not exceeding 8 inches compacted thickness. Initially

compact under the haunches of the pipe by hand tamping or other acceptable means, until reaching a level in which the dynamic tamping can commence. Compact each lift by applying at least eight passes of a hand operated, dynamic mechanical compaction device over the surface of each lift. The in-place density of Type A backfill materials and bedding materials will not be measured or calculated. Place Type A backfill, exclusive of RAP and flowable fill, at or near optimum moisture content in accordance with DOTD TR 415 or 418. Place and compact RAP materials in a slightly moist condition

- ii. **Type B:** For all sewerage pipes where Type B backfill is allowed, place the Type B material in layers not exceeding 8 inches compacted thickness. Compact with suitable mechanical equipment. Determine the maximum dry density of initial or final Type B backfill under all paved areas which are to be under traffic in accordance with DOTD TR 415 or TR 418. Determine in-place density in accordance with DOTD TR 401. Place initial and final Type B backfill under all paved areas under traffic, at or near optimum moisture content in accordance with DOTD TR 415 or TR 418. Compact each layer by approved methods prior to the placement of a subsequent layer to achieve at least 95 percent of maximum dry density in accordance with DOTD TR 401.
 - iii. **Unpaved Areas:** The Director of the Department of Engineering, with the concurrence with the Director of the Department of Utilities, may approve the use of native soil in unpaved areas when it is apparent that the backfill will be suitable for unpaved areas.
4. *Pipe and Fittings.* New sewerage force mains installed using an open cut/trench method shall be polyvinyl chloride (PVC) pipe conforming to AWWA C900. New sewerage force mains between 8 inch and 48 inch diameter shall have a pressure class of 235 psi (DR18). Connections between pipe lengths shall be of an integrated “bell and spigot” push-on design with a rubber gasket seal. Rubber seal shall conform to AWWA C111. New sewerage mains shall be the green and labeled as “sewer”. Tracer wire and identification tape shall be installed along the entire length of the sewerage main for all lines installed using the open cut method. The tracer wire and identification tape shall be installed simultaneously with the sewerage main.
- a. Joint restraints for PVC pipe bell joints shall be restrained with an approved harness. All sewerage force main joints shall be restrained. Fittings shall be restrained as prescribed by the requirements of this Code.
 - b. New sewerage force mains installed using Horizontal Directional Drilling (HDD) methods shall be high-density polyethylene (HDPE) pipe conforming to AWWA C906, ASTM D3035 and ASTM 714. New HDPE sewerage force mains between 8” and 48” diameter shall have a pressure class of 200 psi (dr11) and conform to Ductile Iron Pipe Size (DIPS). Connections between pipe lengths shall be fused in accordance with the manufacturer's directions and recommendations. New HDPE sewerage mains shall be the color black with a green stripe. Connections to other sewerage mains, including those of different material, shall be made using restrained mechanical joint adapters with stainless steel stiffener rings.
 - c. Fusible polyvinyl chloride (PVC) pipe conforming to AWWA C900 shall be permitted for new sewerage force mains installed using horizontal directional drilling (HDD) methods. New sewerage force mains between 8 inch and 30 inch diameter shall have a pressure class of 235 psi (DR18). Connections between pipe lengths shall be fused by the pipe manufacturer's approved installer and in accordance with the pipe manufacturer's instructions. New sewerage

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- force mains shall be green and labeled as “sewer”. Connections to other sewerage force mains, including those of different material, shall be made using mechanical joint restraints.
- d. Fusible PVC pipe shall be used for uninterrupted segments of new sewerage force mains greater than 1,000 linear feet that are installed using an open cut trench method.
 5. *Drilling logs.* Upon completion of sewerage force main construction, the drilling logs for all HDD installed sewerage force mains shall be provided with the record drawings/as-built plans. The drilling logs shall contain, at minimum, the size of the sewerage force main, the depth of installation, and the length of the segment.
