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GUIDELINES FOR SELECTING PROJECTS FOR MAINTENANCE CONTRACT WORK

MARCH 1992

PREPARED BY
OFFICE OF MAINTENANCE
HIGHWAY DIVISION
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**Iowa Department
of Transportation**

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INDEX

	<u>PAGE</u>
GENERAL	1
DEVELOPMENT OF CONTRACT MAINTENANCE PROJECTS.....	3
DEVELOPMENT FLOW CHART	4
GUIDELINES FOR SELECTING PROJECTS FOR MAINTENANCE CONTRACT WORK (ALSO PROVIDES INFORMATION NEEDED FOR ESTIMATES)	5
ESTIMATE INFORMATION (GENERAL)	22
WORK CODES.....	23
PROJECT DATA SHEET	25
BRIDGE PAINTING SHEETS	27
TABULATION OF EXISTING PAVEMENT.....	29
PATCHING FORMS	30
SUBMITTAL OF ESTIMATE INFORMATION (EXAMPLE)	34

This publication sets forth the scope of the contract maintenance program and material procurement procedures. It is also intended to provide guidelines for submitting information this office needs to prepare project proposals for contract maintenance projects.

CONTRACT PROCUREMENT OF MAINTENANCE
MATERIALS AND REHABILITATIVE SERVICES

The Highway Division, through the offices of Maintenance, Contracts, Purchasing and Inventory and the district offices, develops annual programs for procurement by formal contract of maintenance materials such as shoulder aggregate, asphaltic materials, chemicals, etc., and rehabilitative services such as bridge painting, pavement patching, seal coating, resurfacing, mowing, etc. In addition, small quantities of materials and services may be purchased directly as set out in PPM 010.14.

Material needs are determined by field offices, residency and district, and approved for contract by the offices of Maintenance, and Purchasing and Inventory. Aggregate and asphaltic concrete quantities are assembled and prepared for letting through the Office of Contracts by the Office of Maintenance. Other material quantities such as asphaltic road oils, patching premix, chemicals, signs, posts, etc., are assembled on the basis of field estimates and requests, and prior usage history. They are then let to contract through the Office of Purchasing and Inventory. These items, depending on type, storage requirements and usage, are often purchased on continuing yearly contracts. Delivery of material let under these contracts is authorized by purchase orders.

Contract rehabilitative services such as bridge painting and pavement and shoulder maintenance are identified and prioritized by the districts. The Office of Maintenance, after field reviews of the candidate projects, assembles the project data and arranges for contract lettings through the Office of Contracts. Funding for work is provided through a special cost center (6500) that is established jointly by the Highway Division and Planning Division (Office of Program Management). Additional rehabilitative activity, such as repair or replacement of access control fence and signing, are also developed in a similar manner but use other funding sources. The total allocation is approved by the Iowa Transportation Commission yearly as part of the planning and programming process.

The selection and prioritization of candidate projects is initiated in the field offices. The "system preservation concept" emphasizes preserving capital investments, traffic services and safety, and maintenance cost/effort containment. A central office review of the program is coordinated by the Office of Maintenance,

which draws on the expertise contained in the offices of Road Design, Bridge Design, Construction, Materials and Contracts. Contract administration and inspection are handled as set forth in the Code and DOT policies which govern all construction and maintenance project work.

All work is to be performed in accordance with current applicable specifications. Inspection is to be provided as set out in the instructions provided by the offices of Construction and Materials.

DEVELOPMENT OF CONTRACT MAINTENANCE PROJECTS

Near the middle of each fiscal year the Office of Program Management prepares a pavement condition listing for each district. This listing includes all primary roads. With some guidance concerning the cutoff level associated with pavement condition ratings (and pavement related parameters) for each level of service (provided by the Office of Program Management), each district develops recommendations for minor and major pavement rehabilitation (construction) work. (Involvement of resident maintenance engineers in the selection of these candidates for projects is strongly recommended.) Preliminary rehabilitation needs and cost estimates are coded by each district according to the minor and major pavement rehabilitation work codes (see pages 23 and 24), including the year recommended for accomplishment. District construction recommendations are returned to the Office of Program Management. The District also prepares recommendations for corrective and preventative maintenance work, and are provided to the Office of Maintenance.

Interstate (4R) candidate lists are developed through a separate process by the Highway Division staff. This would include large patching projects, but would not include normal maintenance activity.

