SECTION 02500 – PAVING AND SURFACING……20 Pages

PART 1 - GENERAL

1.01 Summary

A. Scope: This section covers all work involved in the installation of new pavement, sidewalks, and curbs, and the repair and replacement of existing streets, roads, highways, drives, parking areas, curbs, gutters, sidewalks, and other paved areas damaged or destroyed during construction.

B. Related Sections: Related Work Specified in the following Section

1. Section 02100 Subgrade Treatment
2. Section 02220 Trenching, Backfilling and Compaction for Utilities
3. Section 04950 Preservation Seal

1.02 References

A. Codes, specifications, and standards referred to by number or title shall form a part of this specification to the extent required by the reference thereto. Except as specifically modified in this specification, paving and surfacing operations, materials and testing will comply with the most current revisions of applicable sections per the latest version of the Indiana Department of Transportation Standard Specifications.

1.03 Definitions

A. Abbreviations

1. INDOTSS Indiana Department of Transportation's Standard Specifications
2. AASHTO American Association of State Highway & Transportation Officials
3. ACI American Concrete Institute
4. ASTM American Society for Testing & Materials
5. NRMCA National Ready-Mix Concrete Association
6. HMA Hot Mix Asphalt
7. PCCP Portland Cement Concrete Pavement

A. Rock: A natural aggregate of mineral particles connected by strong and permanent cohesive forces. Rock includes limestone, sandstone, dolomite, granite, marble, and lava.

B. Subgrade: The prepared and compacted soil immediately below the pavement or sidewalk system and extending to such depth as will affect the structural design.

C. Subbase: The layer of specified or selected material of designed thickness placed on a subgrade to support a base course and surface course.

D. Base Course: The layer of specified or selected material of designed thickness placed on a subbase to support an intermediate or surface course.

E. Intermediate Course: The layer of specified or selected material of designed thickness placed on a base course to support a surface course.

F. Surface Course: The layer of specified or selected material of designed thickness placed on a subbase, base course or intermediate course to support the traffic load.

G. Preservation Seal: The penetrating asphalt seal for HMA courses, in accordance with Section 04950 – Preservation Seal.

1.04 Quality Assurance

A. The Developer/Contractor shall employ, at the request of the Town of FRANKTON or designee and pay for the services of an independent testing laboratory (unless otherwise noted) to perform specific services and necessary field density tests. The Developer/Contractor shall demonstrate to the Town of FRANKTON or designee that proper compaction has been obtained and proper asphalt and concrete mix designs are following the specifications.

B. Mixing Plant: Prior to placing any HMA pavement or PCCP, the Contractor shall provide the Town of FRANKTON or designee the name and location of the HMA or concrete mixing plant and the type and composition of mixes the Contractor proposes to use in the work.

C. Paving and surfacing shall comply with the tolerances specified in INDOTSS 401, 402, 501 and 502.

1. Subgrade and subbase shall be within 1/2 inch of dimensions indicated on drawings.
2. HMA base shall not vary longitudinally more than 1/4 inch from a 10-foot straightedge. HMA and PCCP surfaces shall not vary more than 1/8 inch from a 10-foot straightedge.

3. Finished surface shall be within 1/4 inch of dimensions indicated on drawings. (The cross slope of the street can be checked by dividing 0.02' by the lane width to get the slope tolerance.)

D. HMA and PCCP shall be installed by a contractor whose prime business is HMA or PCCP paving.

1.05 Project Conditions

A. Do not place paving and surfacing materials on a wet surface, pumping subbase or when weather conditions would prevent the proper construction of paving and surfacing.

B. Do not place aggregates on frozen subgrade or subbase. Do not place aggregates when ambient air temperature is below 35 degrees F.

C. Asphalt materials are to be placed in accordance with INDOTSS 402 and 406.05.

D. When air temperatures are at or below 35 degrees F, an admixture is required to be added to the concrete to prevent freezing.

E. Do not place paving and surfacing materials when natural light is not sufficient to properly observe work or operations.

