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TRANSPORTATION  
RESEARCH BOARD

1983 ANNUAL MEETING  
JANUARY 17-20, 1983 WASHINGTON, D.C.

**IOWA'S EXPERIENCE  
WITH  
CONTRACT MAINTENANCE**

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HIGHWAY DIVISION

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Iowa Department of Transportation

THE OPINIONS, FINDINGS, AND CONCLUSIONS EXPRESSED  
IN THIS PUBLICATION ARE THOSE OF THE AUTHOR AND  
NOT NECESSARILY THOSE OF THE HIGHWAY DIVISION OF  
THE IOWA DEPARTMENT OF TRANSPORTATION.

## IOWA'S HIGHWAY SYSTEM

As of January 1, 1981, there were over 112,000 miles of roads and streets in the state of Iowa. Despite being 25th in the land area, Iowa has the seventh largest rural road system in the nation.

The jurisdictional responsibility for Iowa's 112,000 miles of roads is vested in the Iowa DOT, 99 counties and 956 municipalities. The Iowa DOT currently maintains about 10,000 miles, the counties 90,000 miles, and the municipalities 12,000 miles

The condition of these systems is at a critical decision point. Many of the primary roads and bridges have outlived their design life and are severely limited in serving current volumes of automobile and truck traffic. Many pavement and bridge structures are nearing the point of complete failure and must be replaced in order to continue to provide for Iowa's minimum traffic service demands.

The following table shows how the state's roads and streets were divided by jurisdiction and travel as of January 1, 1981.

Jurisdictional Responsibility	Miles of Roads	Percent of Total Roads	Percent 1980 Vehicle Miles of Travel
State--Rural	8,804	7.8	43.1
--Municipal	1,321	1.2	16.6
County	89,752	79.9	18.0
City	12,071	10.8	22.2
State Park and Institutional Roads	<u>309</u>	<u>0.3</u>	<u>0.1</u>
Total	112,257	100.0%	100.0%

### The Physical Condition of the Primary Road System

- Three thousand miles of pre-1940 pavement remains in service.
- Pavement replacement is only being accomplished at one-quarter of the recommended rate.
- The average pavement age is 36 years, compared to a design life of 20 years.
- One-third of the major non-interstate miles are in need of rehabilitation.
- One hundred twenty-five bridges are embargoed.
- Over one-fourth of the 4,000 bridges are over 40 years old.
- Over 600 of the bridges will be 50 years old in 1990 at the current rate of replacement.
- Pavement preservation is the only feasible alternative under current funding.

### MAINTENANCE RESPONSIBILITIES AND RESOURCES

The department is responsible for the maintenance of the entire primary road system and state parks and institutional roads, a total of 24,190 lane miles. An inventory of some of the more significant features included for maintenance is shown in

STATE LIBRARY OF IOWA  
Historical Building  
DES MOINES, IOWA 50319

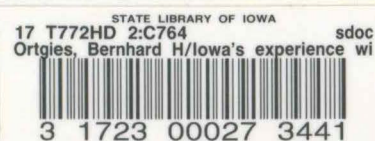


Table 1. The budgeted resources available for fiscal year 1983 to accomplish the maintenance program are shown in Table 2.

Table 1

HIGHWAY FEATURE INVENTORY

Highways (Center Line Miles)	10,170
Pavement (Lane Miles)	24,190
Bridges (Number)	3,676
Culverts (Number)	95,881
Signs (Number)	397,790
Shoulders (Miles)	21,212
Guard Rail (Lineal Feet)	2,308,161
Luminaires (Number)	9,151
Ditches (Miles)	19,575

Table 2

RESOURCES

Fiscal Year 1983

Maintenance Work Program Budget - \$61.7 Million

Labor	-	\$33.8 Million
Materials	-	\$17.1 Million
Equipment	-	\$10.8 Million

Personnel

Number Actual Employees (7/1/81) -	1709
Number Actual Employees (11/18/82)	1637
Number of Supervisors and Administrative -	253
Number of Mechanics and Helpers -	157
Number of Equipment Operators -	1227

Equipment - Number of Major Items

Trucks	-	1045
Motor Graders	-	100
Wheel Tractors	-	453
Rotary Snow Plows	-	19
Draglines/Hydroscoops	-	20
Total Maintenance Fleet of Self-propelled Equipment -		2487

The number of employees in field maintenance is being intentionally held to a minimum, to help compensate for the anticipated costs of the general contract maintenance projects, the costs of snow removal in case of a severe winter and other budget constraints.

A maintenance management system was developed and has been in use since 1975 to provide field supervisors sufficient data to help them manage their operations. The system provides for budget preparation based on features maintained, planning and scheduling work on both a short-range and long-range basis, and feedback of costs and accomplishment rates for monitoring purposes.

In addition, the department has begun developing differential maintenance standards for conducting field operations. The first phases which involve the classification of system components into service levels, assignment of overall priorities, and the development of definitive guidelines for one of the largest maintenance programs, i.e. snow and ice removal, have been completed. Development of additional guidelines and standards consistent with the "differential concept" is ongoing.

### CONTRACT MAINTENANCE

Contract maintenance includes all highway maintenance activities which a contractor or another public agency is paid to accomplish. This includes projects let through the bidding process to contractors as well as negotiated contracts with cities, counties and institutions for routine maintenance work on roads for which the state is responsible. Contract work has increased significantly over the past few years as priorities have shifted from highway construction to system preservation. Contract maintenance is divided into the following two categories:

#### Functional Contract Maintenance:

This program provides for individual contracts for specific items of work. Program trends are shown in Table 3.

Table 3

Item	FY 1979	FY 1980	FY 1981	FY 1982	FY 1983
Bituminous Surfacing Conc. Pavt. Repair & Pressure Relief Joints	\$1,707,000	\$2,400,000	\$5,300,000	\$6,800,000	\$7,064,000
Paved and Stabilized Shoulder Repair				1,200,000	1,436,000
Bridge Painting and Repair	817,000	1,600,000	2,800,000	1,800,000	1,500,000
City Maintenance Agreements and Miscellaneous	233,000	340,000	262,000	502,000	500,000
<b>TOTALS</b>	<b>\$2,757,000</b>	<b>\$4,340,000</b>	<b>\$8,362,000</b>	<b>\$10,302,000</b>	<b>\$10,500,000</b>

Functional contract maintenance has proven to be a very efficient means of accomplishing necessary maintenance types of work that are beyond the capability of local crews. Contracts are developed and awarded for specific items of work allowing contractors to perform the work with specialized equipment and operators trained in the use of this agreement. This allows the local maintenance crew to concentrate on the wide variety of smaller, more routine maintenance activities and respond to the emergency situations that are more difficult to contract and/or schedule. The contracting industry has responded very well to this program by accomplishing the required work expeditiously and economically.

### General Contract Maintenance

General contract maintenance is defined for the purposes of this report as that maintenance performed on a designated section(s) of highway on an overall basis over an extended period of time. Also, general maintenance would include a large and highly variable work load with numerous types of material and work requirements.

In the past it was assumed contracting general maintenance to private contractors would be more difficult and costly. This assumption was based in part on a lack of experience and on the premise general maintenance operations must be under the direct control of the agency in order to respond to emergencies such as snow storms, accidents, pavement blowups, signing problems, etc. Moreover, experience gathered in other states indicated administrative, contract and performance problems would offset any economic advantages. This experience also indicated general contract maintenance, although feasible under certain conditions, was not cost effective.

Due to the declining work available for highway contractors and suppliers which would make this work more attractive to the private sector and the department's need to continually evaluate its operations and performance, studies were initiated to examine the potential for general contract maintenance programs in Iowa. The first meeting with representatives of the construction industry regarding general contract maintenance was held July 14, 1981. At that time the total maintenance spectrum was reviewed and it was mutually agreed bids would be solicited for general contract maintenance of pavements, shoulders, roadsides, drainage facilities and bridges. It was also agreed the department would retain the responsibility for performing traffic services, snow and ice control operations and emergency responses.

This division of responsibility was determined after the contractors advised they would not initially be capable of acquiring the necessary equipment and expertise in some of these specialized areas. Also, capital requirements, interest rates and performance risks precluded them from undertaking all of the general maintenance work items and responsibilities.

After receiving contractors' comments, the department's staff developed specifications for six projects around the state. The first three projects were advertised for bid letting on November 10, 1981. Prior to the lettings special prebid conferences were held October 29, 1981 and December 7, 1981, to discuss the contract and clarify any ambiguities and correct identifiable deficiencies. Approximately 55 persons from the contracting industry attended and participated in these meetings.

Due to the special nature of the work and the desire to encourage small contractors with limited resources, the specifications included both descriptive direction and end result concepts. Provisions were also included to provide mobilization

payments. These efforts were not successful in as much as only large, well established contractors bid the work. Small contractors may not have been interested due to the rather long duration of the contract periods and the relatively large dollar volumes of work. Both required significant commitments which were probably beyond the capability of very small contractors. By comparison, the functional contract maintenance program has effectively utilized and encouraged the continuance of small contracting firms.

Only one, the District 3 project, was awarded after the first letting. The second group of projects was advertised for letting December 15, 1981. After the bids were analyzed the District 4 project was awarded. The four projects that were rejected were readvertised for letting on January 19, 1982. Two more contracts, Districts 5 and 6, were awarded; all were scheduled to begin operations in early 1982 and terminate so as to coincide with the end of the 1983 fiscal year. The specifications, contractor performance, and economic advantages and disadvantages are to be evaluated throughout the course of the contract.

The bids were analyzed on the basis of the department's records of performing similar types of work by the department's maintenance forces. Since the contractors in many cases, were unable to fully evaluate the costs associated with doing a specific type of maintenance work the bids were analyzed on an overall basis. Factors considered in determining acceptable bids included direct cost data, departmental overhead, contractor overhead, interest rates and profit.

The general maintenance contracts under evaluation by the department include as many as 22 items of work. The quantity of work is estimated from the department's maintenance work program records. A copy of one of the proposals with bid items, specifications and quantities is attached. In some cases this involves considerable effort by the contractor and in other cases only minimal effort is required at infrequent intervals. Since this variability is inherent in maintenance operations, it makes it very difficult for contractors to bid this type of work.

The general maintenance contracts are equivalent to about 24 staff-years. Since the projects are scattered and do not include all the required functions, a large reduction in personnel is not anticipated.

The mileage and contract amount of each of the awarded contracts are:

<u>District</u>	<u>Mileage</u>	<u>Contract Amount</u>
3 - Northwest Iowa	68.84	\$524,155
4 - Southwest Iowa	81.14	247,911
5 - Southeast Iowa	58.07	314,728
6 - Eastern Iowa	99.76	664,160

The projects started in January, February and March 1982 and are to run until June 30, 1983, or for approximately an 18 month period. They include most items of routine maintenance except snow removal, traffic services and emergency responses.

An initial progress report was compiled on May 7, 1982. At that time very little productive work had been accomplished by the contractors due to weather conditions. They had mobilized the necessary work force and equipment. Several minor problems developed, such as communications with the contractor, response time,

lack of proper equipment, and misunderstandings of the intent requirements of the contracts. Most of these problems were resolved through a cooperative effort between the contractor and the state contract administrators.

The following field reports describe work accomplished and general observations through the end of 1982.

District 3 MP-3144--69-D3

Some problems with the quality of work by the contractor, Irving F. Jensen, have been experienced. Filling of edge ruts and mowing were not accomplished satisfactorily. The contractor was not using a spreader of any kind. He was merely dumping material in the edge rut and then attempting to blade it out with a motor patrol. The weed patches were not sprayed as instructed, so mowing was required. A five-foot rotary mower used by the contractor just bent most of the weeds over without cutting them. Response time for doing work as scheduled has been getting slower due to some of the workers being assigned to other contracts. Accomplishment to date of contract work items is listed below.

