

## Session 3

### William Nickas

FL. Dept. of Transportation - Structures

#### *Introductory Remarks on High Priority (HIPR) Panel & Topics*

##### **Topic Description**

A very brief structural review of national and state efforts will be made to set the stage for many interesting structures session topics.

##### **Speaker Biography**

Graduated from the Citadel in 1983.

William began with Department of Transportation on the P.E. Trainee Program 1983-1984.

Served as Junior Engineer in the Structures Bureau – 1984

Served as Structural Analyst for the DOT – 1984-1987

Entered Private Sector – 1987-1997

Served as FDOT State Value Engineer – 1997-1998

Appointed and Serving as State Structures Design Engineer since April 17, 1998 to Present

Mr. Nickas is a member of the Skyway Steering Committee;

He is presently Chairman of the AASHTO T-10 Concrete Bridge Committee;

Florida voting member of the AASHTO Sub-Committee on Bridges.

## Session 3

### Robert Robertson

FL. Dept. of Transportation - CO Structures

### *Consultant Qualifications*

#### **Topic Description**

Design Consultant prequalifications.

#### **Speaker Biography**

Worked with consultant for 7 years before joining Central Office Construction as a structures engineer. Moved into Structures Design Office and is now Assistant State Structures Design Engineer in charge of Plans Review.

## Session 3

**Henry Bollmann**

FL. Dept. of Transportation CO

### *Structural Analysis & Standards Overview*

#### **Topic Description**

Effect on PS beam design using new loss calculations, transformed section properties and better LL distribution.

New Standards for Temporary Bridges.

New Plastic Fender Standards, design procedure.

#### **Speaker Biography**

Henry Bollmann is a Senior Structures Design Engineer working in the FDOT Central Office, Tallahassee Fl. Henry received his MSCE degree from the University of Florida in 1974 and has spent his entire professional career working in many facets of bridge engineering while focusing on design.

## **Session 3**

**Dennis Mertz**

University of Delaware

### ***LRFR Methodology***

#### **Topic Description**

The application and basis of the Load and Resistance Factor Rating procedures of the new AASHTO Manual for Condition Evaluation and the Florida Structure Manual are discussed.

#### **Speaker Biography**

Professor Mertz teaches bridge engineering at the University of Delaware, and is the Director of the University's Center for Innovative Bridge Engineering (CIBrE). Previous to his appointment to the University, he was an Associate of the bridge design firm of Modjeski & Masters, Inc.

Dennis was the Co-Principal Investigator of the NCHRP research project which wrote the original edition of the AASHTO LRFD Bridge Design Specifications. He continues to be active in its further development and implementation.

All of Professor Mertz's engineering degrees are from Lehigh University in Bethlehem, Pennsylvania. He is also a Professional Engineer in the Commonwealth of Pennsylvania.

## **Session 3**

**Marc Ansley**

Fl. Dept. of Transportation - Structures Research

*Structures Research Center Projects*

### **Topic Description**

Review of what will be presented in sessions on structural research

### **Speaker Biography**

In charge of Structures Research Center

## Session 3

Larry Jones

FDOT

### *Non-Redundant Drilled Shafts*

#### **Topic Description**

Quick introduction of old and new geotechnical and design requirements for non-redundant drilled shaft bridge foundations contained in the FDOT Soils & Foundations Handbook, FDOT Structures Design Guidelines, FDOT Structures Detailing Manual, and FDOT Standard Specifications which will be presented more fully in Session 46.

#### **Speaker Biography**

Larry earned BSCE & MSCE degrees at the University of South Florida in Tampa, where he was a member of Chi Epsilon, Tau Beta Pi, and Phi Kappa Phi honor societies. Before joining FDOT, Larry worked with three different geotechnical engineering consultants: Law Engineering Testing Company in Tampa, Jammal & Assoc./PSI in Winter Park and Geotechnical Consultants International in Winter Park. Larry started with FDOT nearly 11 years ago in the Panhandle's District Three Materials Office, and has been FDOT's State Geotechnical Engineer for almost 5 years.

In 2003 & 2004, Larry participated in the FHWA funded technical working group (TWG) with AASHTO representatives and other engineers from the states using LRFD for bridge design. The TWG was asked to critically evaluate the rewrite of the AASHTO LRFD Bridge Design Specifications Section 10, Foundations which eventually became part of the 2006 AASHTO LRFD Bridge Design Specifications.

## **Session 3**

### **Dean Perkins**

FL. Dept. of Transportation CO

### ***Structures ADA Condensed Training Course***

#### **Topic Description**

This session covers how the requirements of the Americans with Disabilities Act (ADA) apply to structures design and construction projects and the responsibilities of structures design and construction personnel in providing access to persons with disabilities.

#### **Speaker Biography**

Dean Perkins is the Department's statewide ADA Coordinator. Dean is principle in directing the FDOT ADA/accessibility program. This includes initiating changes to Department policies and practices relating to accessibility for persons with disabilities and conducting training in accessibility requirements.

