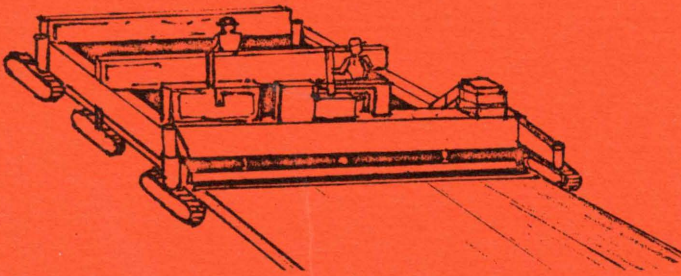


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INSPECTOR'S HANDBOOK

PORTLAND CEMENT CONCRETE PAVING



IOWA STATE HIGHWAY COMMISSION

AMES, IOWA

1969

PORTLAND CEMENT CONCRETE PAVING

Lauren Dean

CONTENTS

	Page
PROJECT PLANS AND CONTRACT DOCUMENTS	1
EQUIPMENT	2
FIELD INSPECTION OF MATERIAL	3
PREPARATION OF SUBGRADE OR SUBBASE	5
FORMS AND FORM SETTING	11
MIXING AND PLACING CONCRETE	13
BOX-OUTS AND ADJUSTING PAVEMENT FIXTURES	25
JOINTS AND HEADERS	25
CURING AND PROTECTION	28
SEALING JOINTS	31
SURFACE TREATMENT OF CONCRETE	32
SIDEWALKS AND DRIVES	33
FORM REMOVAL	36
BARRICADES	36

INCIDENTAL CONCRETE	38
OPENING TO TRAFFIC	38
RESTRICTIONS OF PAVING OPERATIONS	39
SHOULDERS	40
SAFETY	41
FORM 224	42
WEEKLY POST CARDS	59
DIARY AND FIELD BOOKS	61

#### Illustrations

Suggested Field Book Headings for Material Approvals	6
Suggested Field Book Headings for Subbase and Subgrade Correction	10
A Typical Crown Sheet for 24' Slab of Interstate	18
Sample of Form 224	58
Weekly Post Cards	60
Sample Diary Set Up	62

PROJECT PLANS AND CONTRACT DOCUMENTS

Project plans consist of the approved plans, profiles, typical cross-sections, or reproductions which show the location, character, dimensions, and details of the work to be done. These plans should be carefully studied in detail before work is started by the contractor. Proper planning requires a complete knowledge of the plans and the nature of the work to be done.

Although the plans have had a reasonable amount of checking by the Design Department, it is still possible that errors may occur in typing, lettering, dimensions, and other details. Such mistakes usually will be caught in checking the plans and should be corrected before the work is allowed to proceed. The errors should be reported to the Resident Construction Engineer. It is his duty to notify the proper authorities and have the corrections made.

The construction of concrete highways has gone through a rapid evolution in recent years and probably will continue to do so. For this reason no set of specifications compiled as a standard can remain up to date for any length of time. Between reprints of the specifications, it is necessary to issue supplemental specifications to cover such changes. The inspector should examine these closely and be familiar with those changes which affect his project.

The inspector should be familiar with all phases of current specifications affect-

have written or verbal approval before laying any tile or drain pipe as it is quite common for the contractor to purchase these items from small suppliers who have not had their stock previously inspected.

All cement used must be accompanied by a certification ticket from the producer. This will be the only approval received by the inspector. He must examine this certification, make appropriate entry in his field book, and then turn the ticket into his office for a permanent record.

Liquid curing materials, air-entraining admixtures, burlap, plastic film, and most other items found in the contractor's storage area are inspected at the source. Water obtained from a municipal supply, suitable for drinking water, may be accepted without testing. A sample must be taken to the District Materials Engineer if water from a creek, river, pond, or lake is used.

The important point to remember from the inspector's viewpoint is first to visually inspect all material stored in storage area. Enter each item in approval field book, if not previously entered, showing amount, lot numbers (if any), and producer. Make very sure that none of these items are used before proper approval is received. Sometimes a phone call to your District Materials Office will produce a verbal approval which is valid. Be sure to record the verbal approval as a temporary approval, in your field book. Also, be sure to make a record in your diary concerning any verbal approvals given you by District

Materials. If the proper approval does not come through, a follow-up would be necessary as memories are often very short.

Do not hesitate to stop a contractor from continuing any portion of his project if the materials involved have not been approved. He has the responsibility of furnishing materials that meet the specifications. Do everything in your power to prevent a delay for this reason, but the responsibility is his.

The suggested field book headings are shown on the following page.

#### PREPARATION OF SUBGRADE OR SUBBASE

The subgrade is the top surface of a roadbed upon which the pavement and shoulders are constructed. In many paving operations today, a granular, asphalt, or some other type of subbase is constructed on the subgrade before the concrete is placed.

The subgrade shall be so constructed as to have uniform stability for a width at least equal to that of the proposed pavement plus one foot on each side. Stones over four inches in size shall be removed from the subgrade. Subgrade often is constructed by contractors using a blade with scarifying teeth, sometimes a scraper, and a steel roller. The subgrade must be so shaped that the surface conforms with the required elevation and cross section, with a tolerance of .05 feet up or down unless otherwise specified. After the final cut or fill has been made, the area should be



may be completed as far in advance of the paving operation as the contractor may elect. In case the paving is not done immediately, the contractor is required to maintain the completed subbase at the required density to a true cross-section and in a smooth condition free from loose material, at his own expense. Experience has shown that after properly wetting and sealing the surface with a steel roller, the density may be maintained very easily if the area is closed to all forms of traffic.

The last operation in preparing subgrade or subbase before paving is the process of trimming the surface to the proper elevation by the subgrade planer or tailblade. The tailblade is a steel shod template and may be adjusted to the crown desired. It leaves the subgrade or subbase ready for concrete. To enable the template to do its best, the subgrade should be kept at a height which will require the machine to cut lightly as it advances. Even though you have carefully supervised or checked the adjustment of the tailblade, checking of the subgrade or subbase elevation must be done. The hardness of occasional areas in the grade may cause the tailblade to raise up and leave high spots. By checking with a string drawn tightly over the forms or from the form line, in the case of slip-form paving, these high spots must be located and the contractor must remove them before placing concrete.

Many of the large contractors today use a type of grade finishing machine called

a C.M.I. This electronically controlled machine works from a guideline set from the paving hubs and operates at a high degree of cutting accuracy. At the discretion of the engineer in charge, this machine may be used to cut the formline and subgrade and serve as a final strike off before paving all in one operation. Of course, the inspector must continually check behind this machine to determine if it is working properly and the guidelines are properly set in transitions and superelevated areas. After final preparation of subgrade or subbase, no traffic may be permitted thereon. For sections of pavement more than 600 feet long, the subbase shall be completed not less than 600 feet in advance of the paving operation, unless otherwise agreed to by the engineer.

