



DESIGN UPDATE TRAINING

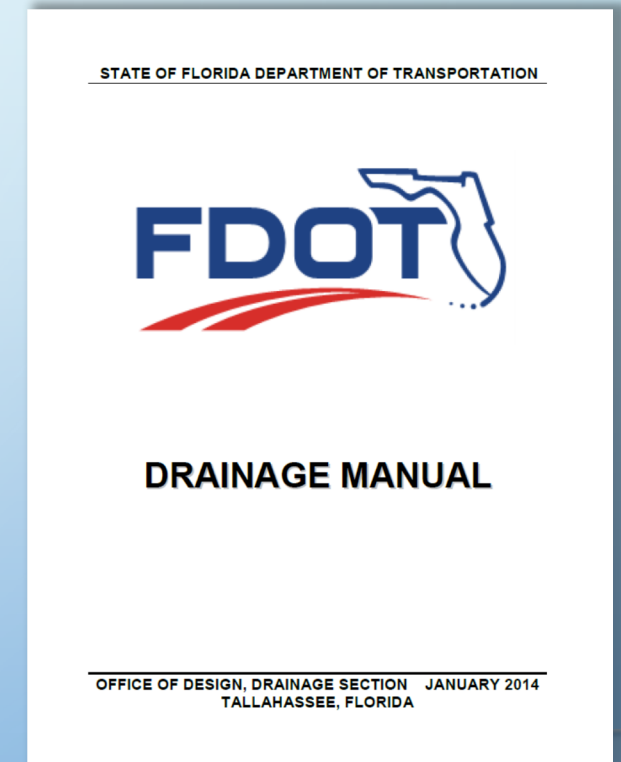
DRAINAGE STANDARDS & UPDATES

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WHAT'S NEW IN 2014?

- HYDROPLANING GUIDANCE
- DRAINAGE MANUAL 2014 UPDATES
 - JULY 2013: INDEX 205 → APPENDIX E
 - 2014: LRFD PIPE COVER
- CULVERT SERVICE LIFE ESTIMATOR



HYDROPLANING GUIDANCE

- HYDROPLANING ANALYSIS PROCEDURE
 - LOOKS AT LESSER EVENTS
 - INCLUDES DRIVER REACTION TO RAINFALL
 - SIMULATOR AND FLORIDA FREEWAYS
- HP COMPUTER PROGRAM



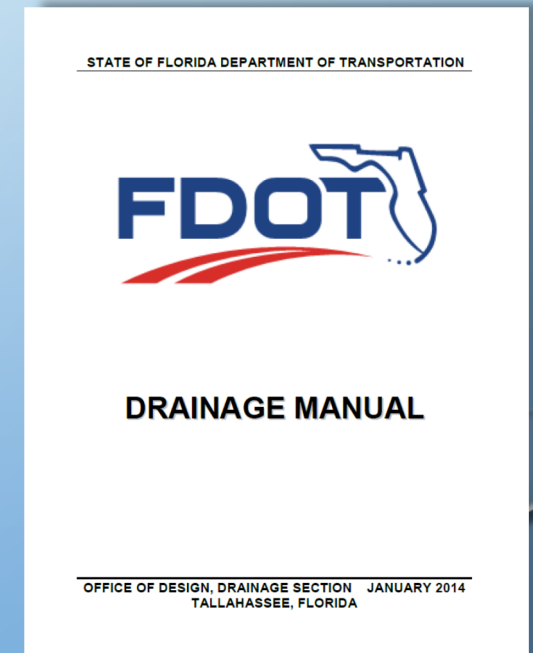
HYDROPLANING GUIDANCE

- BULLETIN RELEASE IN MID-FEBRUARY
 - ✓ NEW PPM LANGUAGE
 - ✓ NEW PPM TYPICAL SECTIONS
- WEBINAR
- EXPO
- HELP AVAILABLE ON CURRENT PROJECTS



DRAINAGE MANUAL 2014 UPDATES

- SECTION 1.5 DRAINAGE REPORT CONTENTS
- SECTION 3.7.3 JUDGMENT ON SHOULDER GUTTER
- SECTION 3.10 CLARIFICATION ON MH ACCESS
- SECTION 3.10.3 PRESSURE JOINTS > 5 PSI



