

# CITY OF NAPLES, FLORIDA

## AGREEMENT (PROFESSIONAL SERVICES)

**Bid/Proposal No. RFP 009-12**

**Contract No.** \_\_\_\_\_

**Project Name Pavement Maintenance Striping and Repair Services**

THIS AGREEMENT (the "Agreement") is made and entered into this 7th day of March 2012, by and between the City of Naples, a Florida municipal corporation, (the "CITY") and **C.W Roberts Contracting, Inc. a Florida corporation located at 13350 Rickenbacker Parkway, Fort Myers, Florida 33913.**

### WITNESSETH:

WHEREAS, the CITY desires to obtain the services of the CONTRACTOR concerning certain services specified in this Agreement (referred to as the "Project"); and

WHEREAS, the CONTRACTOR has submitted a proposal for provision of those services; and

WHEREAS, the CONTRACTOR represents that it has expertise in the type of professional services that will be required for the Project.

NOW, THEREFORE, in consideration of the mutual covenants and provisions contained herein, the parties hereto agree as follows:

### ARTICLE ONE CONTRACTOR'S RESPONSIBILITY

1.1. The Services to be performed by CONTRACTOR are generally described as **professional contracting services for pavement maintenance striping and repair services**, and may be more fully described in the Scope of Services attached as Exhibit A and made a part of this Agreement.

1.1.1 All Services to be performed by CONSULTANT pursuant to this Agreement shall be in conformance with the scope of services, which shall be described in a Work Order issued pursuant to the procedures described herein. The form of the Work Order is set forth in attached Schedule A. Reference to the term "Work Order" herein, with respect to authorization of Services, includes all written Amendments or Change Orders to any particular Work Order. CONSULTANT acknowledges and agrees that each individual Work Order shall not exceed the current amount allowable in accordance with Florida Statute 287.055.

1.1.2 All Services must be authorized in writing by OWNER in the form of a Work Order (EXHIBIT E). CONSULTANT shall not provide any Services to OWNER unless and to the extent they are required in a written Work Order. Any Services provided by CONSULTANT without a written Work Order shall be at CONSULTANT'S own risk and OWNER shall have no liability for such Services.

1.1.3 As OWNER identifies certain Services it wishes CONSULTANT to provide pursuant to the terms of this Agreement, OWNER shall request a proposal from CONSULTANT for such Services, said proposal to be in

compliance with the terms of this Agreement. If the parties reach an agreement with respect to such Services, including, but not limited to the scope, compensation and schedule for performance of those Services, a Work Order shall be prepared which incorporates the terms of the understanding reached by the parties with respect to such Services and if both parties are in agreement therewith, they shall jointly execute the Work Order.

1.1.4 Upon execution of a Work Order as aforesaid, CONSULTANT agrees to promptly provide the Services required thereby, in accordance with the terms of this Agreement and the subject Work Order.

1.1.5 It is mutually understood and agreed that the nature, amount and frequency of the Services shall be determined solely by OWNER and that OWNER does not represent or guarantee unto CONSULTANT that any specific amount of Services will be requested or required of CONSULTANT pursuant to this Agreement.

1.1.6 CONSULTANT shall have no authority to act as the agent of OWNER under this Agreement or any Work Order, or to obligate OWNER in any manner or way.

1.1.7 All duly executed Work Orders (including all written Amendments or Change Orders thereto) are hereby incorporated into and made a part of this Agreement by reference.

1.2. The CONTRACTOR agrees to obtain and maintain throughout the period of this Agreement all such licenses as are required to do business in the State of Florida, the City of Naples, and in Collier County, Florida, including, but not limited to, all licenses required by the respective state boards and other governmental agencies responsible for regulating and licensing the professional services to be provided and performed by the CONTRACTOR pursuant to this Agreement.

1.3. The CONTRACTOR agrees that, when the services to be provided hereunder relate to a professional service which, under Florida Statutes, requires a license, certificate of authorization or other form of legal entitlement to practice such services, it shall employ or retain only qualified personnel to provide such services.

1.4. CONTRACTOR agrees to employ and designate, in writing, within 5 calendar days after receiving its Notice to Proceed, or other directive from the CITY, a qualified licensed professional to serve as the CONTRACTOR's project manager (the "Project Manager"). The Project Manager shall be authorized and responsible to act on behalf of the CONTRACTOR with respect to directing, coordinating and administering all aspects of the services to be provided and performed under this Agreement.

1.5. The CONTRACTOR has represented to the CITY that it has expertise in the type of professional services that will be required for the Project. The CONTRACTOR agrees that all services to be provided by CONTRACTOR pursuant to this Agreement shall be subject to the CITY's review and approval and shall be in accordance with the generally accepted standards of professional practice in the State of Florida, as may be applied to the type of services to be rendered, as well as in accordance with all published laws, statutes, ordinances, codes, rules, regulations and requirements of any governmental agencies which regulate or have jurisdiction over the Project or the services to be provided and performed by CONTRACTOR. In the event of any conflicts in these requirements, the CONTRACTOR shall notify the CITY of such conflict and utilize its best professional judgment to advise CITY regarding resolution of the conflict.

1.6. The CONTRACTOR agrees not to divulge, furnish or make available to any third person, firm or organization, without CITY's prior written consent, or unless incident to the proper performance of the CONTRACTOR's obligations hereunder, or in the course of judicial or legislative proceedings where such information has been properly subpoenaed, any non-public information concerning the services to be rendered by CONTRACTOR hereunder, and CONTRACTOR shall require all of its employees, agents, subconsultants and subcontractors to comply with the provisions of this paragraph. However, the CONTRACTOR shall comply with the Florida Public Records laws.

1.7 The CONTRACTOR agrees not to employ or offer to employ any Elected Officer or City Managerial

Employee of the CITY who in any way deals with, coordinates on, or assists with, the professional services provided in this Agreement, for a period of 2 years after termination of all provisions of this Agreement. For purposes of this paragraph, the term "Elected Officer" shall mean any member of the City Council. For purposes of this paragraph, the term "City Managerial Employee" shall mean the City Manager, the Assistant City Manager, the City Clerk, and any City department head or director. If the CONTRACTOR violates the provisions of this paragraph, the CONTRACTOR shall be required to pay damages to the CITY in an amount equal to any and all compensation which is received by the former Elected Officer or City Managerial Employee of the CITY from or on behalf of the contracting person or entity, or an amount equal to the former Elected Officer's or City Managerial Employee's last 2 years of gross compensation from the CITY, whichever is greater.

1.8 The CONTRACTOR agrees not to provide services for compensation to any other party other than the CITY on the same subject matter, same project, or scope of services as set forth in this Agreement without approval from the City Council of the CITY.

1.9 Except as otherwise provided in this Agreement, the CONTRACTOR agrees not to disclose or use any information not available to members of the general public and gained by reason of the CONTRACTOR's contractual relationship with the CITY for the special gain or benefit of the CONTRACTOR or for the special gain or benefit of any other person or entity.

## **ARTICLE TWO CITY'S RESPONSIBILITIES**

2.1. The CITY shall designate in writing a project coordinator to act as the CITY's representative with respect to the services to be rendered under this Agreement (the "Project Coordinator"). The Project Coordinator shall have authority to transmit instructions, receive information, interpret and define the CITY's policies and decisions with respect to the CONTRACTOR's services for the Project. However, the Project Coordinator is not authorized to issue any verbal or written orders or instructions to the CONTRACTOR that would have the effect, or be interpreted to have the effect, of modifying or changing in any way whatever:

- (a) The scope of services to be provided and performed by the CONTRACTOR;
- (b) The time the CONTRACTOR is obligated to commence and complete all such services; or
- (c) The amount of compensation the CITY is obligated or committed to pay the CONTRACTOR.

Any such modifications or changes ((a) (b) or (c)) shall only be made by or upon the authorization of the CITY's city manager as authorized by city council in the enabling legislation or in the CITY's procurement policies.

2.2. The Project Coordinator shall:

- (a) Review and make appropriate recommendations on all requests submitted by the CONTRACTOR for payment for services and work provided and performed in accordance with this Agreement;
- (b) Arrange for access to and make all provisions for the CONTRACTOR to enter the Project site to perform the services to be provided by the CONTRACTOR under this Agreement; and
- (c) Provide notice to the CONTRACTOR of any deficiencies or defects discovered by the CITY with respect to the services to be rendered by the CONTRACTOR hereunder.

2.3. The CONTRACTOR acknowledges that access to the Project Site, to be arranged by the CITY for the CONTRACTOR, may be provided during times that are not the normal business hours of the CONTRACTOR.

## **ARTICLE THREE**

## TIME

3.1. Services to be rendered by the CONTRACTOR shall be commenced subsequent to the execution of this Agreement upon written Notice to Proceed from the CITY for all or any designated portion of the Project and shall be for a **three (3) year period with the option for both the City and Contractor to extend the contract for two (2) additional one (1) year periods.** Time is of the essence with respect to the performance of this Agreement.

3.2. Should the CONTRACTOR be obstructed or delayed in the prosecution or completion of its services as a result of unforeseeable causes beyond the control of the CONTRACTOR, and not due to its own fault or neglect, including but not restricted to acts of God or of public enemy, acts of government or of the CITY, fires, floods, epidemics, quarantine regulations, strikes or lock-outs, then the CONTRACTOR shall notify the CITY in writing within 5 working days after commencement of such delay, stating the cause or causes thereof, or be deemed to have waived any right which the CONTRACTOR may have had to request a time extension.

3.3. No interruption, interference, inefficiency, suspension or delay in the commencement or progress of the CONTRACTOR's services from any cause whatsoever, including those for which the CITY may be responsible in whole or in part, shall relieve the CONTRACTOR of its duty to perform or give rise to any right to damages or additional compensation from the CITY. The CONTRACTOR's sole remedy against the CITY will be the right to seek an extension of time to its schedule. This paragraph shall expressly apply to claims for early completion, as well as claims based on late completion.

3.4. Should the CONTRACTOR fail to commence, provide, perform or complete any of the services to be provided hereunder in a timely and reasonable manner, in addition to any other rights or remedies available to the CITY hereunder, the CITY at its sole discretion and option may withhold any and all payments due and owing to the CONTRACTOR until such time as the CONTRACTOR resumes performance of its obligations hereunder in such a manner so as to reasonably establish to the CITY's satisfaction that the CONTRACTOR's performance is or will shortly be back on schedule.

## ARTICLE FOUR COMPENSATION

4.1. The total compensation to be paid the CONTRACTOR by the CITY for all Services shall not exceed **\$150,000.00 per project assignment** and shall be paid in the manner set forth in the "Basis of Compensation", which is attached as **Exhibit B** and made a part of this Agreement.

## ARTICLE FIVE MAINTENANCE OF RECORDS

5.1. The CONTRACTOR will keep adequate records and supporting documentation which concern or reflect its services hereunder. The records and documentation will be retained by the CONTRACTOR for a minimum of five 5 years from the date of termination of this Agreement or the date the Project is completed, whichever is later. the CITY, or any duly authorized agents or representatives of the CITY, shall have the right to audit, inspect and copy all such records and documentation as often as they deem necessary during the period of this Agreement and during the 5 year period noted above; provided, however, such activity shall be conducted only during normal business hours. If the CONTRACTOR desires to destroy records prior to the minimum period, it shall first obtain permission from the CITY in accordance with the Florida Public Records laws.

## ARTICLE SIX INDEMNIFICATION

6.1. The CONTRACTOR agrees to indemnify and hold harmless the City from liabilities, damages, losses and costs, including, but not limited to, reasonable attorneys' fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the CONTRACTOR and persons employer or utilized by the

CONTRACTOR in the performance of the Contract.

**ARTICLE SEVEN  
INSURANCE**

7.1. CONTRACTOR shall obtain and carry, at all times during its performance under this Agreement, insurance of the types and in the amounts set forth in the document titled General Insurance Requirements, which is attached as Exhibit C and made a part of this Agreement.