1.06 Grade Adjustments of Existing Structures

A. When grade adjustment of existing structures is required, the manhole frames, covers and gratings, and the gas and water valve boxes and covers, shall be removed and reconstructed to grade as required.

B. On resurfacing work, the castings and boxes shall be adjusted to grade after the last intermediate course has been laid and before placing the surface course.

C. All castings, frames and valve boxes adjusted to grade shall be done in advance of the final paving and shall be paid for by the Contractor as part of the project.

1.07 Contractor's Organization

A. The Contractor shall be a firm whose prime business is HMA or PCCP paving. The Contractor shall have a competent supervisor on the site during the progress of the work, acting for the Contractor in all matters concerning the work. He shall have the authority to receive directions and act upon them for the Town of FRANKTON or designee.

B. The Contractor shall keep a set of Plans and Specifications available on the site and in good condition.

1.08 Traffic Control

A. The Developer's Engineer shall plan construction operations so that existing local traffic access can be maintained. During the construction, the Contractor will also maintain appropriate use of barricades, lights, flagmen and other protective devices, whether specified for the project or required by the local governing authority. Traffic control devices used for maintenance of traffic shall comply with the latest version of the Indiana Manual on Uniform Traffic Control Devices.

PART 2 - PRODUCTS

2.01 Aggregate

A. Coarse aggregates shall comply with INDOTSS 904.03. Fine aggregates shall comply with INDOTSS 904.02.

2.02 Asphalt Materials

A. Asphalt materials for binder shall consist of:

1. PG Binder, grade PG 64-22 (or adjusted for recycled materials).
2. Materials shall conform to INDOTSS 902.01.

B. Asphalt materials for tack coat shall consist of:

1. Asphalt emulsion - AE-T.
2. Materials shall conform to INDOTSS 902.01.

C. Asphalt materials for seal coat shall consist of:

1. Asphalt emulsion - RS-2, AE-90, AE-150, HFRS-2.
2. Materials shall conform to INDOTSS 902.01.

D. Asphalt materials for joint adhesive shall consist of:

1. Asphalt emulsion – SS-1h or AE-NT.

2. Materials shall conform to INDOTSS 902.01.

2.03 Hot Mix Asphalt (HMA)

A. Hot mix asphalt (HMA) shall consist of an intimate mixture of coarse aggregate, fine aggregate (including mineral filler if required), and asphalt binder or emulsion combined in proportions specified in INDOTSS 401 and 402.

B. When the use of one type or source of aggregate or binder is started, the use of that same type or source shall be continued for the entire lift being constructed, unless otherwise directed by the Town.

C. The use of recycled materials shall conform to INDOTSS 401 and 402.

D. Preparation of HMA mixtures shall comply with the requirements of INDOTSS 401 and 402.

2.04 Portland Cement Concrete (PCC)

A. Cement shall be Portland cement and shall meet the requirements of ASTM Specification C 150, ACI 301, and ACI 318. Cement shall be Type 1 for normal use, Type 1A where air entrainment is desired, or Type III or Type IIIA where high early strength is desired and authorized by the Town. Blended hydraulic cements which meet the requirements of ASTM Specification C 595 Type 1P Portland pozzolan cement may be used where a more watertight concrete is required. Fly ash may also be used as a partial cement replacement for Types 1 or 1A. Cement shall meet requirements specified in INDOTSS 901.

B. Regular fine and coarse aggregates shall meet the requirements of ASTM Specification C 33. Aggregate shall be crushed limestone with a maximum size of 3/4 inch, except in mass concrete the maximum size may be 1-1/2 inches.

1. Lightweight fine and coarse aggregates shall meet the requirements of ASTM Specification C 330.
2. Insulating fine and coarse aggregates shall meet the requirements of ASTM Specification C 332.

C. Water shall be potable, clean, and free from injurious amounts of oils, acids, alkalis, organic materials, or other substances that may be deleterious to concrete or steel. A maximum of 500 mg/L of chloride ion may be present in the water.