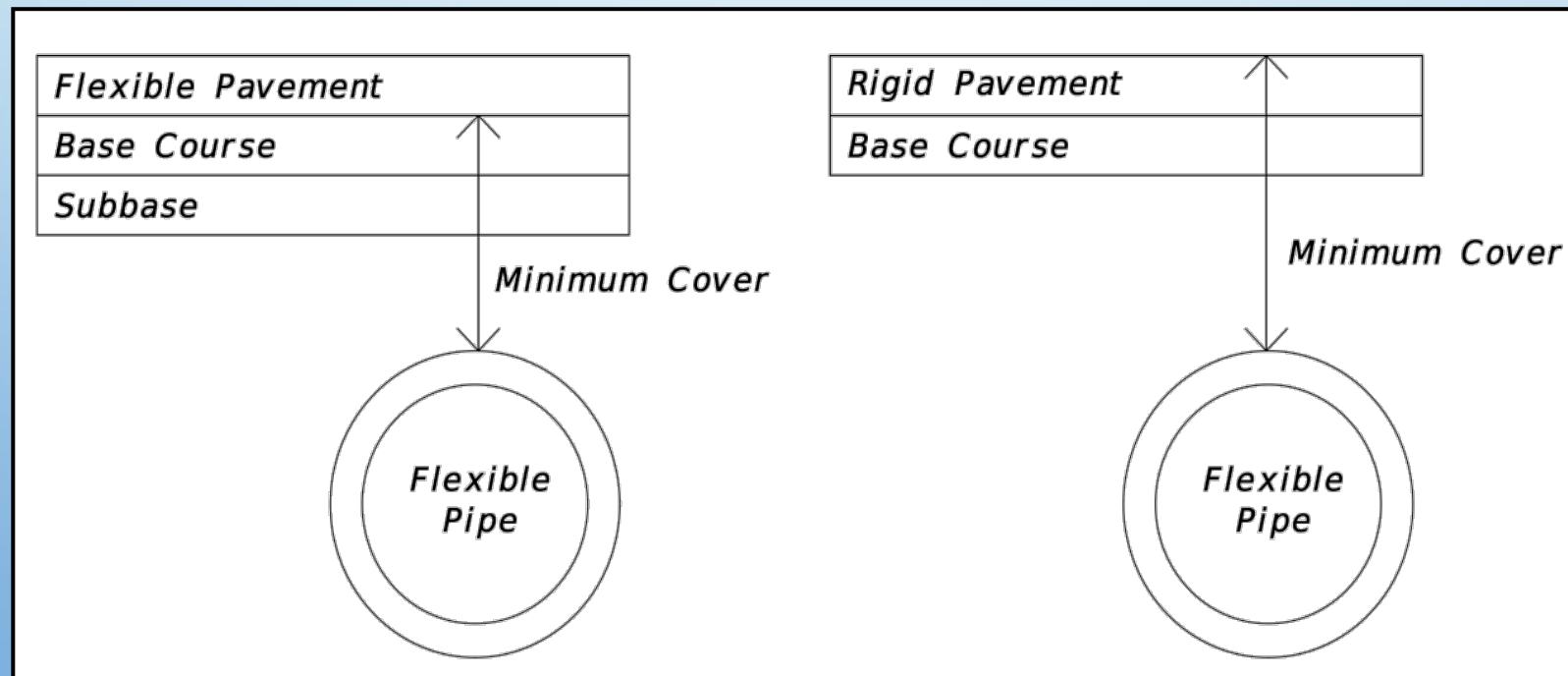
APPENDIX E: LRFD IMPLEMENTATION

- MINIMUM PIPE COVER CONTROL POINT
- MINIMUM COVER INCREASED TO PREVENT PIPE PLACEMENT WITHIN ROADWAY BASE
- CHANGES TO MINIMUM AND MAXIMUM COVER FOR PIPES