**ARTICLE EIGHT  
SERVICES BY CONTRACTOR'S OWN STAFF**

8.1. The services to be performed hereunder shall be performed by the CONTRACTOR's own staff, unless otherwise authorized in writing by the CITY. The employment of, contract with, or use of the services of any other person or firm by the CONTRACTOR, as independent contractor or otherwise, shall be subject to the prior written approval of the CITY. No provision of this Agreement shall, however, be construed as constituting an agreement between the CITY and any such other person or firm. Nor shall anything contained in this Agreement be deemed to give any such party or any third party any claim or right of action against the CITY beyond such as may otherwise exist without regard to this Agreement.

**ARTICLE NINE  
WAIVER OF CLAIMS**

9.1. The CONTRACTOR's acceptance of final payment shall constitute a full waiver of any and all claims, except for insurance company subrogation claims, by it against the CITY arising out of this Agreement or otherwise related to the Project, except those previously made in writing and identified by the CONTRACTOR as unsettled at the time of the final payment. Neither the acceptance of the CONTRACTOR's services nor payment by the CITY shall be deemed to be a waiver of any of the CITY's rights against the CONTRACTOR.

**ARTICLE TEN  
TERMINATION OR SUSPENSION**

10.1. The CONTRACTOR shall be considered in material default of this Agreement and such default will be considered cause for the CITY to terminate this Agreement, in whole or in part, as further set forth in this section, for any of the following reasons: (a) failure to begin work under the Agreement within the times specified under the Notice(s) to Proceed, or (b) failure to properly and timely perform the services to be provided hereunder or as directed by the CITY, or (c) the bankruptcy or insolvency or a general assignment for the benefit of creditors by the CONTRACTOR or by any of the CONTRACTOR's principals, officers or directors, or (d) failure to obey laws, ordinances, regulations or other codes of conduct, or (e) failure to perform or abide by the terms or spirit of this Agreement, or (f) for any other just cause. The CITY may so terminate this Agreement, in whole or in part, by giving the CONTRACTOR at least 3 calendar days' written notice.

10.2. If, after notice of termination of this Agreement as provided for in paragraph 10.1 above, it is determined for any reason that the CONTRACTOR was not in default, or that its default was excusable, or that the CITY otherwise was not entitled to the remedy against the CONTRACTOR provided for in paragraph 10.1, then the notice of termination given pursuant to paragraph 10.1 shall be deemed to be the notice of termination provided for in paragraph 10.3 below and the CONTRACTOR's remedies against the CITY shall be the same as and limited to those afforded the CONTRACTOR under paragraph 10.3 below.

10.3. The CITY shall have the right to terminate this Agreement, in whole or in part, without cause upon 7 calendar day's written notice to the CONTRACTOR. In the event of such termination for convenience, the CONTRACTOR's recovery against the CITY shall be limited to that portion of the fee earned through the date of termination, together with any retainage withheld and any costs reasonably incurred by the CONTRACTOR that are directly attributable to the termination, but the CONTRACTOR shall not be entitled to any other or further recovery

against the CITY, including, but not limited to, anticipated fees or profits on work not required to be performed.

**ARTICLE ELEVEN  
CONFLICT OF INTEREST**

11.1. The CONTRACTOR represents that it presently has no interest and shall acquire no interest, either direct or indirect, which would conflict in any manner with the performance of services required hereunder. The CONTRACTOR further represents that no persons having any such interest shall be employed to perform those services.

**ARTICLE TWELVE  
MODIFICATION**

12.1. No modification or change in this Agreement shall be valid or binding upon the parties unless in writing and executed by the party or parties intended to be bound by it.

**ARTICLE THIRTEEN  
NOTICES AND ADDRESS OF RECORD**

13.1. All notices required or made pursuant to this Agreement to be given by the CONTRACTOR to the CITY shall be in writing and shall be delivered by hand or by United States Postal Service Department, first class mail service, postage prepaid, return receipt requested, addressed to the following CITY's address of record:

**City of Naples  
735 Eighth Street South  
Naples, Florida 34102-3796  
Attention: A. William Moss, City Manager**

13.2. All notices required or made pursuant to this Agreement to be given by the CITY to the CONTRACTOR shall be made in writing and shall be delivered by hand or by the United States Postal Service Department, first class mail service, postage prepaid, return receipt requested, addressed to the following CONTRACTOR's address of record:

**C.W. Roberts Contracting, Inc.  
13350 Rickenbacker Parkway  
Fort Myers, Florida 33913  
Attention: Dennis Breuer, Area Manager**

13.3. Either party may change its address of record by written notice to the other party given in accordance with requirements of this Article.

**ARTICLE FOURTEEN  
MISCELLANEOUS**

14.1. The CONTRACTOR, in representing the CITY, shall promote the best interest of the CITY and assume towards the CITY a duty of the highest trust, confidence, and fair dealing.

14.2. No modification, waiver, suspension or termination of the Agreement or of any terms thereof shall impair the rights or liabilities of either party.

14.3. This Agreement is not assignable, in whole or in part, by the CONTRACTOR without the prior written consent of the CITY.

14.4. Waiver by either party of a breach of any provision of this Agreement shall not be deemed to be a waiver of any other breach and shall not be construed to be a modification of the terms of this Agreement.

14.5. The headings of the Articles, Exhibits, Parts and Attachments as contained in this Agreement are for the purpose of convenience only and shall not be deemed to expand, limit or change the provisions in such Articles, Exhibits, Parts and Attachments.

14.6. This Agreement constitutes the entire agreement between the parties hereto and shall supersede, replace and nullify any and all prior agreements or understandings, written or oral, relating to the matter set forth herein, and any such prior agreements or understanding shall have no force or effect whatever on this Agreement.

Sec. 14. 7. The CONTRACTOR shall comply fully with all provisions of state and federal law, including without limitation all provisions of the Immigration Reform and Control Act of 1986 (“IRCA”) as amended, as well as all related immigration laws, rules, and regulations pertaining to proper employee work authorization in the United States. The CONTRACTOR shall execute the Certification of Compliance with Immigration Laws, attached hereto as **Exhibit “D”**.

#### **ARTICLE FIFTEEN APPLICABLE LAW**

15.1. Unless otherwise specified, this Agreement shall be governed by the laws, rules, and regulations of the State of Florida, and by the laws, rules and regulations of the United States when providing services funded by the United States government. Any suit or action brought by either party to this Agreement against the other party relating to or arising out of this Agreement must be brought in the appropriate Florida state court in Collier County, Florida.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement for the day and year first written above.

ATTEST:

**CITY:**

CITY OF NAPLES, FLORIDA,  
A Municipal Corporation

By: \_\_\_\_\_  
Tara A. Norman, City Clerk

By: \_\_\_\_\_  
A. William Moss, City Manager

Approved as to form  
and legal sufficiency:

By: \_\_\_\_\_  
Robert D. Pritt, City Attorney

**CONTRACTOR: C.W. Roberts Contracting, Inc.**

A Florida Corporation

By: \_\_\_\_\_

Its \_\_\_\_\_

\_\_\_\_\_  
Witness

(CORPORATE SEAL)

General Contract (not Architects/Engineers)



## EXHIBIT A

### SCOPE OF SERVICES

The Services to be provided under this Agreement are those set out below, attached and made part of this Exhibit A.

### SPECIFICATIONS

#### SECTION 1. SCOPE OF WORK:

The City of Naples desires to enter into a contractual relationship with vendors capable of providing general street and right-of-way maintenance, repair and rehabilitation capable of undertaking and completing street resurfacing and construction projects of a defined scope and capable of providing a combination of manpower, equipment and materials to perform general emergency street repairs. It is the City's intent to award to multiple contractors. Contractors may be designated in terms of primary service providers and standby service providers based on the selection committees' overall ranking. The general routine maintenance work, capital improvement work and/or emergency repair work will be included under one or more of the following areas of work. Each Contractor's submitted qualifications, experience and compensation schedule will be utilized in determining the most responsive firms.

#### SECTION 2. CONTRACT WORK - STREET MAINTENANCE, RESURFACING & REHABILITATION (SECTION A OF COMPENSATION SCHEDULE)

Annual road resurfacing and reconstruction typically begins in May of each year in accordance with the City's Pavement Management Program (PMP), while other road maintenance occurs throughout the year. In regards to the PMP, the City will provide the Contractor a list of streets to be serviced, as well as the proposed method of maintenance resurfacing, repair or reconstruction. The total quantity of work associated with the PMP for any given year at any one time is not expected to be below 15,000 SY of area. More likely, the total quantity will be well above this minimum level. Contractors do not need to be qualified in all of the maintenance and repair items described in Section 1A, and in that case, the Contractor shall omit a unit price for that item. Although the bulk of the consolidated PMP work shall be performed between May and September of each year, there may be resurfacing projects that will be required outside of this time frame, primarily alley resurfacing and emergency repairs involving large areas of asphalt. Other road maintenance work such as pot hole repairs, utility patches, and sidewalk and curb repairs will occur on an as needed basis throughout the year, see Section 3.

- A. Mobilization for any and all contract work shall be included in unit pricing for all projects and type of work.
- B. Maintenance of traffic cost shall be included in unit pricing for all projects and type of work.

#### 2.1 FULL DEPTH RECLAMATION

Work items under this section may include: (1) Mobilization for reclaiming, (2) Reclaimed Asphalt Base Course, (3) Furnishing and Applying a Stabilizing Agent, (4) grading and compaction.

#### RECLAIMING

The work item for Reclaimed Asphalt Base Course shall consist of pulverizing an existing bituminous pavement and its base course and mixing them together, adding water and new base material as the Public Works/Engineering Department may require; injecting the specified stabilizing agent directly into the mixing chamber of the reclaiming machine and uniformly mixing it with the pulverized material at the rate and depth specified; and watering, shaping, grading, and compacting the blended material to produce a stabilized base

course, true to the established line and grade of the road. Areas to be widened shall be excavated and filled with new base material prior to the reclaiming operation and the Contractor shall apply the reclaiming machine to mix and stabilize the widening area with the existing layers in the same operations.

The Contractor may be required to perform reclaiming work while traffic is maintained in another lane or lanes of the road. The work item for Reclaimed Asphalt Base Course shall include all necessary traffic control services provided during the reclaiming operation which are not covered under other work items in the Contract. All traffic control and maintenance of traffic is to be performed in conformity with Agency standards with Roadway and Traffic Design Standards, published by the Florida DOT, and with the Manual for Traffic Control Devices, published by the U.S. Department of Transportation.

## MATERIALS

a. References: the abbreviated title, "FDOT Specifications," used herein refers to the Standard Specifications for Roads and Bridges, 1999, of the Florida Department of Transportation.

b. Stabilizing Agent: Stabilizing agent shall consist of emulsified asphalt as indicated in the specifications Sheet. The contractor shall manufacture its own emulsion.

When asphalt emulsion treatment is specified, asphalt emulsion, type CSS-1h or CMS-2h mod., meeting the requirements of ASTM D2397-98, shall be injected in the base material.

c. Asphalt Emulsion mix design: Asphalt emulsion is to be used as the stabilizing agent, the Contractor shall obtain a mix design study based on the material in the existing layers. Prior to scheduling the work, the Contractor shall obtain the services of a laboratory which shall sample the pavement, base, subgrade and shall perform a modified Marshall Stability Test and a recommendation as the depth of mixing and the rate and depth of emulsion treatment. The design study and recommendations shall be forwarded to the Public Works/Engineering Department at least five work days prior to starting operation.