<u>Item Description</u>	<u>Contract Quantity</u>	<u>Completed</u>
Mobilization	100%	100%
Spall Patching, Regular Pre-Mix	120 Tons	65.13 Tons
Spall Patching, High Performance Pre-Mix	20 Tons	53.88 Tons
Machine Surface Restoration & Leveling	375 Tons	262 Tons
Joint & Crack Filling	9,150 Gal.	9,576.3 Gal.
Strip Seal	90 Miles	0
Burn/Plane Surface	728 Sq. Yd.	427.8 Sq. Yd.
Raise Pavement	120 Cu. Yd.	53.76 Cu. Yd.
Repair Shoulders w/Bituminous Mix	105 Tons	40.10 Tons
Seal Edge Ruts & Bituminous Shoulders	8,100 Sq. Yd.	6,964.64 Sq. Yds.
Fill Longitudinal Shoulder Joint	4,500 Gal.	0
Paved Shoulder Repair	105 Sq. Yd.	60.4 Sq. Yd.
Repair Shoulders with Aggregates	1,884 Tons	1,085 Tons
Mow Shoulders & Medians	660 Acres	348.16 Acres
Blade Shoulders	60 Miles	20.95 Miles
Repair Shoulders with Earth	2,430 Cu. Yd.	115 Cu. Yd.
Roadside Mowing	120 Acres	88.94 Acres
Foliage Spraying	390 Acres	0
Clean & Restore Roadside Ditches	6,100 Cu. Yd.	4,190 Cu. Yd.
Clean Bridge Decks, Piers, Abutments & Expansion Joints	25,500 Sq. Yd.	0
Bridge Painting	28 Gal.	0
Other Work, Labor	1,130 Hours	129.75 Hours
Other Work, Equipment	\$15,984	\$927.14

Expenditures of \$307,623, or 58.7% of the contract total of \$524,155 have been made for work completed.

District 4 MP-4483--69-D4

The Resident Maintenance Engineer reports that the contractor, Irving F. Jensen, is providing good quality work on scheduled items. Small items of maintenance work have been done by local crews since response time by the contractor is slow because



their office is located in Sioux City. Accomplishment to date of contract items is listed below.

<u>Item Description</u>	<u>Contract Quantity</u>	<u>Completed</u>
Mobilization	100%	100%
Spall Patching	16 Tons	38.74 Tons
Temporary Blow Up Repair	12 Tons	101.5 Tons
Pavement Replacement	32 Sq. Yd.	17.8 Sq. Yd.
Seal Coat	6,500 Sq. Yd.	8,024.6 Sq. Yd.
Strip Seal	78 Miles	0
Repair Shoulders with Aggregate	7,500 Tons	2,647.3 Tons
Mow Shoulders	660 Acres	522.9 Acres
Blade Shoulders	69 Miles	0
Roadside Mowing	79 Acres	71.53 Acres
Litter Pickup	75 Miles	37.45 Miles
Bridge Painting	30 Gal.	0
Other Work, Labor	471 Hours	760.75 Hours
Other Work, Equipment	\$4,748	\$6,826.16
Crack Filling (Extra Work)	1,200 Gal.	4,586 Gal.

Expenditures of \$202,156, or 81.5% of the contract total of \$247,911 have been made for work completed.

District 5 MP-5236--69-D5

The work by the contractor, Norris Construction, improved during the fall months. The larger production items are handled better than the items requiring quick responses. Reaction time has been substandard due to other contract work being performed by the contractor. Work that is sub-contracted adds to administration time requirements. These items have included mowing and weed spraying. Edge rut correction has improved since the contractor adapted his equipment to the one-unit concept. Accomplishment to date of contract items is listed below.

<u>Item Description</u>	<u>Contract Quantity</u>	<u>Completed</u>
Mobilization	100%	77%
Spall Patching, Regular Pre-Mix	43 Tons	33.75 Tons
Spall Patching, High Performance Pre-Mix	5 Tons	0
Machine Surface Restoration & Leveling	291 Tons	687 Tons
Joint & Crack Filling	2,250 Gal.	1,000 Gal.
Pavement Replacement	156 Sq. Yd.	267.51 Sq. Yd.
Strip Seal	91 Miles	0
Burn/Plane Surface	435 Sq. Yd.	0
Repair Shoulders w/Bituminous Mix	7 Tons	0
Repair Shoulders with Aggregate	3,600 Tons	1,973.4 Tons
Mow Shoulders and Medians	538 Acres	137.2 Acres
Blade Shoulders	375 Miles	52.31 Miles
Rebuild Shoulders with Earth	160 Cu. Yd.	0
Roadside Mowing	130 Acres	0
Foliage Spraying	140 Acres	140 Acres
Litter Pickup	58.070 Miles	58 Miles
Clean & Restore Roadside Ditches	2,032 Cu. Yd.	1,268 Cu. Yd.
Bridge Deck Repair	36 Sq. Yd.	0

<u>Item Description</u>	<u>Contract Quantity</u>	<u>Completed</u>
Clean Bridge Decks, Piers, Abutments & Expansion Joints	16,950 Sq. Yd.	916.5 Sq. Yd.
Bridge Painting	72 Gal.	0
Pressure Relief Joints	504 Lin. Ft.	0
Other Work, Labor	993 Hours	1,131.5 Hours
Other Work, Equipment	\$11,856	\$14,804.22

Expenditures of \$202,648 or 64.4% of the contract total of \$314,728 have been made for work completed.

District 6 MP-6946--69-D6

Many of the problems associated with this contract are due to the contractor's headquarters being located in Chicago. He has a superintendent and a local office, but there are time delays when major decisions are involved. As with the other contractors, Gannon Construction performs best when the work item is of sufficient size and scheduled in advance. Some of the other problems encountered to date include not enough proper equipment, lack of personal interest in the work and residency administrative time. The workmanship is good when flexibility is held to a minimum. Accomplishment to date of contract work items is listed below.

<u>Item Description</u>	<u>Contract Quantity</u>	<u>Completed</u>
Mobilization	100%	100%
Spall Patching, Regular Pre-Mix	151 Tons	126.82 Tons
Spall Patching, High Performance Pre-Mix	65 Tons	0
Machine Surface Restoration & Leveling	1,200 Tons	930.9 Tons
Joint & Crack Filling	6,500 Gal.	1,225.72 Gal.
Pavement Replacement	150 Sq. Yd.	224.97 Sq. Yd.
Strip Seal	15 Miles	9 Miles
Burn/Plane Surface	228 Sq. Yd.	232.46 Sq. Yd.
Brooming/Sweeping	40 Hours	39.5 Hours
Repair Shoulders w/Bituminous Mix	500 Tons	0
Repair Shoulders with Aggregate	6,090 Tons	7,411.1 Tons
Mow Shoulders and Medians	839 Acres	508.88 Acres
Blade Shoulders	550 Miles	341.99 Miles
Rebuild Shoulders with Earth	4,900 Cu. Yd.	64.33 Cu. Yd.
Roadside Mowing	195 Acres	393.63 Acres
Foliage Spraying	127 Acres	56.5 Acres
Litter Pickup	99,760 Miles	100.6 Miles
Clean & Restore Roadside Ditches	3,700 Cu. Yd.	3,465 Cu. Yd.
Clean Bridge Decks, Piers, Abutments & Expansion Joints	12,000 Sq. Yd.	6,030 Sq. Yd.
Bridge Painting	29 Gal.	5 Gal.
Other Work, Labor	3,018 Hours	2,486 Hours
Other Work, Equipment	\$40,365	\$32,877.67

Expenditures of \$470,401, or 70.8% of the contract total of \$664,160 have been made for work completed.

## SUMMARY

The contractors have shown that they can perform scheduled work in a satisfactory manner. However, delays are often experienced in completing assigned work. There have also been some problems with completing non-bid work items or work involving small quantities which are not economical for the contractor to perform. Contractors are not accustomed to responding quickly to isolated complaints and highway hazards that need attention without delay. These problems seem to be more prevalent as distance increases between the contractors' base and the job site.

Substantial delays have also been experienced in responding to citizen complaints and potentially hazardous roadway conditions. This unsatisfactory response has prompted the departments maintenance crews to assume responsibility for such work as edge rut repair, noxious weed control, drainage problems, litter pickup, and surface patching. From time to time, the departments' crews have assumed almost all of this type of work.

The best work performance has been achieved when one type of work is scheduled and the contractor is allowed to proceed without interruption. Most of these problems have been resolved at the local level. Supervision and administration of the contracts appear to be consuming more of state employees' time than was anticipated.

It seems to be the general consensus of the contractors doing this work that the projects are ideal for a contractor having his home headquarters in the center of the project area where they can utilize their normal work force to do maintenance as "fill-in" work. If a contractor is remotely located and needs to hire a complete crew to handle the maintenance contract, the work load is not constant enough to allow efficient use of his manpower. Equipment availability under the latter conditions is also a problem.

# CONTRACT

NO. 19193

TYPE OF WORK MISCELLANEOUS  
MILES 99.760

PROJECT NO. MP-6946--69-DB  
COST CENTER 556200 OBJECT 467  
COUNTY DISTRICT 6

AT VARIOUS LOCATIONS IN CLINTON, JACKSON AND DUBUQUE  
COUNTIES (SEE SPECIAL PROVISIONS FOR LOCATIONS)

THIS AGREEMENT MADE AND ENTERED BY AND BETWEEN THE IOWA DEPARTMENT OF TRANSPORTATION  
ROBERT R RIGLER, DARREL RENSINK, DENNIS VOY, DEL VAN HORN,  
BARBARA DUNN, BRUCE VAN DRUFF, & C ROGER FAIR

GANNON CONSTRUCTION CORP. OF COLFAX, IOWA PARTY OF THE FIRST PART AND 15110

PARTY OF THE SECOND PART.

