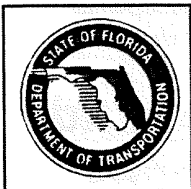


CHAD 1997

DISTRICT THREE DESIGN



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

NEWS

LETTER

**DISTRICT THREE DESIGN
FLORIDA DEPARTMENT OF
TRANSPORTATION**

**If you are interested in obtaining
a copy of this free quarterly
newsletter, contact Brian
Blanchard, District Design
Engineer.**

**(904) 638-0250 X-425
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Second Quarter

**Brian Blanchard, P.E.
District Design Engineer**

This is the second quarter news-
letter for 1997. This quarter we are
continuing with our efforts to
provide feed back to designers on
design issues, construction
supplemental agreements and
process performance reviews. We
have included articles on recent
management decisions concerning
access management and public
involvement opportunities.
Transportation is our business. We
must recognize the importance of
meeting schedules, utility
avoidance, right-of-way avoidance
and permitting issues early in the
design process to assist us in
meeting this goal.
We always welcome your input on
future design issues needing
clarification or discussion.

Bridge Rail

**Frank Sullivan,
Area Design Engineer**

As per memo dated April 8, 1993
from Mr. Skinner at FHWA to the
State Highway Engineer, all projects
on the NHS will be upgraded to
crash tested rails or an exception

would need to be processed. If the
project is off the NHS then it is
subject to state standards and
policies only. This would mean that
according to PPM Chapter 25 the
rail would have to be structurally
and functionally adequate (same as
FHWA requirements), but a
variation would have to be
processed instead of an exception.
However, Freddie Simmons wants
consistency statewide and approval
on the Central Level since it is a
safety issue and covered by one of
the 13 elements. He said the
districts should process an
exception. For now this is probably
the way we will go. I would like to
see it processed as a variation, but
approved in the Central Office since
this would satisfy FHWA and State
procedures. I'll keep you updated on
our progress.

Public Involvement Opportunities

**Jason D. Peters, P.E.
Project Management
Engineer**

On April 16, 1997, The Florida
Department of Transportation
adopted a policy to promote public
involvement in the design of
transportation facilities. The
Department recognizes that it is
necessary to involve the public and

Seasonal High Water Table

**William F. Knight,
District Geotechnical**

This office has received numerous requests concerning a seasonal high water table for various projects. A general discussion of the factor affecting the situation is necessary prior to discussing specifics relating to the water table. Water table locations in clayey soils are a completely different situation from those of sandy soils. In the sands of southern Florida there is often a thin layer of different colored sand, a slight hard pan (indurated or cemented sands) or a complete color change that is indicative of a seasonal water table. In the clayey soils of northwest Florida this physical evidence is not present, thus making determination of seasonal high water extremely difficult. Further complicating the question is that two (2) different water tables are possible with clayey soils, perched and general or normal water tables. In certain situations the general or normal water table can be artesian. Artesian means a general water table is confined by a impervious soil stratum and exists at a pressure greater than zero. Penetration of the impervious stratum will allow the water to rise to the point of zero pressure. If the point rises to above the ground surface then it is often called a flowing well or an artesian well.

A third aspect is the changes in capillary flow above the water table, perched or general. The direction of capillary flow is dependant upon the season, cold, hot, rainy or dry. The zone of capillary action is dependant upon the parent materials present, sand or clay, the depth of the water table, the type of water table (perched or general) and the environmental changes occurring such as temperature or rainfall frequency. This is all to say that a storm water retention area or roadway construction site may function or be constructable in one season and not another. Estimation of the zone of capillary action can only be done by examining the physical behavior of the soil's plasticity. To sum up the dissertation of the three (2) previous paragraphs: Identification of the seasonal water table, especially in clayey soils, requires direct physical observation at the time and under the conditions in question. To this end some visual observations made along the project after an extremely high rainfall event will enlighten the designers as to problem areas. Areas exhibiting standing or draining water along the project are the ones to focus on. The location survey team or others can record these observations. Noting other indicators such

as stains on trees, stains on headwalls, debris lines along ponds, vegetation normal to wet areas, tops of tussocks, etc., can also give indications of seasonal highs. Use of engineering judgement to identify indicators such as these do not require geotechnical expertise.