## EQUIPMENT

a. General: The Contractor shall accomplish the work utilizing a road reclaimer, a motor grader, a vibratory roller or three-wheeled roller, a water truck with spray bar and such additional equipment as may be necessary to the operation. The required equipment shall be subject to the Public Works/Engineering Department's approval, and the Department may, at any time during the work, disapprove the use of a particular machine for unsafe, erratic, or inadequate performance. Utilization of a proper road reclaimer and compaction equipment as specified herein is of the essence of this work, and substitution of other equipment or a different technique shall not be acceptable.

b. Reclaimer: The work shall be performed utilizing a road reclaimer machine originally designed for pavement reclaiming. The road reclaimer shall be a CAT 350, larger or a comparable model of equal or greater horsepower and rotor size, produced by another manufacturer. The reclaimer shall be capable of pulverizing and mixing pavement, base materials, and subgrade soil to depth of 0.40m , (16 inches). It shall be capable of injecting asphalt emulsion into the rotor chamber at an accurately controlled rate and of doing so in confined areas inaccessible to a tanker truck.

c. Compacting equipment: The Contractor shall compact the reclaimed base material with a vibratory roller weighing not less than 6.0 metric tons (13,000 lbs.) or by a three wheeled roller weighing not less than 10.0 metric tons (11 tons). The vibrator must be fully operable at maximum amplitude throughout the compacting process.

## CONSTRUCTION PROCEDURE

a. General: When the work is to be performed under traffic, each lane shall be completed in segments, the lengths and limits of which shall be approved by the Public Works/Engineering Department may limit the length of the work zone to avoid causing a traffic hazard or undue delay. Before commencing the reclaiming operations, the Agency shall set alignment stakes (laths) at intervals of 60 meters (200 feet) or less on both sides of the road, offset at least 1.2 meters (4 feet) from the proposed edge of pavement for use in preparing the base and placing the new pavement. The setting of laths shall be in addition to any other markers or reference points required under the Contract, and the placing of surveying markers or other references elsewhere shall not substitute for the required laths along the existing pavement.

Prior to beginning work, the Contractor shall relocate all mailboxes, newspaper boxes, signs, and other appurtenances which are located within such proximity to the roadway as to risk damage or to interfere with the work. Before this work may begin, residents shall be notified of the impending relocations by means of printed flyers. After all other work items are complete, the removed items shall be replaced in their original locations, except that the distance from the proposed edge of pavement shall be as prescribed in the Department of Public Works/Engineering Design Guidelines.

b. Reclaiming: The Contractor shall pulverize the existing pavement in multiple passes of the reclaimer, applying sufficient mechanical effort to reduce the fragments to a maximum size of 75 mm (3 inches). In this process the pulverized material shall be combined uniformly with the base and subgrade to a depth which the Public Works/Engineering Department may specify. Following the reclaimer, a roller shall be applied to compact the blended material sufficiently to support traffic temporarily. The depth of material to be compacted shall not exceed .150 m (6 in). The Public Works/Engineering Department may require removal of up to 50 mm (2 in) of pulverized material prior to addition of the stabilizing agent. When the pulverizing and mixing step is complete, the material shall be graded, watered, remixed, shaped, and compacted as necessary to establish proper grade and uniform thickness and to support traffic temporarily. Water shall be applied if necessary to obtain uniform moisture content as the Public Works/Engineering Department may specify. The Contractor shall apply additional water at frequent intervals as needed to suppress dust, preserve the surface, and maintain the specified moisture content. The stabilizing agent shall then be applied and mixed to the depth specified by the Public Works/Engineering Department, and grading and compaction of the combined base material shall proceed immediately behind the mixing of the stabilizing agent.

Before final grading and the addition of the emulsion, when directed by the Public Works/Engineering Department, the Contractor shall adjust the cross-slope, super elevation, and profile grade by adding granular base material in areas the Public Works/Engineering Department may designate.

c. Compaction: The Contractor may employ other compaction equipment and methods in addition to the vibratory roller to accomplish the final grading and to compact and finish the surface. Transverse joints shall be compacted by cross-rolling parallel to the joint. After the material has been compacted to load-bearing strength, the Contractor shall proof-roll the prepared base in the presence of the Inspector. The Public Works/Engineering Department may, as it deems necessary, direct the Contractor to correct areas of weakness and excess moisture in the base by scarifying, aerating, and reworking shore sessions to the full depth of the layer. If, after an area has been reworked and recompacted, it remains soft or does not attain the required density, the Public Works/Engineering Department may direct the Contractor to remove the material and replace it with Granular Base Material meeting the requirements of these specifications. This material shall be counted for payment under the pay item for Excavation and Granular Base Material.

## BASIS OF PAYMENT

a. Mobilization for Reclaiming: Mobilization shall be included within the unit price for Full Depth Reclamation set forth in the compensation schedule.

b. Reclaimed Asphalt Base, in place and accepted, shall be paid for at the contract unit price per square yard, as indicated in the Compensation Schedule. The area of work for the purpose of payment shall be the overall length

of each reclaimed lane times the specified total base width for the lane. The total base width shall include the widening width, if any, in which the reclaimer is to be used to blend new base material with the pulverized layers. Payment under this item shall be full compensation for all work included in or incidental to the reclaiming operation, for the grading, shaping, and compacting of the Reclaimed Asphalt Base, for the mix design study, for furnishing, delivering, and applying water, for applying and mixing and furnishing asphalt emulsion or other stabilizing agent as specified, and for all other work incidental to the reclaiming operation. Also this item shall include all work and expenses involved in wasting or hauling and disposing of excess material off site, and including reshaping of the shoulders as the Public Works/Engineering Department may direct. Payment shall be full compensation for this work, including incidentals.

d. Limerock base material shall be paid for at the contract price per ton as determined from load tickets, which the Contractor shall collect and deliver to the Public Works/Engineering Department. Payment shall be full compensation, including hauling, spreading, mixing, and incidentals. Where a substantial quantity of material is lost because of the Contractor's placement methods or lack of care and if the quantity delivered exceeds the calculated quantity by ten percent or more, the full quantity of lost material shall be estimated and deducted from the pay quantity.

e. Asphalt Emulsion type CSS-1h or CMS-2h mod., uniformly incorporated in the layer at the rate specified by the Certified Mix Design, shall be measured according to the volume (gallons) delivered from the tanker. Payment under this pay item shall be full compensation for furnishing and delivering this material, including demurrage charges and all incidentals.

f. Manholes: Prior to reclamation process, each manhole shall be lowered to a depth of at least 2" below the initial pulverizing depth. After final pass of reclaimer and final compaction, manholes shall be readjusted to the appropriate height to accommodate the final overlay.

g. Water Shutoffs: Water shutoffs shall be adjusted to accommodate the reclamation process. After final pass of reclaimer and final compaction, water shutoffs shall be adjusted to the appropriate height to accommodate the final overlay.

h. Material/Removal: When directed by the owner, material shall be removed from the roadway area in order to prepare for a desired final grade or removal of unsuitable material. Up to 2" removal shall be allowed off the top after initial pulverization. When over 2" of removal is required, the initial pulverized material shall be winnowed into a lane and sub-base shall be removed. It is the intention of this specification to maximize the reclaimed asphalt pavement in the final reclaimed asphalt base course.

## 2.2 MICRO-SURFACING

### OPENING TO TRAFFIC

Micro-Surfacing shall be capable of producing an emulsified asphalt paving mixture that will cure at a rate which will permit traffic on the pavement within one hour after application without damaging the pavement surface. Any damage done by traffic to the Micro-surfacing shall be repaired by the contractor at his/her expense.

### EMULSIFIED ASPHALT

General: The emulsified asphalt shall be quick-set latex modified cationic type CSS-1h emulsion with natural or synthetic latex and shall conform to the requirements specified in AASHTO M208 or ASTM D2397. It shall pass all applicable storage and settlement tests. The Contractor shall manufacture its own emulsion. The cement mixing test shall be waived for this emulsion.

The polymer material shall be milled or blended into the asphalt or emulsifier solution prior to the emulsification process.

The minimum amount and type of polymer modifier shall be determined by the laboratory performing the mix design. The minimum amount required will be based on asphalt weight content and will be certified by the emulsion supplier. In general, a three percent (3%) polymer solids, based on asphalt weight, is considered minimum.

The five-day (5) settlement test may be waived, provided job stored emulsion is used within thirty-six (36) hours from the time of the shipment, or the stored material has had additional emulsion blended into it prior to use.

Quality Tests: When tested according to the following tests, the emulsion shall meet the requirements of AASHTO M208 or ASTM D2397 for CSS-1h, plus the following:

AASHTO TEST NO.	ASTM TEST NO.	QUALITY	SPECIFICATION
AASHTO T59	ASTM D244	Residue after Distillation	62% Minimum

The temperature for this test should be held below 280°F (138°C). Higher temperatures may cause the polymers to break down.

AASHTO TEST NO.	ASTM TEST NO.	TESTS ON RESIDUE	SPECIFICATION
AASHTO T53	ASTM D36	Softening Point	135°F (57°C) Minimum
AASHTO T49	ASTM 2397	Penetration at 77°F (25°C)	40 – 90*
	ASTM 2170	Kinematic Viscosity @ 275 °F (135°C)	650 cSt/sec. Minimum °F

Climate conditions should be considered when establishing this band.

Each load of emulsified asphalt shall be accompanied with a Certificate of Analysis/ Compliance to assure that it is the same as that used in the mix design.

### AGGREGATE

General: The mineral aggregate used shall be of the type and grade specified for the particular use of the Micro-Surfacing. The aggregate shall be a manufactured crushed stone such as granite, slag, limestone, chat, or other high-quality aggregate, or combination thereof. To assure the material is totally crushed, one-hundred percent (100%) of the parent aggregate will be larger than the largest stone in the gradation to be used.

Quality Tests: When aggregate is tested according to the following test, it should meet these minimum requirements:

AASHTO TEST NO.	ASTM TEST NO.	QUALITY	SPECIFICATION
AASHTO T176	ASTM D2419	Sand Equivalent	65 Minimum
AASHTO T104	ASTM C88	Soundness	15% Maximum using NA2 SO4 or 25% Maximum using MgSO4
AASHTO T96	ASTM C131	Abrasion Resistance	30% Maximum

The abrasion test is to be run on the parent aggregate. The aggregate should meet state-approved polishing values. Proven performance may justify the use of aggregates that may not pass all of the above tests.

Grading: When tested in accordance with AASHTO T27 (ASTM C136) and AASHTO T11 (ASTM C117), the target (mix design) aggregate gradation (including the mineral filler) shall be within one of the following bands.

SIEVE SIZE	TYPE II PERCENT PASSING	TYPE III PERCENT PASSING	STOCKPILE TOLERANCE
<sup>3</sup> / <sub>8</sub> (9.5 mm)	100	100	
#4 (4.75 mm)	90 – 100	70 - 90	± 5 %
#8 (2.36 mm)	65 – 90	45 – 70	± 5 %
#16 (1.18 mm)	45 – 70	28 - 50	± 5 %
#30 (600 um)	30 – 50	19 - 34	± 5 %
#50 (330 um)	18 – 30	12 - 25	± 4 %
#100 (150 um)	10 – 21	7 - 18	± 3 %
#200 (75 um)	5 – 15	5 - 15	± 2 %

The job mix (target) gradation shall be within the gradation band for the desired type. After the target gradation has been submitted (this should be the gradation that the mix design is based on), then the percent passing each sieve shall not vary by more than the stockpile tolerance shown in the above table for each individual sieve, and still remain within the gradation band. It is recommended that the percent passing shall not go from the high end to the low end of the range for any two consecutive screens.

The aggregate will be accepted at the job location stockpile or when loading into the support units for delivery to the lay-down machine. The stockpile shall be accepted based on five gradation tests according to AASHTO T2 (ASTM D75). If the average of the five tests is within the gradation tolerances, then the materials will be accepted. If the tests show the material to be out, the contractor will be given the choice to either remove the material or blend other aggregate with the stockpiled material to bring it into specification. Materials used in blending must meet the quality tests before blending and must be blended in a manner to produce a consistent gradation. If blending is used, it will require that a new mix design be performed.

