PUTNAM COUNTY

INVITATION-TO-BID

FY 16 LMIG

"RESURFACING AND RECONSTRUCTION PROGRAM"

ADDENDUM

Addendum #6

Date: April 18th, 2016

Description of Bid Document Change: Replace the "Specifications" in the Invitation-To-Bid package, Issuance Date of March 28th, 2016, with the following revised "Specifications":

SPECIFICATIONS

Unless otherwise noted, all work associated with this contract shall meet the Georgia DOT standard specifications for construction materials, methods and procedures not specifically listed in this solicitation.

The following are special provisions prepared specifically for this contract and may be in conflict with parts of the standard specifications. If conflicts are evident the special provisions shall take precedence over the standard specifications.

PROSECUTION AND PROGRESS

The County desires to have all work completed no later than August 1st, 2016. Please indicate on the Bid Sheet your projected response time and calendar days to complete the project. This information will be considered when awarding this contract.

Construction shall begin no later than 10 calendar days following the Notice to Proceed. The Contractor will mobilize with sufficient forces such that all construction identified as part of this contract shall be substantially completed within the calendar days indicated on the Bid Schedule. Inclement weather days will not count against the available calendar days.

Normal workday for this project shall be 9:00 am to 4:00 pm and the normal work week shall be Monday through Friday. The County will consider extended workdays or workweeks upon written request by the Contractor on a case by case basis. No work will be allowed on County recognized holidays including Memorial Day.

The work will require bidder to provide all labor, administrative forces, equipment, materials and other incidental items to complete all required work. The County shall perform a Final Inspection upon completion of all work. The Contractor will be allowed to participate in the Final Inspection. All repairs shall be completed by the Contractor at his expense prior to issuance of Final Acceptance. 10% retainage will be held from the total amount due the Contractor until Final Acceptance of work is issued by the County.

The Contractor shall provide all materials, labor, and equipment necessary to perform the work without delay unto completion.

PERMITS AND LICENSES

The Contractor shall procure all permits and licenses, pay all charges, taxes and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work.

QC/QA TESTING OF MATERIALS

The Contractor will be responsible for all quality control testing (sampling and testing)

of materials incorporated into the project. All materials and workmanship shall meet appropriate GDOT specifications. Materials quality control testing types will meet GDOT specifications. This includes extraction testing (for AC % and gradation), in-field density testing and test roll patterns on each resurfaced road.
Contractor shall secure the services of a GDOT qualified materials testing firm to perform all required tests. Test results shall be provided to the County promptly as the work progresses. If field densities are not satisfied, the contractor will be required to perform densities on core samples in the lab and compare to the field densities. All material testing work shall be considered incidental to the rest of the work and no separate payment will be made.

Contractor will be responsible for replacing any work performed with material from rejected sample lot at no cost to the County.

DEVIATION OF QUANTITIES

The quantities given are estimates only and will vary from those indicated. Payment will be made based on actual quantities of work completed and accepted. The County reserves the right to add or delete quantities at any time. Contractor will notify the County in writing if additional items are identified or quantities of contract items will exceed plan. At no time will contractor proceed with work outside the prescribed scope of services for which additional payment will be requested without the written authorization of the County.

UTILITIES

Contractor shall be responsible for coordinating any utility relocation necessary to the completion of the work.

GENERAL CONSTRUCTION GUIDELINES

1. The Prime Contractor shall be required to perform 100% of the actual resurfacing paving work included in the Schedule of Items and will not be allowed to sublet this item. Subletting of the additional items such as patching, milling, structure adjustment, crack filling, etc., is permitted by Putnam County. All work shall be in accordance with Section 108.01 of the Standard Specifications of the Georgia Department of Transportation.

2. The contractor shall be required to give 24 hour notice to the Owner's Representative before proceeding with paving on any road.

3. The contractor shall be required to email a work schedule every Friday before 5pm during the course of the resurfacing contract to the Owner's Representative. This paving schedule shall outline the anticipated work activities planned for the following week and locations in which this work will take place.

4. Prior to beginning the patching work (or paving work if there is no patching), the Contractor shall install the appropriate post-mounted road construction signs on each non-residential road they are resurfacing. These signs will remain in place until approved for removal by the

Owner's Representative.

5. Control and testing of materials will be the contractors' responsibility for all mix provided in accordance with sections 106, 400, 402 and related special provisions of the Georgia Department of Transportation Standard Specifications. The cost of such testing shall be included in the unit price of the material being used, and no additional compensation will be made.

6. All driveways and intersections shall be tied-in with surface mix at the time of paving for a sufficient distance to provide a smooth transition from the new pavement to the existing surface. Unless approved by the Owner's Representative, all intersections will be pulled back a minimum of a spreader length (12'). The tied-in area shall be cleaned and tacked prior to paving, and the material placed and compacted in such a manner to eliminate edge raveling.