Note that the water levels mentioned above can be due to water perching on the clayey soils. With time and dry weather they will retreat to or below the levels reflected in the soils survey. Reference to the locations and the elevations of the observed water discussed above will give a general indication of the seasonal high water table possible along the project under design.

Permeability Tests And Retention Ponds in Northwest Florida

**William F. Knight
District Geotechnical**

Tied closely to the concerns surrounding high water tables is the function ability of retention ponds. General field permeability tests are used to obtain data to model pond performance thus producing a design for the pond. Results from permeability tests can be misleading and produce designs that do not function as desired.

Results of permeability tests are influenced by dry weather. A permeability test measures flow in steady state conditions. To accomplish this requires the soils to be saturated, a difficult task when the surrounding soils are adsorbing the water as fast as it is being made available. This phenomenon occurs mostly in what is known as borderline soils. These are soils with a minus 200 percent in the range of 20 to 35. They may not have plastic behavior. Often an increase of a few points in either the minus 200 or the Atterburgh Limits will cause these soils to classify as A-4, A-2-6 or A-6 soils. Although these A-2-4 soils are known as select soils, their behavior is often that of a plastic soil.

In most locations in District 3 it is not very deep to soils of this nature. This is often true in locations that are considered sandy. Where these soils are located, it is often the case that during dry seasons the ponds will function because the surrounding soils are dry and can readily absorb the rainfall. However, during wet seasons the soils are already at or near saturation, thus the ponds will not function as desired.

For ponds located on the sides of slopes or hillsides the

result, less comments and corrective action were required from Bidability. Less design related supplemental agreements during construction has also been noticed. However, as with a lot of things, there is a BUT. In the last several weeks we in Bidability have noticed a serious change in the thought process from designers. It appears you are waiting on Bidability to tell you what to do. **DON'T!** Comments and required corrective actions are on the rise. We have had to recommend three (3) projects be "pushed out" further on their letting dates due to our comments and required corrective actions. This is not acceptable. Appropriate checks, comments and corrective changes must be made during the allotted time frames and design phases. By the time plans reach Bidability, we should be finding only minor problems and not trying to design a job. The ideal scenario of course would be for plans to reach Bidability without any corrective actions required. This must be the goal of us all. In closing I would like to thank Kenny Sapp, Paula Roberts, Eugene Toole, and Mary Powell for making Bidability the success it has been. These people truly make this job a pleasure.

Supplemental Agreement Report-March

Brian Blanchard, P.E.
District Design Engineer

This is the Supplemental Agreement Report for the month of March, 1997. There were two (2) categories for this month containing the largest percentage of supplemental agreements (codes 001 and 053). The three largest S.A.'s were not considered avoidable and are listed below:

Description Code 001: Subsoil Conditions Not Detected During Plans Development

Number of S.A.'s in this category = 4

% of Total S.A. = 23.10%

Cumulative Amount = \$260,737

S.P. No. 48040-3546

Reason: Improvement under this contract includes roadway widening of varying widths and construction of paved shoulders.

The Department has determined the unsuitable subsoil shall be removed and replaced to provide a nonyielding foundation.

Increase = \$139,000.00

Response: The Department does not provide soil surveys on minor widening projects due to the associated cost. The costs of repetitive soil surveys on resurfacing projects outweigh the benefits. As a result, unsuitable subsoil will be addressed in the field when encountered on a case by case basis.

