KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 1990 EDITION

NOTE: This special provision is generally written in the imperative mood. The subject, "the *Contractor*" is implied. Also implied in this language are "*shall*", "*shall be*", or similar words and phrases. The word "*will*" generally pertains to decisions or actions of the Kansas Department of Transportation.

Page 228, Section 309. Delete this Section and replace with the following:

SECTION 309

CEMENT TREATED BASE

Exception: If the PCCP on this Project is <u>not</u> specified as QC/QA, subsections 309.02(entire subsection) and 309.04 f. of this Special Provision are <u>not</u> applicable to this Project.

309.01 DESCRIPTION.

Design a cement treated base (CTB) mixture. Construct 1 or more courses of the CTB on a prepared roadbed.

BID ITEM	UNIT
Cement Treated Base	Square Yard (square meter)
Quality Control Testing (CTB)	Square Yard (square meter)

309.02 CONTRACTOR QUALITY CONTROL REQUIREMENTS.

Provide personnel and equipment to conduct quality control testing that complies with the requirements of the Contract Documents. Employ certified technicians to perform process control testing. Use equipment that complies with the requirements of, and is calibrated according to the specified test methods.

a. Quality Control Plan. Prepare a written Quality Control Plan (QCP) that details the type and frequency of sampling, testing, and inspection necessary to measure and control the various properties of materials and construction governed by the Contract Documents. Submit the QCP for the Engineers' approval at least 6 weeks before work is started.

Address these requirements in the QCP:

(1) Submit an organizational chart (with names and telephone numbers) that shows the lines of responsibility and authority relating both to the mix design and the quality control operations during production. Identify the Contractor's representative that will serve as the liaison to KDOT personnel. Identify the certified technicians that will perform process control testing for this project.

This project requires individuals certified as ACI Concrete Field Technician, ACI Aggregate Field Tester, and Nuclear Moisture Density Gauge Tester.

(2) Submit the mix design for the CTB (if an existing mix design is used, provide the mix design number). Include all the elements of the mix design specified in the Contract Documents.

(3) Submit the proposed methods and procedures to control the elements identified as necessary for the quality of the CTB. These elements are, but not limited to: producing the aggregate, managing the aggregate stockpiles, proportioning the individual materials for the mixture, mixing and transporting the mixture, placing and consolidating the mixture, and finishing and curing the mixture.

(4) Submit a plan for sampling and testing at random locations at the frequency specified in KDOT's Sampling and Testing Frequency Chart for Cement Treated Base for Quality Control/Quality Assurance Projects (attached to this specification).

Include a plan for controlling non-conforming materials. In the plan identify the methods and procedures for recognizing the non-conforming materials, isolating the non-conforming materials, determining the disposition of the non-conforming materials, and the re-claiming or re-working of the non-conforming materials if approved by the Engineer.

(5) Submit a documentation plan to maintain adequate electronic records of all inspections and tests. Design the documentation plan to indicate the nature and number of observations made, the number and type of deficiencies found, the quantities approved and rejected, and the nature of corrective action taken as appropriate. Design electronic data sheets to record test results and calculations, daily quality control summary sheets, quality control charts, and other forms as necessary to provide complete documentation.

Include a plan to document the quality control requirements considered to be normal activities necessary to control the production and placing of a given product or material at an acceptable quality level.

(6) Submit for the District Materials Engineer's approval any alternative sampling and testing methods, inspection procedures, or equipment requirements.

b. Production Requirements.

(1) Make certain the certified technicians are present if material is produced for or placed on the project. Make certain that the certified technicians perform and use quality control tests and other quality control practices to assure that delivered materials and proportioning comply with the requirements of the mix designs. Make certain that the certified technicians periodically inspect equipment used in proportioning, mixing, transporting, placing, consolidating, finishing, and curing the CTB to assure compliance with the specified requirements.

(2) Locate the testing facility at the plant site or at the project site. Any other location for the testing facility must have the District Materials Engineer's approval.

Equip the testing facility with a telephone for the exclusive use of the Contractor's quality control personnel, a copying machine, and a facsimile machine for use by the Contractor's quality control personnel and the Engineer. Post a copy of the Contractor's quality control organizational chart in the testing facility.

Allow KDOT access to the testing facility and testing equipment to perform verification tests (KT-37).