## Session 3

### Angel Rodriguez

FL. Dept. of Transportation

### *Movable Bridges/Mechanical Electrical*

#### **Topic Description**

Explain changes to the Electrical and Architectural sections of Chapter 8 (Movable Bridges) of the Design Guidelines.

#### **Speaker Biography**

Angel Rodriguez graduated from the University of Puerto Rico in 1974 with a BSEE. He has been with the Department for the last 20+ years working with movable bridges first in Maintenance and now in Design. Previous to working with the Department, he worked for the sugar mill industry, Westinghouse, and the Federal Government.

## **Session 3**

**Andre Pavlov**

FL. Dept. of Transportation

### ***Structures Standards Overview***

#### **Topic Description**

Overview of the presentations to be given on changes to the Design Standards, structural engineering programs, and related FDOT policies.

#### **Speaker Biography**

12 years of experience with the Florida DOT

11 years of experience with the New York State DOT



## Structures General Session 3



### Panel Discussion of High Priority Topics



### Introduction - William Nickas

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- Consistency: Policies and Standards
- 2004 Hurricanes Sessions 38
- SPMT's Sessions 9 and 10
- LRFD nearly fully implemented
  - FHWA mandate by Oct. 2007
  - Steel Curved Girder software
  - Continued code refinements
  - Notes for implementation on plans

# MOVING DAY

Use of Self-Propelled Modular Transporters (SPMTs)

## Move In



**FICE/FDOT Design Conference 2006**  
Designing For More Than Bridges & Roads

One man drove it in.....  
Seemed so simple



### Introduction Cont. - William Nickas

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- PPP and Design/Build
  - Preserve EOR Professional Role
- Construction Costs Session 9 & 10  
Bid Options
- Project Optimization
  - “Do not need” verses “Cannot afford”
- Constructability Review
- Biddability Review

## Consultants Qualifications - Robert Robertson

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- All Firms must submit under new Rule
- Need to Resubmit upon Loss/Change of Personnel
- Resume clearly describes bridge design (type of bridge, actual componets designed or technical contributions to project)
- Experience in Rehabilitation not Critical
- Airport, Building Design or Bridge Inspection does not qualify for 4.x.x categories

## Consultants Qualifications - Robert Robertson

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In 2000 there were 161 consultants in 4.1

In 2006 there are 129 consultants in 4.1

How many will there be in 4.1.1 and 4.1.2?

## Consultants Bridge Qualifications

Work Group	(P)	(S)	(P) (DBE'S)	(S) (DBE'S)	TOTAL
4.1(old)	92	19	13	5	129
4.2(old)	69	9	8	2	88
4.3(old)	18	1	0	0	19
4.4(old)	13	2	0	0	15
4.1.1					
4.1.2					
4.2.1					
4.2.2					
4.2.3					
4.3.1					
4.3.2					
4.4					

## Structural Analysis & Standards Topics - Henry Bollmann

- New PS loss equations and transformed section properties for the design of PS beams: effects on the Service 3 stress check

By Henry Bollmann: Session 17  
 & Repeated in Session 39

## Structural Analysis & Standards Topics - Henry Bollmann

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- Temporary Bridges Standards
- By Henry Bollmann: Session 25



## Structural Analysis & Standards Topics - Henry Bollmann

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- New Plastic Fender Standard: Philosophy/Design Approach
- By Henry Bollmann: Session 62



## LRFR - Dennis Mertz

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- By Dennis Mertz: Session 33 and Repeated in Session 47



FLORIDA'S  
GREENBOOK  
(Newest Chapter)  
Chapter 17  
Bridges and Other Structures

## Authority

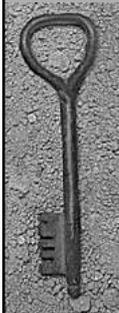
- Section 334.044, Florida Statutes. Department; power and duties. Sets forth FDOT to develop and adopt uniform minimum standards and criteria....
- Section 336.045, Florida Statutes and Rule 14-15.002. Uniform minimum standards for design, construction, and maintenance; advisory committees.

## Authority continued

- Section 336.045, Florida Statutes.  
(1)The department shall develop and adopt uniform minimum standards.....  
(4) All designs and construction plans for projects..... Substantial conformance with standards established pursuant to section (1) ..... By a professional engineer who is registered in this state.

## Authority continued

- Section 336.045, FS (4) goes on to say... Standards established by this Manual are intended for use on all new construction projects off the state highway and federal aid systems.
- Section 335.07, FS mandates a sufficiency rating system.....and by Federal rule The Department shall post all bridges in the NBI within: 90 days for on-system 180 days for off-system



## Staff Hours for New Designs

- ◆ 16 hours per unique span includes QC
- ◆ With skew greater than 15 degrees add 10% for multiple girder line analysis
- ◆ With skew greater than 30 degrees add 25% for multiple girder line analysis
- ◆ For bridges with 4 or more spans being load rated multiply by 85% for efficiency gains.