When asphalt treated base is used as a subbase, it is laid either on grade or slightly high. If laid above grade, it must be trimmed while still warm, usually with an electronically controlled grader. No hauling is permitted on this type of subbase although passenger cars and light pickups are permitted.

The following page shows suggested field book headings for subbase and subgrade correction.





which can be set accurately. Bent or twisted sections make form setting and inspection difficult. A good riding surface is almost impossible to achieve. Such forms, and those with locking devices that have become inoperative through wear or misuse, should be removed from the project. Most inspectors mark these forms with a spray can of yellow or red paint, thus preventing their reuse again on the project.

When forms are reused, they soon become coated with concrete, mainly on the riding surface. Many contractors fail to properly clean these forms. This must be done before final alignment. After the forms are set to grade and line the inspector should make a visual inspection by eyeing the forms, looking for vertical dips and horizontal misalignment. Many times the forms will be hit by a truck or may be pumped out of line by trucks rutting the haul road near the forms. Before concrete is placed, the form faces must be thoroughly oiled to permit easy removal.

Flexible or curved forms must be used for curves having a radius of 100 feet or less. This problem occurs mainly in urban paving and is very important to the appearance of the finished product. Wood forms may be used in paving operations where finishing is done by hand and the forms are not required to support heavy equipment.

When a finishing machine or slip-form paver is used, the cutting of the form or paver truck line must be done by a form

grader, commonly known as a chicken picker. Since the firmness of the area being cut will affect the settlement of the forms, it is important that the formline be cut to true grade and in firm material. To do this, the form grader must be cutting at all times. In projects that are graded and paved in the same year, it is advisable to do additional rolling on the form lines before cutting with the form grader. This helps to prevent form settlement.

After the forms are set, they must be tamped. This is done by mechanical tampers which are designed to run on a single form rail. The number of tampers required is dependent upon the speed of the operation and this is shown in the current specifications. If a C.M.I. or similar machine is used to cut the grade, the form grading and tamping may be omitted upon approval of the engineer, in which case the forms may be set and staked with the proper alignment on the form line built by this machine.

#### MIXING AND PLACING CONCRETE

On most paving projects of any size today, the concrete is mixed in a central paving plant and delivered by agitating trucks to the paving site. However, the concrete may be delivered unagitated, or it may be proportioned and placed in a mixer truck that mixes the concrete prior to or during transit to the job.

Concrete transported without agitation (wet batch) shall not be used if the period

elapsed between the time the concrete is discharged from the mixer and the time it is placed is greater than 30 minutes. The maximum time for agitated concrete is one and one-half hours.

The contractor must guarantee adequate delivery of concrete to the job. He must deliver concrete to the work at a rate sufficient to maintain a sustained rate of progress of not less than 100 feet per hour for the width and depth of the slab to be placed. If a ready mix plant is used, it must be approved by the materials engineer. However, for incidental work, the engineer may waive the requirements for automatic cement controls.

The mixer most commonly used, when mixing is done on the grade, is the dual drum 34E mixer. The 34 indicates the manufacturer's capacity rating in cubic feet. The letter "E" indicates end discharge. A few three compartment drum mixers (tri-batch) are in use. These mixers all take the same size batch, 34 cubic feet plus 10%, or 37.4 cubic feet. The main difference in the two mixers is the cycle time. The dual drum mixer can dump a batch every  $41\frac{1}{2}$  seconds while the tri-batch mixer can do so every 30 seconds. These cycles are possible only if batch trucks are always ready to dump and there are no breakdowns or delays in the operation of the mixer.

The inspector must be familiar with the timing devices, batch meters, water measuring, and air-entraining agent dispensing equipment of the mixer. If he

has had no previous experience he can locate the batch meter, water metering crank, and air-entraining dispenser by visual inspection and by contacting the operator. The air-entraining dispenser must be located on the mixer where it can be seen by both the operator and the inspector. The inspector should make numerous checks to be sure that this dispenser empties each time the skip is raised, and then refills to the proper position.

The inspector should not advise as to how much water to add or take out. He should be definite in requiring the concrete to be within slump tolerance when placed. He should advise the contractor when the slump is outside the allowable tolerance and take the necessary steps to see that the contractor corrects the situation.

The timing of the mixing cycle involves precise measurements. If your immediate supervisor does not have a list for checking the cycle on your mixer, contact your Materials Engineer, or his representative. He can give you this information. Each batch must be mixed a minimum of 60 seconds.

The concrete must be deposited upon the grade in a manner which will minimize disturbance of the steel reinforcement. Although the specs do not require a spreader, any contractor doing rural paving will have one, as the uniform placement of the concrete is essential to a fast and efficient operation.

Where side clearance is provided, a finishing machine is required on all uniform width slabs  $8\frac{1}{2}$  feet or more in width and at

least 600 feet long. The finishing machine must have two mechanically-operated screeds which move transversely upon the concrete in such a manner as to leave the top of the slab smooth and with the desired crown and elevation. When operating with one side of the machine on pavement and the other side on forms, the wheels on the forms should be double flanged. The wheels on the pavement must be flangeless and rubber faced. The ends of the finishing machine screeds operating over the edge of concrete less than three months old shall be supported or hung from an approved guide or track on the finish machine in a manner that will provide 1/16" to 1/8" clearance between the screed and the old slab.

Before the start of the paving operation, the contractor must adjust the screed of his paving machine or machines to the crown shown on the plans. By setting up on the forms and drawing a piano wire tightly from the bottom edge of the screed at the formline to the bottom edge of the screed at the other formline, the crown shown on the plans may be set on the screed by measuring up from the wire to the screed at the designated intervals.

The contractor sets the crown in his screed by making adjustments on lock-nut adjusting screws which are located every two feet across the screed. When he has the screed adjusted, the inspector will make the final inspection. As these measurements are often taken to 1/32 or 1/64 of an inch, the inspector must make his

readings carefully and directly below the adjusting nuts. He must also realize that sometimes a perfect setting on one adjustment may slightly affect the adjacent setting. The front screed often is set just a little high. The back screed is set "on the money."

The paving machine is so constructed that the crown may be changed from parabolic to flat by the use of a crank. In areas of transitions, when going into or leaving a curve, the crown may be slowly cranked in or out as the case may require.

Often the screed mechanism will become clogged with concrete, and it becomes difficult to crank the full crown back into the screed after being flat in a super and then returning to a full crown. Crown checks should be made after leaving every superelevated curve to determine if the screed has returned to the desired crown. A thorough cleaning of the machine each evening after a days' run is needed. Asking for a screed check before starting in the morning will improve the quality of the cleaning operation. Daily screed checks should only be taken when screed problems exist.

A typical crown sheet for a 24' slab of interstate is shown on the following sheet. The lettered measurements would be the ones used in checking the screed of the paver.

