



Florida Department of Transportation

**District 4 Design
Newsletter**

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From the Editor's Desk

Howard Webb, P.E., District Design Engineer

We have recently concluded another fiscal year and I want to thank the Design Staff, our Consultant partners and all the other Departments for the hard work that contributed to the successes we have had this past year. We have some accomplishments of which we should be proud. We were successful in meeting our goals for Letting, consultant acquisition, Value Engineering and most of the goals set by our Drainage, Structures and Utility Departments. We also made significant improvements in meeting production dates and responding to log letters. We were also successful in developing and implementing processes for Local Government Involvement in Design, Resurfacing Program, Cost Recovery for Errors & Omissions, and Pond Site Identification.

In spite of our successes, there is still room for improvement. We need to continue our efforts to improve response to log letters, meeting production dates, and reducing construction time & cost overruns. There is also a need for involvement by a larger cross-section of the Design Staff in developing and tracking of our Business Plan. We will continue to monitor our performance and look for areas to improve.

I look forward to the challenges of the new fiscal year and with your continuing help and support, I am confident we will continue to make significant improvements in our performance.

Community Awareness Plan (CAP) Guidelines Revised!

Richard Creed, P.E. District Roadway Design Engineer

In case you have not heard the good news, the guidelines for the Community Awareness Plan (Referred to as CAP among other names by the PM's.) has been revised. No longer are the 27 signatures needed...actually it was more like 4 but who really knew.

There are 2 parts to this new procedure, Pre-Initial submittal or Post-Initial submittals. First, the semi-bad news. If you have NOT completed the CAP prior to your actual Initial Engineering submittal, the guidelines spell out that the CAP will require 2 signatures to be complete for the Constructability review and Final Engineering submittal. The required signatures include the appropriate Department Head approval and signature as well as the District Construction Engineer concurrence and signature similar to the old process

And now for the good news, great news actually! If Initial Engineering phase occurs after July 1st, the PM shall complete the "Draft" CAP pertinent to his/her project and submit that plan along with the Initial Engineering Submittal. Tim Brock's Final Plans unit WILL NOT accept either the Initial Engineering submittal or Final Engineering submittal without the "Draft" CAP. In addition, the "Draft" CAP will also be a part of the plans submitted to construction for the Constructability review. Once the CAP has been revised following the Final Engineering Submittal, the now "completed" CAP will be included in the Hand-off meeting materials for construction. (Not part of the Production complete submittal.)

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District 4 Quarterly Design Newsletter

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Community Awareness Plan (CAP) Guidelines Revised! (Continued)

Richard Creed, P.E., District Roadway Design Engineer

The intent of this change in the process was to (Stop driving the PM's crazy?), streamline the process, put the responsibility for the CAP with the PM and make the document an active part of the design process. The "Draft" CAP will be revised throughout the life of the project as the design parameters, community needs and phase comments dictate.

If you want the more detailed version of the CAP guidelines, please visit the infamous D4 website "knowledge based" area.

What is a Drainage Connection Permit?

Georgi Celusnek, P.E., District Drainage Connection Permit Engineer

A permit issued by the FDOT to property owners who are developing or improving land located within 250-feet of state road right of way. The jurisdiction for Drainage Connection Permits is defined in Florida Administrative Code (FAC) Rule Chapter 14-86. The purpose of FAC Rule Chapter 14-86 is to ensure safe conditions and the integrity of the transportation facilities and to prevent an unreasonable burden on lower properties by providing standards and procedures for drainage connections from the properties adjacent to the FDOT's right of way.

FAC Rule Chapter 14-86 indicates that sites requiring a Drainage Connection Permit shall demonstrate that the proposed improvements do not increase the stormwater runoff to the FDOT's right of way. The sites must be designed to retain or attenuate the increase of runoff created by reducing the property's pervious area. The permit application package must demonstrate that the peak stage from the design storm event (usually the 25-year/3-day) does not exceed the proposed perimeter berm elevation. The stormwater management systems for these developments are often similar to the systems designed for FDOT roadway projects, such as wet and dry ponds, swales, and exfiltration trench. Less often, the sites use more expensive, high-maintenance options not used by the FDOT, such as wells and underground storage.