Screening shall be required at the stockpile prior to delivery to the paving machine if there are any problems created by having oversize material in the mix.

Mineral Filler: Mineral filler, if required, shall be any recognized brand of non-air entrained Portland cement or hydrated lime that is free from lumps. It may be accepted upon visual inspection. The type and amount of mineral filler needed shall be determined by a laboratory mix design and will be considered as part of the aggregate gradation. An increase or decrease of less than one percent (1%) may be permitted when the Micro-Surfacing is being placed if it is found to be necessary for better consistency or set times.

Water: Water shall be potable and free of harmful or deleterious materials.

Additives: Additives may be added to the emulsion mix or any of the component materials to provide the control of the quick-traffic properties. They must be included as part of the mix design and be compatible with the other components of the mix.

Rate of Application: The Micro-Surfacing mixture shall be of the proper consistency at all times, so as to provide the application rate required by the surface condition. The average single application rate, as measured by the Project Manager, shall be in accordance with the following table:

AGGREGATE TYPE	LOCATION	SUGGESTED APPLICATION RATE
TYPE II	Urban and Residential Streets	10 – 20 lb/yd <sup>2</sup> (5.4 – 10.8 kg/m <sup>2</sup> )
TYPE II	Primary and Interstate Routes  Wheel Ruts	15 – 30 lb/yd <sup>2</sup> (8.1 – 16.3 kg/m <sup>2</sup> )  As Required

Suggested application rates are based upon the weight of dry aggregate in the mixture. Application rates are affected by the unit weight of the aggregate.

Micro-Surfacing is often put down in two full-width passes in place of rut-filling when the rutting or deformation is not severe. When two passes are used, the first pass (scratch course) is made using a metal or stiff rubber strike-off and applying only what the surface demands for leveling. The second course is applied at 15 – 30 lb/yd<sup>2</sup> (8.1 – 16.3 kg/m<sup>2</sup>).

## EQUIPMENT

General: All equipment, tools, and machines used in the performance of this work shall be maintained in satisfactory working condition at all times to ensure a high-quality product.

Mixing Equipment: The machine shall be specifically designed and manufactured to lay Micro-Surfacing. The material shall be mixed by an automatic-sequenced, self-propelled Micro-Surfacing mixing machine, which shall be a continuous-flow mixing unit able to accurately deliver and proportion the aggregate, emulsified asphalt, mineral filler, control setting additive, and water to a revolving multi-blade, double-shafted mixer and to discharge the mixed product on a continuous-flow basis.

The machine shall have sufficient storage capacity for aggregate, emulsified asphalt, mineral filler, control additive and water to maintain an adequate supply to the proportioning controls. Because of the varying types of roadways; the Contractor shall have a minimum of two (2) self-loading machines capable of loading to a revolving multi-blade, double-shafted mixer and to discharge the mixed product on a continuous basis.

The machine shall have sufficient storage capacity for aggregate, emulsified asphalt, mineral filler, control additive and water to maintain an adequate supply to the proportioning controls. The machine must be capable of loading materials while continuing to lay microsurfacing, thereby minimizing construction joints.

The self-loading machine shall be equipped to allow the operator to have full control of the forward and reverse speeds during applications of the Micro-Surfacing material and be equipped with opposite-side driver stations to assist in alignment. The self-loading device, opposite-side driver stations, and forward and reverse speed controls shall be original equipment manufacturer design.

**Proportioning Devices:** Individual volume or weight controls for proportioning each material to be added to the mix (i.e. aggregate, mineral filler, emulsified asphalt, additive, and water) shall be provided and properly marked. These proportioning devices are used in material calibration and determining the material output at any time.

**Spreading Equipment:** The mixture shall be agitated and spread uniformly in the surfacing box by means of twin-shafted paddles or spiral augers fixed in the spreader box. A front seal shall be provided to insure no loss of the mixture at the road contact point. The rear seal shall act as a final strike-off and shall be adjustable. The spreader box and rear strike-off shall be so designed and operated that a uniform consistency is achieved to produce a free flow of material to the rear strike-off. The spreader box shall have suitable means provided to side shift the box to compensate for variations in the pavement geometry.

**Secondary Strike-off:** A secondary strike-off shall be provided to improve surface texture. The secondary strike-off shall have the same adjustments as the spreader box.

**Rut-filling Box:** When required, before the final surface course is placed, preliminary micro-surfacing material may be required to fill ruts, utility cuts, depressions in the existing surface, etc. Ruts of one-half (½) inch (12.7 mm) or greater in depth shall be filled independently with a rut-filling spreader box, either five foot (5) (1.5m) or six foot (6) (1.8 m) in width. For irregular or shallow rutting of less than one-half (½) inch (12.7 mm) in depth, a full-width scratch-coat pass may be used as directed by the Project Manager. Ruts that are in excess of one and one-half (1-½) inches (38.1 mm) in depth may require multiple placements with the rut-filling spreader box to restore the cross-section. All rut-filling level-up material should cure under traffic for at least a twenty-four (24) hour period before additional material is placed on top of the level-up.

**Auxiliary Equipment:** Suitable surface preparation equipment, traffic control equipment, hand tools, and any other support and safety equipment shall be provided by the contractor as necessary, (or as the Project Manager requires) to perform the work

**Calibration:** Each mixing unit to be used in the performance of the work shall be calibrated in the presence of the Project Manager or his/her designee prior to construction. Previous calibration documentation covering the exact materials to be used may be acceptable, provided that no more than sixty (60) days have lapsed. The documentation shall include an individual calibration of each material at various settings, which can be related to the machine metering devices. No machine will be allowed to work on the project until the calibration has been completed and/or accepted.

**Weather Limitations:** Micro-Surfacing shall not be applied if either the pavement or air temperature is below 50°F (10°C) and falling, but may be applied when both pavement and air temperatures are above 45°F (7°C) and rising. No Micro-Surfacing shall be applied when there is the possibility that the finished product will freeze within 24 hours. The mixture shall not be applied when weather conditions prolong opening to traffic beyond a reasonable time or as directed by the Project Manager.

## NOTIFICATION AND TRAFFIC CONTROL

All homeowners and businesses affected by the construction shall be notified two (2) days in advance of the surfacing. Suitable signs shall be posted prior to the surfacing. Should work not occur on the specified day, a new notification will be distributed. The notification shall be in a form of a written posting, stating the time, date that the surfacing will take place. A current phone number of the contractor's on-site supervisor and a brief description of Micro-Surfacing. The contractor will be responsible for contacting any Waste Management companies, United States Mail Carriers, United Parcel Services, etc. on the day that Micro-Surfacing is planned.



Failure to do so will result in the contractor repairing the roadway at his/her cost.

## **SURFACE PREPARATION**

**General:** Immediately prior to applying the Micro-Surfacing, the surface shall be cleared of all loose material, silt spots, vegetation, and other objectionable material. Any standard cleaning method will be acceptable. If water is used, cracks shall be allowed to dry thoroughly before applying Micro-Surfacing. Manholes, valve boxes, drop inlets and other service entrances shall be protected from the Micro-Surfacing by a suitable method. The Project Manager or his/her designee shall approve the surface preparation prior to surfacing. No dry aggregate either spilled from the lay-down machine or existing on the road, will be permitted.

**Tack Coat:** Normally, tack coat is not required unless the surface to be covered is extremely dry and raveled or is concrete or brick. If required, the tack coat should consist of one part emulsified asphalt/three parts water and should be applied with a standard distributor. The emulsified asphalt should be SS or CSS grade. The distributor shall be capable of applying the dilution evenly at a rate of 0.05 to 0.10 gal/yd<sup>2</sup> (0.23 to 0.45 l/m<sup>2</sup>). The tack coat shall be allowed to cure sufficiently before the application of Micro-Surfacing. If a tack coat is to be required, it must be noted during the Pre-Construction Meeting.

**Cracks:** It is advisable to pre-treat the cracks in the surface with an acceptable crack sealer prior to the application of the Micro-Surfacing. The Project Manager or his/her designee will make the determination on a road by road basis whether pre-treatment will be required.

## **APPLICATION**

**General:** If required by the Project Manager, it is recommended that a test strip be placed in conditions similar to those expected to be encountered during the project.

When required by local conditions, the surface shall be pre-wetted by fogging ahead of the spreader box. The rate of application of the fog spray shall be adjusted during the day to suit temperatures, surface texture, humidity, and dryness of the pavement.

The Micro-Surfacing shall be of the desired consistency upon leaving the mixer. A sufficient amount of material shall be carried in all parts of the spreader at all times so that a complete coverage is obtained. Overloading of the spreader shall be avoided. No lumping, balling, or unmixed aggregate shall be permitted.

No streaks, such as those caused by oversized aggregate, shall be left in the finished surface. If excess streaking develops, the job will be stopped until the contractor proves to the Project Manager or his/her designee that the situation has been corrected. Excessive streaking is defined as more than four drag marks greater than one-half (½) inch wide (12.7 mm) and four inches (4) long (101 mm), or one inch (1) wide (25.4 mm) and three (3) inches long (76.2 mm), in any 29.9 yd<sup>2</sup> (25 m<sup>2</sup>) area. No transverse ripples or longitudinal streaks of one-fourth (¼) inch in depth (6.4 mm) will be permitted, when measured by placing a ten (10) foot (3 m) straight edge over the surface.

**Joints:** No excess buildup, uncovered areas, or unsightly appearance shall be permitted on longitudinal or transverse joints. The contractor shall provide suitable-width spreading equipment to produce a minimum number of longitudinal joints throughout the project. When possible, longitudinal joints shall be placed on lane lines. Half passes and odd-width passes will be used only in minimum amounts. If half passes are used, they shall not be the last pass of any paved area. A maximum of three (3) inches (76.2 mm) shall be allowed for overlap of longitudinal lane line joints. Also, the joint shall have no more than a one-fourth (¼) inch (6.4 mm) difference in elevation when measured by placing a ten (10) foot (3 m) straight edge over the joint and measuring the elevation drop-off.

**Mix Stability:** The Micro-Surfacing shall possess sufficient stability so that premature breaking of the material in

the spreader box does not occur. The mixture shall be homogeneous during and following mixing and spreading. It shall be free of excess water or emulsion and free of segregation of the emulsion and aggregate fines from the coarser aggregate. Under no circumstances shall water be sprayed directly into the lay-down box while laying micro-surfacing material.

Handwork: Areas which cannot be reached with the mixing machine shall be surfaced using hand squeegees to provide complete and uniform coverage. If necessary, the area to be hand worked shall be lightly dampened prior to mix placement. Care shall be exercised to leave no unsightly appearance from hand work. The same type of finish as applied by the spreader box shall be required.

Lines: Care shall be taken to ensure straight lines along curbs and shoulders. No runoff on these areas will be permitted. Lines at intersections will be kept straight to provide a good appearance. If necessary, a suitable material will be used to mask off the end of streets to provide straight lines. Edge lines shall not vary by more than  $\pm 2$  inches ( $\pm 50$  mm) horizontal variance in any 96 feet (30 m) of length.

Clean-up: All areas, such as man-ways, gutters, and intersections, shall have the Micro-Surfacing mix removed as specified by the Project Manager. The contractor shall, on a daily basis, remove any debris associated with the performance of the work, completely and thoroughly to the satisfaction of the Project Manager or his/her designee. In addition, the contractor shall, at the request of the Project Manager pressure wash any area such as, curb and gutter, private driveways, etc. removing any and all stains associated with the placement of the Micro-Surfacing.

#### METHOD OF MEASUREMENT

Area: The method of measurement and payment is based on the area covered, measured in square yards.