Description Code 503: Changes Made by Engineer (Construction Preference)

% of Total S.A. for the month = 55.8%

Cumulative Amount = \$629,479

Number of S.A.'s in this category = 6

S.P. No. 47020-3515

Reason: Subsequent to this project being awarded, the Department approved the implementation of a superpave asphalt program on nonlimited access facilities. The Department has determined this program shall be implemented to allow for construction of test sections for evaluation of mix designs and pavement experience. The State Materials Office has recommended the Department participate in the research study of friction being produced with or without the use of ground rubber. The National Center for Asphalt Technology is currently conducting a long term study of crumb rubber modifiers in asphalt pavements. The Department's District Materials Engineer has reviewed the pavement design and has determined FC-3 with rubber shall be utilized in lieu of FC-2 with rubber. Past experiences on other FDOT projects with open-graded FC-2 reveals the pavement surface raveling and showing displacement when subjected to various turning movements at intersections and sideroads.

Increase = \$262,464

Response: This program is designed to enhance research and obtain a better working knowledge of the design and performance of asphalt mixes. This knowledge will insure a full service life on future pavements.

S.P. No. 47030-3504

Reason: This project incorporated superpave asphalt and eliminated ground tire rubber from the FC-3 design mix for reasons explained in the previous

This is the Supplemental Agreement Report for the month of May, 1997. A review of the supplemental agreements (S.A.) for each category indicate there were three problems areas (codes 001, 014, 700). These problem areas and responses are provided to all designers through the design newsletter.

Below is a description of those areas and our responses:

Description Code 001: Subsoil Conditions Not Detected During Plans Development

% of Total S.A. For This Month = 43.5%

Reason: During base construction for the paved shoulder, areas of soft material were encountered. Field investigation of the existing condition revealed the material contained a high moisture content and when subjected to compaction exhibited an unstable condition. Installation of underdrains will be utilized in excessively wet areas to allow proper drainage of subsurface ground water which is causing moisture accumulation in the shoulder and roadway base. The limerock base material which has been spread in excavated areas on the shoulders shall be incorporated into the subgrade by mixing. In addition, the Department has decided that ABC III asphalt shall be utilized for base construction.

Increase = \$643,285

Response: Using the reduced plans format for resurfacing projects, soil surveys are not included in the design scope of work. The cost of this S.A. is reasonable in lieu of a full soils survey and cross sections for every project. This is not a design error. No remedial action is planned.

Description Code 014: Changes Resulting From An Administrative Decision

% of Total S.A. for the month = 8.73%

Reason: This new section of curb and gutter transitions from a thirty-seven foot to a twenty-four foot curb and gutter section and back into a twenty-four foot rural section with five foot paved shoulders. The referenced varying pavement is located within the City of Greenwood. Observation of vehicular traffic traversing the project subsequent to construction of the roadway in accordance with the plans reveal the inadvertent creation of a safety hazard. This condition exists within the limits of the twenty-four foot municipal section as a result of channeling traffic from wider pavement width to the narrow section,

thus creating a hazard to motorists when encountering wide load vehicles (heavy farm equipment). To alleviate this hazardous condition, it is the Department's desire to remove the newly constructed curb and gutter, widen the southbound roadway an additional eight feet, and place new curb and gutter.

Increase = \$128,000

Response: Designers will be notified in the newsletter to consider special wide load vehicles such as farm equipment when designing the M.O.T. or new curb and gutter sections. This S.A. was not coded as a design error. The claim settlement resulted from an administrative decision. No further action is required.

Description Code 700: Minor Changes in the Plans and/or Specifications

% of Total S.A. for this month = 33.29%

Reason: The plan quantity for this item (commercial material for driveway maintenance) was to be utilized to maintain 118 driveway locations. Due to additional driveways added by plan revisions and court stipulated judgments a total of 154 will require material. Utilization of these M.O.T. items (barricades, construction sign, arrow panels, flashing lights) as required throughout the duration of this contract in accordance with the approved Maintenance of Traffic Plan and The Manual on Uniform Traffic Control Devices (MUTCD) will result in substantial overruns. These overruns are contributed to the approved contract time. Utilization of these items (temporary pavement markings) as required to delineate travel lanes during construction phasing throughout the duration of this contract will result in overruns. Utilization of this item (6" concrete sidewalk) to construct additional driveways as required to implement plan revisions, and comply with court stipulated judgements, will result in overruns to this item of work.