(3) Perform all sampling and testing according to the QCP. Retain the latest 10 gradation samples for use by the Engineer in case of a dispute or other circumstances requiring re-testing.

(4) Record all test results and calculations on electronic data sheets. Record specific test results on a daily summary sheet to facilitate the computation of moving test averages. Base the moving averages on 4 consecutive test results. Include a description of quality control actions taken (adjustment of aggregate or additive proportions in the mix, moisture adjustments, etc.) in the daily quality control summary sheet.

Post quality control charts and keep current; show both individual test results and moving average values. As a minimum, plot the single test values and the 4-test moving average values for gradation of individual and combined aggregates, in-place CTB moisture and dry density, and compressive strength (requires a separate graph for PWL, but no moving average plot). Plot individual test results in black for each test point. Connect points with a solid black line. Plot the moving average for each test variable in red starting with the 4th test. Connect the points with a dashed red line. Plot the Department's verification test results with green asterisks. Do not include the Department's verification tests in the moving average. Indicate specification working range limits for single test results on the control charts using a green inked dotted line and for 4-point moving average results with a green inked solid line.

Complete the testing and charting within 24 hours after sampling.

Make all test results and control charts available to the Engineer at the project site. The Engineer will periodically make compliance checks on the documentation during the progress of the work.

Fax copies of all failing test results (based on a moving average of 4 tests, if appropriate) and a summary sheet to the Construction Engineer on a daily basis.

File all reports, records, charts, and diaries developed during the progress of construction activities. Upon completion of the project, all documentation becomes the property of the Engineer.

(5) Notify the Engineer when the moving average test result trend line for any property approaches the specification limits. Cease operations if 2 consecutive moving average points fall outside the specification limits or 2 consecutive single compressive strength tests exceed the specification limits. Ceasing operations is the Contractor’s responsibility. Quality control tests for this determination include aggregate gradation, compliance with the mix design band, and in-place density of CTB. Suspend the production pending the satisfactory results of a pre-production sample, unless waived by the District Materials Engineer.

Failure to cease operations for the conditions cited above will subject all subsequent material to rejection by the Engineer, or acceptance at a reduced price, as determined by the Engineer.

The Engineer may examine materials represented by individual test results which lie beyond the Contractor's normal quality control testing variation. The investigation may be based on either Contractor's test results or the Department's test results. The information from additional testing (including testing of in-place CTB) may be used to define unacceptable work according to the requirements of **subsection 106.08** and apply appropriate price reductions or initiate corrective action as determined by the Engineer.

For any test, if a dispute exists between the Engineer and the Contractor about the validity of the other test results, the KDOT Materials and Research Center (MRC) will perform referee testing. If 1 of the disputed Department test results was generated at the MRC, then an Independent Laboratory agreeable to both parties will be selected. The Independent Laboratory must be approved by the AASHTO Accreditation Program. If referee testing indicates that the departments test results are correct then the Contractor pays for the additional testing, including referee testing performed at the MRC. If the referee testing indicates that the Contractor's test results are correct then the Department pays for the additional testing.

(6) Identify all non-conforming materials and products to prevent use, shipment, and intermingling with conforming materials and products. Provide holding areas, mutually agreeable to the Engineer and the Contractor.

The reclaiming or reworking of non-conforming materials is allowed if procedures acceptable to the Engineer are used.

309.03 MATERIALS.

a. Provide emulsified asphalt that complies with the requirements of **Section** 1200. Provide concrete admixtures and curing materials that comply with the requirements of **Section 1400**. Provide Portland cement and fly ash that comply with the requirements of **Section 2000**. Provide water for CTB that complies with the requirements of **Section 2400**.

b. Aggregates. Provide aggregates that comply with requirements of **Section 1100**, with the following exceptions and additions:

(1) **Delete subsection 1106.02(a) and replace with this:**

(a) Composition. Compose the aggregate for cement treated base of any combination of crushed limestone, crushed dolomite, crushed PCCP pavement reclaimed from the project site and sand or sand-gravel produced from a naturally occurring alluvial deposit.

(2) **Delete subsection 1106.02(b) and replace with this:**

(b) Quality. Provide individual virgin aggregate materials that comply with the following quality requirements:

(1) Crushed Limestone and Dolomite.

a. Soundness, minimum	0.85
b. Wear, maximum	45%

(2) Sand or Sand Gravel.

a. Soundness, minimum	0.75
b. Wear, maximum	50%
c. Specific Gravity, min by KT-6, Proc I Bulk S.S.D.	2.45

NOTE: The requirements for soundness and wear do not apply to sand-gravel aggregates having less than 10 percent retained on the No. 8 (2.36 mm) sieve.