WITNESSETH THAT THE PARTY OF THE SECOND PART FOR AND IN CONSIDERATION OF \$ \*\*\*664,160.45 PAYABLE AS SET FORTH IN THE SPECIFICATIONS CONSTITUTING A PART OF THIS CONTRACT, HEREBY AGREES TO CONSTRUCT VARIOUS ITEMS OF WORK AND, OR, TO SUPPLY VARIOUS MATERIALS OR SUPPLIES IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS THEREFOR, AND IN THE LOCATIONS DESIGNATED IN THE NOTICE TO BIDDERS AS FOLLOWS:

ITEM NO	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
<b>CONTRACT MAINTENANCE, ROADWAY AND RIGHT OF WAY</b>					
1	MOBILIZATION	115.00%			64,670.25
2	609 - SPALL PATCHING, REGULAR PRE-MIX	151 TONS		120.00	18,120.00
3	609 - SPALL PATCHING, HIGH PERFORMANCE PRE-MIX	65 TONS		185.00	12,025.00
4	611 - MACHINE SURFACE RESTORATION AND LEVELING	1,200 TONS		68.00	81,600.00
5	612 - JOINT AND CRACK FILLING	6,500 GALS.		6.25	40,625.00
6	613 - PAVEMENT REPLACEMENT	150 SQ. YDS.		100.00	15,000.00
7	618 - STRIP SEAL	15 MILES		300.00	4,500.00
8	619 - BURN/PLANE SURFACE	228 SQ. YDS.		20.00	4,560.00
9	620 - BROOMING/SWEEPING	40 HOURS		60.00	2,400.00
10	628 - REPAIR SHOULDERS WITH BITUMINOUS MIX	500 TONS		110.00	55,000.00
11	634 - REPAIR SHOULDERS WITH AGGREGATES	6,090 TONS		15.25	92,872.50
12	636 - MOW SHOULDERS AND MEDIANS	839 ACRES		26.00	21,814.00
13	640 - BLADE SHOULDERS	550 MILES		60.00	33,000.00

PARTY OF THE SECOND PART CERTIFIES BY HIS SIGNATURE ON THIS CONTRACT, UNDER PAIN OF PENALTIES FOR FALSE CERTIFICATION THAT HE HAS COMPLIED WITH 324 (718) OF THE 1975 CODE OF IOWA AS AMENDED, IF APPLICABLE SAID SPECIFICATIONS AND PLANS ARE HEREBY MADE A PART OF AND THE BASIS OF THIS AGREEMENT, AND A TRUE COPY OF SAID PLANS AND SPECIFICATIONS IS NOW ON

FILE IN THE OFFICE OF THE PARTY OF THE FIRST PART UNDER DATE OF JANUARY 14, 1982

THAT IN CONSIDERATION OF THE FOREGOING, THE PARTY OF THE FIRST PART HEREBY AGREES TO PAY THE PARTY OF THE SECOND PART, PROMPTLY AND ACCORDING TO THE REQUIREMENTS OF THE SPECIFICATIONS THE AMOUNTS SET FORTH, SUBJECT TO THE CONDITIONS AS SET FORTH IN THE SPECIFICATIONS. THE PARTIES HERETO AGREE THAT THE NOTICE AND INSTRUCTIONS TO BIDDERS, THE PROPOSAL FILED HEREIN, THE GENERAL SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION FOR 1977 TOGETHER WITH SPECIAL PROVISIONS ATTACHED, TOGETHER WITH THE GENERAL AND DETAILED PLANS, IF ANY, FOR SAID PROJECT MP-6946--69-DB TOGETHER WITH SECOND PARTY'S PERFORMANCE BOND, ARE MADE A PART HEREOF AND TOGETHER WITH THIS INSTRUMENT CONSTITUTE THE CONTRACT BETWEEN THE PARTIES HERETO THAT IT IS FURTHER UNDERSTOOD AND AGREED BY THE PARTIES OF THIS CONTRACT THAT THE ABOVE WORK SHALL BE COMMENCED OR COMPLETED IN ACCORDANCE WITH

THE FOLLOWING SCHEDULE

APPROX. OR SPECIFIED STARTING DATE OR NUMBER OF WORKING DAYS	SPECIFIED COMPLETION DATE OR NUMBER OF WORKING DAYS
MARCH 1, 1982	JUNE 30, 1983

THIS TIME IS THE ESSENCE OF THIS CONTRACT AND THAT SAID CONTRACT CONTAINS ALL OF THE TERMS AND CONDITIONS AGREED UPON BY THE PARTIES HERETO. IN WITNESS WHEREOF THE PARTIES HERETO HAVE SET THEIR HANDS FOR THE PURPOSE HEREIN EXPRESSED TO THIS AND THREE OTHER IDENTICAL INSTRUMENTS AS OF THE \_\_\_\_\_ DAY OF \_\_\_\_\_, 19\_\_\_\_

IOWA DEPARTMENT OF TRANSPORTATION

BY \_\_\_\_\_  
PARTY OF THE FIRST PART  
GANNON CONSTRUCTION CORP. OF COLFAX, IOWA

BY \_\_\_\_\_  
PARTY OF THE SECOND PART

ITEM NO	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
14	641 - REBUILD SHOULDERS WITH EARTH	4,900	CU. YDS.	10.00	49,000.00
15	645 - ROADSIDE MOWING	195	ACRES	26.00	5,070.00
16	646 - FOLIAGE SPRAYING	127	ACRES	25.00	3,175.00
17	649 - LITTER PICK UP	99.760	MILES	120.00	11,971.20
18	655 - CLEAN AND RESTORE ROADSIDE DITCHES	3,700	CU. YDS.	10.00	37,000.00
19	684 - CLEAN BRIDGE DECKS, PIERS, ABUTMENTS AND EXPANSION JOINTS	12,000	SQ. YDS.	1.50	18,000.00
20	687 - BRIDGE PAINTING	29	GALS.	150.00	4,350.00
21	OTHER WORK, LABOR	3,018	HOURS	16.25	49,042.50
22	OTHER WORK, EQUIPMENT	100.00%			40,365.00
				GRAND TOTAL	\$664,160.45



**PROPOSAL FORM**

704  
 Type of Work **MISCELLANEOUS**  
 System **MAINTENANCE** Miles **99.760** County **DISTRICT 6**  
 Location and description **AT VARIOUS LOCATIONS IN CLINTON, JACKSON AND DUBUQUE**  
**COUNTIES (SEE SPECIAL PROVISIONS FOR LOCATIONS)**

Proj. No. **MP-6 946--69-D6**

**CONTRACT MAINTENANCE, ROADWAY AND RIGHT OF WAY**

Proposal of \_\_\_\_\_  
 (name of bidder)

(Street Address) \_\_\_\_\_ (Town) \_\_\_\_\_ (State) \_\_\_\_\_ (Zip) \_\_\_\_\_

**TO THE IOWA DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION**

The bidder hereby certifies that he or they are the only person or persons interested in this proposal as principals; that an examination has been made of the plans, specifications, and conditions of the project as provided herein and that the bidder understands that the quantities of work shown herein are approximate and are subject to increase or decrease and that all quantities of work, whether increased or decreased, are to be performed at the unit prices stipulated herein. The bidder proposes to furnish all necessary machinery, equipment, tools, labor and other means of construction to complete the work and to do the work at the prices hereinafter set out, and that it is not in violation of the provisions of Section 314.2 Code of Iowa, 1971 as amended (Interest in contract prohibited), and 324.17(8) of the 1971 Code of Iowa as amended (Refund to non licensee-fuel used other than in motor vehicles).

**ESTIMATING**

We further propose:

To do all "Extra Work" which may be required to complete the work contemplated, at unit prices or lump sums to be agreed upon in writing prior to starting such work, or if such prices or sums cannot be agreed upon to perform such work on a force account basis, as provided in the Specifications.

To execute formal contract within fifteen days or forfeit the proposal guaranty furnished herewith.

To begin work by the date specified and to complete the same within the contract period, or to pay the liquidated damages stipulated below accruing for each calendar or working day elapsing after the expiration of the contract period, before completion of the work.

Group or Division Number	Amount of Proposal Guaranty	Approx. or Specified Starting Date or Number of Working Days	Specified Completion Date or Number of Working Days	Liquidated Damages Per Day
	\$27,000.00	MARCH 1, 1982	JUNE 30, 1983	\$ .00

**PROPOSAL**

To furnish a contract bond in an amount less than 100 percent of contract award, as security for the construction and completion of the work awarded the bidder in accordance with the plans, specifications and contract.

Enclosed herewith find certified check, cashier's check, or bank draft for the amount of the penal sum as shown in the contract document as a proposal guaranty, which it is understood will be retained in the event the formal contract or bond is not executed, if award is made to the undersigned.

By virtue of statutory authority preference will be given to products and provisions grown and coal produced within the State of Iowa where applicable.

Signatures are to be by authorized agent, if joint venture, each should sign

Date of Letting

**JANUARY 19, 1982**  
**9 00 AM**

Signed

**Not To Be Used**  
**For Bidding**

714 18  
1-2-3 4-5

SCHEDULE OF PRICES DISTRICT 6  
MISCELLANEOUS

CONTRACTOR'S NUMBER

Item No.	Item and Unit on which bid is based. Bidder shall show unit price and extension for each item and total for each group.	Quantity	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
	<b>MOBILIZATION</b>		XXX,XXX	XXXXX		
	ENGINEERS ESTIMATE \$56,235.00 % OF ESTIMATE			%		
2	609 - SPALL PATCHING, REGULAR PRE-MIX PER TON	151 TONS				
3	609 - SPALL PATCHING, HIGH PERFORMANCE PRE-MIX PER TON	65 TONS				
4	611 - MACHINE SURFACE RESTORATION AND LEVELING PER TON	1,200 TONS				
5	612 - JOINT AND CRACK FILLING PER GAL.	6,500 GALS.				
6	613 - PAVEMENT REPLACEMENT PER SQ. YD.	150 SQ. YDS.				
7	615 - STRIP SEAL PER MILE	15 MILES				
8	619 - BURN/PLANE SURFACE PER SQ. YD.	228 SQ. YDS.				
9	620 - BROOMING/SWEEPING PER HOUR	40 HOURS				
10	628 - REPAIR SHOULDERS WITH BITUMINOUS MIX PER TON	500 TONS				
11	634 - REPAIR SHOULDERS WITH AGGREGATES PER TON	6,090 TONS				
12	636 - MOW SHOULDERS AND MEDIANS PER ACRE	839 ACRES				
13	640 - BLADE SHOULDERS PER MILE	550 MILES				
14	641 - REBUILD SHOULDERS WITH EARTH PER CU. YD.	4,900 CU. YDS.				
15	645 - ROADSIDE MOWING PER ACRE	195 ACRES				
16	646 - FOLIAGE SPRAYING PER ACRE	127 ACRES				
17	649 - LITTER PICK UP PER MILE	99.760 MILES				

704 13  
1-2-3 4-5

SCHEDULE OF PRICES DISTRICT 6  
MISCELLANEOUS

CONTRACTOR'S NUMBER

Item No.	Item and Unit on which bid is based. Bidder shall show unit price and extension for each item and total for each group.	Quantity	Unit Price		Amount	
			Dollars	Cents	Dollars	Cents
18	655 - CLEAN AND RESTORE ROADSIDE DITCHES PER CU. YD.	3,700 CU. YDS.	XXX.XXX	XXXXX		
19	684 - CLEAN BRIDGE DECKS, PIERS, ABUTMENTS AND EXPANSION JOINTS PER SQ. YD.	12,000 SQ. YDS.				
20	687 - BRIDGE PAINTING PER GAL.	29 GALS.				
21	OTHER WORK, LABOR PER HOUR	3,018 HOURS				
22	OTHER WORK, EQUIPMENT ENGINEERS ESTIMATE \$40,365.00 % OF ESTIMATE			%		
	TOTAL					
SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS						
501	STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, DEPARTMENT OF TRANSPORTATION - SERIES OF 1977					
#871	SEPTEMBER 15, 1981 GENERAL SUPPLEMENTAL SPECIFICATION					
#815	OCTOBER 11, 1977 EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES ON NON-FEDERAL AID PROJECTS					
#886	MAY 27, 1981 PAVEMENT REPAIR					
#893	NOVEMBER 10, 1981 MOBILIZATION (CONTRACT MAINTENANCE)					
#894	NOVEMBER 10, 1981 BITUMINOUS SLURRY SURFACE TREATMENT					
#898	JANUARY 19, 1982 LONGITUDINAL SUBDRAINS (NOTE POROUS BACKFILL GRADATION REQUIREMENT)					
SP-324	SEPTEMBER 19, 1980 HIGH-PERFORMANCE BITUMINOUS PATCHING MATERIAL					
SP-383	NOVEMBER 10, 1981 SPECIAL PROVISIONS FOR CONTRACT MAINTENANCE					
502	UNIT BIDS MUST BE TYPED OR SHOWN IN INK OR THE BID WILL BE REJECTED.					
530	CONTRACTOR SHALL BID ON ALL ITEMS OF THIS PROPOSAL OR HIS BID WILL BE REJECTED.					
518	THIS PROJECT SHALL NOT BE BID IN COMBINATION WITH ANY OTHER					





Estimated Number of Hours (Manhours) for each function covered by "Other Work."

