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LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

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MEMORANDUM

TO: **CHRISTOPHER P. KNOTTS, P. E.**
CHIEF ENGINEER

FROM: **PATRICK J. LANDRY, P.E.** PJL
DEPUTY ASSISTANT SECRETARY, OFFICE OF PUBLIC WORKS

DATE: **MARCH 18, 2022**

SUBJECT: REVISION REQUESTED FOR EDSM II.2.1.1

I am requesting approval for a revision to EDSM II.2.1.1: Pipe Material Selection Policy for Cross Drains, Side Drains, and Storm Drains.

The revisions are being requested to move CPPPDW and CPPPTW pipe materials from phase I to phase II restrictions, and to clarify phase restrictions.

Requested changes have also been verified by the sections affected by this EDSM. These Section Heads have signed below.

If you have any questions or concerns; please feel free to contact me accordingly.

Attachments:
EDSM current version
EDSM with proposed changes highlighted
EDSM with proposed changes for signature

RECOMMENDED FOR APPROVAL — DATE 3/21/22
RECOMMENDED FOR APPROVAL — DATE 03.21.22
RECOMMENDED FOR APPROVAL — DATE 3-21-22
APPROVED — DATE 3/21/2022

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

ENGINEERING DIRECTIVES AND STANDARDS

Volume	Chapter	Section	Directive Number	Effective Date
II	2	1	1	3/21/2022

SUBJECT: **PIPE MATERIAL SELECTION POLICY FOR CROSS DRAINS, SIDE DRAINS, AND STORM DRAINS**

1. PURPOSE:

The purpose of this directive is to establish a policy for the design life and determination of the allowable types of pipe for cross drains, side drains, and storm drains.

2. POLICY:

It will be the policy of the Department to allow alternate materials and options in the construction of drains. The determination of alternates or options to be allowed will be based on the performance evaluation data currently available to the Department. The design life given in Table 1 and the policy described in the following paragraphs will be used in the process, along with the criteria given for materials selection.

A. EXCEPTIONS TO THE REQUIREMENTS GIVEN IN TABLE 1

1. For all roadways which ordinarily require a 50 year design service life (see Table 1), a 70 year design service life shall be used if the fill height on the cross drain is greater than 10 feet, measured from top of culvert, or if the surfacing is to be Portland Cement Concrete.

2. For highways which ordinarily require a 50 year design service life (see Table 1), a 30 year design life may be used for interim alignments such as a tie-in from two to four lanes, where new alignments are planned, or similar applications.

3. Extensions of existing pipe installations will be of the same type of material as that of the pipe being extended or modified at the discretion of the Chief Engineer.

B. METAL PIPE

The gage (thickness) and coating requirement for metal pipe will be determined as outlined in EDSM II.2.1.6.

C. PLASTIC PIPE

EDSM II.2.1.13 describes quality assurance and installation requirements for plastic pipe.

D. MATERIAL TYPE ABBREVIATIONS AND DEFINITIONS

RCP – Reinforced Concrete Pipe
RCPA – Reinforced Concrete Pipe Arch
CMP – Corrugated Metal Pipe
CMPA – Corrugated Metal Pipe Arch
CAP – Corrugated Aluminum Pipe
CAPA – Corrugated Aluminum Pipe Arch
CSP – Corrugated Steel Pipe
CSPA – Corrugated Steel Pipe Arch
BCCSP – Bituminous Coated Corrugated Steel Pipe
BCCSPA – Bituminous Coated Corrugated Steel Pipe Arch
RPVCP – Ribbed Polyvinyl Chloride Pipe (ASTM F794 or ASTM F949)
(Phase IV)
CPEPDW – Corrugated Polyethylene Pipe Double Wall
(AASHTO M294 - Type S) (Phase I)
CPPPDW – Corrugated Polypropylene Pipe Double Wall (AASHTO M330,Type S) (Phase II)
CPPPTW – Corrugated Polypropylene Pipe Triple Wall (AASHTO M330, Type D)
(Phase II)

E. JOINT TYPES

1. (T1) Type 1 Joints.
   The combination of gasket material and joint configuration are to prevent infiltration. See specifications for more detailed information. Type 2 or 3 joints may be used as an alternative to type 1 joint.