(3) Reclaimed crushed PCCP.

a. Soundness, minimum	0.85
b. Wear, maximum	60%

(3) **Delete subsection 1106.02(c) and replace with this:**

(c) Product Control.

Size Requirements:

Sieve size	1½" (37.5 mm)	¾" (19 mm)	No. 4 (4.75 mm)	No. 8 (2.36 mm)	No. 40 (425 µm)	No. 200 (75 µm)
Single point	*	*	*	*	*	*
Tolerance	±*	±*	±*	±*	±*	±*

* These values to be established by the Contractor

c. Mix Design. Design a mixture of aggregate and Portland cement or fly ash or both. Design the mixture according to the following requirements:

Compressive Strength: minimum 650 psi (4.5 MPa)
maximum 1250 psi (8.5 MPa)

Note: Compressive strength determined at 7 days, according to **Section 2500** of the Standard Specifications.

(1) Submit a single point gradation for the combined aggregates along with a plus/minus tolerance for each sieve to the Engineer. The plus/minus tolerances will be used by the Contractor to perform quality control checks and by the Engineer to perform aggregate gradation verification testing. Perform tests on the combined materials and on individual aggregates.

(2) Submit the mix batch weights in an acceptable manner to the District Materials Engineer. Address the initial set times (specified in AASHTO T 154) and placement times (with regards to the set times) in the proposed mix design.

(3) Submit laboratory compressive strength test results on a minimum of 1 set of 3 plugs, produced from proposed mix design utilizing the actual materials proposed for use on the project.

(4) Submit the test results 6 weeks prior to the anticipated date for using the design on the project. The Engineer will review the design within 5 working days following submittal.

The Engineer may perform any testing necessary to verify the adequacy of the Contractor's design. If the Engineer calls for verification tests, supply the Engineer within 5 working days of notification with the necessary materials to enable the Engineer to test the mix properties.

(5) No CTB will be placed on the project until the Engineer has reviewed and approved the Contractor's mix design.

Submit any proposed changes to the approved mix design to the District Materials Engineer for approval before implementing the proposed changes.

309.04 CONSTRUCTION REQUIREMENTS.

a. Preparation and Maintenance of the Subgrade. Use equipment automatically controlled in regard to both line and grade to trim the surface of the subgrade.

The Engineer may waive the use of automatically controlled equipment on irregular areas. In such cases, trim the subgrade by wetting, blading, and rolling.

Do not disturb the compacted top (of the untrimmed subgrade) any more than necessary while trimming the subgrade. The trimmed subgrade should be uniformly compacted, and trimmed to the required line and grade.

Maintain the subgrade as prepared. Take the necessary measures to provide proper drainage at all times. If poor drainage develops, correct the defects in the subgrade.

b. Mixing the Materials. Plant mix the aggregate, cementing agent, and water according to the requirements of the mix design approved by the District Materials Engineer.

Control the charge in a batch mixer, or the rate of feed to a continuous mixer (pugmill), to allow complete mixing of all the materials. Regulate the mixing to produce a homogeneous mixture. Do not use frozen aggregate. Construct a test strip so testing can verify that the plant production is compliant with this specification prior to the start of full production.

Acquire all compressive strength samples at the plant site. Compact the samples prior to the CTB reaching its initial set.

c. Spreading and Compacting the CTB. Before spreading the CTB, moisten the surface of the compacted subgrade.

The maximum compacted thickness of a single lift is 6 inches (150 mm). Spread base thickness of 6 inches (150 mm) or less in a single lift. Spread base thickness greater than 6 inches (150 mm) in 2 or more lifts of equal thickness.

If the base is spread in multiple lifts, offset the longitudinal joints by at least 6 inches (150 mm).

If multiple lifts are placed, keep the surface of each lift moist until the succeeding lift is spread. Cover the exposed lower lift with the final lift the same day the lower lift is placed.

Compact each lift of CTB to not less than 95 percent of the standard density. Determine dry density and moisture content according to the requirements of **Section 2500**. Maintain records of all sampling and testing.