625 - Other Surface Maintenance	47
643 - Other Shoulder Maintenance	147
647 - Cut Brush and Trees	1183
650 - Erosion Control	51
653 - Other Roadside Maintenance	113
657 - Culvert Maintenance	537
659 - Drain tile, Catchbasins, Inlets	20
660 - Other Drainage Maintenance	97
685 - Repair Bridge Structures	523
689 - Maintain Waterways	263
692 - Other Bridge Maintenance	37

The following shall apply:

Five percent of each monthly progress estimate will be deducted and retained for a period of thirty (30) days. At the end of each additional thirty days, the work completed during the previous thirty days will be reviewed and if found in compliance with the contract requirements will be considered to have complied with the final acceptance provisions of the contract. The five percent retained for this work will be released at that time.

so add the following to Special Provision SP-383:

Stockpiles - No stockpiles of materials will be permitted within highway right of way limits or on State property.

Add new section in Appendix "A" under Function 634 - Shoulder Repair with Aggregate.

Materials

The aggregate to be used shall be Class "A" crushed stone. If Class "C" gravel or other material is to be used wholly or as a blend, an adjusted price shall be negotiated.

The following minor changes should be incorporated into the Contract Maintenance specification SP-383.

1. On page 3 - Materials

Insert the additional paragraph shown below as paragraph 2.

At the option of the engineer, acceptance may be based on tests of official samples, tests of producer's samples, producer's certifications, visual inspection, or any combination thereof. Any material furnished on a certification, approved-brand, or producer's-sample basis may be subject to additional testing or inspection.

2. Raise Pavement, Page 18, Function 621

Under Description add an additional sentence as follows:

Engineer. Portland Cement and flyash in a 1:3 mixture by volume, with necessary water may be substituted for the cement, soil, water mixture with the approval of the Engineer.

3. Repair Bridge Structure, Page 39, Function 685

Under Materials, change first paragraph to read "Concrete used in bridge repair shall be proportioned and mixed in accordance with Sections 2403.03 and 2403.07 of the Standard Specifications."

In the second paragraph, delete the word "penetrating."

4. Pressure Relief Joints, Page 41, Function 690

Under Materials, change the specification number from 886 to 898.

This modification applies to Supplemental Specification #893, dated November 10, 1981:

DELETE Paragraph 893. 02C and add the following in lieu thereof:

C. At the end of each succeeding month, with payment based on the monthly invoice, an additional 10% of the engineer's estimate for this item may be paid. When the total partial payment is equal to 100% of the contract price for this item, no additional partial payments will be made.

District 6  
 MP-6946 --69-D6  
 Miscellaneous

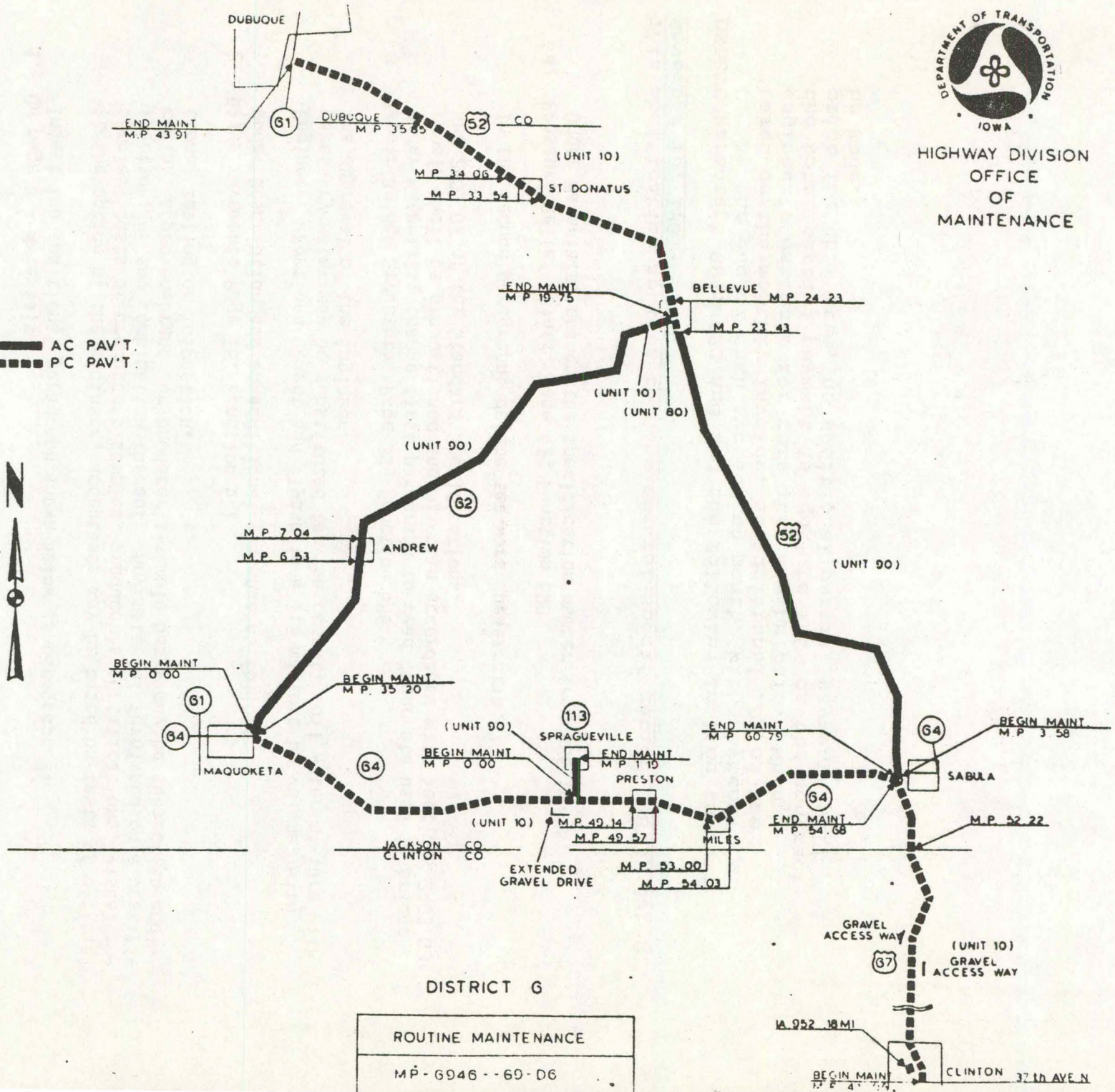


HIGHWAY DIVISION  
 OFFICE  
 OF  
 MAINTENANCE

— AC PAV'T.  
 - - - - - PC PAV'T.



4 OF 4



DISTRICT G  
 ROUTINE MAINTENANCE  
 MP-6946 --69-D6

IOWA DEPARTMENT OF TRANSPORTATION  
Ames, Iowa



Supplemental Specifications  
for

MOBILIZATION  
(Contract Maintenance)

November 10, 1981

THE STANDARD SPECIFICATIONS, SERIES OF 1977, ARE AMENDED BY THE FOLLOWING ADDITIONS. THESE ARE SUPPLEMENTAL SPECIFICATIONS AND SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

893.01 MOBILIZATION. This item shall consist of preparatory work and operations, including, but not limited to, those necessary for the organization and movement of personnel, equipment, supplies, and incidentals; for the establishment of all offices, buildings, and other facilities which must be performed or costs incurred prior to beginning work on the various items of the contract. This item may include demobilization costs.

Nothing herein shall be construed to limit or preclude partial payments otherwise provided for by the contract.

The proposal will show an amount, the engineer's estimate, in dollars, for this item. The bidder will bid a percentage of the amount shown on the proposal as the engineer's estimate. The contract price for this item will be the amount computed in dollars from the amount shown on the proposal as the engineer's estimate and the percentage bid.

893.02 PARTIAL PAYMENTS. Partial payments may be made as follows:

A. At the end of the first month, with payment based on the monthly invoice, either 25 percent of the contract price for this item or 25 percent of the amount shown on the proposal as the engineer's estimate, whichever is less, may be paid.

B. At the end of the second month, with payment based on the monthly invoice, either 40% of the contract price for this item or 40% of the amount shown on the proposal as the engineer's estimate, whichever is less, may be paid. This partial payment of 40% is a total at the end of the second month, which includes the 25% paid for the first month.

C. At the end of each of six succeeding months, with payment based on the monthly invoice, an additional 10% of the contract price for this item or 10% of the amount shown on the proposal as the engineer's estimate, whichever is less, may be paid. When the total partial payment is equal to 100% of the contract price for this item or 100% of the amount shown on the proposal as the engineer's estimate, whichever is less, no additional partial payment will be made.

893.03 FULL PAYMENT. Upon completion of all work required by the contract, full payment will be made for this contract item, including any amount not paid as a partial payment.



IOWA DEPARTMENT OF TRANSPORTATION  
Ames, Iowa



Special Provisions  
for  
CONTRACT MAINTENANCE

November 10, 1981





## Special Provisions

### Contract Maintenance

#### Project Management

The contractor shall provide a project manager to direct the work of his employees and to act as the contact person to coordinate with the engineer. The manager shall be available so he can be reached by telephone or other common communication media during work hours. There shall also be off-work-hour telephone number (s) where the contractor or his designated representatives can be reached at any time. A list of at least three contacts shall be furnished in priority order, designating who should be called if the project manager is not available.

#### Scope of Work

The work required of the contractor shall consist of those contract items listed as bid items for individual functions in the schedule of prices, plus "Other Work" will be directed by extra work order. The "Other Work" category may include labor only for assistance in the state's snow removal or other emergencies.

The descriptions of the work for individual functions are included in Appendix A, including measurement and payment. Appendix A may include some functions that are not a specific part of this contract.

"Other Work" includes, but is not limited to the following functions. Where indicated, the descriptions of the work of these functions are also included in Appendix A.

625 - Other surface maintenance.

Pavement deslickling, surface grinding, linseed oil sealing, rebuilding curbs, edge sealing and winter sealing, and other items of surface maintenance not covered elsewhere.

643 - Other shoulder maintenance.

Experimental projects, and items of shoulder maintenance not covered elsewhere.

647 - Cut brush and trees.

See Appendix A.

650 - Erosion control.

See Appendix A.

653 - Other roadside maintenance.

Maintain trees and plantings, maintain frontage roads and extended driveways, and other items of roadside maintenance not covered elsewhere.

## 657 - Culvert maintenance.

Clean, repair, relay or install culverts, end sections and letdown devices. Includes repairs to barrels, aprons, wing walls, flumes, drop inlets, and filling voids around culvert structures.

## 659 - Drain tile, catch basins and inlets.

Install, maintain, and clean drainage tile, sub-drains, inlets, catch basins, and storm sewers normally maintained by the state.

## 660 - Drainage.

Maintain and restore drainage within the right-of-way.

## 685 - Repair bridge structures.

See Appendix A.

## 689 - Maintain bridge waterways.

Removal of debris from bridges, repair wing dams, replace rip-rap, and excavation or placing fill at waterways.

## 692 - Other bridge maintenance.

Includes items of bridge maintenance not covered elsewhere.

#### Labor and Equipment Bid Items

The Other Work, Labor, and Other Work, Equipment, items on the schedule of prices will be used in payment for labor and equipment utilized in the performance of "Other Work". The contractor's labor used outside of normal work hours at the direction of the engineer shall be paid for at the rate of 1-1/2 times the contract rate for labor.

The contract price for equipment used in "Other Work" will be the contract percentage of the rental rate shown in the 1981 "Rental Rate Blue Book for Construction Equipment". The rates used in negotiating extra work orders will be the current rate for the make and size actually used. The rates used on items of equipment shall be extended using the contract percentage of Blue Book price.

