District Construction Engineer's Meeting

October 30, 2009 8:00 AM to 4:00 PM

Room 348 CO Burns and Video Conference Bridge 4977

The following individuals were in attendance for the District Construction Engineer's Meeting:

State Construction Office – David Sadler, Paul Steinman, Jerry Rudd, David Chason, Stefanie Maxwell, Steve Carter, Kim Smith, Sastry Putcha, Lewis Harper, Alan Autry
Central Office Legal – Dan Hurtado, Nancy Aliff, Calvin Johnson
D1 – Jon Sands, Terry Muse
D2 – Tim Ruelke, Ernest Garcia, Michael Sandow
D3 – Steve Benak, Keith Hinson, Renae Sanders
D4 – Pete Nissen, Pat McCann
D5 – Frank O'Dea, Lorie Wilson, Jennifer Taylor, John Burnette, Tonii Brush, Jonathan Duazo
D6 – Mark Croft
D7 – Brian McKishnie, Conrad Campbell, Patrick Stanford
TP – Matt Price, Kurt Stone, Bill Sears, Karen Akers
FHWA – Rafiq Darji, Chad Thompson

The following topics were discussed during the meeting. Action Items are highlighted.

1) Warranty Administration (Jerry Rudd)

   a) Ride Numbers. Acceptance numbers as compared to warranty numbers.

      Raise awareness of a proposed specification change w/acceptance based on 3.5 vs. 3.7 Ride Number. Jerry Rudd is drafting CPAM and specification revisions which will reflect this change. These proposed revisions will be sent for review prior to implementation.

   b) Value Added pavement administration requirements

      Raise awareness that FDOT is no longer entering into Tolling Agreements as a method of resolving latent defect issues when the 820 days following Final Acceptance is nearing expiration. FDOT will file suit prior to expiration of 820 days but hold said suit for 120 days thereafter to attempt further resolution of the issues. There was discussion among the districts about language which holds bonding company responsible for 2 years vs. 820 days referenced in the specifications.

c) Mast Arm Update

The Department is no longer specifying painted galvanized mast arms or strain poles. If a city or county insist on painted structures, they must agree to pay the difference for painting the structure(s) and agree to accept maintenance. The Plans Preparation Manual has been updated to reflect the current policy.

d) Warranty Administration (Jon Sands)

- We recently learned that Warranty Letters for corrective action need to be sent out by the State Construction Office. The Districts administer the entire project and the entire warranty process, can these corrective action letters to the contractor still be sent from the Districts with a copy to the SCO?
  The current process was agreed to with Industry. Districts would prefer to issue these letters rather than the State Construction Office (SCO). SCO has no objection to this process change and will update the CPAM chapter accordingly.
- When warranty work occurs on a Federally Funded project do certified payrolls need to be submitted by the contractor? Are all Districts enforcing this requirement?
  This federal requirement was discussed. See the attached memo provided by D6 (See attachment 1-A). If warranty work represents ≤ 20% of an employees work week, certified payrolls not required. Districts should enforce current requirements from this point forward.

2) Use of the Traffic Control Officers (Pete Nissen/Tim Ruelke)

a) The discussion will revolve around when the DOT will pay for having traffic control officers on projects. Refer to section 102-7 in the Standard Specs for when this should be called out in the plans. Also refer to the FHP Hireback Contract Manual for additional speed control in work zones. The link is attached.
http://www.dot.state.fl.us/construction/Engineers/MOT/FHPHirebackContract.pdf

Discussed consistency of Traffic Control Officer and Hire back programs. Districts are encouraged to follow conditions of specifications 102-7. Discussed the 4 hour minimum of spec 102-11.2.

3) Wage Rate Compliance changes and associated issues (David Sadler/Kim Smith)

a) Department of Labor has changed the Davis Bacon Wage tables for highway construction. Effective the October 19, 2009 letting these rates must be used in contracts.

Discussed the higher rates recently imposed by the Department of Labor. Anticipate that contractors will increasingly claim credit on certified payrolls for the cost of fringe benefits provided to their employees (this creates a challenge to those reviewing payrolls that have not dealt with fringe benefits before). While they might file contract claims, it should not be a problem if we properly reference the wage table in the bid document. FDOT/FTBA will continue challenging notification and new rates. Potential errors by FHWA are noted in certain instances.

b) Potential for work classification conflicts on reports when Contractors change work classification titles due to Davis Bacon updates.

Discussed the classification changes and specific requirements of Wage Rate tables and Davis Bacon Act. District Compliance personnel are encouraged to coordinate with contractors to establish proper classification of contractor employees (laborers, mechanics, etc.).

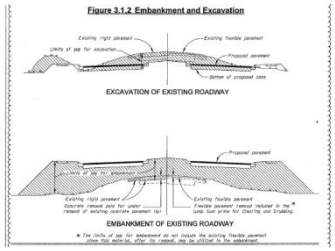
4) Field Measuring Plan Quantity Items (David Sadler)

Discussed current methods used to determine quantities and certain items which are currently plan quantity items. Plan Quantity Items should not be field measured but rather only the authorized changes to the Plan Quantity should be measured. Districts identified that designers are not addressing existing sidewalk ramps which do or do not meet current ADA standards. Also design is including "contingency" items (sidewalk, grassing, etc.) which lead to required measurement.

5) Method of Calculating Embankment and Excavation (Frank O'Dea)

D5 design asked DCE's & SCO to discuss definition and classification of "Original Ground line". Need to consistently identify the original ground line the same for existing concrete pavements and asphalt pavement areas. SCO (David Chason) will look into this further based on the below email from D5.

Issue: Method for calculating embankment and excavation.
Apparently, at the request of the Construction office last year, the Sr. Designers were trying to standardize method of calculating the quantity of embankment, especially as it relates to existing pavements that are being removed.
PROBLEM: The SR Designers ended up tabling the issue because lack of consensus of "how" to properly calculate. Our District Roadway Design Engineer summed up the stalemate as, "the Construction office" wanted to calculate it this way:



But this method treats RIGID and FLEXIBLE pavements differently, and there does not appear to be logical reason why.
BACKGROUND: Current Plans Preparation Manual (PPM) is silent on how the "original ground line" is defined in areas where existing pavement is being removed. Some designers could use the existing paved (top) surface, some ground as it would exist with the pavement removed. We have seen both.
The specs that govern the payment say, in section 120-13.7 (Embankment): ..... The measurement will include only material actually placed above the original ground line, within the lines and grades indicated in the plans or directed by the Engineer. ....Where the work includes excavation of unsuitable material below the finished grading template or original ground line, whichever is lower as defined in 120-3.3, the original ground line is defined as the surface prior to beginning excavation, except that this surface is not outside the permissible tolerance of lines and grades for Subsoil Excavation as indicated in the plans or as directed by the Engineer.

It does appear to be problematic that the specs don't clearly define the original ground line.

6) Drilled Shaft Slurry Testing (Sastry Putcha)

   a) Mineral

   b) Polymer

   c) Mineral/Polymer combination

   Current drilled Shaft inspection requirements per 455-15.8.4 and signing and sealing requirements of slurry test reports for mineral and polymer slurries were discussed. District personnel are encouraged to become familiar with current specifications and to enforce/follow those requirements.

7) Listing of FDOT and the Contractor on Crash Reports as Interested Parties (David Sadler/Tim Ruelke)

   FHP is requesting additional specific information about projects (specific limits, specific scope, interested parties, etc.). By providing this information FHP will be able to release information relevant to crashes in the work zone in a timely manner and maintain compliance with Florida Statutes. The email below summarizes information requested by FHP.

   From: *Gaston, Keith [mailto:KeithGaston@flhsmv.gov]*
   Sent: *Monday, September 14, 2009 3:23 PM*
   To: *Moyle, Allan; Vega, Peter; Ausher, Jerry*
   Cc: *Major Tony Allen; Captain Gene Spaulding; Captain Jerry Crews; KeithGaston@flhsmv.gov; Captain Rick Kelley*
   Subject: *FDOT Project Contractors*

   Gentlemen,

   We have been reminding our personnel to list FDOT, contractors and other interested parties in the section of the crash report PROPERTY DAMAGEED – OTHER THAN VEHICLES.
   If FDOT or the contractor is not listed on the crash report they are not considered an "interested party" and not entitled to a copy of the crash report for 60-days (F.S. 316.066). A problem that has been brought to my attention is the lack of knowledge by field personnel on who to list on the crash report.
   The other issue is who is actually the general contractor? If the crash occurs during a non-work period of time how does the trooper determine ownership or the contractor? If there is actual construction at the time of the crash it can be more confusing. If APAC is on the job site paving for Superior Construction and a crash occurs, who should be listed? Superior would be listed as the General Contractor.
   Here is how you can help. If the general contractor would provide a detailed description of their limits of work in the letter they send to the Troop Commander notifying FHP of the construction commencement. Such as I-95 between Point A and Point B, including the intersection road from Point C to Point D would be very helpful to the Trooper in the field. I would even suggest a small map detail of the area if it is an area without cross-streets.
   Additional information that needs to be included in the letter is who from the company is authorized to pickup crash reports on behalf of the company. Four things must occur in order for us to provide a construction company a copy of the report.

   1. *They must be listed on the crash report.*
   2. *We must have a letter stating who is authorized to receive a copy of the report on behalf of the company.*

3. *The attached Sworn Statement for Traffic Crash Report Information must be completed for each report. (form attached)*
4. *The company must pay the $10 for the crash report.*

This is not an agency policy; these requirements are established by Florida Statutes 316.066. The most important part of the statue to FHP personnel is the following: 316.066(6)(b) which states "Any employee of a state of local agency in possession of information made confidential and exempt by this section who knowingly discloses such confidential and exempt information to a person not entitled to access such information under this section is guilty of a felony of the third degree…" This section would also apply to you as a FDOT employee if we provided you a copy of the report to which you were legally entitled and you provided a copy of the report to someone who was not entitled to the information within the 60-day exemption period.

8) Manufacturer Field Rep on Bridge Joint Installations (Pete Nissen)

Discussed requiring a field representative be on site when these items (modular joints) are installed. Central Office Design and Specifications does not support requiring this via a TSP, SP or Standard Specification. SCO (Steve Plotkin) will discuss this will Central Office Design/Specifications and provide an update to DCE's.

9) Elastometic Bearing Pad Testing (David Sadler)

This discussion centered on raising awareness for the districts of the current specification requirements (932). Update from recent Structures Committee meeting - Industry resisting the current specification requirements and will provide additional data to SCO for review. Expect resistance from contractors. Each District was polled to determine contractor compliance.

Follow-up Item: DCE Memo 20-09 was issued 11/9/2009 which addresses this requirement.

10) Third Party Damage on Construction Contracts (Pete Nissen)

Discussed issue of damaged caused by auto fire where motorists insurance does not cover this damage or if motorist responsible for damage does not possess insurance. FDOT will compensate contractor when this occurs for actual work but not allow mark-ups. Contractor must show clear/convincing proof of pursuit of cost from responsible party but were not able to obtain reimbursement. If contractor only able to recover partial cost from the Third Parties insurance, FDOT will pay the balance as described above. The items listed in Section 7-11.4 of the Specifications are excluded from this direction as they are already addressed in that specification.

11) FDOT Fraud Video (David Sadler)

Discussed Fraud Awareness video developed by OIG which should be shown at preconstruction conferences, contractors meetings, etc. See attachment (11-A).

12) Use of Contingency Supplemental Agreements (Paul Steinman/Steve Carter)

Discussed additional CSA pay items made available in March 2009 (Bulletin 01-09). Currently Site Manager limits CSA's to 5. An update to CPAM 7.4 will be issued in 2010 to reflect the current requirements. Districts are encouraged to coordinate with District Secretaries and program larger contingency amounts if needed.

13) Status of Roadway Sampling (Lorie Wilson)

D5 previously provided a report to SCO and is seeking feedback from this review (see attachment 13-A). D5 provided an update to the DCE group outlining the pilot process being used. Industry has voiced opposition to this method of sampling. Update will be provided as to the plan to proceed following further review of data provided by D5 pilot program and discussion with Industry. D3 (Tim Ruelke) also has data and will submit this information to SCO.

14) District Materials Engineer's Meeting Minutes considering a procedure for suspending QC and VT techs if they do not act when they observe a deficiency. (Lorie Wilson)

Discussed a proposed procedure for issuing "strikes" against QC technicians and/or VT's when testing requirements are not met or specification requirements are not enforced. Group agreed to follow up with the SME and DME's to further review the proposal.

> ***From:*** *Wilson, Lorie*
> ***Sent:*** *Wednesday, September 02, 2009 9:45 AM*
> ***To:*** *Steinman, Paul J.*
> ***Cc:*** *O'Dea, Frank*
> ***Subject:*** *Agenda Items for DCE Meeting*
>
> - *See the District Materials Engineer meeting minutes below. They are working on striking our roadway verification technicians. What is the status and where are we headed with this?*
>   - ***Paving Issues. Anything to stop DMRE staff from issuing the QC and V paving technicians a strike, if there are many deficiencies observed in the paving operation? – Hesham Ali***
>
> *Hesham related a recent experience during an FHWA review where the contractors paving operation had several QC issues even though they knew they would be under review. Hesham discovered there is no procedure for suspending a paving technician in the CTQM. Kathy Gray pointed out the language in the geotechnical section for drilled shaft inspectors and the group agreed to adopt similar language for Asphalt, Earthwork, and Concrete. These sections will work together and with Construction to get the needed changes in the CTQM*.

15) Design/Build RFP's (Paul Steinman)

a) Utilities

b) ROW

c) Environmental/Permits

d) Max Bid Price Proposals and responsiveness

Discussed proposed RFP documents which have historically include vague or limited information related to utility relocation, ROW acquisition, environmental and permitting requirements. Emphasized awareness of identify and address these areas as effectively as possible when developing proposed RFP's. Group discussed D/B firms' responsibility of addressing these areas as they are sometimes factors of the design concepts proposed by the D/B firm.

Max Bid – if firm submits a bid which exceed the Max Bid Price, the firm would be eligible for Stipend provided all other aspects of proposal are determined to be responsive.

Division I D/B boiler plate specifications Section 7-13.2 states not applicable as a public liability – This has been corrected in the current Division I boiler plate specifications.

16) Update on Automated Machine Grading (David Sadler)

An update was provided to the group. The State Surveyor is analyzing the current process and technology along with the results of pilot projects which have used this method of construction control.

17) Dead Animal Removal and the new mowing spec (Paul Steinman)

Discussed the proposed specification which requires FDOT maintenance or Asset Maintenance (AM) contractor be responsible for dead animal removal. Polled districts to establish agreement with the proposed specification. Some objections voiced on projects where AM contractors are involved. Mowing specification (107) will be resubmitted for 2nd Industry review. District staff are encouraged to review this proposed specification change when submitted.

18) Time extensions on D/B projects when utilities are late in relocating (Pete Nissen)

Discussed instances when D/B projects may be impacted by a Utility Agencies/Owners failure to either identify facilities or relocate facilities. Should be a responsibility of the D/B firms and FDOT should not be granting TE's in these instances.

19) Training on Specifications and Standard Index Updates (Lorie Wilson)

D5 requested SCO provide this training to the districts. Some of this training should be accomplished through the Process Review performed by the SCO Specialty Engineers. Requested a status update on Design Standard update training performed by the Central Office of Design. SCO committed to explore the possibility of rolling out new or additional training. The Districts are in favor of this approach.

20) Arithmetic Mean Update (Paul Steinman)

Following is a comparison of three projects from different districts comparing the Arithmetic Mean with the Average Method.

Base course project size: 18929 SY - Arithmetic Mean = +$28,242; Average method per design mix = +$24,062
Base course project size: 7480 SY - Arithmetic Mean = --$22,875; Average method per design mix = +$29,280
Structure course project: 23,754 TN; 309509 SY - Arithmetic Mean = $1,875; Average method per design mix = +$6,035

Discussed the above comparison and the value or benefit of completing the arithmetic mean method. SCO (David Chason) will establish a method of using cores used for density as the means for calculating thickness.

SCO will issue additional guidance on this subject once an updated process is identified.

21) Update on Flexible Pipe Research (David Sadler)

Updated the group on research on-going at UF. Desired result is early laser video inspection of flexible pipe based on the results of this research. Districts are encouraged to identify projects for this research & development study.

22) CPAM requirements for review of SA's, Spec Changes , etc. (Paul Steinman)

Districts are to begin sending specification change requests, project limit extension requests, and electronic copies of executed SA's and Work Orders on contracts ≥ $10M, etc. to Alan Autry effective immediately.

23) (Lorie Wilson) The new specification on Signals 611-2.3.3 requires that we hold 15% retainage for as-builts. Also the proposed 104-6.6 specification as currently written and under review states that final payment is to be withheld until the as-builts are received. Our question is how is this being implemented statewide. It is cumbersome when you hold 15% on each item. . What final payment, what if the contractor is in the negative?
Site Manager processes for handling this on each signalization is cumbersome on district staff. Polled Districts to determine how this is being handled. Industry (via LESS committee) requested this be reduced to 5%. Industry claims these are being submitted monthly and then timely upon final acceptance. Discussed alternate proposals to withhold payment or qualifications (perhaps part of 9-8 submittals). SCO (Stefanie Maxwell & Larry Ritchie) will review with Central Office Legal and will provide an update to the DCE group.