D. Air entraining admixtures shall meet the requirements of ASTM Specification C 260.

1. Water reducing and retarding admixtures shall meet the requirements of ASTM C494, Type A or Type D; however, they shall contain no chlorides, be nontoxic after 30 days and compatible with the air entraining admixtures. The amount of admixture added to the concrete shall be in accordance with the manufacturer's requirements. Furnish a compliance statement that the admixture used satisfies all requirements of this specification. Evidence that the admixture is included in the approved list of the INDOTSS Division of Materials and Tests, in accordance with INDOTSS 912.03, will satisfy the requirement for a compliance statement.
2. Fly ash shall meet the chemical and physical requirements of ASTM C 618 for mineral admixture Class F, except loss on ignition shall not exceed 6%. Fly ash shall be sampled and tested in accordance with ASTM C 311 prior to use.

E. Reinforcing steel shall meet the requirements of ASTM Specification A 615, Grade 60.

1. Welded wire fabric or wire mesh shall meet the requirements of ASTM A 185.
2. Reinforcing steel and appurtenances shall follow INDOTSS 910.01.

F. Preformed expansion joint filler shall meet the requirements of ASTM Specification D 1752, Type III.

1. Flexible foam expansion joint filler will not be allowed for general use in the Town of FRANKTON. Prior written approval must be obtained before this material can be used. If used without written approval from the Town of FRANKTON, the concrete shall be removed and replaced with expansion joint material approved by the Town.
2. Hot-poured elastic joint filler shall meet the requirements of ASTM Specification D 1190.
3. Waterproof expansion joint filler shall meet the requirements of ASTM Specification D 1850.
4. Joint materials specified in INDOTSS 906 may be used, approved by the Town.

G. Concrete pavement shall be wet cured by using burlap, waterproof blankets, or ponding; or by using a membrane compound. If the membrane method is used, the compound shall be Type 2, complying with AASHTO M148 for white pigmented compound. A pressure sprayer capable of applying a continuous uniform film to the pavement surfaces will be required.

H. Concrete for drives shall be within $^{1}/_{4}$ inch of the thickness specified, be reinforced with 6x6 - W2.9 / W2.9 welded wire fabric and have tooled control joints at 12' maximum spacing. Tooled control joints shall be 1/8-inch-wide and 11/8 inch deep.

I. Dowel bars shall be smooth, round bars of plain billet steel conforming to ASTM A615, Grade 40, and free of any deformation or foreign material that would restrict slippage in concrete. Dowel bars shall be coated as required by INDOTSS. For expansion joints, each bar shall be provided with a metal cap, or approved plastic cap, on one end that will provide for ample movement of the slabs.

1. Dowel bars and assemblies shall conform to the requirements of INDOTSS 503.04.

J. Concrete base shall meet the requirements of INDOTSS 305.

K. Reinforced concrete pavement shall meet the requirements of INDOTSS 502.

L. Reinforced concrete for sidewalks and steps shall meet the requirements of INDOTSS 604.

M. Reinforced concrete for curbing shall meet the requirements of INDOTSS 605.

2.05 Underdrains

A. Refer to Section 02710 - Underdrain Systems.

PART 3 - EXECUTION

3.01 General

A. The Contractor is responsible to provide equipment, workmanship and materials required to achieve a finished product that meets these specifications.

B. Use compaction equipment suitable to the material being placed. Compacting equipment shall include at least one piece of equipment capable of providing a smooth even surface on the pavement surface course.

C. Prior to placing paving and surfacing materials, shape subgrade as required to produce finished pavement grades and cross-sections shown on drawings.

D. Do not place paving and surfacing material before subgrade is reviewed (proof roll) and accepted by the Town of FRANKTON or designee. Do not place paving and surfacing materials on a frozen or muddy subgrade.

E. Compact subgrade to not less than 100% of its maximum density as determined in accordance with AASHTO T99.

F. Always provide adequate drainage to prevent water from standing on subgrade, pavement or sidewalks.

G. Apply preservation seal to asphalt courses in accordance with Section 04950 – Preservation Seal, if requested by the Town.