The proposal will show several items of equipment, a number of hours, and an approximate Blue Book rate. These are estimates for typical equipment which will be used as part of the procedure for determination of low bid. The contract percentage of Blue Book rate will be applied to all equipment utilized in the performance of "Other Work", even though not listed.

#### Specifications

The Standard Specifications, Series of 1977, where appropriate, and the supplemental specifications and special provisions identified in the contract documents shall apply to the work of this contract.

### Materials

All materials incorporated into the work shall meet the requirements of Part IV of the Iowa Standard Specifications for Highway and Bridge Construction. Certification by the supplier, materials from approved stockpiles, or testing by private laboratories will be acceptable.

Materials required to complete "Other Work" or extra work may be furnished by the State at the discretion of the engineer. If furnished by the contractor, payment will be included in the negotiated price, as specified in the Standard Specifications, Article 1109.04 B2.

### Bid Prices

The prices bid for the individual functions will include all labor, equipment, and materials used in accomplishing the work, unless otherwise specified in the individual function specifications.

### Incidental Items

The contractor's overhead costs are to be included in the mobilization item. Traffic control for operations, travel time to and from the work site, all tools, materials, and supplies necessary to support the operations, and any other unforeseen expenses incurred in performance of the routine work shall be considered incidental to the work.

### Public Relations

The nature of highway maintenance work places the workman in close contact with the public, as both traffic and land owners. Contacts made by the public to complain or report a condition, such as driveway condition, drainage, etc., shall be referred to the Resident Maintenance Engineer or his designated representative.

### Regular Work Hours

Routine maintenance operations will normally be performed between 8:00 a.m. and 5:00 p.m., Monday through Friday, except on State holidays. Work performed outside these hours at the contractor's option will be with the engineer's approval and at the bid price.

### Traffic Control and Safety

Traffic control to guide traffic around and through a maintenance operations area and to protect workmen shall be in accordance with the 1979 Iowa Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), the 1976 Iowa Construction and Maintenance Traffic Control Handbook and Appendix A of the Maintenance Standards Manual entitled "Traffic Control for Maintenance Operations". In cases where the documents differ in application of traffic control devices, the MUTCD shall control. In special circumstances where none of the standards apply to the operation to be performed, the contractor shall consult with the engineer for guidance and instruction.

Equipment working on the surface or shoulders shall be equipped with a yellow rotating beacon which flashes a minimum of 60 times per minute. Mower tractors may use a yellow flashing strobe light in lieu of the rotating beacon. Mounting heights or locations of lights are shown in the Maintenance

Equipment Lighting Manual. Where applicable, slow moving vehicle emblems shall be used in accordance with the Code of Iowa.

The cost of providing all traffic control devices for contract maintenance operations including installation and removal shall be considered incidental to other contract items for specific functions. No additional compensation shall be made for any traffic control work required for these functions.

Parking of contractor vehicles and equipment will be permitted within the right-of-way only at locations designated by the engineer but in no case shall they be closer than 30 feet to the roadway. Any damage done to trees, shrubs, and vegetation within areas permitted for parking will be corrected at the contractor's expense. Parking of private vehicles within the right-of-way is prohibited at all times.

Contractor's personnel shall wear orange safety vests when working at any place on the right-of-way and shall wear hard hats when working on pavement or shoulders. This is a minimum and should not be construed to supersede the contractor's other safety work rules.

#### Highway Maintenance Work

Planning and scheduling maintenance work is a very important part of the operation. However, plans and schedules are oftentimes necessarily altered due to weather conditions, emergency operations to protect the traveling public, and other unforeseen events which will occur. The contractor will need to be totally flexible to respond to these conditions on very short notice. An important part of maintenance work is becoming familiar with the highways to be maintained and the features of this highway that are included in the contract.

#### Scheduling Work

All work performed, including procedures, must have prior approval of the engineer or his designated representative according to job orders or extra work orders. This approval, scheduling, and issuance of job orders will be at regular bi-weekly meetings, or at other times made necessary by unforeseen events, between the contractor and the engineer or their representatives, at a mutually agreed upon location. The approved work schedule may be changed if acceptable to the engineer, or a change may be directed by the engineer if determined necessary. The attached Table No. 1 indicates the time of the year that the various types of work have historically been performed or required.

#### Reporting Accomplishment

The contractor will report all work performed by function and route number. Surface, shoulder, and bridge maintenance accomplishment will also include the milepost location of the work. All necessary reporting forms and milepost reporting instructions will be provided by the State. This report shall be submitted with the monthly invoice.

### Payment

Payment for work accomplished will be made on receipt of an invoice from the contractor at the end of each month. The invoices shall be accompanied by the accomplishment report and copies of materials reports or certifications. The contractor shall certify the invoice to be just and unpaid.

For the quantity of work involved in individual functions for which there is a contract item, the contractor will be paid the contract price therefor.

For the quantity of work involved in "Other Work", the contractor will be paid on the basis of the contract prices for Other Work, Labor, and Other Work, Equipment.

### Contract Period

The contract period will be from January 1, 1982, until June 30, 1983.

### Mobilization Bid

The contract amount for mobilization shall be considered to include all overhead items and those items listed as incidental to the work, according to the Supplemental Specification for Mobilization.

### Estimated Quantities

The quantities shown on the schedule of prices are estimates only. The actual quantities determined necessary may vary considerably. Section 1109.03 of the Standard Specifications will not apply.

### Bid Prices

Contract prices shall be firm bids for the duration of the contract.

### Coordination

The bidder is advised that other activities may be performed or authorized within the project limits by the DOT during the contract period. When appropriate, the engineer will decide questions concerning disputed or mutual rights between the contractor and the DOT or other authorized parties.

### Damages to Highway, Appurtenances, or Utilities

Any damage to highway facilities or utility installations due to the contractor's operations shall be repaired at the contractor's expense.

### Manuals and Instructions

The documents listed will be made available for examination by prospective bidders to assist in bid preparation and as guides for work performances.

Maintenance Standards

Maintenance Policies and Procedures

Equipment Lighting Manual

Milepost Reporting Instructions

### Definitions

1. Mobilization Costs - Costs incurred by the contractor for office, communications, equipment, movement, organizational work and all other overhead and incidental costs.
2. Other Work - Work of a general nature, not included in contract items, and specific jobs. To be performed as directed by the engineer.
3. Regular Work Hours - 8:00 a.m. to 5:00 p.m., Monday through Friday.
4. Function - One of the numbered items appearing in the schedule of prices which describes the specific work operation.
5. Surface Types - For reporting purposes and plat references, surface types included are as follows:
  - Unit 10 - Portland Cement Pavement
  - Unit 30 - Inverted Penetration - no base
  - Unit 40 - Inverted Penetration on-base
  - Unit 80 - Portland Cement overlaid with Asphaltic Concrete
  - Unit 90 - Asphaltic Concrete - base
6. Milepost - Mileage from beginning of route, posted each mile on right side and numbered from west to east and from south to north, depending on cardinal direction of the route.
7. Job Order - A written directive to the contractor authorizing specific routine work to be performed.
8. Extra Work Order - To be used to authorize the contractor to perform "Other Work", or other unforeseen special functions.
9. Standard Specifications - The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series of 1977, and revisions listed on the proposal.

10. High Type Mix - Hot asphaltic concrete or Sylvax premix or equivalent.
11. Blue Book - The 1981 Rental Rate Blue Book for Construction Equipment.

TABLE NO. 1  
HISTORICAL MONTHLY DISTRIBUTION OF WORK BY PERCENT

Function No.	Description	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
<b>SURFACE</b>													
609	Spall Patching	7	6	5	5	7	4	5	4	14	17	14	12
610	Blow-up Rpr. & Mud Level	31	11	7	5	7	4	1	1	1	4	5	23
611	Machine Level	15	15	16	16	9	1	0	0	0	2	7	20
612	Crack Seal	3	3	3	2	4	7	7	13	17	18	15	8
613	Pav. Patching FD	10	7	15	27	13	4	1	0	0	1	5	17
614	Seal Coat	12	19	23	19	9	2	0	0	0	2	5	9
618	Strip Seal	20	15	18	13	4	0	0	0	1	1	9	19
619	Burn/Plane	19	16	16	9	7	6	3	1	3	4	5	11
620	Broom & Sweep	10	10	7	7	6	3	2	1	2	10	23	19
621	Raise Pavement	7	7	9	13	16	3	0	0	0	3	19	23
690	Exp. Relief Jts.	9	12	10	9	9	7	4	3	5	8	12	12
625	Other	12	12	11	9	7	5	1	3	3	10	13	14
<b>SHOULDERS</b>													
628	Rpr. Sh. W/Bit. Mix	13	13	19	9	13	3	2	1	1	2	6	18
629	Seal E.R. & Pvd. Sh.	12	14	17	23	15	5	1	0	0	1	4	8
632	Fill Long. Jnts.	4	8	15	7	11	5	6	6	8	17	2	11
633	Pvd. Sh. Rpr.	16	28	20	8	6	1	1	0	0	6	3	11
634	Repair W. Agg.	8	11	9	10	13	7	1	0	4	15	10	12
636	Now Sh. & Med.	15	18	15	15	5	0	0	0	0	0	0	32
638	Hnd. Mowing	21	20	15	11	4	1	0	0	0	0	3	25
640	Bld. Sh.	6	8	10	12	14	7	2	0	2	9	16	14
641	Rebuild Sh.	8	11	12	24	16	6	0	0	0	2	8	13
643	Other Sh. Mt.	7	10	7	11	12	5	4	1	4	10	12	17
<b>ROADSIDE</b>													
645	Rdsid. Mowing	27	31	21	9	3	0	0	0	0	0	0	9
646	Foliage Spraying	15	6	3	7	2	0	0	0	0	1	14	52
647	Cut Brush & Trees	2	2	2	2	5	23	22	14	10	8	6	4
649	Litter Removal	2	1	1	4	4	5	3	1	2	29	42	6
650	Erosion Control	10	12	13	8	10	10	3	0	0	2	15	17
653	Other Roadside	7	5	6	8	12	10	6	3	4	9	14	16
<b>DRAINAGE</b>													
655	Clean Ditches	11	12	13	13	14	4	1	1	0	1	12	18
657	Culvert Maintenance	11	8	8	12	14	6	1	0	4	7	13	16
659	Dr. Tile, Catch Basin & Inlet	6	12	10	13	11	6	1	0	3	6	16	16
660	Other Drainage	4	4	4	30	5	7	5	2	7	16	7	9
<b>BRIDGES</b>													
683	Deck Repair	19	21	15	12	8	1	0	0	0	1	6	17
684	Cln. Deck, Piers, Abts., Jntc.	6	6	12	13	7	5	3	1	3	13	17	14
685	Repair Structure	9	13	13	12	11	6	1	2	2	5	11	15
687	Br. Painting	14	7	10	18	8	3	0	0	0	1	18	21
689	Maint. Waterway	6	11	16	8	8	9	5	2	1	6	14	14
692	Other Br. Mt.	6	10	9	6	32	8	4	2	5	6	5	7



## APPENDIX A

## FUNCTIONS

<u>Function</u>	<u>Title</u>
600, 609, 611	Patching and Leveling with ACC and Bit. Premix
612, 643	Fill Joints and Cracks with Bit. Material or Joint Sealing Compounds
613	Full Depth Pavement Replacement
614, 629	Seal Coating
618	Strip Sealing
619	Burn/Plane Surface
620	Brooming and Sweeping
621	Raise Pavement
628	Repair Shoulders with Bituminous Mix
633	Paved Shoulder Repair
634	Shoulder Repair with Aggregate
636	Mow Shoulders and Medians
638	Hand Mowing
640	Blade Shoulders
641	Rebuilding Shoulders with Earth
645	Roadside Mowing
646	Foliage Spraying
647	Cut Brush and Trees
649	Litter Pick Up
650	Erosion Control
655	Clean and Restore Roadside Ditches
683	Deck Repair
684	Clean Decks, Piers, Abutments and Expansion Joints
685	Repair Bridge Structures
687	Bridge Painting
690	Pressure Relief Joints

PATCHING AND LEVELING WITH ASPHALTIC CEMENT CONCRETE AND BITUMINOUS PRE-MIX  
REF. MAINTENANCE FUNCTIONS 609 (TYPE A), 610 (TYPE B), 611 (TYPE C)

Purpose

To repair small isolated deteriorated spots or holes in roadway, bridge and paved shoulder (Type A), make temporary blowup repairs or hand leveling (Type B), and machine leveling with asphaltic cement concrete or bituminous pre-mix (Type C).