611 ACCEPTANCE PROCEDURE.
(REV 7-7-08) (FA 7-22-08) (1-09)
SUBARTICLE 611-2.3.4 (Page 678) is deleted and the following substituted:
611-2.3.3 Compensation: All costs involved with providing as-built plans are incidental to the other items of work associated with traffic signals. Payment for the work associated with traffic signals will be made at 85% of the unit price bid for signal installation. The remaining 15% of the unit price will be made after submittal and acceptance of the As-Built Plans.
http://www.dot.state.fl.us/specificationsoffice/Implemented/WorkBooks/JanWorkBook2009/Files/SS6110203.pdf

***PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION*- CONSTRUCTION REQUIREMENTS. - SIGNED AND SEALEDAS BUILTDRAWINGS.**
(REV *10*6-*12*15 09)
ARTICLE 104-6 (of the Supplemental Specifications) is expanded by the following:
104-6.6 Signed and Sealed As-Built Drawings: *Prior to final acceptance of the project, submit to the Engineer threetwo copies of as-built drawings and a certified survey verifying the as-built conditions for all installed and constructed surface water management systems.prepared according to the permitting agency's requirements. The as-built drawings and certified survey must satisfy all the requirements and special conditions listed in the Water Management District's Environmental Resource Permit (ERP) and any applicable local permit. The as-built drawings and certified survey must be signed and sealed by an appropriately licensed professional registered in the State of Florida.for the surface water management system must be signed and sealed by an engineer registered in the State of Florida.* ***Final payment is contingent upon acceptance of the as-built drawings and certified survey by the Department.permitting agency.***

24) J wall – Are districts requiring the J wall to be installed fully extended to have the J hooks engaged, closed, or somewhere in between? Our concern is the allowable deflection from the closed position to the engaged position. Based on testing it takes approximately 13.5" inches before engagement. It is unclear if this was considered in testing. We found a revision to the J wall design that took out the requirement for the wall to be installed fully engaged dated after FHWA approval. (Matt Price)

Discussed proper placement of J wall. TP questions proper placement when wall sections are fully engaged may exceed spacing requirements. Contractors not fully locking wall sections together which appears to be an isolated issue. TP will provide additional details to Stefanie Maxwell.

Follow-up - (see email below):

From: *Maxwell, Stefanie*
Sent: *Monday, November 02, 2009 8:13 AM*
To: *Steinman, Paul J.*
Cc: *Keel, Andy; Mills, Jim*
Subject: *RE: DCE Agenda Items*
I spoke with Andy Keel in Roadway Design and he confirmed that the JJ Hook is acceptable if it is engaged, closed or somewhere in between.
Stefanie D. Maxwell, P.E.
Specialty Engineer
FDOT State Construction Office
605 Suwannee Street, MS 31
Tallahassee, FL 32399
(850)414-4314; Fax (850)412-8021

25) Spec. 971-4.3.3, Retroreflectivity. Paint retroreflectivity not lasting 3 months when spec. requires 6 months. Is any other District testing? What results are other Districts getting after 3 months? (Matt Price)

Discussed instances where higher AADT's have caused apparent failures before the 180 observation period expires. Districts should enforce the requirements of the specifications. There are more durable products on the QPL/APL and should use those products if the situation occurs. Contractors rolling the dice, using cheaper products which may not be applicable to the estimated AADT's identified in the plans. Districts reminded to take reflectivity readings prior to expiration of 180 days or contractor is released of responsibility to correct deficiencies. D5 proposed performance contracting specification (provide a stripe 6" wide, specific color, XX value reflectivity) and allow contactor the ability to provide the type of material.

26) Spec. 102-7, Traffic Control Officer. Suggest adding "setting up & removing lane closures" to the list of allowable operations where an off-duty officer is useful and his time can be added to the computation book pay item quantity. On- duty hireback officers for speed enforcement will not perform this duty in South Florida. (Matt Price)

Standard Index 619 in conjunction with Specification 102.7 should be followed. If the condition described isn't in accordance with this Index, then contractor should bear this cost in LS MOT item.

27) DRB (Pete Nissen)

a) No strike system from Task Team, how are we all going to handle at District level?

Discussed a proposed strike system which would be implemented when DRB members continually return recommendations which are not consistent with the contract requirements or when DRB members do not remain engaged in the hearing/meeting process. SCO will continue discussing this proposal with the DRB Task Team. Reviewed proposed revisions to eligibility requirements for DRB participation summarized as follows:

- *Full time contractor or full time CCEI employees = no participation*
- *Meeting frequency established by contractor and FDOT – not board*
- *Rate increase for each Hearing to $2500/member and $3000/chairman*
- *Contractor and FDOT will share the cost of Hearings*
- *No rate increase for regular meetings*
- *If current active members experience a change in employment status which prevent them from being considered, the website would reflect that member in an inactive status.*

Discussed expectations of DRB participants (Members & Chairman). Members should review the position papers, rebuttals, etc. and be familiar with the issues prior to the hearing.

b) Consistency on how 5-12 issues will be handled.

Should claims or disputes which contractor has waived rights under 5-12 be presented to DRB's. Polled Districts to determine how this has been handled. Various situations and opinions were discussed. Claims and/or disputes in which the contractor has not fulfilled the certification requirements of 5-12, should not be presented to the DRB.

28) Landscape Warranty Bond – everyone consistent? (Pete Nissen)

Discussed Warranty Bond requirements and polled Districts to see if warranties are beginning at Final Acceptance or some other point. Districts are requiring these warranties beginning at Final Acceptance. The group discussed requiring the warranty period to begin upon completion of the work and be in effect for 1 year from completion of the work. This would encourage contractors to complete the work early. A possible specification change may be required. The group also discussed adding this requirement as a condition of specification 9-8.

29) Fuel & Bit counts against FTC time & money measures – any way to change that? (Pete Nissen)

The group discussed these potential built in performance measure impacts. Districts would like consistency with numbers reported to FTC annually, Executive Directors monthly, etc. SCO will review and discuss this further. Each DCE is to summarize specific examples and send them to Paul Steinman.

30) 4-3.1 – 'automatic' renegotiation with significant change (Pete Nissen)

Discussed the current language of 4-3.1 and specific examples where major items of work were under-run. Specific examples will be provided to SCO by Districts 4 (Pete Nissen) & 7 (Brian McKishnie). These will be reviewed by SCO and if necessary, the specification will be revised.

31) Thickness measuring device – still need instruction manual (Pete Nissen)

An instruction manual for the 3 dial gauges was provided by D5 (see attachments 31-A & 31- B). Raise awareness that the thermoplastic thickness measurement is taken from the FC "surface". Thermoplastic placed on FC-5 will be required to be placed at heavier application rates in order to achieve the minimum thickness requirements of the specifications due to the characteristics of open graded FC. Measurement of odd shaped areas (gore, arrows, messages, etc.) is currently an issue where the current device provided by SMO will not measure these markings. The email below includes directions for obtaining the instruction manual.

From: *Davis, Jack*
Sent: *Thursday, May 07, 2009 5:27 PM*
To: *D5-Resident Engineers; D5 Construction SPE; D5-PE Trainees*
Subject: *Procedure for Measuring the Thickness of Thermoplastic Materials*
Hello all,
This is the link to State Material's Office Florida Sampling and Testing Methods (FSTM) 5-541 Procedure for Measuring the Thickness of Thermoplastic Materials
http://www.dot.state.fl.us/statematerialsoffice/administration/resources/library/publications/fstm/methods/fm5-541.pdf
Attached are instructions on how and where to use the machine. Each Resident office has one. Also attached is a spreadsheet for tracking the test results.
All of this information is on the D5 Website at the bottom of the Operating Procedures under Miscellaneous / Project Administration Tools
http://www.dot.state.fl.us/construction/DistrictOffices/d5web/operating_procedures.shtm
Thanks,
Jack R. Davis
Construction Support Specialist; Quality Control
FDOT District 5 - Construction
719 South Woodland Blvd. MS 3-506
DeLand Florida 32720-6834
PH: (386) 943-5463 / FAX: (386) 943-5716
jack.davis@dot.state.fl.us

32) Fed full oversight projects – hold paying work orders until feds sign off? (Pete Nissen)

Discussed specific District examples. Districts are encouraged to follow the direction of CPAM 7.4 in this matter. Minor changes are to be approved retroactively. An excerpt from CPAM 7.4.6.9 follows:

> *FHWA written approval for additional work or contract changes shall be obtained retroactively and documented on the **Work Order**. FHWA may elect to approve additional work by having the **Work Order** sent to them for signature or by signing the **Work Order** at the time of a routine field visit.*

33) Modified Special Provision on thermoplastic placement. 30 day cure versus 14 day cure (Brian McKishnie)

Discussed consistency of thermoplastic cure periods among the districts. Districts should gather and provide data to demonstrate whether or not tracking issues occur when a 14 day cure period is used (audible and standard thermo should be observed). Some districts currently place thermo via construction contracts while other districts placing thermo via maintenance contracts.

34) Electronic Data Collectors (Lorie Wilson) - EDC is in the specification for January 2010, it is my understanding that at a minimum the additional cost is $2,000 per pile and could be as much as $4,000. The training itself is $4,000 to get an EDC operator certified and AFT is the sole provider for the training. Have we looked at the cost benefit ratio?
Discussed cost increases associated with EDC requirements. Relaxed phi (Φ) factor currently used is based on EDC data using both top and tip of pile data. Industry concerned about EDC requirements for all pile (availability). SCO will be meeting with Industry in near future to discuss those impacts and will update DCE's accordingly. Geotechnical community continues to resist EDC use. Districts concerned about overall cost impacts.

35) Shipping precast beams before they reach 28 Day strength (David Sadler) – Refer to section 346-10.2 and section 450-16.3
Discussed the intent of these specifications where the shipping should be allowed. Central Office Specifications is developing a proposed specification change to revise the percentages of the current specifications.

36) Contractor Past Performance Report (CPPR) (Paul Steinman/Lewis Harper)

1.) Provide a copy of the final CPPR to the State Construction Office, per the CPAM as stated below.

13.1.7.1 Preparing the Report

(A) Resident Level Responsibilities

Once the appeal process has been completed the ***Contractor's Past Performance Report*** shall become final. The ***Final Report*** shall be scanned into the Department's ***Electronic Document Management System (EDMS)*** and the results sent electronically to the District Construction Engineer, State Construction Office, and a copy sent to the Contractor. For project(s) that are in Site Manager, the Resident Engineer shall put the final grade into the Department's Site Manager Computer System.

Reminder for districts to send final CPPR grades to Lewis.

2.) Certification of Previous Periodic Payment to Subcontractors (Form # 700-010-38), as stated in the Instructions # 1 – Attach copy of the notification good cause sent to each applicable subcontractor. The Department is seeing letters and/or e-mail from the prime concerning good cause being sent to the Department, when this letter or e-mail should be going to the subcontractor(s) or suppliers and then the prime should be providing a copy of this letter or e-mail with the certification to the Department.

Districts were encouraged to discuss Certification of Previous Periodic Payment to Subcontractors with Prime Contractors.

37) Jon Sands 10-28-09 e-mail forwarded on 10-29-09.

Discussed the payment of Mobilization during the design phase of D/B projects. SCO (Alan Autry) will review current payment MOB guidelines and update the D/B guidelines to convey intent.

Follow-up: The D/B project Schedule of Values was updated on 11/19/2009 and can be accessed at the following link:
http://www.dot.state.fl.us/construction/DesignBuild/DBDocuments/DBDocsMain.shtm

Discussed the Design Build escalation processes for Design and Construction disputes. District 1 suggested a change where issue escalation stops at DCE then reverts to DRB for Construction related disputes. Polled districts to see if the escalation processes have been an issue. This will be a topic of discussion at the next Alternative Contracting Task Team Meeting.

Resolution Tracking System not set up to track CCEI E&O errors. Districts must track these using separate methods. SCO will follow up with Sean Murphy to see if modifications to current system are warranted.

Follow-up email below:

From: Murphy, Shawn
Sent: Friday, October 30, 2009 3:14 PM
To: Sadler, David A
Subject: RE: RTS
Currently no, David.
And OIS has suspended enhancements to RTS because it was built on a Lotus Notes platform, as well as the limited availability of funds for all Enterprise Applications.
From: Sadler, David A
Sent: Friday, October 30, 2009 3:04 PM
To: Murphy, Shawn
Subject: RTS
Shawn,
A question is coming up about whether or not the RTS captures CEI E&O. Does RTS capture this?
Please let me know if you have any questions.
David A. Sadler, P.E.
Director, Office of Construction
(850)414-5203
Fax - (850)-414-4874
userid: cn982da
email: david.sadler@dot.state.fl.us

Return receipt e-mails - Can this be used as a method of documentation delivery in lieu of Certified Mail? SCO (Jerry Rudd) will discuss with Central Office Legal to obtain a determination on this proposal.

38) Items from LESS, Structures, and Specifications Meetings (David Sadler)

LESS MEETING

Mast Arms (touch up painting) – *Industry expressing concerns over mast arm touch up painting. Project personnel need to focus on mast arm handling by contractors to minimize required touch up painting.*

Foundation Removals – *plans call for deep foundation removal but reality is shallow foundation removal is only possibility due to existing conditions. When this occurs, renegotiation is warranted.*

Drill Shafts for Miscellaneous Structures – *Industry expressing concerns over being required to hire Specialty Engineers to survey adjacent properties and FDOT not willing to pay for these surveys.*

Tolerance of Guardrail height – *Industry expressing concerns over methods being employed to measure guardrail height.*

Guardrail Reflectors – *Industry expressing concerns over being required to upgrade to new reflectors or remove installed new reflectors and replace with old markers based on AM Contractors contract.*

FDOT following National Electric Code vs. other (local) codes – *Typically this is a request of the Maintaining Agencies. Paul to follow up with Central Office Design on this issue.*

Lights on Drums/Barricades – now is the time to discuss removing these items.

STUCTURES MEETING

Profile Grinding – *Industry express concerns over current specification to grind ¼" depth minimum of Spec. 400-15.2.5.5*

SPECIFICATIONS MEETING

No update

WALK ON ITEMS

39) CSX delays to projects – *Concerns over this issue were discussed amongst the meeting participants.*
40) JPA Requirements (Pete Nissen) – *JPA's require licensed contractors (plumbing, electricians, etc.) as shown in FDOT boilerplate JPA's.*
41) Shuttle buggy Use (Pat McCann) – *SMO requesting this equipment be a requirement in D4 as a Pilot Project.*
42) Allowing Traffic on Milled Surface (Pat McCann) – *SMO requesting D4 to require traffic on milled surface for XX-XX hrs (or days) as a Pilot Project. Solicited and discussed feedback on this concept.*

THE NEXT DCE MEETING WILL BE HELD FOLLOWING THE CONSTRUCTION CONFERENCE IN FEBRUARY 2010

ATTACHMENT 1-A

Construction Guide
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Printable version of this page (.pdf, 47 kb)

U.S. Department of Transportation
Federal Highway Administration

MEMORANDUM

Subject: **INFORMATION**: Applicability of Prevailing Wage Rate Requirements to Federal-aid Construction Projects

Date: June 26, 2008

From: Dwight A. Hornes
Director, Office of Program Administration

Reply To Attn. of: HIPA-30

To: Directors of Field Services
Acting Resource Center Manager
Division Administrators

Over the years, a number of questions have been brought to our attention concerning the prevailing wage rate requirements under 23 U.S.C. 113. Generally, 23 U.S.C. 113 requires all laborers and mechanics employed for construction work on Federal-aid highways shall be paid wages at rates not less than those prevailing wages as determined by the Secretary of Labor under the Davis-Bacon Act. In addressing these questions, this office has issued a number of memorandums, e-mails and letters to communicate the decisions regarding these questions. As a result, the FHWA's guidance on the applicability of 23 U.S.C. 113 is contained in various different sources. The purpose of this memorandum is to consolidate and briefly restate existing guidance and policies concerning the applicability of the prevailing wage rate requirements under 23 U.S.C. 113.

The US Department of Labor's (DOL) regulation in 29 CFR Parts 1, 3 and 5 provides the applicable policy for the implementation of prevailing wage rate requirements on federally funded construction projects. Congress extended these requirements to Federal assistance programs through a series of related acts. For the Federal-aid highway program, the related act is found in 23 U.S.C. 113 - "Prevailing rate of wage." Thus, Section 113 serves as the source statute for applicability determinations in the Federal-aid highway program while the DOL's statutes, regulations and directives provide the appropriate policy for implementing Section 113 prevailing wage rate requirements whenever these requirements apply to a Federal-aid highway project.

Section 113(a) states:

> The Secretary shall take such action as may be necessary to insure that all laborers and mechanics employed by contractors or

Events

- **International Construction Management Conference**
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- View all Upcoming Construction Events

Contact

Jerry Yakowenko
Office of Program Administration
202-366-1562
E-mail Jerry

ATTACHMENT 1-A

> subcontractors on the construction work performed on highway projects on the Federal-aid highways authorized under the highway laws providing for the expenditure of Federal funds upon the Federal-aid systems, shall be paid wages at rates not less than those prevailing on the same type of work on similar construction in the immediate locality as determined by the Secretary of Labor in accordance with sections 3141-3144, 3146, and 3147 of title 40.

First, we have determined that the phrase:

- "Construction work performed on highway projects on the Federal-aid highways" means any construction project that takes place in the right-of-way of a Federal-aid highway is subject to 23 U.S.C. 113. This would include work that may not appear to be highway construction (construction of wetlands, landscaping, etc.) but is an otherwise eligible project under Title 23. Thus, any Federal-aid construction project (regardless of Federal-aid funding source) physically located within the right-of-way of a Federal-aid highway is subject to 23 U.S.C. 113 requirements. See Mr. Anthony R. Kane's February 13, 1992 memorandum titled: "ISTEA of 1991 – Construction and Maintenance Requirements."
- The term "Federal aid highway" is defined in 23 U.S.C. 101 as "... a highway eligible for assistance under this chapter other than highways classified as local roads or rural minor collectors." Therefore, 23 U.S.C. 113 requirements are applicable to Federal-aid construction projects on highways functionally classified as arterials and collectors but not applicable to projects located on highways functionally classified as local roads or rural minor collectors. In addition, 23 U.S.C. 113 requirements are not applicable to Federal-aid construction projects that are not located within the right-of-way of a Federal-aid highway. In certain circumstances, 23 U.S.C. 113 requirements apply to a Federal-aid construction project not located on a Federal-aid highway if the project is linked to or dependent upon a Federal-aid highway project. Examples include: a project required by an environmental document for a Federal-aid highway project or a project for the construction of a traffic control center that monitors traffic on one or more Federal-aid highways. In both cases, the project would not exist without the Federal-aid highway project. See Mr. David R. Geiger's July 28, 1994 memorandum titled: "Applicability of Davis-Bacon for Transportation Enhancement Projects."