The Micro-Surfacing shall be paid for by the unit area of work and accepted by the Project Manager. The price shall be full compensation for furnishing all preparation; mixing and applying these materials; and all labor, equipment, tools, test designs, cleaning, and incidentals necessary to complete the job as specified herein.

## 2.7 OPEN GRADED POROUS ASPHALT

### 3. DEFINITIONS

#### 3.1 Porous Asphalt

*Porous Asphalt is an open graded mixture of coarse and fine aggregates, mineral filler and a bituminous based binder produced hot in a mixing plant. It is delivered, spread and compacted while hot.*

*In this specification three types of porous asphalt are defined:*

*PA 15HS this mix has a lower air void content and higher shear strength than the other mixes. It can thus withstand higher traffic shear stress.*

*PA 20 This mix has a minimum design air void content of 20% and is intended for use in most locations. It can be used with or without polymer or additive modification.*

*PA 25HV This mix must have binder modification to withstand the abrasive stress of traffic. It is a high air void mix with a minimum design air voids content of 25% although design air voids of approximately 30% will give enhanced noise reducing properties.*

#### 3.2 Twin Layer

*In this system a layer of mix with a maximum particle size of 16 or 20mm is laid 30-50mm thick. On top of this layer a 20-30mm thick layer of a mix with a smaller top size is laid. The intention of the system is to:*

- 1. Increase the void content of the surfacing to absorb noise*
- 2. Use a small sized aggregate in the surfacing to reduce noise*
- 3. Use the smaller voids on the top layer to trap detritus and use the large voids in the bottom mix to allow water to flush the detritus – thus maintaining the drainage and noise properties of the system.*

#### 3.3 Coarse Aggregate

Coarse Aggregate is comprised of aggregate components retained on a 4.75mm test sieve. The source rock from which the components are manufactured shall comply with the requirements of Table 4.1.

#### 3.4 Fine Aggregate

Fine aggregate is the fraction of aggregate components passing the 4.75mm test sieve, excluding mineral fillers.

#### 3.5 Mineral Filler

Mineral Filler is finely ground particles of limestone, hydrated lime, Portland cement or other non-plastic mineral matter, predominantly finer than 0.075mm that is added to the mix.

### 3.6 Binder

Binder is penetration grade bitumen complying with TNZ M/1 specification. If polymer modification is required then this is included in the specific contract requirements.

### 3.7 Specified Mix Envelope

The Specified Mix Envelope (SME) is the porous asphalt particle size distribution and bitumen content limits as set out in Table 5.1.

### 3.8 Job Mix Formula

The Job Mix Formula (JMF) is the combined aggregate particle size distribution and bitumen content that falls within the SME and produces a mix that complies with the volumetric and mechanical criteria of Table 5.2.

Note that particle size distribution acceptance limits derived from application of the permissible variations of Table 7.1 to the JMF particle size distribution may allow test results to fall outside the SME envelopes of Table 5.1. This is acceptable.

## 4. MATERIALS

### 4.1 Testing

All sampling and laboratory testing required demonstrating that materials used, and that the resulting mix complies with this specification shall be performed by a laboratory accredited to ISO 17025 (e.g. IANZ Accreditation).

### 4.2 Coarse Aggregate

Coarse aggregate shall consist of crushed stone or crushed gravel or a combination of the two, produced from hard durable rock or river boulders. Synthetic aggregates can be used as long as they comply with the requirements of this specification. The source rock from which individual components are produced shall comply with Table 4.1 and the blended coarse aggregate shall comply with the requirements of Table 4.2:

**Table 4.1: Requirements for Coarse Aggregate Source Rock**

Criteria	Test Method	Requirements
Crushing Resistance	NZS 4407 Test 3.10	230 kN minimum
Weathering Resistance	NZS 4407 Test 3.11	AA or BA
Polished Stone Value	BS EN 1097 Part 8	*see below

\* refer to specific contract requirements for minimum Polished Stone Value

At least 85% by mass of the coarse aggregate shall comply with the specified minimum Polished Stone Value.

The Cleanness value of the combined coarse aggregate shall be measured during the mix design process. This measured value minus 5 shall then be the minimum required during production of the mix.

**Table 4.2: Requirements for Blended Coarse Aggregate**

Criteria	Test Method	Requirements
Particle Shape	NZS 4407 Test 3.13	2.25 maximum
Broken faces	NZS 4407 Test 3.14	98% minimum

**4.3 Fine Aggregate**

Fine aggregate shall consist of particles of sand, crushed stone, crushed gravel crushed synthetic aggregate or a mixture of these materials. The parent material from which any crushed fine aggregate is produced shall comply with the crushing resistance criteria of Table 4.3.

**Table 4.3: Requirements for Fine Aggregate**

Criteria	Test Method	Requirements
Crushing Resistance	NZS 4407 Test 3.10	130 kN minimum

**4.4 Mineral Filler**

Mineral Filler (if used) shall consist of finely ground particles of limestone, hydrated lime, Portland cement or other non-plastic mineral matter, complying with Table 4.4. Pumice and other similar absorbent materials are not acceptable. The mineral filler shall be thoroughly dry and free from lumps. The Mineral Filler shall predominantly be all passing the 0.600 mm sieve.

**4.5 Binder**

The bitumen used in the asphaltic concrete mixture shall be 80/100 or 60/70 grade compliant with TNZ M/1 Specification modified if required as detailed in the specific contract requirements. The bitumen may be modified also through the use of adhesion agent, polymers, fibres, etc. Modification of the binder is required for the HV mixes. The modifier type and content is the responsibility of the contractor.

**5. MIX DESIGN**

Penetration grade bitumen mixing and compaction temperatures shall be modified to attain binder viscosities of 1 Pa.s  $\pm$  0.1 Pa.s and 2 Pa.s  $\pm$  0.2 Pa.s respectively. *The determination of the design bitumen content shall be made in accordance with the principles given in Section 4.12 of APRG report No 18 (AP-T20). The binder drain down test shall be performed at 10<sup>o</sup>C above the mixing temperature and then ensuring that the other criteria in Table 5.2 are achieved. If the time from manufacture to*

*laying is expected to be significantly greater than one hour then the drainage time may be increased to model the expected storage and transport time.*

For polymer modified binders the design binder content will be the same as that obtained with penetration grade binder but the other criteria in Table 5.2 must be achieved with the modified binder.

The particle size distribution of the Job Mix Formula shall comply with the Specified Mix Envelopes requirements of Table 5.1.

Test specimens shall be made using the method of ASTM D6926. The specimens shall be compacted using 50 compaction blows on each side of the specimen. *Alternatively specimens can be compacted using a Servopac compaction at 80 cycles, in accordance with AS 2891.2.2*

For polymer modified binders the mixing and compaction temperatures shall be as recommended by the manufacturer.

Specimen volume shall be determined by mensuration to ASTM D3549 and air voids shall be calculated in accordance with ASTM D3203.

Retained tensile strength shall be determined in accordance with ASTM D4867, except that the air void limits for saturation are waived. Saturation shall be performed by placing the compacted specimen complete with mould in distilled or deionised water at  $60^{\circ} \pm 1^{\circ} \text{C}$  for 24 hours. When samples have been prepared using gyratory compaction samples will be required to be transferred into a suitable sleeve to prevent sample slumping in the  $60^{\circ}\text{C}$  bath. After the saturation time, the specimens shall be cooled, removed from the mould or sleeve and placed in the  $25^{\circ} \pm 1^{\circ} \text{C}$  water bath for 1 hour before testing for retained strength.

*Abrasion loss shall be determined using the cantabro test at  $25^{\circ}\text{C}$  in accordance with Test method AGPT / T 236 Asphalt Particle Loss (%).*

*Durability of Polymer modified mixes shall be assessed using the ageing procedure given in the appendix and then testing for abrasion loss using AGPT / T 236.*  
The volumetric and physical data of the mixture shall be provided to the Engineer prior to commencement of work.

**Table 5.1: Porous Asphalt Specified Mix Envelopes**

Sieve Size mm	PA 10 HS	PA 10	PA 14	PA 7 HV	PA 10 HV	PA 14 HV	PA 20 HV
26.5							100
19			100			100	85-100
13.2	100	100	85-100		100	85-100	
9.5	85-100	85-100	35-50	100	85-100	10-25	10-25
6.7				85-100			
4.75	30-40	20-40	12-22	10-30	10-30	7-20	7-20
2.36	19-25	5-15	5-15	5-15	5-15	5-15	5-15
0.075	2-5	2-5	2-5	1-5	1-5	1-5	1-5
Effective Binder Content % by mass min	4.5	4.5	4.0	4.5	4.0	4.0	4.0
Minimum Thickness of Asphalt (mm)	25	25	30	20	25	30	50

**Table 5.2: Laboratory Mixture Design Volumetric and Physical Requirements**

Criteria	PA	PA HV	PA HS
Air Voids (%)	20 - 25	25 - 30	12 - 16.
Retained Tensile Strength (%)	75 min.	75 min.	75 min.
Binder drainage (%)	0.1-0.3	0.1-0.3	0.1-0.3
Cantabro loss max %	15	20	20
Max ratio of cantabro loss before and after ageing*	2	2	2

*Where the mix does not comply with the durability cantabro loss ratio the mix may still be used with approval of the Engineering policy manager if other evidence of durable performance can be demonstrated. The durability criteria only apply to mixes using polymer modified binders.*

**6. PRODUCTION**

The manufacturing plant shall be calibrated and operated to consistently produce a uniform mixture within the tolerances specified by Table 7.1.

If the period of time between production and laying exceeds 1.5 hrs the contractor shall provide details of how they will mitigate drain down and segregation problems in the contract documents.

If mix is to be stored prior to transportation and laying, storage bins shall be designed and controlled to prevent segregation and minimise degradation of the mix.

Aggregates shall be stored at the plant in such a manner that each separate aggregate component and stockpile is physically separate. Conditions of storage shall be arranged so that the aggregate stockpiles are not contaminated, nor subject to deterioration.

The binder shall be heated at the plant to a temperature at which it can be properly handled by the pumping system. Any bitumen heated above 175°C, or held for more than 8 hours above 162°C shall be rejected and not used unless subsequent testing shows compliance with M/I specification. Polymer modified binder shall be handled and stored in accordance with the manufacturers recommendations.

Where the binder is penetration grade bitumen the aggregate shall not be heated above 135°C. The temperature at which the viscosity of the bitumen is 1 Pa.s shall be the mixing temperature. For polymer modified binders the mixing temperature shall be as recommended by the manufacturer.

The temperature of the Porous Asphalt mix discharging from the mixing plant shall not be more than 15°C above the mixing temperature and the average temperature of any truck load of mix measured at the plant shall be within  $\pm 10^\circ\text{C}$  of the mixing temperature.

7. **TESTING**

Samples of the Porous Asphalt shall be drawn from production lots and tested. Samples shall be taken in accordance with ASTM D979 or equivalent, and shall be obtained from the mixing plant.

The samples shall be tested for bitumen content and particle size distribution with test results falling within the mix control envelope, formed by applying the tolerances of Table 7.1 to the JMF.

Bitumen content shall be measured using the method of ASTM D2172 or approved alternative. Suitable alternatives include the solvent extraction method generally designated ADL 4.02/15a and Ignition using a furnace (ASTM D6307). Note that if the Ignition method is used, appropriate calibration offsets must be established.



**Table 7.1: Mix Control Envelope Tolerances**

Criteria	Permissible Variation from JMF (% by mass of total mixture)	
	Individual Results	Average of Three Consecutive Tests
Aggregate passing 4.75 mm and larger	± 5.0	± 3.0
Aggregate passing 2.36 mm	± 3.0	± 2.0
Aggregate passing 0.075 mm	± 2.0	± 1.0
Bitumen Content	± 0.5	± 0.4

**8. TACK COAT**

Where a general tack coat or membrane seal is required, the material and rate of application are defined in the "Specific Contract Requirements" section of this specification.