For additional protection of storm sewer system capacity, District Four does not allow direct connections to the state roadway drainage systems. Applicants proving a pre-

development discharge may continue discharging to FDOT right of way but must do so in a similar manner, such as by sheet-flow from a bubble-up structure located on their property. Permit applications with private pipes connecting to FDOT pipes or structures are not approved.

How does the Drainage Connection Permit application process work?

The permittee submits the Drainage Connection Permit application package to the appropriate Operations Center, where it is logged-in and transmitted to the Drainage Office for approval. After the permit has been approved and construction is complete, the permittee is required to certify permit compliance and submit as-built drawings. The District Permits office keeps copies of all approved permits. The Drainage Connection Permit is administered by Georgi Celusnek in the Drainage Design Office.

Do You Know..... Bridge Barriers?

John Danielsen, P.E., District Structure Engineer

So what's all the fuss about anyway? Why is the Department spending considerable amounts of funds to replace existing barriers on bridges that have been in service for over 50 years? Why does the Plans Preparation Manual, 3R chapter, requires that all barriers meet or exceed design strength per National Cooperative Highway Research Program (NCHRP) Report 350? What is the phrase "Crash Tested" referring to? We hear it over and over again, "Is this bridge barrier safe?". Well, to answer some of these questions, we need to step back in time and look at the evolution of the bridge railing, from the early part to this century.

The first published document regarding railings was the American Association of State Highway Organization (AASHO) (not to worry, the "I" came at a later date) Standard Specification for Bridges, 1935. This document was not very helpful in the design of railings as it left it up to the individual States to come up with barrier designs based on past practices. Here is what AASHO had to say "**Substantial railings along each side of the bridge shall be provided for the protection of traffic.**" Not too much direction here! This non-descript direction continued through the 1964 AASHO. In 1962, three years prior to the issuance of the more detailed AASHO requirements for traffic railings, one of the first crash testing documents was issued. Crash testing criteria continued to evolve over the next two decades. With the adoption of the 1965 AASHO came "**While the primary purpose of traffic railing is to contain the average vehicle using the structure, consideration should also be given to protection of the occupants of a vehicle in collision with the railing, to protection of other vehicles near the collision and to appearance and freedom of view from passing vehicles.**" And in 1969, "**A smooth transition by means of a continuation of the bridge barrier, guard rail anchored to the bridge end, or other effective means shall be provided to protect the traffic from direct**

Do You Know..... Bridge Barriers? (Continued)

John Danielson, P.E., District Structure Engineer

collision with the bridge rail ends.” Nothing happens too fast in this code arena! Let’s go back to this Crash Test document. From its inception in 1962, many revisions were made throughout the years. Finally in 1989, American Association of State Highway Transportation Organization (AASHTO) Guide Specification on Bridge Railings required new prototype barriers pass specific crash testing criteria. We have now progressed to NCHRP Report 350, 1993, which is currently in use and stipulates the different categories of crash testing. The Florida Department of Transportation has adopted a test level of TL-4.

Wow, now that was a handful of information. Well, it does take us to current day policy, where the Federal Highway Administration mandated in 1999, that all barriers on existing bridges be retrofitted with crashworthy barriers. The Department also has adopted the Load and Resistance Factor Design (LRFD) Bridge Code, which refers to the NCHRP Report 350 for new bridge designs. So now we are covered for both rehabilitation as well as new construction.

So what are the criteria engineers are looking for in a crash test? In assessing the results of a crash test, the structural adequacy of the rail, risk posed to the occupants of the vehicle and the post impact vehicle trajectories are all evaluated. All three areas must be satisfactory for the crash test to pass. An example of a traffic rail that passes structural adequacy and post impact vehicle trajectory but fails due to occupant risk is the Texas Classic Rail. You can see this rail on the Wilton Drive Bridge in Wilton Manners. While it failed TL-4 test level, it did pass TL-3, an acceptable barrier under the variance process. Did you know that to pass TL-4 test level criteria, three different types of vehicle are crashed into the subject barrier; an 1800 lb car (20 degree impact at 60 MPH), a ¾ ton pickup truck (25 degree impact at 60 MPH) and an 18,000 lb single axle truck (15 degree impact at 50 MPH)? The current thinking is to replace the pickup with an SUV, due to its recent surging sales.