3.02 Subgrade

A. The subgrade material and testing shall comply with INDOTSS 207, before placement of subbase.

3.03 Subbase Preparation

A. Provide 8 inches of crushed aggregate subbase in locations where pavement is to be placed on a material other than Structure Backfill. Subbase shall meet the requirements of INDOTSS 302. Pea gravel, or rounded aggregate is not an approved material for subbase or base material.

3.04 Aggregate Base, Surface or Shoulders

A. Aggregate base, surface, or shoulders shall consist of crushed aggregate. The aggregate type shall be suitable for the area in which the project is located. The aggregate thickness shall be as shown on the drawings and as specified herein.

B. Compacted aggregate materials and construction shall conform to INDOTSS 303.

C. If the required thickness of the aggregate exceeds 4 inches, the material shall be placed and compacted in separate lifts, no more than 6 inches of compacted depth.

D. If spreading devices are used which will ensure proper depth and alignment, forms will not be required; otherwise, forms shall be required. Forms shall be of wood or steel, adequate in depth, straight, of uniform dimensions and equipped with positive means for holding the form ends rigidly together and in line. Segregation of material shall be avoided by any spreading method used. No payment will be made for aggregate placed beyond the dimensions shown on the drawings.

E. Compact material in each lift after material is spread and shaped. Compact material to not less than 100% of maximum dry density as determined by AASHTO T99. Use construction procedures, including enough wetting and number of passes, to ensure specified density is attained.

F. The Contractor shall employ an independent testing laboratory to perform field density tests to demonstrate proper compaction of aggregate.

G. In a brick surfaced street, unless specifically excepted and pending the structural adequacy of any remaining brick, the Contractor may remove all brick and enough base material to allow full width repaving using either HMA or PCCP. If

   providing an HMA base and HMA intermediate for the full depth of the brick across a trench, overlay the entire street with 1.5 inches of HMA surface over geotextile.

H. When placing HMA over existing concrete pavement, the existing pavement shall be stable and true to line and grade. This may require cracking and seating, or removal of some sections to stabilize the subgrade, placement of a wedge and level course or other means and methods approved in writing by the Town of FRANKTON. After the existing pavement determined to be acceptable (with or without treatments) the entire street will receive a minimum of 1.5-inch HMA surface over geotextile.

I. Unless otherwise shown on the drawings, the minimum concrete section shall be: 6 inches of 4,000 psi concrete, over 6 inches of compacted aggregate No. 53, over treated subgrade.

J. Unless otherwise shown on the drawings, for a street with a brick base and an asphalt surface, the replacement section shall be full depth asphalt from the bottom of the brick base to the top of the asphalt surface. The top 1.5 inches shall be HMA surface.

K. Unless otherwise shown on the drawings, for a street with a concrete base and an asphalt surface, the replacement section shall be a new concrete base, not less than 6 inches thick with HMA base to within 1.5 inches of the existing grade and then 1.5 inches of HMA surface.

L. Unless otherwise shown on the drawings, chip and seal pavements shall have 8 inches of compacted aggregate No. 53 base and 1-inch processed asphalt coated aggregate pavement placed and rolled.

M. Unless otherwise shown on the drawings, aggregate pavement shall be replaced with 6 inches of compacted aggregate No. 53.

3.05 Asphalt Milling

A. Milling shall produce the line and grade necessary to provide a uniform platform and required elevation for subsequent HMA courses. Prior to milling, areas for patching shall be marked and repaired to within 1.5 inches of the new surface elevation. The existing pavement shall be cut to provide a vertical face of 1.5 inches for the termini of the new pavement. Milling shall comply with INDOTSS 306.

3.06 Hot Mix Asphalt (HMA)

A. This work shall consist of constructing one or more courses of HMA base, intermediate, wedge leveling, and/or surface mixtures on a prepared foundation in accordance with these specifications and in reasonably close conformance with the lines, grades, thicknesses, and typical cross sections shown on the plans or established by the Town.