On projects where the potential capacity of mixers for producing and placing



plus two feet. Wood hand floats, pointing trowels, two light straight edges 10' long with handles not less than 12' for use in detecting irregularities in the surface may be required. Two heavy straightedges for use in correcting the surface and two light straightedges 6' long without handles for checking curb and gutter line should be included. Edgers of 1/4" and 1/8" radius are a necessity in addition to one movable bridge for finishing transverse expansion-type joints.

Many areas to be paved are of irregular shapes and sizes that cannot be paved by regular paving machines but must be hand-finished. These areas must be vibrated by the use of hand-held vibrators and struck off with screeds of wood or steel shaped to the crown desired.

The final operation is a burlap drag. This is normally a separate piece of equipment of the paving train. Care must be taken to be sure that the burlap that contacts the new concrete is kept wet. In the case of slip-form paving, the burlap is attached to the bridge at the end of the movable forms. Care must be taken to prevent the burlap from lapping over the edge of the slab, causing a rounded edge.

As a final word in the mixing and placing of concrete, the inspector must remain alert and exercise good judgment from the beginning to the end of each day's operation. As it is not possible to properly vibrate the header with the vibrators on the finishing machine, this area should be consolidated with a hand-vibrator. The same is

true at a day's work joint when completing a day's run. If a portion of the paving train is backed over the previous day's run, backup rails that can be securely attached to the rails must be furnished by the contractor to prevent damage by the wheel flanges. In the case of slip-form pavers, false forms made of wood may be fed into the throat on each side of the paver for the last 20' - 30' before the end of a day's run. When the paver pulls off the slab, these forms should be staked. This allows the paver to back up over the day's work joint to start the next run.

#### CONCRETE TESTS

A minimum of four slump tests should be taken daily and recorded in your paving record. For paving projects using a finishing machine, two inch slump is the maximum allowed. In addition to making a stronger and better mix, this slump is critical when pouring steep grades or curves with full superelevation. It is the responsibility of the contractor to observe this slump tolerance. Failure to do so is grounds for refusal to accept the batch.

On hand pours the slump may be increased by the engineer, provided the maximum water-cement ratio is not exceeded. This is necessary as the hand finishing is much slower. If the temperature is high, low slump concrete may set up before it is properly finished.

Four air tests are required each day as a minimum. Air content of the vibrated concrete should be between five and seven percent. The test material normally is taken from vibrated concrete in place behind the finish machine. The concrete foreman should be kept informed of the test results. If they do not fall within tolerance, it is his duty to make immediate corrections. The tests should be repeated after the changes are made and all results recorded in the paving field book.

Two depth checks are required daily. The common practice is to set 4" square galvanized plates every two feet transversely across the grade on the first test made. If a tailblade is used, these plates must be set behind the tailblade. They must be set with a stringline and at measured intervals from a form line, at a known point. By duplicating the line and the measured distances to the plates, it is possible to probe from the back of a finish machine or bridge through the new slab at each point. After the first test, one or two plates set every 500 or 600 feet would be ample checking. These checks must be recorded.

Form settlement may be checked by driving a nail flush with the form base before the train has passed. An alternate method would be to use a carpenter's level and measure the vertical distance from the form to a hub or known point before and after the passage of the paving train. A minimum of two per day is required, and also should be recorded. This test is very important when

paving over new grade. If excessive form settlement occurs, it may be necessary to require additional rolling of the formlines before the form grade is cut.

It is advisable, but not required, to check the height of crown at least once a day. This may be done by cutting small blocks (2" x 2") the height of the crown. By placing small wood blocks equal in height to the crown on the forms and drawing a string tightly on the blocks transversely across the slab, the relation of the crown to the string may be observed. In slip-form paving, rods driven beside opposite paving hubs with the fill plus the crown measured up from the hub and marked at the proper elevation on the rod will give a line for drawing a stringline at top of crown as described above.

The completed slab must be smooth within a tolerance of 1/8" in 10'. The entire surface of the pavement must be checked with a surface testing straightedge (commonly called a bump buggy) having a length of 10'. The outside 6" of slip-form paving will not be checked. The adjusting screws on the straightedge should be checked often. This may be done by placing the buggy, wheels down over a true straightedge (steel if available) and adjusting the set screws to 1/8" clearance. The use of string pulled over the wheels is not advised.

Test beams must be made for each day of operation. Only one 33" beam or two 20" beams need be made each working day on pav-

ing projects. These are used for one seven day and one fourteen day break.

The vibrating units of a finishing machine or hand vibrator shall operate at not less than 3500 vibrations per minute. To check the amplitude of the vibrator it must be operating in concrete. Lay a 1" x 6" x 6" block of lumber on the surface of the concrete not closer than 12 inches to the nearest point of the vibrating unit. A vibrating odometer will be pressed down near the center of the wood block. The vibration observed at this spot will be the basis of determining if the amplitude requirement has been met.

#### REINFORCING STEEL

Steel reinforcement shall be installed in the intended position as shown on the plans. Tolerance for vertical and horizontal displacement will be shown on the plans or in the special provisions. Bars may be supported by chairs or they may be positioned after the concrete is struck off, but prior to its consolidation by vibration.

When wire mesh is used, the concrete is struck off at the elevation specified for the mesh. Care must be used in handling wire mesh as it becomes easily bent or kinked and subject to rejection. A final lift of concrete is then placed and vibrated.

#### BOX-OUTS AND ADJUSTING PAVEMENT FIXTURES

The standard specifications make provisions for boxing out fixtures in the pavement. However, it is preferred that if the fixture is entirely inside the form lines, the fixture should be raised to match the pavement surface and concreted with the slab. It is important to have the lid on the fixture as it often increases the height at least 1/4 inch.

The box-out for fixtures occurring in the formline should be three-sided with the end section at 60 degrees with the form and the center section parallel with the form. All three sides should be about 12" from the upper edge of the ring. A keyway should be placed on the box at mid-height and for the full length.

Boxed out rings should be set at the required grade and concreted in when the adjacent slab is being poured. When the concrete is placed around the fixture, a reinforcing bar (minimum diameter 1/2") shall be placed around the fixture at about 6" distance. A parting strip from the box-out to the opposite form should be installed. After the concrete is set, the fixture should be grouted on the inside if necessary to insure adequate support.

#### JOINTS AND HEADERS

Transverse contraction joints extend entirely across the pavement and at right angles to the centerline. These joints are



formed by sawing with an approved saw to the depth and width shown on the plans. To prevent the development of excess random cracking, joints at approximately 80' intervals should be sawed before the concrete obtains an age of twenty-four hours. All remaining contraction joints must be sawed before the concrete has reached an age of three days. Sawing of the 80' joints about six or seven hours of age may be necessary to prevent random cracking.

Expansion joints usually consist of mastic held in place by some type of dowel basket. They should be set in advance of the paving operation. They must be set perpendicular to the formline and 1/2" below the crown. Care must be taken when placing the concrete to prevent damage to the assembly. Care shall also be taken when moving finishing equipment over the joint. If movement of the mastic in excess of 1/2" has occurred, the assembly must be repositioned immediately.