Description

Type A - Filling spalls, small corner breaks, pitting, popouts, raveling and joint failures with high type bituminous pre-mix, as approved by the Engineer.

Type B - Hand leveling of dips, sags, depressions and areas of severe surface deterioration with hot asphaltic cement concrete or regular bituminous pre-mix. Temporary repair of pavement blowups to accommodate traffic until pavement conditions stabilize and/or permanent repair can be made.

Type C - Placing asphaltic cement concrete with laydown machine on unit 10, 80 and 90 surfaces or bituminous pre-mix with motor grader on unit 30 and 40 surfaces to level uneven surfaces, or cover large areas of severe surface deterioration.

Quality

Type A - Except when patching under emergency conditions all loose materials shall be removed from the area to be patched. Edges of the hole will be cut nearly vertical to a depth of approximately 1", and the hole will be dried and a tack coat applied. Patches will be compacted with a hand or mechanical tamper. The compacted surface of the patch shall not be lower than nor more than 3/8 inch higher than the adjacent pavement surface.

Under emergency conditions the patches will be done in a manner to alleviate the emergency conditions as expeditiously as the conditions permit.

Type B - When leveling dips, depressions, sags or covering areas with severe surface deterioration, the area to be covered shall be cleaned and tack coat applied. The patch shall be placed in lifts not to exceed 2 inches. Each lift shall be compacted with tamper or roller. The surface of the patch shall not deviate from the surrounding surface more than 3/8 inch when checked with a straight edge.

Temporary blowup and emergency pothole repair shall be performed in a manner as to provide the maximum safety and convenience for the traveling public that is possible under the existing conditions.

Type C - The area to be covered under this activity shall be cleaned, holes filled (per Type A) and the surface shall have tack coat applied. Materials shall be placed in lifts not to exceed two inches. Compaction and profile shall be as directed by the Engineer.

### Procedures

All holes being filled and areas being covered shall be free of unsound materials, cleaned and tack coat applied. No tack coat is to be applied when using high performance pre-mix. Incidental shoulder work will be scheduled as shoulder maintenance activity. Temporary pavement marking will be placed as directed by the Engineer. Sealing of runouts will be incidental work as directed by the Engineer.

### Materials

One-half inch maximum aggregate size Type A, B or high type commercial asphaltic cement concrete as approved by the Engineer. Regular bituminous pre-mix (Standard Specifications for Highway and Bridge Construction, Part IV Supplement, Materials, Section 4202 dated 1977). High performance pre-mix (special provision SP-324 dated SEPTEMBER 19, 1980)

### Measurement and Payment

Measurement of this activity will be by ton of bituminous mix placed in patches. Type A repair will have two separate bid items for regular and high performance pre-mix. Type B and C repair will each be separate bid items.

Temporary pavement marking, when required, is incidental.

## FILL JOINTS AND CRACKS WITH BITUMINOUS MATERIAL OR JOINT SEALING COMPOUNDS

## FUNCTION 612 AND 632

Purpose

To provide flexible material in joints and cracks including the joint between the slab and paved shoulder, to prevent entry of moisture and foreign materials.

Description

Includes cleaning of the crack or joint, the application of the sealing material and blotting with sand when necessary.

Quality

Cracks and joints shall be filled to between 1/4 and 1/2 inch below the surface unless the Engineer specifies otherwise.

Cracks and joints open 1/2 inch or more shall be choked to approximately 1 1/2 inch below the surface with sawdust, vermiculite, ground corn cobs, etc. to reduce the amount of sealant required. (Sand may be used to choke cracks on flexible pavements.) Any spills or overfills will be blotted with sand to avoid tracking.

Procedures

Cracks being sealed with emulsion or other liquid bituminous material approved by the Engineer will be thoroughly cleaned.

Materials

Emulsion and liquid bituminous material shall comply with standard specifications.

Measurement

Measurement will be by gallons of sealant placed in crack. Bid item will include blotting and choking materials as incidental. Payment will be at the unit bid price.

## FULL DEPTH PAVEMENT REPLACEMENT

## FUNCTION 613

Purpose

To make permanent repair of pavement structure.

Description

Full depth patching of both rigid and flexible pavements with either P.C. or A.C. concrete. Includes removal and disposal of old pavement, any necessary base repair, and edge seal when required.

Quality

Removal of old pavement, hole preparation, finishing, and curing shall be performed in compliance with the specifications for pavement repair, Supplemental Specification 886.

Procedures

In general, work should be planned and materials used which will not require overnight traffic restrictions and signing. Any deviation must receive concurrence of the Engineer.

Measurement and Payment

Measurement will be by square yard of patch and paid for at the contract unit price. The price bid will cover either P.C. or A.C. as directed by the Engineer.

SEAL COATING  
FUNCTIONS 614, 629

Purpose

To correct map cracking, abrasion, top lift raveling, checking, dry surface, weathering, wheel rutting, seal patches, bituminous edge rut treatments and bituminous shoulders and to increase skid resistance.

Description

Inverted penetration seal on roadway or shoulder surface using emulsified asphalt and aggregate or emulsified asphalt slurry mix.

Quality

This work shall comply with special provisions for seal coat contracts or Supplemental Specification 894 for slurry seal contracts.

Procedures

Small areas should be sealed in uniform rectangular patches.

Measurement and Payment

Work will be measured in square yards of surface sealed and paid for at the contract unit price.

## STRIP SEALING

## FUNCTION 618

Purpose

To seal centerline and pavement widening cracks.

Description

Application of slurry or inverted penetration seal in strips of from 8 inches to 12 inches wide on centerline or pavement widening crack.

Quality

Any spalls or popouts should be patched with bituminous mix as type "A" patches, before seal material is applied.

Procedures

A squeegee box as described in No. 1 Section XVIII of Maintenance Policies and Procedures shall be used to apply CRS-2 emulsion in the crack. The emulsion shall be heated to 140<sup>o</sup> - 160<sup>o</sup> F. Blotting sand shall be applied to the crack immediately behind the squeegee. Special signing to be accomplished by the contracting authority, is required when traffic markings will be obliterated. Close coordination with the local area supervisor is necessary.

Materials

CRS-2 emulsion complying with standard specifications shall normally be used. The Engineer may approve use of alternative materials.

Measurement and Payment

This activity will be measured in mile of crack sealed and payment will be at the contract unit price.

## BURN/PLANE SURFACE

## FUNCTION 619

Purpose

To remove humps, excess bituminous ripples, heaved joints, and to eliminate wheel ruts.

Description

Heating and/or planing of bituminous surfaces.

Quality

After planing heaved joints, rippling or shoving on A.C. resurfacing, the area shall be sealed with CRS-2 emulsion and immediately blotted with sand.

Procedures

Material planed off shall be used on adjacent edge ruts or shoulders or picked up and stored as directed by the Engineer. The Engineer may approve alternate methods for removing humps. Prior to burning within the corporate limits of any city, the contractor shall notify the city authorities and utility companies.

Measurement and Payment

Measurement will be by square yard burned and/or planed. Payment will be at the contract unit price.



## BROOMING AND SWEEPING

## FUNCTION 620

Purpose and Description

Brooming or sweeping surfaces with mechanical broom or sweeper to either clean surfaces, gutters and intersections, or to redistribute cover aggregate.

Procedures

The contractor shall be responsible for disposal of the sweepings. Before brooming, wind conditions and the amount of dirt raised must be considered.

Measurement and Payment

Measurement will be in hours of sweeping. Payment will be at the unit rate bid. The contractor shall report the number of manhours utilized in performing this item to the Engineer at monthly intervals.

## RAISE PAVEMENT

## FUNCTION 621

Purpose

Raise pavement and/or fill voids under the pavement.

Description

Correction of surface profile as a result of subsurface cavities by pressure injection of a portland cement, soil and water mixture, or the filling of subsurface cavities without surface profile correction as directed by the Engineer.

Quality and Workmanship

All known voids shall be filled. When raising pavement, the finished grade will not vary by more than 1/2 inch from string line.

Procedure

Upon determination of areas to be corrected as to type and size, holes for injection of the mixture are to be drilled through the pavement. The recommended procedures as outlined by the manufacturer for the equipment used shall be followed for best results.

Upon completion of this work the surface shall be cleaned and any edge ruts or shoulder damage shall be corrected before leaving the area.

Materials

Pumping mixture shall be as recommended by the manufacturer for the equipment used and as approved by the Engineer.

Measurement and Payment

This activity shall be measured in cubic yards of mixture placed for pavement raised and/or cavities filled. Unit price shall include all operations to complete this activity including preparation of the mixture, drilling the holes and clean up of the work site. Payment will be made at the contract unit price.

## REPAIR SHOULDERS WITH BITUMINOUS MIX

## FUNCTION 628

Purpose and Description

To fill edge ruts on unpaved shoulder, build wedges on bituminous or paved shoulders to correct drop off between pavement and shoulder, leveling and repair of shoulders other than full depth repair, using bituminous pre-mix.

Quality

Bituminous pre-mix as approved by the Engineer shall be used to fill edge ruts where traffic, wind erosion or washing on unpaved shoulders makes treatment with aggregate impractical. Treatment shall be in uniform width as directed by the Engineer.

A wedge of asphaltic cement concrete mix shall be placed on paved shoulders along the pavement if shoulder settlement has resulted in a drop off of more than two inches. The wedge will be placed at a nominal 6:1 slope.

Procedures

Areas of edge ruts to be treated on unpaved shoulders shall be reasonably free of loose material, areas shall have a tack coat applied, bituminous pre-mix placed in designated areas and spread evenly. Compaction will be as directed by the Engineer.

Areas to receive wedge treatment on paved shoulders shall be reasonably free of loose materials, and a tack coat shall be applied. Asphaltic cement concrete shall be placed in designated areas to a uniform slope. Compaction shall be as directed.

Materials

Bituminous pre-mix as approved by the Engineer shall be used to fill edge ruts.

1/2" size Type A, Type B, or high type commercial asphaltic concrete as approved by the Engineer shall be used to construct the wedge on paved shoulders.

Measurement and Payment

Measurement of this activity will be by ton of approved materials placed in the edge rut or the wedge. Payment will be at the contract unit price.

## PAVED SHOULDER REPAIR

## FUNCTION 633

Purpose

To repair damaged areas in paved shoulders.

Description

Full or partial depth repair or replacement of paved shoulders with A.C. or P.C. concrete.

Quality

In making repairs to higher type shoulders, replacement shall be in kind. Rumble strips on shoulders shall be replaced when disturbed by patching operations. Base repairs where necessary shall be incidental to this activity.

Procedures

Material removed in patching and base repair will be disposed of as directed by the Engineer. Loose and unsound materials shall be removed and holes squared up. Holes to be filled with asphaltic cement concrete shall have a tack coat applied to the hole. Compaction of material placed shall be as directed by the Engineer.