1. If the required finished depth of any course is to exceed four times the top size of the aggregate used as shown by actual screen analysis, the course shall be constructed in two or more lifts, as directed.
2. Mix type shall be as indicated on the drawings, without exception, unless otherwise approved in writing by the Town.
    a. Job mix formulas shall be prepared and submitted for approval in accordance with INDOTSS 401 and 402. The job mix formula shall include standard asphalt mixture information including, but not limited to, aggregate gradation, binder content, maximum specific gravity, and air voids.
3. Materials and construction requirements shall comply with the requirements of INDOTSS 401 and 402.

B. Place and spread HMA with proper paving equipment. In areas inaccessible to a paving machine, place and spread HMA by other acceptable mechanical or hand methods.

C. Tack coat shall be placed on ALL horizontal and vertical existing asphalt or concrete surfaces before a new lift of HMA material is added. Apply tack coat uniformly at a rate of 0.06 gallon per square yard (0.000252 ton per square yard), resulting in a minimum of 90% coverage. If spray bar does not provide complete coverage, the tack coat operation shall be stopped until the equipment can produce the required coverage. If the equipment cannot produce the required coverage in a single pass, a second pass may be allowed or required, at the discretion of the Town of FRANKTON. The tack material shall be allowed to cure over approximately 90% of the surface area before paving operations can begin.

1. Patch and clean existing surface. The surface shall be free of irregularities and provide a reasonably smooth and uniform surface to receive the tack coat. Remove and replace unstable corrugated areas with suitable patching materials.
2. Tack coat shall be placed in accordance with INDOTSS 406.

D. Placement and compaction of HMA shall conform to INDOTSS 401 and 402.

E. Place HMA used for wedging or leveling, approaches, and/or feathering by mechanical methods or acceptable hand methods for placing and spreading in accordance with INDOTSS 610.

F. HMA Surface shall be 9.5mm surface mix unless approved in writing by the Town of FRANKTON.

G. Hot poured joint adhesive shall be applied to all construction joints and longitudinal joints on new HMA pavement in accordance with INDOTSS 401.15.

H. HMA pavement that is subject to regular flooding or HMA pavement not covered by HMA surface for a period of six (6) months or longer, or if surface is not anticipated to be place prior to November 1 of the current year, shall be treated with a preservative sealer (Reclamite or approved equal), selected by the Town of FRANKTON, paid for by the Contractor.

3.07 Seal Coat and Covering Aggregate (Chip and Seal)

A. Seal coat and covering aggregate shall conform to INDOTSS 404.

3.08 Portland Cement Concrete Pavement (PCCP)

A. PCCP shall consist of a coarse aggregate base and a reinforced or unreinforced Portland cement concrete surface, as shown on the drawings.

1. Compacted aggregate No. 53 shall be used for subbase, unless otherwise shown or specified.
2. Pavement cross-section shall be as shown on drawings.

B. Where an aggregate base course is shown or specified, it shall be constructed in accordance with Article 3.04 of this specification.

C. PCCP operations and materials shall comply with INDOTSS 502 unless otherwise specified by the Town.

1. Alternate equipment to that specified in INDOTSS 502 shall be allowed if line, grade, surface, smoothness and other requirements of the specifications are met.

2. Expansion and contraction joints shall be installed as indicated on the drawings or as required by INDOTSS. Expansion joints shall be required whenever new concrete abuts fixed objects or existing concrete surfaces, whether shown on the drawings.
3. Keyway construction, load transfer devices, tie bars and slab and ear reinforcement shall be installed as indicated on the drawings.
4. Unless otherwise shown on the drawings, finishing and curing the concrete pavement shall conform to INDOTSS 504.
5. The Contractor shall always have materials available to protect the surface of concrete against rain. These materials shall consist of burlap, curing paper or plastic sheeting.
6. New concrete pavement shall be protected by the Contractor until opening to traffic is approved by the Town. It shall not be opened to traffic until the field-cured concrete has attained a flexural strength of 550 psi, or a compressive strength of 6,000 psi. If such tests are not conducted, the pavement shall not be opened to traffic until 14 days after the concrete was placed. Before opening to traffic, the pavement shall be cleaned, and permanent lane markings applied to the pavement.