2. (T2) Type 2 Joints.
   The combination of gasket material and joint configuration meets the 5 psi hydrostatic pressure test. See specifications for more detailed information.

3. (T3) Type 3 Joints.
   The combination of gasket material and joint configuration meets the 10 psi hydrostatic pressure test. See specifications for more detailed information.

APPLICATION	DESIGN SERVICE LIFE	JOINT TYPE	MATERIALS
Storm Drain Pipes Flumes Other Watertight Systems	70 years	T3	RCP(A), RPVCP*, CPPPDW*, CPPPTW*
Storm Drain Pipe (Outfall) {See Section F.1}	50 years	T3	BCCSP(A), CAP(A), CSP(A), RPVCP*, CPPPDW*, CPPPTW*
Cross Drain Pipes for: Freeways Arterials Ramps Multi-lane Collectors	70 years	T3	RCP(A), RPVCP*, CPPPDW*, CPPPTW*
Cross Drain Pipes for: 2-lane Collectors Local roadways	50 years	T2	RCP(A), BCCSP(A), CAP(A), RPVCP, CPEPDW, CPPPDW, CPPPTW
Side Drain	30 years	T1	RCP(A), BCCSP(A), CAP(A), CSP(A), RPVCP, CPEPDW, CPPPDW, CPPPTW
Side Drain (Erosion) {See Section F.2}	30 years	T1	BCCSP(A), CAP(A), CSP(A), RPVCP, CPEPDW, CPPPDW, CPPPTW
Side Drain (Bridge Drains) {See Section F.3}	50 years	T1	BCCSP(A), CAP(A), CSP(A), RPVCP, CPEPDW, CPPPDW, CPPPTW

Table 1: Design Service Life and Material Selection for Culverts and Storm Drains (pipe installations must also adhere to Phase restrictions specified in sections D and G of this EDSM for all plastic pipe)

*** Not allowed under interstate pavement**

F. SPECIAL INSTALLATIONS

Special installation conditions are generally defined as conditions which may restrict the use of some culvert materials.

Some examples of special installation conditions are discussed below. The allowable material types are listed in Table 1.

1. Storm Drain Pipe (Outfall)
   Outfall into a Perpendicular or Nearly Perpendicular Waterway: When an outfall pipe line, usually from a storm drain system, discharges into a stream, at or near a right angle to flow, a potentially erosive condition is present.

2. Side Drain (Erosion)
   Roadside Ditch Erosion Control at Crossing Waterways: It is sometimes desirable to "drop" roadside ditch discharges sharply at larger crossing waterways. Blocking the roadside ditch and discharging the water through a pipe is one solution to this problem.

3. Side Drain (Bridge Drains)
   Down Drains at Bridge Ends: It is sometimes desirable to drain water from the roadway with catch basins and drain pipes through the embankment into roadside drainage.

There are other possible special installation conditions which might require deviation from the material choices outlined in Table 1. The types of structures chosen for these conditions should be based on engineering justification.

G. RESTRICTED USE OF NEW PIPE

After a new pipe material has been evaluated and found to be satisfactory, it will be placed in a restricted status. The purpose of the restricted status is to allow DOTD to evaluate the product for its ability to perform as designed. Additional product-specific restrictions may be added if analysis indicates a need.

Suppliers can apply for phase upgrade by submittal to the Chief Engineer. Advancement to the next phase is subject to the sole discretion of the Chief Engineer. Submittals shall show the product has met the requirements listed below and include the following:

- Project Number where pipe was installed (DOTD projects only)
- Control Section of route
- Installation Date
- Pipe type, size, location (GPS Coordinates)
- Daily work report (DWR) of pipe installation, which is to include pipe information, backfill type used, and any images or videos taken at the time of installation
- Video evidence of successful mandrel pull in accordance with 701.09.01 at time of installation
- Video evidence of successful mandrel pull in accordance with 701.09.01 one year after Project Final Acceptance date.