If using a pugmill to mix the CTB, then determine the standard density by averaging the 3 most recent field molded densities using plant mixed base material. Compact 1 standard mold (using plant mixed material with the proper moisture content) for each day's operation as specified in KT-37.

If using a batch plant to mix the CTB, then determine the Standard Dry Density by averaging the 3 most recent vibrated unit weight (mass) test results (as specified in KT-20). This process is also known as Modified CTB or making "lean concrete". It will be necessary to convert the unit weight (mass) (wet density) into a standard dry density which also requires the percent of moisture (using KT-11 d.) to be known. To determine the standard dry density, use the following equation:

$$\text{Standard Dry Density} = \frac{\text{Wet Density}}{(1 + [\%\text{Moisture}/100])}$$

Determine the density of the CTB within 1 day of the compaction operations. The Engineer may choose to verify the Contractor's density test results by conducting density tests at random. If the comparison is not favorable, the Engineer will investigate to determine the cause.

Compact the CTB within 2 hours from the time the water is added to the aggregate and cement, or before the mixture reaches the initial set, whichever is the shorter timeframe.

d. Trimming and Finishing the CTB. Trim and re-compact the CTB within 2½ hours of the time the water is added to the aggregate and cementing agent.

Use equipment automatically controlled in regard to both line and grade to trim the surface of the CTB.

Keep the surface of the CTB moist during all finishing operations.

Perform the finishing and compacting operations in such a manner as to produce a smooth, dense surface free of surface compaction planes, cracks, ridges, or loose material.

If required, lightly scarify the surface of the CTB to loosen any imprints left by the trimming and compacting equipment. Re-compact the surface of the CTB.

Trim and compact the CTB to the grades, lines, and typical cross sections shown in the Contract documents. Dress the edge slopes and eliminate all evidence of laps between sections.

At the end of each day's operations, construct a straight transverse construction joint by cutting back into the completed work to form a vertical face. Place a protective covering of earth on the newly constructed CTB for a distance back of the joint required for turning of equipment used on the following day's work.

Complete the trimming and finishing during daylight hours.

The Engineer may permit the use of equipment that combines the placing, compacting, and finishing operations. Use of this type of equipment is contingent upon satisfactory performance of the equipment.

e. Protection and Curing. Keep the surface of the CTB moist until the curing material is applied. Apply the curing material immediately after completing the trimming and finishing. Protect the CTB against the loss of moisture for a curing period of 7 days (unless the Contractor's mix design test results justify a different curing period). Protect the CTB against freezing during the curing period.

Apply either a bituminous material or wax-based liquid membrane-forming compound for the curing material. Cover the surface and edges of the CTB with a uniform and complete coverage. Use a hand spray in inaccessible areas. Repair any location where the bituminous curing material is disturbed before the end of the 7-day curing period.

The minimum application rate for bituminous material is 0.20 gallons per square yard - 0.13 gallons per square yard residue (0.90 L/m² - 0.60 L/m² residue), and the minimum application rate for wax-based liquid membrane-forming compound is 0.12 gallons per square yard (0.54 L/m²). Keep all traffic and construction equipment off of the CTB. The only exception is the equipment used to apply the curing material.

If bituminous material is selected, apply either a SS-1 or SS-1H emulsion. Heat and apply the bituminous material at the temperature specified in **Section 602**. Use a bitumen distributor (**Division 150**) to apply the curing material. Protect all structures and other roadway appurtenances from overspray. Clean or repair any appurtenances sprayed or marred.

If a wax-based liquid membrane-forming compound is selected use an enclosed spray system that minimizes wind influence and ensures the proper application rate is achieved on the CTB surface. If the wax-based liquid membrane-forming compound has been in place for more than 30 days, reapply within 24 hours of placing the pavement using the same application rate.

At locations where it is necessary to carry traffic across the CTB, place a layer (not less than 8 inches [200 mm] compacted depth) of stable earth (sand-clay) over the CTB.

The Contractor will be permitted to place portland cement concrete pavement on the CTB after a minimum of 24 hours, provided all traffic and construction equipment is kept off the CTB. If the Contractor chooses to place the PCCP before the 7-day compressive strength of the CTB is determined, it is at his own risk to do so.

f. Compressive Strength Determination. Using random numbers, obtain material at the plant. Make and cure compression test specimens to represent each sublot. Determine the 7-day compressive strength of the CTB according to the requirements of **Section 2500**. The Contractor has the option to make additional test specimens for early determination of the compressive strength (for information only).