Materials

Materials shall conform to the standard specifications.

Measurement and Payment

Measurement will be by square yard of surface repaired. Payment will be at the contract unit price.

## SHOULDER REPAIR WITH AGGREGATE

## FUNCTION 634

Purpose

To replenish surfacing on shoulders and mailbox turnouts. To fill edge ruts and shoulder washes.

Description

Application of aggregate on unpaved shoulders and mailbox turnouts within the normal shoulder width.

Quality

Care shall be exercised to minimize the amount of aggregate placed on the slab. No piles or windrows of aggregate shall be left on the shoulders. Edge rut and general shoulder application shall be compacted as directed by the Engineer. Shoulder surface shall not be finished higher than 1/2 inch below pavement surface. Shoulder slope and width of repair shall be as directed by the Engineer.

Procedures

Application methods may range from continuous application with spreaders to dumping and spreading with blades or shovels.

Repair of edge ruts on other than stabilized shoulders may require an application of bitumen at the nominal rate of 0.3 gal. per sq. yd. prior to placing aggregate if directed by the Engineer. Surfacing of private drives outside the shoulder line is not permitted while performing this activity.

Measurement and Payment

Measurement will be by ton of aggregate placed on shoulders. Payment will be at the contract unit price.

The application of bitumen prior to the aggregate, when required, will be paid for as a negotiated item.

## MOW SHOULDERS AND MEDIANS

## FUNCTION 636

Purpose

To delineate the shoulder edge, provide sight distance and aid in snow removal and reducing snow accumulation.

Description

This work shall consist of mowing the vegetation on non-paved shoulders and a strip along the edge of shoulder.

Quality

The mower cutting height shall be set such that after completion of the mowing operation the height of the remaining stubble will average six inches plus or minus one inch. More than one pass of the mowing unit may be necessary to accomplish the mowing. Where more than one pass of the mowing equipment is required, successive passes shall be lapped so as not to leave any uncut vegetation. Bunching or windrowing the mowed vegetation will not be permitted. Where wet soil conditions result in rutting of the foreslope, mowing shall be suspended. The speed of the mowing equipment shall not exceed the ability of the mower to cut cleanly and completely.

Procedures

Mowing equipment shall consist of a tractor with a sickle type mower, an underbody rotary mower, a gang type rotary mower, or other types approved by the Engineer. Rotary mowers shall be equipped with a suction type blade and safety chains or other approved protective devices. Sickle bar mowers shall have protective shields on all sections. Broken sections shall be replaced to insure a clean, smooth cut. Different types of mowers may be used on the same project as approved by the Engineer.

The shoulder vegetation and a swath adjacent to the shoulder should be mowed when 50% of the vegetation reaches a height of 14 inches or greater. The swath adjacent to the shoulder will range in width from 5 feet to 15 feet as specified by the Engineer. Generally the wider width will be limited to the last mowing in the fall and will occur after September 1.

Where W-beam guardrail is present, in the median, all vegetation within the specified limits shall be mowed plus a minimum of five feet on all sides of the guardrail. Where cable guardrail, W-beam guardrail or guard posts are present, along the outside shoulder, all the vegetation between the edge of the shoulder and a point 5 feet beyond the guardrail or posts shall be mowed.

Hand equipment will be required for areas inaccessible to other equipment for trimming around and under delineator posts, sign posts, guardrail, bridges, culverts, or other obstructions and shall be accomplished in accordance with specifications for function 638.

Mowers shall not be operated on slopes steeper than 2.5 to 1.

On four lane divided roadways mowing of the shoulder and adjacent swath shall include the median shoulders as well as the outside shoulders. Median crossover slopes shall be mowed.

Mowing shall progress in the same direction as traffic when mowing along the mainline and right ramp shoulders. Mowing along the left ramp shoulder in the direction opposite the flow of traffic will be permitted. Mowing operations shall be conducted such that the equipment does not encroach in the travelway except where shoulder width does not permit. In these situations encroachment will be permitted in conjunction with proper traffic control. When mowing behind guardrail, the direction of travel may be opposite that of adjacent traffic.

#### Measurement and Payment

Shoulder and median mowing shall be measured in feet based on the centerline length and the width specified, and the area calculated in acres. Deductions will be made for bridges or other areas not mowed. Areas around guardrails beyond the specified limits shall not be measured separately. Any mowing accomplished with hand equipment will not be measured or paid for separately.

For the number of acres calculated, the contractor will be paid the contract unit price. This will be considered full compensation for accomplishing the mowing in accordance with the contract documents including mowing around guardrails, signs, delineators, drainage structures, bridges and crossovers.

## HAND MOWING

## FUNCTION 638

Purpose

To maintain visibility of roadside appurtenances in areas where tractor mowing has occurred.

Description

This work shall consist of cutting vegetation with hand sickle, scythes, string trimmers, or hand mowers to control vegetation around signs, delineators, guardrail, bridge ends, plantings, and other areas where cutting is necessary but cannot be cut with tractor mowers.

Quality

Vegetation which is mowed with hand equipment shall be no higher than the surrounding vegetation which has been cut with tractor mowers.

Procedures

Where the area behind guardrail is inaccessible with tractor mowers, the vegetation behind the guardrail shall be mowed with hand equipment to a minimum width of 2 feet.

The contractor shall report, at monthly intervals, the manhours of labor incurred in accomplishing hand mowing.

Measurement and Payment

Hand mowing shall not be measured or paid for separately but rather shall be considered incidental to "Mow Shoulders and Median", function 636.



## BLADE SHOULDERS

## FUNCTION 640

Purpose

Maintain even surface and proper slope on earth, stone or stabilized shoulders.

Description

Blade shoulders with motor grader, tractor mounted blade or towed grader, as required to maintain a relatively smooth surface and to remove aggregate build up near the pavement edge that interferes with surface drainage or inconveniences traffic. Includes blading of approaches and driveways within normal shoulder width to prevent a build up of material on the shoulder.

Quality

Shoulders are to be maintained at a uniform cross slope. Where sufficient shoulder material is present the cross slope shall not be flatter than 1/2 inch drop per foot of shoulder width. Approaches are to be maintained as close as possible to as built cross section to facilitate proper drainage.

Procedures

Windrowing of material at the pavement edge will not be permitted without traffic control. Care shall be taken that aggregate is not lost over the shoulder.

Measurement and Payment

This activity will be measured in miles of shoulder blading completed on each side. Payment will be made at the contract unit price. When special compaction equipment, other than truck wheel compaction, is required, it will be paid for as a negotiated item.

## REBUILDING SHOULDERS WITH EARTH

## FUNCTION 641

Purpose

To raise the elevation of earth shoulders, to repair washes in the shoulder and foreslope and to repair shoulder surface.

Description

Includes placing dirt on the shoulder, compacting and blading the shoulder to restore it to the elevation and width as directed by the Engineer, and seeding of the finished shoulder, foreslope and other areas disturbed within the right of way.

Quality

Each shoulder should be maintained at about 1/2 inch drop per foot of width. The shoulder width as directed by the Engineer is to be kept uniform. Material used for shoulder work shall be from a source approved by the Engineer.

Procedures

The existing shoulder will be scarified and/or bladed to remove existing vegetation and to flatten shoulder to form a base for the new fill. New fill material will be placed in accordance with Section 2123 of the Standard Specifications.

Compacted shoulder will be bladed to required width and slope. Excess material shall be carried forward and not bladed over foreslope. Seeding of the disturbed area on the shoulder and in the borrow area will be in accordance with Section 2601 of the Standard Specifications and shall be considered incidental. Wherever practical, this function will be coordinated with ditch cleaning function 655 to make best use of material removed.

Measurement and Payment

Measurement will be cubic yards placed on the shoulder. Payment will be at the contract unit price.

## ROADSIDE MOWING

## FUNCTION 645

Purpose

To control noxious weeds, weed patches, brush, and provide sight distance.

Description

This work shall consist of cutting vegetation with sickle, flail or rotary mowers in the rights-of-way beyond the one mower swath cut included in shoulder mowing.

Quality

Mowing shall be done in neat rectangular patches with all vegetation within the area mowed to a uniform height.

The mower cutting height shall be set such that after completion of the mowing operation the height of the remaining stubble will average six inches plus or minus one inch. More than one pass of the mowing unit may be necessary to accomplish the mowing. Bunching or windrowing the mowed vegetation will not be permitted. Where wet soil conditions result in rutting of the foreslope or backslope, mowing shall be suspended. The speed of the mowing equipment shall not exceed the ability of the mower to cut cleanly and completely.

Procedures

Mowing equipment shall consist of a tractor with a sickle type mower, an underbody rotary mower, a gang type rotary mower, or other types approved by the Engineer. Rotary mowers shall be equipped with a suction type blade and safety chains or other approved protective devices. Sickle bar mowers shall have protective shields on all sections. Broken sections shall be replaced to insure a clean, smooth cut. Different types of mowers may be used on the same project as approved by the Engineer.

Mowing in rights-of-way will be limited to cutting patches of noxious or undesirable weeds, brush and improving sight distance when directed by the Engineer.

Mowers shall not be operated on slopes steeper than 2.5 to 1.

Measurement and Payment

The length and width of areas which have been mowed shall be measured in feet and the area calculated in acres.

For the number of acres mowed, the contractor will be paid the contract unit price. This will be considered full compensation for accomplishing the mowing in accordance with the contract documents.

The contractor shall report the number of manhours utilized in the performance of this work to the Engineer at monthly intervals.

## FOLIAGE SPRAYING

## FUNCTION 646

Purpose

To control vegetation in pavement joints, around roadside appurtenances, and at spot locations within the roadside.

Description

This work shall consist of the application of chemicals to control vegetation, retard growth, or act as a soil sterilent.

Quality

Areas to which chemicals are applied to control noxious weeds shall kill the weeds but not result in a sterile soil condition. Where soil sterilent is used, it shall be applied such that the resultant sterile soil condition is limited to the area designated by the Engineer.

Procedures

Equipment shall be commercially available, specifically designed for the application of herbicides. Spraying equipment should be capable of applying chemicals in the correct proportions and rates in accordance with the manufacturer's recommendations.

The contractor shall maintain a daily log of spraying giving information shown on the attachment. A copy of this log shall be furnished to the Engineer. All spraying shall be done under the supervision of an applicator licensed by the State of Iowa for the application of herbicides, category 6. All chemical handling, storage, application and disposal shall conform to applicable state and federal laws.

Chemicals shall be applied to noxious weed patches and other areas identified by the Engineer at the rates specified on the label.

The contractor shall take necessary precautions to eliminate any drift which will injure adjacent vegetation. Any damage caused to adjacent property due to the application of chemicals within the right of way is the responsibility of the contractor.

The contractor should also be aware of adjacent commercial bee farms or bee hives located in the area and avoid spraying or take the necessary precautions to prevent injury.

The contractor shall report at monthly intervals the gallons of chemical solution or pounds of dry chemical applied.

### Materials

Chemicals will be commercially available products, labeled for use in Iowa. The Department shall furnish the specific chemicals required. Chemicals may be in the form of a liquid or granular.

### Measurement and Payment

The length and width of areas to which chemicals have been applied shall be measured in feet and the area calculated in acres.

Spot applications around posts shall be counted as 2 square feet. The length of joints treated shall be the square feet used in calculating the acres.

For the number of square feet to which chemicals have been applied, and satisfactory results obtained, the contractor shall be paid the contract unit price. This will be considered full compensation for accomplishing the work described herein.



## CUT BRUSH AND TREES

## FUNCTION 647

Purpose

To maintain sight distance and enhance scenic beauty of the right of way.