3.09 Sidewalks

A. Sidewalks shall consist of a coarse aggregate base and a concrete pavement. Use compacted aggregate No. 8 or No. 53 as base, unless otherwise shown. Concrete shall be Class "A", 4,000 psi concrete conforming to INDOTSS 702.

B. The minimum width for sidewalks shall be 5 feet.

C. Base shall be 4 inches thick, and concrete shall be 4 inches thick, unless crossing driveways, where the concrete will be the same thickness of the adjacent concrete drive, a thickness equivalent to the existing HMA drive, or 6 inches thick, whichever is greater.

D. Compact base to not less than 95% of maximum dry density, as determined in accordance with AASHTO T99.

E. Proportion, mix, and place concrete as specified in INDOTSS 604 and 702. Sidewalks shall have a coarse broom finish. Edge all outside edges of sidewalk and all joints with a $^1/_4$-inch radius edging tool.

F. Unless otherwise shown on the drawings, sidewalks shall be divided into sections not more than five feet in length by grooved joints formed by a jointing tool with a $^1/_4$-inch radius.

G. Form construction joints around all abutting structures and appurtenances such as manhole, utility poles, hatches, and hydrants. Install $^1/_2$-inch-thick pre-molded expansion joint filler in construction joints. Expansion joint material shall extend for the full depth of the sidewalk.

H. If existing sidewalk is to be removed and replaced with new sidewalk or new sidewalk extended from existing sidewalk, the existing sidewalk shall be sawcut full depth and removed at the nearest joint of suitable quality or as directed by the Town of FRANKTON.

I. Ramps shall meet the requirements of INDOT standard drawings and Public Right-of-Way Accessibility Guidelines.

3.10 Curbs

A. The construction of curbs, combination curb and gutter, and integral curb and gutter shall be in accordance with these specifications and as shown on the plans and shall be within $^1/_4$ inch of the lines and grades shown on the plans. (The cross slope of the street can be checked by dividing 0.02’ by the lane width to get the slope tolerance.)

B. Excavation for curbs shall be made to the required depth, and the subgrade or base upon which the curb is constructed shall be compacted to a firm, even surface to not less than 95% of maximum dry density as determined in accordance with AASHTO T99.

C. Concrete for curbs shall be Class A, 4,000 psi conforming to INDOTSS 702.

D. The curbs shall be constructed using wood or metal forms; or the curb may be constructed using a curb slip form machine. Forms, if used, shall be straight, free from warped or bent sections, and shall extend for the entire depth of the curb and shall be securely held in place so that no deviation from alignment and grade will occur during placement of concrete. The concrete shall be consolidated by vibration or other acceptable methods. The top of the curb shall be floated smooth and the top outer corner rounded to a $^1/_4$-inch radius.

E. The face, top, and gutter of curbs shall not have deviations or irregularities of more than $^1/_4$ inch when checked with a 10-foot straightedge. Curb inlets shall be placed $^1/_4$ inch lower than the adjacent gutter elevation.

F. Joints shall be placed at 10-foot intervals, unless otherwise shown or directed the Town. The joint shall be uniform, of 1/8 to 1/4 inch in width, and to a depth of approximately 2-1/2 inches. The joint may be formed using concrete tools, saw cut or formed by approved removable strips providing a straight joint at right angles to the length of curb. Expansion joints shall be filled with joint sealant. Expansion joints shall be formed around all abutting structures such as inlets.

G. As soon as possible after placing and finishing of concrete, the curbing shall be moistened and kept moist for three days or cured with the use of a specified membrane compound.

H. If existing curb is to be removed and replaced with new curb or new curb extended from existing curb, the existing curb shall be sawcut full depth and removed to the nearest joint.