So next time you’re driving around town, look around and you will see many

Shop Drawings.....The Process

John Danielson, P.E., District Structure Engineer

District 4 is now into its second year of eliminating the third party shop drawing reviews (FDOT reviews) and all is going smoothly. Revised shop drawing specifications and Plans Preparation Manual language now allows the Districts to deviate from the current policy of the “red stamp from FDOT is only valid stamp” and allows the elimination of the third party review on a case-by-case basis. District 4 had decided to eliminate such reviews on all projects, with the exception of movable bridge and Design/Build projects. For a shop drawing flow chart that better explains the process as well as a list of areas to look for during reviews, one should view this at the District 4 web site, under the Structures link. The short version is as follows; Contractor to EOR, EOR reviews per compliance to plans, EOR distributes back to Contractor, CEI, FDOT and independent inspection agency, if applicable. Note, that the District 4 Structures office must be copied on the original transmittal back to the contractor. At such time, we will perform random quality assurance reviews and proceed accordingly if drawings and review are not to DOT requirements. The Department’s specifications still have a 45 day review period requirement. Due to the elimination of the FDOT review, we hope that consultants will strive for a 20 day turnaround.



Test Level 4 (TL-4) Crash Test of the Florida Bridge Sound barrier

phases of the bridge barrier and know that it’s just a matter of time before some will be replaced. With all the years of crash testing data the transportation industry collects, it is being used to provide a safer travel way for the public. Crash testing of barriers is here to stay, with new versions of barriers requiring testing before implementation. A new FDOT Sound Wall barrier will currently be available for the clear zone, another example of a successful crash test program. Also be sure to check out the Structures new standards online regarding barrier retrofits. The standards do not fit all situations but it’s a great place to start.

Electronic Letting - District 4 Way

Morteza Alian, P.E., District Consultant Project Management Engineer (DCPME)

Now that we are back from FDOT/FICE Design Conference, most designers and project managers should know that all projects being let after July 2005 are processed electronically. However, for District 4, the electronic letting is NOW. All projects with letting after January 2005 will be processed electronically. No More Paper Plans. Of course there are some exceptions. Projects being processed for letting in the district are still being processed using paper, at least for now.

The FDOT established the electronic delivery process since July 2000 as part of CADD manual. This process has gone through some changes year after year for improvement. Training has also been provided for consultants and FDOT personnel. Modern Tech has been providing training for consultants and FDOT for some time. ECSO (Engineering / CADD Systems Office) has also given several presentations through events such as the FLUG and Design Conference. So, technically speaking, we should have some experience with electronic preparation of CADD files up to and including authentication. In 2003, the CADD manual was updated to include signing and sealing of plans as a new requirement. But, just like anything else in life, we will go through the real life experience when there is a deadline which for us, is now.

We have identified 12 projects between now and February 2005 production for this fiscal year 04-05. To ensure that we are complying with all requirements uniformly and at all times, we have established a CADD QA team in Design Office to review all deliveries prior to submittal to Final Plans. The team consists of Kuntharet Hing and Hernando Mercado. Our goal is to improve the delivery of our projects and avoid rejection from Central Office. This will also help us with the District CADD QAR.

There are 3 phases to this process. The first phase is Pre-Production. This is where the SEED project CD is created at the onset of project by CADD QA Team. The scope and relevant project specific information should be given to Hernando for inclusion in the SEED project. This SEED project CD is given to the consultants at NTP. The consultants are required to review the SEED CD immediately and inform FDOT PM of any inconsistency. The second phase is Production. This is where the consultants are working on the project and complying with recent CADD requirements. To keep up with the stringent requirements, the FDOT project manager will request one set of project CD at each phase submittals. This CD will be checked by the CADD QA team. The third phase is Post-Production. This is the end of the production line. The consultant will deliver Three Secured Project CD's (this is the one with all design files, engineering files, image files, project index, PEDDS information, and composite PDF of plans. This is sometimes referred to as the BIG CD). **However, we are only requesting TWO PROJECT CDs to be submitted to the FDOT PM at production complete.** This is to minimize waste. With the project CDs, the consultant will also deliver a Compliance Certification form and PEDDS reports (manifest and signatory reports). Once all problems are resolved then, we request the consultant to submit THREE PROJECT CDs with accompanying reports.