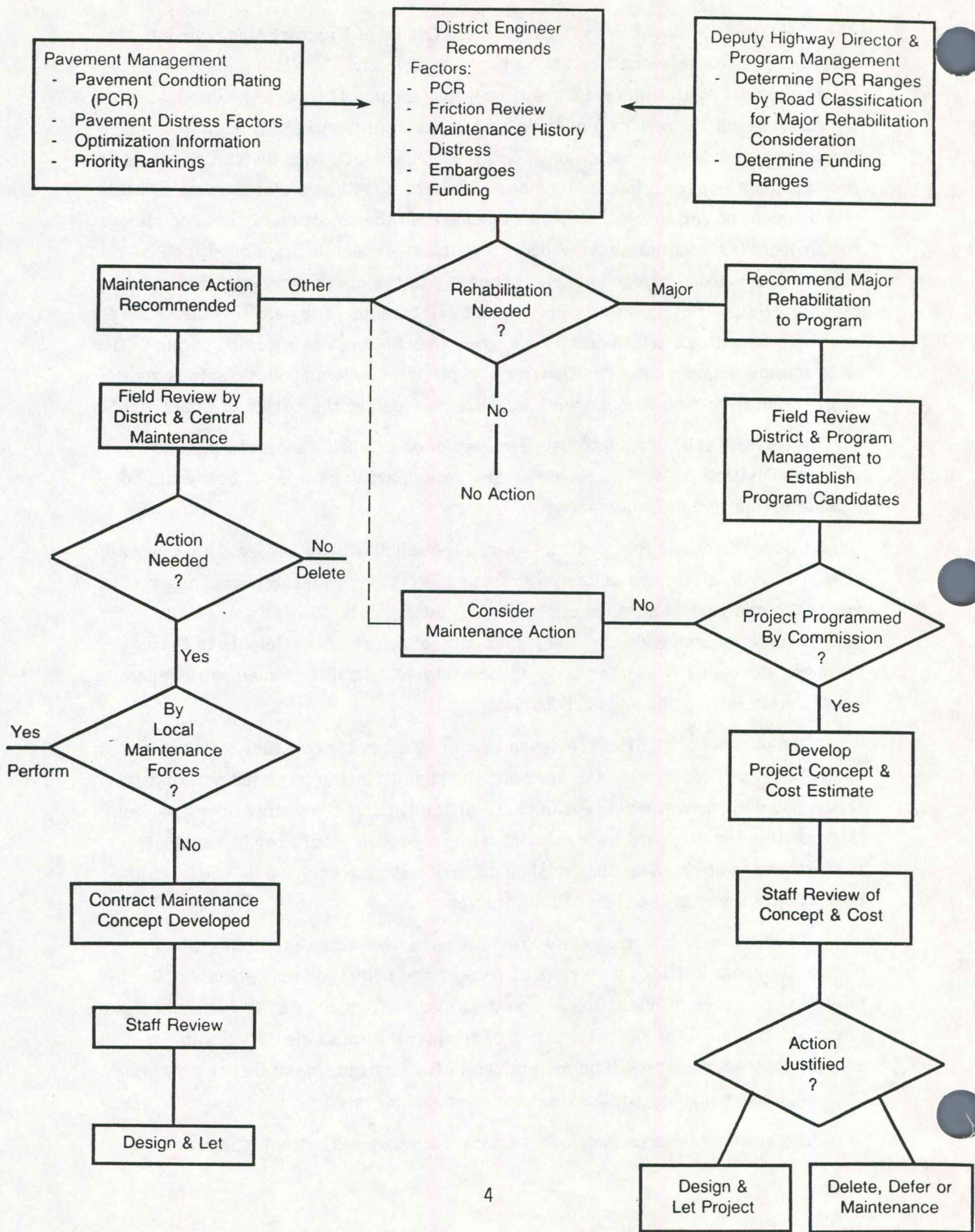
Concept reviews for construction-related rehabilitation projects are generally scheduled well in advance of the programmed D/O date, generally occurring six months to one year in advance of the project letting date. The Office of Maintenance recommends that the field maintenance staff participate in these reviews. Concept reviews for maintenance-related rehabilitation activity generally occur during late spring and early summer.

The purpose of the field review of the candidates for contract maintenance projects is to: (1) determine the need and the timing for the proposed activity; (2) refine and document the concept in detail at the time of the concept reviews; and (3) prioritize the proposed improvement with respect to other project candidates throughout the state. The district should provide the information indicated on the project data sheet at the time of these reviews.

When the maintenance-related reviews have been completed, all project candidates are prioritized with respect to need and 6500 fund allocations. This information is then provided to each district along with a request to gather necessary information needed for the preparation of the project proposals. Flexibility to address unplanned needs will be maintained in the contract maintenance program. Each unplanned activity will be field reviewed and assessed.

The system preservation flow chart on the next page outlines the process.

System Preservation Flowchart



GUIDELINES FOR SELECTING PROJECTS FOR
MAINTENANCE CONTRACT WORK

The following information should be used to determine the type of work normally done under the contract maintenance program and for developing project quantities. NOTE: WHEN PREPARING PROJECT QUANTITIES REFER TO THE NOTES TAKEN ON THE CONCEPT REVIEWS FOR SPECIFIC STATEMENTS CONCERNING THE PROJECT CONCEPT.

I. Bridge Painting and Repair

A. Bridge Painting

Each year the bridge maintenance engineer sends the district maintenance engineers and resident maintenance engineers a list of bridges in their area which may require painting. Additional painting candidates may be selected by the district. These candidates are reviewed by the district and the necessary information required for proposal preparation is transmitted via the bridge painting cost estimate form to the Office of Maintenance.

Bridge steel should be painted before there is section loss due to rusting.

It is important each district coordinate bridge painting with bridge replacement projects, and other programmed bridge related activity.

When programmed bridge repair work (not MB) is necessary, repainting should be included when needed in concepts developed for these projects. These concepts are generally developed by the Office of Road Design.

B. Bridge Repair

Minor strengthening, damage repair, etc. may be included in this program. The need for this work should be reviewed with the bridge maintenance engineer.

II. Pavement Patching

This work should be programmed when the repair needs are beyond the capability of the local crews.

NOTE: The cause of pavement failures should be ascertained and corrected as a part of the contract if possible. Refer to the following checklist:

1. Wet subgrade: ditch cleaning (local crew), pavement edge drain, patch drainage.
2. Settlement: check for need of culvert or tile repair (local crew).
3. Pressure: clean and seal contraction joints, install pressure relief joints (refer to the PCC Pavement Maintenance and Repair Manual).
4. On ACC resurfaced/PCC pavements: if pressure relief is necessary, full depth asphalt patches should be specified. These patches shall be full pavement width for a uniform section through the pavement (2-ft. patches min.). (Refer to the PCC Pavement Maintenance and Repair Manual.)

A. Full-Depth Patching

Full-depth patching projects should be grouped, if possible, to provide a basis for competitive bidding. Individual projects should not be let if the quantity is less than 150 square yards. The measurements should result in the removal of all unsound concrete.

The practice of using an existing transverse joint as a patch edge should be avoided. Many transverse existing joints show distress once the pavement is opened up, leading to unsound patch edges.

Determine the type of PCC full-depth patch required as outlined in the supplemental specifications. All full depth patches shall be full lane width. Length may be variable, but shall be a minimum of 8' for

continuously reinforced concrete and 6' for patches that require dowels. As a rule, dowel requirement will be considered when traffic exceeds 150 trucks per day. For PCC patches that do not require dowels, a minimum patch width of 4' may be used. See current specifications for additional information regarding full-depth patching.

Tabulation of full-depth patches should be typed on 8 1/2" x 11" tabulation form #102-6C (see attached) for full-depth patches. Utilize the appropriate column of the form as to location, size, type of patch and number of dowel assemblies. The remarks column should be used for pertinent information such as patches with curb, utility access points or other fixtures. The Office of Maintenance will supply blank forms upon request.

Tabulation of existing pavement tabulation form #102-5 (see attached) should include pavement type (PCC, ACC or ACC/PCC) pavement thickness, coarse aggregate (gravel or limestone), and durability of coarse aggregate. Details of existing reinforcement should be described by the use of a legible, reproducible typical detail. When a reproducible detail is not available a written description may be substituted. This information should accompany patching projects.

B. Partial Depth PCC Patches

Purpose of partial depth PCC patching is to correct surface defects in PCC pavement. PCC partial depth patches are utilized when PCC pavement is in REASONABLY GOOD CONDITION.

Patch sizes should be estimated to include all the distressed area and approximate three inches of sound concrete in all directions. An additional 10 to 15 percent of quantity is normally added to the estimate to take care of areas that may become distressed between the time the estimate is made and the work is done.

Patches will generally have a rectangular appearance. Partial depth PCC patches will be estimated in square feet. Tabulate patches by the mile or by the stations. Tabulations should include number of patches and square feet per lane mile or lane station.

Tabulated information shall be typed on an 8 1/2" x 11" tabulation form #102-10 (see attached).

Refer to current specifications for additional information regarding PCC partial depth patching.

C. Regular or Irregular ACC Partial Depth Patches

ACC Surface Patching: This type of work may be considered for heavily "D" cracked PCC pavement, spalled ACC surfaces and other deteriorated pavements where spalling has not reached the point where full depth repair or resurfacing is warranted. This work is not considered to be a permanent repair. Other work, such as full depth patching or resurfacing, should be programmed by the district for future review to facilitate a more permanent means of pavement rehabilitation.

The purpose of ACC partial depth patches is to correct surface defects and retard deterioration of PCC, ACC and composite pavements. This type of work is generally used on older pavements with extensive deterioration. Patch dimensions may be regular or irregular in shape. When deterioration extends thru the pavement the patches may be constructed full depth at the direction of the engineer. It would be appropriate to include quantities for full depth areas on roadways which exhibits "D" cracking.

Tabulations for irregular ACC patches shall be typed on tabulation form #102-12 (see attached) and should include number of patches, square yards, and tons of ACC material per mile or station.

Tabulations for regular ACC patches shall be typed on tabulation form #102-11 (see attached) and should include location of patches by traffic lane, by mile post or station, patch dimension (length x width), and estimated quantities (square yards and tons). Refer to project concept review notes for type of partial depth patch to be used on the project. This style of patch is generally not used on maintenance projects.

III. Pavement Surface Maintenance

A. Pavement Milling

This work may be appropriate for ACC pavements where low friction numbers or wheel rutting are present on a highway with a high wet weather accident experience. The pavement structure must be adequate and the base pavement or surface must be in a generally good condition. This work would generally only be appropriate as a part of pavement preparation prior to a seal coat, slurry seal or thin lift ACC resurfacing.

B. Fog Seals

The purpose of a fog seal is to retard the oxidation of the ACC surface. This work should be programmed when minor raveling appears on the asphalt surface.

Roadways with sprinkle treatment aggregate should also be considered for fog sealing when the surface appears to be losing sprinkle treatment aggregate.

Information needed for proposal preparation includes a plat (pencil drawing on county map section is satisfactory) showing:

1. The project limits (beginning and ending points) by mile post and stationing.
2. Gaps or bridges not to be fog sealed.
3. Equations.
4. Pavement widths, specifying any irregular widths.

Tabulate mainline interstate and primary roadways by width and length. On four-lane divided and interstate routes, tabulate ramps and loops for width and length to be sealed. List (by mile post) interchanges to be sealed for reference in the contract documents.

Coordination of fog seal placement with department traffic paint crews is important.

C. Bituminous Seal Coats

Seal coats are normally limited to bituminous surfaces with less than 1,000 vehicles per day.

This work should be considered for programming when raveling, excessive cracking or a polished surface condition exists.

Information needed for proposal preparation includes a plat (pencil drawing on county map section is satisfactory) showing:

1. The construction limits (beginning and ending points) by mile post and stationing.
2. Gaps or bridges not to be sealed.
3. Equations.
4. Pavement widths, specifying any irregular widths.

When full depth patching, crack filling, slurry leveling or strengthening and leveling are a part of the work, furnish estimates as stated elsewhere in this handbook.

Pavement marking estimates (in stations) shall include: (1) solid yellow "no passing" line; (2) dashed yellow centerline - actual paint line; (3) solid edgeline; (4) solid yellow edgeline (4-lane divided); (5) dashed white centerline - actual paint line (4-lane divided); (6) solid white cross walks and stop lines; and (7) symbols - number of each and type (as outlined in section 9000 of the Road Design Aids Manual - "green book").

D. Slurry Seals

The pavement structure must be adequate. Generally wheel rutting should be less than 1/4 inch (1/2 inch for double course).

No maximum ADT has been set for slurry seals, except that with very high traffic they do tend to wear through quite rapidly. Slurry seal work should be considered where raveling, excessive cracking or low friction numbers

have developed. Minor wheel rutting may be corrected with this concept. Slurry seal work may also be used on an ACC paved shoulder.

Information required for proposal preparation is the same as that listed for seal coats.

Refer to the appropriate specifications for further details.

E. Thin Lift ACC Overlay (1" ± Max.)

The pavement structure must be adequate, wheel rutting should average less than 1/4 of an inch. Thin lift overlays may be considered for a dry raveled surface, or for a pavement surface with low friction numbers. Some improvement in ride will be experienced with this work. Thin lift ACC overlays should not be generally considered for portland cement concrete surfaces. Quantities for pavement marking should be provided (see seal coat). Aggregate for granular fillets (3-foot max.) will also be required when this concept is utilized.

Before proposing project work for a thin lift ACC overlay, consideration should be given to the use of a seal coat or a slurry seal.

F. Heater Scarification With Thin Lift ACC Overlay

The pavement structure must be adequate. This type of work will correct wheel rutting up to 3/4 of an inch. It will correct a moderate amount of cracking and surface deterioration, and will improve pavement friction.

Project proposals for this work should include all necessary surface and full depth pavement repair. This concept is not suitable for badly oxidized, low penetration, ACC surfaces. Information concerning pavement marking will also be required for this work (see seal coat).

G. Strengthening and Leveling

Overlays in excess of one inch will be considered for funding if limited to short areas (normally 600 feet or less in length). It is suggested that they

be used where short stretches of highway needs strengthening, leveling, or where a thicker overlay will eliminate the need for excessive full depth patching through short areas.

This concept can also be utilized for bridge approaches (may require pavement milling to remove the material from existing approach prior to ACC placement).

Information needed for proposal preparation includes a plat, a tabulation of proposed areas to be overlaid, estimated aggregate quantities for granular surfacing of shoulders, and necessary pavement markings (see seal coat).

This concept will provide for the contractor to furnish and place the ACC material. This concept has proven to be cost effective and allows increased flexibility for scheduling the state lay down machines.

Minimum contract size 1000 tons.

H. Pavement Planing (Diamond Grinding)

Pavement must be structurally sound and in good condition. Use of this concept is applicable to PCC pavements with low friction numbers and high wet weather accident experience (posted slippery when wet). This concept can also be utilized on a faulted pavement. Pavement grooving may be utilized with planing, where considered necessary. This work will not be considered when pavements are eight inches or less in thickness.

Pavement undersealing may be necessary in conjunction with this work. Undersealing would only be considered when the Soils Design Section (Office of Road Design) concurs.

The installation of longitudinal subdrains, when required, would be done prior to this work. Pavement preparation, including full depth patching, should be a part of this concept. See appropriate type of work for required information.

Preferences in scheduling are to install longitudinal subdrain one year or more prior to planing work with necessary patching. Planing work and additional patching and pavement resealing should be scheduled the following year.

Information needed for proposal preparation includes:

1. Plat
2. Coarse aggregate type (limestone or gravel)
3. Durability of coarse aggregate
4. Area (sq. yds.)
5. Type of grinding (longitudinal or transverse)
6. Pavement markings
7. Initial profilometer traces of planing areas (should be scheduled through district materials engineer). This information must be submitted to this office four weeks prior to the letting date.

NOTE: This work should normally be programmed through the construction rehabilitation program due to lack of funds in the contract maintenance program. Refer to appropriate specifications for details concerning this work.

IV. Joint Maintenance

A. Joint and Crack Sealing (PCC Pavements)

Portland cement concrete pavements should be considered for crack and joint sealing when the joint sealer has failed. Bond failure of the joint sealing material can be determined by visual inspection. Spalling at the joints due to the intrusion of incompressibles is also an indication that the joint sealer has failed. The intent is to perform this work on the better PCC pavements first. Candidates for joint and crack sealing should be reviewed for longitudinal subdrains. Partial depth patches may also be a part of this work. The type of patching (ACC or PCC) will be determined on the concept review. See pavement patching section for information needed for proposal preparation of partial depth patches.

Estimate joint and crack lengths in accordance with the specifications by class by mile posts. The intent is not to route or saw and seal random cracks which are not working and are tight (1/8 of a inch or less in width). Provide the date the estimates for this work were made. Detailed estimates are necessary to avoid large overruns on these projects. Totals of joints and cracks by class should be provided.

Centerline or other longitudinal joints which were formed using a parting strip (generally found on pavements prior to mid 1950 placement) should be tabulated as a joint. The existences of "parting strip joints" on a project should noted in the contract documents.

A plat is required for this type of work.

Include coarse aggregate type (gravel or limestone) and source that was used in the pavement.

Local crews should be advised not to use emulsion in the joints of pavements which are candidates for this work. If emulsion has been placed in the joints, this information should be noted on the proposal.

B. Crack Sealing (ACC Surfaces)

Sealing of ACC surfaces should be considered for contract when the work load exceeds the local crew capability. The intent is to seal fairly new ACC surfaces when the reflection cracking is complete. Estimate crack lengths in accordance with the current specifications by class. Only transverse and random cracks should be routed and sealed.

The centerline crack or the constructed longitudinal joint should be sealed by the use of a sand seal or strip slurry. Sand seal application if chosen should be placed after the routing and sealing work. The slurry work may be placed prior to the sealing work if desired. This work should be done in house.

A plat is required for this type of work.

Crack filling with emulsion by local crews SHOULD NOT BE ALLOWED on roadways where routing and crack sealing work is proposed.

C. Crack Filling ACC Surfaces with Emulsion

This work will normally be done in conjunction with seal coat, slurry seal and slurry leveling projects as a part of surface preparation. This work could also be considered for contract if local crews are falling behind in crack filling work.

An estimate of the number of gallons per mile will be required. The need for emulsion generally varies from 200 to 700 gallons per mile (two-lane roadway). Before sending in an estimate for this work, the resident engineer should contact the supervisor responsible for the roadway and consult with that supervisor concerning the emulsion needs. (A test section by local crews may be appropriate to determine need.) CRS-2 or CRS-2P asphalt emulsion may be used.

An estimate for the number of tons of ACC material needed for crack patching will also be required.

A plat should be submitted for this type of work.

Refer to current specifications for this type of work.

D. Longitudinal Joint Repair

Purpose of this work is to mill distressed material from longitudinal widening joints, centerline joints and random longitudinal cracks. Preparatory work may include cleaning and sealing or filling of the longitudinal opening in the concrete base before placing ACC mix in the milled trench.

Tabulate length and width of proposed longitudinal joint repair. Normally the payment width to be milled is 6 inches; however, when a 12-inch width is designated, the payment length (for measurement purposes) will be doubled.

NOTE: Some ACC resurfacing work placed in the 1950's and 1960's provided for a steel mesh placement over the widening unit joint. Review as built plans and advise if steel mesh was used. "Sweeping" with a large magnet may be necessary if steel mesh was placed.

Refer to current specifications for this type of work.

E. Slurry Leveling of Cracks

This work can be used on a roadway to improve the ride on an ACC pavement, or could be preparatory work for a bituminous seal coat or slurry seal.

Provide the total number of joints or cracks to be leveled per mile, and the width of the pavement.

A plat is required for this type of work.

Refer to current specifications for this type of work.

F. Slurry Strip Treatment

This work is generally used to fill depressions at the pavement centerline and widening crack. This will consist of placing an asphalt emulsion slurry mixture in narrow strips (usually 1-3 feet wide). Slurry strip treatment may be preparatory work for bituminous seal coat or slurry seals.

Crack filling with emulsion may be considered as preparatory work for the slurry strip treatment.

Provide a tabulation showing the average depth of depression, width and length of strips. Include a plat showing locations (a mile post and station) of width changes and breaks in construction.

Refer to current specifications for this type of work.

V. Miscellaneous Pavement Maintenance

A. Longitudinal Subdrains

Subdrains should be considered through areas where wet subgrade may be causing pavement cracking, instability, frost heaves, settlements and pumping. All subdrain needs will be reviewed by the Soils Design Section, Office of Road Design.

VI. Shoulder Rehabilitation

A. Paved ACC Shoulders

1. Fog seal when the surfaces become dry. Fog seals should not be considered if excess raveling or breakup has occurred on the shoulder surface. Fog seals can be placed on shoulders that are flush with the pavement surface.
2. Seal coat to correct raveling and cracking problems. Shoulders should be about 1/2 inch low to accommodate the seal coat and to facilitate drainage off the roadway. When shoulders are flush with the pavement surface, pavement milling may be utilized to provide adequate room for the seal coat adjacent to the pavement edge. Aggregate for shoulder seal coats will normally be the 3/8-inch size. Strip seal coats may be required if the shoulders are more than 1/2 inch low. The placement of a slurry wedge could also be considered for this work.
3. Slurry seal may be placed in lieu of a seal coat if the shoulders are between 1/4 to 1/2 inch low. The use of a slurry seal should not be employed on a shoulder which lacks adequate structure. This concept can also be used to correct pavement shoulder edge dropoffs and to fill cracks between the shoulders and the pavement. The width of the slurry seal may vary depending on the shoulder condition from a minimum of 12" wide to full width.

4. Full depth repair of asphalt shoulders can be included for contract work if beyond the capability of the local crew. Large projects (quantities) on the interstate system should be considered as project candidates in the interstate 4R program.

For shoulder rehabilitation work on four-lane divided and interstate routes, tabulate ramps and loops for width and length to be sealed. List (by milepost) interchanges to be sealed for reference on the contract document.

Tabulate mainline interstate and primary shoulders by width and length.

Include a plat outlining the limits of the project (beginning & ending points) by mile post and stationing, any gaps or equations and pavement widths, specifying any irregular widths.

B. Granular Shoulders

1. Granular shoulder material should be replaced when it is no longer practical to blade existing material up to fill the edge rut and placement of this material is beyond the scope of work which could be accomplished by local crews. Material should be added by the local crew as needed to correct minor problems as a part of routine maintenance operations.
2. The estimate of quantities should be developed from cross sections (not less than four per mile per side) to insure accurate quantities are provided for the estimate. The tons per station per side should be developed by using 145 lbs. per cu. ft. of material needed.

When removal of the existing earth "dam" at the edge of an existing granular shoulder or when coring out an earth shoulder and placing granular shoulder material, furnish a tabulation of haulout areas when it is not possible or appropriate to waste excavation on the foreslope. Indicate a designated waste area or state that the contractor should waste the material off the project.

Indicate whether or not there is bituminous edge rut material on the existing shoulder (built up seal coat or ACC hot mix) and how this material should be disposed of.

Furnish a plat as indicated under seal coat. Note: When the existing shoulders are earth, work will generally be done per the specifications for granular shoulders. Upgrading of earth shoulders is generally beyond the scope of contract maintenance projects.

3. If there are known aggregate sources not suitable for this work in the project area, a special note must be added to the proposal; please advise of potential problems and provide the necessary notes.

VII. Maintenance of Primary Road Extensions and Institutional Park Roads

A. Primary Road Extensions

Primary highways within the corporate limits of cities may be reviewed and included in the contract maintenance program. These can be submitted as MP projects, they can be added to the maintenance agreement with the city, or done by supplemental agreement.

B. Institutional and State Park Roads

Institutional and state park roads may be included in the contract maintenance program. These projects should not be listed in the priority sequence with the other work within the district. They are to be prioritized separately and funded from the Parks and Institutional Road Fund. The Office of Program Management should be contacted to coordinate this work. The Office of Maintenance will assist in developing the concept for this work when requested.

VIII. Interstate Sign Refurbishment

A. Evaluation

Signs which have been installed for seven years or more should be monitored frequently to determine replacement needs. Retro-reflectometer readings of 50 percent of new values are an indication that replacement will be required in the near future. Cracking of background surface visible from 30 feet or more in daylight is evidence of poor serviceability. Signs with physical damage such as dents, bent sections, bullet holes, etc., should be considered for replacement. Nighttime checks which reveal that the legend is not uniform and clear from a readable distance indicate the need for replacement.

B. Procedures

When recommending contract sign replacement, all signs needing refurbishing on a section of roadway should normally be replaced at one time. Generally, projects should include entire sections as they were originally installed or reconditioned. Type B signs on ramps and side roads should be included in the refurbishing projects.

C. Miscellaneous

When recommending a contract sign refurbishing project, the size of panel and content of legend should be reviewed for any necessary changes to conform with standards. Some original signs may be downgraded in size. Mountings should be reviewed for modification, such as break-away design, set back from roadway and conversion to smaller wood signs.

D. Signing needs should be coordinated directly with the traffic engineer.

IX. Miscellaneous Items

A. Miscellaneous Types of Maintenance Work

Other types of work may be let to contract if found to be cost effective and/or beyond the capability of local maintenance crews and budgets. Contract work performed outside the shoulder line should be funded from the local budget. Proposals for this type of work should be developed for specific needs as they are identified.

B. Fencing

The need for replacement or repair of access control fencing on the Interstate system has been identified. Independent funding has been provided for this work.

Fencing needs should be coordinated directly with the maintenance services engineer.

QUANTITY ESTIMATE INFORMATION

Information for the development of the project proposals should be provided by the district offices. Information required is indicated under the major types of work items, which begin on page 5 of this handbook. To provide the necessary information please refer to the current specifications, supplemental specifications or special provisions that apply to each bid item. A current listing of supplemental specifications and special provisions can be obtained from the Specifications Engineer. Copies of the supplemental specifications and special provisions may be obtained from the Office of Contracts.

We encourage you to maintain up to date copies of current Supplemental Specifications and Special Provisions in your office.

Transmittal of this information to the Office of Maintenance should be presented as shown in the example on pages 34 and 35 with a plat. The need for the modification of any specifications dealing with this work or other information pertinent to the project should be provided with this submittal.

Due to the pavement management system, maintenance management and maintenance cost distribution systems, quantity tabulations and quantity estimates must be divided and shown as divisions of work (provide map showing mile posts at B.O.P., divisions splits and E.O.P.) at the following locations:

- (1) Show pavement surface type changes (mile post and station) which are more than .50 mile in length.
- (2) Show county lines (mile post and station) when work on a roadway crosses a county line.
- (3) When work is to be done (patching, spot leveling, etc.) on more than one route within a maintenance area responsibility, list each route on a separate tabulation sheet.
- (4) Indicate projects that should be tied.
- (5) When preparing the Final Payment Estimate, at the completion of the maintenance project, care must be taken to insure that costs are broken down by division and sent to the Office of Accounting.

OFFICE OF MAINTENANCE
MINOR & MAJOR PAVEMENT REHABILITATION WORK CODES

WORK CODES	DESCRIPTION	COST/CENTERLINE MI. EXCEPT AS NOTED (based on ave. project cost-FY91) \$
01- *	JOINT & CRACK FILLING W/EMULSION (AC SURFACE) - 2 LANE	2,800
02- *	JOINT & CRACK SEALING (AC PAVT) - 2 LANE.....	3,000
03- *	JOINT & CRACK SEALING (PC PAVT) - 2 LANE.....	10,000
04-	NOT ASSIGNED.....	-----
05- *	JOINT & CRACK FILLING W/EMULSION (AC PAVT) 4 LANE.....	5,600
06- *	JOINT & CRACK SEALING (AC PAVT) - 4 LANE.....	6,000
07- *	JOINT & CRACK SEALING (PC PAVT) - 4 LANE.....	21,500
08-	NOT ASSIGNED.....	-----
09- *	NOT ASSIGNED.....	-----
10- *	FULL DEPTH PATCHING	65/SQ. YD.
20- *	ACC PARTIAL DEPTH PATCHING.....	60/SQ. YD.
21- *	PAVEMENT FOG SEAL (AC PAVT) - 2 LANE	1,000
22- *	PAVEMENT SEAL COAT - 2 LANE (W/CRS-2P - \$10,000)	9,000
23- *	PAVEMENT SLURRY SEAL - 2 LANE.....	13,000
24- *	PAVEMENT DOUBLE SLURRY SEAL - 2 LANE	24,000
25- *	PAVEMENT FOG SEAL (AC PAVT) - 4 LANE	2,000
26- *	PAVEMENT SEAL COAT - 4 LANE (W/CRS-2P - \$20,000)	18,000
27- *	PAVEMENT SLURRY SEAL - 4 LANE.....	26,000
28- *	PAVEMENT DOUBLE SLURRY SEAL - 4 LANE	48,000
29-	NOT ASSIGNED.....	-----
30- *	INTERMITTENT AC RESURFACING (SPOT LEVELING)	50/TON
31-	RESURFACING - AC (INCLUDES AVERAGE BASE REPAIR	-----
	AND RESURFACING PAVED SHOULDERS)	
33-	RESURFACING - AC 4-LANE DIVIDED 4" - 5" (2 LANE MILE) ..	220,000
40-	RESURFACING - AC (INCLUDES AVERAGE BASE REPAIR & GRANULAR SHOULDERS).....	-----
41-	RESURFACING - AC 2 LANE 1".....	40,000
42-	RESURFACING - AC 2 LANE 2".....	95,000
43-	RESURFACING - AC 2 LANE 3".....	110,000
44-	RESURFACING - AC 2 LANE 4" - 4 1/2"	130,000
45-	RESURFACING - AC 2 LANE 6".....	170,000

SPECIAL ESTIMATE REQUIRED FOR 4 LANE UNDIVIDED ROADWAYS

* INDICATES WORK CODE NORMALLY ASSOCIATED WITH CONTRACT
MAINTENANCE PROGRAM

		\$
50-	SHOULDER RESTORATION (NON-PAVED)	-----
51- *	SHOULDER RESTORATION WITH EARTH	SPECIAL EST.
52- *	SHOULDER RESTORATION WITH AGGREGATE	11,000
53-	CONVERT EARTH TO 6" GRANULAR SHOULDER (10 FT. SHOULDER) PRORATE FOR VARIABLE WIDTHS & DEPTHS	52,000
60- *	SHOULDER SURFACE RESTORATION (PAVED)	-----
61- *	SHOULDER FOG SEAL 20' WIDE	3,000
62- *	SHOULDER SAND SEAL 20' WIDE	4,000
63- *	SHOULDER SEAL COAT 20' WIDE	6,300
64- *	SHOULDER SLURRY SEAL 20' WIDE	11,000
65- *	SHOULDER FOG SEAL 32' WIDE	3,000
66- *	SHOULDER SAND SEAL 32' WIDE	8,000
67- *	SHOULDER SEAL COAT 32' WIDE	10,000
68- *	SHOULDER SLURRY COAT 32' WIDE	18,000
69-	NOT ASSIGNED	-----
70-	PAVEMENT REPLACEMENT	SPECIAL EST.
71-	INLAY-PCC W/EXISTING PAVED SHLD. - 2 LANE	650,000
72-	RESURFACING-PCC BONDED WITH PAVED SHOULDER - 2 LANE / PER INCH OF DEPTH	100,000
73-	RESURFACING-PCC BONDED W/GRANULAR SHOULDERS - 2-LANE / PER INCH OF DEPTH	85,000
74-	MEDIAN CROSSOVERS - FOR PCC INLAY/OVERLAY - EACH	100,000
80-	BRIDGE	-----
81- *	BRIDGE PAINT	SPECIAL EST.
82-	BRIDGE REPAIR	SPECIAL EST.
90-	OTHER - SPECIFY	SPECIAL EST.
91-	DIAMOND GRINDING (PC PAVT)-2 LANE (LIMESTONE)	38,000
92-	DIAMOND GRINDING (PC PAVT)-2 LANE (GRAVEL)	45,000

MISCELLANEOUS WORK
(2 LANE MILE COSTS)

A -	ADDS SURFACE PATCHING TO CRACK FILLING CONTRACTS	1,000
B -	ADDS SLURRY LEVELING TO CRACK FILLING CONTRACTS	2,200
C -	ADDS HEATER SCARIFICATION TO AC RESF. CONTRACTS	8,000
D -	ADDS PAVEMENT MILLING TO AC RESF. CONTRACTS (1 1/2" Depth) ..	7,500
E -	ADDS UNDERSEALING TO A JOINT SEALING CONTRACT	18,000
	(100% OF LENGTH TO BE UNDERSEALED)	
F -	ADDS 4' WIDENING TO A RESURFACING CONTRACT	25,000
G -	ADDS 6' WIDENING TO A RESURFACING CONTRACT	43,000
H -	ADDS LONGITUDINAL SUBDRAINS (COST PER 100 FT.)	500
I -	ADDS PCC PARTIAL DEPTH PATCHES TO JOINT & CRACK SEALING (PCC) CONTRACTS (\$20.00/Sq.Ft.)	SPECIAL ESTIMATE
K -	ADDS GUARDRAIL INSTALLATION OR UPDATE ...	\$10,000/INSTALLATION
L -	ADDS CULVERT EXTENSIONS TO RESURFACING PROJECTS .	SPECIAL EST.

* INDICATES WORK CODE NORMALLY ASSOCIATED WITH CONTRACT MAINTENANCE PROGRAM

CONTRACT MAINTENANCE REVIEWS

1. **DATE OF REVIEW:** _____
2. **PARTICIPANTS:** _____
3. **UNIQUE NO:** _____
4. **PROJECT DATA**
 - A. COUNTY: _____
 - B. ROUTE: _____
 - C. RESIDENCY: _____
 - D. LOCATION: _____
 - E. EXISTING SURFACE TYPE: _____
 - F. LEVEL OF SERVICE: _____ PLANNING/ _____ MAINTENANCE
 - G. TRAFFIC: _____ VPD / _____ TRUCKS
 - H. PSI: _____
 - I. PAVEMENT CONDITION RATING (PCR): _____
 - J. STRUCTURAL NO: _____ / 80% _____
 - K. SUBGRADE SUPPORT VALUE (K): _____
 - L. RUTDEPTH: _____
 - M. FAULT / ROLLDOWN: _____
 - N. FRICTION NO. _____
5. **DISTRICT PROPOSED WORK:** _____
6. **EXISTING CONDITIONS: (SHOULDER TYPE & WIDTH),(PAVEMENT HISTORY)**
7. **PROJECT LENGTH (MILES):** _____
8. **RECOMMENDATIONS:** _____
9. **DISTRICT PRIORITY:** _____
10. **ESTIMATED COST:** _____

INFORMATION WHICH SHOULD BE SUPPLIED BY THE RESIDENT AT THE TIME OF THE REVIEW:

<u>ITEM NUMBER</u>	<u>COMMENTS</u>
3	If a new project, this will be assigned by the Office of Maintenance. If reviewing an active project again, RME should provide the number from "old" concept notes.
4A	All counties in project limits in order of progression on the route.
4B	Route No. (Iowa ____, U.S. ____)
4C	Residency number
4D	Milepost to milepost limits and verbal description as it would appear on the face of the contract proposal form.
4E	Provide the type of existing wearing surface (ACC, PCC, seal coat, etc.) and the year placed.
4F	Planning LOS can be obtained from your copy of pavement management information.
4G	Obtain from the most recent copy of "VOLUME OF TRAFFIC ON THE PRIMARY ROAD SYSTEM." Use traffic which is representative in the proposed work area.
4H,I,J,K,L,M,N	Obtained from your copy of Pavement Management Information.
5	Provided by RME/District
6	Provide shoulder width information and type (granular/earth). I will have pavement history information with me. The remainder of this information will be obtained on site.
7	PROVIDE. I will also use the transwave to gather.
8	Determined on site.
10	Concept estimate will generally be developed on site.

DMR:vs

BRIDGE PAINTING COST ESTIMATE

Res. _____

Bridge No. _____ a _____' x _____' _____
 with _____' x _____' _____ Approach Spans
 carrying _____ over _____
 and located _____ mi. _____ from _____

CLEANING & PAINTING	Square Feet	\$/Sq. Ft.	Cost
Superstructure			
Handrails			
Other (describe)			
Total			

Comment: Present paint system on superstructure, handrails and other surfaces is:

Zinc Silicate Alum-epoxy Other _____

Recommendation: Painting system to be used:

Cycle Repaint Epoxy Aluminum Other _____

Comment: Special conditions, special provisions needed, recommended ties to other bridge, etc. _____

Residence Priority _____ of _____ District Priority _____ of _____

Contract let on _____, 19____ to _____

* To be completed
in Central Office

No. of Lanes _____

	Cost Record		
	Estimate	Actual	\$/Sq. Ft.
Cleaning and Painting			
Traffic Control (*)			
Flaggers (*)			
Mobilization (*)			
Total (*)			

PAINT ESTIMATING WORK SHEET

Bridge No. _____ a _____' x _____'
 with _____' x _____' _____ Approach Spans

Member				Total Lin. Ft.	Sq. Ft./ Lin. Ft.	Total Sq. Ft.
Description	Size & Shape	Length	No.			
SUPERSTRUCTURE						
Stringers						
Floorbeams or Diaphragms						
Girders						
Lower Lateral Bracing						
					Sub-total	
					Add-on for Miscellaneous (0-10%)	%
					SUPERSTRUCTURE TOTAL	
HANDRAIL						
Posts						
Rail						
					Sub-total	
					Add-on for Miscellaneous (0-5%)	%
					HANDRAIL TOTAL	
OTHER						
					OTHER TOTAL	

TABULATION OF EXISTING PAVEMENT

102-5
07-16-91

NO.	LOCATION	EXISTING PAVEMENT Type	COARSE AGGREGATE		SOURCE	DURA- BILITY CLASS	PAVEMENT THICKNESS Inches	REINFORCEMENT	DETAIL TYPICAL
			TYPE						
			GRAVEL	CRUSHED STONE					

SAMPLE SUBMITTAL

RECAP THE ESTIMATE INFORMATION
IN THIS FORM. TYPING OR
MEMO FORMAT IS NOT NECESSARY.
ANY TABULATIONS NEEDED SHOULD
BE TYPED AND ATTACHED

/ /
650

Minor Rehabilitation Projects - 1984

Unique No. - 89300
County - Buena Vista
Highway - US 71
Location - N.C.L. Storm Lake to Jct. Iowa 3

Proposed Work - Joint & crack fill, slurry level depressed joints, longitudinal joint repair, full depth AC patches, selected milling and slurry seal.

<u>Length</u>	<u>Station</u>	<u>Mile Post</u>
Begin Project	59+00.0	168.63
End Project	<u>492+28.0</u>	176.95
Length =	43,328.0 L.F. = 8.21 Miles	

Width - 24 feet

Work Items:

1. Cleaning and filling cracks 8.21 Miles
2. Filler material (Emulsion) 8.21 Miles
Estimated at 300 gallons per mile = 2,463 Gallons
3. ACC mix for crack filling 8.21 Miles
Estimated at 1 ton per mile = 8 Tons
4. Slurry leveling - 115 Depressed Joints
Total and/or 14 per Mile
5. Longitudinal joint repair 9,750 L.F.
(See attached listings for location.)
6. Full Depth AC patches -
96 patches for 585.5 square yards. (See typed attached tabulation form 102-7.)

Note: As discussed on the project concept field review, we need to specify 60% crushed particles in the AC mix for these full depth patches.

7. Partial depth AC patches
68 patches for 272 square yards (see attached tabulation).
Equipment will be on project for milling so partial depth patches by milling will be possible. Partial depth repair was not discussed on minor stop gap review, but these locations warrant repair. Typed tabulation attached.
8. Milling of high or tipped widening unit. All of the widening unit is either high or tipped. Enclosed is a tabulation showing the widening unit less than 3/8-inch high and that over 3/8-inch high. Typed tabulation attached.
9. Spot AC leveling - this was not discussed on field review, but should be done prior to the slurry seal. Typed tabulation attached.

150+00 to 151+00	42 Ton
237+75 to 238+75	42 Ton
294+25 to 295+25	42 Ton
366+50 to 367+50	42 Ton
370+75 to 371+24	<u>42 Ton</u>
TOTAL	210 Ton

10. Granular surfacing of shoulders
53 tons to be placed along the asphalt leveling.
11. Surface preparation 8.21 Miles
12. Slurry seal
43,328.0 L.F. x 24 feet = 115,541 sq. yds.
13. Granular fill - 66.7 sq. yds. for under the full depth patches at Sta. 291+60.
14. Subdrain - 60 lin. feet for outletting the granular fill at Sta. 291+60.
15. Pavement marking - See attached tabulation. Summary of markings as follows:

a. Dashed yellow centerline	100.02
b. Solid yellow - no passing line	136.27
c. Double yellow centerline	66.98
d. Solid white edgeline	<u>835.46</u>
TOTAL	1,138.73 Sta.

Recommended working days are _____ with recommended start or stop date: _____.

Note: These recommendations should be set by the district.

Speed limits which exist in work areas are: _____

The Administrating Engineer for this project will be: _____