As soon as the finish paver has passed over the joint, a bridge will be placed at the location and the concrete directly over the expansion material removed and edged according to the specifications. Sawing the concrete above the mastic is not permitted.

Special care must be taken to prevent bridging of concrete to concrete across the joint either under the mastic or at the edges of the pavement. On form paving as well as slip-form paving, the mastic usually

will be covered with concrete at the pavement edges. It is necessary to remove this concrete as soon as possible. If not removed it is likely to cause radial cracking into the slab.

Longitudinal saw joints should be constructed as shown on the plans. These must be sawed before the concrete has reached an age of seven days and before the pavement is opened for traffic. Unless otherwise shown on the plans, the saw cut shall not be less than 1/4 of the pavement depth. The inspector should periodically check the depth of saw cut.

Improper header installation is the source of many bumps found in pavement today. Whenever thirty minutes or more, depending upon the wind and temperature, has elapsed since the last concrete has been deposited on the grade or at the end of a day's run, a header will be installed. It shall be shaped to fit the cross-section of the pavement and placed so that the upper edge will conform to the crown of the pavement. A square or some other device must be used to make the header perpendicular to the centerline of the pavement.

Concrete collected by the finishing machine during its first passage may be used adjacent to the header. Concrete collected on following passes must be wasted. The header board will have holes for smooth dowel bars of the size and spacing shown on the plans. The bars will be held rigidly by the method shown on the plans or by any

alternate method approved by the engineer. The concrete must be well vibrated against the header and finished with an edger. The header must be placed at least 45 minutes before sundown in good weather and earlier if cloudy, to assure completion before dark.

The header and all supports will be removed before paving is resumed. Again the concrete must be vibrated and edged. The inspector should make certain that the finishers overlap their straight edges (half on previous slab) when leaving a header, to prevent a bump. If you still have questions after eyeing the alignment, pull a string from the surface of the previous slab to the surface of the new and check the line on the string.

#### CURING AND PROTECTION

The curing of concrete is just as important as any phase of the concrete operation. The inspector should demand that the contractor follow the prescribed methods at the proper time. If he can't take care of what he has laid, he should not be allowed to place any more.

Probably the most critical time in curing is when the concrete takes the initial set. There are several methods which may be used in many paving projects. However, one particular method may be specified in the plans, or the special provisions. As pointed out previously, the plans and provisions must be carefully studied.

If wet burlap is required, it must be placed as soon as the finishing operation has been completed and the burlap can be applied without marring the surface. The burlap must be kept continuously wet for a period of 72 hours. During hot and dry windy weather, continuous surveillance is required. Sometimes it is necessary to weight the burlap with dirt to prevent it from being blown off during windy weather. If the forms are removed the burlap must be placed and secured over the sides. If curing with plastic or paper, the concrete should be initially covered with one layer of wetted burlap which must remain continually wet and in place for at least 16 hours. Upon removal of the burlap, the concrete is thoroughly wetted and then covered with plastic or curing paper for a period of 72 hours after the placing of the concrete. At junctions of units of the paper or plastic, the joints must be lapped at least 18 inches and sealed with dirt or sand.

When curing with white pigmented liquid curing compound is approved, it must be applied with a fine spray to form a continuous uniform film on the surface and vertical edges of the pavement slab. The rate of application to be used shall be not less than .067 gallons per square yard or a coverage of 15 square yards per gallon. The drum of curing material must be well agitated before being transferred to the distributor and must be kept thoroughly

agitated during application. Hand operated sprayers may be used for spraying the sides and irregular areas. The inspector should compute the number of lineal feet that one barrel of cure will cover. He should then check the operation to be assured that at least minimum required coverage is obtained.

The curing of slip-form paving does not differ from conventional pavement except the contractor is required to have a supply of burlap or plastic and temporary side forms available for use as protection in case of rain. This type of paving is very vulnerable to damage by rain before the initial set. Failure to properly protect unhardened concrete may be cause for the removal and replacement of defective pavement.

In case of an unexpected rain storm in either conventional or slipform paving, the burlap should be placed as closely as possible to the finish operation. Some marking of the slab by the burlap may occur but often this is the only means of saving that portion of the slab that has not had its initial set.

During cold weather conditions, concrete less than 36 hours old must be protected with one layer of burlap or plastic, when the temperature is expected to drop to a minimum of 32 degrees. With a minimum of 25 degrees one layer of plastic plus one layer of burlap or 2 layers of burlap must be used. Below 25 degrees, six inches of straw in addition to the regular curing method must be used.

The inspector should check weather forecasts each day to aid in determining the type and amount of protection needed to prevent damage to pavement by freezing, and require the contractor to have the proper protective materials on the project. Paving operations must be shut down in time to comply with the protection requirements. In good weather the header should be set at least 45 minutes before sunset. During cold weather, the finishing and protecting take longer and should all be accomplished before darkness.

#### SEALING JOINTS

Unless otherwise provided, all expansion joints, sawed transverse joints, and longitudinal joints must be sealed with an approved sealing material before being opened for use by the contractor's forces or public traffic. The inspector must make certain that these joints are sawed to the proper depth and are clean and dry before filling. Often it is necessary to hand clean with a hook-shaped cleaning rod. The joints should always be blown with compressed air to dry and clean before filling.

The hot poured joint filler must be heated in a thermostatically controlled heating kettle to the temperature recommended by the manufacturer. The method of applying the filler to the transverse joints shall be such as to insure that

they are slightly overfilled without soiling the adjacent surface. On longitudinal joints, the upper surface of the filler shall be flush with or not more than 1/8 inch below the surface of the adjacent pavement. This work must be neat. The inspector should require the contractor to scrape off objectionably excessive material. This should be done early in the morning when the sealant is cool. Joints in curbs should be sealed only two inches above the gutter. Attempts to seal more than this result in unsightly puddles at the base of each joint. Sometimes it is necessary for the contractor to reseal under-filled joints.

#### SURFACE TREATMENT OF CONCRETE

The current policy is to treat all primary and interstate pavement with a mixture of linseed oil and kerosene, regardless of the time the pavement is constructed. If possible, the treatment should be applied only when the air temperature is 50° or higher and the pavement is fourteen days old. On stage construction projects where an extra week's delay seriously hampers job progress, or in late fall when 50° or higher temperatures are impossible, the application may be made at 40° minimum temperature and to pavement not less than seven days old. Since federal participation is limited to applications to pavement fourteen days old and at temperatures of 50° or higher, records

of temperatures and pavement age must be kept to indicate the amount of treatment eligible for federal participation on federal aid projects.

The treatment material consists of a 50-50 mixture of boiled linseed oil and kerosene. Lab approvals must be obtained for the mixture components.

All surfaces to be treated must be free of dirt and other foreign material. All surfaces of pavement and curb and median exposed after final construction must be sprayed or mopped with two applications of the solution, each at the rate of approximately one gallon per 600 square feet. The second application will be made as soon as the first application has been absorbed. Most contractors use an asphalt distributor or a farm type sprayer except on irregularly shaped areas where a hand spray is more efficient. Care must be taken to get uniform coverage. A distinct pattern on the slab for each spray nozzle should not be seen.