7. Putnam County does not commit to furnishing full-time inspection or testing of the work in progress or at material sources. Lack of inspection and/or testing by the County will in no way relieve the Contractor of his responsibility to provide quality workmanship in accordance with the Specifications.

8. The contractor shall furnish, install, maintain and remove all necessary traffic signs, barricades, lights, signals, cones and other traffic control devices, and all flagging and other means of traffic protection and guidance as required by the Standard Specifications of the Georgia Department of Transportation. Such work shall be considered incidental to the overall contract, and no additional compensation will be made.

9. On roads without curb and gutter, the contractor shall be required to knock down any windrows created by the clipping operation. This work shall be done following resurfacing, at such time that the mix has sufficiently cured to prevent damage by no later than 15 days after resurfacing takes place except as otherwise noted in the Bid Specifications and/or Special Provisions. Such work shall be incidental to the cost of the resurfacing work being performed and no additional payment shall be made. Shoulder preparation details to be discussed in the subsequent section.
10. Contractor shall provide "construction notices" to those residences whose property fronts the proposed work. These notices shall be approved by the owner being being delivered. Notices must be provided a minimum of 48 hours before work commences.
11. The contractor will be required to re-establish the traffic striping in accordance with the details in the special provisions. All personnel and equipment required for maintaining temporary traffic control, public convenience and safety will not be paid for separately and shall be incidental to other pay items.

GRADING- SHOULDER ADJUST TO-GRADE AFTER RESURFACING

1. After asphalt has sufficiently cured to prevent damage, but not to exceed 15 working days, the contractor shall re-grade the shoulder area along the road edge of sufficient width to dress to the pavement edge and flush with the new pavement surface. The shoulder reconstruction is required due to clipping of the roadway edges prior to resurfacing. The contractor shall then place "Select Material" in sufficient quantity to supplement the existing "clipped" soil material. Contractor will be required to provide this material, from off-site and haul it to the

job site with all associated costs included in the bid unit price for "Grade; Shoulder Adjust to Grade". Clipping shall be minimized to limit shoulder grading as directed by Owner's Representative.

2. Materials shall then be thoroughly incorporated into the existing shoulder. Any material which could interfere with mixing, planting and maintaining will be considered unsuitable and must be removed by the Contractor.

3. Contractor shall then use the material to construct a shoulder which is level with the new pavement for a maximum distance of three (3) feet from the edge of pavement, and then tapered down to the existing ground line.

4. The Contractor will be responsible for the relocation of any mailboxes except permanent structures such as brick which are affected by the shoulder reconstruction work.

5. The shoulder stabilization materials shall be stabilized sufficiently to allow penetration and growth of the hydro-seeding.

6. Loose asphalt, as well as any stone material, larger than 3 inches in diameter will be picked up and hauled off by the contractor. Pieces of woody debris or other deleterious material that will hinder shoulder reworking shall be removed.

7. All constructed areas shall then be hydro seeded with seed, fertilizer and Wood Fiber Mulch, in accordance with Section 700; and maintained by the Contractor until sufficient permanent growth cover is established, including regrading and reseeding, if necessary, at no additional cost to Putnam County. In particular areas subject to high volumes of water runoff, the contractor will, when directed by the Owner's Representative, install erosion control netting, to help establish vegetation. Cost of this material and its installation shall be incidental to shoulder reconstruction, with no additional compensation paid.

8. In addition to the above shoulder construction, mailboxes that are set back sufficiently to allow construction, asphaltic concrete Mailbox Turnouts shall be constructed to allow for ease of mailbox carrier access and as directed by the Owner's Representative. Grading and preparation of mailbox turnout areas will be considered incidental to the overall contract, and no additional compensation will be made for this work.

9. All above work will be paid for as Grading; Shoulder Adjust to Grade -Per Lane Mile, per GDOT section 201-0200, and shall include, but not be limited to; all labor, materials and equipment required for preparation and dressing of all areas, removing and resetting affected mailboxes, hauling additional or removing excess material, grading and rolling shoulders, hydro seeding, erosion control, required traffic control and necessary maintenance to insure sufficient grass cover. This pay item will be measured in <u>linear miles per side of road.</u>

10. Adequate quality and quantity of soil exists, at no charge to the contractor, for shoulder rehabilitation. Soil is located on Reids Rd at the Morgan County line)

All cleanup and landscape restoration activities in a residential neighborhood (Whitney Street) <u>will</u> be completed within three (3) calendar days after resurfacing takes place. If not completed within 3 calendar days,

all work in the contract will stop until this cleanup occurs.

MILL ASPHALT CONCRETE PAVEMENT

1. This work shall consist of milling and removing existing asphaltic concrete pavement prior to resurfacing, at locations designated by the Owner's Representative, primarily to remove various types of pavement distress before resurfacing occurs.

2. All work shall be performed in accordance with the Georgia Department of Transportation Standard Specifications, Section 432, with the exception of the required lighting system for night work, and other exceptions noted herein.

3. The County will provide the contractor with a list of roads to mill, and will pre-mark the areas of removal.

4. The contractor will give the County a minimum of 24 hour notice before proceeding on milling a particular road.

5. Areas to be milled will be specified by the Owner's Representative but generally 4-8 feet in width and between 1 1/2" and 3" in depth with variable lengths. The depth of milling is dependent on the magnitude of pavement distress. The Owner's Representative will identify pre-mark areas for milling and depth of milled pavement as milling occurs. If the contractor is required by the Owner's Representative to make two milling passes on a specific road, in order to facilitate smooth traffic flow, total payment will be based on 1.5 times the number of square yards in a single pass. However, **no** additional payment will be made on roads where the contractor chooses to make two or more passes for equipment, productivity or other reasons.

6. After milling is completed, all loose and flaking masses of asphalt shall be removed.

7. The removal and disposal of the milled material will be the responsibility of the contractor and done to the satisfaction of the Owner's Representative and his time allowances.

8. The contractor shall prepare and pave the milled areas with the specified mix, as directed by the Owner's Representative. Paving of these milled areas shall occur at the discretion of the Owner's Representative. The contractor shall erect and maintain signs warning of uneven pavement, for the period of time between the milling and paving operations.

9. The above milling work shall be paid for by the square yard of Mill Asphaltic Concrete Pavement; <u>1-2.5 inches</u> or <u>> 2.5 inches</u> and shall include all milling disposal and required traffic control.

9. The cleaning, tacking and paving of the milled area prior to resurfacing will be paid for at the bid unit price per ton for the particular type of asphalt used.

10. The Contractor and County shall measure all work and determine the total pavement area in square yards, to establish the basis of payment for the milling work.

ROADWAY PATCHING

1. Road Patching, as described herein, shall apply to the removal and replacement of failed areas, as indicated by the Owner's Representative, on roads scheduled for resurfacing.

2. The "Road Patching" work is intended to cover the removal and replacement of relatively small failed areas of pavement.

3. The County will provide the Contractor with a list of roads for patching, and pre-mark the areas to be patched.

4. The Contractor will give the County at least 24 hour notice before proceeding on patching a particular road.

5. The required procedures for patching Bituminous Asphaltic Concrete roads shall be as follows:

a) Areas to be patched shall be milled using an approved machine.

b) Material shall normally be removed to a required depth of between 1.0 to 2.5 inches or as directed by the Owner's Representative. Where pavement distress causes more than the required depth to be removed, the additional depth shall be inspected and approved by the Owner's Representative prior to placing the asphalt. Less milling may be allowed, but must be approved by the Owner's Representative prior to placing the asphalt.

c) Where unsuitable material exists below the depth of > 2.5 inches, the contractor will notify the Owner's Representative prior to placing asphalt so a decision can be made as to the method of dealing with the unsuitable material. When directed by the Owner's Representative, the Contractor shall remove the unsuitable material and replace it with full depth asphalt. Pay Item for Full-Depth Asphaltic Concrete placement will be utilized as this situation arises. Full depth represents existing pavement removal to the soil subgrade or as directed by the Owner's Representative.

d) The base and edges of the milled areas shall be tack coated using approved material.

e) Patch material, Bituminous Asphaltic Concrete, shall be compacted using approved equipment. Prior to starting any work, the County shall approve the job mix design.

f) The existing pavement surface shall be cleaned to remove all loose patching related materials, upon completion of the day's work, using suitable equipment.

6. The above patching operations shall be paid for as follows:

a) Bituminous Asphaltic Concrete Roads: Will be paid at the Unit price bid for Asphalt Concrete Patching, 12.5mm, and shall cover all work required; including milling, removal and disposal of all existing material disturbed during the patching operation and any new loose material not incorporated into the patching on the same day; applying tack coat; placing and compacting new material and all required traffic control. For milled areas greater than 2.5 inches, 19 mm asphalt mix to be used or as directed by the Owner's Representative.

ASPHALT-RUBBER CRACK FILL

1 This work shall consist of cleaning and filling cracks in existing asphaltic concrete pavement with rubber asphalt in advance of resurfacing, at locations designated by the Owner's Representative.

2 All work shall be performed in accordance with the Georgia Department of Transportation Standard Specifications-Section 407 for type M crack filling.

3 The County will provide the contractor with a list of roads to crack fill, and pre-mark the areas to be worked.

4 Crack widths greater than or equal to ¼ inch to be filled with asphalt rubber crack filling or as directed by the Owner's Representative

5. The contractor will give the County a minimum of 24 hour notice before proceeding on crack filling a particular road.

6. This process is intended for use on roadways in advance of overlay, on cracks at least 1/4" in width.

7. Payment will be per linear feet. Payment shall include cleaning and filling of the cracks, as well as required traffic control and other items incidental to the crack-filling operation.

8. If necessary to prevent the Asphalt-Rubber Fill from being picked up; clean, dry sand shall be spread by hand or mechanically over the filled areas. Sand shall only be applied to those areas that are tacky, and the amount shall be the least needed to prevent picking up. No extra payment for this work or material will be made.

HOT MIX RECYCLED ASPHALTIC CONCRETE

1. All work shall be performed in accordance with the Georgia Department of Transportation Standard Specifications-Section 402

2. The work performed and materials furnished, as prescribed by these specifications, will be paid for at Contract Unit Price per ton for the type of mix being placed. This payment shall be full compensation for providing all materials, hauling and necessary crushing, processing, placing, rolling, and finishing of the recycled mixture, and labor, tools, equipment, and incidentals necessary to complete the work. Any milling of existing asphaltic concrete pavements required by the County, prior to placement of the asphaltic concrete will be performed as per the Specifications for Mill Asphaltic Concrete Pavement, and paid for at the unit price for that item.

3. Topping shall be tapered/feathered so as to tie into existing asphalt driveways with the best possible ride and aesthetic result. Tie-ins shall be marked on the ground and approved by the County prior to paving. Where driveways are stone, tie-into driveway shall provide a smooth transition to the paved roadway but no less than 5 feet in travel length and across the entire width of the driveway.

4. On driveways with concrete or textured/stamped surface, the roadway paved surface shall match the driveway surface elevation. Asphalt encroachment onto the driveway must be avoided.

5. The Contractor shall be responsible to repair any damage to driveways caused by the Contractor's operations at no additional cost to the County.

6. The Contractor is to maintain the existing roadway cross slopes, grades and super-elevations on each roadway unless otherwise directed by the Owner's Representative.

7. To minimize potential for pavement-edge drop-off conditions, the contractor will be required to install a 30- to 35-degree tapered asphalt wedge or fillet (aka safety edge). This asphalt edge/fillet will be constructed along each side of the roadway during resurfacing where drop-off exceeds 2 inches (**note**: the wedge is a modified strike-off bolted onto the screed end gate where the shoe of the end gate rides on the pavement shoulder and moves freely vertically, allowing it to adjust to height changes with a rounded leading edge that produces a smooth appearance). See diagram in the bid package for diagram of edge fillet.

BITUMINOUS TACK COAT

1. This work shall consist of the placement of bituminous tack on all areas that are milled, resurfaced and the vertical surfaces of patch areas.
2. The cost of bituminous tack shall be included in the cost of asphalt. Bituminous tack is not measured as a separate pay item.
3. NTSS-1HM trackless tack or equivalent shall be used.
4. All surfaces shall be cleaned completely and thoroughly before any tack is applied. Tack shall not be applied when the pavement is wet. Bituminous tack coat shall be applied between .05 to 0.1 gallons per square yard.

PAVEMENT MIX DESIGN

1. The plant mix materials from which the asphaltic pavement is manufactured and the plant at which it is manufactured shall meet the requirements of the State of Georgia Department of Transportation (GDOT), Standard specifications, Articles 820; 802; 883; 831; 828; and 882.

2. Load tickets that meet Georgia Department of Transportation Specifications must accompany all delivered materials. The Contractor must supply copies of all asphalt tickets to the County on a daily basis. The JMF's shall be provided to the Owner's Representative for approval a minimum of three (3) days before resurfacing occurs.

EXPANDED (FOAMED) ASPHALT STABILIZED BASE COURSE

DESCRIPTION: This work shall consist of pulverizing 100% of the existing asphalt, asphalt surface treatments, RAP or any combination of the above, through the full depth reclamation process, stabilizing the pulverized pavement section through injection/mixing of expanded (foam) asphalt cement and compacting this chemically treated material to form a new stabilized pavement base course in accordance with the specifications as outlined in this bid package. The work will be performed with reasonably close conformity with the lines, grades and typical cross sections shown on the Plans or established by the Owner's Representative. All of the provisions of Section 300 apply to this Item. Work scope project limits are as follows: Harmony Rd from 951 Harmony Rd to Lake Man & a portion of Godfrey Rd as directed by the Owner's Representative.

MATERIALS: The materials to be used and the Specifications for them are listed below:
Asphalt Cement Grade PG 67-22…… 820.01
(Asphalt Cement shall not contain silicone)

NOTE: The physical and material properties of the existing asphaltic concrete roadway pavement section will differ depending based on the age and asphalt composition of the various asphalt courses. However, all pulverized material shall be thoroughly ground and pre-pulverized prior to addition of expanded asphalt cement, conform to the specifications in their respective areas of Section 800 and have a maximum of 5 percent retained on the 1½-inch sieve size. Compaction and mix water shall be free from deleterious substances and can be acquired from a hydrant, stream or lake. EQUIPMENT: All equipment necessary for the proper construction of the expanded asphalt base course shall be on the Project and in satisfactory condition before construction will be permitted to begin. Under no circumstances will the contractor have less than the following minimum pieces of equipment for the expanded asphalt base construction:

- An AC injecting pulverizer shall be a CMI RS 650 or approved equivalent with a minimum 8 ft. cutting width, 650 HP spray bar with nozzles capable of being shut off in 12" increments and a computer controlled microprocessor that accurately measures the amount of additives in relation to the travel speed of the machine and mass of material involved. The microprocessor shall display the rate of application of the AC, travel speed of the

reclaimer, depth sensors, flow rates of the AC, as well as a totalizer that provides total volume of the additive(s) as well as distance traveled by machine. Spreading of water, lime or cement on the road surface ahead of the machine, will be allowed at the request of the Owner's Representative. No asphalt cement shall be sprayed ahead in this manner.

- Motor graders must be of a sufficient horsepower to handle a windrow of the expanded asphalt material and its respective grading.

- At minimum, the contractor shall supply a 25 ton pneumatic roller (also sheepsfoot when mat is > 6" in depth) and a 10 ton smooth drum roller. The mix must be compacted on a minimum of 96 percent of a laboratory specimen prepared in accordance with AASHTO T-245 (75 blows) (Modified Marshall Expanded Asphalt Mix design method).

- A water truck having not less than 2000 gallon capacity will be on site at all times to provide compaction water and to maintain moist curing and handling conditions.

- Where deemed necessary by the Owner's Representative, a pilot vehicle and flag persons shall be employed to control the flow of traffic and to provide adequate worker protection on the construction site.

CONSTRUCTION

A. METHODS

This Specification is based on the traveling mix method, and plow and harrow mixing will not be permitted. The Owner's Representative will determine whether the materials in the roadbed are suitable for use, and all materials must be approved before mixing by means of proper asphalt mix design. Supplementary aggregate and/or RAP can be added if required for widening or strengthening the expanded asphalt mat if mix design permits. Materials in the roadbed shall be used without additional measurement for payment, except the payment per square yard provided herein.

B. TEMPERATURE LIMITATIONS

While pre- pulverizing may be performed at any temperature, the expanded asphalt mixing shall not occur until in-situ base temperatures are at least 46° F (8° C) and rising. Air temperature shall be 41° F (5° C) and rising including adjustments for wind-chill.

C. PROCESSING IN-PLACE MIXING

1. Supplementary Materials: Any additional materials as specified shall be placed on the roadbed and spread uniformly to the proper width and depth to obtain the specified thickness of the finished base. No base material shall be placed on muddy or frozen sub base.

2. Pulverization: The materials in the roadbed shall be pulverized for the width and depth of them material to be stabilized, but this work shall be done without disturbing or damaging the underlying subgrade. During pulverization, water may be added if necessary to assist in the process. All roots, sod and rock more than 3 inches in diameter, and all other harmful products shall be removed.

3. Moisture Content: The moisture content of the pulverized base material shall be adjusted under the direction of the Owner's Representative. The final control moisture content will be that content which produces a uniformly blended expanded asphalt mixture with the proper amount of Total Fluids Level as per the expanded asphalt mix design. The Contractor will maintain the proper control moisture by aeration or addition of water as necessary prior to stabilization. No separate payment will be made for adding water nor for aerating or rolling for this purpose.

4. Application of Bituminous Material: After the roadbed material has been pre-pulverized, compacted and shaped to the required slope, the pulverizer shall proceed with the injection and remixing of the base course with the expanded asphalt cement. The temperature of the bituminous material shall be no less than 300°F at the intake hose of the pulverizer. The bituminous material shall be blended with a controlled amount of water in the expanded asphalt chamber prior to injection into the pre-pulverized roadbed. This amount of water normally will be a ratio of approximately 2 percent water as a percent by weight of bitumen. The design Asphalt Cement content shall be expressed in terms of the total asphalt cement content of the mixture based on the total mixture including existing aged binder and the new Expanded Asphalt cement. Minor field modifications of the expanded asphalt mix design may be performed by the Contractor if deemed necessary by the Owner's Representative on site. All bitumen and water supply will be controlled and monitored by the onboard microprocessor of the pulverizer.

5. Mixing: Mixing shall be carried on in successive sections so that the roadway can be compacted for its full lane width in one uniform operation. Mixing shall continue until a homogenous and uniform mixture is produced.

E. QUANTITY OF BITUMINOUS MATERIAL

The quantity of bituminous material required will be determined by the Owner's Representative based on the expanded asphalt mix design and measurement of roadbed to be treated. Variations of 5 percent or less in total bitumen used will be accepted to make up for differences of in-situ asphalt cement content. If deemed necessary by the Owner's Representative, a section of roadbed may be retreated with 1 percent bitumen, reshaped and re-compacted the following day after original treatment. The cost of this re-treatment shall be borne by the Contractor as a part of this Pay Item.

F. EXTENT OF APPLICATION

The extent of the application of bituminous material shall be so regulated that a full tanker load of liquid is used for a complete and finished selection of roadway where possible. Compaction and grading must follow after second subsequent pass of expanded asphalt injection has been completed.

G. PLACING

1. Preparing Mixture for Compaction: After expanded asphalt material has been uniformly clipped and windrowed by motor grader, it can be laid down and shaped to the pre-determined proper line, grade and cross section.

2. Aeration: Aeration may be allowed if satisfactory compaction of the expanded asphalt base cannot be obtained due to the moisture content of the mixture at the time of compaction. This work shall consist of loosening and turning the mixture with the motor grader, pulverizer or other equivalent equipment until the moisture content is reduced to a level that does not impede the compactive effort.

3. Thickness of Course: The full depth of base specified shall be stabilized in one pass of the mixing equipment up to a maximum of 6 inches in depth. Based on core results, existing asphalt depth ranges from 3.5 to 6.5 inches. No stone base exists within the pavement section.

H. COMPACTION AND FINISHING

1. Compaction shall begin immediately after mixing with the 25 ton traffic roller. The base shall be brought to line, grade and cross fall and rolled until the full thickness of the course has been compacted to a minimum of 96 percent of the laboratory compacted density as noted in the laboratory prepared mix design. Once the expanded asphalt base has been compacted to final grades with rubber tire traffic roller, the surface shall be compacted with a steel wheel roller, beginning at the edges and working towards the center, until the surface is smooth, closely knit, and free from cracks, conforming to the proper line, grade, and typical section, within the limits specified. Defects, if there are any, shall be corrected as specified in 300.04. At all places not accessible to the roller, the required compaction shall be secured by means of mechanical tampers approved by the Owner's Representative. The same density requirements as stated above apply. A prime coat is not required with expanded asphalt base stabilization.

2. Tests:
a. Pre-Testing and Mix Design: Prior to commencing the work, the Contractor shall engage an AASHTO certified (AMRL) laboratory familiar with the expanded asphalt process who has a proper laboratory foaming apparatus (Wirtgen WBL-10 or JEGEL proprietary apparatus or equivalent). This laboratory shall obtain representative samples of the material that will be produced during the reclamation operation to carry out the necessary testing to establish the proper "Mix Design" for the expanded asphalt. These tests shall include at least one sample per lane mile randomly spaced of the following:

- Site investigation
    - Existing pavement core samples and testing
    - Gradation and sieve analysis of the asphalt cement
    - In-situ asphalt cement % content and penetration
    - Propose new asphalt cement expansion testing and "Job Mix Design"
    - Marshall Stability

At least one sample for each expanded asphalt contract shall include the following tests:

- Wet and Dry Tensile Strength in accordance with ASTM 4867
- Tensile Strength Ratio (TSR minimum 50%)

b. Filed and Laboratory Testing Requirements During Construction: The Contractor shall engage the services of a certified testing consultant and laboratory that are familiar with the expanded foam asphalt process and in the testing of the material being placed or constructed. The testing technician shall be on-site throughout the entire foaming and compaction operations to ensure the foamed asphalt base conforms to the mix Design established for the project.

The cost of the testing consultant shall not be paid for separately, but shall be paid for as part of the unit price for EXPANDED FOAM ASPHALT BASE.

The testing subcontractor shall have a minimum of 2 years of experience in the State of Georgia and participates in the AASHTO Materials Reference Laboratory (AMRL) program relating to performing the following tests:

1. Technician shall perform field moisture testing using a propane oven on the mixed material after the initial mixing pass has been made (prior to asphalt injection). Determination of the field moisture content of the mixed material shall be performed by the direct heating method in accordance with ASTM D4959 (modified by drying the material to a constant weight using a temperature no greater than 50 degrees C) using a Coleman type propane oven instead of directly heating the sample on the stove eye. Technician shall compare in-situ moisture to the design moisture and inform the Contractor as to the need and extent of moisture adjustments required.

2. Technician shall collect sample(s) of the before injected mixture from the locations where the original samples were collected (approx. 5 lbs. at each sampling location) and seal to prevent moisture loss in approved containers (lidded five gallon buckets). Deliver the sample(s) to the approved laboratory for blending and performing in-situ moisture content in accordance with ASTM D2216, with the material dried to a constant weight using a temperature no greater than 50 degrees C and asphalt binder content determination in accordance with AASHTO T 308.

3. Technician shall collect sample(s) of the after injected mixture (approx. 5 lbs. at each original sampling location) and seal to prevent moisture loss in approve containers (lidded 5 gallon buckets). Deliver the sample(s) to the laboratory for blending and performing moisture content determination in accordance with ASTM D2216, with the material dried to a constant weight using a temperature no greater than 50 degrees C, gradation determination in accordance with ASTM C136, with the material dried to a content determination in accordance with AASHTO T308 and stability testing of the samples utilizing the procedures for briquette preparation specified in AASHTO T245 shall be performed, with the material preheated to 60 degrees C prior to compaction. After the briquettes are prepared and cured

they shall be tested for Wet and Dry Tensile Strength in accordance with ASTM D4867/D4867M and the Tensile Strength Ratio determined.

4. The laboratory tests performed on the "Before" and "After" samples will provide the results of the in-situ moisture, net Asphalt Cement (AC) percent (Foamed Asphalt Cement), mixture gradation, air voids and Tensile Strength Ration of the foamed base. These results shall be submitted to the Owner's Representative for Quality Assurance purposes.

5. The Technician shall be responsible during construction to determine that the Mix Design application rates for the asphalt cement, Lime and Portland cement, as required, are met and that the design base thickness is obtained throughout the project limits.

6. Once the mixture has been injected with asphalt cement, establish a roller pattern using a nuclear gauge. The procedure used to establish the roller pattern shall be identical to the procedure used to establish the rolling pattern for granular material in accordance with GDOT SSCTS 310, except that a rubber tired roller shall be used last to compact the top one inch of material. Vibrator roller settings shall be high amplitude/low frequency first, then low amplitude/high frequency second and rubber tired rolling last. Monitor pattern periodically throughout the compaction process and change pattern if required.

7. For the compaction testing phase of the foamed asphalt base the technician shall attempt to establish a correlation factor for the nuclear gauge to be used for field density and moisture content determinations in accordance with ASTM D2922, on the compacted foamed base mixture by comparing the nuclear gauge results with those determined through the use of the Sand Cone Test Method performed in accordance with ASTM D1556. If the technician is unable to establish a reliable correlation factor, determine dry density compaction using only the Sand Cone Method. A minimum of five (5) density tests/day shall be performed within the project limits. If a nuclear gauge is utilized to perform the compacted density verifications, it must be correlated daily and every fifth test by performing a Sand Cone Method density test.

8. The minimum compaction standard for the foamed base course shall be 96% of the laboratory Marshall density as determined in accordance with AASHTO T-245 (75 blows) or 98% of the field dry density of a one point Modified Proctor check plug prepared in the field in accordance with the requirements of ASTM D1557. The in-situ base material must be within 3% of the Mix Design optimum moisture content prior to performing the testing.

   a. Finished Surface: It shall be the contractor's responsibility to conduct his operations in such a manner that the finished grade lines and cross sectional profile meet the job specifications as directed by the Owner's Representative.

b. Job Samples: Job samples of expanded asphalt treatment shall be taken by the Contractor and be laboratory tested for Total Asphalt Cement Content, Aggregate Gradation, Compacted Bulk Density and TSR.

I. PRESERVATION OF BASE & TRAFFIC USE

The Contractor shall maintain the expanded asphalt base in a smooth and acceptable condition until it is covered by other construction. The repairs specified in 300.04.I. Shall be made whenever defects appear. The preservation of the base here does not relieve the Contractor of his general duty to maintain The Work until it is accepted, as specified in Section 105, Control the Work.

At the end of each work day, the expended asphalt base course shall be available for the public to utilize. No traffic detours will be permitted. Access must be provided onto Harmony Rd at each driveway location during work tasks.

J. THICKNESS TOLERANCES

Depth: The depth of the expanded asphalt base project will be set out by the Owner's Representative prior to commencement of construction. To check that the automatic sensor system on the pulverizer is functioning correctly, the actual depth of cut shall be physically measured at both ends of the pulverizing drum at least once every 500 feet along the cut length.