LRFD WEBINAR WILL TAKE PLACE SOON

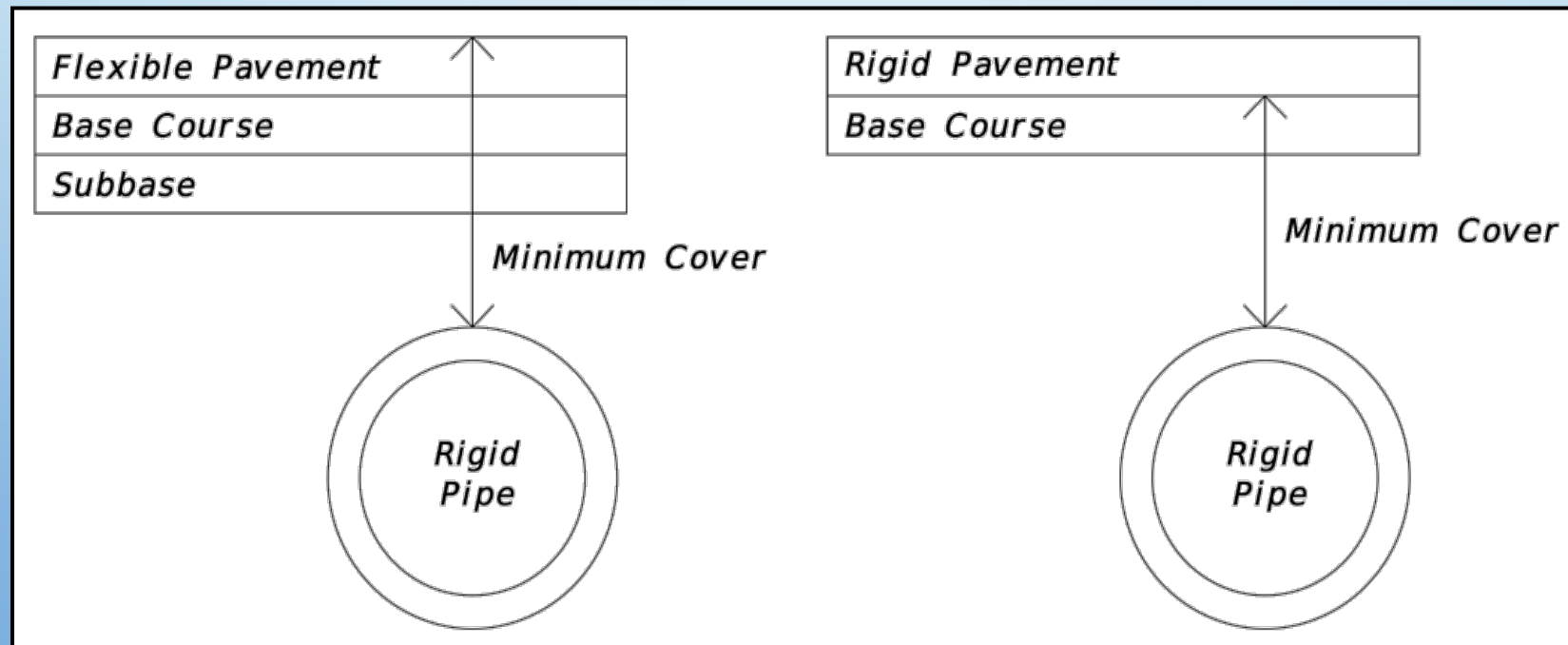
PIPE COVER FOR FLEXIBLE PIPE

- MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT
- MEASURED FROM TOP OF PIPE TO TOP OF RIGID PAVEMENT



PIPE COVER FOR RIGID PIPE

- MEASURED FROM TOP OF PIPE TO TOP OF FLEXIBLE PAVEMENT
- MEASURED FROM TOP OF PIPE TO BOTTOM OF RIGID PAVEMENT



MAXIMUM AND MINIMUM PIPE COVERS SIGNIFICANT CHANGES

- MINIMUM COVER MAY ACTUALLY BE REDUCED DUE TO NEW CONTROL POINT
- MAXIMUM COVER OF RCP REDUCED
- MAXIMUM COVER OF PVC INCREASED
- MAXIMUM COVER OF POLYETHYLENE PIPE (HDPE) REDUCED SLIGHTLY
- POLYPROPYLENE PIPE (PP) WAS ADDED TO APPENDIX E
- METAL PIPES COVER REQUIREMENTS COMPARABLE TO STANDARD INDEX 205

CULVERT SERVICE LIFE ESTIMATOR

- CHECKS SERVICE LIFE OF OPTIONAL PIPES
- UPDATED TO MATCH NEW LRFD DATA

Culvert Service Life Estimator 2013 Version 5.1.3.0

File Analysis Settings About

Environmental Check

Design Life (years) 100

pH 7

Resistivity 2500

Chlorides 2000

Sulfates 1500

Diameter 36

Structural Check

Structural Check

Gage	Type of Culvert	Service Life	Structural Check
Pass	(NRCP) Non-Reinforced Concrete, CL 1"	360	Pass
16	(SRAP) A		
14	(SRASP)		
	(RCP) St		
	(RCP) St		
	(PVC) Po		
	(HDPE) H		
Fail			

Calculate

Quit

Print

Select Cover

Flexible Pavement

Cover thickness measured from the bottom inside radius of pipe.

63

Inches

3

Inches of Asphalt Pavement

Close Window

This program is designed to estimate the service life of a culvert to match the LRFD design criteria. The user has the ability to choose the proper cover type and thickness allowable for the selected pipe diameter and environmental conditions. Additional gage requirements must be determined by the designer.

Thank you... Questions?