Perform the 7-day compressive strength testing. Maintain records of all sampling and testing. The Engineer will witness all compressive strength tests and initial the Contractor's documentation.

A percent within limits (***PWL***) analysis will be made on a lot-by-lot basis and may be based on Contractor quality control test results on all quality control samples representing the lot of the completed CTB. The ***PWL*** result will be determined as specified under Computation of Pay Factor. The pay adjustment will be computed as shown in Equation 4. It will be based on the compressive strength values within each lot and the specification limits (***USL*** and ***LSL***).

Note 1: KDOT will use a spreadsheet program to calculate pay adjustments for compressive strength and to compare the Contractor's QC and KDOT's verification test results. If the comparison fails, then KDOT's value will be used to calculate the pay adjustment for that lot. The lot comparison is based on KDOT's verification result falling within the contractor's mean, plus or minus 2 times the contractor's sample standard deviation. If the contractor's sample standard deviation is less than 145 psi (1.0 MPa), then 145 psi (1.0 MPa) will be used for the sample standard deviation. KDOT will provide a copy of this program to the Contractor if one is requested. It is the Contractor's responsibility to obtain the MICROSOFT EXCEL software required to run this program.

Note 2: A typical lot is defined as a normal day's placement. At the beginning of the project, estimate the quantity to be placed during a normal day and submit for approval to the Engineer. Once approved, break the quantity into 4 equal parts (each part represents a sublot). Determine a random location for sampling within each sublot. If the total quantity for the day deviates from expectations, then adjust the number of sublots based on the following table.

Sublot Breakdown of a Normal Day's Production

Number of Sublots	% of Daily Quantity
4	75-115
3	50-74
2	25-49
1	1-24

Adjust the quantity of the last sublot to accommodate any minor changes in production and adjust the random location for sampling based on the size of the sublot. When there is only 1 or 2 tests in a lot, combine the tests with the next lot to create a 5-test or 6-test lot. When there are 3 or 4 tests, then the lot stands on its own. If the quantity exceeds 115 percent of the normal daily quantity, then increase the number of sublots and restrict the 4th sublot to a maximum of 100 percent of the established normal daily quantity. Each sublot added can have a maximum of 25 percent of the normal daily quantity.

Note 3: The sample standard deviation will be computed using the following equation:

$$S = \sqrt{\frac{\sum_{i=1}^{n}\left(X_i - \overline{X}\right)^2}{n-1}}$$

Where: S is the sample standard deviation of the test results for a given lot.

n is the number of test results for a given lot.

$\overline{X}$ is the mean of the test results for a given lot.

X_i is the individual test result.

Compressive Strength Quality Indices (Q_U and Q_L) Computation. Calculate the compressive strength quality indices Q_U and Q_L for each lot using Equations 1 and 2, and round to the nearest hundredths (0.01).

Equation 1: $$Q_U = \frac{USL - \overline{X}}{S}$$

Equation 2: $$Q_L = \frac{\overline{X} - LSL}{S}$$

Where: $\overline{X}$ is the average measured compressive strength of all QC samples representing a lot and is rounded to 1.0 psi (0.01 MPa).

USL is the upper specification limit for compressive strength and is defined as 1250 psi (8.5 MPa).

LSL is the lower specification limit for compressive strength and is defined as 650 psi (4.5 MPa).

S is the sample standard deviation of the compressive strength of all QC samples representing a lot and is rounded to 0.1 psi (0.001 MPa).

Determination of the ***PWL*** Values. Use the computed ***Q*** values to determine the compressive strength percent within limits value (PWL_C) by locating the quality index values in the left column of the percent within limits ***PWL*** Table in **section 5.17.09** of Part V of the Construction Manual. Select the appropriate percent within limits values (PWL_U and PWL_L) by moving across the selected quality index row to the column representing the number of samples in the lot.

If 1 of the computed quality index values (Q_U or Q_L) is a negative value ($\overline{X}$ lies beyond the ***USL*** or ***LSL***) then the Engineer will determine if the material in the lot may remain in place. If the material is left in place, and there were no individual plugs found to be less than 600 psi (4.0 MPa), or greater than 1300 psi (9.0 MPa), then 50.00 is assigned as the ***PWL*** value. For results exceeding these limits and permitted to remain in place, use the calculated ***PWL*** value.