The Project CDs will take two separate paths in the District Office. One of the CDs will be submitted to the CADD QA Team and the other one will go to Final Plans. The Final Plans Office will begin to examine the delivery for proper format and content and authenticate utilizing the PEDDS Software. This is to match the delivery manifest hash code with the one generated by Final Plans. If the project delivery has all the proper documentation and authenticates, then the Final Plans will create the Letting CD, perform the QA and eventually determine the Quality Delivery Indicator (QDI). If the delivery does not meet the requirements, then the Project CD will be returned to the consultant to make appropriate corrections. The consultant has to make all changes within the same week and resubmit a new Project CD in order to maintain the current project schedule.

The CADD QA Team, on the other hand, will examine the content of CD for compliance with the CADD Manual. They will review the Microstation files, engineering files, and the QC report. In the QC report, they would mainly look for high percentage in compliance typically 95% and higher. Any items below 80% will require re-submittal or a written explanation. Once all issues are resolved, the consultant will now submit THREE (3) Project CDs to the Department.

This is a new process and our goal is to improve the delivery of our projects and to avoid rejection from **DISTRICT FINAL PLANS OFFICE and CADD QA Team**. These steps will also help us with the District CADD QAR.



Meet Our New Design Members



Ed Cashman - Section 2

Ed recently graduated from Michigan State with Bachelor of Science in Civil Engineering. There he was also a member of Chi Epsilon. Prior to joining us at FDOT, he had a short stint with the City of Detroit working in Traffic Engineering. Please welcome Ed to Design when you get a chance.



Ruben Rodriquez—Drainage

Ruben comes to us from New Jersey where he was working for a Consultant for the past five years doing site design including drainage analysis. He has a Civil Engineering degree from Colombia. Ruben is now residing in Pembroke Pines with his wife and three children. So go ahead and welcome Ruben to the Design Unit of the Year.



Joshua Salazar - Section 3

Joshua comes to our Section from Detroit, Michigan having received his Bachelors in Civil Engineering from the University of Michigan in May 2004. He is a dedicated sports enthusiast, enjoying soccer, baseball, hockey among others. He says he is enjoying the freedom of being out of school and being able to participate in the many outdoor activities available in South Florida. So please welcome Joshua to the Design family when you get a chance.



Bing Wang, P.E. – Section 6

Bing comes to us from Texas DOT with more than 7 years of roadway design experience. She has managed highway projects from design to construction. She is a graduate of Wuhan University in China and received her Master degree in civil engineering from South Dakota School of Mines and Technology. Bing's position at TxDOT required her to be a system automation coordinator, updating software and arrange training courses. She has technical background in geopak and HEC-RAS to name a few. Please welcome Bing to Consultant Management.

Awards Corner.....

The Unit of the Year Award goes to....

We, The Design Department are proud of our Drainage Unit. They are the recipient of the District Four Unit of the Year award for 2003/2004. They worked very hard over the last year to improve their productivity and processes, while ensuring their team members have fun in a professional and relaxed atmosphere. Here are a few of the highlights from the past year:



- They ensure continuous recognition and feedback on their performance through various methods including: (1) A “Recognition and Oops” White Board in the center of the Unit that team members can use to make note of each others contributions, hard work and mistakes (i.e. Oops). (2) The Unit also has a “Catch Me at My Best” card that others outside the unit can use to note special achievement. (3) A “Certificate of Appreciation” card for use in recognizing others within FDOT for their contribution to the Unit’s work.
- They’ve begun tracking their results under the Drainage Unit’s Business plan to better understand their strengths and areas for improvement. For example, under the goal of reviewing all Drainage Connection permits within a two weeks time frame, the first two months of the third quarter show results of 90% and 100% respectfully. This well exceeds the goal of 85%.
- They utilize the Annual FDOT Employee Survey results to provide additional input as to their strengths and areas of improvement. For 2003, The Unit scored some of the highest marks in the District with a total score of 131.83, which exceeds the high quartile score of 126.16. These results were an increase over the scores for 2002 at 118.99 and 2001 at 109.89. ***The unit sustained these scores for 2004 with the highest score of 144.57 in the District.***
- They stress innovation and creativity in their every day practices. They’ve streamlined and improved quite a few of their processes including how they track projects and store information. They completed the District’s first Value Engineering Study of a process for Pond Siting which won a Davis Productivity award for 2004.
- They distribute information on a regular basis at their weekly Team Meetings (which most units still refer to as Staff Meetings). However, instead of having the Supervisor lead these meetings, They have a rotating Team Leader.