Second, 23 U.S.C. 113 requirements are applied on a:

- "Contract basis" as such, contracting agencies need to be aware that the use of Federal-aid funding for any portion of a construction contract invokes 23 U.S.C. 113 requirements for all work under the contract, regardless of the amount of Federal-aid participation or the use of nonparticipating items of work. It should be noted that minor construction activities necessary to provide a connection to a Federal-aid highway would not invoke 23 U.S.C. 113 requirements for a project not located on a Federal-aid highway. Examples of minor construction activities include: the placement of advance construction signs, approach paving, curb returns, or drainage modifications on the right-of-way of a Federal-aid highway.

Third, for projects funded with emergency relief funding:

- Contract work for emergency repairs. All contract work for emergency repairs performed by contractors or subcontractors within the right-of-way of a Federal-aid highway is covered by 23 U.S.C. 113 requirements. The term emergency repair is defined in 23 CFR 668.103 as "Those repairs including temporary traffic operations undertaken during or immediately following the disaster occurrence for the purpose of: (1) Minimizing the extent of the damage, (2) Protecting remaining facilities, or (3) Restoring essential traffic." While contracting agencies are empowered to begin emergency repairs immediately, they must comply with 23 U.S.C. 113

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requirements so that properly documented costs will be eligible for reimbursement once the FHWA Division Administrator makes a finding that the disaster is eligible for emergency relief funding.

- Contract work for debris removal only: 23 U.S.C. 113 requirements do not apply where emergency contract work is only for the removal of debris and related clean up, which is not considered to be a "construction" activity. Since 23 U.S.C. 113 only applies to "construction work," 23 U.S.C. 113 prevailing minimum wage requirements do not apply to debris removal under the emergency relief program. However, debris removal performed in conjunction with construction, alteration, and repair work (such as highway resurfacing, re-grading, significant earthmoving, bridge repairs, etc.) is covered by 23 U.S.C. 113. See DOL's August 25, 2006 letter to Mr. Horne.
- Work by public agency forces: 23 U.S.C. 113 requirements do not apply to State or local government agency employees who perform emergency repairs or construction work on a force account basis because government agencies (such as States or their subdivisions) are not considered contractors or subcontractors. See 29 CFR 5.2 (h). However, 23 U.S.C. 113 requirements do apply to contracts let by State or local government agencies using an alternative procurement procedure that has been approved through the force account approval process.

Fourth, for railroad and utility relocation or adjustment projects:

- Work done by railroads or utilities: 23 U.S.C. 113 requirements do not apply to work performed by railroads, utility companies or work performed by a contractor engaged by a railroad or utility company. Payment for relocation work performed by the utilities and railroads is considered to be compensation for a relocation in order to accommodate highway construction. See Mr. Dowell H. Anders' May 15, 1985, legal opinion titled: "Utility and Railwork – Wage Rate and EEO Requirements."
- Work done by highway construction contract: 23 U.S.C. 113 requirements apply when utility or railroad relocation work is not accomplished through its utility or railroad forces but under a highway construction contract that has been let by the contracting agency.

Fifth, for subsurface utility location services:

- Subsurface utility engineering or utility location services are considered exploratory drilling services. These contracts provide the location of utilities for engineering or planning purposes. 23 U.S.C. 113 requirements do not apply. See DOL's Field Operations Handbook, Section 15d03(b).

Sixth, for ferry boats and terminals:

- The provisions of 23 U.S.C. 113 applies to the building, alteration, and repairs of ferry boats and terminals located on or servicing a Federal-aid highway route. Wage rate determinations for ferryboat building, alteration, and repairs are issued only if the location of the contract performance is known when bids are solicited. 23 U.S.C. 113 does not apply if the location of contract performance is unknown at the time of bid solicitation. However, the contract needs to include all other applicable DOL requirements. See DOL's Field Operations Handbook, Section 15d08.

Seventh, for High Priority and other congressionally designated projects:

- These projects are subject to all Federal requirements unless the requirement is specifically waived in legislation. If the project is physically located within the right-of-way of a Federal-aid highway, then 23 U.S.C. 113 requirements apply. For rail line construction projects, if a portion of a rail line construction contract is within the right-of-way of a Federal-aid highway, 23 U.S.C. 113 requirements apply to all contract work. 23 U.S.C. 113 requirements do not apply to rail line contracts that are not located

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within the right-of-way of a Federal-aid highway.

Eighth, for Safe Routes to School and Nonmotorized Transportation Pilot projects:

- Congress required that States treat these projects as if they were on the Federal-aid system despite their functional classification or location outside the right-of-way of a Federal-aid highway. Therefore, 23 U.S.C. 113 requirements apply to all Safe Routes to School construction projects, even for projects not located within the right-of-way of a Federal-aid highway. See P.L. 109-59, Section 1404 (j).

Ninth, for warranty work:

- 23 U.S.C. 113 applies to warranty or repair work if this work is required in the original construction contract. This is true regardless of whether there is a pay item for the warranty work. If an employee spends more than 20 percent of his/her time in a work week engaged in such activities on the site of the original work, he/she is covered for all time spent on the site. The original contract prevailing wage rates apply regardless of when the warranty work is done. This is consistent with the DOL Wage and Hour Division Opinion Letter dated March 9, 1973, that concluded Davis-Bacon Related Act requirements applied to warranty/repair work for the construction of prefabricated housing units. The DOL determined that such work was covered because it took place at the site of the construction work and involved more than an incidental amount of construction activity.

Finally, it should be noted that other labor requirements of the DOL may apply to contracts even when 23 U.S.C. 113 is not applicable. These requirements include the Fair Labor Standards Act requirements (minimum wage, overtime pay, record keeping and child labor standards) and the Contract Work Hours and Safety Standards Act (overtime requirements). For guidance on the application of these requirements, please visit the DOL Web site at http://www.dol.gov/esa/whd/.

If you have any questions regarding the applicability of DOL requirements to Federal-aid construction projects, please contact Mr. Edwin Okonkwo at 202-366-1558.

This page last modified on 06/27/08

Attachment 11-A

DEPARTMENT OF TRANSPORTATION
OFFICE OF INSPECTOR GENERAL

CHARLIE CRIST
GOVERNOR

STEPHANIE C. KOPELOUSOS
SECRETARY

September 4, 2009

Secretary, District
Florida Department of Transportation

RE: Fraud Awareness Video

Dear Secretary :

We are pleased to announce the release of our Fraud Awareness video. The department produced this video to ensure that personnel and our industry partners understand the Office of Inspector General's (OIG) role in relation to department activities.

The video, less than ten minutes in length, includes comments from the Secretary, Inspector General and the Governor's Chief Inspector General. The video contains helpful information about the OIG function, contact information for reporting suspicious activity on fraud or misconduct and highlights regarding a few OIG cases.

We encourage you to show this video to department personnel. The video should also be shown to industry partners during initial preconstruction conferences. It is our preference that at preconstruction conferences for larger projects, an OIG staff member is also present to answer questions. To have a staff member present, please coordinate with Mike Strickland, Accreditation and Investigative Training Manager, who can be reached at (850) 410-5825. You may also contact Michael Bowen, Director of Investigations at (850) 410-5800.

Sincerely,

Ron Russo
Inspector General

Enclosure

605 Suwannee Street, MS 44
Tallahassee, FL 32399-0450
http://www.dot.state.fl.us

Ron Russo, Inspector General

Phone: 850-410-5800
Fax: 850-410-5851

Attachment 13-A

Roadway Sampling Research Report

written by Richard Hewitt, P.E.
District Five Bituminous Engineer

March 5, 2009

DCE Meeting 10/30/09

Item 13

(Attachment 13-A)

Executive Summary

District Five conducted research on several construction projects in order to evaluate the viability of using roadway sampling as a means of obtaining hot mix asphalt samples for acceptance and payment on Florida Department of Transportation (FDOT) projects. By sampling asphalt at the roadway, significant savings can be realized as the need for staffing asphalt plants with verification technicians (VT's) can be reduced or even eliminated. The research showed the test results from roadway samples are comparable to the Quality Control (QC) samples currently used for acceptance and payment. Last year District Five spent $1.2 million to staff asphalt plants with VT's. While some of this time is spent running tests or directing the Quality Control personnel to obtain payment samples, considerable money is spent having VT's travel throughout the district to the asphalt plants, as well as, for time the VT is idle, but cannot leave due to either the proximity of the next pay sample or due to the Federal Highway (FHWA) requirement to have the plant staffed with a VT anytime mix is being produced for Federally-funded projects.

By using roadway sampling, asphalt could be sampled at the point of placement (similar to other materials) thereby eliminating the need to staff asphalt plants throughout the entire production run. It is estimated that somewhere in the order of $500,000 to $1,000,000 per year could be saved in District Five alone by having the Roadway VT (already on site) direct the random pay sampling. (see Table 1 "Roadway Sampling Cost Savings" for cost analysis). This figure is in the order of several million dollars per year for the entire state.

Currently, roadway samples are already part of asphalt materials acceptance and pay. For instance, density cores, which amount to the largest portion of the Composite Pay Factor (35%), are sampled from the roadway. In addition, all tests run for Engineering Analysis Reports (EAR's) and delineation testing is performed on material obtained from roadway cores (which are sampled from the roadway).

Analysis Approach

The main analysis in this report is the comparison of the averages and standard deviations of the mix designs for each sampling method (QC, RT, Auger). In addition, composite pay factors were computed using test results for the various samples. Finally, the report performs a basic cost analysis by comparing the money spent for last fiscal year's asphalt VT program and estimates the cost savings if roadway sampling was implemented.

The main body of the report contains data summaries and more detailed test data is available in the Appendices.

Roadway Sampling & Background

The current practice at FDOT is to staff asphalt plants with Verification Technicians (VT's) anytime asphalt producers are making asphalt mix. This is done to ensure sampling for pay occurs randomly and without advanced notice. However, this level of involvement carries a significant price tag. The cost of asphalt plant VT's is in the order of $1,200,000 per year in District Five alone. With Florida's seven Districts plus the Turnpike District, the Statewide Asphalt Plant VT cost is in the order of several million dollars per year. Therefore if a sampling system that reduces or eliminates the VT costs could be employed, it would result in a significant cost savings to the Department (see Table 1 for cost comparison of current asphalt VT costs and proposed method if Roadway Sampling were implemented).

In effort to significantly reduce or eliminate the need for VT's at the asphalt plants, an alternative method of obtaining asphalt samples was investigated. In addition to providing point-of-placement material sampling, roadway sampling eliminates the need to staff asphalt plants with VT's in order to direct the Quality Control technician to obtain random pay samples. This can be done by Roadway VT's who are already on site monitoring and verifying paving operations.

While the concept of roadway sampling may be a new idea for the FDOT, it is common practice in other states, Canada, and is a frequently used sampling method for city, county, and private asphalt projects in Florida and other states. A review of state specifications revealed 35 states (70%) have provisions (Specification or test method) for some form of roadway sampling.

The aim in developing a roadway sampling method was to use a method which produced reliable and comparable results that did not adversely affect the paving operations. Several states use a roadway sampling method where a template is placed on the road prior to paving, then after the paver places the asphalt (but prior to any compaction), a sample is obtained from the template area. While this method could be used to obtain a roadway sample, our aim was to use a method with little or no impact to paving operations. As such, the template method was not evaluated as it is considered to negatively affect the paving operation as it not only requires handwork to fill in the area after the sample is removed, it could possibly result in ride quality issues.

Two sampling methods which do not affect the pavement surface were initially conceived. One known as "Hopper Sampling" where sample is obtained from the paver hopper. The other method known as "Auger Sampling" is where sample is obtained from the auger wing area of the paver. Part way through the pilot project, "hopper sampling" was abandoned primarily due to safety concerns for workers getting between the paver and an asphalt truck and secondarily due to the fact that Auger sampling exhibited better comparisons with QC samples obtained at the plant. Standard practice on any paving crew is to obtain material from the auger wing area for filling voids or making repairs to the mat, so Auger sampling can easily be incorporated into current contractor operations.

Methodology

Since the research was done on actual FDOT projects, the normal Quality Control (QC), Verification (VT), and Resolution (RT) samples were obtained from randomly selected trucks at the asphalt plant. In addition, roadway samples were obtained from two locations. One set of samples was obtained from the Auger wing area of the paver and the other set of samples was obtained from the Hopper. The roadway samples (both hopper and auger) were always obtained from the same truck sampled at the plant in attempt to try to keep the actual normal fluctuations in asphalt mix material properties from erroneously appearing to be differences due to sampling methods. The QC samples were tested at the paving contractor's lab and were then compared to the roadway samples that were tested at either the FDOT District 5 lab or a consultant lab.

After this research was done, one pilot project was let containing Specification provisions that used roadway sampling for acceptance and payment purposes. The roadway samples were then tested by the contactor and verified by the Department's VT.

Discussion on Analysis of Test Results

The individual data for each sample type (QC, RT, and Auger) is listed in Appendix A. This is sorted by material property for each mix design. This allows review and comparison of each set of samples to be compared on an individual basis. At the bottom of each data set are the averages and standard deviations which are summarized in Table 2 "Summary of Test Results". By comparing individual test results or overall averages and standard deviations one can see how Roadway sampling compares to currently used QC and RT testing. The reasoning here is that if Roadway (Auger) sampling has similar individual results, as well as, similar averages and standard deviations, then this sampling method must be similar and is not adversely affecting test results.

Table 3 "Pay Factor Summary", provides a comparison of pay factors (individual and composite) for each mix design, as well as, for each sample type (QC, RT, Auger). The spreadsheet in Table 3 was developed by Greg Sholar of the State Materials Office. For each mix design, the Auger sample pay factors compared very closely to QC plant samples. In fact, the pay factors based on Auger samples compared more closely to QC than the RT samples (which are split samples of QC). Basically, if Auger samples were used for pay, the overall pay would have been the same as occurred on the project when using the QC samples.

Analysis of Test Results

Basic Statistical Analysis

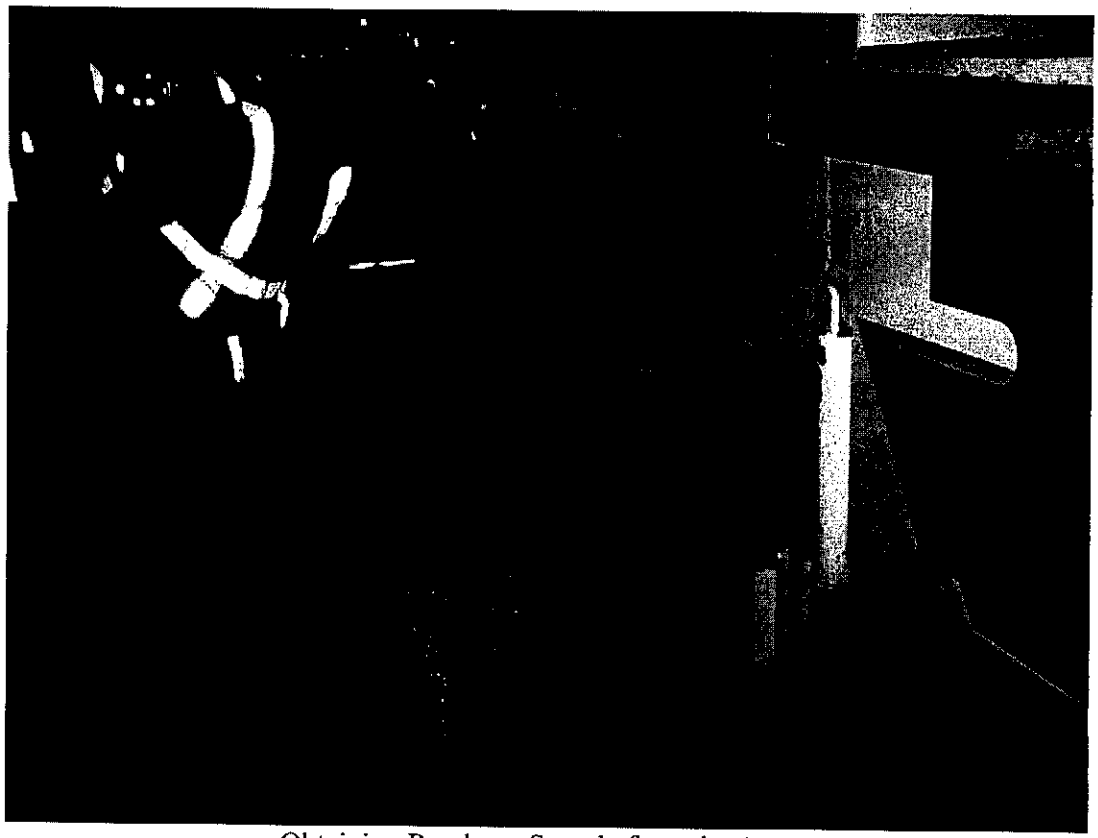
In reviewing Table 2, the data shows that the average values for the Auger samples provided better comparison to the QC samples than the RT samples for Gmm, -200, and in most cases for Gmb, Asphalt Content, and -8 sieve. The Standard Deviations were split evenly where the standard deviations were better on the Auger samples for 9 cases and better for RT for 9 cases. In all but one case, the standard deviations are comparable with each other when comparing RT and Auger sampling.