Ie. 3 span bridge with all unique spans with 35 degree skewed end span.

$$\{(2 \times 12 \text{hrs}) + (1 \times 12 \times 1.25)\} = 39 \text{ hours for LRFR of new bridge}$$



## Staff Hours for existing structures

Multiply above by 1.5 for an existing structure to address shop drawing review and recreating capacity analysis.

## Staff Hours for Post Design

Load Ratings should be updated to match the RFI's, Shop Drawings and as-builts.

Generally these are minor in nature.

Before a VECP can be approve a new Load Rating shall be completed.



A take home reminder

Design lives through  
Construction and.....

The Load Rating  
effects Mobility Forever

## Structures Research Center Projects - Marcus Ansley

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Several in house efforts including looking at LRFR load testing thresholds (Diagnostic versus Proof loading)

Eight Major Contracted Projects

Two presented in Sessions 36  
and repeated in Session 63



## Structures Research Center Projects - Marcus Ansley

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## Structures Research Center Projects – Session 36

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- ◆ Dr. Ron Cook, Prevention of Splitting Failure at Ends of Pre-stressed Beams During Fabrication
- ◆ Dr. Trey Hamilton, St. George Island Pile Testing
- ◆ Dr. Ron Cook, Field Verifications of Camber Estimates for Prestressed Concrete Bridge Girders
- ◆ Dr. Trey Hamilton, Crack Control in Toppings for Precast Flat Slab Bridge Deck Construction

## Structures Research Center Projects – Session 63

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- ◆ Tony Michael, Testing of Structural Concrete Members Reinforced with a Carbon Fiber Grid
- ◆ Dr. Lei Zhao, Testing of an FRP Bridge Deck
- ◆ Dr. Primus Mtenga, Elastomeric Bearing Pads Under Combined Loading
- ◆ Farouk Mahama, Validation of Stresses Caused by Thermal Gradients in Segmental Bridges

## Nonredundant Drilled Shafts - Larry Jones

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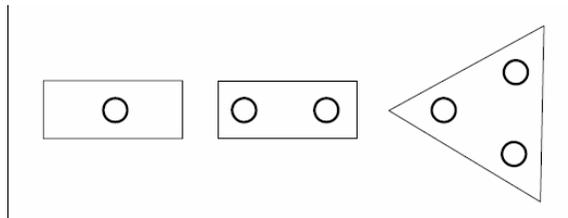
- Design investigation requirements

By Larry Jones: Session 46



## Session 46 Nonredundant Drilled Shafts

- Nonredundant Examples





## Session 46 Nonredundant Drilled Shafts

- FDOT Requirements
  - FDOT Soils & Foundations Handbook
  - FDOT Structures Design Guidelines
  - FDOT Structures Detailing Manual
  - FDOT Standard Specifications



## ADA for Structures Design – Dean Perkins

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- What went wrong and what happened next?

By Dean Perkins: Session 54

and Repeated in Session 55



## ADA for Structures Design – Dean Perkins

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Come for a hands on class  
By Dean Perkins: Session 54  
and Repeated in Session 55



## ADA for Structures Design – Dean Perkins

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How do you get to the Pedestrian Button and which  
Signal is the Pedestrian feature?

By Dean Perkins: Session 54  
and Repeated in Session 55



## Structures Movable Bridges: Mechanical & Electrical - Angel Rodriguez

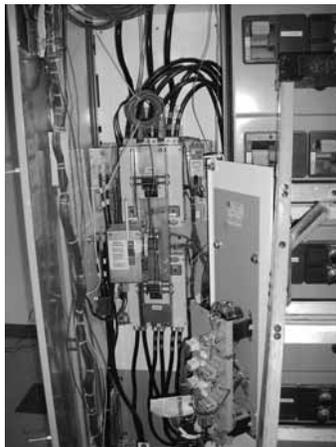
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## Structures Movable Bridges: Mechanical & Electrical - Angel Rodriguez

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- Electrical By Angel Rodriguez: Session 55
- Mechanical By Tom Cherukara: Session 55





## Structures Standards Topics: Andre Pavlov

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- Adoption of 2001 AASHTO Standard Specification for Structural Support for Highway Signs, Luminaries and Traffic Signals



By Dongming White: Session 17  
and Repeated in 39



## Structures Standards Topics: Andre Pavlov

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- Crosswalk & Standards Migration  
By Charles Boyd: Session 18
- Attachments to Traffic Railings  
By Charles Boyd: Session 23
- Research Findings for LRFD Deck Design

By Charles Boyd: Session 23



## Structures Standards Topics: Andre Pavlov

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- **Computer Programs & Sign and Signal Standards**

By Charlie Harvey: Session 25

- **LRFD Box Culvert Standards**

By Steve Nolan: Session 25

## Structures Standards Topics: Andre Pavlov

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- **Expansion Joint Standards / Strip Seal & Poured Joint with Backer Rod Standards**

By Charles Boyd: Session 62

- **MSE Wall Standards**

By Andre Pavlov: Session 62



**FICE/FDOT Design Conference 2006**  
Designing For More Than Bridges & Roads

## General Discussion and Q/A...

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