I. During the placement of new concrete curb, utility marking shall be embossed into the top of the curb. The marking shall be a 2" high letter stamped into the concrete before the concrete sets up. The letters shall be located perpendicular from the utility feature that is being marked.

1. The letters shall be as follows:

G = Gas

C = Conduit

SS = Sewer Service Lateral

MH = Manhole Behind Curb

W = Water

V = Water Valve

SD = Subsurface Drain

ST = Storm

J. Apply a clear deep penetrating sealer to all new concrete curbs and gutters.

K. Curb installed within 15 feet of a corner or stop sign shall be painted with standard yellow traffic paint and coated with Silica sand at the rate of 6.0 lb./gal. while the paint is still wet, in accordance with INDOTSS 808.06.

3.11 Lane Striping

A. Lane striping is to be in accordance with all applicable standards of INDOTSS 808 and the construction plans.

B. Material for pavement markings shall be thermoplastic on HMA pavement or multi-component on Concrete pavement.

C. Contractor will clean the new pavement surface to remove all dust, dirt, mud and debris prior to striping.

3.12 Testing for Hot Mix Asphalt (HMA)

A. At the discretion of the Town of FRANKTON, the Developer/Contractor shall employ and pay for the services of a competent independent testing laboratory to take cores at selected locations and perform described tests. Compaction requirements for HMA mixtures placed in accordance with INDOTSS 402 shall be controlled by in place density determined from cores cut from the compacted pavement. A minimum of two cores per section shall be cut for each course of each material or as directed by the Town of FRANKTON. Sections are defined as a maximum of 1041 tons of HMA base or intermediate or 624 Tons of HMA surface. The transverse core location shall be located so that the edge of the core will be no closer than 3 inches from a confined edge or 6 inches from a non-confined edge of the course being placed.

B. For compaction of HMA mixtures with quantities less than 104 tons per day, acceptance may be visual as determined by the Town.

C. The Contractor along with their independent testing lab representative shall obtain cores in the presence of the Town of FRANKTON with a device that shall produce a uniform 6 inches in diameter pavement sample. Each HMA course shall be cored within one workday of placement. Damaged core(s) shall be discarded and replaced with a core from a nearby location as selected by the Town.

D. The Contractor, in the presence of the Town of FRANKTON, shall mark the core to define the course to be tested. If the defined area is less than 1.5 times the maximum particle size, the core will be discarded and a core from a new random location will be selected for testing as determined by the Town. Within one workday of coring operations the Contractor shall clean, dry, refill and compact the core holes with HMA of the same mix type as the surrounding surface. Cold mix asphalt repair or cold patch is not acceptable.

E. The Contractor's testing lab representative shall take immediate possession of the cores. If the cores are subsequently damaged, additional coring within the specific section(s) will be required at locations to be determined by the Town of FRANKTON.

F. Each core shall be tested within one workday of coring operation to determine thickness, bulk specific gravity, aggregate gradation and binder content. Test results shall then be transmitted either verbally or by other means to both the Contractor and the Town of FRANKTON for verification before each subsequent HMA lift is placed.

1. Average thickness of the cores shall not vary from the plan thickness more than 0.5 inches for HMA base and intermediate course(s) and 0.25 inches for HMA surface course(s) for acceptance in accordance with INDOTSS 105.03.
2. The bulk specific gravity shall be determined in accordance with AASHTO T166 or AASHTO T 275. The in-place density of a section for a mixture shall be expressed as:

Density % = (BSG/MSG) * 100

Where:

BSG = bulk specific gravity as determined from independent testing laboratory

MSG = maximum specific gravity as reported on job mix formula.

3. The calculated density of the cores shall not be less than 90% nor more than 96% as set out above. Test results which are outside stated limits shall be considered and adjudicated as a failed material in accordance with INDOTSS 105.03.