Composite Pay Factors (CPF's)

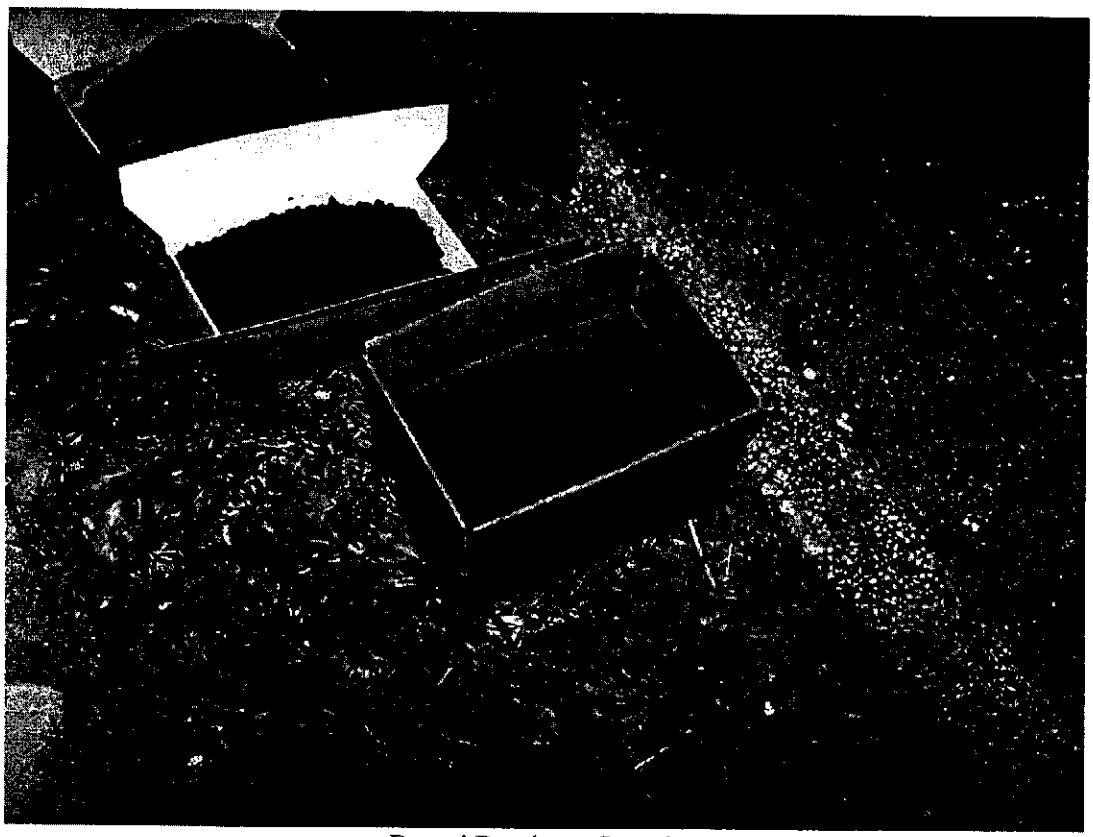
For all intents and purposes, the overall CPF's are identical for both the Plant and Roadway (Auger) sampling. For the two projects (three mix designs), the average CPF calculated using the plant samples and the average CPF calculated when using the roadway samples are both 1.00. (see Table 3, for the individual pay factors and the CPF values).

Conclusion

While roadway sampling may be a new idea in Florida, it is standard practice in other cities, counties, states, and countries. Furthermore, Florida's current CQC system already uses roadway-sampled density cores for the largest portion (35%) of the composite pay factor. In addition, all EAR's and delineations use roadway-sampled materials (cores) when providing disposition of defective material. Combining these facts with the results of our research indicate roadway sampling could be used as a viable means of determining the quality of asphalt going to FDOT projects. By using roadway sampling, FDOT could significantly reduce the need for asphalt plant verification technicians thereby saving an estimated several million dollars per year Statewide. It would also provide point-of-placement sampling of hot mix asphalt. Based on research outlined in this report, the recommendation is to add roadway sampling provisions to the Specifications so roadway sampling could be implemented on Department projects.



Obtaining Roadway Sample from the Auger



Boxed Roadway Samples

List of Tables and Appendices

Table **Name**

Table 1 Roadway Sampling Cost Savings

- Compares cost of D-5 Plant VT program last fiscal year to reduced cost if roadway sampling were enacted.

Table 2 Summary of Test Results

- Summary of test results average (AVG) and standard deviation (StDev) for each material property

Table 3 Pay Factor Summary

- For each mix design provides a comparison of pay factors (individual and composite) for each sample type (QC, RT, and Auger)

Appendices

Appendix A Test Data Sorted by Material Property

- Contains listing of all individual tests for each sample type (QC, RT, and Auger) and is sorted by material property/test.

Appendix B Test Data Sorted by Mix Design

- Contains separate mix design tracking charts for each sample type. This provides a convenient view of all material properties for a given sample type and a given mix design number.

Table 1 Roadway Sampling Cost Savings
District 5
District 5 Plant VT Cost Analysis FY 2007-08

# samples	Sample Type	Tests Performed
361	Regular (non-FC-5)	Bulk, Rice, gradation, density, AC
85	FC-5	AC & gradation
446	Total for Year	

Testing Costs - Regular Samples (Non-FC5) *					
# samples	Test Type	# tests per sample	cost per test	Totals	
361	Gradation	1	$ 29.07	$ 10,494	
361	AC	1	$ 110.84	$ 40,013	
361	Bulk - Density cores	5	$ 16.73	$ 30,198	
361	Rice	1	$ 104.57	$ 37,750	
361	Compact & Bulk - Pills	1	$ 209.14	$ 75,500	$ 193,954

* Based on SMO rates

Testing Costs - FC5 samples *					
# samples	Test Type	# tests per sample	cost per test	Totals	
85	Gradation	1	$ 29.07	$ 2,471	
85	AC	1	$ 110.84	$ 9,421	$ 11,892

Travel to pick up samples *					
# samples		travel time per sample (hrs)	Sample Retriever Cost (including multiplier) ($/hour)	Total	
446		3	$ 35	$ 47,472	$ 47,472

VT Plant inspections					
# plants	inspections / year / plant	hours per inspection	Technican Cost (includes multiplier) $/hour	Total	
24	24	4	$ 77	$ 177,408	$ 177,408

Lot Package Processing **					
# samples		hours per sample	Technican Cost (includes multiplier) $/hour		
446		2	$ 77	$ 68,684	$ 68,684

Program Totals	
Current System - VT's in Plants	$ 1,206,721
Per Test Basis or Roadway Sampling	$ 499,411
savings per Year in D-5	$ 707,310

* Note: additional savings could occur, if asphalt samples were taken back to a consultant lab when other materials are being taken to lab for a project.

** Note: not all Districts may have the Lot package processing as part of their cost comparison.

Table 2. Summary of Test Results

Mix Design: 3405B		Number of Samples: 10			Project: SR 15A		
		QC		RT		Auger	
Material Property	JMF	AVG	StDev	AVG	StDev	AVG	StDev
Maximum Specific Gravity (Gmm)	2.331	2.350	0.009	2.350	0.015	2.350	0.016
Bulk Specific Gravity (Gmb)	2.238	2.265	0.014	2.258	0.014	2.257	0.012
Air Voids (%) (Calculated)	4.00	3.61	0.890	3.92	1.000	3.96	0.704
Asphalt Content (%)	6.50	6.47	0.200	6.38	0.321	6.30	0.247
#200 Sieve (% passing)	5.70	5.26	0.367	5.29	0.380	5.38	0.457
#8 Sieve (% passing)	52.00	53.24	1.527	54.10	2.192	54.12	2.153

Mix Design: 4502B		Number of Samples: 6			Project: SR 40		
		QC		RT		Auger	
Material Property	JMF	AVG	StDev	AVG	StDev	AVG	StDev
Maximum Specific Gravity (Gmm)	2.402	2.386	0.006	2.389	0.008	2.391	0.005
Bulk Specific Gravity (Gmb)	2.306	2.314	0.004	2.312	0.006	2.308	0.008
Air Voids (%) (Calculated)	4.00	3.02	0.322	3.24	0.403	3.46	0.355
Asphalt Content (%)	6.00	6.04	0.154	6.20	0.083	6.02	0.238
#200 Sieve (% passing)	5.00	5.08	0.213	5.94	0.129	5.59	0.167
#8 Sieve (% passing)	52.00	54.29	1.098	57.14	1.552	56.27	1.872

Mix Design: 4502C		Number of Samples: 14			Project: SR 40		
		QC		RT		Auger	
Material Property	JMF	AVG	StDev	AVG	StDev	AVG	StDev
Maximum Specific Gravity (Gmm)	2.395	2.396	0.009	2.389	0.011	2.396	0.008
Bulk Specific Gravity (Gmb)	2.300	2.301	0.006	2.296	0.008	2.290	0.007
Air Voids (%) (Calculated)	4.00	3.99	0.421	3.88	0.625	4.41	0.436
Asphalt Content (%)	5.90	5.80	0.172	5.95	0.203	5.82	0.211
#200 Sieve (% passing)	5.00	5.39	0.254	5.76	0.325	5.71	0.333
#8 Sieve (% passing)	55.00	56.12	1.389	57.72	1.077	57.47	2.345

Table 3. Pay Factor Summary

Mix Design	Lot	Sublot	Sample Type	Individual Pay Factors					Composite Pay Factor
				Density	Air Voids	Asphalt Content	#200 Sieve	#8 Sieve	
3405B	1	1-4	QC	0.95	0.93	1.05	0.97	0.93	0.97
	1	1-4	Resolution	0.92	0.92	0.95	0.99	0.86	0.93
	1	1-4 (-8, -200, Pb) 2-4 (Va, Density)	Auger	1.05	1.05	1.05	1.05	0.81	1.04
	2	1-4	QC	1.05	0.93	1.05	1.05	1.05	1.02
	2	1-4	Resolution	1.05	0.90	0.93	1.03	0.90	0.97
	2	1-4	Auger	1.00	1.05	0.89	1.05	0.91	0.98
	3	1-4	QC	1.05	0.95	0.84	0.96	1.02	0.96
	3	1-2	Resolution	1.00	0.90	0.80	1.00	1.00	0.93
	3	1-4	Auger	1.05	0.92	0.82	1.03	0.87	0.95
		Averages	**QC**	**1.02**	**0.94**	**0.98**	**0.99**	**1.00**	**0.98**
			Resolution	**0.99**	**0.91**	**0.89**	**1.01**	**0.92**	**0.94**
			Auger	**1.03**	**1.01**	**0.92**	**1.04**	**0.86**	**0.99**
4502B	1	1-4	QC	1.05	0.94	1.05	1.05	0.82	1.01
	1	1-4	Resolution	1.04	0.94	1.05	0.85	0.55	0.97
	1	1-4	Auger	1.04	1.05	1.05	1.05	0.72	1.03
	2	1-2	QC	1.00	0.80	1.05	1.05	1.05	0.97
	2	1-2	Resolution	1.00	0.90	1.05	0.90	0.90	0.97
	2	1-2	Auger	1.05	0.90	0.90	1.00	0.80	0.96
		Averages	**QC**	**1.03**	**0.87**	**1.05**	**1.05**	**0.94**	**0.99**
			Resolution	**1.02**	**0.92**	**1.05**	**0.88**	**0.73**	**0.97**
			Auger	**1.05**	**0.98**	**0.98**	**1.03**	**0.76**	**1.00**
4502C	3	1-4	QC	1.04	1.05	1.05	1.05	0.86	1.04
	3	1-4	Resolution	1.05	1.05	1.05	1.04	0.85	1.04
	3	1-4	Auger	1.05	1.05	1.05	1.05	0.73	1.03
	4	1-4	QC	0.99	1.05	1.00	1.05	1.05	1.02
	4	1-4	Resolution	1.05	1.04	0.93	0.93	1.05	1.01
	4	1-4	Auger	1.03	1.05	0.94	1.05	0.99	1.01
	5	1-4	QC	0.82	1.05	1.05	1.05	1.05	0.97
	5	1-4	Resolution	0.91	1.05	1.05	0.84	0.79	0.97
	5	1-4	Auger	0.86	1.05	0.97	0.90	0.87	0.94
	6	1-4	QC	1.05	1.05	1.05	1.05	1.04	1.05
	6	1	Resolution	1.00	0.90	1.05	1.00	1.05	0.99
	6	1	Auger	1.05	1.00	1.05	0.90	0.90	1.02
		Averages	**QC**	**0.98**	**1.05**	**1.04**	**1.05**	**1.00**	**1.02**
			Resolution	**1.00**	**1.01**	**1.02**	**0.95**	**0.94**	**1.00**
			Auger	**1.00**	**1.04**	**1.00**	**0.98**	**0.87**	**1.00**
		Overall Averages	**QC**	**1.01**	**0.95**	**1.02**	**1.03**	**0.98**	**1.00**
			Resolution	**1.00**	**0.95**	**0.99**	**0.94**	**0.86**	**0.98**
			Auger	**1.03**	**1.01**	**0.97**	**1.01**	**0.83**	**1.00**

Appendix A

Gmm

Sample Test Results

Mix #	JMF
3405B	2.331

Lot	Sublot	QC	RT	Auger
1	1	2.353	2.343	
1	2	2.349	2.338	2.349
1	3	2.368	2.365	2.344
1	4	2.344	2.332	2.338
2	1	2.343	2.331	2.337
2	2	2.340	2.365	2.326
2	3	2.346	2.354	2.368
2	4	2.350	2.348	2.358
3	1	2.339	2.345	2.355
3	2	2.364	2.378	2.379

Average	2.350	2.350	2.350
Standard Deveation	0.009	0.015	0.016

Mix #	JMF
4502B	2.402

Lot	Sublot	QC	RT	Auger
1	1	2.392	2.376	2.382
1	2	2.391	2.393	2.388
1	3	2.388	2.381	2.392
1	4	2.375	2.397	2.394
2	1	2.388	2.391	2.395
2	2	2.383	2.395	2.395

Average	2.386	2.389	2.391
Standard Deveation	0.006	0.008	0.005

Mix #	JMF
4502c	2.395

Lot	Sublot	QC	RT	Auger
3	1	2.391	2.375	2.386
3	2	2.402	2.380	2.392
3	3	2.396	2.390	2.386
3	4	2.387	2.388	2.389
4	1	2.393	2.394	2.389
4	2	2.390	2.383	2.393
4	3	2.387	2.386	2.400
4	4	2.410	2.387	2.405
5	1	2.399	2.374	2.399
5	2	2.397	2.390	2.390
5	3	2.406	2.399	2.404
5	4	2.416	2.389	2.397
6	1	2.394	2.420	2.411
6	3	2.381	2.387	2.402

Average	2.396	2.389	2.396
Standard Deveation	0.009	0.011	0.008

Gmb | **Sample Test Results**

Mix #	JMF
3405B	2.238

Lot	Sublot	QC	RT	Auger
1	1	2.278	2.275	
1	2	2.247	2.246	2.249
1	3	2.238	2.242	2.242
1	4	2.265	2.264	2.269
2	1	2.256	2.255	2.254
2	2	2.275	2.234	2.247
2	3	2.278	2.279	2.275
2	4	2.277	2.268	2.270
3	1	2.279	2.264	2.264
3	2	2.254	2.249	2.246

Average	2.265	2.258	2.257
Standard Deveation	0.014	0.014	0.012

Mix #	JMF
4502B	2.306

Lot	Sublot	QC	RT	Auger
1	1	2.313	2.311	2.311
1	2	2.308	2.303	2.304
1	3	2.312	2.314	2.296
1	4	2.314	2.308	2.306
2	1	2.320	2.311	2.311
2	2	2.318	2.322	2.322

Average	2.314	2.312	2.308
Standard Deveation	0.004	0.006	0.008

Mix #	JMF
4502c	2.300

Lot	Sublot	QC	RT	Auger
3	1	2.299	2.294	2.294
3	2	2.301	2.306	2.302
3	3	2.296	2.290	2.282
3	4	2.303	2.297	2.292
4	1	2.300	2.297	2.294
4	2	2.312	2.315	2.280
4	3	2.305	2.302	2.296
4	4	2.302	2.296	2.284
5	1	2.303	2.294	2.292
5	2	2.299	2.291	2.288
5	3	2.289	2.286	2.282
5	4	2.308	2.300	2.299
6	1	2.303	2.291	2.298
6	3	2.291	2.284	2.279

Average	2.301	2.296	2.290
Standard Deveation	0.006	0.008	0.007

Air Voids | **Sample Test Results**

Mix #	JMF
3405B	2.50
	5.50

Lot	Sublot	QC	RT	Auger
1	1	3.19	2.90	
1	2	4.34	3.93	4.26
1	3	5.49	5.20	4.35
1	4	3.37	2.92	2.95
2	1	3.71	3.26	3.55
2	2	2.78	5.54	3.40
2	3	2.90	3.19	3.93
2	4	3.11	3.41	3.73
3	1	2.57	3.45	3.86
3	2	4.65	5.42	5.59

Average	3.61	3.92	3.96
Standard Deveation	0.890	1.000	0.704

Mix #	JMF
4502B	2.30
	6.00

Lot	Sublot	QC	RT	Auger
1	1	3.30	2.74	2.98
1	2	3.47	3.76	3.52
1	3	3.18	2.81	4.01
1	4	2.57	3.71	3.68
2	1	2.85	3.35	3.51
2	2	2.73	3.05	3.05

Average	3.02	3.24	3.46
Standard Deveation	0.322	0.403	0.355

Mix #	JMF
4502c	2.30
	6.00

Lot	Sublot	QC	RT	Auger
3	1	3.85	3.41	3.86
3	2	4.20	3.11	3.76
3	3	4.17	4.18	4.36
3	4	3.52	3.81	4.06
4	1	3.89	4.05	3.98
4	2	3.26	2.85	4.72
4	3	3.44	3.52	4.33
4	4	4.48	3.81	5.03
5	1	4.00	3.37	4.46
5	2	4.09	4.14	4.27
5	3	4.86	4.71	5.07
5	4	4.47	3.73	4.09
6	1	3.80	5.33	4.69
6	3	3.78	4.32	5.12

Average	3.99	3.88	4.41
Standard Deveation	0.421	0.625	0.436

Asphalt Content

Sample Test Results

Mix #	JMF	Tolerance
3405B	6.50	0.55

Lot	Sublot	QC	RT	Auger
1	1	6.44	6.60	6.28
1	2	6.56	6.16	6.50
1	3	6.51	6.29	6.49
1	4	6.74	6.90	6.66
2	1	6.76	6.71	6.59
2	2	6.59	6.14	6.25
2	3	6.40	6.71	6.02
2	4	6.23	6.07	6.09
3	1	6.34	6.32	6.26
3	2	6.10	5.86	5.86

Average	6.47	6.38	6.30
Standard Deveation	0.200	0.321	0.247

Mix #	JMF
4502B	6.00

Lot	Sublot	QC	RT	Auger
1	1	6.13	6.25	6.19
1	2	6.08	6.21	5.88
1	3	6.11	6.18	5.98
1	4	6.25	6.27	6.19
2	1	5.80	6.03	5.58
2	2	5.88	6.27	6.28