Description

This work shall consist of the removal of undesirable brush and trees from rights-of-way, disposal of dead and diseased trees, tree trimming, and stump removal.

Quality

All trees and brush which is cut shall be in accordance with the requirements of this specification. No cut trees or brush shall be left within the right of way. Areas where stumps are removed shall be restored to the original cross-section.

Procedures

Dead trees within the right of way shall be cut and stumps 6 inches or more in diameter shall be removed. Stumps under 6 inches may be left providing the remaining height is one inch or less above the ground.

All trees, sprouts or stumpgrowth within 30 feet of the edge of the road shall be removed, provided there is sufficient right of way. Trees beyond this limit will be permitted unless they restrict drainage, sight distance or otherwise interfere with traffic. Desirable young trees shall be thinned to approximately a 25 foot spacing.

All shrubs and brush which restrict sight distance or drainage, interfere with traffic or cause snow drifting shall be removed.

The Engineer shall identify trees and brush which are required to be removed.

All stumps which are not removed shall be treated with a chemical brush killer. Application shall be as intended for this purpose and under the general supervision of an applicator licensed by the State of Iowa. The contractor shall furnish the necessary chemical.

Trees removed within rights of way which are occupied by easement are the property of the adjacent land owner and should be offered to him before otherwise disposing. If the adjacent property owner does not want the removed trees, or a portion thereof, it shall become the property of the contractor.

All brush removed by the contractor may be chipped and spread within the highway right of way as directed by the Engineer or removed.

All trees to be disposed which are too large for chipping shall become the property of the contractor and shall be removed from the highway right of way.

No burning will be allowed within the highway right of way.

Measurement and Payment

Payment for this work will be for manhours of labor and hours of equipment used as set out in the specification for "Other Work".



## LITTER PICK UP

## FUNCTION 649

Purpose

To remove unsightly concentration of litter and those objects which could damage equipment and which may be projected by mowing equipment.

Description

This work shall consist of picking up litter and debris from roadsides and medians to remove unsightly concentrations of litter.

Quality

All foreign material within the roadside shall be collected and disposed including cans, bottles, boxes, containers, paper, plastic, garbage, and other items which create unsightly conditions.

Procedure

Pick up of litter shall encompass the area between right of way lines except for the shoulders and roadway surface.

Litter collected and loaded into open trucks shall be covered (tarped) when traveling on public highways.

A concentrated effort shall be undertaken each spring to thoroughly pick up all litter within the right of way. During the remainder of the year unsightly concentrations of litter shall be picked up.

The contractor shall report at monthly intervals to the Engineer the number of cubic yards of litter picked up and disposed.

All dead animals found within the roadside shall be disposed. Small animals may be buried within the right of way. Larger domestic farm animals and deer shall be removed from the right of way and disposed of in an appropriate manner consistent with State and local codes.

All litter disposal is the responsibility of the contractor and shall be completely removed from the highway. Disposal shall be consistent with State and local codes.

All fees and charges for disposing of litter, debris or dead animals shall be paid by the contractor.

Measurement and Payment

Litter pick up shall be measured in centerline miles within the limits designated by the Engineer. No additional mileage shall be added for ramps in interchange areas.

Price bid, per mile, shall be considered full compensation for two concentrated pick-ups plus incidental pick-up for the duration of the contract period.

## EROSION CONTROL

## FUNCTION 650

Purpose

To stop or prevent erosion within the highway right of way.

Description

This work shall consist of seeding, sodding, laying jute mesh, construction of erosion dams, and other erosion control activities.

Quality

Work shall be done in a workmanship manner and shall be appropriate to the problem to be corrected.

Procedures

The area and scope of work will be identified by the Engineer.

Work involving erosion control items shall be done in accordance with Section 2601 of the Standard Specifications as modified by the Engineer.

Seed mixtures when required will be specified by the Engineer.

Materials

Refer to Section 4169 of the Standard Specifications.

Measurement and Payment

Measurement and payment shall be as set out for "Other Work".

## CLEAN AND RESTORE ROADSIDE DITCHES

## FUNCTION 655

Purpose

To clean and restore ditches to adequately handle drainage and provide for snow storage.

Description

This work consists of cleaning ditches which have been choked with silt, filling of roadside ditches using dirt or rip-rap, or reshaping of roadside ditches where no material is moved to or from the work site so they will perform their intended function. Also includes cleanup of drifted silt and earth slides which do not protrude onto the shoulders or travelway.

Quality

Cleaned or restored ditches shall be finished to the specified cross-section. The area should be dressed up as directed by the Engineer to present a neat appearance and to prevent interference with mowing. All disturbed areas shall be seeded in accordance with the requirements set out in Function 650.

Procedures

The Engineer shall designate areas and limits where ditch cleaning or restoring is required.

Any staking required to establish flow lines shall be set by the Engineer.

Ditches may be wet which will preclude the operation of any equipment within the ditch limits.

Prior to any excavation it is the contractor's responsibility to notify any utility company whose facilities occupy the area to be excavated.

Material excavated shall be disposed of at the direction of the Engineer. When no disposal site exists, the contractor shall find his own disposal site off of the highway right of way. Disposal sites identified by the Engineer will be located within 2 miles of the excavation site.

Where material is required for filling, the Engineer may identify locations within the right of way where the material can be obtained within 2 miles of the fill location or the contractor will be responsible for finding his own source of fill material.

The contractor shall report to the Engineer, at monthly intervals, the lineal feet of ditch cleaned.

Material excavated may be used in conjunction with Function 641, Rebuilding Shoulders with Earth.

If working from the shoulder the operation should be set up so loaded trucks move with traffic and, if possible, the truck should turn around empty.

#### Measurement and Payment

The number of cubic yards of material excavated shall be calculated based on minimal cross section measurement, load count or other mutually agreed methods.

For the number of cubic yards excavated within the ditch or borrow areas, the contractor will be paid the contract unit price bid. This will be considered full compensation for accomplishing all work described herein. Any required reseeded of disturbed areas shall be paid for separately as set out in "Other Work". Seeding will be paid for separately as set out in "Other Work".

## DECK REPAIR

## FUNCTION 683

Purpose - to repair spalled areas on bridge decks, curbs and sidewalks.

Description

Permanent PC concrete patching of bridge decks to preserve the floor and reduce impact load. This may include curbs and sidewalks.

Quality

1. Area to be patched will be designated by the Engineer.
2. Saw the edges of the patch 3/4 to 1" deep.
3. Remove the concrete in the patch area to the top of the reinforcing steel or until sound concrete is found, whichever is deeper. No hammer heavier than 15 lb. will be allowed.
4. Clean patch area including exposed reinforcing steel with sand blast.
5. The Engineer shall be given an opportunity to inspect the patch area after cleanup and before concrete is placed.
6. Mix concrete in paddle mixer proportioning as specified in Sec. 2413.02 of the Standard Specifications, Series of 1977.
7. Just before placing concrete, apply 50-50 sand-cement grout to all surfaces of the hole. Surfaces must be dry when the grout is applied.
8. Patch should be struck off about 3/8" high and worked with a vibrating screed or vibrating plate to match adjacent surface.
9. Finish with wood trowel (particular attention to attain tight edges) and apply white pigmented curing compound immediately.
10. Open to traffic after four hour cure. All work shall be scheduled so the complete roadway is open to traffic before sundown.

Materials

Sand, gravel and cement used in deck repair shall comply with the appropriate section in the 1977 Standard Specification of the Iowa D.O.T.

Measurement and Payment

PC concrete deck patches shall be paid for at the bid price per square yard of designated area patched. Bid price shall include all labor, equipment and materials.

## CLEAN DECKS, PIERS, ABUTMENTS AND EXPANSION JOINTS

## FUNCTION 684

Purpose - to remove all foreign materials from bridges.

Description

Removal of foreign materials from decks, curbs and sidewalks, abutments and pier tops, cleaning drains, cleaning expansion joints, and removal of debris from trusses, beams, flanges, etc. to prevent deterioration of the structure. This activity deserves special emphasis during winter and spring when salt and treated abrasives are being used. The spring cleanup is normally scheduled as soon as weather permits.

Also includes cleaning and lubricating rollers and other devices.

Quality

Areas which have been cleaned shall be free of all accumulations of sand, gravel, dirt or other foreign materials.

Procedure

Normally, decks are cleaned using a power broom, but other methods such as water, compressed air or hand tools may be used.

Other cleaning on the bridge and lubrication of bearing devices shall be performed as directed.

Measurement and Payment

Cleaning of deck shall be paid for at the bid rate per square yard for the area designated to be cleaned. Bid price shall include all labor, equipment and materials.

Payment for other cleaning and for lubrication of bearing devices will be a negotiated item.

## REPAIR BRIDGE STRUCTURE

## FUNCTION 685

Purpose - to protect and/or repair the bridge, exclusive of the deck.

Description

Repair performed on bridge structures, exclusive of deck, including repair to piers, abutments, superstructure, concrete end posts, wingwalls and concrete slope protection. It may include concrete barrier curbs and deck drain extension. It also may include epoxy sealing of piers and/or abutments.

Quality

The repair shall be completed to the satisfaction of the Engineer.

Equipment and Procedure

This work shall be performed as directed by the Engineer.

Materials

Concrete used in bridge repair shall be mixed as specified in Section 2403.03 in the 1977 Standard Specification of the Iowa D.O.T.

Epoxy use for sealing piers or abutments shall be an appropriate type of penetrating epoxy and shall be one of the brands approved by the Iowa D.O.T. for this type of work.

Measurement and Payment

Measurement and payment shall be as set out for "Other Work".

## BRIDGE PAINTING

## FUNCTION 687

Purpose - to protect steel bridge components from rust and deterioration.

Description

Spot painting structural steel, bearing devices, handrails, and bearing pile.

Quality

The finished paint will be of uniform appearance with no sags, runs or thin areas.

Procedure

1. The area to be painted will be designated by the Engineer.
2. Remove all rust and unsound paint in the designated area by sandblasting to bare metal.
3. The Engineer shall be given the opportunity to inspect the sandblasted area before paint is applied.
4. Apply prime coat by brush or spray using a red lead paint. The application shall result in an even coat with a minimum thickness of three mils.
5. The prime coat shall be allowed to dry thoroughly.
6. Apply top coat by brush or spray using a foliage green or a white semi-gloss alkyd. This application will also result in an even coat with a minimum thickness of three mils.

Materials

All paints shall comply with Sections 4182.94, 4182.06, or 4182.07 in the 1977 Standard Specification of the Iowa D.O.T.

Measurement and Payment

Bridge painting will be paid for at the bid price per gallon of paint used on the bridge.



## PRESSURE RELIEF JOINTS

## FUNCTION 690

Purpose

To provide for relief of pressure in Portland Cement Concrete Pavement due to the expansion pavements at bridge and railroad crossings.

Description

Includes cutting a gap through the pavement and into the base under the pavement and out through the shoulder. Filling the trench under the pavement and through the shoulder with granular fill material and the gap in the pavement with a compressible material. Shoulders will be repaired to prior condition.

Quality

Pressure relief joints shall be cut, or recut at approaches to bridges when the existing joint has closed to 1/2 its original width.

Pressure relief joints shall be cut or recut each side of railroad crossings to prevent damage to the crossing due to pressure.

All pressure relief joints shall include drainage except when ordered otherwise by the Engineer.

Procedures

Pressure relief joints shall be installed in accord with details attached and Specification Sp-293.

Materials

Granular fill as per Supplemental Spec. No. 886. Preformed urethane foam joint material with lubricant adhesive as per Standard Road Plan RH-2 and Special Provision SP-293.

Measurement and Payment

Measurement will be for feet of joint installed and payment will be at the contract unit price.