Increase = \$492,404

Response: The above overruns are due to increases in approved contract time and plan revisions to comply with court stipulated judgements. This is not a design error. Designers are reminded of the importance of implementing court-ordered plan revisions prior to letting when possible.

resurfaced roadway, provide a better rideability, and give the contractor an opportunity to better finalize the desired cross slope for the roadway.

Note: Use a minimum of 30mm of structural course over paved shoulders when an open graded friction course is proposed.

Process Performance Reviews

Ronnie Peel
Quality Assurance Engineer

The Department performs process performance reviews on a sample of projects that have been completed within the last 12-24 months.

The purpose of these reviews is to determine ways similar projects can be improved. Review teams are composed of members from each department within the FDOT that might of had a part in the project, i.e. Construction, Maintenance, Design, etc. The problem identified is then sent to the Department that the problem seemed to originate from and that can possibly emend it.

The following two projects had problems that involved the design of the plans. It was determined that there was either a problem with the plans or design's/project designer's approach to the project. It was determined that the newsletter would be a good way to provide designer's and projects managers information on preventing these type problems on future projects.

State Project Number: 61001-3415

S.R. (I-10) From Holmes County line to S.R. 77
Washington County

Problem number 1: Asphalt quantities designed by 100 lbs. per S.Y. inch resulted in overrun in tonnage. Large projects have a significant difference between plan quantities and actual tonnage.

Teams recommendation: Increase assumed weight from 100 lbs. Per S.Y. inch to 105 lbs. S.Y. inch or base all quantities on tonnage.

Design's finding and solution: There was a problem with the plans and the pavement design. The pavement design called for placing 4" of type S asphalt over the ARMI course. The Typical Section in the plans called for 400 lbs. Per S.Y. and was shown correctly, however there were several layer details in the plans and they were shown in inches rather than in pounds per S.Y. to agree with the Typical Sections.

When the asphalt is being paid for by the ton the Pavement Design and course layers should be shown as pounds Per

S.Y. (Kilograms Per Meter Square, Metric) in all locations in the plans. Even if the Pavement Design shows it in inches or millimeters, it is the designer's responsibility to show the pavement design in the appropriate terms in the plans.

Problem number 2: The construction sequences conflict with maintenance of traffic plan. The specifications for pouring of concrete during Slip-Form paving of barrier wall over four-lane divided roadway did not allow adequate time for switching of lane closure.

Teams recommendation: Not allow Slip-Form paving of barrier wall over four-lane divided roadways

Design's finding and solution: Designer's (consultant and in-house) should not give the contractor the option of Slip Forming the barrier wall when traffic must be maintained under the bridge. See **Section 521 of the Standard Specifications for road and Bridge Construction** for specifications on Slip Form Construction.

State Project Number: 61001-3430

S.R. 8 (I-10) From 0.014 miles east of S.R. 77 to Jackson County line Washington County

Problem Number 1: To maintain clearance under bridge at Falling Waters Road overpass required lump sum supplemental agreement for pay **Item Number 19999021 for \$50,000.00.**

Teams Recommendation: Request all designers to obtain bridge inspection reports when a bridge is on the project.

Design's Findings and Solution: In a previous set of plans done in 1987 the concrete was removed completely for about 640' in the eastbound lane under the Falling Waters overpass to maintain the necessary clearance.

However, in the westbound lane a special treatment was provided that cracked and resealed the concrete and placed 2 5/8" of Asphalt over the concrete. It was in this area that the problem occurred. The designer should have found this in the previous plans and provided a method of correction to maintain clearance for this area.

Additional measures that need to be made to ensure this does not happen on future plans are:

- 1) Project Mangers should point out the clearance requirement in the scope.
- 2) Project manager should make sure the designer is provided with all previous plans or Typical sections on a project, especially when the project has been resurfaced or reworked as in this case.
- 3) The designer should obtain the bridge inspection report.
- 4) The designer should require the surveyor to provide existing clearances on overpass bridges, or this should be included in the scope as a survey requirement.

Problem number 2: Designer error in calculations, misplaced decimal point resulted in supplemental