The folks in the Drainage Unit embody the qualities of a high performing team who provide a nurturing and dynamic environment for employees, as well as, for customers.

In the picture from left to right: Christine Nabong, Francis Lewis, Dustin Duke, Amie Goddeau , Chris Jackson, Shandra Sanders and below are Georgi Celusnek and Pat Webster.

Henry Oaikhena, P.E. Division Employee of the Year And Highway Engineering Award

Henry Oaikhena started his career with the Department as a Professional Engineer Trainee in 1987. He is now a Senior Project Manager in Consultant Management section. Henry is an exemplary Project Manager.

Henry’s duties as a Project Manager is to assist the Department and his Consultants to meet the Department’s Work program goals. He has excelled in this task and has worked well with his consultants to meet the production readiness for major roadway projects for Fiscal Year 2003-2004.

Henry is able to apply his technical knowledge and vast experience in the field of civil engineering to communicate the essential requirements for different level of highway projects. Henry has applied same energy and attitude towards all his projects for one reason alone. The reason is to produce quality plans through effective communication and coordination with all levels and progressive time management. Henry has produced plans with construction cost estimate of \$131 million since June 2003. This accounts for over 30% of total construction letting in District 4 for FY 2003-2004.

It is for these reasons that Henry is highly considered and received both, the Highway Engineering Award and the Division Employee of the Year.



Supplemental Agreement Report – April 2004

Morteza Alian, P.E., District Consultant Project Management Engineer (DCPME)

Description Code 115: Drainage modification required due to grade differentials, structure, omissions, problems with pond designs, offsite flow not handled, incorrect elevation of structure, improper hydraulic design, etc.

Reason: This project consists of widening, reconstruction, drainage improvements, lighting and signal upgrading.

A work order was issued to compensate the contractor for costs incurred as a result of inaccurate information in plans. The plans showed, in three locations, drainage structures in conflict with existing utilities. The contractor ordered the drainage structures and began installation process. However, the contractor could not find any conflict with the existing utilities thus, no structures were used at these locations. The contractor was instructed to remove and dispose of unused drainage structures for a total cost of \$9,203.98. This cost is coded as design error and the premium is recoverable.

Response: The designer utilized utility information provided by soft dig. The soft dig consultant was hired by the department. This is being investigated to determine the extent of recovery from each firm.

Description Code 105: Conflicts resulting from discrepancies, inconsistencies, etc, between plan notes, details, pay items, standard index or specifications

Reason: This project consists of widening, reconstruction, drainage improvements, lighting and signal upgrading.

The plans called for construction of new signs in the median. At the same locations, the landscaping plans called for placement of myrtle trees. The myrtle trees are tall bushy variety and would obstruct the line of sight to the signs. The contractor was instructed to remove the trees for clear sight to the signs and relocate of the multi-post signs to provide a clear line of sight. The contractor has incurred additional cost of \$3,274.81 and this is considered recoverable premium cost.

Response: The designer should have checked the landscaping plans for clear line of sight for signs being placed in the same locations. A quality review of plans and components would minimize errors such as this. At the same time, the CEI is required to check the plans ahead of contractor's work schedule to ensure plans are not lacking information. However, this is the designer's responsibility and thus it is a design error with recoverable premium cost of \$3,274.81.

Description Code 128: Inaccurate or inadequate survey information in plans preparation

Reason: This project consists of widening, reconstruction, drainage improvements, lighting and signal upgrading.

One of the plan sheets indicated inaccurate angle of deflection from the survey baseline to the offset reference line. This was verified with a field survey and the angular difference resulted in several drainage structures being installed at incorrect locations, which required remedial work on several of those locations. In this case, the contractor shared responsibility for the error by not properly checking into nearby baseline control points, thus agreed to 67% compensation or \$22,069.81. The contractor was also given 5 days of indirect impact. This was coded as design error with premium cost of \$6,720.50 which is the cost incurred as a result of this error and is considered recoverable premium cost.

Response: The designer should have checked the surveying information more closely and performed a quality control with the surveyor. This is the designer's responsibility and thus it is a design error with recoverable premium cost of \$6,720.50