Average	6.04	6.20	6.02
Standard Deveation	0.154	0.083	0.238

Mix #	JMF
4502c	5.90

Lot	Sublot	QC	RT	Auger
3	1	5.98	5.97	6.06
3	2	5.85	5.99	5.71
3	3	5.70	6.00	5.82
3	4	6.13	6.19	6.12
4	1	5.74	5.98	5.72
4	2	6.03	6.29	6.06
4	3	5.91	6.14	5.79
4	4	5.48	5.48	5.38
5	1	5.70	5.95	5.57
5	2	5.66	5.77	6.00
5	3	5.59	5.65	5.52
5	4	5.89	5.97	5.84
6	1	5.72	5.83	5.87
6	3	5.79	6.02	5.95

Average	5.80	5.95	5.82
Standard Deveation	0.172	0.203	0.211

#200 Sieve

Sample Test Results

Mix #	JMF	Tolerance
3405B	5.70	1.50

Lot	Sublot	QC	RT	Auger
1	1	5.93	6.03	5.73
1	2	4.96	5.36	4.82
1	3	4.66	4.73	5.41
1	4	5.52	5.18	5.77
2	1	4.93	4.94	5.41
2	2	5.54	4.99	6.06
2	3	5.45	5.36	4.95
2	4	5.52	5.84	5.95
3	1	5.04	5.09	4.92
3	2	5.05	5.34	4.82

Average	5.26	5.29	5.38
Standard Deveation	0.367	0.380	0.457

Mix #	JMF
4502B	5.00

Lot	Sublot	QC	RT	Auger
1	1	4.88	6.05	5.68
1	2	4.96	5.72	5.30
1	3	5.41	6.12	5.80
1	4	4.87	5.88	5.46
2	1	5.33	5.98	5.59
2	2	5.02	5.90	5.71

Average	5.08	5.94	5.59
Standard Deveation	0.213	0.129	0.167

Mix #	JMF
4502C	5.00

Lot	Sublot	QC	RT	Auger
3	1	5.27	5.27	5.42
3	2	5.14	5.37	5.78
3	3	5.37	5.69	5.69
3	4	5.58	5.92	5.86
4	1	5.32	5.78	5.61
4	2	5.81	5.93	5.42
4	3	5.54	6.00	5.67
4	4	5.45	5.23	4.89
5	1	5.54	5.63	5.72
5	2	5.82	5.88	5.82
5	3	4.88	5.70	5.57
5	4	5.35	6.45	6.22
6	1	5.07	5.59	6.17
6	3	5.27	6.15	6.12

Average	5.39	5.76	5.71
Standard Deveation	0.254	0.325	0.333

#8 Sieve

Sample Test Results

Mix #	JMF	Tolerance
3405B	52.00	5.50

Lot	Sublot	QC	RT	Auger
1	1	52.56	55.38	53.24
1	2	55.39	52.35	55.34
1	3	54.98	54.84	56.81
1	4	52.84	55.56	54.57
2	1	54.58	53.17	55.04
2	2	51.98	55.17	56.21
2	3	53.37	55.87	50.87
2	4	50.93	49.54	51.29
3	1	51.15	51.91	51.40
3	2	54.63	57.25	56.46
Average		53.24	54.10	54.12
Standard Deveation		1.527	2.192	2.153

Mix #	JMF
4502B	52.00

Lot	Sublot	QC	RT	Auger
1	1	55.39	58.75	57.68
1	2	54.87	59.70	52.51
1	3	55.35	56.95	58.34
1	4	54.55	55.78	56.76
2	1	52.63	55.93	55.74
2	2	52.97	55.74	56.57
Average		54.29	57.14	56.27
Standard Deveation		1.098	1.552	1.872

Mix #	JMF
4502c	55.00

Lot	Sublot	QC	RT	Auger
3	1	58.33	56.26	58.09
3	2	54.94	56.89	57.28
3	3	56.27	58.70	58.59
3	4	59.65	58.92	60.78
4	1	54.53	56.38	54.73
4	2	56.99	56.89	58.09
4	3	55.25	57.40	54.28
4	4	54.71	56.84	52.55
5	1	54.99	57.67	55.37
5	2	56.40	57.56	58.69
5	3	55.93	58.07	57.81
5	4	56.54	59.27	57.99
6	1	55.51	57.24	59.51
6	3	55.60	59.93	60.88
Average		56.12	57.72	57.47
Standard Deveation		1.389	1.077	2.345

Appendix B

Project Summary																	
Project No.:	240856-1-52-01							Date:	1/12/2006	2/15/2006	2/16/2006	03/27/06	04/11/06	4/13/2006	04/27/06	06/03/06	07/13/06	07/24/06
SR No. :	15A							Tested by:	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Contractor:	P & S Paving							Sample ID:	2C001Q	2C002Q	2C003Q	2C004Q	2C005Q	2C006Q	2C007Q	2C008Q	2C009Q	2C010Q
Mix Design No.:	04-3405B		Gyrations @ Ni:	7				Load #:								26		
Traffic Level:	C		Gyrations @ Nd:	75				Lot/Sublot	L1S1	L1S2	L1S3	L1S4	L2S1	L2S2	L2S3	L2S4	L3S1	L3S2
Mix (mm):	12.5		Gyrations @ Nm:	115				FM Number	240856	240856	240856	240856	240856	240856	240856	240856	240856	240856
Property	JMF	AVG	STD	MIN	MAX	RNG	CNT											
25.0mm (1")	100	100.00	0.000	100.00	100.00	0.00	10.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
19.0mm (3/4")	100	100.00	0.000	100.00	100.00	0.00	10.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
12.5mm (1/2")	96	96.93	1.466	93.38	98.51	5.13	10.00	93.38	98.23	98.26	96.26	96.51	96.73	98.12	97.25	96.06	96.53
9.5mm (3/8")	88	90.37	2.253	85.26	94.32	9.06	10.00	85.26	90.77	90.63	88.89	94.32	92.26	89.81	90.37	89.58	91.82
4.75mm (#4)	64	67.34	1.939	64.65	70.90	6.25	10.00	64.65	68.03	69.03	66.08	70.90	67.82	67.20	65.65	64.86	69.21
2.36mm (#8)	52	53.24	1.527	50.93	55.39	4.46	10.00	**52.56**	**55.39**	**54.98**	**52.84**	**54.58**	**51.98**	**53.37**	**50.93**	**51.15**	**54.63**
1.18mm (#16)	43	46.21	2.144	43.30	49.92	6.62	10.00	46.46	47.67	48.80	46.69	44.11	44.90	46.89	43.30	43.38	49.92
600um (#30)	36	40.82	2.024	36.87	43.14	6.27	10.00	41.09	42.21	43.14	41.55	42.26	40.15	40.61	37.52	36.87	42.82
300um (#50)	31	32.28	2.620	28.36	35.67	7.31	10.00	30.33	35.14	35.67	34.34	34.88	33.27	28.42	30.70	28.36	31.64
150um (#100)	17	11.91	0.674	10.83	13.27	2.44	10.00	13.27	11.56	11.48	12.52	11.79	12.31	10.83	12.32	11.21	11.82
75um (#200)	5.7	5.26	0.367	4.66	5.93	1.27	10.00	**5.93**	**4.96**	**4.66**	**5.52**	**4.93**	**5.54**	**5.45**	**5.52**	**5.04**	**5.05**
Ext. AC %:	6.5	6.47	0.200	6.10	6.76	0.66	10.00	**6.44**	**6.56**	**6.51**	**6.74**	**6.76**	**6.59**	**6.40**	**6.23**	**6.34**	**6.10**
Rice MSG (Gmm):	2.331	2.350	0.009	2.339	2.368	0.03	10.00	2.353	2.349	2.368	2.344	2.343	2.340	2.346	2.350	2.339	2.364
Avg. Bulk (Gmb):	2.238	2.265	0.014	2.238	2.279	0.04	10.00	2.278	2.247	2.238	2.265	2.256	2.275	2.278	2.277	2.279	2.254
Agg. Sp. Gr. (Gsb):	2.459	2.459	0.000	2.459	2.459	0.00	10.00	2.459	2.459	2.459	2.459	2.459	2.459	2.459	2.459	2.459	2.459
Hgt.@N int.:		124.0	1.042	121.4	125.4	4.00	10.00	121.4	123.6	124.1	123.4	125.2	124.1	123.9	124.4	124.1	125.4
Hgt.@N des.:	115	117.8	0.931	115.5	119.3	3.80	10.00	115.5	117.7	118.3	117.4	118.6	117.7	117.6	117.9	117.7	119.3
%Gmm @ Ni	89	91.6	0.724	90.1	92.4	2.32	10.00	92.11	91.09	90.09	91.93	91.21	92.21	92.16	91.83	92.41	90.71
% Gmm @ Nd	96	96.4	0.890	94.5	97.4	2.92	10.00	96.81	95.66	94.51	96.63	96.29	97.22	97.10	96.89	97.43	95.35
% Air Voids @ Nd	4.0	3.61	0.890	2.57	5.49	2.92	10.00	**3.19**	**4.34**	**5.49**	**3.37**	**3.71**	**2.78**	**2.90**	**3.11**	**2.57**	**4.65**
% VMA @ Nd	14.9	13.86	0.606	13.17	14.91	1.74	10.00	13.33	14.61	14.91	14.10	14.45	13.58	13.29	13.17	13.20	13.93
% VFA @ Nd	73	74.12	5.389	63.18	80.53	17.35	10.00	76.07	70.29	63.18	76.10	74.33	79.53	78.18	76.39	80.53	66.62
Dust/Asphalt	1.1	1.13	0.085	1.00	1.29	0.29	10.00	1.29	1.05	1.06	1.12	1.00	1.13	1.16	1.22	1.05	1.19
Gmb @ Nd	2.238	2.265	0.014	2.24	2.279	0.04	10.00	2.278	2.247	2.238	2.265	2.256	2.275	2.278	2.277	2.279	2.254
Density lbs/cf		141.3	0.890	139.65	142.2	2.560	10.00	142.15	140.21	139.65	141.34	140.77	141.96	142.15	142.08	142.21	140.65
Gse		2.6	0.010	2.56	2.6	0.04	10.00	2.58	2.58	2.60	2.58	2.58	2.57	2.57	2.57	2.56	2.58
Pba		1.92	0.155	1.65	2.27	0.62	10.00	1.96	1.96	2.27	1.96	1.96	1.81	1.81	1.81	1.65	1.96
Pbe	5	4.68	0.216	4.26	4.93	0.67	10.00	4.61	4.73	4.39	4.91	4.93	4.90	4.71	4.53	4.79	4.26
Roadway Core 1 Gmb								2.200	2.178	2.190	2.173		2.171			2.200	2.220
Roadway Core 2 Gmb								2.237	2.158	2.165	2.202		2.223	2.181		2.222	2.181
Roadway Core 3 Gmb								2.250	2.146	2.192	2.192	2.189	2.227	2.200	2.266	2.217	2.173
Roadway Core 4 Gmb								2.236	2.143	2.16	2.232	2.200	2.214	2.196	2.191	2.227	
Roadway Core 5 Gmb								2.235	2.185	2.199	2.179	2.181			2.199		2.212
Average Core Gmb		2.20	0.02	2.16	2.23	0.07	10.00	2.232	2.162	2.181	2.196	2.190	2.209	2.192	2.219	2.217	2.197
Sublot Gmm		2.35	0.01	2.34	2.37	0.03	10.00	2.353	2.349	2.368	2.344	2.343	2.340	2.346	2.350	2.339	2.364
% of Sublot Gmm	93.00	93.61	0.97	92.04	94.84	2.80	10.00	**94.84**	**92.04**	**92.11**	**93.67**	**93.47**	**94.39**	**93.45**	**94.41**	**94.76**	**92.91**

Project Summary																	
Project No.:	240856-1-52-01							Date:	1/12/2006	2/15/2006	2/16/2006	3/27/2006	4/11/2006	4/13/2006	04/27/06	07/13/06	07/14/06	07/24/06
SR No. :	15A							Tested by:	D-5	D-5	D-5	D-5	D-5	D-5	PSI	D5	D5	D5
Contractor:	P & S Paving							Sample ID:	2C001R	2C002R	2C003R	2C004R	2C005R	2C006R	2C007R	2C008R	2C009R	2C010R
Mix Design No.:	04-3405B		Gyrations @ Ni:	7				Load #:										
Traffic Level:	C		Gyrations @ Nd:	75				Lot/Sublot	L1S1	L1S2	L1S3	L1S4	L2S1	L2S2	L2S3	L2S4	L3S1	L3S2
Mix (mm):	12.5		Gyrations @ Nm:	115				FM Number	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution
Property	JMF	AVG	STD	MIN	MAX	RNG	CNT											
25.0mm (1")	100	100.00	0.000	100.00	100.00	0.00	10.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
19.0mm (3/4")	100	99.88	0.366	98.78	100.00	1.22	10.00	100.00	100.00	100.00	100.00	98.78	100.00	100.00	100.00	100.00	100.00
12.5mm (1/2")	96	96.46	1.013	94.49	98.02	3.53	10.00	96.07	95.70	97.60	96.38	96.87	98.02	97.55	95.88	96.00	94.49
9.5mm (3/8")	88	90.01	1.594	88.09	92.40	4.31	10.00	89.57	88.09	89.58	90.14	92.14	92.23	92.40	88.30	89.32	88.35
4.75mm (#4)	64	67.35	2.049	63.68	69.72	6.04	10.00	68.33	64.31	67.55	69.10	67.49	68.40	69.72	63.68	65.41	69.52
2.36mm (#8)	52	54.10	2.192	49.54	57.25	7.71	10.00	**55.38**	**52.35**	**54.84**	**55.56**	**53.17**	**55.17**	**55.87**	**49.54**	**51.91**	**57.25**
1.18mm (#16)	43	46.42	2.169	41.77	48.79	7.02	10.00	47.94	45.24	47.65	47.91	45.80	47.47	48.06	41.77	43.56	48.79
600um (#30)	36	40.56	2.049	36.45	42.36	5.91	10.00	42.14	40.20	42.12	42.36	40.58	42.17	41.31	36.45	36.94	41.30
300um (#50)	31	32.28	2.440	28.30	34.63	6.33	10.00	34.37	33.57	34.63	34.62	33.34	34.36	28.47	29.92	28.30	31.22
150um (#100)	17	12.89	0.909	10.80	14.46	3.66	10.00	14.46	12.86	12.32	13.39	12.66	12.87	10.80	13.67	12.60	13.22
75um (#200)	5.7	5.29	0.380	4.73	6.03	1.30	10.00	**6.03**	**5.36**	**4.73**	**5.18**	**4.94**	**4.99**	**5.36**	**5.84**	**5.09**	**5.34**
Ext. AC %:	6.5	6.38	0.321	5.85	6.90	1.05	10.00	**6.60**	**6.16**	**6.29**	6.90	**6.71**	**6.14**	**6.71**	**6.07**	**6.32**	[redacted]
Rice MSG (Gmm):	2.331	2.350	0.015	2.331	2.378	0.05	10.00	2.343	2.338	2.365	2.332	2.331	2.365	2.354	2.348	2.345	2.378
Avg. Bulk (Gmb):	2.238	2.258	0.014	2.234	2.279	0.04	10.00	2.275	2.246	2.242	2.264	2.255	2.234	2.279	2.268	2.264	2.249
Agg. Sp. Gr. (Gsb):	2.459	2.459	0.000	2.459	2.459	0.00	10.00	2.459	2.459	2.459	2.459	2.459	2.459	2.459	2.459	2.459	2.459
Hgt.@N int.:		123.6	1.497	121.5	125.7	4.20	10.00	121.5	122.9	123.2	122.2	123.4	124.5	121.9	125.6	125.7	125.4
Hgt.@N des.:	115	117.6	1.276	115.7	119.5	3.80	10.00	116.0	117.2	117.6	116.5	117.1	118.4	115.7	118.9	119.2	119.5
%Gmm @ Ni	89	91.4	0.917	89.8	92.7	2.87	10.00	92.70	91.61	90.49	92.56	91.80	89.83	91.89	91.44	91.55	90.13
% Gmm @ Nd	96	96.1	1.000	94.5	97.1	2.64	10.00	97.10	96.07	94.80	97.08	96.74	94.46	96.81	96.59	96.55	94.58
% Air Voids @ Nd	4.0	3.92	1.000	2.90	5.54	2.64	10.00	**2.90**	**3.93**	**5.20**	**2.92**	**3.26**	[redacted]	**3.19**	**3.41**	**3.45**	**5.42**
% VMA @ Nd	14.9	14.05	0.452	13.37	14.73	1.36	10.00	13.59	14.28	14.56	14.29	14.45	14.73	13.54	13.37	13.75	13.89
% VFA @ Nd	73	72.17	6.625	60.98	79.57	18.59	10.00	78.66	72.48	64.29	79.57	77.44	62.39	76.44	74.50	74.91	60.98
Dust/Asphalt	1.1	1.15	0.123	0.96	1.39	0.43	10.00	1.23	1.13	1.10	0.99	0.96	1.16	1.13	1.29	1.10	1.39
Gmb @ Nd	2.238	2.258	0.014	2.23	2.279	0.04	10.00	2.275	2.246	2.242	2.264	2.255	2.234	2.279	2.268	2.264	2.249
Density lbs/cf		140.9	0.875	139.40	142.2	2.810	10.00	141.96	140.15	139.90	141.27	140.71	139.40	142.21	141.52	141.27	140.34
Gse		2.6	0.013	2.55	2.6	0.04	10.00	2.57	2.55	2.59	2.57	2.56	2.58	2.59	2.56	2.57	2.59
Pba		1.85	0.211	1.49	2.12	0.63	10.00	1.81	1.49	2.12	1.81	1.65	1.96	2.12	1.65	1.81	2.12
Pbe	5	4.64	0.396	3.85	5.21	1.36	10.00	4.91	4.76	4.30	5.21	5.17	4.30	4.73	4.52	4.62	3.85
Roadway Core 1 Gmb								2.200	2.178	2.190	2.173		2.171			2.200	2.220
Roadway Core 2 Gmb								2.237	2.158	2.165	2.202		2.223	2.181		2.222	2.181
Roadway Core 3 Gmb								2.250	2.146	2.192	2.192	2.189	2.227	2.200	2.266	2.217	2.173
Roadway Core 4 Gmb								2.236	2.143	2.16	2.232	2.200	2.214	2.196	2.191	2.227	
Roadway Core 5 Gmb								2.235	2.185	2.199	2.179	2.181			2.199		2.212
Average Core Gmb		2.20	0.02	2.16	2.23	0.07	10.00	2.232	2.162	2.181	2.196	2.190	2.209	2.192	2.219	2.217	2.197
Sublot Gmm		2.35	0.01	2.33	2.38	0.05	10.00	2.343	2.338	2.365	2.332	2.331	2.365	2.354	2.348	2.345	2.378
% of Sublot Gmm	93.00	93.60	0.99	92.23	95.25	3.02	10.00	**95.25**	**92.47**	**92.23**	**94.15**	**93.95**	**93.39**	**93.13**	**94.49**	**94.52**	**92.37**