G. The Contractor's independent testing laboratory representative shall determine the aggregate gradation and binder content of the core samples in accordance with ITM 571. Aggregate gradation shall be within tolerances set forth in INDOTSS 402.04 and binder content shall be within ±0.5 percent from the job mix formula. Test results which are outside the stated limits shall be considered and adjudicated as a failed material in accordance with INDOTSS 105.03.

H. If core testing fails, the Contractor is to remove and replace with new HMA.

I. A copy of all core test results shall be submitted to the Town for verification of specification compliance within one calendar week of core testing.

3.13 Testing for Concrete

A. The Contractor shall make the following tests at their cost and they shall be as specified in this Article and requested by the Town. Perform tests in accordance with the following ASTM Specifications:

Test	ASTM Specification
Slump	C143
Air Content	C173
Test Cylinders	C31 or C513
Core Samples	C42
Fly Ash	C311

1. Measure slump each time test beams, or cylinders are to be made and at any other time requested by the Town of FRANKTON. The slump shall be as specified in INDOTSS 502, or as otherwise specified herein, unless specifically excepted by the Town of FRANKTON.
2. Measure air content each time test beams, or cylinders are to be made and at any other time requested by the Town of FRANKTON. The field test may be omitted if the air content is known prior to taking samples. The field test may not be omitted if fly ash is used in the mix.
3. Concrete paving mixes shall comply with guidelines of INDOTSS 502 and shall meet the testing requirements of INDOTSS 502. However, in lieu of forming test beams as described in INDOTSS 502, the Contractor may substitute cylinder tests as follows:
    a. Make test cylinders in sets of four. Field cure one cylinder and break at seven days. Laboratory cure the remaining three cylinders and break at 28 days. The Contractor shall be responsible for handling and transportation of cylinders.
    b. If fly ash is used in the mix, a total set of seven cylinders shall be taken. The additional three cylinders shall be laboratory cured and broken at 56 days, if the 28-day strength does not meet specifications.
    c. Make one set of test cylinders for each 100 cubic yards, or fraction of 100 cubic yards, of concrete placed; or at other times requested by the Town of FRANKTON.

d. Unless otherwise specified, concrete shall have a 28-day compressive strength of 4,000 psi, as demonstrated by laboratory tests of cylinders.

3.14 Protection

A. Maintain compacted aggregate base and surface true to line and grade and required density. Maintain base until pavement is placed. When there is a delay, protect base and/or intermediate course with preservative seal until the surface is placed. Maintain surface until job is complete.

B. Do not permit vehicular traffic of any kind on any HMA course until the HMA has hardened sufficiently not to be distorted beyond specified tolerances. Remove any foreign material which is on the surface of any course before the course is rolled or any subsequent course is placed.

C. Do not permit traffic on concrete pavement or walks until concrete has developed sufficient strength not to be marked or damaged. Do not permit vehicular traffic on concrete for at least 14 days.

D. Repair or replace damaged pavement and walks to the satisfaction of the Town of FRANKTON or designee.

E. The Town of FRANKTON may require pavement maintenance during the 3-year maintenance period, when it is determined by the Town that it is necessary.

3.15 Cleanup

A. Clean up the job site following pavement and surfacing restoration. Remove all rubbish, excess materials, temporary structures, and equipment. Leave the work in a neat and presentable condition.

PART 4 - FIGURES

4.01 Associated Standard Details

Detail No.	Description
TR-01	Concrete Chair Back Curb & Gutter
TR-02	Concrete Roll Curb & Gutter
TR-03	Driveway Curb Cut
TR-04	Curb Inlet Detail
TR-05	Concrete Center Curb
TR-06	Concrete Sidewalk Detail
TR-07	Sidewalk ADA Ramp Detail
TR-08	Detectable Warning Surface Detail
TR-09	Concrete Driveway
TR-10	Commercial & Industrial Street Pavement & Underdrain Pipe Detail
TR-11	Residential Street Pavement & Underdrain Pipe Detail
TR-13	Connection to Existing Streets
TR-14	Widening Detail
TR-15	HMA Pavement Trench Repair Detail

END OF SECTION 02500