 6. *Pipe specifications.* Gravity sewerage pipe shall consist of polyvinyl chloride (pvc) gravity pipe 4 inches through 15 inches in diameter (mains and lateral service connections) shall meet astm specification d-3034 (latest revision), dr26 with minimum pipe stiffness of 115 psi. Pvc pipe larger than 15 inches in diameter shall meet astm specification f-679 with minimum pipe stiffness of 115 psi. Fittings shall meet astm specification d-3034 (latest revision), dr35. Pipe sections and fittings shall be integral cast bell and elastomeric gasket as recommended by the manufacturer and astm specification d-3212. Installation of the sewer gravity lines shall conform to astm specifications d-2321.
 7. *Pipe laying and installation.* Pipe laying shall begin at downstream end of line. Bell or groove ends of pipe shall be placed facing upstream. Bell holes shall be excavated to assure that only the pipe barrel shall bear upon the trench bedding material. No blocking under the pipe will be permitted.
 - a. Extreme care shall be used when handling and installing pipe and fittings. Under no circumstances shall pipe or fittings be dropped either into the trench or during unloading. The interior of the pipe shall be kept clean of oil, dirt, and foreign matter.
 - b. When necessary to cut and machine all pipe in the field, the appropriate tools as recommended by the pipe manufacturer, shall be used. A “full insertion mark” shall be provided on each field cut pipe end. Field-cut pipe shall be beveled with a beveling tool specifically made for the pipe material.
 - c. The jointing of the pipe shall be done in strict accordance with the pipe manufacturer’s instructions and shall be done entirely in the trench. Joints and gaskets shall be as specified herein. Workmen who are certified by the pipe manufacturer to join the pipe shall only perform pipe jointing. They should perform the work as follows:
 - d. Expend extreme care to keep the bells of the pipe free from dirt and rocks so joints may be properly assembled without overstressing the bells.
 - e. Provide lubricant, place and drive home newly laid sections. Use of backhoes or similar powered equipment will not be allowed.
 - f. Install pipe to “full insertion mark” where provided.
 8. *Manholes.* The Applicant shall provide sewer manholes of the type and dimensions indicated on the drawings in accordance with the Contract Documents. Manhole walls, transitions, conical sections, and base shall conform to the requirements of ASTM C 478 for the depths indicated on the Contract Documents. Conical sections shall be designed to support cast iron frames and covers under an AASHTO HS-20 loading. Axial length of sections shall be selected to provide the correct total height required with the fewest joints.
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9. *Precast Concrete Riser Rings.* New precast concrete riser rings free from cracks, voids and other defects and shall conform to ASTM C478. Applicant shall use precast concrete riser rings of a nominal thickness of not less than 4 inches and not more than 6 inches for reconstruction and/or adjustment of the manhole frame and cover. Joints shall also be externally wrapped with an external seal wrap.
 10. *Cast Iron Riser Rings.* New cast iron riser rings shall be of domestic origin, conforming to the latest edition of AASHTO M306. Applicant shall use cast iron riser rings for reconstruction and/or adjustment of the manhole frame and cover of less than 4 inches.
 11. *New pipe-existing pipe connections.* Connections between existing and new pipe, with the exception of HDPE pipe, shall be jointed with non-shear repair couplings conforming to ASTM C425 and ASTM C1173. The stainless steel shear rings and clamping bands used in conjunction with the molded rubber sleeve shall conform to ASTM A 240 Series. When using the non-shear repair coupling, the gap between the two pipes shall be no more than ¼ inch. When non-shear repair couplings are not available for a particular size or material, connections between existing and new pipe shall be jointed using flexible elastomer couplings with a 300 stainless steel band for each end and adjusting screws capable of sustaining an applied torque in excess of 80 inch-pounds. When dissimilar pipe materials are joined, the Applicant shall use flexible couplings that are resistant to the corrosive action of the soils and sewage, and that provide a permanent watertight joint. Connections between existing and new HDPE pipe shall be jointed with HDPE electrofusion couplings as specified herein. Prior to ordering materials, Applicant shall check existing pipe diameters and take care to provide matching pipe and coupling to make proper connection.