Project Summary			
Project No.:	240856-1-52-01		
SR No. :	15A		
Contractor:	P & S Paving		
Mix Design No.:	04-3405B	Gyrations @ Ni:	7
Traffic Level:	C	Gyrations @ Nd:	75
Mix (mm):	12.5	Gyrations @ Nm:	115

								Date:	1/12/2006	2/15/2006	2/16/2006	3/27/2006	4/11/2006	4/13/2006	04/27/06	07/13/06	07/14/06	07/24/06
								Tested by:	D-5	D-5	D-5	D-5	D-5	D-5	D-5	D5	D5	D5
								Sample ID:	2C001A	2C002A	2C003A	2C004A	2C005A	2C006A	2C007A	2C008A	2C009A	2C010A
								Load #:										
								Lot/Sublot	L1S1	L1S2	L1S3	L1S4	L2S1	L2S2	L2S3	L 2 S 4	L3S1	L3S2
								FM Number	Auger	Auger	Auger	Auger	Auger	Auger	Auger	Auger	Auger	Auger
Property	JMF	AVG	STD	MIN	MAX	RNG	CNT											
25.0mm (1")	100	100.00	0.000	100.00	100.00	0.00	10.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
19.0mm (3/4")	100	99.76	0.418	98.68	100.00	1.32	10.00	99.44	100.00	100.00	100.00	100.00	99.49	100.00	100.00	98.68	100.00
12.5mm (1/2")	96	95.73	1.182	94.42	98.39	3.97	10.00	96.12	96.28	96.58	94.60	98.39	96.17	94.42	95.52	94.49	94.76
9.5mm (3/8")	88	89.37	2.180	86.47	94.20	7.73	10.00	86.47	89.53	91.27	90.10	94.20	90.73	87.30	87.93	87.97	88.16
4.75mm (#4)	64	67.56	2.669	63.57	71.82	8.25	10.00	65.21	68.59	70.19	67.57	71.82	69.89	63.57	64.48	65.08	69.17
2.36mm (#8)	52	54.12	2.153	50.87	56.81	5.94	10.00	**53.24**	**55.34**	**56.81**	**54.57**	**55.04**	**56.21**	**50.87**	**51.29**	**51.40**	**56.46**
1.18mm (#16)	43	46.41	1.991	43.21	49.13	5.92	10.00	46.24	47.29	49.13	47.35	47.00	48.54	44.03	43.57	43.21	47.72
600um (#30)	36	40.56	2.147	36.64	43.38	6.74	10.00	40.61	41.65	43.38	42.02	41.77	43.01	38.16	38.08	36.64	40.25
300um (#50)	31	32.30	2.970	26.58	35.77	9.19	10.00	33.03	34.44	35.77	34.53	34.21	34.77	26.58	31.45	28.03	30.14
150um (#100)	17	13.04	0.991	10.87	14.14	3.27	10.00	13.76	12.34	13.22	14.07	13.31	13.95	10.87	14.14	12.30	12.45
75um (#200)	5.7	5.38	0.457	4.82	6.06	1.24	10.00	**5.73**	**4.82**	**5.41**	**5.77**	**5.41**	**6.06**	**4.95**	**5.95**	**4.92**	**4.82**
Ext. AC %:	6.5	6.30	0.247	5.86	6.66	0.80	10.00	**6.28**	**6.50**	**6.49**	**6.66**	**6.59**	**6.25**	**6.02**	6.09	6.26	[redacted]
Rice MSG (Gmm):	2.331	2.350	0.016	2.326	2.379	0.05	9.00		2.349	2.344	2.338	2.337	2.326	2.368	2.358	2.355	2.379
Avg. Bulk (Gmb):	2.238	2.257	0.012	2.242	2.275	0.03	9.00		2.249	2.242	2.269	2.254	2.247	2.275	2.270	2.264	2.246
Agg. Sp. Gr. (Gsb):	2.459	2.459	0.000	2.459	2.459	0.00	9.00		2.459	2.459	2.459	2.459	2.459	2.459	2.459	2.459	2.459
Hgt.@N int.:		123.7	0.996	122.0	125.2	3.20	9.00		123.1	123.6	122.0	123.7	123.9	122.6	124.4	125.0	125.2
Hgt.@N des.:	115	117.7	1.021	116.2	119.5	3.30	9.00		117.4	117.6	116.2	117.3	117.6	116.4	118.4	118.9	119.5
%Gmm @ Ni	89	91.4	0.582	90.1	92.4	2.32	9.00		91.31	91.01	92.43	91.46	91.69	91.21	91.62	91.44	90.11
% Gmm @ Nd	96	96.0	0.704	94.4	97.1	2.64	9.00		95.74	95.65	97.05	96.45	96.60	96.07	96.27	96.14	94.41
% Air Voids @ Nd	4.0	3.96	0.704	2.95	5.59	2.64	9.00	[redacted]	**4.26**	**4.35**	**2.95**	**3.55**	**3.40**	**3.93**	**3.73**	**3.86**	[redacted]
% VMA @ Nd	14.9	13.99	0.531	13.05	14.74	1.69	9.00		14.49	14.74	13.87	14.38	14.34	13.05	13.31	13.69	14.01
% VFA @ Nd	73	71.69	4.990	60.10	78.73	18.63	9.00		70.60	70.49	78.73	75.31	76.29	69.89	71.98	71.80	60.10
Dust/Asphalt	1.1	1.17	0.091	1.03	1.36	0.33	9.00		1.03	1.13	1.16	1.10	1.21	1.18	1.36	1.11	1.25
Gmb @ Nd	2.238	2.257	0.012	2.24	2.275	0.03	9.00		2.249	2.242	2.269	2.254	2.247	2.275	2.270	2.264	2.246
Density lbs/cf		140.9	0.722	139.90	142.0	2.060	9.00		140.34	139.90	141.59	140.65	140.21	141.96	141.65	141.27	140.15
Gse		2.6	0.013	2.54	2.6	0.05	9.00		2.58	2.57	2.57	2.57	2.54	2.58	2.57	2.58	2.59
Pba		1.84	0.204	1.34	2.12	0.78	9.00		1.96	1.81	1.81	1.81	1.34	1.96	1.81	1.96	2.12
Pbe	5	4.58	0.368	3.86	4.99	1.13	9.00		4.67	4.80	4.97	4.90	4.99	4.18	4.39	4.42	3.86
Roadway Core 1 Gmb								2.200	2.178	2.190	2.173		2.171			2.200	2.220
Roadway Core 2 Gmb								2.237	2.158	2.165	2.202		2.223	2.181		2.222	2.181
Roadway Core 3 Gmb								2.250	2.146	2.192	2.192	2.189	2.227	2.200	2.266	2.217	2.173
Roadway Core 4 Gmb								2.236	2.143	2.16	2.232	2.200	2.214	2.196	2.191	2.227	
Roadway Core 5 Gmb								2.235	2.185	2.199	2.179	2.181			2.199		2.212
Average Core Gmb		2.20	0.02	2.16	2.23	0.07	10.00	2.232	2.162	2.181	2.196	2.190	2.209	2.192	2.219	2.217	2.197
Sublot Gmm		2.35	0.02	2.33	2.38	0.05	9.00		2.349	2.344	2.338	2.337	2.326	2.368	2.358	2.355	2.379
% of Sublot Gmm	93.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	9.00	**#DIV/0!**	**92.04**	**93.05**	**93.91**	**93.71**	**94.96**	**92.58**	**94.09**	**94.12**	**92.33**

Project Summary													
Project No.:	241009-1-52-01							Date:	4/18/2006	4/18/2006	4/18/2006	4/19/2006	4/19/2006	4/20/2006
SR No. :	40							Tested by:	QC	QC	QC	QC	QC	QC
Contractor:	Halifax Paving							Sample ID:	2C001Q	2C002Q	2C003Q	2C004Q	2C005Q	2C006Q
Mix Design No.:	05-4502B			Gyrations @ Ni:	7			Load #:						
Traffic Level:	C			Gyrations @ Nd:	75			Lot/Sublot	L1S1	L1S2	L1S3	L1S4	L2S1	L2S2
Mix (mm):	12.5			Gyrations @ Nm:	115			FM Number	241009	241009	241009	241009	241009	241009
Property	JMF	AVG	STD	MIN	MAX	RNG	CNT							
25.0mm (1")	100	100.00	0.000	100.00	100.00	0.00	6.00		100.00	100.00	100.00	100.00	100.00	100.00
19.0mm (3/4")	100	99.92	0.190	99.49	100.00	0.51	6.00		100.00	100.00	100.00	100.00	99.49	100.00
12.5mm (1/2")	95	96.49	1.584	94.52	98.97	4.45	6.00		95.73	95.92	98.97	98.28	94.52	95.53
9.5mm (3/8")	86	89.90	1.685	88.14	92.37	4.23	6.00		88.40	90.09	92.37	91.83	88.55	88.14
4.75mm (#4)	70	69.73	1.481	67.35	71.49	4.14	6.00		71.32	69.90	71.49	69.93	67.35	68.39
2.36mm (#8)	52	54.29	1.098	52.63	55.39	2.76	6.00		**55.39**	**54.87**	**55.35**	**54.55**	**52.63**	**52.97**
1.18mm (#16)	41	43.81	0.862	42.58	44.72	2.14	6.00		44.58	44.33	44.72	43.95	42.58	42.70
600um (#30)	34	36.19	0.715	35.17	36.99	1.82	6.00		36.73	36.68	36.99	36.30	35.17	35.27
300um (#50)	25	26.95	0.466	26.35	27.59	1.24	6.00		27.27	27.21	27.59	26.91	26.35	26.35
150um (#100)	9	11.46	0.257	11.14	11.88	0.74	6.00		11.29	11.47	11.88	11.14	11.69	11.27
75um (#200)	5.0	5.08	0.213	4.87	5.41	0.54	6.00		**4.88**	**4.96**	**5.41**	**4.87**	**5.33**	**5.02**
Ext. AC %:	6.0	6.04	0.154	5.80	6.25	0.45	6.00		**6.13**	**6.08**	6.11	**6.25**	**5.80**	**5.88**
Rice MSG (Gmm):	2.402	2.386	0.006	2.375	2.392	0.02	6.00		2.392	2.391	2.388	2.375	2.388	2.383
Avg. Bulk (Gmb):	2.306	2.314	0.004	2.308	2.320	0.01	6.00		2.313	2.308	2.312	2.314	2.320	2.318
Agg. Sp. Gr. (Gsb):	2.528	2.528	0.000	2.528	2.528	0.00	6.00		2.528	2.528	2.528	2.528	2.528	2.528
Hgt.@N int.:		124.1	1.955	119.8	125.3	5.50	6.00		124.8	125.3	125.2	125.2	119.8	124.4
Hgt.@N des.:	115	117.7	0.571	116.5	118.2	1.70	6.00		117.8	118.2	118.0	118.0	116.5	117.4
%Gmm @ Ni	89	91.9	1.168	91.1	94.5	3.42	6.00		91.27	91.06	91.25	91.83	94.48	91.80
% Gmm @ Nd	96	97.0	0.322	96.5	97.4	0.90	6.00		96.70	96.53	96.82	97.43	97.15	97.27
% Air Voids @ Nd	4.0	3.02	0.322	2.57	3.47	0.90	6.00		**3.30**	**3.47**	**3.18**	**2.57**	**2.85**	**2.73**
% VMA @ Nd	14.3	13.99	0.264	13.55	14.25	0.70	6.00		14.11	14.25	14.13	14.19	13.55	13.70
% VFA @ Nd	72	78.45	2.116	75.65	81.89	6.24	6.00		76.61	75.65	77.49	81.89	78.97	80.07
Dust/Asphalt	1.1	1.04	0.059	0.94	1.12	0.18	6.00		1.02	1.02	1.10	0.94	1.12	1.04
Gmb @ Nd	2.306	2.314	0.004	2.31	2.320	0.01	6.00		2.313	2.308	2.312	2.314	2.320	2.318
Density lbs/cf		144.4	0.245	144.02	144.8	0.750	6.00		144.33	144.02	144.27	144.39	144.77	144.64
Gse		2.6	0.007	2.60	2.6	0.02	6.00		2.62	2.61	2.61	2.60	2.60	2.60
Pba		1.23	0.112	1.13	1.43	0.30	6.00		1.43	1.28	1.28	1.13	1.13	1.13
Pbe	4.6	4.89	0.146	4.74	5.19	0.45	6.00		4.79	4.88	4.91	5.19	4.74	4.82
Roadway Core 1 Gmb									2.231	2.231	2.201	2.222	2.251	2.235
Roadway Core 2 Gmb									2.258	2.221	2.213	2.172	2.231	2.223
Roadway Core 3 Gmb									2.204	2.227	2.189	2.214	2.232	2.243
Roadway Core 4 Gmb									2.246	2.165	2.224	2.248	2.235	
Roadway Core 5 Gmb									2.237	2.225	2.196	2.223	2.233	
Average Core Gmb		2.22	0.01	2.20	2.24	0.03	6.00		2.235	2.214	2.205	2.216	2.236	2.234
Sublot Gmm		2.39	0.01	2.38	2.39	0.02	6.00		2.392	2.391	2.388	2.375	2.388	2.383
% of Sublot Gmm	90.00	93.17	0.53	92.32	93.73	1.41	6.00		**93.44**	**92.59**	**92.32**	**93.30**	**93.65**	**93.73**

Project Summary													
Project No.:	241009-1-52-01						Date:	4/18/2006	4/18/2006	4/18/2006	4/19/2006	4/19/2006	4/20/2006
SR No. :	40						Tested by:	D5	D5	D5	D5	D5	D5
Contractor:	Halifax Paving						Sample ID:	2C001R	2C002R	2C003R	2C004R	2C005R	2C006R
Mix Design No.:	05-4502B	Gyrations @ Ni:	7				Load #:						
Traffic Level:	C	Gyrations @ Nd:	75				Lot/Sublot	L1S1	L1S2	L1S3	L1S4	L2S1	L2S2
Mix (mm):	12.5	Gyrations @ Nm:	115				FM Number	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution
Property	JMF	AVG	STD	MIN	MAX	RNG	CNT						
25.0mm (1")	100	100.00	0.000	100.00	100.00	0.00	6.00	100.00	100.00	100.00	100.00	100.00	100.00
19.0mm (3/4")	100	100.00	0.000	100.00	100.00	0.00	6.00	100.00	100.00	100.00	100.00	100.00	100.00
12.5mm (1/2")	95	96.85	1.002	94.89	97.84	2.95	6.00	97.63	97.84	97.10	96.30	97.33	94.89
9.5mm (3/8")	86	91.18	1.036	89.61	92.99	3.38	6.00	90.77	92.99	91.50	90.65	91.56	89.61
4.75mm (#4)	70	72.54	1.808	70.75	75.46	4.71	6.00	74.28	75.46	72.74	70.75	70.98	71.00
2.36mm (#8)	52	57.14	1.552	55.74	59.70	3.96	6.00	[illegible]	[illegible]	**56.95**	**55.78**	**55.93**	**55.74**
1.18mm (#16)	41	45.73	0.986	44.58	47.40	2.82	6.00	46.63	47.40	45.37	44.87	45.51	44.58
600um (#30)	34	37.49	0.742	36.68	38.60	1.92	6.00	38.38	38.60	37.33	37.11	36.82	36.68
300um (#50)	25	28.08	0.403	27.67	28.66	0.99	6.00	28.66	28.61	27.96	27.82	27.67	27.75
150um (#100)	9	12.42	0.235	11.92	12.61	0.69	6.00	12.61	12.42	12.60	12.43	12.53	11.92
75um (#200)	5.0	5.94	0.129	5.72	6.12	0.40	6.00	**6.05**	**5.72**	**6.12**	**5.88**	**5.98**	**5.90**
Ext. AC %:	6.0	6.20	0.083	6.03	6.27	0.24	6.00	**6.25**	**6.21**	**6.18**	**6.27**	**6.03**	**6.27**
Rice MSG (Gmm):	2.402	2.389	0.008	2.376	2.397	0.02	6.00	2.376	2.393	2.381	2.397	2.391	2.395
Avg. Bulk (Gmb):	2.306	2.312	0.006	2.303	2.322	0.02	6.00	2.311	2.303	2.314	2.308	2.311	2.322
Agg. Sp. Gr. (Gsb):	2.528	2.528	0.000	2.528	2.528	0.00	6.00	2.528	2.528	2.528	2.528	2.528	2.528
Hgt.@N int.:		120.9	0.403	120.0	121.3	1.30	6.00	121.0	121.0	120.9	120.9	121.3	120.0
Hgt.@N des.:	115	114.5	0.379	113.7	114.9	1.20	6.00	114.6	114.9	114.5	114.6	114.7	113.7
%Gmm @ Ni	89	91.7	0.338	91.3	92.1	0.85	6.00	92.12	91.39	92.04	91.27	91.40	91.86
% Gmm @ Nd	96	96.8	0.403	96.2	97.3	1.02	6.00	97.26	96.24	97.19	96.29	96.65	96.95
% Air Voids @ Nd	4.0	3.24	0.403	2.74	3.76	1.02	6.00	**2.74**	**3.76**	**2.81**	**3.71**	**3.35**	**3.05**
% VMA @ Nd	14.3	14.24	0.216	13.91	14.56	0.65	6.00	14.30	14.56	14.12	14.42	14.10	13.91
% VFA @ Nd	72	77.28	2.614	74.18	80.84	6.66	6.00	80.84	74.18	80.10	74.27	76.24	78.07
Dust/Asphalt	1.1	1.21	0.030	1.17	1.24	0.07	6.00	1.17	1.17	1.23	1.23	1.24	1.23
Gmb @ Nd	2.306	2.312	0.006	2.30	2.322	0.02	6.00	2.311	2.303	2.314	2.308	2.311	2.322
Density lbs/cf		144.2	0.360	143.71	144.9	1.180	6.00	144.21	143.71	144.39	144.02	144.21	144.89
Gse		2.6	0.011	2.60	2.6	0.03	6.00	2.60	2.62	2.61	2.63	2.61	2.63
Pba		1.38	0.166	1.13	1.58	0.45	6.00	1.13	1.43	1.28	1.58	1.28	1.58
Pbe	4.6	4.91	0.141	4.79	5.19	0.40	6.00	5.19	4.87	4.98	4.79	4.83	4.79
Roadway Core 1 Gmb								2.231	2.231	2.201	2.222	2.251	2.235
Roadway Core 2 Gmb								2.258	2.221	2.213	2.172	2.231	2.223
Roadway Core 3 Gmb								2.204	2.227	2.189	2.214	2.232	2.243
Roadway Core 4 Gmb								2.246	2.165	2.224	2.248	2.235	
Roadway Core 5 Gmb								2.237	2.225	2.196	2.223	2.233	
Average Core Gmb		2.22	0.01	2.20	2.24	0.03	6.00	2.235	2.214	2.205	2.216	2.236	2.234
Sublot Gmm		2.39	0.01	2.38	2.40	0.02	6.00	2.376	2.393	2.381	2.397	2.391	2.395
% of Sublot Gmm	90.00	93.07	0.60	92.44	94.07	1.63	6.00	**94.07**	**92.51**	**92.59**	**92.44**	**93.53**	**93.26**