If either of the computed quality index values (Q_U or Q_L) is greater than the largest quality index value shown in the table, then a value of 100.00 is assigned as the percent within limits value for the designated compressive strength ***PWL***. Otherwise, add

the 2 calculated ***PWL***'s together and subtract 100 to determine the overall PWL_C value, as shown in Equation 3.

Equation 3: $PWL_C = PWL_U + PWL_L - 100$

Computation of Pay Factor. Compute the pay factor for compressive strength using Equation 4 and round to nearest hundredth (0.01). Multiply the pay factor times the square yards (square meter), times $5.00 per square yard (square meter) to determine the pay adjustment.

Equation 4: $P = \frac{(PWL_C * 0.15)}{100} - 0.135$

Compressive Strength Pay Factor (Failing Comparison Test). If the comparison between Contractor and KDOT tests fail, the Department's test result will be used to calculate the compressive strength pay factor for the lot. Follow the procedures as stated above to determine the pay factor or disposition of the lot. Use the following values in Equations 1 and 2 above. The value of $\overline{X}$ will be the Department's test result for the lot, the value of ***S*** will be 145 psi (1.0 MPa), the value of ***USL*** will be 1250 psi (8.5 MPa) and the value of ***LSL*** will be 650 psi (4.5 MPa). When selecting the PWL_U and PWL_L values from the ***PWL*** Table in 5.17.09 the value of ***n*** will be 4.

g. Weather Limitations. If the CTB is constructed in cold weather, comply with the provisions for cold weather concrete, **Division 400** of the Standard Specifications. If fly ash is used in the mixture, address the set time and strength gain as a function of the ambient temperature.

309.05 MEASUREMENT AND PAYMENT.

The Engineer will measure the completed and accepted CTB by the square yard (square meter) (to the nearest 0.1 sq. yd. [m²]). Material placed beyond the neat lines indicated in the Contract documents is not measured for payment unless authorized by the Engineer.

The Engineer will measure the completed and accepted quality control testing by the square yard (square meter) (to the nearest 0.1 sq. yd. [m²]) of CTB placed and accepted.

Payment for "Cement Treated Base" and "Quality Control Testing (CTB)" at the Contract unit prices is full compensation for the specified work.

No adjustment of the Contract unit price for "Quality Control Testing (CTB)" is made for overruns or underruns in the Contract quantity.

11-10-03 M&R(SP) (AJG & REK)
typographical correction 04-23-04

SAMPLING AND TESTING FREQUENCY CHART FOR CTB CONSTRUCTION ITEMS FOR QUALITY CONTROL/QUALITY ASSURANCE PROJECTS

TEST	QUALITY CONTROL BY CONTRACTOR	VERIFICATION BY KDOT
Moisture (KT-11)	4 per day per design	1 per week
Sieve Analysis of Individual Aggregates (KT-2)	1 per 2 000 ton (Mg) of each individual aggregate (**Note a**)	1 per 60 000 ton (Mg) per individual aggregate
Sieve Analysis of Combined Aggregates (KT-2)	1 per 2 000 ton (Mg) of combined aggregate	1 per 60 000 ton (Mg) per combined aggregate
Density Standard (KT-37) or Unit Wt. (mass) (KT-20) (**Note b**)	1 per day per design	1 per project per design
Field Density (KT-41)	4 per day per design	1 per week per design
Compressive Strength (KT-37)	4 test specimens for each normal day's production	1 test specimens for each day's production

General Note: All sampling and testing frequencies are minimum. Additional quality control, verification and assurance tests will be performed, when necessary, to provide effective control of the work.

Note a: The aggregate producers tests may be used for quality control purposes if the test were performed by an appropriately certified technician. In such cases, the Contractor may reduce the testing frequency to 4 000 ton (Mg). If during the determination of individual aggregate gradation, it is found that soft or friable particles, shale or shale like materials and sticks are determined to be present in the aggregates then KT-7, KT-8 and KT-35, respectively, shall be performed at such frequencies as jointly deemed necessary by the Contractor and the District Materials Engineer.

Note b: The KT-20 option is only permitted in conjunction with batch plant produced Modified CTB. See **309.04 c. Spreading and Compacting the CTB,** for clarification.