#### SIDEWALKS AND DRIVES

The first step in the construction of concrete sidewalks is the preparation of the subgrade. It must be cut or filled with suitable dirt to a depth below the finish grade line that will give a hard firm subgrade at the required depth.

Forms of wood or steel shall be used along each edge of the sidewalk. These

forms must be set true to line and grade, and will be held solidly in place by stakes placed outside the forms.

All forms shall have a height equal to the full depth of the sidewalk. Wood forms shall not have less than two inch nominal thickness. The thickness of the sidewalk will be four inches unless otherwise specified.

Before the placing of concrete, the subgrade must be thoroughly moistened, or covered with approved paper or plastic film. The concrete used in sidewalks shall be class C concrete. When sidewalk is placed in conjunction with a concrete paving project, the class of concrete specified for the pavement may be used providing a suitable finish can be obtained. The maximum slump allowed is four inches.

The concrete should be consolidated by tamping or the use of a small vibrator. Particular attention should be given the area near the forms at expansion joints, and around headers. It should then be screeded off flush with the forms. A straight 2 x 4 works well for this operation.

The finish, unless otherwise specified, will be a wood float finish. The transverse cross-slope should have a drop of 1/4" per foot for drainage toward the curb. The edges of the sidewalk should be edged with a suitable edging tool. The surface of the walk should be marked off into squares not larger than thirty-six

or less than nine square feet. On these lines, the concrete must be cut with a pointing trowel to a depth not less than one-fourth the sidewalk depth. These lines must also be edged after cutting.

Expansion joints shall be constructed at all points where the walk meets another walk, curbs, or fixtures in the surface and at intervals not greater than fifty feet. These joints consist of 3/4" full depth approved premolded joint material. These joints should not be filled with joint sealer.

Driveways should be constructed according to the dimensions shown on the plans. The preparation of the grade and the type of concrete used is the same as the requirements listed for sidewalks. Both sidewalks and driveways must be cured for a period of four days after placing the concrete. White pigmented curing compound may be used at the rate of not more than 135 square feet per gallon. Alternate curing methods are those described for concrete pavement. Any areas of driveway or sidewalk not designated to be removed, but which are broken or removed by the contractor's operations shall be replaced by the contractor at his expense. The contractor also has the obligation to protect the sidewalk or drive from damage by pedestrians. This becomes a major problem in areas of urban paving where foot traffic is heavy. Barricades must be firm and complete to

prevent footprints and damage to the new concrete. Sidewalks that pass through driveways will be considered as part of the driveway and built to the thickness of the driveway.

#### FORM REMOVAL

Side forms and curb forms shall be left in place not less than six hours after the concrete has been placed. Occasionally, the eighty foot contraction joints can be sawed without excessive raveling before the six hours have elapsed. In this case, it would be necessary to remove the forms at each joint sawed.

Extreme care must be taken when removing the forms to prevent cracking or spalling of the edge of the concrete. All stakes must be removed before the forms are lifted. Should the method of form removal cause damage to the concrete, the inspector may require the forms to be left in place longer than six hours. The weather is an important factor in this decision.

#### BARRICADES

The contractor shall provide and maintain barricades, danger, and warning signs and suitable and efficient lights so as to take every reasonable precaution to prevent accidents. The contractor will not be required to erect or be responsible for barricades, road closed signs, and danger lights at the point or points where

traffic is detoured from a road which is closed for construction. Neither will he be responsible for barricades and signs where a primary road intersects a primary road under construction.

The contractor shall construct a barricade for the full width of the slab near the end of each day's run. The barricade shall be constructed with two steel posts driven into the grade on each side of the slab. Between these posts a slat snow fence shall be stretched and fastened to the posts. The area between the posts must be supported by at least two 55 gallon drums.

If the contractor elects to leave his paving train at the end of the day's run, he must build the barricade no later than four hours after paving has stopped. In the event equipment is moved to another site, the barricade protecting the end of the slab must be constructed within one hour after the removal of the equipment. A similar barricade must be placed parallel to and within fifty feet of the slab at all public roads and side street intersections. They must be constructed within one hour after the hand finishing operations are completed past that point. Each barricade must be equipped and maintained with not less than two torches or red lights. They will remain in place until the concrete has reached the age and strength required by the current specifications. While the road is under construction, the contractor is responsible for any damage to the newly

completed portions of the work resulting from traffic permitted by his negligence. The inspector is cautioned to check the special provisions. The requirements therein may be very detailed for the type of operations on the project.

#### INCIDENTAL CONCRETE

Rolled headers are sometimes required to be placed at the end of a paving project to protect the end of the slab. This type of concrete is incidental concrete. The current specifications outline the method of measurement and payment. The paving standard adequately describes the shape and design.

The concrete will be of the same class as that for the pavement and shall be placed, finished, and cured as directed by the engineer.

#### OPENING TO TRAFFIC

The time for opening pavement for use by the contractor is based on the age and sometimes the strength of the concrete. Class A or Class C concrete must, in addition to the age requirements, show a beam break of five hundred pounds or more per square inch.

Class of Concrete	Kind of Cement	Minimum Age
A or B	Normal Portland	14 days*
A or B	High Early Strength	7 days
C	Normal Portland	7 days
C	High Early Strength	48 hours
*Class A pavement 8" or more in thickness		10 days

As stated earlier, the contraction joints must be filled before opening for contractor's use. The shoulders must be completed before opening for public use. If shoulders are not a factor, as in some urban projects, the pavement may be opened to traffic before shouldering is completed.

#### RESTRICTIONS OF PAVING OPERATIONS

Sudden showers occurring while paving is underway necessitate covers to be placed on all exposed concrete to prevent the cement from being washed away from the surface. Burlap or plastic film is satisfactory for this purpose and should be carried on or near the train at all times for an emergency. If the storm is for any duration, the paving will have to be stopped and a header constructed. The finishing that will have to be completed in the storm may be done by uncovering a few feet at a time and then immediately replacing the cover as the finishing is completed. This

will not give a perfect finish, but the alternative would be to lose that portion of the slab. and the effort to save it is worthwhile.

Concrete shall not be placed when stormy weather will prevent good workmanship. No aggregates containing frozen lumps may be used. Concrete must not be placed on frozen subgrade. The temperature must be 34° F. and rising, to start mixing and paving operations. The concrete mixture must have a temperature of at least 40° F. at time of placement. When the air temperature reaches 38° F. and is falling, paving operations (mixing and placing) must be halted.