Project Summary													
Project No.:	241009-1-52-01						Date:	4/18/2006	4/18/2006	4/18/2006	4/19/2006	4/19/2006	4/20/2006
SR No. :	40						Tested by:	D5	D5	D5	D5	D5	D5
Contractor:	Halifax Paving						Sample ID:	2C001A	2C002A	2C003A	2C004A	2C005A	2C006A
Mix Design No.:	05-4502B	Gyrations @ Ni:	7				Load #:						
Traffic Level:	C	Gyrations @ Nd:	75				Lot/Sublot	L1S1	L1S2	L1S3	L1S4	L2S1	L2S2
Mix (mm):	12.5	Gyrations @ Nm:	115				FM Number	Auger	Auger	Auger	Auger	Auger	Auger
Property	JMF	AVG	STD	MIN	MAX	RNG	CNT						
25.0mm (1")	100	100.00	0.000	100.00	100.00	0.00	6.00	100.00	100.00	100.00	100.00	100.00	100.00
19.0mm (3/4")	100	99.83	0.391	98.95	100.00	1.05	6.00	98.95	100.00	100.00	100.00	100.00	100.00
12.5mm (1/2")	95	95.97	1.521	94.54	98.11	3.57	6.00	94.94	94.54	95.38	98.11	98.07	94.77
9.5mm (3/8")	86	89.39	2.812	84.10	92.96	8.86	6.00	89.21	84.10	89.63	92.96	91.84	88.61
4.75mm (#4)	70	71.41	2.777	65.67	74.31	8.64	6.00	74.31	65.67	73.15	72.77	71.24	71.32
2.36mm (#8)	52	56.27	1.872	52.51	58.34	5.83	6.00	**52.51**	**52.51**	**58.34**	**56.76**	**55.74**	**56.57**
1.18mm (#16)	41	44.96	1.535	41.92	46.78	4.86	6.00	45.54	41.92	46.78	45.98	44.51	45.02
600um (#30)	34	36.98	1.338	34.40	38.57	4.17	6.00	37.33	34.40	38.57	38.09	36.54	36.92
300um (#50)	25	27.60	0.958	25.71	28.76	3.05	6.00	27.89	25.71	28.76	28.24	27.31	27.70
150um (#100)	9	11.97	0.285	11.54	12.46	0.92	6.00	12.14	11.54	12.46	11.91	11.99	11.80
75um (#200)	5.0	5.59	0.167	5.30	5.80	0.50	6.00	**5.68**	**5.30**	**5.80**	**5.46**	**5.59**	**5.71**
Ext. AC %:	6.0	6.02	0.238	5.58	6.28	0.70	6.00	**6.19**	**5.88**	**5.98**	**6.19**	**5.58**	**6.28**
Rice MSG (Gmm):	2.402	2.391	0.005	2.382	2.395	0.01	6.00	2.382	2.388	2.392	2.394	2.395	2.395
Avg. Bulk (Gmb):	2.306	2.308	0.008	2.296	2.322	0.03	6.00	2.311	2.304	2.296	2.306	2.311	2.322
Agg. Sp. Gr. (Gsb):	2.528	2.528	0.000	2.528	2.528	0.00	6.00	2.528	2.528	2.528	2.528	2.528	2.528
Hgt.@N int.:		120.6	0.731	119.2	121.4	2.20	6.00	120.2	121.4	121.1	120.8	121.0	119.2
Hgt.@N des.:	115	114.5	0.636	113.3	115.2	1.90	6.00	114.2	115.2	115.1	114.7	114.6	113.3
%Gmm @ Ni	89	91.7	0.370	91.2	92.2	0.95	6.00	92.18	91.55	91.23	91.46	91.39	92.15
% Gmm @ Nd	96	96.5	0.355	96.0	97.0	1.03	6.00	97.02	96.48	95.99	96.32	96.49	96.95
% Air Voids @ Nd	4.0	3.46	0.355	2.98	4.01	1.03	6.00	**2.98**	**3.52**	**4.01**	**3.68**	**3.51**	**3.05**
% VMA @ Nd	14.3	14.19	0.306	13.69	14.61	0.92	6.00	14.24	14.22	14.61	14.43	13.69	13.92
% VFA @ Nd	72	75.64	2.251	72.55	79.07	6.52	6.00	79.07	75.25	72.55	74.50	74.36	78.09
Dust/Asphalt	1.1	1.17	0.049	1.10	1.24	0.14	6.00	1.14	1.10	1.21	1.13	1.24	1.19
Gmb @ Nd	2.306	2.308	0.008	2.30	2.322	0.03	6.00	2.311	2.304	2.296	2.306	2.311	2.322
Density lbs/cf		144.0	0.495	143.27	144.9	1.620	6.00	144.21	143.77	143.27	143.89	144.21	144.89
Gse		2.6	0.011	2.60	2.6	0.03	6.00	2.61	2.60	2.61	2.62	2.60	2.63
Pba		1.31	0.160	1.13	1.58	0.45	6.00	1.28	1.13	1.28	1.43	1.13	1.58
Pbe	4.6	4.79	0.143	4.51	4.99	0.48	6.00	4.99	4.82	4.78	4.85	4.51	4.80
Roadway Core 1 Gmb								2.231	2.231	2.201	2.222	2.251	2.235
Roadway Core 2 Gmb								2.258	2.221	2.213	2.172	2.231	2.223
Roadway Core 3 Gmb								2.204	2.227	2.189	2.214	2.232	2.243
Roadway Core 4 Gmb								2.246	2.165	2.224	2.248	2.235	
Roadway Core 5 Gmb								2.237	2.225	2.196	2.223	2.233	
Average Core Gmb		2.22	0.01	2.20	2.24	0.03	6.00	2.235	2.214	2.205	2.216	2.236	2.234
Sublot Gmm		2.39	0.00	2.38	2.40	0.01	6.00	2.382	2.388	2.392	2.394	2.395	2.395
% of Sublot Gmm	90.00	92.99	0.56	92.17	93.84	1.67	6.00	**93.84**	**92.71**	**92.17**	**92.56**	**93.38**	**93.26**

Project Summary																					
Project No.:	241009-1-52-01						Date:	4/21/2006	4/21/2006	4/24/2006	4/24/2006	4/25/2006	04/26/06	4/27/2006	5/3/2006	5/3/2006	5/4/2006	06/26/06	06/27/06	06/28/06	07/12/06
SR No. :	40						Tested by:	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Contractor:	Halifax Paving						Sample ID:	2C007Q	2C008Q	2C009Q	2C010Q	2C011Q	2C012Q	2C013Q	2C014Q	2C015Q	2C016Q	2C017Q	2C018Q	2C019Q	2C021Q
Mix Design No.:	05-4502C	Gyrations @ Ni:	7				Lead #:							15	8	42	30		29	21	
Traffic Level:	C	Gyrations @ Nd:	75				Lot/Sublot	L3S1	L3S2	L3S3	L3S4	L4S1	L4S2	L4S3	L4S4	L5S1	L5S2	L5S3	L5S4	L6S1	L6S3
Mix (mm):	12.5	Gyrations @ Nm:	115				FM Number	241009	241009	241009	241009	241009	241009	241009	241009	241009	241009	241009	241009	241009	241009
Property	JMF	AVG	STD	MIN	MAX	RNG	CNT														
25.0mm (1")	100	100.00	0.000	100.00	100.00	0.00	14.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
19.0mm (3/4")	100	100.00	0.000	100.00	100.00	0.00	14.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
12.5mm (1/2")	95	96.14	1.417	93.81	98.74	4.93	14.00	94.75	97.12	94.55	98.74	97.24	97.33	95.68	95.21	95.55	93.81	95.40	96.57	95.59	98.47
9.5mm (3/8")	86	89.67	1.805	86.12	93.56	7.44	14.00	88.72	89.91	86.12	93.56	89.07	91.27	88.96	87.68	88.87	89.09	88.82	90.97	90.29	92.07
4.75mm (#4)	70	70.79	1.653	68.72	74.51	5.79	14.00	69.36	69.60	71.42	74.51	69.03	69.77	68.72	68.78	70.43	71.42	70.91	72.25	72.53	72.34
2.36mm (#8)	55	56.12	1.389	54.53	59.65	5.12	14.00	58.33	54.94	56.27	59.65	54.53	56.99	55.25	54.71	54.99	56.40	55.93	56.54	55.51	55.60
1.18mm (#16)	43	45.55	1.044	44.30	48.44	4.14	14.00	46.34	45.16	45.59	48.44	44.30	46.69	45.35	44.53	44.90	46.17	45.18	45.51	44.57	45.01
600um (#30)	34	37.98	0.882	36.80	40.21	3.41	14.00	38.75	37.93	38.25	40.21	36.98	38.98	37.96	37.30	37.67	38.59	37.37	37.65	36.80	37.31
300um (#50)	25	28.57	0.685	27.39	30.02	2.63	14.00	29.15	28.67	28.81	30.02	27.92	29.31	28.77	28.18	28.61	29.20	27.91	28.26	27.39	27.81
150um (#100)	9	11.97	0.388	11.21	12.50	1.29	14.00	12.08	12.01	11.91	12.34	11.81	12.44	12.29	12.15	12.20	12.50	11.39	11.79	11.21	11.43
75um (#200)	5.0	5.39	0.254	4.88	5.82	0.94	14.00	5.27	5.14	5.37	5.58	5.32	5.81	5.54	5.45	5.54	5.82	4.88	5.35	5.07	5.27
Ext. AC %:	5.9	5.80	0.172	5.48	6.13	0.65	14.00	5.98	5.85	5.70	6.13	5.74	6.03	5.91	5.48	5.70	5.66	5.59	5.89	5.72	5.79
Rice MSG (Gmm):	2.395	2.396	0.009	2.381	2.416	0.04	14.00	2.391	2.402	2.396	2.387	2.393	2.390	2.387	2.410	2.399	2.397	2.406	2.416	2.394	2.381
Avg. Bulk (Gmb):	2.3	2.301	0.006	2.289	2.312	0.02	14.00	2.299	2.301	2.296	2.303	2.300	2.312	2.305	2.302	2.303	2.299	2.289	2.308	2.303	2.291
Agg. Sp. Gr. (Gsb):	2.528	2.509	0.070	2.258	2.528	0.27	14.00	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.258	2.528
Hgt.@N int.:		124.9	0.425	124.0	125.8	1.80	14.00	125.2	125.1	124.9	124.6	125.3	124.0	124.4	124.8	124.5	124.9	125.8	124.8	124.8	125.2
Hgt.@N des.:	115	118.4	0.379	117.5	119.1	1.60	14.00	118.8	118.4	118.4	118.2	118.6	117.5	118.0	118.1	118.2	118.4	119.1	118.2	118.3	118.8
%Gmm @ Ni	89	91.0	0.459	90.1	91.7	1.60	14.00	91.24	90.66	90.84	91.53	90.97	91.67	91.60	90.39	91.14	90.92	90.07	90.48	91.19	91.30
% Gmm @ Nd	96	96.0	0.421	95.1	96.7	1.60	14.00	96.15	95.80	95.83	96.48	96.11	96.74	96.56	95.52	96.00	95.91	95.14	95.53	96.20	96.22
% Air Voids @ Nd	4.0	3.99	0.421	3.26	4.86	1.60	14.00	3.85	4.20	4.17	3.52	3.89	3.26	3.44	4.48	4.00	4.09	4.86	4.47	3.80	3.78
% VMA @ Nd	14.4	13.53	2.695	3.84	14.62	10.78	14.00	14.50	14.30	14.35	14.49	14.24	14.06	14.21	13.93	14.09	14.21	14.51	14.08	3.84	14.62
% VFA @ Nd	72	66.90	18.507	1.04	76.81	75.77	14.00	73.45	70.63	70.94	75.71	72.68	76.81	75.79	67.84	71.61	71.22	66.51	68.25	1.04	74.15
Dust/Asphalt	1.1	7.12	21.460	1.08	84.50	83.42	14.00	1.10	1.14	1.16	1.13	1.14	1.20	1.14	1.28	1.23	1.27	1.11	1.26	84.50	1.08
Gmb @ Nd	2.3	2.301	0.006	2.29	2.312	0.02	14.00	2.299	2.301	2.296	2.303	2.300	2.312	2.305	2.302	2.303	2.299	2.289	2.308	2.303	2.291
Density lbs/cf		143.6	0.365	142.83	144.3	1.440	14.00	143.46	143.58	143.27	143.71	143.52	144.27	143.83	143.64	143.71	143.46	142.83	144.02	143.71	142.96
Gse		2.6	0.011	2.59	2.6	0.05	14.00	2.61	2.62	2.60	2.61	2.60	2.61	2.60	2.61	2.61	2.60	2.61	2.64	2.60	2.59
Pba		1.60	1.233	0.98	6.00	5.02	14.00	1.28	1.43	1.13	1.28	1.13	1.28	1.13	1.28	1.28	1.13	1.28	1.73	6.00	0.98
Pbe	4.7	4.29	1.193	0.06	4.93	4.87	14.00	4.78	4.50	4.63	4.93	4.67	4.83	4.85	4.27	4.49	4.59	4.38	4.26	0.06	4.87
Roadway Core 1 Gmb									2.199	2.232	2.184	2.219	2.211	2.235	2.206	2.211	2.260	2.134	2.221	2.225	2.195
Roadway Core 2 Gmb									2.195	2.217	2.225	2.198	2.264	2.207	2.212	2.235	2.227	2.193	2.145	N/A	
Roadway Core 3 Gmb								2.208	2.214	2.212	2.211	2.224	2.233	2.230	2.194	2.182	2.234	2.199	2.217	N/A	
Roadway Core 4 Gmb								2.204	2.206	2.211	2.218		2.236	2.225	2.223	2.238	2.218	2.210	2.219	2.204	2.214
Roadway Core 5 Gmb								2.237	2.212	2.2	2.218			2.223	2.217	2.232	2.231		2.215	2.266	2.172
Average Core Gmb		2.21	0.01	2.18	2.24	0.05	14.00	2.216	2.205	2.214	2.211	2.214	2.236	2.224	2.210	2.220	2.234	2.184	2.203	2.232	2.194
Sublot Gmm		2.40	0.01	2.38	2.42	0.04	14.00	2.391	2.402	2.396	2.387	2.393	2.390	2.387	2.410	2.399	2.397	2.406	2.416	2.394	2.381
% of Sublot Gmm	90.00	92.40	0.77	90.77	93.56	2.79	14.00	92.69	91.81	92.42	92.64	92.51	93.56	93.17	91.72	92.52	93.20	90.77	91.20	93.22	92.13