1. Phase I
    1. New products will initially be considered under Phase I restrictions.

Phase I Restrictions:

- Roadways with current 4000 ADT or less
- Inside pipe diameters no greater than 36 inches
- Multiple installations are limited to a maximum of two adjacent pipes
- Fill heights over pipe will be 2 feet to a 14 feet maximum except for private driveways where fill height may be reduced to a minimum of 1 foot.
- Installations are to be cross drain or side drain culverts, which allows for post-construction inspection and evaluation of the pipe installation without having to enter a manhole or other closed system component.
- Districts may restrict private driveway pipe materials at their discretion.

2. Phase II
    1. Products will be considered for Phase II restrictions when the following criteria have been met.
        i. Five projects installed under Phase I restrictions. Only cross drain installations will count towards the five required. DOTD projects in which the pipe product was specified or included as an alternate will count towards the five required. Pipe installations shall be completed and functioning satisfactorily. Projects considered acceptable will be at the sole discretion of DOTD.

Phase II Restrictions:

- Roadways with current 8000 ADT or less
- Inside pipe diameters no greater than 48 inches
- Multiple pipe installations are limited to a maximum of three adjacent pipes
- Fill heights over pipe will be limited to 14 feet maximum
- Installations are to be cross drain or side drain culverts, which allows for post-construction inspection and evaluation of the pipe installation without having to enter a manhole or other closed system component.
- Districts may restrict private driveway pipe materials at their discretion.

3. Phase III
    1. Products will be considered for Phase III restrictions when the following criteria have been met.
        i. Five *additional* projects have been installed under Phase II restrictions. Only cross drain installations will count towards the five required. A minimum of three (3) projects submitted must be on roadways >4000 ADT. DOTD projects as described in Phase II will count towards the required five. Pipe installations shall be completed and functioning satisfactorily. Projects considered acceptable will be at the sole discretion of DOTD.

Phase III Restrictions:

- Roadways with current 12,000 ADT or less
- Inside pipe diameters no greater than 60 inches
- Multiple pipe installations of pipe diameters no greater than 48 inches in diameter are limited to a maximum of four adjacent pipes
- Multiple pipe installations of pipe diameters of 60 inches are limited to a maximum of two adjacent pipes
- Fill heights over pipe will be limited to 14 feet maximum
- In addition to cross drain and side drain culverts, closed storm drain systems are allowed under Phase III as long as they are at least one pipe diameter outside of the travel lanes.
- Districts may restrict private driveway pipe materials at their discretion.

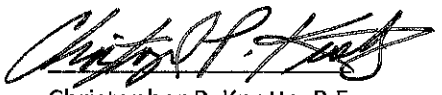
4. Phase IV (Unrestricted)
    1. Products will be considered for Phase IV (unrestricted) when the following criteria have been met.
        i. Projects have been successfully installed and functioning satisfactorily under Phase I, Phase II, and Phase III restrictions.
        ii. Five additional projects have had the pipe installed under Phase III restrictions. Only cross drain or closed storm drain installations will count toward the five required. A minimum of three (3) projects submitted must be on roadways >8000 ADT. DOTD projects as described in Phase III will count towards the required five. Pipe installations shall be completed and functioning satisfactorily. Projects considered acceptable will be at the sole discretion of DOTD.
    2. Thermoplastic pipe shall not be installed under interstate pavement.

3. OTHER ISSUANCES AFFECTED:

This memorandum supersedes EDSM 11.2.1.1, dated 12/22/2020. All directives, memoranda or instructions issued heretofore in conflict with this directive are hereby rescinded.

4. EFFECTIVE DATE:

This policy will be implemented on all projects except those where use of this EDSM would result in scheduling delays.



Christopher P. Knotts, P.E.
Chief Engineer