 12. *Pipe-manhole Connections.* All sewer pipe shall be connected to new manholes with either flexible rubber boot connectors or integrally cast flexible connectors installed in accordance with the manufacturer's integrally cast flexible connectors installed in accordance with the manufacturer's instructions. Then the opening on the inside and outside of the manhole shall be grouted (non-shrink) if necessary, to achieve a watertight seal. For existing manhole connections, pipe shall be connected with a hydraulic cement material having a set time of no more than 2 minutes; compressive strength of 600 psi at 1 hour, 1,000 psi at 24 hours; bond of 40 psi at 1 hour, 80 psi at 24 hours. These requirements apply whether it is a connection to an existing sanitary sewer manhole or connection through a storm water conflict manhole, junction box, or inlet. In the case of HDPE pipe, in addition to the flexible manhole connectors and non-shrink grout, electrofusion flex restraints shall be permanently attached to the pipe to prevent movement. HDPE flex restraints shall be as specified herein.
 13. *Service Lateral Connections.* Connections between the existing service lateral and the new/rehabilitated sewer main line shall be in accordance with the Contract Documents. Existing sewer service lateral and house connections shall be adjusted as required avoiding conflicts with the new Work. New pipe and fittings shall be furnished and installed as necessary and in accordance with the Contract Documents.
 - a. Service lateral connections located within the limit of a rehabilitation method or repair are required to be replaced (regardless of construction method) in both directions up to the property line with a clean-out and pad installed at the property line. Construction shall be in accordance with the appropriate typical drawings in the Contract Documents. The exception to this is with service lateral connections on the mainlines to be rehabilitated with CIPP lining. In this case. Unless a point repair or remove and replace repair is shown on the plans, service lateral
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- connections on mainlines to be CIPP lined will receive a lateral connection sealing and repair product (top hat) as specified herein.
- b. Service lateral vertical connection stacks shall be required in accordance with the Contract Documents.
 - c. New service lateral terminations, required prior to private service connection and cleanout installation, shall be required in accordance with the Contract Documents and stubbed a minimum of 3 feet above ground and capped.
14. *Acceptance tests for new pipe.* Installed sewer lines shall pass one or more of the following tests performed by the Applicant. Applicant shall perform the test in the presence of the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) or of his representative. Applicant shall coordinate testing with surface restoration requirements of the approved plans. Any removal or replacement of temporary or final surface restoration by the Applicant to investigate leaks shall be done so at the expense of the applicant. Sewer tests shall be tested for leakage as follows: Low Air Pressure Test for sewer pipe 24 inch in diameter and smaller; Infiltration Test for sewer pipe greater than 24 inches in diameter with groundwater equal to or greater than 2 feet above top of pipe; and an Exfiltration Test should be used for sewer pipe greater than 24 inches in diameter with groundwater less than 2 feet above top of pipe.
- a. Low Pressure Test. This practice defines the proper procedures for acceptance testing of installed gravity sewer pipe using low-pressure air, to provide assurance that the pipe, as installed, is free from significant leaks. Included are requirements for equipment accuracy, safety precautions, line preparation, test method, and minimum holding times. Applicable sections of ASTM F1417 shall also apply.
 - b. For pipes 36 inches in Diameter and less (Manhole to Manhole Reach), only lines tested after backfilling to final grade will be considered for acceptability. Acceptance will be dependent on a passing test. However, the installer as a presumptive test to determine the condition of the line prior to backfilling may also use this test. During sewer construction, all service laterals, stubs and fittings into the sewer test section shall be properly capped or plugged to prevent air loss that could cause an erroneous air test result. It may be necessary and is always advisable for the applicant to restrain gasketed caps, plugs, or short pipe lengths with bracing stakes, clamps, and tie-rods or wire harnesses over the pipe bells.
 - c. Unless otherwise specified, the applicant shall furnish all the necessary equipment and be responsible for conducting all low-pressure air tests. In addition, the applicant shall be responsible for any necessary repair work on sections that do not pass the test at no additional cost to the OWNER.