Vertical surfaces against which hot mix asphalt is to be placed shall not be tack coated.

**9. LAYING**

The open graded porous asphalt material shall, where practical, be spread and struck off with a self-powered and propelled paving machine capable of spreading and finishing the mix true to line, grade and cross-section without the use of forms or side supports. The paving machine shall be capable of laying courses in thicknesses as specified, and it shall be equipped with a suitably controlled screed heating device. The screed shall strike off the mix to the elevation and cross-section required and shall provide a smooth and uniform texture without segregation, tearing, shoving or gouging. Equipment that leaves tracks or indented areas that cannot be corrected in normal operation or which produce flushing or other permanent blemishes or fails to produce a satisfactory surface shall not be used.

No paving shall be carried out without the prior agreement of the Engineer of the method of construction to be used. The Contractor shall set out true line markings to be closely followed by the paver in constructing longitudinal joints and edges. The Contractor shall include in the Quality Plan a detailed paving plan to be followed by the paver. This shall include details on the procedure to be used to minimise stopping of the paver.

Segregation of materials shall not be permitted. If segregation occurs, the spreading operation shall be immediately suspended until the cause is determined and corrected. Any area of segregation that is not corrected prior to rolling shall subsequently be removed and replaced with material supplied and compacted to specification requirements by the Contractor at his own expense.

**10. COMPACTION**

**10.1 Equipment**

Rolling shall be carried out with tandem non-vibrating steel tyred roller or rollers weighing not less than 6 tonnes and exerting a load of not less than 2700 kg per metre of drive roll width.

The Contractor shall include in the Quality Plan details of the rollers and rolling procedures that will be used.

**10.2 Thickness and Surface Requirements**

The final surface shall be of a uniform texture conforming to the lines, grades and cross-sections shown on the plans. The roughness of the completed surface shall comply with the specific contract requirements.

Thickness shall be carefully controlled during construction and shall be in full compliance with plans and specifications. During compaction, preliminary tests as an aid for controlling the thickness shall be made by inserting a flat blade or spike, correctly graduated, through the material to the top of the previously placed base, or by other means acceptable to the Engineer.

Geometric design considerations excepted, no part of the finished surface shall deviate more than 5 mm from a 3 m straight edge lying under its own weight on the road surface parallel to or perpendicular to the road centreline.

Any irregularities that vary more than 5 mm from this straight edge longitudinally or transversely shall be corrected. Irregularities that develop before the completion of rolling shall be remedied by loosening the surface mix and removing or adding material as may be required. Should any irregularities, defects, surface projections or mismatched joints remain after final compaction, the material shall be removed promptly and sufficient new material laid to form a true and even surface.

To achieve a satisfactory finished surface it is essential that the pavement be checked regularly before and during the final compaction operation with the aid of a 3 m straight edge. The Contractor will be required to have such a straight edge on the site of the works and to use it in the control of the final rolling operation.

## 2.8 PERVIOUS PORTLAND CEMENT CONCRETE

### QUALITY ASSURANCE

Prior to award the contractor shall submit references with experience in performing pervious concrete paving work or history of two successful pervious concrete pavement projects including but not limited to the following:

1. Project name and address, owner name and contact information
2. Test results including density (unit weight), void content and thickness

This requirement may be waived by the owner provided the contractor can demonstrate successful experience in the concrete industry and constructs test panel(s) for inspection and testing.

At least one member or 30% of the crew should be certified by the ACI Certified Concrete Flatwork Finisher Program.

Special Equipment: Pervious concrete requires specific equipment for compaction and jointing. The pavement shall be jointed and compacted using the methods listed.

- A. Rolling compaction shall be achieved using a minimum 10-inch diameter steel pipe that spans the width of the section placed (and exerts a vertical pressure of at least 10 psi on the concrete).
- B. When joints are placed in pervious pavements, they may be constructed by rolling, forming or sawing. Rolled joints shall be formed using a "salt roller" to which a beveled fin with a minimum depth of  $\frac{1}{4}$  the thickness of the slab has been welded around the circumference of a steel roller. Sawed joints shall be constructed using an early entry or wet saw.

Submittals: Prior to commencement of the work the contractor shall submit the following:

- A. Concrete materials:
  1. Proposed concrete mixture proportions including all material weights, volumes, density (unit weight), water cement ratio, and void content.
  2. Aggregate type, source and grading.
  3. Cement, fly ash and admixture manufacturer certifications
- B. Qualifications: Evidence of qualifications listed under Quality Assurance.
- C. Project Details: Specific plans, details, schedule, construction procedures and quality control plan.
- D. Subcontractors: List all materials suppliers and subcontractors to be used on the Project.

Test Panels: Prior to construction, test panel(s) shall be placed and approved by the owner. The owner is permitted to waive this requirement based on contractor qualifications.

- A. Test panel(s) shall be constructed in accordance with the plans and specifications. A minimum of 225 sq. ft panel size shall be placed, jointed and cured using materials, equipment, and personnel proposed for the project.
- B. Test panel(s) cost and removal, if necessary, shall be included as a line item in the contract proposal and contract.
- C. Quality: Test panels shall have acceptable surface finish, joint details, thickness, porosity and curing procedures and shall comply with the testing and acceptance standards listed in the Quality Control section of this specification.
- D. If test panels placed at the site are found to be deficient in thickness, density (unit weight) or percentage of voids, or of an unacceptable appearance, they shall be removed at the contractor's expense and taken to an approved landfill or recycling facility. If test panels are found to be satisfactory, they may be left in-place and included in the completed work.

## PART 2 MATERIALS

Cement: Portland cement Type I or II conforming to ASTM C150 or Portland cement Type IP or IS conforming to ASTM C595.

Supplementary cementations Materials:

- A. Class F Fly ash conforming to ASTM C618
- B. Ground Iron Blast-Furnace Slag conforming to ASTM C989

Chemical Admixtures:

- A. Air entraining agents shall comply with ASTM C260.
- B. Chemical Admixtures shall comply with ASTM C494
- C. Hydration stabilizers are permitted to be used when the concrete producer deems them necessary.

Aggregates: Coarse aggregate shall comply with ASTM C33. Size 8 (3/8" to No. 16) or Size 89 (3/8" to No. 50) shall be used unless an alternate size is approved for use based on successful history or meeting the project requirements. Fine aggregate complying with ASTM C33, if used, shall not exceed 3 cu. ft. per yard.

Water: Water shall comply with ASTM C 1602.

Mixture Proportions: The composition of the proposed concrete mixtures shall be submitted to the owner's representative for review and/or approval and shall comply with the following provisions unless an alternative composition is demonstrated to comply with the project requirements.

- A. Supplementary cementations content: Fly ash: 25% maximum. Slag: 50% maximum
- B. Admixtures: Admixtures shall be used in accordance with the manufacturer's instructions and recommendations.
- C. Mix Water: The quantity of mixing water shall be established to produce a pervious concrete mixture of the desirable workability to facilitate placing, a compaction and finishing to the desired surface characteristics.

## PART 3 EXECUTION

Subgrade:

- A. Materials: The top 6 inches shall be composed of granular or gravelly soil that is predominantly sandy with no more than a moderate amount of silt or clay. Granular sub-base may be placed over the subgrade.
- B. Permeability: Subgrade shall have a minimum permeability of 0.5 inch per hour determined in accordance with ASTM D3385.
- C. Compaction: Compact sub-grade to a minimum 90% and a maximum 95%. Over-compaction can inhibit subgrade percolation. Compaction shall be in accordance with ASTM D1557.
- D. Fill: If fill material is required to bring the subgrade to final elevation, it shall be clean and free of deleterious materials. It shall be placed in 6-inch maximum layers, and compacted by a mechanical vibratory compactor to a minimum density of 90 and a maximum 95% in accordance with ASTM D1557.
- E. Moisture: The subgrade moisture content shall be 1% - 3% above optimum as determined by ASTM D1557.
- F. Verify subgrade preparation, grade, and conduct permeability & density tests for conformance to project requirements.

Formwork:

- A. Form materials are permitted to be of wood or steel and shall be of width to the depth of the pavement. Forms shall be sufficient strength and stability to support mechanical equipment without deformation of plan profiles following spreading, strike-off and compaction operations.

Forms may have a removable spacer of ¼” to ½” thickness placed above the depth of pavement. The spacers shall be removed following placement and vibratory strike-off to allow roller compaction.

#### Mixing and Hauling:

- A. Production: Pervious concrete shall be manufactured and delivered in accordance with ASTM C 94.
- B. Mixing: Mixtures shall be produced in central mixers or in truck mixers. When concrete is delivered in agitating or non-agitation units, the concrete shall be mixed in the central mixer for a minimum of 1.5 minutes or until a homogenous mix is achieved. Concrete mixed in truck mixers shall be mixed at the speed designated as mixing speed by the manufacturer for 75 -100 revolutions.
- C. Transportation: The pervious concrete mixture may be transported or mixed on site and discharge of individual loads shall be completed within one (1) hour of the introduction of mix water to the cement. Delivery times may be extended to 90 minutes when a hydration stabilizer is used.
- D. Discharge: Each truckload will be visually inspected for consistency of concrete mixture. Water addition is permitted at the point of discharge to obtain the required mix consistency provided a measurable quantity is used before more than 0.5 cubic yard of concrete is discharged, and the design w/c is not exceeded. A minimum of 30 revolutions at the manufacturer’s designated mixing speed shall be required following the addition of any water to the mix. Discharge shall be a continuous operation and shall be completed as quickly as possible. Concrete shall be deposited as close to its final position as practical.

#### Placing and Finishing:

- A. The contractor shall provide either slip form or vibratory form riding equipment to place the concrete unless otherwise approved by the Owner or Engineer in writing. Internal vibration shall not be permitted. Unless otherwise permitted placement procedures shall utilize a mechanical vibratory screed to strike off the concrete ¼” to ½” above final height, utilizing the form spacers described in Formwork.
- B. Placed concrete shall not be disturbed while in the plastic state. Low spots after the screening operation shall be filled up and tamped with hand tampers.
- C. Following strike-off, remove spacers and compact the concrete to the form level, utilizing a steel roller or other method approved by the Owner. Care shall be taken during compaction that sufficient compactive force is achieved without excessively working the concrete surface that might result in sealing off the surface porosity.
- D. Hand tampers shall be used to compact the concrete along the slab edges immediately adjacent to the forms. After compaction, inspection and repair, no further finishing shall be performed on the concrete. Surface curing shall begin immediately.
- E. The pervious concrete pavement shall be compacted to the required cross-section and shall not deviate more than +/- ½ inch in 10 feet from profile grade.

#### Jointing

- A. Control (contraction) joints shall be installed at regular intervals not to exceed 15 feet, or the width of the placement. The control joints shall be installed at ¼ the depth (to a maximum depth of 11/2”) of the thickness in pavement. These joints can be installed in the plastic concrete or saw cut after the concrete has hardened.
- B. Jointing plastic concrete: Joints installed in the plastic concrete shall be constructed utilizing a small roller as described in the Special Equipment section of this specification. When this option is used it shall be performed immediately after roller compaction and prior to curing.
- C. Jointing hardened concrete: Saw-cuts shall be made as soon as the pavement has hardened sufficiently to prevent raveling and uncontrolled cracking. Early entry sawing occurs later with pervious concrete than with conventional concrete. For either method, the curing cover shall be

- removed and the surface kept misted to prevent moisture loss. After sawing the curing cover shall be securely replaced for the remainder of the curing cycle.
- D. Transverse construction joints: Transverse construction joints shall be installed whenever placing is suspended for 30 minutes or whenever concrete is no longer workable.
  - E. Isolation joints: Isolation joints shall be used when abutting fixed vertical structures such i.e. light pole bases, building foundations, etc. Isolation material shall be positioned before concrete is placed and shall be the depth of the pavement section.