Project Summary																					
Project No.:	241009-1-52-01						Date:	4/21/2006	4/21/2006	4/24/2006	4/24/2006	4/25/2006	04/26/06	4/27/2006	5/3/2006	5/3/2006	5/4/2006	06/26/06	06/27/06	06/28/06	07/12/06
SR No. :	40						Tested by:	D5	PSI	PSI	PSI	PSI	PSI	PSI	PSI	PSI	PSI	D5	D5	D5	D5
Contractor:	Halifax Paving						Sample ID:	2C007R	2C008R	2C009R	2C010R	2C011R	2C012R	2CO13R	2C014R	2C015R	2C016R	2C017R	2C018R	2C019R	2C021R
Mix Design No.:	05-4502C		Gyrations @ Ni:	7			Load #:												29	21	
Traffic Level:	C		Gyrations @ Nd:	75			Lot/Sublot	L3S1	L3S2	L3S3	L3S4	L4S1	L4S2	L4S3	L4S4	L5S1	L5S2	L5S3	L5S4	L6S1	L6S3
Mix (mm):	12.5		Gyrations @ Nm:	115			FM Number	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	Resolution	241009
Property	JMF	AVG	STD	MIN	MAX	RNG	CNT														
25.0mm (1")	100	100.00	0.000	100.00	100.00	0.00	14.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
19.0mm (3/4")	100	99.95	0.193	99.25	100.00	0.75	14.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.25	100.00
12.5mm (1/2")	95	96.60	1.604	94.43	99.63	5.20	14.00	95.67	99.63	94.43	98.30	95.41	97.30	94.47	96.12	95.52	96.16	94.94	98.43	97.73	98.32
9.5mm (3/8")	86	90.29	1.710	88.37	94.60	6.23	14.00	89.43	90.36	88.82	92.10	88.37	89.09	88.68	89.88	89.33	91.44	88.81	91.17	92.04	94.60
4.75mm (#4)	70	72.48	2.030	69.13	76.97	7.84	14.00	69.40	72.04	74.07	73.29	70.35	69.13	71.47	71.07	72.99	72.71	73.01	74.15	74.06	76.97
2.36mm (#8)	55	57.72	1.077	56.26	59.93	3.67	14.00	56.26	56.89	58.70	58.92	56.38	56.89	57.40	56.84	57.67	57.56	58.07	59.27	57.24	59.93
1.18mm (#16)	43	46.85	0.996	45.34	49.01	3.67	14.00	46.14	49.01	47.19	47.74	45.34	46.25	46.71	45.64	46.85	46.85	46.57	47.75	45.71	48.08
600um (#30)	34	38.72	0.679	37.65	39.68	2.03	14.00	38.51	38.11	39.42	39.68	37.65	38.52	38.89	37.92	39.04	39.01	38.39	39.65	37.73	39.51
300um (#50)	25	29.24	0.534	28.34	30.10	1.76	14.00	29.11	28.67	29.85	29.89	28.47	29.12	29.49	28.75	29.62	29.51	28.90	30.10	28.34	29.50
150um (#100)	9	11.89	0.575	11.20	13.22	2.02	14.00	11.30	11.31	11.89	11.92	11.22	11.63	11.94	11.20	11.73	11.81	12.46	13.22	12.03	12.79
75um (#200)	5.0	5.76	0.325	5.23	6.45	1.22	14.00	5.27	5.37	5.69	5.92	5.78	5.93	6.00	5.23	5.63	5.88	5.70	6.45	5.59	6.15
Ext. AC %:	5.9	5.95	0.203	5.48	6.29	0.81	14.00	5.97	5.99	6.00	6.19	5.98	6.29	6.14	5.48	5.95	5.77	5.65	5.97	5.83	6.02
Rice MSG (Gmm):	2.395	2.389	0.011	2.374	2.420	0.05	14.00	2.375	2.380	2.390	2.388	2.394	2.383	2.386	2.387	2.374	2.390	2.399	2.389	2.420	2.387
Avg. Bulk (Gmb):	2.3	2.296	0.008	2.284	2.315	0.03	14.00	2.294	2.306	2.290	2.297	2.297	2.315	2.302	2.296	2.294	2.291	2.286	2.300	2.291	2.284
Agg. Sp. Gr. (Gsb):	2.528	2.509	0.070	2.258	2.528	0.27	14.00	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.258
Hgt.@N int.:		121.1	0.508	119.9	121.8	1.90	14.00	121.6	120.8	121.4	120.8	121.7	119.9	121.0	121.1	120.8	120.9	121.5	120.9	121.8	121.8
Hgt.@N des.:	115	115.0	0.477	113.8	115.6	1.80	14.00	115.3	114.6	115.2	114.7	115.2	113.8	114.8	115.0	114.7	114.8	115.6	114.7	115.6	115.6
%Gmm @ Ni	89	91.2	0.577	89.9	92.2	2.35	14.00	91.59	91.92	90.92	91.33	90.82	92.20	91.54	91.34	91.75	91.02	90.66	91.34	89.85	90.81
% Gmm @ Nd	96	96.1	0.625	94.7	97.2	2.48	14.00	96.59	96.89	95.82	96.19	95.95	97.15	96.48	96.19	96.63	95.86	95.29	96.27	94.67	95.68
% Air Voids @ Nd	4.0	3.86	0.625	2.85	5.33	2.48	14.00	3.41	3.11	4.18	3.81	4.05	2.85	3.52	3.81	3.37	4.14	4.71	3.73	5.33	4.32
% VMA @ Nd	14.4	13.85	2.481	4.94	14.85	9.91	14.00	14.67	14.25	14.85	14.76	14.57	14.18	14.53	14.15	14.66	14.60	14.68	14.45	14.66	4.94
% VFA @ Nd	72	69.21	16.224	12.55	79.90	67.35	14.00	76.76	78.18	71.85	74.19	72.20	79.90	75.77	73.07	77.01	71.64	67.92	74.19	63.64	12.55
Dust/Asphalt	1.1	2.94	6.293	1.04	25.63	24.59	14.00	1.04	1.09	1.19	1.22	1.21	1.17	1.21	1.11	1.12	1.25	1.28	1.35	1.33	25.63
Gmb @ Nd	2.3	2.296	0.008	2.28	2.315	0.03	14.00	2.294	2.306	2.290	2.297	2.297	2.315	2.302	2.296	2.294	2.291	2.286	2.300	2.291	2.284
Density lbs/cf		143.3	0.486	142.52	144.5	1.940	14.00	143.15	143.89	142.90	143.33	143.33	144.46	143.64	143.27	143.15	142.96	142.65	143.52	142.96	142.52
Gse		2.6	0.014	2.58	2.6	0.06	14.00	2.59	2.60	2.61	2.62	2.61	2.61	2.61	2.58	2.59	2.60	2.61	2.61	2.64	2.61
Pba		1.57	1.287	0.82	6.15	5.33	14.00	0.98	1.13	1.28	1.43	1.28	1.28	1.28	0.82	0.98	1.13	1.28	1.28	1.73	6.15
Pbe	4.7	4.47	1.195	0.24	5.09	4.85	14.00	5.05	4.93	4.80	4.85	4.78	5.09	4.94	4.70	5.03	4.71	4.44	4.77	4.20	0.24
Roadway Core 1 Gmb									2.199	2.232	2.184	2.219	2.211	2.235	2.206	2.211	2.260	2.134	2.221	2.225	2.195
Roadway Core 2 Gmb									2.195	2.217	2.225	2.198	2.264	2.207	2.212	2.235	2.227	2.193	2.145	N/A	
Roadway Core 3 Gmb								2.208	2.214	2.212	2.211	2.224	2.233	2.230	2.194	2.182	2.234	2.199	2.217	N/A	
Roadway Core 4 Gmb								2.204	2.206	2.211	2.218		2.236	2.225	2.223	2.238	2.218	2.210	2.219	2.204	2.214
Roadway Core 5 Gmb								2.237	2.212	2.2	2.218			2.223	2.217	2.232	2.231		2.215	2.266	2.172
Average Core Gmb		2.21	0.01	2.18	2.24	0.05	14.00	2.216	2.205	2.214	2.211	2.214	2.236	2.224	2.210	2.220	2.234	2.184	2.203	2.232	2.194
Sublot Gmm		2.39	0.01	2.37	2.42	0.05	14.00	2.375	2.380	2.390	2.388	2.394	2.383	2.386	2.387	2.374	2.390	2.399	2.389	2.420	2.387
% of Sublot Gmm	90.00	92.69	0.71	91.04	93.83	2.79	14.00	93.32	92.66	92.65	92.60	92.47	93.83	93.21	92.60	93.50	93.47	91.04	92.23	92.22	91.90

Project Summary

Project No.:	241009-1-52-01							Date:	4/21/2006	4/21/2006	4/24/2006	4/24/2006	4/25/2006	04/26/06	4/27/2006	5/3/2006	5/3/2006	5/4/2006	06/26/06	06/27/06	06/28/06	07/12/06
SR No. :	40							Tested by:	D5	PSI	PSI	PSI	PSI	PSI	PSI	PSI	PSI	PSI	D5	D5	D5	D5
Contractor:	Halifax Paving							Sample ID:	2C007A	2C008A	2C009A	2C010A	2C011A	2C012A	2C013A	2C014A	2C015A	2C016A	2C017A	2C018A	2C019A	2C021A
Mix Design No.:	05-4502C		Gyrations @ Ni:	7				Load #:												29	21	
Traffic Level:	C		Gyrations @ Nd:	75				Lot/Sublot	L3S1	L3S2	L3S3	L3S4	L4S1	L4S2	L4S3	L4S4	L5S1	L5S2	L5S3	L5S4	L6S1	L6S3
Mix (mm):	12.5		Gyrations @ Nm:	115				FM Number	Auger	Auger	Auger	Auger	Auger	Auger	Auger	Auger	Auger	Auger	Auger	Auger	Auger	Auger	241009
Property	JMF	AVG	STD	MIN	MAX	RNG	CNT															
25.0mm (1")	100	100.00	0.000	100.00	100.00	0.00	14.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
19.0mm (3/4")	100	99.85	0.170	99.34	100.00	0.66	14.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.34	100.00	100.00	100.00	100.00	100.00	100.00	100.00
12.5mm (1/2")	95	94.01	6.952	69.98	98.99	29.01	14.00	96.91	95.92	96.39	69.98	92.11	96.91	94.41	92.22	94.37	95.96	95.69	98.31	98.99	98.02	
9.5mm (3/8")	86	89.40	3.020	83.85	94.25	10.40	14.00	88.46	90.89	88.93	93.68	83.85	88.46	85.54	85.56	88.00	90.58	88.96	91.34	93.12	94.25	
4.75mm (#4)	70	72.04	3.327	66.68	78.84	12.16	14.00	70.35	72.57	73.99	74.94	67.89	70.35	67.52	66.68	70.00	73.61	72.37	73.56	75.92	78.84	
2.36mm (#8)	55	57.47	2.345	52.55	60.88	8.33	14.00	58.09	57.28	58.59	[illegible]	54.73	58.09	54.28	52.55	55.37	58.69	57.81	57.99	59.51	[illegible]	
1.18mm (#16)	43	46.37	1.793	42.68	49.31	6.63	14.00	47.35	46.23	47.06	49.31	43.96	47.35	44.41	42.68	44.69	47.74	46.07	46.24	47.75	48.36	
600um (#30)	34	36.52	1.430	35.58	41.01	5.43	14.00	39.33	38.33	39.44	41.01	36.68	39.33	37.16	35.58	37.18	39.56	38.04	38.09	39.75	39.77	
300um (#50)	25	29.09	0.949	27.11	30.84	3.73	14.00	29.64	28.92	29.92	30.84	28.00	29.64	28.22	27.11	28.23	29.67	28.65	28.86	29.85	29.77	
150um (#100)	9	11.89	0.626	10.60	12.96	2.36	14.00	11.64	11.83	11.85	12.27	11.31	11.64	11.22	10.60	11.60	11.82	12.18	12.69	12.96	12.79	
75um (#200)	5.0	5.71	0.333	4.89	6.22	1.33	14.00	5.42	5.78	5.69	5.86	5.61	5.42	5.67	4.89	5.72	5.82	5.57	6.22	6.17	6.12	
Ext. AC %:	5.9	5.82	0.211	5.38	6.12	0.74	14.00	6.06	5.71	5.82	6.12	5.72	6.06	5.79	5.38	5.57	6.00	5.52	5.84	5.87	5.95	
Rice MSG (Gmm):	2.395	2.396	0.008	2.386	2.411	0.02	14.00	2.386	2.392	2.386	2.389	2.389	2.393	2.400	2.405	2.399	2.390	2.404	2.397	2.411	2.402	
Avg. Bulk (Gmb):	2.3	2.290	0.007	2.279	2.302	0.02	14.00	2.294	2.302	2.282	2.292	2.294	2.280	2.296	2.284	2.292	2.288	2.282	2.299	2.298	2.279	
Agg. Sp. Gr. (Gsb):	2.528	2.528	0.000	2.528	2.528	0.00	14.00	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	
Hgt.@N int.:		121.6	0.556	120.6	122.9	2.30	14.00	121.6	120.6	122.9	121.5	121.3	121.9	121.8	121.9	121.2	121.1	121.4	121.2	121.1	122.3	
Hgt.@N des.:	115	115.2	0.911	112.4	116.4	4.00	14.00	115.3	114.6	116.4	115.2	115.0	115.9	115.5	115.7	115.1	115.2	115.4	112.4	115.0	116.2	
%Gmm @ Ni	89	90.6	0.592	89.0	91.5	2.50	14.00	91.16	91.45	90.58	90.97	91.04	90.59	90.72	90.14	90.73	91.07	90.23	88.95	90.51	90.15	
% Gmm @ Nd	96	95.6	0.436	94.9	96.2	1.36	14.00	96.14	96.24	95.64	95.94	96.02	95.28	95.67	94.97	95.54	95.73	94.93	95.91	95.31	94.88	
% Air Voids @ Nd	4.0	4.41	0.436	3.76	5.12	1.36	14.00	3.86	3.76	4.36	4.06	3.98	4.72	4.33	5.03	4.46	4.27	5.07	4.09	4.69	5.12	
% VMA @ Nd	14.4	14.68	0.328	14.14	15.27	1.13	14.00	14.76	14.14	14.99	14.88	14.45	15.27	14.43	14.51	14.39	14.93	14.71	14.37	14.44	15.21	
% VFA @ Nd	72	69.94	2.779	65.33	73.85	8.52	14.00	73.85	73.41	70.91	72.72	72.46	69.09	69.99	65.33	69.01	71.40	65.53	71.54	67.52	66.34	
Dust/Asphalt	1.1	1.24	0.081	1.12	1.41	0.29	14.00	1.12	1.25	1.20	1.19	1.21	1.15	1.24	1.13	1.27	1.21	1.29	1.34	1.41	1.33	
Gmb @ Nd	2.3	2.290	0.007	2.28	2.302	0.02	14.00	2.294	2.302	2.282	2.292	2.294	2.280	2.296	2.284	2.292	2.288	2.282	2.299	2.298	2.279	
Density lbs/cf		142.9	0.458	142.21	143.6	1.430	14.00	143.15	143.64	142.40	143.02	143.15	142.27	143.27	142.52	143.02	142.77	142.40	143.46	143.40	142.21	
Gse		2.6	0.009	2.60	2.6	0.03	14.00	2.61	2.60	2.60	2.61	2.60	2.62	2.61	2.60	2.60	2.61	2.61	2.61	2.63	2.62	
Pba		1.27	0.133	1.13	1.58	0.45	14.00	1.28	1.13	1.13	1.28	1.13	1.43	1.28	1.13	1.13	1.28	1.28	1.28	1.58	1.43	
Pbe	4.7	4.62	0.185	4.31	4.92	0.61	14.00	4.86	4.64	4.76	4.92	4.65	4.72	4.58	4.31	4.50	4.80	4.31	4.63	4.38	4.61	
Roadway Core 1 Gmb									2.199	2.232	2.184	2.219	2.211	2.235	2.206	2.211	2.260	2.134	2.221	2.225	2.195	
Roadway Core 2 Gmb									2.195	2.217	2.225	2.198	2.264	2.207	2.212	2.235	2.227	2.193	2.145	N/A		
Roadway Core 3 Gmb								2.208	2.214	2.212	2.211	2.224	2.233	2.230	2.194	2.182	2.234	2.199	2.217	N/A		
Roadway Core 4 Gmb								2.204	2.206	2.211	2.218		2.235	2.225	2.223	2.238	2.218	2.210	2.219	2.204	2.214	
Roadway Core 5 Gmb								2.237	2.212	2.2	2.218			2.223	2.217	2.232	2.231		2.215	2.266	2.172	
Average Core Gmb		2.21	0.01	2.18	2.24	0.05	14.00	2.216	2.205	2.214	2.211	2.214	2.236	2.224	2.210	2.220	2.234	2.184	2.203	2.232	2.194	
Sublot Gmm		2.40	0.01	2.39	2.41	0.02	14.00	2.386	2.392	2.386	2.389	2.389	2.393	2.400	2.405	2.399	2.390	2.404	2.397	2.411	2.402	
% of Sublot Gmm	90.00	92.41	0.70	90.85	93.47	2.62	14.00	92.89	92.19	92.81	92.56	92.66	93.44	92.67	91.91	92.52	93.47	90.85	91.92	92.56	91.33	

Attachment 31-A

OPERATION INSTRUCTIONS FOR 3 DIAL GAUGE

1. Turn dials on while gauge is still on base/block.
2. Set dials to desired readings (inches)
3. Press Zero to insure all dials are reading "zero" while gauge is still on the base/block.
4. If dials are not reading zero, use hex head wrench and adjust dials on base until all are reading zero. If the dial is loose, it will not zero.
5. If the dial gauge readout is flashing, the battery is low.
6. Loosen bolts on both sides of base and remove gauge from base/block.
7. Center the thickness gauge over the marking material in an area avoiding glass spheres and read the values of all three dial indicators. The location thickness measurement is the average of the three dial indicators.
8. Take one measurement at the beginning, middle, and end of each one mile section of line type (i.e. color, solid, skip).
9. The average of the three location measurements shall be used for acceptance of the one mile section of line type. In the example below, values in parentheses () are the average of the three readings. The "Lot Average" is the average of the three location measurements in parentheses. If available, identify locations by station numbers. See attached spreadsheet for documenting thickness measurements.

EXAMPLE

LOT NO. 1-Thickness Measurements

OUTSIDE SOLID WHITE EDGELINE	WHITE SKIP	INSIDE SOLID YELLOW EDGELINE
.146, .148, .152 (.149)	.143, .123, .150 (.139)	.156, .150, .160 (.155)
.121, .111, .117 (.116)	.163, .153, .130, (.149)	.158, .148, .140, (.149)
.103, .108, .105, (.105)	.090, .089, .103, (.094)	.156, .092, .123, (.124)
Lot average = .123	**.127**	**.143**

Specification 711-4.2 Thickness: Initial/Recapped Stripes: 0.10 to 0.15 inch measured above the pavement surface.

Thermoplastic Thickness

Begin			Begin (Avg)	Middle			Middle (Avg)	End			End (Avg)	LOT (Avg)
48	0.155	0.149	0.151	0.093	0.103	0.096	0.097	0.120	0.130	0.140	0.130	0.126
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000
			0.000				0.000				0.000	0.000

Attachment 31-B