 - d. The Department of Public Works will witness all low-pressure air tests and verify the accuracy and acceptability of the equipment utilized. The Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) will inform the applicant regarding acceptable methods of repair in the event one or more sections fail to pass the low-pressure air test.
 - e. The applicant should use mechanical or pneumatic plugs. All plugs shall be designed to resist internal testing pressures without the aid of external bracing or blocking. However, the

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- applicant shall internally restrain or brace the plugs to the manhole wall as an added safety precaution throughout the test.
- f. Air test gauges shall be laboratory-calibrated test gauges, and shall be recalibrated by a certified laboratory prior to the leakage test. Air gauges shall have a size and pressure range appropriate for the pipe being tested. All pressurizing equipment used for low-pressure air testing shall include a regulator or relief valve set no higher than 9 psig to avoid over-pressurizing and displacing temporary or permanent plugs. As an added safety precaution, the pressure in the test section should be continuously monitored to make certain that it does not, at any time, exceed 9 psig. (It may be necessary to apply higher pressure at the control panel to overcome friction in the air supply hose during pressurization.)
 - g. To facilitate test verification by the Department of Utilities, all air used shall pass through a single, above ground control panel. The above ground air control equipment shall include a shut-off valve, pressure relief valve, input pressure gauge, and a continuous monitoring pressure gauge having a pressure range from 0 to at least 10 psi. The continuous monitoring gauge shall be no less than 4 inches in diameter with minimum divisions of 0.10 psi and an accuracy of plus or minus 0.04 psi. Two separate hoses shall be used to: 1) connect the control panel to the sealed line for introducing low-pressure air, and 2) a separate hose connection for constant monitoring of air pressure build-up in the line. This requirement greatly diminishes any chance for over-pressurizing the line.
 - h. If pneumatic plugs are utilized, a separate hose shall also be required to inflate the pneumatic plugs from the above ground control panel.
 - i. After a manhole-to-manhole reach of pipe has been backfilled to final grade and compacted, prepared for testing, and a 24-hour waiting period has elapsed, the plugs shall be placed in the line at each manhole and secured.
 - j. The applicant is advised to seal test all plugs before use. Seal testing may be accomplished by laying one length of pipe on the ground and sealing it at both ends with the plugs to be checked. The sealed pipe should be pressurized to 9 psig. The plugs shall hold against this pressure without bracing and without any movements of the plugs out of the pipe. No persons shall be allowed in the alignment of the pipe during plug testing. It is advisable to plug the upstream end of the line first to prevent any upstream water from collecting in the test line. This is particularly important in high groundwater situations.
 - k. When plugs are being placed, the pipe adjacent to the manhole shall be visually inspected to detect any evidence of shear in the pipe due to differential settlement between the pipe and the manhole. A probably point of leakage is at the junction of the manhole and the pipe, and this fault may be covered by the pipe plug, and thus not revealed by the air test.
 - l. Low-pressure air shall be slowly introduced into the sealed line until the internal air pressure reaches 4.0 psig. If the groundwater table is above the sewer being tested, the air pressure shall be increased 0.43 psi for each foot that the water table is above the invert of the sewer, up to a maximum of 9.0 psig. After a constant pressure of 4.0 psig (greater than the average groundwater back pressure) is reached, the air supply shall be throttled to maintain that internal pressure for at least 2 minutes. This time permits the temperature of the entering air to equalize with the temperature of the pipe wall.

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- m. When temperatures have been equalized and the pressure stabilized at 4.0 psig (greater than the average groundwater backpressure), the air hose from the control panel to the air supply shall be shut off or disconnected. The continuous monitoring pressure gauge shall then be observed while the pressure is decreased to no less than 3.5 psig (greater than the average backpressure of any groundwater over the pipe). At a reading of 3.5 psig, timing shall commence with a stopwatch.
 - n. If the time shown for the designated pipe size and length elapses before the air pressure drops to 0.5 psig, the section undergoing time shall have passed. The test may be discontinued once the prescribed time has elapsed even though the 0.5 psig drop has not occurred. If the pressure drops 0.5 psig before the appropriate time shown in Table 1 has elapsed, the air loss rate shall be considered excessive and the section of pipe has failed the test.
 - o. If the section fails to meet these requirements, the applicant shall determine at their own expense the source, or sources, of leakage, the shall repair or replace all defective materials or workmanship to the satisfaction of the Department of Public Works. The extent and type of repair, which may be allowed, as well as results, shall be subject to the approval of the Department of Public Works. The completed pipe installation shall then be retested and required to meet the requirements of this test.
 - p. For Pipes Larger than 36” in Diameter (Individual Joint Testing): Individually test each sewer pipe joint with an approved joint air testing apparatus to an air pressure of 4.0 psig. If the groundwater table is above the sewer being tested, the air pressure shall be increased 0.43 psi for each foot that the water table is above the invert of the sewer, up to a maximum of 9.0 psig unless otherwise restricted by pipe manufacturer’s recommendation. The testing apparatus shall be positioned within the pipe in such a manner as to straddle the joint to be tested.
 - q. The apparatus packer ends shall be expanded so as to isolate the joint from the remainder of the pipe and create a void area between the packer and the pipe joint. The ends of the testing device shall be expanded against the pipe in accordance with the manufacturer’s recommendations.
 - r. After void pressure is observed to be equal to or greater than the required test pressure, the air flow shall be stopped. If the void pressure drops by more than 1.0 psi within 15 seconds, the joint will have failed the test.
 - s. Upon completing the testing of each individual joint, the packer shall be deflated with the void pressure meter continuing to display void pressure. The applicant shall note and record the pressure display reading before each joint test. Should the void pressure meter fail to drop to 0.0 (± 0.5) psig, the applicant shall make necessary equipment repairs to provide for an accurate void pressure reading.
 - t. Infiltration Test: Where the natural groundwater is 24 inches or more above the top of a section of pipe, the applicant shall measure the flow of water in the pipe and the rates of seepage and infiltration. applicant shall measure the flow rate by using a calibrated weir. The applicant shall leave the weir in the line until the flow rate has stabilized. The applicant is responsible for verifying the groundwater level by providing sight gauges in manholes or digging test holes at suitable locations.

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- i. The total seepage and infiltration of groundwater as determined by the test shall in no case exceed 50 gallons per 24 hours per inch-mile of pipe.
 - i. The applicant shall make infiltration tests on all sewer construction before placing the lines in service and before making any connections to other sewers.
 - ii. If the amount of infiltration into the sewer(s) is in excess of the maximum quantity specified above, then repair the joints, relay the sewer (if necessary), or perform other remedial construction, at the applicant's expense, in order to reduce groundwater infiltration to within the specified limits.
 - u. Exfiltration Test: Where the groundwater is not 24 inches or more above the top of the pipe section being tested, the applicant shall perform an exfiltration test. The applicant shall bulkhead the pipe below the lower manhole of the section being tested with a pneumatic plug or other device. Insert a vent pipe 48 inches long in the stopper of the upper end of that section. Then fill the lower manhole with water, or add water until there is a minimum of 4 feet over the upper end; make certain that all air is forced out through the vent tube. The applicant will measure the drop in the level of the water in the manhole due to exfiltration over a specific time, and calculate the water loss due to exfiltration. The total exfiltration shall not exceed that specified above for infiltration.
 - v. Mandrel Test (Plastic and Fiberglass Pipe): Pipe shall not exceed a deflection of more than 5%. after pipe has been backfilled for at least 30 days, a mandrel sized at 95% of the inside pipe diameter shall be pulled through the pipe.
15. *Fittings and Valves.* New sewerage force main fittings shall be ductile iron fittings conforming to AWWA C110/A21.10 with fitting joints conforming to AWWA C111/A21.11. Fittings shall be epoxy coated inside and out. Buried fittings shall be mechanical joint (MJ) fittings. The connection between the PVC force main and the fitting shall be restrained with approved mechanical joint thrust restraints. Restraint nuts and bolts shall be Teflon coated Cor-ten fasteners. Above ground fittings shall be flanged, and fasteners shall be stainless steel.
- a. Sewerage force main valves 3 inches or larger shall be AWWA C509 or C515 resilient-seated gate valves for sewerage service. Sewerage force main valves shall be fusion bonded epoxy and lined per AWWA C550. Sewerage force main valves shall be restrained joint and restrained with approved mechanical joint thrust restraints. Restraint nuts and bolts shall be Teflon coated Cor-ten fasteners.
 - b. Buried valves, including 2 inch valves, shall have a 3-piece cast iron box installed and adjusted to finished grade. Buried valves shall have an AWWA operating nut and a cover labelled "SEWER". Each valve box shall have a precast or cast-in-place concrete pad measuring at least 4 inches thick by 24 inches by 24 inches square or 4 inches thick by 24 inches round.
 - c. Manhole and valve covers shall have diamond tread pattern and have word "SEWER" cast on the cover.
16. *Testing.* All new sewerage force mains shall undergo hydrostatic testing to verify leak tightness. New sewerage force mains shall be tested a 125 psi for 2 hours. There shall be no pressure drops during the test. In the event the sewerage force main fails the test, the sewerage force main pipes shall be checked and repaired accordingly. The sewerage force main shall be re-tested.
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17. *Record Drawings.* The applicant shall record horizontal and vertical location of all new sewerage infrastructure. The applicant shall provide "red line drawings" to the Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) upon completion of construction. The applicant shall field verify and certify elevations, depths and location of sewerage infrastructure when preparing the record drawings/as-built plans for the project.
- a. The Department of Utilities shall not accept the project until the applicant provides an accurate, verified set of record drawings/as-built plans for the project.
 - b. The record drawings/as-built plans shall contain the following sheets of information:
 - i. All sheets shall be stamped with the block "record drawings" or "as-built plans" and shall be dated.
 - ii. Title sheet with an index of sheets. Additional sheets to capture changes via change-order/plan change shall be listed in the index of sheets and be added at the end of the plan set.
 - iii. General notes and legend. Strike-through notes which do not apply.
 - iv. Site vicinity map showing new sewer infrastructure and tie-in location to the existing system(s).
 - v. Overall sewerage plan and site/street specific sewerage plans shall be provided as needed to show additional information and clarity. Conflicts and offsets shall be called out on all sewerage plans.
 - vi. Summary of material quantities. Final quantities for all installed materials (i.e. pipe, all valves, manholes, etc.) Shall be provided.
 - vii. Summary of valves and fittings. Information regarding the valves and fittings shall be tabulated. The location of each valve, tee, cross, and bend shall be determined by measuring along the centerline of the wse main from fitting to fitting or valve to fitting. Tabulations shall be from street intersection to street intersection. The size, type, manufacture and model of the valves and fittings shall be recorded in the summary tabulations as applicable. The top-of-casting elevation of the valve housing shall recorded and noted in the summary of valves and fittings.
 - c. The applicant's redline drawings shall not be substituted for or accepted by Department of Utilities (for systems to be dedicated to St. Tammany Parish Department of Utilities) or the Department of Engineering (for other systems) as record drawings/as-built plans.
 - d. The applicant shall provide record drawings/as-built plans in the following formats and quantities:
 - i. Three full-size 22 inch by 34 inch hard copies,
 - ii. One copy in pdf format, and
 - iii. One copy in AutoCAD 2016 format. The Department of Utilities will not issue a letter of acceptance until record drawings/as-built plans have been provided.

SEC. 900-9 JACKING AND BORING OF PIPE

A. Jacking and Boring.

1. Where crossing existing Parish roadways, the applicant shall place water mains, gravity sewer mains and force main pipes by jacking and boring. A casing shall be jacked through the embankment and service provided by a carrier pipe.
2. The applicant shall provide a casing of welded steel pipe meeting ASTM A53, Grade B, and have a minimum yield strength of 35,000 psi. The exterior of the casing pipe shall be coated with coal tar epoxy or bituminous asphalt. Provide at least the wall thickness shown in the following table:

Carrier Pipe Nominal Diameter	Minimum Casing Pipe Diameter	Minimum Thickness of Casing Pipe
6	12	0.250 inch
8	16	0.281 inch
10	20	0.344 inch
12	24	0.375 inch
14	28	0.438 inch
16	30	0.469 inch
18-20	30	0.531 inch
21-24	42	0.625 inch
30	48	0.688 inch
36	54	0.781 inch
42	60	0.844 inch
48	66	0.938 ch

3. Where carrier pipe nominal diameter is greater than 48 inches, the applicant shall provide a minimum casing pipe diameter great enough to provide a minimum 3-inch radial clearance between the casing pipe and the “bell” outside diameter of the carrier pipe. The applicant shall provide thickness calculations prepared by a professional engineer licensed in the state of Louisiana and submit those calculations to the Department of Engineering.
4. For casing pipes larger than 36 inches in diameter, the applicant may choose to furnish casing pipe with 2-inch diameter threaded grout holes or nipples at centerline and crown for pressure grouting. The spacing of grout holes shall not exceed a spacing of 5'. Neat cement grout shall be used for filling voids outside of a casing.
5. The applicant shall provide casing spaces for all carrier pipes.

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6. Casing spacers shall be sized sufficiently to provide a minimum clearance of two (2) inches between outside of carrier pipe bells or couplings and inside of casing. The applicant shall provide spacers consisting of the following components:
 - a. Spacer Band Material: Minimum 14-gauge steel band of either Type T-304 stainless steel or Carbon steel coated with fusion bonded epoxy or PVC coating.
 - b. Spacer Liner Material: Ribbed liner of PVC or EPDM rubber designed to overlap the edges of the spacer band and prevent slippage. Provide a liner of a minimum thickness of 0.090 inches and a hardness of 85-90 durometer “A”.
 - c. Spacer Width: As recommended by spacer manufacturer for the specific application. Provide spacers with a minimum width of 8 inches. The applicant shall obtain the manufacturer’s approval for installations exceeding 300 feet in length, carrier pipes in excess of 48 inches in diameter or multiple carrier pipes in casing. The applicant shall provide risers of minimum 10-gauge steel of the same material and requirements as spacer band. Spacers shall be welded to the spacer band. Risers suitable for supporting the weight of carrier pipe shall be provided. Risers shall be minimum 10-gauge steel risers of same material and requirements as spacer band.
 7. When the grade at the jacking or boring end is below ground surface, the applicant shall excavate suitable pits or trenches for conducting operations and placing joints of pipe. The applicant shall provide shoring to prevent earth caving in accordance with the requirements of with applicable Federal, State, and local regulations, laws, and rules; but not be than the standards and regulations established by OSHA in 29 CFR Part 1926.
 8. The applicant shall not weaken or damage the existing embankment. Dips or settlement in the embankment shall be considered damage and shall be repaired as directed by the Department of Engineering.
 9. The applicant shall use heavy duty jacks specifically designed for forcing pipe through the embankment. The use of excavators to pull or push casing through embankment shall be prohibited. The jacks shall apply even jacking pressure to all jacks and transmit jacking pressure to the pipe end through a jacking head. The applicant shall provide a jacking head designed and constructed so that pressure is uniformly applied around the ring of the pipe. The applicant shall provide a backstop or jacking frame which is adequate to resist pressure of the jacks under load. The applicant shall pipe on guides properly fastened together to support the pipe in the proper direction at correct grade.
 10. A steel cutting edge may be used around the forward end of pipe, constructed so that it will transmit pressures uniformly around the ring of the pipe.
 11. The applicant shall continue jacking without interruption, to prevent pipe from becoming firmly set in the embankment.
 12. The applicant shall not allow pipe to vary horizontally or vertically by more than 1/4 inch in 10 feet from the line and grade shown on the approved plans. Any variation must be regular, and no abrupt changes in direction will be permitted. The applicant shall remove and replace pipe misaligned in jacking operations at his expense.