Curing:

- A. Curing procedures shall begin no later than 20 minutes after final placement operation have been completed. The pavement surface shall be covered with a minimum of six (6) mil thick polyethylene sheets or other approved covering material. The cover shall overlap all exposed edges and shall be secured to prevent dislocation due to winds or adjacent traffic conditions. For additional guidance on hot weather concreting, see ACI 305.
- B. The low water/cement ratio and high amount of exposed surface of pervious concrete makes it especially susceptible to drying out. Immediately after screening, the surface shall be kept moist and evaporation prevented.
- C. The curing cover shall remain securely in place for a minimum of 7 days. No vehicular traffic shall be permitted on the pavement until curing is complete and no truck traffic shall be permitted for at least 15 days. The owner has the option of permitting earlier traffic opening times.

Quality Control:

- A. The owner shall employ a testing laboratory that conforms to the requirements of ASTM E329 and ASTM C1077. All personnel engaged in testing shall be certified by the American Concrete Institute as ACI Concrete Field Technicians or equivalent.
- B. Traditional Portland cement pavement testing procedures based on strength and slump control are not applicable to this type of pavement material.
- C. Concrete tests shall be performed for each 150 cubic yards or fraction thereof with a minimum of one test for each day's placement.
- D. Plastic concrete shall be sampled in accordance with ASTM C 172 and density (unit weight) measured in accordance with ASTM C 138. The density (unit weight) of the delivered concrete shall be +/- 5 pcf of the design density (unit weight).
- E. Plastic void content shall be calculated as per ASTM C138, Gravimetric Air Determination and compared to the void percentage required by the Hydraulic design. Unless otherwise specified, Void content shall be at least 15%.
- F. Hardened concrete shall be tested at a rate of one set of three cores per 150 cy of concrete placed on one day or fraction thereof. The cores shall be drilled in accordance with ASTM C 42. The cores when measured for length shall not be more than ½ inch less than the specified design thickness.
- G. The cores shall be tested for density (unit weight) and void content using ASTM 140. Density (unit weight) shall be +/- 5 pcf of the design unit weight. Void content shall not be less than 15%. Void content shall be calculated as follows:  

$$\% \text{ Voids} = 1 - (Dd/Di) * 100$$
 Where: Dd=oven dried density of core  
 Di=immersed density of core

Basis of Payment

- A. Pervious concrete pavement shall be paid for based on the square yard.

I ROADWAY PAINTING

A. SCOPE OF WORK:

The scope of work consists of painting reflective traffic strips, including edge lines, to upgrade existing traffic markings, or initial painting applications on newly resurfaced roads in accordance with Section 710, and subsequent sections, of the current Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction.

B. MATERIALS:

1. Traffic Paint - The paint used for this work shall conform with the requirements of 971-12, or, at the contractor's option, fast dry traffic paint as specified in 971-13, may be used.
2. Glass Spheres (for reflective traffic paint) - Glass spheres shall conform with requirements of 971-14.

II THERMOPLASTIC

A. SCOPE OF WORK:

The scope of work consists of placing traffic stripes and markings by method of extrusion for upgrading existing markings and/or initial thermoplastic applications on newly resurfaced roads in accordance with Section 711 and subsequent sections of the current Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction.

III REMOVAL OF PAINT OR THERMOPLASTIC MARKINGS

A. SCOPE OF WORK:

Contractor to provide labor, equipment and material for the removal of pavement markings from various roadways to include edge lines, center lines, bike paths and symbols.

IV TRAFFIC CONTROL AND LANE CLOSURES

The Contractor shall provide all lane closures and all maintenance of traffic. The cost of traffic control and associated lane closures shall be included in the unit prices for the pavement marking services. The standards applicable to traffic control and lane closure shall be those minimum standards set forth by the Florida Department of Transportation as set forth in the FHWA Manual on Uniform Traffic Control Devices (MUTCD).

**SECTION 3. MINOR ASPHALT REPAIRS**  
**(SECTION B OF COMPENSATION SCHEDULE)**

This work consists of minor street repairs involving hot-mix asphalt patching due to pot holes appearing in the existing pavement and/or street repairs involving patching areas subject of utility work and drainage work wherein the street base is constructed by others up to the asphalt surface leaving the need to patch one to two inches of asphalt in depth. Quantities of work will be typically small and response shall be on a weekly basis.

- A. All items designated ‘Pot Holes’ shall consist of asphalt patching of City streets & alleys with plant-mixed mixture uniformly compacted followed by an asphalt ‘tack & fill’ to produce a level area. The basis of price and payment includes furnishing mixture, shaping the area to be patched, patching, compacting and MOT.
- B. All items designated ‘Utility Cut Patch’ shall be asphalt ‘tack & fill’ with a depth of up to two inches. Work in excess of two inches in depth shall be performed on a ‘time & material’ basis.

**SECTION 4. ROW REPAIRS/SIDEWALKS-ALLEYS-DRIVEWAY-ETC.**  
**(SECTION C OF COMPENSATION SCHEDULE)**

This work consists of right-of-way repairs involving the removal and replacement of the identified items of work. Unless this work is part of other maintenance activities, the quantities will typically be small and response shall be, at the minimum, on a monthly basis.

- A. The basis for price and payment of all #520 and #522 items shall be ‘remove and replace’.
- B. The basis for price and payment of all items under the #287 shall include the equipment, material and manpower for the removal and installation of the designated driveway area and/or the repair of concrete drainage structures.
- C. The basis for price and payment for items under #911, #913 & #901 shall include grading and compacting as necessary.

**SECTION 5. CONTRACT WORK – SPECIAL PROJECTS**  
**(SECTION D OF COMPENSATION SCHEDULE)**

This work consists of projects involving a substantial amount of work at a single location but not more than \$50,000 in expenditures per project. The projects can include landscape, street, sidewalk, driveway, drainage and/or utility work using both unit price items identified on the compensation schedule and other items with cost to be subject of ‘time & material’ pricing. Timing-scheduling of projects is not known and are anticipated to be performed on an as-needed-availability basis. In addition to these special projects, the City reserves the right to negotiate with the successful bidders additional capital improvement projects of an expanded scope with successful negotiations being subject of contract amendments with the City Manager having contract authority for executing such contracts with individual amendment not exceeding \$50,000.00.

**SECTION 6. TIME AND MATERIALS COST INFORMATION**  
**(SECTION E OF COMPENSATION SCHEDULE)**

This information is being requested for use by the City in determining the cost of work not included in the compensation schedules and for estimating the cost of contract services and project costs performed on a ‘time & material’ basis. This information will be taken into consideration in any contract award or awards under this annual compensation. In implementing work under a ‘time & material’ basis or under a ‘time & rate’ basis, the City reserves the right to furnish any minor materials and/or services should such action be in the City’s best



interest.

END OF EXHIBIT A

## EXHIBIT B

### BASIS OF COMPENSATION

As consideration for providing the Services as set forth in the Agreement, the CITY agrees to pay, and the CONTRACTOR agrees to accept payment on a time and reimbursement cost basis *[or other basis]* as follows:

#### COMPENSATION SCHEDULE

##### Section A – Street Maintenance/Resurfacing

Annual street maintenance typically begins in May of each year. The City will provide the Contractor a list of streets to be maintained, repaired, and reconstructed, as well as the method of maintenance or repair. **The total quantity of work given at any one time under Section A is not expected to be below 15,000 SY of area.** The City and Contractor shall quantify the work and determine price for the work based on the following rate schedule to be completed by the Contractor. **Contractors do not need to be qualified in all of the items described below, and in that case, a unit price is not required.**

Item	Description	Unit	UNIT PRICE
102-76	Arrow/Message Boards	ED	\$ 500.00
102-77	Hi-Intensity Lights	ED	\$ 350.00
110-2	Standard Clearing & Grubbing	SY	\$ 10.00
110-7	Existing Pavement Removal	SY	\$ 10.00
120-1	Excavation	CY	\$ 18.00
162-2	Topsoil (6")	SY	\$ 25.00
285-911	Limerock Base	TN	\$ 25.00
300	Bituminous Material (Tack Coat)		INCLUDE IN UNIT PRICES BELOW
2.1	Full Depth Reclamation 0" – 6"	SY	\$
2.1	Full Depth Reclamation 6" – 9"	SY	\$
2.1	Full Depth Reclamation 9" – 12"	SY	\$
916-4	Emulsion for Reclamation	GA	\$
2.2	Micro-Surface Single 18-22 lbs.	SY	\$
2.2	Micro-Surface Double 28-32 lbs.	SY	\$
2.4	Crack Fill / Sealing	GAL	\$
2.7	Porous Bituminous Asphalt Pavement (1.5")	TN	\$ 85.00
2.8	Porous Portland Cement Concrete Pavement (6")	SY	\$ 35.00
331-2.1	Asphaltic Concrete Leveling S-1	TN	\$ 80.00
331-2-2	Asphaltic Concrete Overlay Type III (1")	TN	\$ 80.00
331-2-2	Asphaltic Concrete Overlay Type III (1.5")	TN	\$ 80.00
327	Milling	SY	\$ 18.00
425-5	Manholes (Adjust)	EA	\$ 125.00
425-6	Valve Boxes (Adjust)	EA	\$ 50.00
425-8	Structures Miscellaneous (Adjust)	EA	\$ 2,500.00
520-1.10	Curb & Gutter (Concrete Type F)	LF	\$ 20.00
520-2.4	Curb (Concrete Type D)	LF	\$ 18.00
520-3	Valley Gutter - Hand form (Concrete)	LF	\$ 35.00
520-3.B	Valley Gutter - Slip Form (Concrete)	LF	\$ 30.00
121	Flowable Fill	CY	\$ 175.00
575	Sod - Bahia	SY	\$ 5.00
575	Sod - St. Augustine	SY	\$ 7.00

**Section B - Street Maintenance/Asphalt Repairs**

Item	Description	Unit	Unit Price
331	Pot Hole (max 5 SF area ea. location)	SF	\$ 500.00
331	Utility Cut Patch (1 - 10 SF ea. location)	SF	\$ 800.00
331	Utility Cut Patch (11 - 50 SF ea. location)	SF	\$ 500.00
331	Utility Cut Patch (50 - 250 SF ea. location)	SF	\$ 300.00
331	Utility Cut Patch (greater than 250 SF ea lo)	SF	\$ 200.00

**Section C - Right-of-Way Maintenance**

Item	Description	Unit	Unit Price
520-2.4.1	Type "D" Curb (1 - 50 LF)	LF	\$ 18.00
520-2.4.3	Type "D" Curb (Greater than 50 LF)	LF	\$ 15.00
520-1.10.1	Type "F" Curb & Gutter (1 - 50 LF)	LF	\$ 21.00
520-1.10.3	Type "F" Curb & Gutter (Greater than 50 LF)	LF	\$ 18.00
520-3.1.1	Valley Gutter (1 - 50 LF)	LF	\$ 35.00
520-3.1.3	Valley Gutter (Greater than 50 LF)	LF	\$ 30.00
522-1.1	Concrete Sidewalk 4" (1 - 50 SF)	SF	\$ 100.00
522-1.3	Concrete Sidewalk 4" (Greater than 50 SF)	SF	\$ 90.00
522-2.1	Concrete Sidewalk 6" (1 - 50 SF)	SF	\$ 125.00
522-2.3	Concrete Sidewalk 6" (Greater than 50 SF)	SF	\$ 115.00
287-1	Driveway Restoration - Concrete	SY	\$ 50.00
287-2	Driveway Restoration - Brick Pavers	SY	\$
121	Flowable Fill	CY	\$ 175.00
287-3	Driveway Restoration - Asphalt	SY	\$ 45.00
304	Detectible Warning on Curb Ramps (Handicap & Truncated Warning Dome – Brick Red)	SF	\$ 100.00
911-1	Alley Restoration - Limestone	TN	\$
913-1	Alley Restoration - Shell	TN	\$
901-1	Alley Restoration-Gravel (#57 or equivalent)	TN	\$

**Section D - Street Maintenance/Asphalt Repairs**

**Section Three - Special Projects:**

Special projects are emergency and/or time sensitive work performed on a time, material and unit cost basis to be negotiated between the City and Contractor. Each project shall not exceed \$50,000.