FULL DEPTH RECLAMATION

Description: The full depth reclamation process consists of in-place pulverizing of the existing asphaltic pavement in combination with graded aggregate base that is imported to the project site. This combined pulverized matter is blended and graded and re-laid to construct a new base. Work scope project limits are as follows: Harmony Rd from 951 Harmony Rd to Lake Man & a portion of Godfrey Rd as directed by the Owner's Representative.

Construction

(1) Pulverize the full depth of the existing asphaltic pavement until 97 percent or more will pass the 2-inch sieve. Mix the pulverized existing asphalt with imported graded base (no existing stone bade exists on any road in this project) to soil subgrade. Care to be taken to minimize the contamination of the blended asphaltic base and imported base course with soil. Windrow material as construction operations dictate.

(2) Immediately after pulverizing, relay the material with a motor grader

(3) Match the lines, grades, and cross slopes with the existing road geometrics. On Godfrey Rd, up to a maximum of 4 inches of imported graded aggregate base may be added. Asphalt transitions to all asphalt and unpaved driveways abutting the reconstructed road will required. For existing concrete driveways, concrete (4000 PSI with fiber mesh) shall be used as the transition material.

(4) Payment will be made under Bid Item - 9.5 mm Recycled Asphaltic Concrete Resurfacing for asphalt transitions to existing asphalt or unpaved driveways. The

cost for concrete transitions will be included in the bid price for reclamation – per SY

(5) The total depth of pulverized and compacted matter shall be no more than six (6) inches. Some milled material may need to be hauled off-site.

(6) Immediately after relaying, compact the re-laid material first with either a rubber tired roller and second with a vibratory steel roller. Add water, as required, both before and during compaction. Compact each layer to the extent required to achieve min. of 90% of the Standard Proctor. Achieving this compaction may require a greater percentage of GAB than pulverized asphalt millings in the blended matter. Proofrolling with a loaded tandem will be allowable on a case-by-case basis by the Owner's Representative to assess reclaimed base density suitability

(7) At the end of each work day, no longitudinal elevation differences between adjacent lanes due to reclamation will be permitted. This may necessitate full depth reclamation of both lanes so that no longitudinal elevation changes exist at the end of each work day.

(8) Repair surface damage caused by intervening construction or public traffic immediately before paving as necessary to provide a good riding pavement.

(10) Appropriate signage warning the traveling public during reclamation process of the transition from paved surface to reclaimed material shall be placed on the project.

(11) The roadway elevation between the newly reclaimed/resurfaced roadway section and the resurfacing of the existing pavement may require a suitable asphalt transition to be determined in consultation between the Owner's Representative and the Contractor.

Measurement

(1) The County will measure Pulverize and Relay by the square yard acceptably completed, measured using the centerline length and the width from outside to outside of completed base, but limited to the width of the existing roadway section.

Payment

(1) Full Depth reclamation Payment is full compensation for pulverizing, windrowing, relaying, furnishing and adding water, shaping, dust control and compacting. Cost of haul-off of excess pulverized materials to be included in the bid price for reclamation – per SY.

TRAFFIC STRIPING:

1. This work shall consist of placement of "Paint" with Thermoplastic Pavement Markings as an "Add Alternate".

2. This work shall consist of the re-establishment of the existing roadway markings upon completion of the street/road resurfacing at locations designated by the Owner's Representative.

3. All work shall be performed in accordance with the Georgia Department of Transportation Standard Specification section 652 except measurement and payment.

4. The Contractor shall notify the County 24 hours before proceeding with the striping work.

5. The Contractor shall place the striping upon completion of the streets/roads resurfacing and in no case later than 3 days afterward when "Paint" is utilized or 7 days afterward if "Thermoplastic" striping is applied. Interim markings consisting of temporary tape will be required until which time permanent striping occurs. No pay item will be established for temporary tape.

5. Traffic striping is required for only those streets that have existing roadway markings, replacing the "long line" markings consisting of centerlines, edge lines and skip lane lines, special markings such as RR Crossing markings and stop bars.

6. Traffic striping work shall follow the existing striping configuration unless directed otherwise by the Owner's Representative.

7. Re-establish existing stop bars at all resurfaced intersections and side roads.

8. Thermoplastic striping shall meet the former GDOT specifications and **not** the "high build" material

CLEANUP

All restoration and clean-up work shall be performed daily. Operations shall be suspended if the Contractor fails to accomplish restoration and clean-up within an acceptable period of time. Asphalt and other debris shall be removed from gutters, yards, driveways, etc. Failure to perform clean-up activities may result in suspension of the work. **All cleanup activities in the residential neighborhood (Whitney Street) will be completed within three (3) calendar days after the resurfacing is completed. If not completed within 3 calendar days, all work in the contract will stop until this cleanup occurs.**