#### SHOULDERS

Dirt shouldering operations should be started when the pavement has attained the age requirements for opening to the contractor. The major portion of this work should be completed within six days after the slab has been released to the contractor. If fills greater than six inches below subgrade are involved, the fills should be treated as embankments and compacted accordingly. The material more than three inches below the upper edge of the pavement shall be spread in uniform layers of not more than six inches in loose thickness and rolled at least three times. The final three inch layer need not be rolled except for one foot adjacent

to the pavement. After compaction, they shall be shaped to the specified cross-section and smoothed to a condition which will be acceptable to the engineer. Normally, this can be done with mechanical equipment; however, if satisfactory results are not obtained, hand methods may be required. In no case will dirt be placed on the slab and then bladed to the shoulder.

On some projects (Interstate) asphalt shoulders with granular subbase have been required. This type of shoulder must be built according to the standards shown on the plans and to the requirements outlined in the special provisions.

The specifications contain a number of restrictions regarding the use of heavy equipment by the contractor. It is much easier and faster to build shoulders with the use of self-loading scoops. If the inspector cannot find the information about a particular model of scoop to be used, he should contact his superior who can get this information from the equipment distributor, if necessary. Axle loads of equipment operating on the pavement must not exceed legal limits.

#### SAFETY

In the performance of his contract, the contractor shall comply with all Federal, State, and local laws governing safety, health, and sanitation. The contractor shall furnish such additional



safeguards, safety devices, and protective equipment and shall take such actions as the engineer determines as being reasonably necessary to protect the life and health of his employees and the public.

Safety is closely related to the proper use of signing and barricades. The inspector should become thoroughly familiar with the applicable traffic control devices listed in the special provisions. When working under traffic, the inspector should strictly enforce all traffic control policies. This is the best safety measure he can take.

#### FORM 224

The daily inspection report on paving work is an hourly and daily record of the progress, the working conditions, the weather, and all the other happenings during the paving operation which may affect the results obtained. It is intended to accomplish two purposes; first, to keep the district and central offices advised of the status of the job, and, second, to serve as a detailed permanent record to supply information concerning the work done in case such information is ever needed in the future.

At the end of each day on which any pavement was laid, this report is to be compiled by the inspector from the information recorded in his notebook during the day's paving operations.

Three copies are made, one for the

resident construction engineer's records, one for the district office, and one for the central office at Ames. The latter two copies are to be forwarded as soon as possible (not later than the morning after the day covered by the report) to the district office. After checking by the district office, the copy intended for the central office will be forwarded promptly to Ames. The resident construction engineer should see that the reports are dispatched with minimum delay. To aid the inspector in preparing the report in a way that will supply the desired information, each entry required on Form 224 is discussed in some detail in the following paragraphs.

County. This entry is self-explanatory, but care should always be used that it is not overlooked. In the case of a project which includes work in two or more counties, the names of the counties should be listed in the order in which they appear on the contract.

Project Number. This furnishes the final and conclusive identification of the report. In order to do this it must be correct and complete. Project numbers have gradually grown more complex, but each part has some special significance and is necessary to properly designate the project and distinguish it from others. Therefore, all the letters and other symbols, as

well as the figures, should be included each time the project number is entered on a report. It should be kept in mind that these reports are filed and used for reference in some cases by individuals who have no other contact with the work, and that those who do see the job often enough to be familiar with it will not always be present to interpret the information on the report from memory in case this information is scant or incomplete.

Road or Street. The entry called for here is the number designation of a U. S. or Iowa Highway or the letter or number designation of a county road. The addition of a word or two as to the location on that road is often a distinct help.

Examples:

U. S. 30 - W. of Tama  
Iowa 10 - E. of Hampton  
County A or County 504 - S. of Adair

If the project is so located as to fall on none of the above routes, a description should be improvised which will enable others to properly identify the report with the work.

Examples:

E. Market St. - Des Moines  
Local Road - 3 mi. S. of Creston  
Entrance Road - John Deere Plant

Contractor. Use the official name of the firm. Abbreviations are acceptable if they are the usually recognized abbreviations for commonly used words. Initials alone are unsatisfactory.

Examples:

Official Name of Firm

Western Contracting Corporation  
Central Engineering Company  
M. and S. Construction Company

Abbreviations  
(Satisfactory)

Initials  
(Unsatisfactory)

West. Contr. Corp.	W.C.C.
Cent. Engr. Co.	C.E.C.
M. & S. Constr. Co.	M.S.C.C.

Square Yards or Miles in Project. More space has been provided for this item so that the status of pavements laid in multiple lanes can be more easily shown. On a normal country paving job laid full width, cross out the Right and Left headings and show the mileage in the center column. If the paving is laid in two lanes, cross out the Left and Right headings and draw a vertical line dividing the center column. If in three lanes, use the columns as printed. If in four lanes, divide the center column and show the mileage in each column. In all cases

"Left" and "Right" columns should be consistent with the direction of the stationing and not with the direction the mixer happens to be traveling. On small, irregularly-shaped jobs, it may be easier to show the project quantities in square yards instead of miles. In this case, cross out the Right and Left headings and show the yardage in the center column. Describe in column marked "Lane" the section of the irregular slab you are laying. However, if a widened intersection is a minor part of a uniform width slab, carry the mileage through as shown on the plans. When this intersection is poured the mileage record may not change that day, but you can show in the "Lane" column where you were paving. Square Yards or Miles Laid. Show here in the proper column the total square yards or miles laid, including the current date.

Square Yards or Miles to Lay. This is obtained by subtracting miles or square yards laid from the line next above.

Weather. Use descriptive terms that really describe the weather, not merely "good" or "bad".

Examples:

"Clear and dry," "hot and humid,"  
"cloudy and cold," "foggy," "windy,"

Day's Temperature, Maximum-Minimum.

An inexpensive thermometer will furnish the information required with sufficient exactness. It should be read morning and evening for the minimum and around mid-afternoon for the maximum. Readings should be taken in the shade or they will be meaningless. Telegraph poles, fence posts, or the shady side of a parked automobile will usually be available for this purpose. While such a thermometer is easily and cheaply replaceable, care should be taken to avoid loss and breakage, in order that the instrument may be available when needed.

Minimum Temperature During Following Night. This entry is of special significance in early spring and late fall when temperatures sometimes fall to the freezing point during the night, thus endangering pavement laid during daylight hours when temperatures are safe. It is of less importance in midsummer, though even then, a sudden cooling of the concrete may cause more frequent transverse cracks. Since recording thermometers are seldom available, the information is usually obtained from someone around the job who was on duty during the night or very early in the morning. A reading at five or six o'clock a.m. is ordinarily not far from the daily minimum.

Method of Hauling. Use some term like the following: One-batch trucks, two-batch trucks, truck mixers, agitators, wet batch.

Air-entraining Agent. Show here the brand of air-entraining agent used.  
Date. Don't overlook the need for a date on each report. Also, check the correctness of the date shown. Reports sometimes reach the office with no date and occasionally two have the same date, in which case a detailed study of the stationing and direction of progress must be made in the office to determine the necessary corrections.

Report Number. The plan is to start numbering the reports at the beginning of the season, serially. The first report for a given crew on a given project in a given year is Number 1, etc., ending when that crew quits the project with Number 99 or some other number. If this same crew starts again on a different project or a different contract, start again with Number 1. This is true even though the new start is in the same year, in the same county, or on the same highway. If the same crew laid part of this same project last year, do not carry forward the numbering from where it stopped last year. Start over at the beginning of each season with Number 1. These reports must be filed for each day that pavement is laid. They need

not be filed on days when no pavement is laid, but the reason for the shut-down must be shown on the next report. For example, "No work yesterday - Sunday," or if on account of rain, "No work Tuesday and Wednesday, May 20 and 21, because of rain." The numbers will be kept serially, with no omissions on days for which no reports are made. When a contractor has several projects in the same residency and suspends one project to work on another, the last report on the project temporarily suspended should be marked "suspended" and a statement made as to the project to which the contractor is moving. If this is done, no reports need be made on the project suspended as long as it remains inactive and reports are sent in on the active report.

Inspector on Pavement. Enter surname in full, preceded by christian name or initials, whichever is your customary practice for signatures on letters or other documents. Surname alone is insufficient. There might be several Smiths who were inspectors on the Commission force during a series of years or even at the same time. Initials alone for surnames are also inadequate. R.E.J. could mean Ralph E. Jones, Roy E. Johnson, or Raymond E. Jackson, and the party perusing the reports a few years later would

have no idea who had been inspector.  
Inspector at Plant. Same as preceding.  
Location at Plant.

Examples:

C. B. & Q. yards - Fairfield  
 I. C. Ry. - 2 mi. W. Ft. Dodge  
 Roadside - 5 mi. S. Garner

Type of Plant.

Examples:

Central proportioning, central  
 mixing, Keefner - truck-mix

Thickness, Sides - Center. This, of course, refers to the thickness of the pavement slab being laid. Its importance lies in the fact that thicknesses change from year to year even on standard designs. Thickness at sides should be that of the pavement slab itself, disregarding the height of the curb, if any. Thickness at center should be that of the thinnest pavement called for in the standard cross section, disregarding the fact that in some cases, this will not be at the center of the roadway, but in the center of each lane due to possible thickening at longitudinal joints separating the several lanes.

Width Pavement. Show here the full width of the pavement shown on the plans, not the width of the lane you are laying if laid in multiple

lanes. If the project is partly rural and partly urban and of different widths, show the different widths, e.g., urban 49', rural 24'.  
Lane. Note here which part of the slab you are placing. If paving in lanes, show lane such as right 12½', center 24', inside left 12'. If laid full width such as country paving, show this as "full slab."  
Station, From - To. The intention is that a record of the work shall be kept by even stations, that is, by the stations shown on the plans and staked on the ground. This gives a method of tying in the record of the work as shown by the report with the stationing as shown by the plans and the station numbers marked on the edge of the pavement. For example, if a crew starts at Station 10+85 and lays 350 feet the first day, enter the record as follows:

Station		Length
From	To	Feet
10+85	11+00	15
11+00	12+00	100
12+00	13+00	100
13+00	14+00	100
14+00	14+35	35
Total		350

Length - Feet. Enter as shown above.  
 Do not leave blank for all station

entries will not be an even hundred feet long. Show stationing omitted for bridges or other short gaps.

Square Yards. Calculate this for each line entry using the length in the previous column and the width shown in the lane column.

Cubic Yard or Batches Required and Used. On the ordinary uniform paving job, the number of batches per station and the length of slab per batch are known by the inspector. If the batches are uniform in volume, these figures will be constant and the inspector will determine from the length of the section, the theoretical number of batches required. If the batches are not uniform in volume, such as might be the case if hauled in various-sized truck mixers, the inspector should compute the theoretical number of cubic yards required. The number of batches used will usually be determined from the reading of the batchmeter. If the inspector is basing his calculations on cubic yards, he will have to use the record of concrete hauled by truck mixers, usually a printed form filled out at the plant.

In all cases, the inspector must cross out either "C.Y." or "Batches" at the top of the column to show in which units the record is being kept.

Percentage of Required Cement Used.

Enter here the percentage figure obtained by dividing the number of batches or cubic yards used by the number required. Calculate to the nearest one tenth percent.

Water in Materials. Record here the total pounds of water in the materials as reported to you by the plant inspector.

Water Added at Mixer. Record in this column the pounds of water added at the mixer. This figure will be obtained from the calibrated water measuring device either direct or corrected, if necessary, as shown by the calibration test. The total of these last two columns divided by the pounds of cement per batch should not exceed the water-cement ratio permitted by the specifications. If more water seems necessary, something is wrong, and an investigation of all the possible sources of error should be begun immediately.

Time Laid. These two columns are to show the time of starting and the time of ending of the placement of concrete for each station or part of station recorded in the preceding columns. Do not include time devoted to finishing, curb building or other operations.

Percent Air-Remarks. Show here the percent air in the concrete as deter-

mined by the air meter, also the depth in inches as determined by depth checks and the form settlement observed as outlined in Instruction No. 8, Section XII.

Time Lost and Causes. Make short, explicit entries on this line, such as "preparing subgrade - 1 hour," "shortage of trucks - 2 hours," "mixer broke down - 30 minutes," etc. This information tells a lot to anyone scanning the reports to see how the crew was functioning.

Length of Regular Working Day. Enter here the hours the contractor plans to pour concrete, not the actual number he did work on that specific day.

Condition of Subgrade. Use here terms that actually describe, not merely "good" or "bad." The following terms and similar ones, really convey information as to the shape the subgrade is in. "Wet and Springy," "dry and hard," "muddy," "spongy," "rutty," "cloddy," "smooth and compact."

Nature of Soil. Use terms such as "yellow clay," "black loam," "sandy soil," "old gravel road," "black gumbo," "loess."

Was it Sprinkled or Covered with Tar Paper or Plastic? Indicate which in the space provided.

Brand of Cement. Show brand name and type. Regular is Type 1. High early is Type 3.

Fine Aggregate - Source of Same. Fine aggregate in this state is almost invariably sand, where in certain other places, pulverized stone is sometimes used. One possible variation, however, comes when the sand is combined with gravel to form "pit run" aggregate. In such case, a proper notation should be made. The source of the material should usually include the name of the producing plant.

Coarse Aggregate - Source of Same. Mention the type of material in specific terms such as "crushed limestone," "screened gravel," and the name of the plant as above. If pit run is used, note as described above.

Was Fresh Concrete Covered with Burlap? The answer should always be "yes." This question is included on the report only to keep it constantly in the inspector's mind as one of the requirements of the job.

Was Burlap Kept Wet? Answer is "yes." Question on report for reason given above.

Method of Curing. Show here the method of curing used by the contractor such as transparent membrane, burlap, wet straw, paper, etc.

Pounds of Cement Per Batch. Insert here the cement weighed out per batch as reported to you by the plant inspector.

Proportions Used. Enter here the proportion used on your job. It will be sufficient to designate this by the mix number given at the left of the table of proportions shown in the specifications.

Feet Today With Curb - Without. Check that the sum of these two figures is equal to the sum of the lengths of stations and parts of stations shown in Column 4.

Resident Construction Engineer. This does not necessarily have to be the resident construction engineer's signature. When the inspector is located miles from the office and is living on the job, it may be necessary for him to send these reports forward before seeing the resident construction engineer in order to get them in promptly. In such a case, write his name in the blank.

It is well, however, to submit your daily reports to the resident construction engineer for his perusal before mailing, when possible. He wants to know what was done during the day as well as the central office, and he may catch a discrepancy that should be corrected.

General. When a project is shut down indefinitely for any reason, state this fact on last report and tell why. No reports need then be submitted until operations are resumed. Upon comple-

tion of project, mark last report "Final."

Disposition of Report:

One copy to Ames\*

One copy to District Engineer\*

(\*These two go together to district office.)

One copy to Resident Construction Engineer.

At a recent concrete paving workshop, the contractors expressed a desire for a copy of the daily inspection report (Form 224).

After some experimenting, no satisfactory means of making more than the currently required number of carbon copies was found. Actually, the fourth copy is not always completely legible.

Reprints of Form 224 have been made of lighter stock paper, which improved the legibility of the required number of copies. However, the extra copy requested by the contractors will still not be feasible.

In order for the contractor to have daily records of the information supplied by Form 224, the plant inspector should daily furnish the contractor an opportunity to make a copy of this form, provided no delay in forwarding the required copies ensues.

Blank forms for this purpose may be furnished the contractor.



## SAMPLE OF FORM 224

CONCRETE HIGHWAY CONSTRUCTION

IOWA STATE HIGHWAY COMMISSION  
DAILY INSPECTION REPORT

Three copies to be made out for each day regardless of whether any pavement is laid.

County Linn Date Aug 3, 1963  
Project No. U-255 (A) Report No. 5  
Road or St. U.S. 51 S. Highway 64 Inspector on Pavement C. Jones  
Contractor Quod City Concrete Co. Inspector at Plant C. Smith

Location of Plant 4th & N.E. Cedar Rapids  
Type of Plant Central Plant  
Thickness 10" Site 10' Center  
Width Pavement 24'

Day's Temperature: Max. 93° Min. 70°  
Min. Temperature During Following Night 62°  
Method of Hauling 1000 Barbed Wire  
Air Entr. Agent Protex

Weather C. 1901

Date	Lanes	From	To	Length Feet	Square Yards	C. Y. or Bitches		Water Mlb. at Mixer	Water Mlb. at Plant	Time Laid Per Sq. Yd.	Remarks		
						Received	Used						
Center 24'		924+25	926+00	175	466.7	93.53	96	308	308	9.40	10.20	5.2	924+00 3.62 10 1/4
		924+00	928+00	200	533.3	106.96	108	308	308	10.20	11.30	6.5	924+00 6.02 10 1/4
		928+00	930+00	200	533.3	106.96	108	335	335	11.50	11.0	6.1	928+00 4.0 10 1/4
		930+00	934+50	250	613.3	120.33	125	335	335	11.0	3.15	5.9	930+00 3.14 10 1/4
													934+00 4.8 10 1/4
TOTAL				825	2133.6	534.80	546	1279	1279				

This sample illustrates use of square yards instead of miles which is permissible only on municipal multiple-lane and small, irregular projects.

1005 0879.9 534.80 546 1279

3 hrs. in morning. Mixer broken down. 1 1/2 hr. noon.

Wet Fresh Concrete Covered with Burlap 1/2" \*Proportioned Sand

Was Being Used? Yes P. Trolley with Curb 0 Without 1005  
Hours of Use Sandy Clay Total Previously Laid, Feet 0 577  
Method of Curing Hunts Process Total 577  
Wet in Sprinkler or Covered with Paper or Plastic? Plastic \*Lbs. Cement per Batch 834 Laid Trolley 0  
Brand of Cement Dewey \*Slipform or Formed Personnel? Formed Total to Date 0  
\*Plus Aggregate Sand \*Source of Base Concrete Cedar Rapids Resident Engineer P. Sarnusbery by L. J. Jernid  
\*Course Aggregate Intermediate \*Source of Base Concrete Cedar Rapids Physician: Const. Dept. Dist. Off. Bea. Exp.

## WEEKLY POST CARDS

This applies to certain interstate and primary projects only.

Weekly post cards, containing information on certain projects, have been sent to the construction department from the construction field forces for the past several years. This instruction has been written to provide uniformity, and to clear up any misunderstanding as to whether the cards are required.

The three types of cards previously used have been combined into one post card. It covers the following types of construction:

1. AC or PCC Pavement
2. Asphaltic Concrete Resurfacing
3. Interstate Grading

Cards should be sent on only those primary or interstate projects which fit the above classifications, and should be mailed on Friday night or Saturday, so that they will be in the central office the following Monday.

When a project has been suspended, it should be so noted on the card, giving the date of suspension. Cards need not be sent until work on the project has been resumed. Also, when a project has been completed, the final card should contain the date of completion.

New cards are available at the central construction office in Ames.

## WEEKLY POST CARDS

Construction Engineer  
Construction Department  
Iowa State Highway Commission  
Ames, Iowa 50010

WEEKLY REPORT  
AC OR PCC PAVEMENT  
RESURFACING  
OR INTERSTATE GRADING

AC  PC  GRADING   
(check one)

Work done incl. Friday 7-13-68  
(date)  
Contractor Hallett Const. Co.  
Project 1-35-5-(16) 134-01-90  
County Story

Fill in appropriate blank:  
Subgrade 74 % Subbase 43 %  
Base      % Binder      %  
Surface 0.0 % PC Slab 18 %  
Shoulders 0.0 %  
Grading      %

Total Contract Completed 54 %

Remarks: Progress slow  
due to idlement  
weather

Signed John Jones  
Title Proj. Inspector

## DIARY AND FIELD BOOKS

It has become increasingly more important, in fact a requirement, that all pay items, equipment used, material used and even unusual happenings must be properly recorded and documented. If nothing unusual happens, that should also be documented. It will probably be a rarity.

A good diary should first give the date and weather conditions. A list of the type and amount of equipment should be found in one entry. Any delays should be noted and the reasons for such delays. Any unusual job conditions should be listed. In short, make a running job history. Important visitors, either Commission or contractor's personnel, should be noted and their contribution recorded. It is also helpful to record other Commission personnel working under your direction and their duties on this particular day.

If possible, all field books anticipated to be used should be set up before going into the field. A field book for diary, P.C.C. Paving Materials Approvals, P.C. Plant, and Items can be made out and will be needed for almost any paving of any size. If the project is of interstate type, separate field books will be required for subgrade correction, subbase, reinforced P.C. Paving, non-reinforced P.C. Paving and Stabilized Shoulders in addition to those listed above.



STATE LIBRARY OF IOWA



3 1723 02044 2372