**Section E - Time and Material Only Cost Information:**

Item	Description	Unit	Unit Price
1	Supervisor/Foreman	Hour	\$ 65.00
2	Skilled Labor	Hour	\$ 60.00
3	Labor	Hour	\$ 55.00
8	Material Mark-up (Furnish Only)	%	20.00

GA = gallon, TN = ton, LF = linear feet, SY = square Yard, ED = each day, EA = each

**Section F – Pavement Markings:**

**I. PAINT**

1. Contractor to provide labor, equipment and materials for 15 mil reflective roadway paint to be applied on various roadways.

<b>Lines 15 mil</b>				
a.	6"	15 miles	LF	\$
		Under one (1) mile	LF	\$
		Over one (1) mile	LF	\$
b.	8"	15 miles	LF	\$
c.	12"	15 miles	LF	\$
d.	18"	15 miles	LF	\$
e.	24"	15 miles	LF	\$

<b>Symbols and Pavement Messages 15 mil</b>				
a.	Miscellaneous Paint		SF	\$

**SUBTOTAL SECTION I: \$**

**II. THERMOPLASTIC**

1. Contractor to provide labor, equipment and materials for thermoplastic markings to be applied on various roadways and/or intersections, to include symbols and pavement messages.

a.	60 miles		SF	\$
b.	90 miles		SF	\$

2. Contractor to provide labor, equipment and materials for thermoplastic markings to be applied on various roadways to include edge lines, centerlines, stop bars, crosswalks lanes, and bike paths.

<b>60 miles</b>				
a.	6"	60 miles	LF	\$
		Under one (1) mile	LF	\$
		Over one (1) mile	LF	\$
b.	8"	60 miles	LF	\$
c.	12"	60 miles	LF	\$
d.	18"	60 miles	LF	\$
e.	24"	60 miles	LF	\$

<b>90 miles</b>				
a.		90 miles	SF	\$
		Under one (1) mile	LF	\$
		Over one (1) mile	LF	\$
b.	8"	90 miles	LF	\$
c.	12"	90 miles	LF	\$
d.	18"	90 miles	LF	\$

e.	24"	90 miles	LF		\$
<b>SUBTOTAL SECTION II:</b>					\$

### III. REMOVAL OF PAINT OR THERMOPLASTIC MARKINGS

1. Contractor to provide labor, equipment and materials for the removal of pavement markings from various roadways to include edge lines, centerlines, bike paths and symbols.

a.	Paint	SF		\$
b.	Thermoplastic			
	60 miles	SF		\$
	90 miles	SF		\$

<b>SUBTOTAL SECTION III:</b>					\$
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### IV. Raised Pavement Markers (RPMs)

1. Contractor to provide labor, equipment, materials and required maintenance of traffic for the installation of raised pavement markers.

A. Permanent RPMs, raised, reflectorized. Maximum width 5" Mono-directional with one reflective face, one-color reflectors shall be available as Amber (Yellow), Crystal (White), or Red in the following quantities per Work Order:

a.	Less than 200	EACH		\$
b.	200 to 500	EACH		\$
c.	201 to 500	EACH		\$
d.	Greater than 1,000	EACH		\$

B. Permanent RPMs, raised reflectorized. Maximum width 5" two-color Bi-directional with two reflective faces, which shall be available in Amber (Yellow), Crystal (White), Red in the following quantities per Work Order:

a.	Less than 200	EACH		\$
b.	200 to 500	EACH		\$
c.	201 to 500	EACH		\$
d.	Greater than 1,000	EACH		\$

2	Removal of existing RPMs at the time of installation of new RPMs	EACH	\$
3	Furnish and Install Ceramic 6" disks with internal reflectors	EACH	\$
4	Furnish and Install traffic delineator pickets	EACH	\$
5	Night/week-end differential	%	\$

<b>SUBTOTAL SECTION IV:</b>				\$
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**Section G – Special/Additional Services**

Contractors offering specific additional services assisting in the performance of work,  
please provide the information here:

Item	Description	Unit	
	Service		\$
			\$
	Labor		\$
			\$
	Equipment		\$
			\$
	Material		\$
			\$

GA = gallon, TN = ton, LF = linear feet, SY = square Yard, ED = each day, EA = each

**END OF EXHIBIT B**

## EXHIBIT C

### GENERAL INSURANCE REQUIREMENTS

The Contractor shall not commence work until he has obtained all the insurance required under this heading, and until such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work until all similar insurance required of the subcontractor has also been obtained and approved by the Owner.

Certificates of insurance must be issued by an authorized representative of the insurance company at the request and direction of the policyholder and must include sufficient information so as to identify the coverage and the contract for Owner's improvements for which they are issued. Certificates of insurance must be issued by a nationally recognized insurance company with a Best's Rating of no less than B+VII, satisfactory to the Owner, and duly licensed to do business in the state of said Contract.

The Contractor shall procure and maintain, during the life of this Contract, Workmen's Compensation Insurance for all of his employees to be engaged in work under this Contract, and he shall require any subcontractor similarly to provide Workmen's Compensation Insurance for all of the latter's employees to be engaged in such work, unless such employees are covered by the protection afforded by the Contractor's insurance. In case any employees are to be engaged in hazardous work under this Contract, and are not protected under this Workmen's Compensation statute, the Contractor shall provide, and shall cause each subcontractor to provide, adequate coverage for the protection of such employees. It is acceptable to use a State-approved Workmen's Compensation Self-Insurance fund.

The Contractor shall take out and maintain during the life of this Contract, Public Liability and Property Damage and shall include Contractual Liability, Personal Injury, Libel, Slander, False Arrest, Malicious Prosecution, Wrongful Entry or Eviction, Broad Form Property Damage, Products, Completed Operations and XCU Coverage to be included on an occurrence basis, and to the full extent of the Contract to protect him, the Owner, and any subcontractor performing work covered by this Contract from damages for personal injury, including accidental death, as well as from claims for property damage, which may arise from operations under this contract, whether such operations be by himself or by a subcontractor, or by anyone directly or indirectly employed by either of them. The Contractor shall also maintain automobile liability insurance including "non-owned and hired" coverage. The entire cost of this insurance shall be borne by the Contractor.

The amount of such insurance shall be no less than \$1,000,000 annual aggregate for bodily injury and property damage combined per occurrence.

The City of Naples must be named as Additional Insured on the insurance certificate and the following must also be stated on the certificate. "These coverage's are primary to all other coverage's the City possesses for this contract only." The City of Naples shall be named as the Certificate Holder. The Certificate Holder shall read as follows:

The City of Naples  
735 Eighth Street South  
Naples, Florida 34102

No City Division, Department, or individual name should appear on the Certificate.  
No other format will be acceptable.

The Certificate must state the bid number and title.

When using the ACORD 25 – Certificate of Insurance only the most current version will be accepted.

The City of Naples requires a copy of a cancellation notice in the event the policy is cancelled. The City of Naples shall be expressly endorsed onto the policy as a cancellation notice recipient.

## EXHIBIT D

### CERTIFICATION OF COMPLIANCE WITH IMMIGRATION LAWS

The undersigned, is the \_\_\_\_\_ of **C.W. Roberts Contracting, Inc.** and hereby certifies to the following:

1. The CONTRACTOR is in full compliance with all provisions of the Immigration Reform and Control Act of 1986 ("IRCA"), as well as all related immigration laws, rules, regulations pertaining to proper employee work authorization in the United States.

2. The undersigned has verified that the CONTRACTOR has obtained and maintains on file, and will continue to obtain and maintain on file, all documentation required by law, including but not limited to, Form I-9, Employment Eligibility Verification, for all persons employed by or working for the CONTRACTOR in any capacity on any project for the City of Naples (CITY). All such persons have provided evidence of identity and eligibility to work to the CONTRACTOR in accordance with the IRCA and related law. The undersigned hereby affirms that no person has been or will be employed by the CONTRACTOR to work on projects for the CITY who is not authorized to work under law. The undersigned further affirms that the CONTRACTOR's files will be updated by written notice any time that additional employees work on projects for the CITY.

3. The CONTRACTOR will have its contractors, subcontractors, suppliers and vendors who are involved in projects for the CITY to sign a written acknowledgment that they too are in compliance with immigration law. It is understood that failure to do so could result in the CONTRACTOR being liable for any violation of the law by such third parties.

4. The CONTRACTOR will fully cooperate with and have its contractors, subcontractors, suppliers and vendors to fully cooperate with, all inquiries and investigations conducted by any governmental agency in connection with proper compliance with the laws pertaining to appropriate work authorization in the United States.

5. The undersigned, on behalf of the CONTRACTOR, acknowledges that this Certification may be relied upon by the CITY, its officers, directors, employees, and affiliates or related persons and entities.

6. If it is found that the CONTRACTOR has not complied with the laws pertaining to proper employment authorization, and any legal and administrative action ensues against the CITY, the CONTRACTOR will indemnify, defend and hold the CITY harmless along with their officers, directors, employees, and affiliated or related persons and entities.

7. The CONTRACTOR acknowledges that the CITY by their authorized representatives shall have the right, at any time, upon 24 hours notice, to examine the CONTRACTOR's books and records to confirm that the CONTRACTOR is in compliance with the terms of this certification.

Executed this \_\_\_\_\_ day of \_\_\_\_\_, 2012.

By: \_\_\_\_\_



**ACKNOWLEDGMENT**

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

SWORN TO AND SUBSCRIBED before me this \_\_\_\_\_ day of \_\_\_\_\_, 2012.

The Affiant, \_\_\_\_\_, is [ ] personally known to me or [ ] has produced \_\_\_\_\_ as identification, which is current or has been issued within the past five years and bears a serial number of other identifying number.

\_\_\_\_\_  
Print Name:

\_\_\_\_\_  
NOTARY PUBLIC - STATE  
OF \_\_\_\_\_

Commission Number: \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

(Notary Seal)

**EXHIBIT E**

**WORK ORDER**

Agreement for City of Naples, Professional Services, Dated \_\_\_\_\_, 2012 (IFB 009-12 – Pavement Maintenance Striping and Repair Services)

This Work Order is for Professional Services for work known as:

Project Name:

Project No:

The work is specified in the proposal dated \_\_\_\_\_, 2012 which is attached hereto and made a part of this Work Order. In accordance with Terms and Conditions of the Agreement referenced above, this Work Order is assigned to:

Scope of Work: As detailed in the attached proposal and the following:

- \* Task I -
- \* Task II-
- \* Task III-

Schedule of Work: Complete work within \_\_\_\_\_ days from receipt of the Notice to Proceed which is accompanying this Work Order.

Compensation: In accordance with Article Five of the Agreement, the Owner will compensate the Firm in accordance with the following method(s):  Negotiated Lump Sum  Lump Sum Plus Reimbursable Costs  Time & Material (negotiated hourly rate)  Cost Plus Fixed Fee, as provided in the attached proposal. (define which method will be used for which tasks)

Task I -	\$
Task II-	\$
Task III-	\$
<b>TOTAL FEE</b>	\$ _____

Any change made subsequent to final department approval will be considered an additional service and charged

according to negotiated hourly rates.

PREPARED BY:

\_\_\_\_\_  
<Name> , <Title>

DATE:

APPROVED BY:

\_\_\_\_\_  
<Name> , <Title>

DATE:

APPROVED BY:

\_\_\_\_\_  
<Name> , <Title>

DATE:

ACCEPTED BY

\_\_\_\_\_  
<Name> , <Title>

DATE: