



MAINTENANCE MANUAL

2017



Brian Sandoval, Governor



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PREFACE

PURPOSE

The purpose of this *Maintenance Manual* is to provide District Maintenance employees with information relevant to maintenance tasks and responsibilities, and relevant policies and procedures of the Nevada Department of Transportation. It is intended to establish an efficient and standardized approach to maintaining the State Highway System through uniform procedures and best practices.

District Maintenance managers are responsible to make this *Maintenance Manual* available to all employees so they may familiarize themselves with all aspects of the maintenance organization. A thorough understanding of policies and procedures will greatly assist the Department in meeting its objectives and enable employees seeking advancement to enhance these opportunities.

This *Maintenance Manual* is not intended to establish a legal standard of care or conduct. It is a guide subject to modification and revision as conditions warrant.

DOCUMENT FORMAT

A loose-leaf format was chosen for the printed version of the *Maintenance Manual* to accommodate timely revisions. In addition, an electronic version will be published and posted online by the Maintenance and Asset Management Division. (Refer to "Revision Procedure" for more information).

DOCUMENT CONTENTS

This *Maintenance Manual* is divided into the following parts:

- Part I: Organization and General Information
- Part II: Employee Information
- Part III: Administrative Procedures
- Part IV: Maintenance Operations
- Appendices
 - A-1: References
 - A-2: List of Tables
 - A-3: District Snow Plans
 - A-4: Forms
- Glossary
- Index

This *Maintenance Manual* is designed so that each part can be used as a standalone document for:

- Training aids (all parts, chapters).
- New employee orientation (Parts I and II).
- Operational processes (Part III)
- Maintenance task descriptions (Part IV).

REVISION PROCEDURE

Review and Approval

1. All proposed revisions shall be submitted in writing to the Maintenance and Asset Management Division, using a Memo request or similar method of communication.
2. A Review Task Force, led by the Principal Asset Management Engineer and maintenance managers and/or supervisors from each District, will meet as necessary to review the proposed changes. The Task Force should contain at least one representative from each District. Depending on the scope and nature of the revision, the Task Force may solicit participation and/or input from representatives of any District or Division.
3. The Task Force will submit its recommendations and input to the Approval Task Force, led by the Chief Maintenance and Asset Management Engineer and the District Engineers and/or their representative for review and approval.
4. Implementation of approved revisions is the responsibility of each District.

In addition to the review and recommendations of proposed revisions, the Task Force:

- Maintains a list of the *Maintenance Manual* holders.
- Maintains a library of revisions to the *Maintenance Manual* in chronological order.

Publication and Distribution

1. After the revised version, has been reviewed and approved by the Review Task Force and other reviewers as assigned/delegated, the *Maintenance Manual* will be published and posted online.
2. A printed version of the revised pages/modules (i.e., parts, chapters) of the *Maintenance Manual* will be distributed to all holders of the *Maintenance Manual* upon request. A memo describing the revision will be sent by the Chief Maintenance

and Asset Management Engineer. An electronic version will be made available online in the Maintenance and Asset Management SharePoint page.

Each chapter of the *Maintenance Manual* contains a revision date. It will be the *Maintenance Manual* holder's responsibility to replace any existing pages.

PART I

INFORMATION AND ORGANIZATION

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CHAPTER 1: GENERAL INFORMATION

This chapter provides a basic overview of the Nevada Department of Transportation (NDOT).

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

DEPARTMENT MISSION STATEMENT

The mission of NDOT is to provide a better transportation system for Nevada through our unified and dedicated efforts.

Goals

- Optimize safety
- Be in touch with and responsive to our customers
- Innovate
- Be the employer of choice
- Deliver timely and beneficial projects and programs
- Effectively preserve and manage our assets
- Efficiently operate the transportation system

Core Values

- Integrity: Doing the right thing
- Honesty: Being truthful in our actions and our words
- Respect: Treating others with dignity

- Commitment: Putting the needs of the Department first
- Accountability: Being responsible for our actions

PROGRAM AUTHORITY

The Department operates under authority of Chapter 408 of the Nevada Revised Statutes and is responsible for building and maintaining approximately 5,397 miles of roads throughout the state.

PROGRAM FUNDING

The Department's funding comes from fuel tax and license or registration fees collected by the state and from the federal government. State funds are used for Department operations, federal matching requirements and preservation of the existing state and federal highway system. Federal funds are available for construction and the reconstruction of Federal-aid highways only.

For more details on Department funding, refer to the *NDOT Fact Book*.

PROGRAM OBJECTIVES

1. To preserve the existing highway system by maintenance and address only bona fide safety needs.

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2. To reconstruct those sections of the state system, which have reached a point of failure for traffic serviceability. This includes high hazard locations and transportation systems management improvements (signals, turn lanes, etc.).
3. To construct selected new high volume roads on the primary and urban systems.

- Maintain NDOT facilities
- Emergency management, security and continuity of operations
- Reduce fatal crashes
- Project delivery -- schedule and estimate for bid advertisement
- Maintain state bridges
- Streamline permitting process

PERFORMANCE MEASURES

Department management, in order to evaluate the performance of the Department, uses the following performance measures:

- Reduce work place accidents
- Provide employee training
- Improve employee satisfaction
- Streamline agreement process
- Improve customer and public outreach
- Reduce and maintain traffic congestion
- Maintain Nevada water quality standards
- Utilize best management practices (BMP's) while performing maintenance activities
- Streamline project delivery -- bidding to construction
- Maintain state highway pavement
- Maintain NDOT fleet

MAINTENANCE ROLE

The role of the Districts and the Maintenance and Asset Management Division (Headquarters Maintenance) is to assure that the Department-maintained highway system is maintained to the highest possible level consistent with the budget, work plan, policies and program objectives.

MAINTENANCE DEFINED

Maintenance is defined as the preservation of safe and usable roadway facilities. It is performed to delay, prevent or correct deterioration and to maintain facilities that are as close to their original or reconstructed condition as practical. Maintenance also includes emergency repairs as a result of accidents, weather conditions or other unexpected damage to a roadway, structure or facility.

Maintenance may be performed by:

- Department employees.
- Contractors.

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- Other agencies authorized by the Director, such as the Nevada Division of Forestry, Nevada Department of Agriculture, etc.

Maintenance does not include:

- Construction of new transportation facilities.
- Reconstruction.
- Major overlays.
- Major improvements to a facility above the originally constructed or reconstructed condition.

STATE HIGHWAY SYSTEM

The State Highway System consists of approximately 5,397 miles (as of 2014) with about 5,204 miles of asphalt surface, 162 miles of concrete surface and 54 miles of gravel surface.

The system is divided into distinct route classifications for signing, mileposting and reporting purposes. The route classifications and the approximate miles of roadway in each classification are as follows:

- Interstate routes (IR)
590 MI
- US routes (US)
1,830 MI
- State routes (SR)
2,619 MI
- Frontage roads (FR)
272 MI

- Access roads (AR)
23 MI
- Collector/Distributor (C/D) roads
9 MI
- State parks (SP)
55 MI

FEDERAL-AID FUNDING**Maintenance Funding**

Federal-aid funds by law cannot be used for routine highway maintenance purposes. Under certain emergency situations, federal funding may be available for the repair of highways and portions of the work may be performed by the Department's District Maintenance crews. In these special situations, the districts will receive information from headquarters relative to record-keeping for federal-aid reimbursement.

STATE FUNDING

Funds for maintenance operations are normally from state funds. The state-funding source for highways is derived from highway user fees such as gasoline and special fuel taxes, driver's license fees, motor carrier fees, registration fees, etc. These revenues are deposited into the State Highway Fund.

State Maintenance Responsibilities

The Department is responsible for the maintenance of all routes on the State Highway System and those routes designated by agreement.

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The Planning Division maintains the online Milepost Index and the *State Maintained Highways, Descriptions, Index and Maps*, which lists the routes that are the maintenance responsibility of NDOT. Any questions concerning maintenance responsibility of a route should be directed to District Administration, Headquarters Maintenance, Planning Division, Roadway Systems Section, or the Right-of-Way Division for clarification.

MILEPOSTING SYSTEMS

There are two mileposting systems in use on Department-maintained highways: the NDOT Mileposting system (black and white milepost markers) and the Interstate Mileposting system (green and white milepost markers). Both systems were established to provide a method of identifying specific locations along highways such as:

- Location of accidents and incidents.
- Locating and reporting areas of maintenance and construction.
- Providing a standard inventory reference for the Maintenance Management System.
- Assisting motorists in estimating their progress.

The term *milepost marker* relates to a post and sign/reference panel showing the route mile numbers. When it is necessary to re-mark a route, a request should be made to the Planning Division, Roadway Systems.

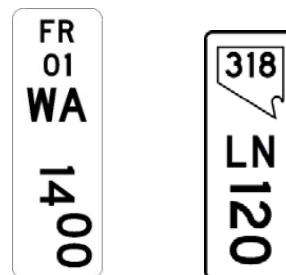
The distance measurements (in miles) originate in the cardinal direction (North and East) of the roadway. Marker placement uses one of the following methods:

- On the right side of the road in each direction
- On the right side of the road in the cardinal direction with two markers mounted back-to-back
- On the median barrier rail with two markers mounted back-to-back

NDOT Mileposting System

The NDOT Mileposting system uses the county cumulative mileage, which indicates the distance on the milepost marker for each route within a county. Milepost zero (0) begins at the southernmost or westernmost point of the route within each county.

The milepost marker has a white background with black lettering that denotes the route number, county and mileage.

Examples:**Interstate Mileposting System**

The Interstate Mileposting system uses the route cumulative mileage, which indicates the distance on the milepost

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marker for each route within state lines. Milepost zero (0) begins at either the southern or western state line or at the south or west junction where a route begins.

The interstate milepost markers have a green background with white lettering, denoting the distance from the state line or the start of the route. (Enhanced reference panels also display the cardinal direction and route number.)

Examples:**INTERCHANGES****Interchange Exit Numbering**

Interchange exit numbering along freeways was established to identify interchange exits. The exit number is the number of the interstate milepost marker preceding the interchange structure. Exit numbers are used for reference by highway organizations, law enforcement officials, and motorists.

The interchange exit panel is displayed with each advance guide sign, exit direction sign and gore sign. It may also be displayed on a separate panel at the top of major signs that are in advance of the interchange. The interchange exit

signs have a green background with white lettering.

Interchange Ramp Numbering

Ramps are numbered according to service type and direction of mainline traffic flow. On-ramps are even-numbered and off-ramps are odd-numbered. The interchange ramp numbering starts on the first off-ramp from the north or eastbound lane. Since most of the interchanges are diamond type or diamond variations, the following summarizes ramp number assignment:

- Ramp 1: North-Eastbound off-ramp
- Ramp 2: North-Eastbound on-ramp
- Ramp 3: South-Westbound off-ramp
- Ramp 4: South-Westbound on-ramp

The sequence for number assignment is normally counter-clockwise. Larger interchange areas with more than four ramps may vary slightly from the normal assignment.

Ramps are identified by mileposts with a regular milepost panel identifying the interchange in conjunction with a supplemental panel identifying that particular ramp. The supplemental panel includes an "R", which indicates ramp and the number assigned to the ramp.

CHAPTER 2: ORGANIZATION

This chapter includes Department organization and duties and responsibilities of the Department administration, the Maintenance and Asset Management Division (Headquarters Maintenance) and District Maintenance crews. Other Department divisions and the type of support they can provide are also described.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

ADMINISTRATION

The Transportation Board of Directors appoints a Director to administer the highway system. The Director appoints three Deputy Directors and retains the authority and responsibility for all Department appointments and hiring; however, the hiring authority is delegated to lower level administrators. In the absence of the Director, a Deputy Director has full authority to administer the affairs of the Department. Additionally, the Director employs such engineers, engineering and technical assistants, clerks and other personnel as may be necessary to accomplish the objectives of the Department. (This authority is limited through the budget process as only a specific number and level of positions are authorized and funded by the legislature.) The Department has more than 1,700 permanent positions.

The Department is organized as a "line and staff" organization, which provides a balance between centralization and decentralization of authority and responsibility for the Department's operation.

Since the transportation facilities requiring maintenance are spread over the state, administration is decentralized to the various District Maintenance

stations and crews that can respond to local needs. In order to provide a degree of uniformity and standardization for the maintenance function, Headquarters Maintenance has the responsibility and authority for program philosophy, objectives and policies. For this blend of centralization/decentralization to be effective, good communication and cooperation must exist between Headquarters Maintenance and the District Maintenance crews.

The Department maintains its central headquarters in Carson City. The headquarters organization is composed of five major divisions:

- Operations
- Engineering
- Planning and Program Development
- Administration
- Stormwater

In order to administer the Department's statewide program on a local level, there are three strategically located District offices: Las Vegas (District I), Reno (District II) and Elko (District III). Each District has definite geographical limits and is responsible for the supervision of the Department's highway program

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activities in that area. A District Engineer administers the highway program and assures that the State's interests are fully considered and protected in each district.

In addition to the three District offices noted above, District I has one Sub-district office located in Tonopah and District III has two Sub-district offices located in Winnemucca and Ely. Each Sub-district is under the supervision of an Assistant District Engineer, who reports to the District Engineer for that District. Each Sub-district is responsible for an established geographical area and for the supervision of highway program activities within the area.

TRANSPORTATION BOARD OF DIRECTORS

The Transportation Board, created by the Nevada State Legislature, oversees the activities of the Department and integrates closely with Department staff to provide top transportation for Nevada.

Members of the board are the Governor, who serves as chairman, the Lieutenant Governor, State Controller, who serves ex officio, and four members who are appointed by the Governor. The four appointed Board members must be residents of Nevada who are informed on, and interested in, the construction and maintenance of highways and other matters relating to transportation. Each must possess at least one of the following qualifications:

- Knowledge of engineering evidenced by the possession of a Bachelor of Science degree in civil or structural engineering and licensure in this state as a professional engineer.
- Demonstrated expertise in financial matters and business administration.
- Demonstrated expertise in the business of construction evidenced by the possession of a license as a general contractor and experience as a principal officer of a firm construction or maintenance in this licensed in this state. Any person currently employed in the field of highway construction or maintenance or who has a substantial financial interest in Highway State is not eligible for appointment to the Board.

The Transportation Board's responsibilities include:

- Considering all questions relating to the general policy of the Department and transacting such business as properly comes before it.
- Reviewing, at such time as the Board selects, an annual report by the Director.
- Acting for the Department in all matters relating to recommendations, reports and such other matters as the Board finds advisable to submit to the legislature.
- Executing or approving all instruments and documents in the name of the State or the Department necessary to carry out the provisions of Chapter 408 of the Nevada Revised Statutes.
- Appointing a Director who is directly responsible for administering the highway program.

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- Delegating to the Director such authority as it deems necessary under the provisions of Chapter 408 of the Nevada Revised Statutes.
- The Transportation Board usually convenes monthly.

DIRECTOR

The Director is responsible for all activities of the Department and the general supervision of construction, reconstruction, improvement, maintenance and repair of all highways, facilities and services authorized under the provisions of Chapter 408 of the Nevada Revised Statutes. The Director is responsible to the Transportation Board of Directors.

Specifically, the Director:

- Directs the Department to develop a general map of the highway system, collects information and compiles statistics and maps relative to the mileage, traffic character and condition of the highways.
- Investigates and determines the methods of highway construction best adapted to the various sections of the state; establishes standards for the construction and maintenance of highways.
- Directs operations of materials testing and research laboratory facilities to establish and maintain standards and specifications.
- Compiles reports outlining the requirements for construction and maintenance of highways for the next 3- and 10-year periods and submits the reports to the Legislative

Counsel Bureau for transmittal to the chairpersons of the Senate and Assembly Transportation Committees.

- Directs a staff in the coordination, evaluation and control of the district offices and divisions of NDOT.
- Provides consultation and guidance to the districts in improving technical programs through education and promotion.
- Acts as a liaison between state and non-state personnel.
- Acts as a liaison between the Department and the Transportation Board of Directors.
- Appoints Deputy Directors who assist the Director in overseeing the functions of the department and who, in the absence of the Director, has full authority to perform any of the required duties of the Director.
- Appoints the Assistant Directors to head each of the four divisions of the Department.
- Prepares a biennial executive budget for Department Funding for the next 2 years, which is submitted for approval to the Nevada Legislature.

DEPUTY DIRECTORS**Deputy Director, Northern Nevada**

This Deputy Director is responsible for assisting the Director in the daily

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operations of NDOT and oversees the following divisions:

- Administrative Services
- Audit Services
- Communications
- Engineering
- Flight Operations
- Human Resources
- Operations
- Planning and Program Development

Deputy Director, Southern Nevada

This Deputy Director provides a Director's Office presence in the Las Vegas area and oversees the following divisions:

- District I Administration
- District II Administration
- District III Administration
- External Civil Rights

Deputy Director, Stormwater

This Deputy Director oversees development and implementation of the Department's Stormwater Program to achieve compliance with requirements of the Clean Water Act, the U.S. Environmental Protection Agency and the Nevada Division of Environmental Protection.

The following outlines the areas of responsibility for the Deputy Director:

- Oversee the development and implementation of the Stormwater Program.
- Ensure compliance with State and Federal requirements.
- Negotiate and carry out terms of permits and enforcement settlements.
- Carry out requirements of Senate Bill 325 of the 2015 legislative session.
- Manage reports and presentations to the Transportation Board, Advisory Committee and others as required.

ASSISTANT DIRECTORS

Each Assistant Director administers one of the major divisions in the Department:

- Operations
- Engineering
- Planning and Program Development
- Administration

The following outlines the areas of responsibility for each Assistant Director:

- Provides statewide direction and coordination of technical program operations.
- Consults and advises their respective Deputy Director.

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- Conducts a statewide program of development, education and promotion in the interest of improved practices, procedures, techniques and operations.
- Acts on behalf of the Director and Deputy Director in their absence or inability.
- Perform other duties as assigned.

Assistant Director, Operations

- Construction
- Equipment
- Maintenance and Asset Management
- Materials
- Traffic Operations

Assistant Director, Engineering

- Environmental Services
- Location
- Right-of-Way
- Roadway Design (including Hydraulics and Specifications)
- Project Management
- Structures

Assistant Director, Planning and Program Development

- Las Vegas Planning
- Multimodal Planning

- Performance Analysis
- Program Development
- Research
- Roadway Systems
- Traffic Safety Engineering
- Traffic Information

Assistant Director, Administration

- Accounting
- Administrative Services
- Financial Management
- Information Technology

ORGANIZATION CHARTS

Maintenance and Asset Management Division

The Maintenance and Asset Management organization chart can be found on the SharePoint page under Enterprise HR. Go to http://intra/eHR_Warehouse/Hierarchy/OrganizationalChart for the latest version of the organization chart.

District I Maintenance

The District I Maintenance organization charts can be found on the SharePoint page under Enterprise HR. Go to http://intra/eHR_Warehouse/Hierarchy/OrganizationalChart for the latest version of the organization charts.

District II Maintenance

The District II Maintenance organization charts can be found on the SharePoint page under Enterprise HR. Go to http://intra/eHR_Warehouse/Hierarchy/OrganizationalChart for the latest version of the organization charts.

District III Maintenance

The District III Maintenance organization charts can be found on the SharePoint page under Enterprise HR. Go to http://intra/eHR_Warehouse/Hierarchy/OrganizationalChart for the latest version of the organization charts.

**POSITION DESCRIPTIONS,
MAINTENANCE AND ASSET
MANAGEMENT DIVISION****Administrator II, Professional Engineer**

Administers the activities of the statewide Maintenance and Asset Management Division to ensure highway maintenance and operations are achieved at the highest level possible utilizing available resources; provide program authority and direction including development of a road network prioritization plan; develop and coordinate a cooperative plan with outside entities to maintain all maintainable features in the Lake Tahoe Basin, and develop and implement master planning, policies, standards and procedures related to highway maintenance.

Administrator I, Professional Engineer

Assists and advises the Administrator II, Professional Engineer on all issues related to administering the Department's maintenance program and maintenance management systems. Performs administrative duties and professional engineering work including coordinating, planning, directing and managing activities as an assistant to the Administrator II, Professional Engineer and assumes the duties of the Administrator II, Professional Engineer in his or her absence.

Project Manager III

Under general direction, incumbents perform as a licensed architect or engineer professional services in planning, coordinating, directing and managing the activities of construction projects and capital improvement

programs; develop design concepts; determine cost estimates and budgets; negotiate reviews and modify contracts, agreements, architectural/engineering plans, specifications, and schedules as appropriate. This level is distinguished from the Project Manager I by professional licensure and authority over major design projects and/or capital improvement programs such as those involving the design of public buildings, office complexes and major structures. Work requires the application of a wide range of architectural and engineering principles and practices as well as considerable judgment and independent decision-making.

**Transportation Asset Management
Manager I**

Under general direction, incumbents perform as a professional engineer in managing the operations and staff of the asset management section. Plan, organize and direct asset management programs to ensure compliance with State and Federal regulations. Provide direction for the design, scope, schedule and budget elements for projects. Develop level of service and maintenance budget decision support tools and monitor progress.

**Maintenance Management Coordinator
II**

Under general supervision, incumbents maintain the Maintenance Management System by reviewing, verifying, and inputting and extracting data. Incumbents perform inspections/audits of maintenance operations and conduct training for maintenance employees to ensure work is performed in compliance with standards and guidelines. In addition, they implement and manage

special projects related to the Maintenance Management System. Conduct special research projects to investigate new materials and technical methodologies for highway maintenance; prepare work programs for the implementation and completion of studies and present results in written form to reflect maintenance program recommendations; conduct field tests for compliance to grade and viscosity standards for asphalt; coordinate with and provide information and recommendations to the Research and Engineering Commission, Strategic Highway Research Program, Transportation Research Board and Technical Transportation Center to set standards for material specifications. They also oversee and monitor all phases of field tests for material conformance and may also direct, supervise, and provide training to assigned Maintenance Management Coordinator I's.

Maintenance Management Coordinator I

Under general supervision, incumbents maintain the Maintenance Management System by reviewing, verifying, and inputting and extracting data. Incumbents perform inspections/audits of maintenance operations and conduct training for maintenance employees to ensure work is performed in compliance with standards and guidelines. Work is performed at the journey level.

POSITION DESCRIPTIONS, DISTRICT MAINTENANCE

Administrator II, Professional Engineer

Directs, manages and oversees the administration of the district to ensure

compliance with departmental policies and procedures regarding the operations and activities conducted in the district; represents the department and coordinate activities with local entities, law enforcement agencies, planning commissions, the Bureau of Land Management and other federal agencies.

Administrator I, Professional Engineer

Administers the district's highway maintenance or construction work program; monitors expenditures to ensure compliance with approved budget; sets priorities for placement of labor and equipment; makes judgments as to types of materials to be used for specific conditions; reviews various management system outputs to ensure compliance; ensures contracts are built in conformance with plans and specifications; provides proper support to maintenance and construction programs.

Manager I, Professional Engineer

Plans, organizes, directs, oversees, and documents all aspects of contract administration; direct changes to contract plans and specifications; prepare progress estimates and authorize payment to the contractor for work completed in conformance with plans and specifications; monitor contractor's workforce wage rates through review of certified payrolls to ensure compliance with federal and State wage and salary regulations; and monitor the Disadvantaged Business Enterprise (DBE) Program to ensure contractor's compliance with equal opportunity and apprenticeship goals.

Supervisor II, Associate Engineer

Under limited supervision, incumbents supervise professional staff, may supervise technical engineering employees, and perform engineering functions requiring professional training and experience, the ability to supervise a project independently, judgment in the analysis and interpretation of diverse and complex data impacting daily operations, and the implementation of established policy and procedures. Duties require analysis and result in recommendations and/or advice used by others in making decisions. Positions at this level deal with management including both internal and external contacts for the purpose of answering questions and solving problems and conflicts requiring interpretation and application of statutes, regulations and administrative policies.

Highway Maintenance Manager

Under general direction of the Assistant District Engineer of Maintenance, Highway Maintenance Managers plan, organize and direct major complex highway maintenance and equipment safety programs, infrastructure facilities, and employees in assigned district in compliance with State and Federal laws, rules and regulations, department policy and budgetary authority.

Facility Manager

Under general direction, incumbents plan, organize and direct buildings and grounds maintenance, repair and construction through subordinate supervisors, skilled and semi-skilled workers, and clerical support staff. Work is assigned through program goals and objectives and reviewed through

compliance with policies and procedures and overall efficiency of facility operations.

Staff I Associate Engineer

Reviews major projects, subdivisions and parcel maps and provides recommendations and requirements to the appropriate county or city planning agencies concerning the project's impact on department facilities. Manages outdoor advertising control program and potable water testing programs for a sub-district. Reviews traffic control plans submitted for permitted encroachment work on the highway system to ensure compliance with established standards and guidelines; approve acceptable traffic control plans; and prepares traffic control plans for State maintenance work when approval by local entity is required or requested. Reviews and processes encroachment permits and special event permits; inspects work performed under encroachment permit and performs field reviews of work in progress under construction contracts. Performs material pit reviews and inspections. Manages a sub-district's permit program and archives "as-built" records.

Engineering Technician III

Under general supervision, incumbents perform a broad range of duties involving technical engineering work in support of professional engineers at the journey level. They perform technical engineering work by applying a variety of methods and practices in compiling technical data, using computer aided software, operating specialized equipment and preparing technical engineering documents. They are

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accountable for the accuracy of the final work product and the correct application and interpretation of office policy and statutory requirements, testing procedures, completed construction work, design plans, engineering data, cost estimates and survey results.

Highway Maintenance Supervisor II

Under general supervision, incumbents oversee and coordinate the maintenance activities for restoring roadway surfaces and restoring or constructing slopes, shoulders, culverts, structures, fixtures and landscaping located on the roadside or right-of-way; oversee and inspect work performed in an assigned geographical area of a district or while implementing a specialty maintenance program such as highway landscaping, highway signs and lighting, or pavement marking and striping.

Training Officer I

Under general supervision of an Employee Development Manager or an administrative supervisor, positions in this class serve as a training and curriculum coordinator for state agencies; develop, deliver, and coordinate training programs; and coordinate and monitor the activities of other trainers. Positions in this class are distinguished from a Training Officer II by the smaller size of the departmental training program, less varied course offerings, and less diverse occupational groups to be trained.

Highway Maintenance Supervisor I

Under general supervision, incumbents supervise skilled and semi-skilled employees engaged in restoring

roadway surfaces and restoring or constructing slopes, shoulders, culverts, structures, fixtures and landscaping located on the roadside or right-of-way; oversee and inspect work performed in an assigned geographical area of a district or while implementing a specialty maintenance program such as highway landscaping, highway signs and lighting, or pavement marking and striping.

Highway Maintenance Worker IV

Under general supervision, incumbents function as lead workers and as an assistant to the Highway Maintenance Supervisor I. Incumbents plan and schedule maintenance activities including determining what equipment and materials are required, assigning employees, and completing required records. As the assistant supervisor, they participate in the duties described in the series concept; assign and review the work of lower level employees; provide input into performance evaluations; assist the supervisor in laying out a variety of roadway or specialty maintenance work; organize equipment, materials, personnel and procedures; and respond to emergency situations.

Equipment Operation Instructor

Under general supervision, Equipment Operation Instructors provide training in the safe operation and preventive maintenance of highway maintenance and other equipment, provide other job related training, and maintain training records.

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Facility Supervisor II

Under general supervision, incumbents are working supervisors who perform all or part of the duties listed in the series concept and supervise skilled and semi-skilled workers engaged in routine facility maintenance, repair and cleaning such as installing electrical outlets, painting worn surfaces, replacing plumbing fixtures, installing partitions in existing office space and performing routine maintenance and repairs on the facility's heating and air conditioning systems.

Maintenance Repair Specialist I

Incumbents in this class typically work under the general supervision of a facility supervisor, maintenance manager, park supervisor, district park maintenance supervisor or division head and perform the range of duties described in the series concept. Incumbents plan, lay-out and prepare cost estimates for projects; perform most repair and maintenance activities independently and are assigned to facilities or districts having varied building and mechanical systems, equipment, and structures. The majority of skilled maintenance and repair work is performed in-house. This is the journey level in the series.

Highway Maintenance Worker III

Under general supervision, incumbents perform the duties described in the series concept at the journey level. Positions in this class are distinguished from those at the lower levels by the complexities involved in operating and training others in the use of specialized or complex highway maintenance and construction equipment as determined

by NDOT. This is the journey level in the series.

Highway Maintenance Worker II

Under supervision, incumbents continue to receive training in performing the duties described in the series concept. This is the continuing trainee level, and incumbents may progress to the next level after 1 year of being certified as a fully trained operator of complex or specialized highway maintenance and construction equipment as designated by NDOT and with the approval of the appointing authority.

Highway Maintenance Worker I

Under close supervision, incumbents work with experienced staff while learning to perform the duties described in the series concept. This is the entry level in the series and incumbents may progress to the next level upon meeting the minimum qualifications and with the approval of the appointing authority.

Highway Construction Aid

Highway Construction Aids work under close supervision and perform unskilled tasks associated with highway maintenance, construction, testing labs and equipment shops.

OTHER NDOT DIVISIONS**Accounting Division**

The Accounting Division, under the direction of the Chief Accountant, has control over all accounting affairs of the Department. Processing of payroll and vendor documents for payment and collecting expenditure information for comparison with budget are some of the

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Accounting Division's major responsibilities.

Go to <http://shptsrv1/060> for more information.

Administrative Services Division

The Administrative Services Division, under the direction of the Administrative Services Officer, partners with licensed Contractors for the construction of portions of the highway systems in Nevada using a public bid process, and with Service Providers for the provision of services using a Request For Proposal, Qualifications, or Information process, or the Unsolicited Proposal process. The Department provides regulatory and informational services to truckers including permits and handbooks.

Go to <http://shptsrv1/070> for more information.

Architecture Section

The Architecture Section of the Maintenance and Asset Management Division, under the direction of the Chief Maintenance and Asset Management Engineer, is responsible for activities related to buildings that are under the jurisdiction of the Department. The Architecture Section and the districts coordinate on the needs, design, and maintenance of the Department-owned district buildings.

Go to <http://shptsrv1/050/Architecture> for more information.

Audit Services Division

The Audit Services Division is responsible for conducting independent

and objective audits as described in Transportation Policy (TP) 1-1-8.

Go to <http://shptsrv1/007> for more information.

Communications Division

The Nevada Department of Transportation Communications Division, under the direction of the Communications Director, includes the public information, multimedia, customer service, public hearings, and photography sections. Communications strives to continually improve the Department's communication efforts by answering every inquiry or complaint promptly; being proactive in informing stakeholders and residents about upcoming road construction projects; maintaining an interactive website and social media presence; and writing newsletter stories, designing collateral, and taking photos that highlight the Department's wide range of activities.

Go to <http://shptsrv1/003/> for more information.

Construction Division

The Construction Division, under the direction of the Chief Construction Engineer, has responsibility and authority for establishing construction-related policies and procedures.

In coordination with the districts, this division is responsible for construction activities on all transportation projects.

Go to <http://shptsrv1/040> for more information.

Environmental Services Division

The Environmental Services Division, under the direction of the Chief Environmental Engineer, houses a diverse group of environmental specialists who research, analyze, and monitor the effects transportation projects have on the environment. These include air, noise, and hazardous materials; biologists, archaeologists, environmental engineers, social analysts, and National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) experts.

Go to <http://shptsrv1/013> for more information.

Equipment Division

The Equipment Division, under the direction of the Equipment Superintendent, is responsible for the procurement, disposal, maintenance and administration of all the Department's rental equipment and materials for highway maintenance.

Go to <http://shptsrv1/737> for more information.

External Civil Rights Division

The External Civil Rights Division, under the direction of the Equal Employment Opportunity Officer, is dedicated to ensuring equal opportunity for all individuals and businesses in Department programs, services and activities.

Go to http://www.nevadadot.com/About_NDOT_Divisions/Administration/Contract_Compliance/Civil_Rights.aspx for more information.

Financial Management Division

The Financial Management Division, a supportive service division under the direction of the Chief Financial Management Officer, is responsible for: (1) scheduling projects, (2) managing and obligating project funding, (3) preparing and managing agency budgets, and (4) forecasting cash flow for the Department.

Go to <http://shptsrv1/053/budget> for more information.

Flight Operations Division

The Flight Operations Division, under the direction of the Chief Pilot, is responsible for scheduling the use of Department-owned planes available for official state use.

Go to <http://shptsrv1/059> for more information.

Human Resources Division

The Human Resources Division, under the direction of the Human Resources Manager, is responsible for a variety of activities related to human resource development and management.

Go to <http://shptsrv1/076> for more information.

Information Technology Division

The Information Technology Division, under the direction of the Chief IT Manager, manages all technical functions for the Department, including system development, programming, maintenance and training related to computer hardware and software. It also

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provides the public with vital transportation information.

Go to <http://shptsrv1/067> for more information.

Las Vegas Planning Division

The Las Vegas Planning Division, under the direction of the Chief Planning Administrator, is responsible for the planning for all modes of transportation throughout Southern Nevada to include Clark, Lincoln, Esmeralda and Nye counties. The office serve as the liaison between the Regional Transportation Commission of Southern Nevada and NDOT, assisting in all matters associated with regional short and long-range planning, federal and State funding. Additionally, the office performs annual County Tours, Workshops and Tribal Consultations and participates in development of the Statewide Transportation Improvement Program (STIP) and Work Program.

Go to <http://shptsrv1/802> for more information.

Location Division

The Location Division, under the direction of the Chief Location Engineer, supports the Department of Transportation and public need for Nevada area maps, geospatial data, aerial photography, retraced alignments, Land Survey and CADD mapping.

Go to <http://shptsrv1/017> for more information.

Materials Division

The Materials Division, under the direction of the Chief Materials

Engineer, is responsible for field sampling, testing and certifying materials used on Department projects. This includes geotechnical analyses and materials analyses for pavements and structures.

Go to <http://shptsrv1/020> for more information.

Multimodal Planning Division

The Multimodal Planning Division, under the direction of the Chief Planning Administrator, is responsible for work groups that manage the systems in which a wide array of transportation modes operate throughout the State, including aviation, bicycle and pedestrian, freight, rail and transit.

Go to <http://shptsrv1/802> for more information.

Performance Analysis Division

The Performance Analysis Division, under the direction of the Chief Planning Engineer, performs a wide variety of value engineering tasks and analysis, and makes recommendations to support the Department's mission and goals. Performance Management is an important mechanism to support the department's ability to monitor and implement effective process change.

Go to <http://shptsrv1/006> for more information.

Program Development Division

The Program Development Division, under the direction of the Chief Planning Administrator, prepares a number of federally mandated reports and has oversight responsibilities to the

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Metropolitan Planning Organizations. This division also oversees corridor studies, long range planning, and various federally mandated initiatives. The essential program reports are the Statewide Transportation Improvement Program (STIP), the Annual Work Program, and the Annual Statewide Planning and Research Program (SPR). The division performs the Annual County Tours, Workshops and Tribal consultations and is the lead contact for the Transportation Alternatives Program.

Go to <http://sharepoint/Program%20Development/SitePages/Community%20Home.aspx> for more information.

Project Management Division

The Project Management Division, under the direction of the Chief Project Management Engineer, is responsible for managing and delivering major transportation projects, developing and implementing alternative project delivery methods as defined by the Pioneer Program, reporting progress of major projects to the Transportation Board of Directors, the Legislative Counsel Bureau and FHWA, and numerous other process improvements.

The Project Management Division leads major projects from inception to completion with a focus on identifying and managing project-specific risks; ensuring timely delivery within defined project scope, cost and schedule constraints; maintaining an honest, transparent and collaborative approach to communication; and coordinating

projects across the Department's functional units.

Go to <http://shptsrv1/015/PM%20Division> for more information.

Research Division

The Research Division, under the direction of the Chief Data Administrator, supports the Department's vision, mission and goals through four unique programs: the Research, Development, and Technology Transfer program; Product Evaluation; the Research Library; and the Local Technical Assistance Program. The Research program identifies and develops new technical knowledge for implementation to address any relevant problem. Product Evaluation is conducted to coordinate the evaluation of innovative products that may be used by the Department and its contractors via the qualified product list (QPL). The Research Library catalogs and shares reference materials, coordinates the loan of materials from other libraries, and can assist with reviews and searches for specific transportation-related information. The Local Technical Assistance Program facilitates technology transfer and training with a focus on the needs of local transportation agencies.

Go to <http://shptsrv1/803> for more information.

Right-of-Way Division

The Right-of-Way Division, under the direction of the Chief Right-of-Way Agent, is responsible for all tasks related to the legal right of way and access onto

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the State Highway System. This includes appraisals, acquisitions, relocation, property management and agreements with utility and railroad companies.

Go to <http://shptsrv1/030> for more information.

Roadway Design Division

The Roadway Design Division, under the direction of the Chief Roadway Design Engineer, is responsible for developing high-quality plans, specifications, and estimates for the construction of safe, efficient, and effective projects to address Nevada's economic, environmental, social and intermodal transportation needs. The Roadway Design Division also includes specific technical units (e.g., Hydraulics, Specifications, Landscaping and Aesthetics) that provide assistance to each District.

Go to <http://shptsrv1/010> for more information.

Roadway Systems Division

The Roadway Systems Division, under the direction of the Chief Data Administrator, is a diverse section comprising a variety of functions and responsibilities pertaining to the federal and state level. Most responsibilities derive from the Department's need to comply with federal laws. Among these are a responsibility for developing and updating a statewide highway functional classification of roadways and developing rural and urban boundary areas that are reported to FHWA. Another is to report on the condition and performance of the roads and highways throughout the state via the Highway

Performance Monitoring System (HPMS), reported to FHWA annually. In addition, this unit is responsible for the field auditing all roads in the state that are open for public travel and annually reporting roads to the Office of Taxation for the distribution of Gas Tax funds back to the local governments. Finally, this office manages the Statewide Road Video program for State-owned and classified roads throughout the state. This data is used by Asset Management, Road Design, Maintenance personnel, Location, and Planning staff, and is a component of assisting the HPMS program and Pavement Evaluation programs.

Go to <http://shptsrv1/805> for more information.

Stormwater Division

The Stormwater Division, under the direction of the Deputy Director, oversees the implementation of the Nevada Department of Transportation's Stormwater Program including managing NDOT's National Pollutant Discharge Elimination System (NPDES) Permit compliance with the U.S. Environmental Protection Agency (EPA) and Nevada Division of Environmental Protection (NDEP), NDOT's Stormwater Management Plan, and NDOT's Stormwater Compliance and Enforcement Program.

Other areas of responsibility are to oversee the development of NDOT's Stormwater reports, required by the permit and plan, to the U.S. Environmental Protection Agency (EPA) and the Nevada Division of Environmental Protection (NDEP), the NDOT monitoring program, the slope erosion control program, design of water

quality improvements, project review, develop Stormwater training in coordination with NDOT's training Division and develop Stormwater public information outreach in coordination with NDOT's communication Division

Go to <http://shptsrv1/018> for more information.

Structures Division

The Structures Division, under the direction of the Chief Structures Engineer, is responsible for the design of all highway related assets including bridges, overhead signs, high mast light poles, earth retaining systems (retaining walls), sound walls, hydraulic structures and other special structures as required. Structural designs are completed in accordance with federal and departmental standards.

Another area of responsibility is to perform federally required bridge maintenance and inventory inspections. All bridges, except for federally owned and railroad bridges, which carry and are open to public traffic, are inspected in accordance with federal requirements and frequencies (typically every 2 years) by Inventory and Inspection staff, or service providers. Inventory and Inspection personnel perform inspections, and they maintain and report all bridge asset data in accordance with federal requirements.

Go to <http://shptsrv1/011> for more information.

Traffic Information Division

The Traffic Information Division, under the direction of the Chief Data Administrator, provides current and

forecasted traffic data on Nevada roadways. The types of data collected are car/truck volumes, vehicle types, vehicle weights, and vehicle speeds. This data is used for traffic operations analysis, traffic engineering studies, roadway/pavement design, environmental, regional travel demand model validation, truck weight enforcement, and many more. This data is required for use in the Highway Performance Monitoring System (HPMS), Pavement Monitoring System (PMS), Federal Bridge Reporting, and Railroad Crossings Report.

Go to <http://shptsrv1/813> for more information.

Traffic Operations Division

The Traffic Operations Division, under the direction of the Chief Traffic Operations Engineer, has five general areas of responsibility: (1) signing, striping and traffic control, (2) signals, lighting, and ITS design, (3) operations and Intelligent Transportation Systems (ITS) programs, (4) network and operational analysis, and (5) statewide radio and ITS networks. Through these functions, the Division applies the principles of traffic engineering and operations to enhance safety on state roadways.

Go to <http://shptsrv1/016> for more information.

Traffic Safety Engineering Division

The Traffic Safety Engineering Division, under the direction of the Chief Planning Engineer, is responsible for administering the Nevada Highway Safety Improvement Program (HSIP) to achieve a significant reduction in traffic

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fatalities and serious injuries on all public roads (including non-State owned and tribal roads). The Nevada HSIP also includes the Rail-Highway Crossing program that addresses safety issues at all public crossings. The work of the Traffic Safety Engineering Division involves engineering, evaluation of safety issues on public roads, implementation of safety improvements, and public awareness and safety education that will produce a decrease in frequency, rate and severity of, and potential for, crashes involving motor vehicles, pedestrians, bicycles and wildlife on all public roads in Nevada.

Go to <http://shptsrv1/816> for more information.

LEGAL SERVICES

Legal services are provided to the Department of Transportation through assignment by the Attorney General. Attorneys and staff delivering legal services and guidance are employees of the Office of the Attorney General, Division of Transportation. Under the direction of Chief Counsel for the Division of Transportation, legal services are delivered to the Department in several areas including but not limited to the following:

- Agreements/Contracts
- Tort claims and litigation (e.g., civil claims)
- Employee issues/litigation
- Eminent Domain/Condemnation litigation
- Administrative matters

- General guidance on all legal matters affecting the Department

Go to <http://ag.nv.gov> for more information.

DISTRICT SPECIALISTS

Districts have specialists who should be contacted for assistance prior to turning to the headquarters divisions. Areas of specialty may include:

- Traffic Safety Engineering
- Permits (R/W)
- Utilities (R/W)
- Right-of-Way
- Bridge

FEDERAL HIGHWAY ADMINISTRATION

The Federal Highway Administration (FHWA) is a division of the U.S. Department of Transportation. It administers the Federal-Aid Highway Program, which funds highway improvements on the Federal-Aid Highway System throughout the nation.

The FHWA's responsibility is to ensure that the state departments of transportation (DOTs) comply with all applicable federal laws in their expenditure of federal funds and to ensure that the state DOTs meet the applicable engineering requirements for their proposed highway projects.

The FHWA maintains a division office in each state. The Nevada office is located

in Carson City and is headed by a division administrator.

Go to <http://www.fhwa.dot.gov/nvdiv/> for more information.

PART II

EMPLOYEE INFORMATION

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CHAPTER 1: EMPLOYEE RESPONSIBILITIES

This chapter provides information regarding personal responsibilities and conduct of Department employees. Summaries of Department policies covering the most common events in the workplace as well as standards of conduct are included. The topics in this chapter provide general information and guidelines.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

WORK READINESS

Punctuality

Employees are expected to be at their assigned work location and prepared to start work at the beginning of the scheduled shift. Being prepared to start work at the beginning of the scheduled shift includes bringing a lunch, as carrying a lunch is considered a condition of employment for maintenance personnel. Failure to report to work at the specified time imposes a hardship on the crew and may result in personnel action. Refer to *Employee's Guide to Prohibitions and Penalties* for more information.

Attendance

All full time employees ordinarily work 8 or 10 hours a day up to 40 hours a week with 30 minutes for lunch and a 15-minute break in the morning and another in the afternoon or some flexible work week totaling 40 hours. Normal working hours and break times may be adjusted depending on the situation.

It is the employee's responsibility to provide reasonable notice of intent to take leave, which is granted at a time that is mutually convenient for both the employee and the Department. Reasonable notice for sick leave in

some cases may be calling just prior to the beginning of the shift.

Failure to report to work without having made prior arrangements may result in some form of disciplinary action.

Emergency Contact Information

Each District Maintenance crewmember must provide an after-hours phone number to the District's road operations/traffic management center.

WORK ATTIRE

Personal Protective Equipment (PPE)

Every employee plays an important role in job safety. Employees should always be aware of the importance of safety and shall use proper protective clothing and equipment.

The Department furnishes PPE for employees while performing their routine work duties in environments that:

- Entail the risk of injury or create high safety risks.
- Require visibility within the Department's right-of-way.
- Require the employee to work with or around harmful or hazardous

materials that may cause contamination to their personal clothing or person or cause inhalation or ingestion problems.

- Require the employee to operate machinery or equipment needing special safety protection.
- Mandate protection by law.

Department-provided PPE includes but is not limited to:

- Gloves.
- Safety glasses or goggles.
- Face shields and masks.
- Welding hoods.
- Earplugs.
- Respiratory protection.
- Other protective equipment as specified by OSHA, Safety Data Sheets (SDS) or any other regulatory provisions.

Workers who are required to wear PPE must receive training, as required by the manufacturer, federal, state or American National Standards Institute (ANSI) regulations, prior to using the equipment.

For more information on protective clothing and equipment, refer to TP 1-7-4 or contact the Human Resources Division's Safety and Loss Control Section.

Proper Work Attire

All maintenance employees are expected to report to work in attire that provides a reasonable degree of safety. Proper work attire includes pants, shirts and work boots in accordance with TP 1-7-4 and the *Employee Safety Manual*. Additional clothing, such as rain gear, cold weather footwear and coat, is the responsibility of each employee and it is expected that these items will be on hand when needed.

Furnished Clothing

The Department furnishes the following ANSI-approved protective garments:

- Orange or fluorescent green vests with reflectorized markings
- Orange or fluorescent green soft hats
- Specialty gear (e.g., hard hats, face shields, gloves)
- Specialty uniforms (e.g., fire-retardant coveralls)

Additionally, each District Engineer or Division Chief determines the need for:

- Coveralls
- Orange shirt
- Pants
- Coats and jackets

Department-furnished clothing must be worn when working. Furnished clothing that is lost, stolen or damaged in non-work situations is the responsibility of

the employee and shall be replaced at the employee's expense. Cleaning of the protective clothing will be according to the procedure established by the District Engineer.

Employee-furnished, ANSI-approved clothing may be allowed, subject to District management approval.

Employees assigned to work that exposes them to excessive temperatures or other climatic conditions shall wear employee provided protection as conditions demand.

ALCOHOL AND DRUGS

Alcohol

Alcohol is not tolerated in the workplace. Employees shall not report to work when under the influence of alcohol and shall not use alcohol while on duty. Employees should be aware that if they are in violation of this policy, they would be subject to disciplinary action that may include termination.

The Department's policy on the use of alcohol or drugs and the procedure for screening tests is covered in Transportation Policy (TP) 1-6-21.

Drugs

- Illegal drugs. Use of illegal drugs may result in termination.
- Prescription and over-the-counter (OTC) drugs. Employees should not drive or operate equipment when taking prescription or over-the-counter (OTC) drugs that may cause drowsiness, ability impairment or any unusual reaction.

Drug-Free Workplace Program

The Department is required by the Drug-Free Workplace Act of 1988, to certify to the Federal Highway Administration (FHWA) on a yearly basis that the Department has a drug free workplace program. All employees should be aware that the unlawful possession or use of a controlled substance is prohibited in any workplace under the jurisdiction of the Department. Any employee who violates this policy will be subject to disciplinary action including termination.

For more information or to seek counseling or rehabilitation, go to the State Human Resources Management Employee Assistance portal.

Prohibitions concerning drug and alcohol use and the associated penalties may be found in the *Employee's Guide to Prohibitions and Penalties*. Employees should be aware that if they are convicted of operating a state vehicle or their own vehicle while on state business while under the influence of alcohol or a controlled substance, they may be subject to termination. In addition, employees are required to notify the Department within 5 days if they are convicted of violating a criminal drug statute in the workplace. The Department is then required to notify the FHWA. The Department will take appropriate personnel action, which may include termination. Should disciplinary action less than termination be taken, the employee would be required to participate in a drug abuse assistance or rehabilitation program approved for such purposes.

For positions requiring a CDL, refer to TP 1-6-20.

PUBLIC RELATIONS, EMPLOYEE'S ROLE

The public's perception of the Department is affected, in large part, by the actions of its employees. The following minimum standards of conduct should be observed:

- Employees are expected to always perform their duties in a professional manner, so their actions demonstrate the efficient use of time and funds. This includes avoiding the use of state vehicles, when practicable, in areas and/or business locations where they might not be publicly perceived as necessary or appropriate.
- Employees shall obey all traffic regulations. This includes driving the speed limit or slower as needed for conditions, and always wearing a seatbelt when practicable for maintenance duties.
- Employees must drive courteously and defensively.
- Employees should be courteous in all of their dealings with the public and fellow employees.
- Employees are expected to be neat and clean, and to wear appropriate clothing.
- When wearing the NDOT logo either on state time or their own time, employees continue to represent the Department and are expected to act in a professional manner.
- Anything posted on social media outlets during working hours or while wearing the NDOT logo are public

and affect the perception of the Department (TP 1-6-34).

While most of these standards of conduct apply to the workplace, employees should be aware that their conduct off duty could also affect the Department's image.

For more information, refer to Part III, Chapter 7 "Communications and Public Relations".

UNAUTHORIZED OUTSIDE EMPLOYMENT

Department policy prohibits employees from engaging in outside employment that will conflict with their Department duties and responsibilities. Employees shall obtain approval from their Division Head/District Engineer before engaging in outside employment. This policy should not be construed as an attempt to control employee activities during off-duty hours unless it reflects upon their performance or the Department.

For more information on outside employment, refer to TP 1-6-10.

WORKPLACE EQUALITY

The Department is committed to providing equal employment opportunities for all persons regardless of race, sex, sexual orientation, gender identity or expression, religion, color, national origin, age, genetic information or disability, as outlined in the Department's Affirmative Action Plan. It is the policy that equal opportunity applies to all aspects of employment including recruitment, hiring, promotions, compensation, benefits, transfers, training and terminations.

Providing workplace equality includes providing a workplace that is free of discrimination and harassment of employees by other employees. Derogatory comments based on a protected class are inappropriate. Employees are expected to carry out their duties in a manner that does not discriminate or harass others or in any way diminish another's opportunities.

For additional information, refer to the Department's Affirmative Action Plan, TP 1-4-1 and 1-4-2, and NAC 284.696.

SEXUAL HARRASSMENT

Sexual harassment is unlawful conduct, which undermines the honesty and sincerity of the working relationship. Sexual harassment, which can include sexual statements (printed or verbal), remarks, touching, action or unwanted attention, which affects or addresses an individual or group, will not be tolerated. Individuals who are judged to have been instigators or participants in a sexual harassment incident may be subject to personnel action. Sexual harassment is a form of discrimination and is covered under the Department's Affirmative Action Plan, TP 1-4-1, 1-4-2 and 1-4-3, and NAC 284.771.

CARRYING OF DEADLY WEAPONS

While on duty, employees shall not carry firearms or deadly weapons of any kind on Department premises or in any state motor vehicle unless their job description authorizes them to do so or unless in possession of a valid concealed carry (CCW) permit and in compliance with TP 1-6-1. As used in this policy, deadly weapons include those weapons set forth in Chapter 202 of the Nevada Revised Statutes (NRS).

Premises includes any real property in which the Department has an interest, including any highways as defined in Chapter 366 and 408 of the NRS.

For more information on this subject, refer to TP 1-6-1 and NRS 202.3673.

LIABILITY PROTECTION

All employees are expected to act within the normal course and scope of their employment by obeying all laws, rules and regulations that govern their employment. Failure to do so could place an employee outside the normal course and scope of their employment.

When a civil action is brought against a Department employee who is acting in the routine course and scope of their employment, the employee is usually entitled to a defense from the Office of the Attorney General (AGO), Division of Transportation. ***The AGO does not represent employees who have acted outside the course and scope of their employment***

The State will indemnify Department employees from civil judgments entered against them arising from the course and scope of their employment unless:

- The employee failed to submit a timely request to the AGO for a defense.
- The employee failed to fully cooperate in good faith in the defense of the action.
- The act or omission was outside the course and scope of the employee's public duty.

EMPLOYEE RESPONSIBILITIES

- The act or omission of the employee was wanton or malicious.

Employees who are served with legal papers relating to their employment must contact the AGO, upon receipt, for guidance on how to proceed.

DEPARTMENT-OWNED PROPERTY**Equipment, Materials and Supplies*****Equipment Use***

All employees shall operate Department vehicles courteously and within the requirements of the law and Department policy.

Employees shall obey all city, county and State traffic laws and will be held personally responsible for fines or other action resulting from conviction of violations of these laws. In addition, employees may face disciplinary action as a result of a violation.

Maintenance employees shall operate only equipment for which they have been certified unless they are receiving training, in accordance with the Department's Equipment Operator Training and Certification Program.

The two-way radios used by most District Maintenance personnel are the most efficient way for workers to communicate with each other and their respective offices.

The following are some general rules for radio use:

- The radio is for Department business only.

- Be brief and to the point, but do not rush.

- Remember that others need to use the radio. Be courteous and do not interrupt.

- ***Profane, foul or abusive language on the radio is prohibited.***

- Be careful what you say. ***Never broadcast the name(s) of individuals involved in an accident; numerous scanners may be monitoring conversations.***

Maintenance and Care of Radios and Telephones

Telephones should be kept clean and in a protected area. When phone repairs are required, the Communications Systems Specialist (Radio Technician) should be contacted. The Radio Technician will either correct the problem or contact an appropriate repair service.

Radio-equipped vehicles require special care. Radio equipment must be kept clean, dry and clear of miscellaneous articles that might cause damage to the cables or unit. Only radio technicians make adjustments to radios. Radios are fragile electronic devices and should be treated as such. Never kick, pound, tamper with or otherwise abuse equipment that does not work.

For more information on the responsibilities for operating Department vehicles and equipment, refer to TP 1-3-4, 1-6-19 and 1-6-22, and Part III, Chapter 8 "Equipment".

Care and Use of Materials and Supplies

Most materials and supplies for maintenance and repair of highway facilities are purchased and stored at District Maintenance stations and distributed as needed. Materials such as salt and sand, and aggregates for sealing can be stored at designated locations along the highway right-of-way. All materials should be stored in a manner that provides for the safety of employees and the public. Materials stored along the highway must be placed a minimum of 30 feet from the edge of the travel lane.

Employees are responsible for the proper use, handling, safeguarding, conserving and disbursing of Department-owned materials and supplies. Department materials and supplies are not to be used for personal benefit.

Facilities

Maintenance Buildings

The facilities needed in order to carry out the maintenance function are:

- Offices.
- Equipment storage buildings.
- Materials storage buildings.
- Fuel depots.
- Pump houses.

The facilities, both inside and out, should present a neat, clean appearance. Maintenance stations should be free of trash, discarded

equipment, material and debris. All employees should participate in keeping facilities neat and clean.

Refer to Part III, Chapter 9 "Maintenance Facilities" for more information.

Residences

In order to attract employees to work and live at remote locations where private housing is not reasonably available, the Department furnishes residences or mobile home spaces for employees and their families. These residences and mobile home spaces are rented to the employees. The rent and rental terms are outlined in an agreement between the employee and the Department prior to employee occupancy.

Some employee responsibilities as a tenant include:

- Follow the terms and conditions set forth in the Rental Agreement.
- Keeping residences clean and in good condition.
- Ensuring that smoke detectors and fire extinguishers are in proper working condition and tested as required.
- Keeping premises in a clean and safe condition.
- Paying all utilities.
- Performing minor repairs (e.g., replacement of broken windows).

- Promptly notifying the immediate supervisor when there is a need for major repairs. Major repairs include items such as the roof, sewer and water lines, electric service, heating units and major appliances furnished with the residence.
- Forbidding the use of the residence or mobile home space for illegal purposes.

It is recommended that for dormitory type residences an escape plan is developed and implemented for each residence and post evacuation routes near exit doors.

Authorized District personnel, upon notice as specified in the rental agreement, have the right to enter and inspect the rented residence or mobile home space.

Reporting Loss or Damage to Department-owned Property

Every effort should be made to prevent loss or damage to Department-owned property. Employees should ensure that materials and equipment are secured in a manner that will deter theft and vandalism.

Loss or damage to Department-owned property should be promptly reported to the employee's Supervisor. If the employee is unable to notify the immediate supervisor, the information should be reported to the Highway Maintenance Supervisor II or the District Administration office.

ACCIDENTS/INCIDENTS

Vehicle Accidents

If an employee is involved in an accident, the employee is responsible for following the procedure contained in TP 1-6-15, Part III, Chapter 8 under "Vehicle Accidents" and Part II, Chapter 3 under "Work Related Injuries".

Accidents/Incidents Involving Hazardous Materials

All reported incidents must be routed through the District's road operations/traffic management center to verify if the incident is within the NDOT right-of-way.

Refer to Part III, Chapter 6 under "Incidents Involving Hazardous Materials" for more information and guidelines, and what to do when encountering an accident/incident involving hazardous materials.

Work-related Injuries

It is Department policy that all work-related injuries involving Department employees be promptly reported to their immediate supervisor or next in the chain of command. It is also the policy for all employees to actively participate in and comply with Nevada's Early Return to Work Program.

For additional information on work-related injuries, reporting, and treatment, refer to TP 1-6-16 and Part II, Chapter 3 under "Work-related Injuries".

EMPLOYEE RESPONSIBILITIES

Providing First-Aid

First-aid is the immediate temporary treatment given in case of injury or sudden illness before the services of trained medical personnel can be secured.

Employees should strive to assist fellow employees and the public whenever possible. First-aid and/or CPR may be administered on a voluntary basis (in accordance with NRS 41.500) and is subject to the employee's discretion, training and ability. In order to provide timely assistance, employees should familiarize themselves with the location of emergency medical services and first-aid supplies.

For additional information, refer to Part II, Chapter 3 "Safety and Welfare".

SAFETY AWARD PROGRAM

The Maintenance and Asset Management Division (Headquarters Maintenance) annually presents Safety Awards to employees with 3 or more years of accident-free driving or equipment operation. To qualify, an employee shall possess a CDL, drive vehicles or operate equipment at least 25 percent of their normal duty time. For details, contact Headquarters Maintenance.

ACCOUNTING AND REPORTING**Time Reports**

Each employee is responsible for daily completion of the personal time sheet. Time sheets are submitted in NEATS (Nevada Employee Action and Timekeeping System) at the end of each

bi-weekly pay period. Accounting requires:

- Daily work and leave hours.
- Time entered in hours and minutes.
- Correct employee information, such as name and Employee ID.
- Time sheets entered, completed and submitted.
- Overtime to be explained in the Notes field and approved in advance.
- All leave must be approved in advance.
- Digital signature of the employee.
- Proper coding for the time shown.

In addition to the daily completion of time sheets, employees must complete the Daily Task Card if required by the supervisor.

For more information, refer to the *Employee Payroll Manual*.

Per Diem Requests

Per Diem is the daily allowance paid for expenses incurred while the employee is on approved travel status. The rate paid for per diem is established by the legislature and includes set amounts for breakfast, lunch, dinner and lodging. Requests for reimbursement of travel expenses must be submitted in NEATS. Receipts are required for lodging and any out-of-pocket expenses (e.g., parking). Receipts are not required for meals. Employees must submit a claim

EMPLOYEE RESPONSIBILITIES

for travel expense reimbursement even if they have previously received payment for a trip under the travel advance procedures.

A number of conditions and restrictions apply to payment of per diem. For more information, refer to TP 1-5-12.

Travel Advances

When employees are required to travel overnight on Department business they are eligible for per diem and they may request an advance to cover anticipated travel expenses. The minimum advance is GSA's current standard lodging rate and the maximum is the anticipated per diem that will be reimbursed for the trip.

A request for travel advance is processed in NEATS by both the employee (request) and the supervisor (approval).

For more information, refer to TP 1-5-12.

DRIVER'S LICENSE REQUIREMENTS

Employees who operate state vehicles are required to possess a valid driver's license of the appropriate class. A commercial driver's license (CDL) is needed for driving most maintenance equipment.

A Department employee shall have a CDL to operate any of the following commercial vehicles:

- A single vehicle with a gross vehicle weight (GVW) rating of more than 26,000 pounds.
- A trailer with a GVW rating of more than 10,000 pounds if the gross

combination weight rating is more than 26,000 pounds.

- A vehicle designed to transport more than 15 persons.
- Any size vehicle, which carries hazardous materials and requires placards.

Employees required to operate any of the commercial motor vehicles listed above shall possess a valid CDL of the appropriate class, "A", "B", or "C" with appropriate endorsements. If new permanent employees' job duties require a CDL, it must be obtained during their first 6 months of employment. The cost of the CDL testing and licensing is the responsibility of each employee. The cost of the physical examination required for the CDL will, up to a pre-determined amount, be paid by the Department. Training, testing and certification are provided by Department instructors.

The need for part-time or temporary employees to possess a CDL, Class "A", "B" or "C", depend on the type of equipment the employee will be operating. As a minimum, Highway Construction Aids shall have a valid Class C Nevada Driver's License at the time of employment.

For positions requiring a CDL, refer to TP 1-6-20. More detailed information concerning operator requirements is included in Part III, Chapter 8 under "NDOT Licensed Equipment, Operator Requirements".

Notification of License Suspension or Revocation

A valid driver's license of the appropriate class is a condition of employment. Under the CDL program, drivers can be disqualified from driving for driving under the influence (DUI) and controlled substance violations. The following can affect an employee's license.

- Drinking alcohol or using a controlled substance when driving a commercial vehicle can result in the loss of driving privileges. For any detectable amount of alcohol less than .02, the employee is prohibited from driving for 24 hours. For a level .02 or more, the CDL is revoked for 1 year for the first offense. For a second offense, the CDL is revoked for life.
- The employee must notify the Department of Motor Vehicles, Driver's License Division within 30 days if convicted in any state of any traffic violation except parking. This applies regardless of what type of vehicle was driven.

It is the employee's responsibility to immediately advise their Supervisor if their driver's license is suspended, revoked or canceled. Failure to make the appropriate notifications may result in disciplinary action up to and including termination.

For additional information on employee responsibilities while operating a state vehicle, refer to TP 1-6-20, 1-6-21 and 1-6-22, and the *Nevada Commercial Driver License Manual*.

CHAPTER 2: TRAINING AND CAREER DEVELOPMENT

This chapter covers the Department's training program as well as career development opportunities for District Maintenance employees.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

TRAINING PHILOSOPHY

The Department provides, supports and encourages job-related training to its employees so that they may help the Department meet its performance objectives. Within budgetary constraints and the provisions of state regulations, the Department provides:

- Training which is beneficial to the Department's operation or otherwise required.
- Training needed to enable employees to meet the standards of performance for their current positions.
- Training needed to update employees' skills, knowledge and techniques for their current positions.

Refer to Transportation Policy (TP) 1-6-13 for additional information.

The Department also encourages licensure, certification, professional development and education assistance within budgetary constraints and the provisions of state regulations.

Refer to TP 1-6-19 for additional information.

TRAINING RESPONSIBILITIES

District Engineer

District Engineers are responsible for:

- Evaluating training needs for their District.
- Budgeting for travel and other expenses related to employee training.
- Ensuring that managers and supervisors understand their responsibilities to properly identify, use, support and evaluate formal training to improve on-the-job performance.
- Working with the Human Resources Division Training Section on any contracted training.
- Designate an employee to receive and process training requests and to act as the District/Sub-district's training coordinator.
- Periodically review training plans and training matrices for their districts.

TRAINING AND CAREER DEVELOPMENT

Maintenance Supervisors/Managers

Each Maintenance Supervisor and Manager is responsible for:

- Evaluating training needs of their work group.
- Helping their employees apply new skills learned during training to their job.
- Providing employee with the details of training courses they are required to attend, including date, time, and location.
- Discussing learning goals with the employee for all approved training.
- Monitoring the employees' successful attendance and completion of training courses.
- Forwarding proof of training attendance, as provided by the employee, to the District/Sub-district's training coordinator.
- Following up on training courses to evaluate their effectiveness.

District/Sub-District Training Coordinators

A designated staff member from each District/Sub-district serves as its training coordinator and is responsible for:

- Seeking approval for training requests from the appropriate District personnel.
- Routing approved training requests to the Training Section.

- Notifying the Training Section of any student cancellations, changes or withdrawals.
- Registering students into courses after the request is approved by the Training Section.
- Providing the Training Section with documented proof that the employee successfully completed the training.

Employee/Trainee

With regard to training, the employees are responsible for:

- Seeking approval from the supervisor when initiating training requests.
- Diligently pursuing any required or approved training.
- Notifying the Supervisor and the District/Sub-district's training coordinator if they cannot attend a class. Notification must be given with sufficient time to allow a replacement to be sent or enrollment to be cancelled for a full refund.
- Notifying the supervisor promptly if they are having difficulties learning or completing any assigned course material.
- Notifying the supervisor promptly if a situation arises that will prevent their successful completion of a course.
- Notifying the supervisor of any needed resources or assistance to help apply the training to the workplace.

TRAINING AND CAREER DEVELOPMENT

- Providing proof to the Supervisor and/or the District/Sub-district's training coordinator that they have completed any approved training course within 30 days of completion.

Training Section

The Human Resources Division's Training Section is responsible for:

- Initiating, interpreting and revising Department training policies.
- Helping supervisors and managers by providing tools to identify, evaluate, and support training.
- Developing programs or contracting for courses to meet identified performance needs.
- Approving and processing all formal requests for training based on funding available. (NAC 284.486 requires funding for training to be used to produce the greatest benefit in relation to the cost of training.)
- Maintaining central records of employees who participate in training.
- Communicating training policies to employees.
- Reporting annually to the Director about the Department's training efforts and results.

Approval for Training

To receive approval for training, employees or their supervisors shall submit Form A077 (Training Request Form) through their District/Sub-district's

training coordinator. The training coordinator will seek approval from the immediate Supervisor, the District Engineer or designee and the Training Manager. Out-of-state training requests require the approval of the Financial Management Office and the Director's Office.

Training requests received after the fact will not be approved and employees will be responsible for any costs.

Employees who do not attend approved training may not be approved for future training.

MANDATORY TRAINING**Mandatory Training for All Employees**

All Department employees are required to attend the following courses:

- "Preventing Sexual Harassment" within 6 months of employment and refresher courses every 2 years. The Department may require employees to attend more often if needed.
- "Globally Harmonized System of Classification and Labeling of Chemicals" upon hire. This class is available online.
- "Driver Improvement Course" (aka "Defensive Driving") within 12 months of employment and refresher courses every 4 years.
- "Information Security Awareness". This class is available online.

Additional information on mandatory training is available on the Training Section SharePoint site (<http://shptsrv1/077>).

Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

The Occupational Safety and Health Administration (OSHA) requires that chemical manufacturers and importers:

- Assess the hazards of the chemicals they produce or import.
- Affix warning labels to all containers of hazardous chemicals they ship.
- Provide Safety Data Sheets (SDS) containing more detailed information for users of the materials.

OSHA further requires (per 29 CFR 1910.120 Section E) that the Department (per TP 1-7-2) ensure that information concerning chemical hazards is instructed to employees.

The Safety and Loss Control Section or District Training and Safety staff conducts the GHS course, which includes:

- A video and orientation describing the Department's Hazard Communication Program and employee rights and responsibilities.
- The specific physical and health hazards of chemicals in their work area.
- Measures required for protection such as safe work practices, personal protective equipment, emergency procedures and how to interpret the SDS.

BMP Storm Water Management

This course provides the training required for Certified Storm Water Inspection certification.

The course includes:

- The fundamental knowledge required for storm water inspection
- Storm water pollution prevention program requirements
- Maintenance facilities best management practices
- General construction permit requirements
- Reporting and documenting to meet compliance with the Department's statewide Municipal Separate Storm Sewer Systems (MS4) Permit.

All District Maintenance employees from entry level to Maintenance Manager are required to obtain certification within 12 months of hire, with refresher courses every 3 years.

Naturally Occurring Asbestos and Erionite (NOA/E)

This general awareness course is designed for employees who may come in contact or work around NOA/E.

This web based training includes:

- What are NOA/E minerals
- Nature and uses of asbestos and erionite

TRAINING AND CAREER DEVELOPMENT

- History of asbestos and erionite health risks and issues
- What to know when working around materials potentially containing NOA/E
- General regulations review

Desert Tortoise Training

All District I Maintenance employees from Tonopah south are required to take this training.

This course includes:

- Desert tortoise behavior
- Geographic distribution
- The Endangered Species Act (ESA)
- Do's and Don'ts when encountering a tortoise

All District Maintenance employees from entry level to Maintenance Manager are required to obtain certification within 12 months of hire, with refresher courses every 2 years.

Equipment Training and Certification Program

The Equipment Training and Certification Program satisfies the requirements that shall be met by Department employees in accordance with TP 1-6-19. Requests must be submitted on the "Request for Equipment Operator Training" form and approved in advance.

The program ensures that through the designated certified operator (DCO)

certification process, employees are fully qualified to safely operate required equipment. Only employees who are provisionally or fully certified will be allowed to operate NDOT equipment. The course includes:

- Classroom training conducted by the Equipment Operator Instructor on the general features of the required equipment: safety aspects, preventative maintenance practices, start-up and shut-down procedures, daily pre-trip inspections and the mechanics of the machine (clutch, engine, gears, etc.).
- Provisional certification on the required equipment.
- Field training and task orientation with the required equipment.

Flagger Certification

All District Maintenance employees, from entry level to Supervisor I, are required to obtain flagger certification (in accordance with TP 1-6-9) upon hire, with refresher courses every 2 years.

This course includes:

- The methodology of operations for flagging and qualifications with state certification.
- Proper PPE and safety apparel used while performing flagging operations.
- Perform traffic control within work sites for maintenance projects.
- Traffic control by flagging to guide traffic through work areas.

The "Flagger Certification" course meets the basic requirements of the Manual on Uniform Traffic Control Devices (MUTCD).

Commercial Driver's License (CDL) Training

District Maintenance personnel required to operate commercial motor vehicles shall possess a valid CDL of the appropriate class, "A", "B", or "C" including appropriate endorsements. If new permanent employee job duties require a CDL, it must be obtained during their first 6 months of employment.

Each CDL course progression module is taught by either District Safety and Training Section staff or a designated certified operator (DCO), per Transportation Policy TP 1-6-19.

The course includes:

- Classroom training: safety training and orientation, familiarization with equipment.
- Training on crew-specific state equipment.
- DCO field training.
- Class "A", "B", or "C" CDL test.

WORK PERFORMANCE STANDARDS

Employees may be required to attend training that will assist with the performance of their work performance standards.

Work performance standards are standards or job duties that are developed between each employee and

their Supervisor. The standards are a written statement of the principal assignments and responsibilities of each individual employee. They contain the results expected by both the Supervisor and subordinate when the job or task is completed. Supervisors use these standards to evaluate an employee's performance.

Mandatory Supervisor Training

Pursuant to NAC 284.498, all State of Nevada supervisors and managers are required to attend courses within a specific timeframe.

Within 6 months of appointment as a Supervisor/Manager:

- Work performance standards
- Employee appraisal

Within 1 year of appointment as a Supervisor/Manager:

- An online Introduction to equal employment opportunity (EEO) for supervisors and managers
- An instructor-led EEO session
- Interviewing and hiring
- Alcohol and drug awareness
- Progressive disciplinary procedures
- Handling grievance procedures

Supervisors are required to take refresher training on most of these topics every 3 years. The Department requires supervisors to take classes on these topics, which are sponsored by

the Department and incorporate Department policies and procedures.

Pursuant to Title 49 CFR Part 382.603, employees who supervise a CDL-licensed driver shall receive training on detecting the physical, behavioral, speech and performance indicators of probable alcohol and drug misuse.

OTHER TRAINING OPPORTUNITIES

Maintenance Academies

Maintenance academies are held regularly as budget allows. The General Maintenance Academy is devoted to roadway maintenance activities. The Specialty Academy is devoted to lighting, striping, signing and landscape workers. The Supervisor Academy is devoted to technical and leadership topics for supervisors and managers.

The academies offer training and instruction in the following:

- Work methods
- Safety products
- Maintenance management system
- Equipment
- Budget and administrative procedures
- Personnel processes and career advancement
- Traffic control
- Teamwork and communication

Nevada Local Technical Assistance Program (LTAP)

The Nevada LTAP provides training for the transportation workforce by delivering the most current concepts and technical assistance available.

The LTAP Center also offers a Roads Scholar certificate program for maintenance personnel. Participants are required to attend 10 1-day workshops during a 4-year period.

Job-Related College Classes

The Department will pre-pay for college classes that are directly related to the employee's job duties.

Optional Job Skills and Safety Training

Training is available on the following topics; contact the District Training Officer for each District or the office manager for each District/Sub-district for more information:

- Aggregate Materials Training/Maintenance Testing School (Construction Division)
- ATSSA Traffic Control for Technicians and/or Supervisors
- Back Safety/Proper Lifting Techniques
- Basic Computer Training
- Blood-borne Pathogens and Biohazards
- Confined Space Awareness

- Emergency Response Guidebook
- Emergency Plans and Evacuation
- Emulsion Viscosity Training (Materials Division)
- Environmental Policies
- Ergonomics/Office Safety
- Fall Protection
- Fire Extinguisher Training
- First-Aid/CPR/AED Certification
- Herbicide Application
- Lockout/Tagout
- New Employee Safety Orientation
- OSHA 10-Hour Construction Course
- OSHA 30-Hour Construction Course
- Respiratory Protection/Fit Testing
- Tort Liability
- Traffic Incident Management System (TIMS)
- USA North 811
- Workers' Compensation Training
- Workplace Injury Accident Investigation
- Workplace Violence

District-specific training modules are also available; contact a District Training Officer for more information.

REPORTING TRAINING ON TIME SHEET

All formal training including equipment training should be coded on time sheets as 9906 by the employee/trainee.

Employees who are providing formal instruction should code their time as 9908 unless the training is provided in conjunction with completing a task. If the employee/trainee is completing a task, the time should be coded to the task.

CAREER DEVELOPMENT

NDOT Leadership Academy

The Department offers a Leadership Academy that is open to all employee. Participants learn about various leadership topics as well as leading at NDOT and complete a project designed to improve NDOT. Participants meet for 2 to 3 days per month over the period of 7 months and complete their project outside of class. The Leadership Academy is offered periodically in each District.

Preferred Degree Plan

The Department also provides an Education Assistance Program to help employees to pursue degrees that will benefit the Department. Refer to TP 1-6-29 for additional information or contact the Human Resources Division's Training Section for more information.

Promotion Opportunities

For employees to progress from one position to the next, they must:

- Submit an application through the Nevada Employee Action and

Timekeeping System (NEATS) for the vacant position.

- Meet the minimum qualifications and any additional position experience listed in the announcement for a vacant position.
- If an examination is required for the job class:
 - Written Exam: Meet the minimum qualifications and receive a passing score.
 - Training and Experience Exam: Meet the minimum qualifications and receive a score ranked among the top five.
- Be selected for an interview:
 - On an unranked list, the hiring supervisor is required to interview a minimum of five applicants per vacancy. They will determine who the most qualified candidates are from anywhere on the list.
 - On a ranked list, the hiring supervisor is required to interview all candidates ranked among the top five.
- Be selected by the appointing authority.

CHAPTER 3: SAFETY AND WELFARE

Included in this chapter are safety principles, programs and committees, as well as guidelines on handling injuries involving Department employees. For more information on any of the topics in this chapter, contact the Human Resources Division's Safety and Loss Control Section (unless otherwise noted).

This chapter does not address vehicle accidents or highway/roadway incidents, emergencies or disasters and their associated response/management systems. Refer to Part III, Chapter 6 "Emergency and Incident Management" or Part III, Chapter 8 under "Vehicle Accidents" for more information.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

SAFETY

The Department is committed to providing a safe work environment for its employees. Additionally, the Department investigates accidents and takes appropriate remedial steps to prevent repetitions of similar accidents. The Department endeavors to appoint only competent individuals to supervise other workers and provides training to increase their knowledge and awareness of safety.

Supervisors are responsible for ensuring that Department safety procedures are followed and employees under their supervision use that safety equipment. To increase awareness and appreciation of safety and promote safe work practices, training is provided through:

- "Tailgate" Safety Meetings.
- District Safety Committee Meetings.
- Individual safety instruction by the supervisor as needed.

- Safety instruction provided by the Equipment Operations Instructors.
- Safety instruction provided by the Safety and Loss Control Section of the Human Resources Division.

District Maintenance operations require all employees to be alert for the protection of themselves, fellow crewmembers, and the traveling public.

Each supervisor is encouraged to familiarize all employees, especially new employees, with safe work practices since the safety of the entire crew rests upon the actions of everyone. The specific practices that pertain to safety of employees and the public when maintenance tasks are being performed are covered in Part IV, Chapter 1 "Maintenance Overview" and in other chapters that cover individual maintenance tasks.

WORK-RELATED INJURIES

Reporting Injuries

The injured employee (when physically possible) is responsible for reporting a

work-related injury and completing Form C-1 (Notice of Injury or Occupational Disease). Supervisors are responsible for reporting all work-related injuries to the Workers' Compensation Claims Manager and to the Safety and Loss Control Section of Human Resources. The Supervisor shall also report the injury to the District Safety and Training Section or the Highway Maintenance Manager. The Workers' Compensation Insurance carrier requires that Form C-3 (Employer's Report of Industrial Injury or Occupational Disease) is submitted to them within 6 working days of the accident.

For the Department to meet this deadline, the employee must report the injury to their supervisor or the next in the chain of command the day of the injury. ***All work-related injury forms, including Form 078-011 (Supervisor's Report of Injury & Accident Investigation), shall be completed no later than 2 business days following the accident or injury and must be sent by FAX followed by interoffice mail to the Workers' Compensation Claims Manager.***

If an employee is physically unable to report the injury, a co-worker, member of the crew or a witness should make the report.

Medical Treatment for Injured Employees

The immediate supervisor is responsible for ensuring that prompt medical treatment is obtained for an injured worker. First-aid should be administered if necessary but only to the limits of an employee's training and ability.

It is highly recommended that an employee reporting any exposure to or contact with bodily fluids and/or any injury to the back, head, neck or any joint of the body be taken to a doctor for treatment or observation.

To be entitled to receive temporary total disability benefits from the workers' compensation insurance carrier, the injury must meet "lost-time" claim status and the employees must be doctor certified unable to work. With the possible exception of initial treatment or evaluation for a work-related injury, all leave used due to the injury should be coded as workers' compensation leave: sick, annual, comp or workers' compensation leave without pay. This includes days off due to the injury, follow-up appointments and chiropractic and/or physical therapy sessions.

All District Maintenance employees are encouraged to complete the CPR/AED/First-Aid certification course with refresher courses every 2 years. Employees should be familiar with the location and contents of first-aid kits and with the location of the nearest medical facility.

If an ambulance is necessary to transport an injured person, request one promptly. In some cases, it may be necessary for the supervisor or a designated crewmember to accompany the employee to the doctor or medical facility. When requesting assistance over the radio or telephone, the following information should be provided:

- Nature of incident (vehicle accident, equipment related accident, employee hit by passing vehicle, etc.)

- Location of injured employee (highway, street, closest crossroad, milepost, etc.)

Do not broadcast the name of the injured person over the radio.

In the event of an injury requiring hospitalization, the immediate supervisor, district representative or designated individual should contact a member of the injured employee's family.

ACCIDENTS/INCIDENTS INVOLVING INJURY OR DEATH TO DEPARTMENT EMPLOYEES

The Department provides protective devices and training to ensure that employee lives are not endangered. The following information provides guidance to employees if an accident occurs that results in injury or death to another employee.

Moving Injured Employees

Department employees should carefully consider all factors before moving an injured person from the highway.

Detouring, or other movement of traffic, is preferred to moving the person. It is preferred that movement of the injured is under the direction of an ambulance crew. Factors to be considered prior to moving an injured person include:

- Nature of the injury and the probability of increasing the severity of the injury if the person is moved.
- Probability of additional injuries if he person is not moved.
- Consequences to traffic flow by not moving the person.

Moving the Deceased

Bodies of deceased persons are not to be moved by Department employees unless the location of the body clearly causes a significant danger to the traveling public or Department personnel. In most cases, traffic should be detoured before the body is moved. If the Nevada Highway Patrol (NHP) cannot respond to the scene, a request should be made to the sheriff or coroner, who will arrange for removal of the body.

Notifying Next-of-Kin

In the case of death to an employee while on the job, notification of next-of-kin is handled through the coroner's office. If possible, a Department representative (preferably a Supervisor or Administrator) should be present at the time of notification. In some rural counties, the coroner's duties are performed by the county sheriff's office. When a death occurs, the coroner or person who has been assigned coroner duties must go to the site and pronounce the death.

In the case of an injured employee who is taken to the hospital, the hospital social services staff or individuals in the emergency room will attempt to contact the next-of-kin. If the individual dies before the hospital can contact the family, the coroner's office will be responsible for the notification.

Employee Survivor Benefits

For information on employee survivor benefits and related entitlements, such as workers' compensation insurance, unpaid salary and accrued leave, Public Employees' Retirement System of

SAFETY AND WELFARE

Nevada System benefits and/or Nevada Public Employees' Deferred Compensation Program, contact the Human Resources Division's Safety and Loss Control Section (workers' compensation insurance) or the State of Nevada Human Resource Management Division (all other benefits).

ACCIDENTS/INCIDENTS INVOLVING HAZARDOUS MATERIALS

All reported incidents shall be routed through the District's road operations/traffic management center to verify if the incident is within the NDOT right-of-way.

Refer to Part III, Chapter 6 under "Incidents Involving Hazardous Materials" for more information and guidelines, and what to do when encountering an accident/incident involving hazardous materials.

DISTRICT SAFETY COMMITTEE

This committee is a cross-section of District Maintenance leadership, selected as a field-level review board for all Department personal-injury and vehicle accidents that occur in the district. It should meet bimonthly and as needed. The committee is composed of:

- The District Engineer or Assistant District Engineer.
- Maintenance Manager.
- District Training Officer or Equipment Operations Supervisor or both.
- Equipment Repair Shop Supervisor.
- An individual from District Maintenance.

The committee is responsible for:

- Reviewing all job-related injuries and vehicle accidents.
- Ensuring that all accidents are being properly reported.
- Initiating suggestions for eliminating recurring accidents or injuries.
- Periodically review building evacuation procedures.

For more information, refer to TP 1-6-3.

CHEMICAL HAZARD COMMUNICATION PROGRAM

The Department's Chemical Hazard Communication Program ensures that all employees are aware of the chemical hazards in their work areas and are informed of and protected from any health and safety effects that such hazards may present. In addition, all Department employees are required to attend the "Globally Harmonized System of Classification and Labeling of Chemicals" upon hire.

The Chemical Hazard Communication Policy applies to all NDOT personnel and covers any chemical that may pose a hazard in the work place. This policy is crucial to the safety and welfare of maintenance employees and they are urged to be familiar with it. The policy covers:

- Hazard determination.
- Written hazard communication program.
- Container labeling.

- Safety Data Sheets (SDS).
- Employee information and training.
- Chemical inventor.
- Hazardous non-routine tasks.
- Informing contractors.
- Enforcing the provisions of the policy.

Under the policy, each employee is responsible for:

- Reviewing the information available on the SDS and the label for any chemical prior to handling.
- Following proper handling procedures for the material.
- Proper use of any personal protection equipment when required.

For more information on the Chemical Hazard Communication Program, refer to Part II, Chapter 2 "Training and Career Development" and TP 1-7-2.

PART III

ADMINISTRATIVE PROCEDURES

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CHAPTER 1: ACCOUNTING AND BUDGETING

This chapter covers maintenance funding, accounting, reporting, line item and Maintenance Management System (MMS) budgeting.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

MAINTENANCE FUNDING

The State Highway Fund is the source of state funds for the Department of Transportation. With one exception, all funding for maintenance operations comes from the State Highway Fund. Federal-aid funds are not usually available for routine maintenance activities. When specifically authorized, repair work by District Maintenance crews and emergency/disaster repair work may be eligible for federal-aid reimbursement. If federal-aid reimbursement is allowed on a project, District Administration staff is notified of project and documentation requirements.

ACCOUNTING SYSTEM

Accounting is described as the recording, classifying, summarizing and interpreting of the financial transactions of a business or governmental entity. The accounting system's primary function is to provide management with financial information for planning, evaluating and controlling the operations of the Department.

To fulfill this function, procedures have been developed for receipts, expenditures, internal accounting, inventory and cash handling:

- Receipt procedures are used to record and categorize receipts in the

various accounts of the Department, such as sale of maps, federal project reimbursements, transportation permit fees, plans and specifications, right-of-way rentals and work for other agencies.

- Expenditure procedures involve recording and tracking payment by the Department, such as payroll, travel, materials, services and construction contracts.
- Internal accounting procedures are used to record and track transactions for materials, supplies and services that are transferred between organizational units and accounts within the Department.
- Inventory procedures are used to record transactions of materials and supplies purchased and issued by stockrooms or through stockpiles.
- Cash handling procedures ensure that cash receipts and disbursements are correctly identified, safeguarded and transferred to the State Highway Fund through the State Treasurer as quickly as possible.

Coding System

A numerical coding system is used to assist in recording, classifying, summarizing and reporting receipts,

inventory, transfers and expenditures, as well as identifying the organizational units involved in these transactions. Coding identifies cost centers such as:

- Fund (201).
- Agency (800).
- Division.
- Activity.

Correct coding of documents is extremely important. People responsible for coding documents must be familiar with the *Chart of Accounts Coding Manual*. If a coding question arises, the supervisor should call the district office and request a clarification rather than leave the code off the document or insert one that may be wrong. Incorrect codes result in inaccurate records. Errors are time-consuming to locate and correct.

The *Chart of Accounts Coding Manual* must be used to determine specific codes to be used on documents. District Maintenance supervisors will assist employees in the use of the manual.

The following describes the major codes used for financial administration of the Department.

Organization Code

The four-digit organization code identifies the District, Division or crew authorizing the expenditure or originating a billing. The organization code is a required part of the coding on a document.

Headquarters Division	A000-100* C000-100**
District I	C101-199
District II	C201-299
District III	C301-399
Equipment Division	C701-799
Planning Division	C800-899
Construction Crews	C901-934

* -- A: Administration

** -- C: Construction & Maintenance

Object Code (Item of Expense)

The four-digit object code identifies the type of service or commodity being used. The object code is a required code on all expenditure documents. Refer to the *Chart of Accounts Coding Manual* for more information.

Project Numbers

An eight-digit project number is used to designate construction projects, Right-of Way and preliminary engineering authorization numbers.

Examples:

60000XXX, 70000XXX

60000 = CE & Construction

70000 = PE, RW, CE & Construction

XXX = E1P (Preliminary Engineering)

E1R (Right of Way)

District/Division	Series
-------------------	--------

CEN (Construction Engineering)

C1C (State Funded Construction Breakout)

C2C (Federal Funded Construction Breakout)

Project coding utilizes an eight-digit number that identifies work orders, stockpile numbers, special facility identification numbers, Right-of-Way and preliminary engineering authorization numbers and radio equipment numbers. When used on accounting documents, these codes identify individual projects for accumulating cost information. The following is a summary of the numbering sequence:

Function	Series
Special Facility ID Code	10000000
Work Orders	20000000
Materials Stockpiles	40000000
Right-of-Way Parcel	80000000

Construction contract numbers are four-digit numbers that are sequential from the first contract issued by the Department. These numbers are used only by the Construction Division for contractor payments.

Special Facility Identification Codes

Special facility identification codes are used to identify facilities that are not directly a part of the roadway system (e.g., maintenance stations, headquarters buildings, radio facility sites), are eight-digit numbers, starting with "1". The second digit identifies the

type of facility and the next three digits are the Division code. The last three digits are zeros. Examples of the second digit are:

- 1: Administrative Facilities
- 2: District Maintenance Stations
- 3: District Communications Shops
- 4: District Equipment Stockroom
- 5: District Equipment Shops

Work Orders

Work orders are eight-digit numbers, starting with "2". The second digit identifies the responsible division.

Examples of the second digit are:

- 1: District I
- 2: District II
- 3: District III

The remaining six digits are a unique identifier for the work order.

Materials Stockpiles

Materials stockpiles are six-digit numbers, starting with "4". The second digit represents the District or major maintenance station, the third and fourth digits represent the type of stock, and the fifth and sixth digits represent the stockpile sequential number.

Refer to Part III, Chapter 2 under "Maintenance Stockpile Procedures" for more information.

Agreement Numbers

A Highway Agreement number is assigned to agreements entered into by the Department. The agreement number is composed of four segments.

The first segment is a letter designating how funds will be exchanged. The following designations are used:

Designator	Description
R	Funds to be received by the Department
P	Funds to be paid by the Department
RP	Both the receipt and payment of funds
NM	No exchange of money

The second segment is a three-digit numeric series representing the number of agreements executed by the Department since the beginning of the calendar year. The third segment contains the last two digits of the calendar year. The fourth segment identifies the three-digit number of the district or division initiating the agreement. The fifth segment identifies the task order assigned by the Agreement Services Division for on-call agreements.

Example: P-061-15-10101

P: The agreement involves a payment of money.

61: This is the 61st agreement executed in the calendar year.

15: The agreement was executed in calendar year 2015.

101: The agreement was initiated by District I, Las Vegas Administration.

01: Task Order

Only a portion of this number is used in the Agreement Number field on accounting documents. From the example above, the number to enter on accounting documents would be 0615101, with the last two digits (01) representing the task order assigned by the Agreement Services Division.

Activity Codes

Activity codes are four-digit numbers used to record and collect cost elements incurred to accomplish a specific type of work. An Activity Code is a required part of the coding on an expenditure document. The first digit identifies Federal Eligibility (e.g., 1 or 3 = eligible; 9 or 4 = ineligible).

Examples:

1. Maintenance workers repairing a piece of non-licensed equipment will code their time sheets with activity 9193, Equipment Maintenance.
2. Maintenance workers assisting the Materials Division with traffic control, while the Materials Division is performing field-sampling activities, would code their time sheets with Activity Code 1221 or 9221.

Thus, activity codes reflect the type of work being performed. In addition to the activity code, workers need to code their documents with the engineering authorization or work order number furnished by the Materials Division.

Refer to the *Chart of Accounts Coding Manual* for more detailed information.

BUDGETS

Maintenance operations are planned and controlled through the District's approved budget.

Funding for the Department's operations is controlled by a line-item biennial budget. This budget is prepared by the Financial Management Division and is approved by the Director, the Transportation Board and the State Legislature. Although the legislature approves a biennial budget, expenditure allocations are assigned on a fiscal year basis (July 1 through June 30). Annual budgets are used to plan and control expenditures for each fiscal year unless they are modified by the Interim Finance Committee. Betterments and other projects included in the Annual Work Program must be listed on a federal fiscal year basis (October 1 through September 30).

Line Item Budget

Each District Budget lists the actual dollars allocated to specific categories on a line-by-line basis. Line items include salaries, overtime, shift differential, in-state travel, in-state formal training, out-of-state travel, operating expenses, equipment purchases, honor camp payments, cooperative agreements, and other additional categories.

Each year, the Financial Management Division establishes a timeline and requirements for budget preparation including the following steps:

1. Each District submits a budget request to Financial Management for the next Fiscal Year for the above

line items. This budget focuses on work performed on the roadway system and facilities reported in the MMS. Since much of maintenance work is in response to a condition or an event that cannot be predicted, some flexibility is allowed in the Budget.

2. Each District submits a list of requested non-licensed equipment to the Financial Management Division. The Equipment Division reviews each request and adjusts prices to reflect current costs.
3. For the Betterment Program, the Maintenance and Asset Management Division (Headquarters Maintenance) establishes a timeline for betterment submittals and gives each District estimated budget amounts for both State crew betterment projects and Contract projects. Each District submits a prioritized list of proposed betterment projects to the Headquarters Maintenance office. These projects include maintenance projects and work planned to be performed in the coming fiscal year. The Headquarters Maintenance office reviews the proposed list of projects and coordinates the approval process with the Director's Office and the Districts. After the Betterment Program projects are approved, the Financial Management Division assigns these projects to the appropriate fiscal year budget and places funding in the Building Capital Improvement category of each District's budget.
4. The Headquarters Maintenance office returns the Approved

Betterments list to the districts and keeps track of the betterment project spending during the fiscal year.

5. Each District submits the balance of budget forms including proposed Out of State Travel and Training. The District describes the location, duration, purpose of travel and the cost for this and other operating categories will be calculated by the Financial Management Division.
6. The Financial Management Division will provide tentative budgets to each District. If the budget allotted on any line does not appear adequate to cover anticipated programs, the district should schedule a meeting with Department management to resolve the issue.
7. Each District will be provided its final approved budget, including approved non-licensed equipment and out of state travel lists, prior to the next fiscal year.

District Administration Responsibilities

To meet the timeline established by the Financial Management Division, districts should begin the budgeting process early enough to ensure that the list of requested equipment is ready to submit to the Financial Management Division in March. The following process usually begins in December:

- Lists of requested non-licensed equipment are obtained from District Maintenance supervisors. The individual lists are compiled into one district-prioritized list. Assistance in obtaining tentative prices for non-licensed equipment is available from

the Equipment Division. Operational Equipment prices are available from the Equipment Division in Carson City.

Planning for the Betterment Program and the Annual Work Program should be done soon after the construction season:

- Proposed betterment projects are submitted by District Maintenance supervisors to the District Administration office. A list of proposed District-wide betterment projects is prepared in prioritized order and submitted to the Headquarters Maintenance office by the timeline established.
- The proposed betterment list must include location, description of work, required resources, cost information for the proposed work to be done by State crews and/or by contracts, and the fiscal year in which the work will be completed.
- District personnel will go out with Headquarters Maintenance to review the proposed betterment projects. The proposed list should be based on physical review of projects as well as use of information contained in the Pavement Management System.

Headquarters Maintenance Responsibilities

The Headquarters Maintenance office coordinates scheduling the betterment list preparation time frame with the Financial Management Division and the Planning Division to ensure that adequate time can include the betterment projects in the Annual Work

Program. This includes a field review of each proposed project with District personnel, summarizing and reporting the program to the Assistant Director, Operations, and coordinating the approval process.

BUDGET ACCOUNTABILITY

Approved spending levels for each division are listed in the approved budget. This amount is the maximum spending level available for each line item. Spending more than these limits is not permitted without written approval from the Director's Office. It is the responsibility of District Engineers and Division Heads to monitor monthly spending patterns and to project needs for the entire year to ensure that adequate funds are available. Even though the District Engineer is charged with the ultimate monitoring responsibility, each individual supervisor shall review purchases and expenditures to ensure that adequate funds will be available for the year's tasks. If a Supervisor believes there is possibility of inadequate funds, they should make their concerns known to District management as soon as possible.

Once the budget is approved, the District is accountable for operating within the approved amounts for each line. If it appears the District will expend more than is budgeted on any line, the District's work plan and purchasing should be modified so the budget is not exceeded. For minor variations on selected lines, the Financial Management Division may be able to assist with transfers of budget authority from other divisions.

Any expenditure that results in an overrun on a cash expenditure line must be justified and approved by Department management prior to the expenditure.

Performance Standards

Performance standards contribute several factors to the budget, including:

- Crew size.
- Equipment requirements.
- Material requirements.
- Typical production quantities and productivity information.

Although not shown on the performance standard, frequency of maintenance based on a statewide 5-year average is established as part of the standard. It is then used in the budget process to indicate how often a task should be performed. Each task in the MMS has a Performance Standard.

PLANNING

District Planning Chart

The District Planning Chart furnishes information on plans for the season's betterment and materials production programs as well as information on District-wide routine maintenance work affecting multiple maintenance stations.

In addition to seasonal scheduling for betterment and materials production, the District Planning Chart is used for scheduling special projects during the year. This chart indicates the following to the Supervisor:

- When to plan betterment task and materials production for the station
- When to plan special projects for the station
- What additional personnel and equipment will be received
- When they must furnish personnel or equipment to other stations
- Features needing maintenance as noted by the crew
- District Planning Chart
- Schedule of Assignment of State-wide Equipment
- Performance standards
- Labor, equipment and material
- Weather

District management should promptly publish and distribute revisions to the District Planning Chart as they occur; so, that affected supervisors may change their plans and schedules accordingly.

Work Scheduling

Supervisors participate in an annual inspection of their sections between December and February to provide input to the Annual Work Program. While developing the Annual Betterment Program, the supervisor can note facilities that need maintenance. The supervisor is responsible for weekly work scheduling. On each Friday, work for the following week is posted on the scheduling board. To assist the supervisor in scheduling work, the following items should be considered:

- Recommendations from immediate supervisors

CHAPTER 2: ACQUISITION AND DISPOSAL OF EQUIPMENT AND MATERIALS

Included in this chapter are topics such as purchasing, disposal of excess property, maintenance stockpile procedures and damage to roadway facilities.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

PURCHASING POLICY

Purchasing of equipment, materials and services for use by NDOT is conducted in accordance with the State Purchasing Act (administered by the State Purchasing Division) and Transportation Policy (TP) 1-3-2. Employees should be familiar with the purchasing section of the *State Administrative Manual* and TP 1-3-2, as purchases made in violation of these policies may be the financial responsibility of the employee.

Under these policies, purchasing authority is in the following order:

- State Purchasing Division
- Equipment Division
- District Engineers

State Purchasing Division Responsibilities

The Division's objective is to obtain materials, supplies and equipment at the most reasonable cost to the taxpayers.

Its operating costs are funded by an annual administrative fee paid by the Department.

The Division is responsible for all functions relating to purchasing or contracting for supplies, materials and

equipment, including disposal of obsolete or excess property.

Responsibilities include:

- Advertising for bids and awarding purchase contracts.
- Storage of purchased materials.
- Disposing of surplus or salvage items.
- Transferring needed supplies, equipment and materials to and between agencies.

There are four general methods of obtaining materials, supplies or services:

1. Requisitions to the State Purchasing Division
2. Open-term contract purchases through the State Purchasing Division
3. Agency or local purchases as approved by the State Purchasing Division
4. Transfers from one agency to another upon approval of the Purchasing Administrator

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Mandatory Purchases through the State Purchasing Division include all items on the open-term contract.

The State Purchasing Division is not responsible for contracts involving highway construction or maintenance, capital improvement projects or contractor services such as plumbing and electrical work.

Equipment Division Responsibilities

Within restrictions imposed by the State Purchasing Division, the Equipment Division has been designated in TP 1-3-2 as NDOT's purchasing authority for:

- Automotive equipment.
- Construction and maintenance equipment.
- Construction and maintenance materials.
- Power tools.
- Communications equipment.
- Auxiliary equipment and repair parts associated with the above equipment.
- Services required keeping the above equipment in operating condition.

As NDOT's purchasing authority for the above equipment, materials, supplies and services, the Equipment Division is:

- The liaison between the Department and the State Purchasing Division,

- Responsible for providing all updated purchasing procedures and policies to district personnel as changes are made.
- Responsible for providing assistance to district personnel in obtaining quotes for materials and supplies listed on the annual District Purchase Authorization (DPA). Refer to "Local Purchases" in this chapter for more information.

Equipment Division Headquarters Stockroom Responsibilities

Within restrictions imposed by the State Purchasing Division, the Equipment Division Headquarters Stockroom has been designated in TP 1-3-2 as the purchasing authority for:

- Office supplies.
- Office furnishings.
- Office equipment.
- Engineering, drafting, surveying, data processing equipment and supplies.
- Traffic recorders and supplies.
- Service contracts (to keep the above items functioning in a satisfactory manner).
- Purchasing books and publications.

As the Department's purchasing authority for the above equipment and

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supplies, the Equipment Division Headquarters Stockroom is:

- The liaison between the Department and the State Purchasing Division.
- Responsible for providing assistance in obtaining specialized equipment and supplies within their purchasing authority.

District Stockroom Responsibilities

District stockrooms function as the purchasing authority and supply center for the District Equipment shops and maintenance crews, as well as other Department divisions operating in the District. The stockrooms operate under the Equipment Division's Purchasing Authority and are responsible for purchasing and control of the following types of inventory items:

- Equipment and automotive repair parts and supplies
- NDOT maintenance and construction supplies
- Household and janitorial goods and supplies
- Paint and paint products
- First-aid and safety
- Gas, diesel and lubricating oils
- Fencing materials and supplies

LOCAL PURCHASES

Each year, the State Purchasing Division publishes a list of items that can be purchased without additional

authorization. This published list is commonly known as the Direct Purchase Authorization (DPA). Agencies are authorized to purchase the following materials and supplies within the limits specified in the DPA, as modified by the NDOT Equipment Division:

- Plumbing supplies
- Petroleum products
- Electrical supplies
- Lumber supplies
- Hand tools not classified as capital equipment items
- Maintenance and construction supplies
- Guardrail supplies
- Corrugated and regular metal pipe
- Paint products, not traffic paint
- Fencing, posts and gates
- Sheet metal, angle iron, reinforcing steel
- Cement, plaster, lime, calcium chloride
- Hardware supplies
- Radio shop supplies
- Automobile and light truck repair (including parts and labor)
- Repair parts, such as electronic and radio equipment

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- Repair parts for heavy equipment, including aircraft, heating and air conditioning systems
- Parts catalogs and shop manuals

Some items within a category may be available through open term contract and must be so purchased. Each category has a maximum that can be expended per purchase. Multiple purchases are not allowed in order to circumvent the limit. Price quotes shall be obtained and records maintained for audit purposes. Since this list is updated yearly, employees should ensure that they have the most current list from the Equipment Division. Most of these supplies and materials should be obtained through district storekeepers through open term contracts.

Stockroom personnel may obtain the requested item(s) or provide a local purchase order for the authorized maintenance employee to purchase the item(s). Stockrooms are provided with a list of district personnel authorized to make purchases.

District Responsibilities

The District Engineers acts as the purchasing authority within their respective District for materials, equipment, supplies and services not designated to be provided by the Equipment Division. The authority for making most of these day-to-day purchases is delegated to appropriate supervisors, who must understand the limitations and procedures that apply.

Each year when the DPA is updated, district employees should review monetary limits to determine if materials needed for maintenance tasks can be

obtained within these limits. If the quantities of materials and supplies exceed that allowed by the DPA, requisitions should be initiated through the Equipment Division and State Purchasing Division to obtain materials by competitive bid.

Most open term contracts for maintenance materials are solicited on an annual basis.

At the beginning of each calendar year, District Maintenance administrators initiate requests for each type of material or product needed. The request must include material or product specifications, delivery points and quantities needed for each location.

BID PURCHASES

The bid purchase method is a formal competitive bidding and awarding of contracts for the purchase of materials, supplies and equipment.

All contracts for materials, supplies and equipment are awarded to the lowest bidder.

Two bid purchase methods are used depending on the product. The following materials and supplies are purchased under an open term contract:

- Petroleum products
- Aggregates
- Asphalt
- Patch materials
- Deicer, salt and sand

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- Pavement markings, traffic paints and beads
- Signs and signposts
- Fertilizer and herbicides

Contracts for these materials and supplies are usually for 1 year, which allow agencies a good deal of latitude in the quantities that can be purchased during the term of the contract.

If problems arise with material supply availability, delivery or District necessities, the Maintenance and Asset Management Office, in agreement with State Purchasing, may extend the life of the contract until a new bid can be issued.

Equipment, materials and supplies (when exact quantities can be determined) are purchased on a more rigid contract. The quantity of dump trucks, for example, is easily identified and the bid is specific. When the products have been delivered, accepted and paid for, the contract is closed.

For specific information concerning purchasing, see TP 1-3-2 and the *State Administrative Manual*.

PROPERTY INVENTORY

The Nevada State Purchasing Division (NSPD) requires that all non-licensed equipment above an established dollar value be assigned a Fixed Asset Number (FA). In addition certain rental equipment is assigned an NH number. The State Administrative Manual requires the Department to provide a yearly inventory of all equipment assigned an FA number. This inventory is reported on the Equipment Division's

"Property Inventory by Location" spreadsheet.

In the past, this inventory was informally referred to as the non-rental inventory as it contained only non-licensed equipment; however, NSPD now requires that some licensed equipment be included. This inventory is actually an NH inventory as it includes all equipment assigned an NH number. In accordance with the *State Administrative Manual*, each agency is responsible for:

- Conducting an annual physical count of all property and equipment charged to the agency.
- Reconciling the results of the annual physical count with the agency records.

Equipment Division Responsibilities

The Equipment Division is responsible for:

- Initiating and disbursing the annual inventory documents to the districts.
- Providing assistance to district personnel on inventory procedures.
- Reviewing and processing the inventory records received from the districts.
- Adjustments to the inventory records.

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District Responsibilities

When the districts receive the annual inventory reports, they are responsible for:

- Physically checking all items (furniture, non-licensed and licensed equipment) located in the stations and administrative buildings against the list.
- Noting and documenting differences between the physical inventory and inventory sheets.
- Requesting that inventory records be adjusted to reflect actual stock on hand.

Supervisor Responsibilities

The Supervisor I and Supervisor II's property inventory responsibilities include:

- Physically checking inventory items in their jurisdiction.
- Documenting differences between the physical inventory and the inventory sheet.
- Requesting that inventory records be adjusted to reflect actual stock on hand.

DISPOSAL OF EXCESS PROPERTY

Excess property is defined as supplies, material or equipment no longer needed for NDOT operations. The following

items that may be considered excess property:

- Licensed and non-licensed equipment no longer needed (must be deactivated through the use of the Equipment Transfer Form)
- Scrap steel, aluminum or copper
- Excess and obsolete stock items
- Used furnaces and air conditioners that have been replaced
- Appliances that have been replaced
- Supplies and materials that have salvage value (e.g., used culvert pipe, signs, guideposts, guardrail)

The Nevada State Purchasing Division is responsible for disposal of excess and obsolete property. Sale of excess state property is conducted by auction, sealed bid, or negotiation. Negotiated sales are used for property with an appraised value under \$500, and when the Purchasing Administrator determines the best interest of the state will be served by using this method.

The Equipment Division is the Department's liaison with the State Purchasing Division and as such is the contact point for disposal of excess supplies and materials.

When materials, equipment or supplies are determined to be in excess of the district's needs, the Equipment Division should be notified. The division will contact other districts and divisions to determine if the material, equipment or supplies are in excess of the Department's needs; if so, they will contact State Purchasing for instructions

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on disposal. For licensed and non-licensed equipment, the Equipment Division serves as the collection point and coordinates disposal activities with State Purchasing.

MAINTENANCE STOCKPILE PROCEDURES

Stockpiles are defined as those materials either purchased or manufactured for use in highway maintenance and normally consist of items such as:

- Aggregates.
- Salt and sand.
- Traffic paint.
- Signs and signposts.
- Patching and premixed materials.

It is the policy of the Department to ensure that procedures are standardized to accurately:

- Keep current records of cost and quantities of materials.
- Reflect labor and equipment used in the creation and maintenance of stockpiles.
- Disburse materials used at realistic prices based on actual costs.

District Responsibilities

District Engineer responsibilities include:

- Ensuring prompt and accurate reporting of materials removed or transferred from stock.

- Ensuring that District or crew representatives enter the stockpiles in the MMS System in a timely manner.
- Ensuring that proper guidance and instruction is provided to the staff involved in the stockpile accounting process.
- Ensuring prompt and accurate reporting of costs and quantities of materials, labor, equipment and other components incorporated into the stockpile, which alter its size and value.
- Ensuring that stockpile task records are maintained for each type of stock.

Crew Supervisor Responsibilities

Crew supervisors who have assigned stockpile duties are responsible for:

- Ensuring that current stockpile records are accurate and complete, which are entered into the MMS System Stockpile Tasks.
- Prompt and accurate reporting of costs and quantities of materials.
- Ensuring labor, equipment and other components incorporated into the stockpile, which alter its size and value, are accurate and current.
- Annual verification of the book inventory of each type of stock by making actual physical measurements or counts of each stockpile. (The measurement needs only to be a close estimate of the material located at each field

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stockpile site and does not require an engineered measurement by a survey crew.)

Maintenance and Asset Management Division Responsibilities

The Maintenance and Asset Management Division (Headquarters Maintenance) is responsible for:

- Annually reviewing each crew and major maintenance station to ensure that stockpile records are current and accurate.
- Assisting the Accounting and Finance Division in the implementation of the Stockpile Accounting procedure if necessary.

Procedures

Each stockpile is assigned a six-digit number, starting with "4". The second digit represents the District or major maintenance station, the third and fourth digits represent the type of stock, and the fifth and sixth digits represent the stockpile sequential number.

Stockpiles are assigned the following class codes:

01: Aggregate

02: Chips

03: Sand

04: Cinders

05: Premix

06: Salt and Chlorides

07: Salt and Sand

09: Salt Brine

12: Liquid Asphalt

13: Rubberized Crack Filler

24: Signs

26: Glass Beads

29: Signposts

45: Traffic Paint - White

47: Traffic Paint - Yellow

50: Dry Chemical Anti-icing Agent

51: Liquid Chemical Anti-icing Agent

Refer to the *Maintenance Management System Manual of Instructions* for the latest list.

Stockpile classes can consist of more than one stockpile located throughout a District or major maintenance station. The numbering convention may vary by District or major maintenance station.

Examples:

1. The number for all salt and sand stockpiles in Tonopah is identified as 450701.
2. The numbers for two of the salt and sand stockpiles in District I for Las Vegas are 410701, 410702.

All work-in-progress items, such as labor, equipment and per diem used in the manufacture or maintenance of district stockpiles, are reported in the MMS System with the applicable stockpile number.

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DAMAGE TO ROADWAY FACILITIES

For information relative to damage, loss and repairs on maintenance station facilities, refer to Part III, Chapter 9 under "Maintenance and Asset Management Division Responsibilities" and "District Responsibilities".

Cost Responsibilities and Documentation

Costs for repairing damage resulting from accidents and other incidents may be recovered by NDOT if the responsible party can be identified. The key to any financial recovery is documentation of loss or damage, the responsible party and the cost of repairs.

When there is damage to a roadway facility, the supervisor should document the damage and repairs using the Unit Cost Method or Actual Cost Method as appropriate.

Unit Cost Method

Guardrail, signs, chain link fence, barbwire fence and marker posts are the items that are billed using unit costs for repair/replacement. These unit costs include labor, equipment and materials necessary to complete the repair work. The Department's Accounting Division provides unit costs to the districts.

Damage to guardrail, signs, chain link fence and barbed wire fence should be repaired in accordance with work schedules and reported to the appropriate MMS task. For these and other unit cost items, the Supervisor reports the amount of damage on Form 060-076 (Report of Damage to Department of Transportation Property)

and returns it to the District Administration office for processing.

Based on information reported on Form 060-076, District Administration initiates Form 060-002 (Billing Request), which includes information on the responsible party obtained from the law enforcement accident report and the cost for repairs. This information is submitted to the Accounting Division where a billing is prepared and submitted to the responsible party.

The Supervisor schedules the repairs and reports the completed work to the appropriate MMS task.

Actual Cost Method

The Actual Cost Method is used for all repairs not covered by the Unit Cost Method and includes the cost of traffic control at accident sites and other ancillary cost associated with the repairs.

When damage occurs to facilities repaired under the Actual Cost Method, the repairs are reported to the appropriate MMS task and the Supervisor reports the actual labor, equipment, materials used in the repairs and the dates work was accomplished to the District Administration office on NDOT Maintenance Management Program.

If repair work is complex, requires multiple operations or is estimated to be greater than \$1,000, and the work is billable, District management should determine if a work order is appropriate for collecting costs. An assigned work order number is used for identifying and coding labor, equipment and material used in the repairs. All costs associated

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with a particular work order are accumulated through the accounting system and submitted to the District Administration office on a monthly basis.

When using a work order, the Supervisor shall code all appropriate documents (time sheets, equipment usage tickets and material purchases) with the assigned work order number.

USE OF NDOT MATERIAL SOURCES BY OTHERS

Occasionally other agencies, contractors or individuals will ask to use an NDOT materials source. Most of the sources are located on U.S. Bureau of Land Management (BLM) withdrawals and as such shall have approval from the BLM and NDOT.

All requests for material source use are subject to environmental clearance and require approval from the NDOT Environmental Services Division and Right-of-Way Division.

If contacted concerning use of an NDOT materials source, it must be determined whether it is a BLM withdrawal or if NDOT has title.

If it is a BLM withdrawal:

1. The requesting party shall submit an application through the BLM.
2. The BLM routes the request to NDOT's Right-of-Way Division for concurrence by the Department.
3. Right-of-Way forwards a copy of the request to the district and to the NDOT Materials Division for their comments and recommendations.

4. If recommended for approval by the District and the Materials Division, the BLM is authorized to allow the applicant to remove material from the materials source subject to conditions suggested by the District and the Materials Division.

Quantities exceeding 5,000 cubic yards require approval from the Director's Office. Any environmental clearances that need to be obtained are the responsibility of the applicant.

If NDOT has title:

1. The requesting party should make the request in writing, specifying the materials source they want to use, time frame, the quantity of material they are requesting and the use of the material.
2. The District makes its recommendation and forwards the request to the Right-of-Way Division for a decision.

CHAPTER 3: MATERIALS SAMPLING AND TESTING

This chapter covers the Quality Assurance Program (testing) and procedural requirements necessary to assure that the Department obtains materials that conform to current specification requirements. Sampling and testing frequencies, as well as reporting requirements, are included for the most commonly-used materials.

For additional information on specifications and testing, refer to the *Nevada Department of Transportation Standard Specifications for Road and Bridge Construction* and the *Materials Division Testing Manual*, or contact the Materials Division.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

QUALITY ASSURANCE PROGRAM

This program was developed to ensure that materials used in District Maintenance operations conform to the Department's current specifications. Quality materials are essential for long-lasting repairs. Training of employees, sampling, testing and reporting of results are essential elements of the Quality Assurance Program.

Training

In order to ensure that materials purchased meet specifications, District Maintenance employees shall be properly trained in sampling and testing procedures. Training provides the basic knowledge and skills for sampling and testing of materials. Training is conducted by the Construction Division's Independent Assurance section (aggregates) and the Materials Division (oil/emulsion viscosity).

Sampling

Sampling is the collection of representative portions of materials to be tested in compliance with the specific requirements. Use extreme care to

ensure that samples taken and submitted to the testing laboratory are representative of material to be incorporated in the work.

Samples that do not properly represent the product may have the following serious negative effects:

- Inferior material may be used in the work.
- Specification material may be rejected.
- Time and expense of sampling and testing is wasted.
- The repair completed with non-specification material may fail.

Sampling and testing may be performed for informational reasons or for acceptance of the material in conformance with the following:

- Informational samples are samples taken prior to the specified acceptance point outlined in the individual bid documents. Samples taken during production of the material are the responsibility of the

supplier; however, the Department may elect to monitor the supplier's test results or obtain informational samples prior to the material being delivered to the acceptance point.

Informational samples may be taken at a temporary stockpile at the supplier's worksite or from the belt of the plant when production is in progress.

- Acceptance samples are samples taken at the acceptance point as outlined in the individual bid documents.

Reporting

For field-testing, test numbers are coded in the following manner with the first letters "T", "I" or "R", representing the first test, informational test or a retest. The second portion of the number represents the daily test number and the last portion of the number represents the report number. Report numbers for a particular type of material are numbered consecutively beginning with Report 1 for all quantities obtained from each supplier.

Examples:

- The first information test for screenings would be coded as I-1-1. This number denotes that the test was the first informational test on Report Number 1.
- The third acceptance test for screenings would be coded as T-3-2. This number denotes that the test was the third acceptance test on Report Number 2.

- Acceptance test number R1-3-2 denotes that this is the first retest of acceptance test number 3 on Report Number 2.

A record of sieve analysis and other results for aggregate materials should also be kept in a field book in the following manner:

- A separate book should be kept for each material supplier.
- Each book should be divided into sections for each type of material.
- Each section should include:
 - Test identification. Tests are listed consecutively by number and identified with the date and location sampled.
 - Test results. Numerical results of all acceptance tests are listed, except that sieve analysis results need not be broken down screen by screen. If all screens are within the specification limits, note the result as "P" (passing). If not, use the notation "F" (failing) and explain in the remarks.
 - Retest and remarks. The date and number of passing retest are included with an explanation of the corrective action taken.

Only acceptance samples should be listed in the aggregate book(s). Informational test results should be retained in a file for reference. Failing tests should be circled in red for quick identification.

AGGREGATES

Aggregates are materials that are crushed or screened from native cinders, sand or gravel deposits. In some areas of the state, Department-owned screening plants may be used for screening aggregates, and in other areas aggregates are purchased from a commercial source which may combine crushing and screening to obtain a graded aggregate material. The gradation of the aggregates must conform to specification requirements for the intended use.

Sampling

For information on sampling requirements, refer to Table III.3-1 to Table III.3-4 at the end of this chapter.

Testing

Testing of the products mentioned above shall be performed in accordance with test procedures outlined in the *Materials Division Testing Manual*.

Reporting

All materials must have a completed Form 072-002 (Combination Request for Supplies, Equipment and Shipping Record, or "Form 51") and Form O-3725 (Asphalt/Aggregate/Paint Purchase Requisition, APR) prior to delivery and acceptance.

These forms shall be completed by District Maintenance project personnel and forwarded to the Highway Maintenance Supervisor II for transmittal to the Highway Maintenance Manager or District Office Manager. The forms are then forwarded to the Equipment Division for processing and coordination

with the State Purchasing Division prior to making payment to the supplier.

The field reporting for aggregates consists of:

- Completing Form 040-013 (Field Material Sieve Sheet). Refer to "Reporting" on page III.3-2 for more information.
- Entering the quantities of delivered materials to the stockpile records in the MMS System.

Transmittals

Complete Form 020-018 (Transmittal for Test Samples and Certifications). A sample form is at the end of this chapter.

BITUMINOUS MATERIALS

Bituminous materials are available in several types, including asphalt cement (with several grades in each type), cutback asphalt and emulsified asphalt. The type of work, climatic conditions, availability and type of mixing or handling equipment determine the type and grade. The following summarizes the materials commonly used by maintenance and the uses of each.

Asphalt Cement

Performance asphalts are graded according to high and low temperature requirements. Normal products include PG 64-28NV, PG 64-28NVTR, PG 58-28, PG 64-16 and PG 64-22 for the northern part of the State, and PG 76-22NV, PG 76-22NVTR and PG 70-16 for the southern part of the State. Final grade is determined by the Materials Division.

The "NV" in the products listed above is used to differentiate State specifications from the standard American Association of State Highway and Transportation Officials (AASHTO) specifications. The NV specifications ensure polymer modification and incorporate Nevada test procedures.

The "TR" in the products listed above indicates a terminal blend rubber asphalt.

Cutback Asphalt

These are asphalt cements that have been liquefied by blending them with petroleum solvents, sometimes called *diluents*. Upon exposure to atmospheric conditions, diluents evaporate, leaving the asphalt cement to perform its function. There are two curing rates for cutback asphalt:

1. Medium-curing products, designated by the letters MC, consist of a paving grade asphalt (asphalt cement) fluxed or blended with a kerosene solvent.
2. Slow-curing products, designated by the letters SC, consist of natural crude oils or residual oils from crude asphalt petroleum or are paving grade asphalt (asphalt cement) fluxed or blended with relatively low-volatile oils.

For each curing rate, there are four viscosities of cutback asphalt: 70, 250, 800 and 3000 viscosity. Viscosity is a measure of a liquid's ability to resist flow, so a 70-viscosity product flows more readily than a 250-viscosity product.

Emulsified Asphalt

Emulsified asphalt is a mixture in which minute globules of asphalt cement are dispersed in water that contains an emulsifying agent (detergent).

Emulsified asphalt can be of two types, depending on the emulsifying agent:

1. Anionic: Electro-Negatively charged asphalt globules
2. Cationic: Electro-Positively charged asphalt globules

These two types are further classified by the rate of setting of the emulsion. There are numerous grades of rapid-, quick-, medium- and slow-setting emulsified asphalt that are used for seal and tack coats.

The anionic grades include products such as:

- Slow-setting: SS-1 and SS-1h

The cationic grades include products such as:

- Rapid-setting: CRS-2nv
- Quick-setting: CQS-1nv/CQS-1h
- Medium-setting: CMS-2s
- Slow-setting: CSS-1/CSS-1h

The "1" in the products listed above indicates a low viscosity product; the "2" indicates a high viscosity product.

The "h" in the products listed above indicates a harder base asphalt.

MATERIALS SAMPLING AND TESTING

The "NV" in the products listed above is used to differentiate State specifications from the AASHTO standard CRS-2h. (The standard penetration was increased to ensure better cold temperature flexibility.)

Emulsions can be further modified by the addition of latex or polymers. Latex-modified emulsions are designated by the addition of the letters LM (LMCRS-2h). Polymer modified emulsions are designated by the addition of the letters PM as in PMPS, PMPS-h, PMPS-QB, PMPS-FS.

Sampling

Sampling methods, sizes and frequencies for bituminous materials used in maintenance operations are shown in Table III.3-5 at the end of this chapter.

Testing

Testing of the products mentioned above shall be performed in accordance with test procedures outlined in the *Materials Division Testing Manual*.

Field-testing for Saybolt viscosity at or near the job site is performed by certified District Maintenance personnel. The Materials Division performs all other acceptance testing.

Reporting

All materials must have a completed Form 072-002 (Combination Request for Supplies, Equipment and Shipping Record, or "Form 51") and Form O-3725 (Asphalt/Aggregate/Paint Purchase Requisition, APR) prior to delivery and acceptance.

These forms shall be completed by District Maintenance project personnel and forwarded to the Highway Maintenance Supervisor II for transmittal to the Highway Maintenance Manager or District Office Manager. The forms are then forwarded to the Equipment Division for processing and coordination with the State Purchasing Division prior to making payment to the supplier.

The field reporting for bituminous materials consists of:

- Entering the quantities of delivered materials to the stockpile records in the MMS System (if applicable).
- Complete the Viscosity Testing Reporting Form. A sample form is at the end of this chapter.

Transmittals

Complete Form 020-016 (Transmittal for Asphalt Samples). A sample form is at the end of this chapter.

TRAFFIC PAINT AND BEADS

Traffic paint is a specially-formulated paint for centerlines, edge lines and legends on the highway surface. After the paint is applied, glass beads are added to provide retroreflectivity for nighttime visibility.

Ordering

Paint is ordered from the supplier in accordance with the terms set forth in the open term contract. Prior to ordering, the successful bidder must submit preliminary samples to the Materials Division for testing. The preliminary samples must meet specifications prior to ordering.

Sampling

Sample methods, sizes and frequency for traffic painting products used on maintenance operations are included in Table III.3-6 at the end of this chapter.

Testing

Testing of the products mentioned above shall be performed in accordance with test procedures outlined in the *Materials Division Testing Manual*.

Testing the dry film thickness will be determined according to Test Method No. Nev. T510A outlined in the *Materials Division Testing Manual*.

Reporting

All materials must have a completed Form 072-002 (Combination Request for Supplies, Equipment and Shipping Record, or "Form 51") and Form O-3725 (Asphalt/Aggregate/Paint Purchase Requisition, APR) prior to delivery and acceptance.

These forms shall be completed by District Maintenance project personnel and forwarded to the Highway Maintenance Supervisor II for transmittal to the Highway Maintenance Manager or District Office Manager. The forms are then forwarded to the Equipment Division for processing and coordination with the State Purchasing Division prior to making payment to the supplier.

The field reporting for traffic paint and beads consists of:

- Entering the quantities of delivered materials to the stockpile records in the MMS System.

Transmittals

Complete Form 020-018 (Transmittal for Test Samples and Certifications). A sample form is at the end of this chapter.

BITUMINOUS PAVEMENTS

Bituminous pavements are a combination of aggregate cemented with a bituminous material. The following types of bituminous pavements are used:

- Premixed bituminous paving material is a combination of aggregate and a bituminous material, such as cutback asphalt (MC or SC grade), and is processed using one of two methods:
 - Roadmixed: The materials are placed on the roadway; the blending and surfacing are performed using a motor grader.
 - Plantmixed: The mixture is blended using a pugmill at a central mixing plant; the surface is placed using a motor grader or paving machine.

When mixed, the premixed bituminous paving material shall be between 95°F and 240°F, depending on the grade of cutback asphalt being used.

Cutback asphalt for premix may be an MC-250, MC-800, MC-3000, SC-250, SC-800, or SC-3000. It may be used and stockpiled for later use.

- Plantmix bituminous surface is a combination of mineral aggregate, mineral filler (normally lime) and a

MATERIALS SAMPLING AND TESTING

bituminous material, asphalt cement performance grade (PG), mixed by mechanical means at a hot plant. When mixed in a hot plant, the product is delivered to the roadway at a minimum temperature of 300°F when using asphalt cements with an "NV" or "NVTR" designation, and at a minimum of 250°F for all other asphalt cements. This material is mixed at a central location and hauled to the roadway where it is placed by a self-propelled paving machine or a motor grader.

Lime marination is required on all plantmix bituminous surface used on interstates, primary routes and urban highways with an average daily traffic (ADT) greater than or equal to 10,000. For smaller quantities, the District Engineer may waive the lime requirement.

When possible, crews should use plantmix material made with performance grade (PG) asphalt cement. When a plantmix asphalt cement surface is not practical, the second choice should be a plantmix cutback asphalt surface. Premixed paving material should be used only when obtaining plantmix material is not practical.

For detailed information on specifications for paving materials, refer to the *Standard Specifications for Road and Bridge Construction*, current edition.

Contact the Materials Division for current mix designs that are available.

Reporting

All materials must have a completed Form 072-002 (Combination Request for

Supplies, Equipment and Shipping Record, or "Form 51") and Form O-3725 (Asphalt/Aggregate/Paint Purchase Requisition, APR) prior to delivery and acceptance.

These forms shall be completed by District Maintenance project personnel and forwarded to the Highway Maintenance Supervisor II for transmittal to the Highway Maintenance Manager or District Office Manager. The forms are then forwarded to the Equipment Division for processing and coordination with the State Purchasing Division prior to making payment to the supplier.

The field reporting for bituminous materials consists of:

- Entering the quantities of delivered materials to the stockpile records in the MMS System.

DEICING/ANTI-ICING MATERIALS

Salt, a salt/sand mixture or other dry chemicals are used for snow and ice control/removal. Salt brine or other liquid chemicals are used for roadway surface pre-treatment and ice prevention.

Sampling and Testing

The Department has specific Municipal Separate Storm Sewer Systems (MS4) Permit requirements for the testing and analysis of deicing/anti-icing materials.

Prior to ordering materials from the supplier, the supplier shall meet the MS4 Permit requirements and materials shall be tested by a Nevada-certified laboratory using current analysis, methodologies and/or procedures approved by the U.S. Environmental

Protection Agency (EPA) for Clean Water Act compliance.

After field tests are performed for sand, a sample is sent to the Materials Division for testing and analysis. Testing is performed in accordance with test procedures outlined in the *Materials Division Testing Manual*.

The sampling parameters and field testing guidelines for all deicing or anti-icing materials are summarized in Table III.3-7 at the end of this chapter.

Reporting

All materials must have a completed Form 072-002 (Combination Request for Supplies, Equipment and Shipping Record, or "Form 51") and Form O-3725 (Asphalt/Aggregate/Paint Purchase Requisition, APR) prior to delivery and acceptance.

These forms shall be completed by District Maintenance project personnel and forwarded to the Highway Maintenance Supervisor II for transmittal to the Highway Maintenance Manager or District Office Manager. The forms are then forwarded to the Equipment Division for processing and coordination with the State Purchasing Division prior to making payment to the supplier.

The field reporting for salt consists of:

- Completing Form 040-013 (Field Material Sieve Sheet). Refer to "Reporting" on page III.3-2 for more information.
- Entering the quantities of delivered materials to the stockpile records in the MMS System.

The field reporting for salt brine consists of:

- Entering the quantity of brine produced in-house in the MMS System.
- Entering the amount of salt and water used for brine production in the MMS System.

Transmittals

Complete Form 020-018 (Transmittal for Test Samples and Certifications). A sample form is at the end of this chapter.

MATERIALS SAMPLING AND TESTING

TABLE III.3-1: TYPE 1, 2 AND 3 BASE AGGREGATES, SHOULDERING MATERIAL

Material or Product	Sample Frequency	Sample Size	Remarks
Type 1, 2 and 3 Base Aggregates	One per project, per source, per supplier	Two full, large canvas sample sacks	For smaller quantities, location and frequency of the sample are at the discretion of the Resident Engineer. Submit to Materials Division for testing. Test types include: <ul style="list-style-type: none"> • Sieve Analysis • Fractured Faces • Plasticity Index • Liquid Limit • Resistance (R Value) • Percentage of Wear
	One per day or one per 2,000 tons when non-uniform material	One full, large canvas sample sack	For field sieve analysis/gradation test; run Test Method Nev. T206. (Refer to the <i>Materials Division Testing Manual</i> for more information.)
	One per day or one per 2,000 tons when non-uniform material	One full, large canvas sample sack	For field moisture test; run Test Method Nev. T112. (Refer to the <i>Materials Division Testing Manual</i> for more information.)
Shouldering Material	One per project, per source, per supplier	Two full, large canvas sample sacks. Taken at belt or stockpile for non-uniform material; taken from windrow for cold milled material.	Submit to Materials Division for testing. Test types include: <ul style="list-style-type: none"> • Sieve Analysis • Plasticity Index
	One per project per source per supplier	One full, large canvas sample sack	For field sieve analysis/gradation test; run Nev. Test Method T206. (Refer to the <i>Materials Division Testing Manual</i> for more information.)

MATERIALS SAMPLING AND TESTING

TABLE III.3-2: TRUCK ESCAPE RAMP ARRESTOR BED AGGREGATE MATERIAL

Material or Product	Sample Frequency	Sample Size	Remarks
Arrestor bed aggregate*	One per project source**	Two full, large canvas sample sacks per source per supplier, from approved material site.	<p>For field sieve analysis/gradation test, run Test Method Nev. T206 (refer to the <i>Materials Division Testing Manual</i> for more information.)***</p> <p>Submit to Materials Division for testing. Project control tests include:</p> <ul style="list-style-type: none"> • Sieve Analysis • Fractured Faces • Absorption of Aggregate <p>Source requirement tests include:</p> <ul style="list-style-type: none"> • Soundness • Abrasion • Flat and Elongated Aggregate • Flakiness Index • Absorption of Aggregate • Specific Gravity

* -- Mineral aggregate from approved material sites. Mineral aggregate shall be clean, hard, durable, rounded, in nature and free from frozen lumps, deleterious matter, balls of clay, calcareous or clay coating, caliche, synthetic materials, organic material and harmful adherent coatings.

** -- Prior to initial installation of truck escape ramp and once every 5 years thereafter

*** -- Sieve sizes: No. 10, 1/2 inch, 3/4 inch, 1 inch, 1-1/2 inch.

TABLE III.3-3: SCREENINGS (CHIPS)

Material or Product	Sample Frequency	Sample Size	Remarks
Surface Treatment Screening	One per project, per source, per supplier	Two full, large canvas sample sacks per source per supplier, from job site stockpiles.	<p>Submit to Materials Division for testing. Test types include:</p> <ul style="list-style-type: none"> • Sieve Analysis • Fractured Faces • Cleanness Value • Stripping Test • Percentage of Wear <p>For field sieve analysis/gradation test; run Test Method Nev. T206. (Refer to the <i>Materials Division Testing Manual</i> for more information.)</p>
	One per project per source per supplier	One full, large canvas sample sacks per source per supplier, from job site stockpiles.	<p>For field cleanness test; run Test Method Nev. T228. (Refer to the <i>Materials Division Testing Manual</i> for more information.)</p>
	One per project per source per supplier	One full, large canvas sample sacks per source per supplier, from job site stockpiles.	<p>Submit to Materials Division for testing. Major test types include:</p> <ul style="list-style-type: none"> • Viscosity • Residue

TABLE III.3-4: SAND AND ABRASIVE MATERIALS

Material or Product	Sample Frequency	Sample Size	Remarks
Sand	One per project per source	One 6"x12" plastic cylinder sealed with duct tape; or one 5-gal. sealed bucket	Submit to Materials Division for testing. Test types include: <ul style="list-style-type: none"> • Sieve Analysis • Moisture Content
	One per day or one per 1,000 tons	Two 5-gallon buckets	For field sieve analysis/gradation and moisture test; run Test Method Nev. T206. (Refer to the <i>Materials Division Testing Manual</i> for more information.)

MATERIALS SAMPLING AND TESTING

TABLE III.3-5: BITUMINOUS MATERIALS

Material or Product	Sample Frequency	Sample Size	Remarks
Asphalt Cements	One per day or one per 25 tons	1-quart round paint can with lid, from a hot plant's bituminous feed line at a suitable location between storage tank and bituminous metering device.	To be sampled by contractor and observed by NDOT representative. Submit to Materials Division for testing. Major test types include: <ul style="list-style-type: none"> • Viscosity • Ductility • Toughness • Tenacity • Sieve
Cutback Asphalts	One sample for each delivery (truck and trailer).	1-quart rectangular metal can with lid, from shipping vehicle after arrival on job and before or at time of unloading.	To be sampled by contractor and observed by NDOT representative. Submit to Materials Division for testing. Major test types include: <ul style="list-style-type: none"> • Viscosity • Water Mass • Residue
Emulsified Asphalts	One sample from each truck and one sample from each trailer. One sample from each truck and one sample from each trailer.	1-quart plastic bottle, from shipping vehicle after arrival on job and before or at time of unloading. 1-quart, from shipping vehicle after arrival on job and before or at time of unloading.	To be sampled by contractor and observed by NDOT representative. For field viscosity test; run Test Method Nev. T759 (Section 408). (Refer to the <i>Materials Division Testing Manual</i> for more information.) To be sampled by contractor and observed by NDOT representative. Submit to Materials Division for testing. Major test types include: <ul style="list-style-type: none"> • Viscosity • Residue

MATERIALS SAMPLING AND TESTING

TABLE III.3-6: TRAFFIC PAINT AND BEADS

Material or Product	Sample Frequency	Sample Size	Remarks
Traffic Paint	One per batch or manufacturer's lot Three per lane mile of stripe. Average five readings per location, minimum.	1- quart wide-mouth metal can, upon delivery to job site Take retroreflectivity readings 1-2 weeks after application	Sample each color. Submit to Materials Division for testing. Major test types include: <ul style="list-style-type: none"> • Total Solids • Pigment Content • Density • Drying Time Epoxy: Sample each component. Include the manufacturer product code and batch on the transmittal. Waterborne paint: Specify Type I or Type II. Retroreflectivity reading only, per manufacturer's recommended procedures; no samples taken for testing.
Traffic Beads	One per batch or manufacturer's lot	1-quart wide-mouth metal can, upon delivery	Include manufacturer's lot number and type on the transmittal. Submit to Materials Division for testing. Major test types include: <ul style="list-style-type: none"> • Sieve Analysis • Moisture Content

MATERIALS SAMPLING AND TESTING

TABLE III.3-7: DEICING/ANTI-ICING MATERIALS

Material or Product	Sample Frequency	Sample Size	Remarks
Salt	1 per 1,000 tons or fraction thereof	Minimum 2.2 lbs., in a covered and sealed container ¹ , from the acceptance point, which normally would be the stockpile at the specified delivery point.	<p>For field moisture test; run Test Method Nev. T112. (Refer to the <i>Materials Division Testing Manual</i> for more information.)</p> <p><i>Do not send to Materials Division for testing.</i></p> <p>Prior to ordering materials from the supplier, the supplier shall comply with MS4 Permit requirements and send a source sample to a Nevada-certified laboratory for testing.²</p> <p>To be analyzed for total phosphorus, total nitrogen, iron and percent sodium chloride.</p>
Sand and Abrasive Materials	Refer to Table III.3-4.	Refer to Table III.3-4.	<p>Refer to Table III.3-4.</p> <p>Prior to ordering materials from the supplier, the supplier shall comply with MS4 Permit requirements and send a source sample to a Nevada-certified laboratory for testing.²</p> <p>Samples shall be determined from composite samples taken from one stockpile that represents deliveries from the originating sources. Composite samples shall be taken from every new deliver from a new originating source.</p> <p>To be analyzed for volatile solids, iron, total nitrogen, total phosphorus, and total reactive phosphorus.</p>
Dry Chemicals (e.g., Ice Slicer RS, Broken Arrow Salt)	Performed by supplier	Performed by supplier	<p>Prior to ordering materials from the supplier, the supplier shall comply with MS4 Permit requirements and send a source sample to a Nevada-certified laboratory for testing.²</p>

MATERIALS SAMPLING AND TESTING

Material or Product	Sample Frequency	Sample Size	Remarks
			To be analyzed for total nitrogen and total phosphorus.
Salt Brine	Performed at the time of brine production	Approximately 2.26 lbs. of salt per gallon of brine solution ³	<p>Follows FHWA recommendation of 23.3 percent salt concentration rate and 91 percent salt saturation rate.</p> <p>During automated brine production, the solution in the mixing vat is checked randomly at regular intervals to ensure the proper concentration and saturation rates, and for quality assurance.</p> <p>During manual brine production, testing needs to be done for each batch to ensure the proper concentration and saturation rates.</p> <p>Salt used for brine production has already been tested to comply with MS4 Permit requirements.</p>
Liquid Chemicals (e.g., Magnesium Chloride, Potassium Acetate)	Performed by supplier	Performed by supplier	<p>Prior to ordering materials from the supplier, the supplier shall comply with MS4 Permit requirements and send a source sample to a Nevada-certified laboratory for testing.²</p> <p>To be analyzed for total nitrogen and total phosphorus.</p>

¹ – Typically a 5-gallon bucket.

² – Must be a Nevada-certified laboratory using current analysis/methodologies/procedures approved by the U.S. Environmental Protection Agency (EPA) for Clean Water Act compliance. A list of laboratories currently certified is available on the Nevada Division of Environmental Protection's Laboratory Certification Program website: <http://ndep.nv.gov/bsdwlabservice.htm>

³ – Sample size should be enough to float a salometer in the brine solution until it reaches the 23.3 percent salt concentration rate. The amount of salt per gallon of solution at this rate is approximately 2.26 lbs.

MATERIALS SAMPLING AND TESTING

TRANSMITTALS FOR TEST SAMPLES

Form 020-018 is used for transmitting samples for the following materials:

- Aggregates
- Sand
- Screenings (chips)
- Traffic paint and beads

[Sample]


020-018

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION

TRANSMITTAL FOR TEST SAMPLES AND CERTIFICATIONS

E.A. or Contract No. Test No. or Sample No.
Materials description Batch No.
Location or source of sample
Primary contractor
Producer
Limits of work represented by sample
Quantity and depth represented
Material is to be used for
Tests needed on this material
Type and grade of asphalt to be used
Asphalt producer
Bin percentages
Bitumen ratio (Target) (Actual) Lab mix design No. (BF)
Remarks
.....
.....
Sampled by *(Please Print)*
Date sampled Date shipped
Resident Engineer signature for mix design submittal:
..... Signed

Distribution: White and Canary, to be inserted in plastic envelope and submitted with sample; Pink, sender's copy

(NSPO Rev. 7-12) (O) 4179 

MATERIALS SAMPLING AND TESTING

Form 020-016 is used for transmitting samples for asphalt products.

[Sample]

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
TRANSMITTAL FOR ASPHALT SAMPLES

Contract No.Project No.Field No.....

County.....HighwayMilepost

Type of AsphaltProducer.....

Shipping Point.....Actual Tonnage

Refinery Ticket No.Weight Ticket No.

Tank Car/Truck/Trailer No.....Contractor


Sampled by.....Date Sampled.....

Observed by

District No.APO No.

Emulsion Field ViscosityTested by

TRANSMITTAL TO BE FASTENED TO SAMPLE CONTAINER WITH MASKING TAPE

NDOT 020-016 (Rev. 2-10) (O) 4883 

MATERIALS SAMPLING AND TESTING

Viscosity Testing Reporting Form for field testing samples for asphalt products.

[Sample]

VISCOSITY TESTING REPORTING FORM

Date: _____ Type Emulsion: _____ Tested By: _____
 Route: _____ From Milepost: _____ To Milepost: _____

Bill of Landing Number	Truck/Trailer Number	Tons of Emulsion	Time (Seconds)	Calibration Factor	Viscosity	Pass Fail
Retest on Failed Materials						

Comments: _____

CHAPTER 4: ENVIRONMENTAL

This chapter covers environmental concerns, cultural resources, biological resources, water quality, air quality, noise, hazardous waste, naturally occurring asbestos and erionite, environmental permits and responsibility levels in the Department.

When maintenance operations impact any of these areas, the Environmental Services Division should be contacted.

When maintenance operations impact water quality, the Stormwater Division should be contacted

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

ENVIRONMENTAL POLICY

There is a clear mandate to preserve the State's cultural heritage, history and environment. The Department recognizes that these concerns must go hand in hand with construction and maintenance task on the highway systems.

The term "environment", as used in this manual, refers to the natural surroundings including water, air, plant and animal life and cultural resources. Maintenance tasks shall be conducted in such a manner as to minimize damage to the environment.

The ability to recognize sensitive resources varies. While some resources such as creeks or streams are readily identified, others such as threatened and endangered plants, cultural resources and animals can only be identified by an expert. The difficulties encountered in recognizing sensitive resources do not, however, relieve maintenance employees of the responsibility of reporting and protecting them. Contact the Environmental Services Division for more information.

Because of the vast amount of public land in Nevada and the federal funding which the Department receives for highway construction, the Department's environmental tasks are closely monitored by the Bureau of Land Management, U.S. Forest Service, Federal Highway Administration, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Services and several state agencies. In many cases when problems arise, there are no clear methods or procedures for resolving the issues. These situations usually involve negotiations between the Department and agencies charged with protecting the environment.

CULTURAL RESOURCES

Cultural resource sites include:

- Prehistoric Native American archaeological sites, historic period trails, mining camps, ranches, farms and towns, and any designated historic districts or sites.
- Historic buildings, neighborhoods, parks, roads or railroads.

- Paleontological sites that contain prehistoric fossils.
- Native American religious sites.

All Maintenance operations off toe-of-slope should be surveyed prior to use to determine if they contain cultural resources. Use of a material site must be confirmed prior to use with the Environmental Services Division. Clearance requests can be obtained by routing a request through District administration to the Environmental Services Division Chief.

BIOLOGICAL RESOURCES

Biological resources include:

- Wetlands (swamps, marshes, bogs) and areas that are usually inundated or saturated by surface or ground water.
- All river, stream and wash channels, perennial and intermittent.
- Wild horses and burros.
- Cactus and yucca.
- Wildlife and fish.
- Threatened and endangered plant and animal species. These occur throughout the entire state in all districts and sub-districts.

Working around these types of environmental resources is very restrictive. ***Supervisors who are uncertain if threatened and endangered species occur in their work areas, should contact the Environmental Services Division for***

assistance. Working in these areas may require review and permits from other agencies, and authorization to proceed with the work may require considerable lead time.

The Environmental Services Division must be consulted if any vegetation is to be cleared or burned to ensure there are no threatened and endangered species issues.

WATER QUALITY

Water pollution is the contamination of any water body resulting from the discharge of pollutants without adequate treatment to remove harmful compounds. Water pollution is generally categorized, and regulated, as either point source or non-point source:

- Point source refers to any discernible, confined and discrete conveyance such as a pipe, ditch, channel, rolling stock, etc. from which pollutants may be discharged.
- Non-point source refers to diffuse sources (i.e., no single discrete source), such as stormwater running off roads and parking lots.

Common water pollution contaminants include sediment, pathogens (e.g., bacteria), nutrients (e.g., fertilizers), pesticides (e.g., herbicides), oils and chemicals.

The Department is responsible for adhering to State and Federal water quality regulations, notably with its statewide Municipal Separate Storm Sewer Systems (MS4) Permit and associated *Stormwater Management Plan* (SWMP), to prevent or reduce (to the maximum extent practicable) the

discharge of pollutants from its right-of-ways.

Stormwater Division Responsibilities

The Stormwater Division is tasked with administering the SWMP, which is a document describing the Department's approach for addressing the requirements of the MS4 Permit. There are several components to the SWMP with which District Maintenance plays an integral role (e.g., public stream maintenance, storm sewer system maintenance, etc.). District Maintenance staff are encouraged to review the SWMP to gain an understanding of MS4 Permit requirements and the Department's commitments for complying with those requirements.

The Stormwater Division assists District Maintenance with developing water pollution control best management practices (BMPs) and with procuring the necessary water quality permits that may be required for maintenance activities.

District Maintenance Responsibilities

District Maintenance tasks that can affect water quality include (but are not limited to):

- Snow removal
- Vegetation and pest control
- Maintenance of roadside rest areas
- Disposal of soil
- Downdrain repair
- Culvert extensions

- Maintenance of hydraulic facilities (e.g., culvert and drop inlet cleaning, ditch repair and cleaning)
- Slope repair
- Grading

Properly maintaining hydraulic facilities and performing pollution prevention practices (e.g., street sweeping) at routine frequencies helps reduce the potential discharge of pollutants from the Department's rights-of-way into receiving bodies of water. Source control efforts (i.e., eliminating or reducing the application of potential pollutant materials such as pesticides, fertilizers and sand/salt) are an effective means of water pollution control.

Any time a maintenance project involves working in or around any waterway (e.g., river, creek, wash, channel, irrigation ditch, wetland, etc.), the Stormwater Division must be notified to determine if the proposed maintenance activity will impact a state or federally regulated waterway, and thus require coverage under the appropriate water quality permits. Should maintenance activities have significant impacts to a waterway, mitigation may be required. The Department's *Construction Site Best Management Practices Manual* is a guide for implementing temporary pollution control measures (as appropriate) while maintenance activities are being performed.

Regulations

Water quality regulations apply to all regions of the state, however there are such areas as the Lake Tahoe Basin that implement specific requirements for maintenance activities. Supervisors

should be familiar with the water quality regulations and the necessary procedures for maintaining compliance for their respective areas of operation. They should also take an active role in conveying this information down to their respective crews and contact the Stormwater Division with any questions regarding water quality compliance.

District Maintenance activities that result in greater than 1 acre of land disturbance (e.g., grading) may require the development and implementation of a stormwater pollution prevention plan (SWPPP). Contact the Stormwater Division to determine whether a SWPPP is required for the proposed maintenance task(s). The Stormwater Division can also assist with the preparation of the SWPPP document.

Emergency work necessary to protect life and property is still subject to the same environmental permitting. In these cases, permitting may be done concurrently as the emergency activities are being conducted or even afterwards. It is vital that District Maintenance staff coordinate with the Stormwater Division to ensure that the proper arrangements have been made to ensure that the emergency activities comply with environmental regulations.

Facility Pollution Prevention Plans (FPPPs)

As a requirement of the MS4 Permit, facility pollution prevention plans (FPPPs) have been developed for all of NDOT's "major" and "minor" Maintenance facilities statewide:

- A major facility performs equipment repairs above and beyond routine maintenance, and it serves as the

primary duty station for multiple maintenance crews.

- Minor facilities are the remaining stations and yards that do not fall under the "major" designation, as well as select off-site material storage/stockpile areas (e.g., roadside sand/salt piles).

The FPPPs serve as the foundation for stormwater pollution prevention practices implemented at District Maintenance facilities. Each major and minor facility has its own plan. The minor stations and yards are covered under one FPPP with site-specific BMPs as appropriate. (Select off-site material storage/stockpile areas are also covered under the FPPP.) All plans provide information and guidance pertaining to BMPs appropriate for District Maintenance facilities and associated operations, allowable and non-allowable discharges and routine site inspections.

All FPPPs have designated administrators who are responsible for ensuring the plans are implemented accordingly for their respective facility(ies). FPPP-related maintenance tasks (e.g., routine facility sweeping, drop inlet/stormwater treatment device maintenance, etc.) shall be documented in the Maintenance Management System (MMS). A summary of FPPP-compliant tasks are provided by the Maintenance and Asset Management Division to the Stormwater Division annually and forwarded to the NDEP as part of the SWMP Annual Report.

Administrators are required to have copies of FPPPs on-site as well as copies of all stormwater inspection documentation. It is critical that the designated FPPP administrators review

and understand all aspects of the FPPPs and convey that information down to their respective crews. FPPP administrators are encouraged to contact the Stormwater Division for guidance pertaining to FPPP compliance.

FPPPs are reviewed and updated annually by the Stormwater Division. Each FPPP contains a current listing of all facilities covered. All plans are available on the Nevada DOT website in the Stormwater Management Program for viewing and downloading.

Training

All District Maintenance personnel are required to successfully complete the Department's stormwater training course within 12 months of hire, with recertification every 3 years thereafter. The course is administered by the Stormwater Division, multiple training sessions are held in each District annually. District Maintenance leaders need to coordinate stormwater training efforts with the Stormwater Division.

AIR QUALITY

Particulate matter (small airborne particles) is a form of air pollution. Exhaust and crankcase emissions are another source of air pollution.

Air quality regulations, along with EPA PM10 standards, are more stringent in Carson City, Clark County, Washoe County and the Lake Tahoe Basin. In Clark and Washoe counties, the air quality departments are charged with the responsibility for monitoring and enforcing air quality regulations. In most other counties, the State is responsible for monitoring and enforcing air quality

regulation. Maintenance supervisors should be knowledgeable of air quality regulations and procedures in their areas.

Dust Control

Since some maintenance tasks may cause dust, supervisors should be aware of air quality regulations. It may be necessary to:

- Obtain a permit
- Submit a dust plan
- Cover loaded trucks to minimize dust

Supervisors should periodically check with the Highway Maintenance Manager to determine any special conditions.

Maintenance tasks most likely to cause dust are:

- Eradicating paint lines
- Sweeping
- Sand sealing
- Chip sealing
- Cleaning, dressing and shaping ditches
- Fill slope repair
- Unpaved shoulder slope maintenance
- Sanding for snow and ice control
- Disturbing soil at material sites

These tasks should be performed on days with minimal wind (0-5 mph) or with the use of non-potable water for dust control. On windy days, the task may have to be curtailed if blowing dust is unsafe for motorists or otherwise causes a nuisance.

Sand from snow and ice control should be removed from the roadway as soon as conditions allow. When it dries, it is ground into finer particles by traffic and blown into the air by turbulence from passing vehicles.

Burning

Under provisions of Nevada Administrative Code 445B.22067, a permit is required for all open burning. The participating Supervisor must obtain the permit. The Nevada Department of Conservation and Natural Resources, Division of Environmental Protection (NDEP) is responsible for issuing permits for all of the state except Carson City, Clark County, Washoe County and the Lake Tahoe Basin. A copy of the permit should be at each burn location as it contains a number of limitations and conditions. ***Local agencies or fire departments may have additional requirements or permitting.***

Refer to "Environmental Permits, Approval Required for Maintenance Operations", in this chapter, for more information.

NOISE FROM MAINTENANCE OPERATIONS

In populated areas, maintenance programs should be in compliance with all applicable noise ordinances and geared toward being a good neighbor, and noise should be considered when

scheduling work. (Nighttime operations normally cause the most noise complaints.)

In most cases, complaints generated by loud operations can be eliminated or reduced by adjustments to schedules or equipment assignments.

It is considered good practice to test noise levels to determine any impact on the surrounding area. To arrange for any noise testing services, contact the Environmental Services Division.

HAZARDOUS WASTE MANAGEMENT

All hazardous waste is managed according to the Code of Federal Regulations (CFR) Title 40, Part 262 "Standards Applicable to Generators of Hazardous Waste".

Definition

Hazardous waste generated by the Department includes any waste such as:

- Solvents, including fuels used for cleaning and degreasing.
- Paint and paint thinners.
- Crankcase oils, unless intended for recycling.
- Mixed oil and solvents, even if the intent is to recycle.
- Pesticides.

Some waste products are listed specifically as hazardous waste in CFR Title 40, Part 261 "Identification and Listing of Hazardous Waste". Other

wastes are regulated based on hazardous characteristics defined as:

- Ignitable, such as a liquid with a flash point of 140°F or less, a solid or compressed gas capable of igniting under normal operating conditions or any material which might support combustion.
- Corrosive, such as a solution with a pH of 2 or less, or 12.5 or more.
- Reactive, such as any material that reacts violently with water, or generates an explosion or toxic vapors when mixed with water, or is potentially explosive at standard temperature and pressure.
- Toxic, such as materials that contain concentrations of specific contaminants such as heavy metals, that exceeds the standards listed in CFR Title 40, Section 261.24.

Hazardous Waste Generators

A Large Quantity Generator is a facility that generates greater than 1,000 kilograms (approximately five 55-gallon barrels) of hazardous waste in a calendar month. Individually there are no large quantity generators of hazardous waste within the Department's operations.

A Regulated Small Quantity Generator (SQG) is a facility that generates between 100 and 1,000 kilograms (1/2 to five 55-gallon barrels) of hazardous waste in a calendar month.

An Exempt Small Quantity Generator is a facility that generates less than 100 kilograms (1/2 of a 55-gallon barrel)

of hazardous waste in a calendar month.

Environmental Services Division Responsibilities

The Division is responsible for:

- Obtaining EPA identification numbers.
 - Generating and submitting the Resource Conservation and Recovery Act (RCRA) Generator Annual Hazardous Waste Report for the Carson City Station and retaining copies of the reports done by Hazardous Waste Coordinators at other stations.
 - Providing training in hazardous waste management along with emergency preparedness and response for other divisions and districts.
 - Communicating with regulatory agencies regarding compliance with hazardous waste management regulations.
 - Awareness of new regulations regarding hazardous waste management regulations and keeping District Engineers and division heads informed of these changes.
 - Assisting Department divisions with hazardous waste problems.
- ### **District Engineer and Division Head Responsibilities**
- Ensuring that hazardous wastes are managed according to policy.

- Appointing hazardous waste coordinators and their alternates for each appropriate Department facility in their jurisdiction.
- Assisting the coordinators and their alternates by providing them with the resources necessary for regulatory compliance.
- Ensuring that employees involved with hazardous waste are provided with appropriate training.

Hazardous Waste Coordinator and Alternate Responsibilities

- Determining whether wastes are hazardous.
- Maintaining proper methods of hazardous waste handling, storage and management.
- Arranging for the proper and legal transportation and disposition of hazardous waste.
- Keeping all records relating to hazardous waste management such as waste identification test results, manifests, invoices, annual reports and recycling contracts.
- Maintenance of an emergency preparedness and prevention plan.
- Preparing the biennial Hazardous Waste Report (as required by NDEP).

Human Resources Division Responsibilities

The Training Section is responsible for maintaining records that indicate which

individuals have been trained in hazardous waste management, emergency preparedness and response.

Regulations

On-site storage and handling of hazardous waste at SQGs is limited to 180 days or 270 days if the waste must be transported a distance of 200 miles or more to a treatment storage and disposal facility (TSD), but the waste can never exceed 5,000 kilograms (approximately 25 55-gallon barrels).

Facilities may have a central storage area for hazardous waste containers. Each container must be clearly labeled "Hazardous Waste", the identity of the contents and the accumulation start date (the date collection began for that container). An exception is made for satellite areas, which are defined as areas in the immediate vicinity of the point of generation. Any waste stored in a satellite area does not require an accumulation start date when accumulation begins in a 55-gallon drum; however, when the drum is full, the accumulation start date must be posted on the drum. The 180-day accumulation period begins on the posted date, and the drum must be moved to the central storage area or to a TSD within 3 days.

Container Storage Area Requirements

- The container storage area must have secondary containment large enough to hold 10 percent of the total volume of waste storage or 100 percent of the largest container stored in the area. Additional capacity must be added for stormwater if the containment area is outside.

- The container storage and containers must be inspected weekly for leaks and other potential problems. A record of this inspection must be kept on-site for a minimum of 3 years.

Container Management Requirements

- Containers must be in good condition, handled carefully and replaced if leaking.
- Containers used must be compatible with the wastes stored in them.
- Containers must be kept closed except when waste is being added or removed.
- Tanks cannot be used to store hazardous waste without permission from the Environmental Division. If tanks are used, all requirements of CFR, Title 40 Part 265, Subpart J must be met.

Transporting and Disposing of Hazardous Waste

- **Do not** dispose of hazardous waste on-site.
- **Do not** discharge hazardous waste into drains that connect to septic tanks, sewer systems or drain fields.
- **Do not** pour hazardous waste on soil surface.
- **Do not** place hazardous waste in dumps or half-buried drums that will discharge to the soil.
- **Do not** use waste solvents or oils for weed control.

- **Do not** discharge hazardous waste into storm drains or nearby streambeds.
- **Do not** use solvent to clean stripers, boot trucks or herbicide sprayers on bare soil surfaces.
- **Do not** allow spilled material to run off paved surfaces onto bare soil surfaces.
- **Do not** allow stored hazardous or potentially hazardous materials to leak onto bare soil surfaces.

It is important to carefully choose licensed transporters and waste management facilities. Generators are responsible for the management of hazardous waste from the moment of generation through the point of destruction, neutralization, recycling or disposal.

For clean-up and disposal of spills generated on roadways, or potentially hazardous materials found or released on roadways, shall follow the Emergency Response Guidelines set forth in Transportation Policy (TP) 1-7-1 and current regulations.

TP 1-7-1 includes additional information on the following topics:

- Verification and record keeping of the transportation and disposition of hazardous waste
- Reporting requirements
- Emergency preparedness and prevention
- Personnel training requirements

Naturally Occurring Asbestos and Erionite (NOA/E)

NOA/E is a mineral-like material that occurs in soil and rock. Such materials may include borrow embankment, selected borrow embankment, decorative rock, decorative boulders, granular backfill, drain rock base aggregates, shouldering material, aggregates for bituminous mixture, aggregates for Portland cement products, rip rap, rip rap bedding, and any other similar type of rock, soil, or mineral material.

NOA/E is potentially a regulated material that may limit or prohibit use and necessitate evaluating worker safety.

ENVIRONMENTAL PERMITS, APPROVAL REQUIRED FOR MAINTENANCE OPERATIONS

Cultural Resource Sites

Clearance is required from the Environmental Services Division. If additional permits or notifications to other agencies are required, the Division will handle them.

Biological Resources

Review is required by the Environmental Services Division and, if applicable, permits/approval from the following:

- Nevada Department of Wildlife
- U.S. Fish and Wildlife Service
 - Approvals are also required when an activity involves any listed threatened or endangered species. The Environmental

Services Division obtains these approvals.

Water Quality

It is the responsibility of the Stormwater Division to acquire any water related permits listed in this section. The following is a summary of common permits that may be required for a given maintenance activity, as well as the authorized permitting agency:

- U.S. Army Corps of Engineers
 - Section 404 Permit: Authorizes the placement of dredged or fill material within the ordinary high water mark of waters of the U.S. (Specific maintenance activities are exempt.)
- Nevada Division of Environmental Protection (NDEP)
 - Section 401 Water Quality Certification: Required if a Section 404 permit is issued.
 - Construction Stormwater General Permit: Authorizes construction/maintenance activities resulting in land disturbance (e.g., grading) in an area greater than 1 acre.
 - Temporary Working in Waterways Permit: Authorizes the use of equipment (e.g., rolling stock) in waters of the state.
 - Temporary Discharge Permit: Authorizes specific discharges into waters of the state.

- General De minimis Discharge Permit: Authorizes specific discharges into waters of the U.S.
- Environmental Protection Agency
 - Construction General Permit: Authorizes construction/maintenance activities performed on tribal lands resulting in land disturbance (e.g., grading) in an area greater than 1 acre.

The time required for permit procurement depends on such factors as the type of maintenance activity and the agency issuing the permit. Early planning and coordination with the Stormwater Division is crucial with ensuring that District Maintenance tasks are performed as scheduled and are compliant with water quality regulations.

Air Quality

The following is a summary of common permits that may be required for a given maintenance activity, as well as the authorized permitting agency:

- Clark County Department of Air Quality
 - Dust Control Permit: For District I maintenance activities; permit is renewed every 3 years.
 - Burn Permit: 10 day, 30 day or 6 months

Go to http://www.clarkcountynv.gov/airquality/compliance/Pages/Compliance_DustPermitting.aspx for more information.

- Washoe County Health District, Air Quality Management Division
 - Dust Control Permit: As needed, per project; valid for 18 months from date of approval.
 - Prescribed Fire Permit: For the specified date(s), duration and location on days when weather, air quality and resources allow; permit is valid for 18 months from date of approval.

Go to <https://www.washoecounty.us/health/programs-and-services/air-quality/forms-and-applications/index.php> for more information.

- NDEP, Bureau of Air Pollution Control
 - Dust Control: Operating Permit for Stand-Alone Surface Area Disturbance: For any land disturbance that equals 5 or more acres of total disturbance

Go to <http://ndep.nv.gov/bapc/permitting/permits.html> for more information.

- NDEP, Bureau of Air Quality Planning
 - Open Burn Permit: For the specified date(s), duration and location; each burn site requires its own permit.

- Local fire department
 - Burn permits

Go to <http://ndep.nv.gov/bagp/technical/smoke.html> for more information.

Hazardous Waste Management

The following is a summary of common permits that may be required for a given maintenance activity, as well as the authorized permitting agency:

- Nevada State Fire Marshal
 - State of Nevada Fire Marshal Hazardous Materials Permit

Emergency Situations

For emergency work that is necessary to eliminate a life-threatening condition, it may not be practical to obtain clearance from the Environmental Services Division and/or the Stormwater Division. The decision to proceed with work that may impact the environment shall be determined by the Highway Maintenance Supervisor II or higher level.

In cases where a Supervisor II is not available, a Supervisor I may have to make the decision; however, the Supervisor II, the Environmental Services Division and the Stormwater Division shall be notified as soon as practical. This notification is critical, as the Department is responsible for any environmental impact in the work area.

Damage, if any, must be reported to appropriate regulatory agencies by the Environmental Services Division. The

Department may be held liable for any damage that is not properly reported.

An emergency situation may not be used as an excuse to conduct maintenance work that is not immediately necessary.

Emergency work necessary to protect life and property is still subject to the same environmental permitting, but it is done after the threat has been addressed. If substantial permanent impact was created by the emergency work, mitigation may be required.

PLANNING MAINTENANCE TASKS

Maintenance supervisors should know the sensitive environmental areas in their respective jurisdiction. If there are recurring problems in restricted areas along the highway, the Environmental Services Division should be asked to survey and clear those areas before a serious problem arises.

When planning maintenance tasks involving vegetation removal, water resources, dry washes, potential roosts for bats or birds, or disturbance of ground not subject to regular recurring maintenance, supervisors should consult the Environmental Services Division and the Stormwater Division for clearance approval/stipulations to conducting the work.

If work is necessary in or adjacent to known restricted areas, supervisors should consult the Environmental Services Division for specifics on what may or may not be done. All approvals from the Environmental Services Division should be logged in the Supervisor's diary. Prior to proceeding with the work, the Supervisor should

review final plans with the crew, so everyone understands the situation and is aware of specific concerns.

Environmental Services Division Responsibilities

The Environmental Services Division is responsible for assessing the impacts of certain maintenance and construction operations on the environment. The Division is responsible for obtaining certain required permits and negotiating on behalf of the Department.

Stormwater Division Responsibilities

This division administers the water quality compliance program for the Department. Cooperation between the Stormwater Division and District Maintenance crews is essential because maintenance employees work in areas and with substances that can impact water quality.

District Administration Responsibilities

The District is responsible for ensuring that maintenance and construction operations are conducted in a manner that does not adversely affect the environment. These responsibilities include:

- Ensuring that maintenance employees are aware of the Department's commitment to protecting the environment.
- Providing guidance and leadership on environmental practices.
- Monitoring of maintenance projects to ensure compliance with environmental policies.

District Maintenance Supervisor Responsibilities

Each Supervisor is responsible for the tasks that occur in their area of jurisdiction, including:

- Emphasizing the importance of protecting the environment, including air quality, water quality biological resources and cultural resources.
- Providing the Environmental Services Division Chief detailed plans, drawings, maps and/or written descriptions in order to begin the clearance process for a maintenance activity that may disturb new areas, create new facilities where none currently exist, extend or expand existing facilities or involve known environmentally sensitive areas.
- Confirm the presence of any avoidance areas with the Environmental Services Division's Cultural Resources Section and Biology Section for those maintenance activities not provided to the Environmental Services Division Chief.
- Contacting District Administration or the Environmental Services Division prior to working in an area that might adversely affect the environment.

Crew Responsibilities

All District maintenance crews are responsible for:

- Being knowledgeable of environmental issues in their jurisdiction.

- Ensuring that they are not responsible for adversely affecting the environment.
- Checking with their Supervisor for the presence of archaeological or biological avoidance areas prior to starting work.
- Reporting sites discovered during work that may have environmental significance.

CHAPTER 5: COOPERATION WITH NDOT DIVISIONS AND OTHER AGENCIES

This chapter outlines the relationships and the cooperation that need to exist within NDOT and between NDOT and city, county, state and federal agencies.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

NDOT DIVISIONS

In order to accomplish the Department's Mission, each division and District must work together. Since District Maintenance crews are responsible for maintenance of state highways, they need the cooperation and assistance of other divisions. Likewise, the other divisions need the cooperation and assistance of District Maintenance crews in order to fulfill their missions.

Maintenance and Asset Management Division

In addition to developing statewide philosophies, objectives and policies for highway and transportation facilities maintenance, the Maintenance and Asset Management Division (Headquarters Maintenance) is responsible for monitoring maintenance operations, providing recommendations to the Director's Office and administering the Maintenance Management System (MMS). District Maintenance crews cooperate with Headquarters Maintenance by:

- Providing information on new procedures tried in the field to Headquarters Maintenance.
- Providing personnel to accompany Headquarters Maintenance staff on the MMS and field reviews.

- Providing input for revisions to:
 - The MMS.
 - This *Maintenance Manual*.
 - Maintenance Policies and Procedures.
 - Operator Training and Certification Program.
- Providing personnel to perform field reviews for each District's proposed Betterment Program. Headquarters Maintenance coordinates the approval and funding of these work programs with the Director's Office.
- Scheduling the Headquarters Maintenance staff on the agendas for the annual Maintenance Managers Meeting and the biennial Supervisors Meeting to discuss statewide maintenance-related issues.
- Providing information and assistance in the implementation and field-monitoring of maintenance contracts issued and administered by Headquarters Maintenance.

Headquarters Maintenance cooperates with District Maintenance crews by being familiar with their operations and concerns, and by soliciting feedback on

COOPERATION WITH NDOT DIVISIONS AND OTHER AGENCIES

maintenance objectives, policies and procedures.

Equipment Division

This division is responsible for:

- Procuring and repairing equipment.
- Procuring materials and supplies.
- Providing training on new equipment.

District Maintenance crews cooperate with the Equipment Division by providing:

- Personnel to be on the Equipment Specifications Committee, so that field input is considered when purchasing new equipment.
- Information on maintenance materials so that the acquisition of the materials is timely.
- Input and assistance to the division regarding the operation of programs such as the Equipment Management System.

The Equipment Division cooperates with District Maintenance by:

- Arranging the timely purchase of equipment, materials and supplies.
- Providing status reports on equipment deliveries.
- Allowing District review of specifications prior to bid.
- Performing the timely repair of vehicles and equipment delivered to the Equipment Division shops.

Structures Division

This division is responsible for the design of all highway-related structural assets including bridges, overhead signs, high mast light poles, earth retaining systems (retaining walls), sound walls, hydraulic structures and other special structures as required.

District Maintenance crews cooperate with the Structures Division by:

- Providing traffic control during bridge inspection activities.

The Structures Division cooperates with District Maintenance crews by:

- Coordinating with the District Bridge Maintenance groups and assisting in developing the scope and providing structural plans for betterment projects.
- Assisting with inspections and structural designs, and by coordinating inspections that require traffic control.
- Performing, upon request by District Maintenance crews, emergency inspections due to natural disasters or vehicular collisions with bridge superstructures or supports.

The District Bridge Specialist is the liaison between the Structures Division and the District, and each District has a Bridge Maintenance Crew.

Environmental Services Division

This division administers the cultural resources, biological resources, air quality and hazardous waste compliance programs for the

COOPERATION WITH NDOT DIVISIONS AND OTHER AGENCIES

Department. Cooperation between the Environmental Services Division and District Maintenance crews is essential because maintenance employees work in areas and with substances that can impact the environment.

District Maintenance crews cooperate with the Environmental Services Division by:

- ***Notifying the Environmental Services Division when conducting work in an area that might impact the environment.***

The Environmental Services Division cooperates with District Maintenance crews by:

- Notifying the districts of any specific environmental concerns.
- Obtaining the required permits, approvals or temporary waivers (if possible) to help facilitate District Maintenance work.

Stormwater Division

This division administers the water quality compliance program for the Department. Cooperation between the Stormwater Division and District Maintenance crews is essential because maintenance employees work in areas and with substances that can impact water quality.

District Maintenance crews cooperate with the Stormwater Division by:

- Notifying the Stormwater Division when working in and around waterways and dry washes and when working with highway and

maintenance facility drainage or water quality infrastructure.

The Stormwater Division cooperates with District Maintenance crews by:

- Notifying the districts of any specific water quality concerns.
- Obtaining the required permits, approvals, or temporary waivers of regulatory policies (if when possible) to help facilitate District Maintenance work.

Materials Division

This division is responsible for field sampling, testing and certifying materials used in highway maintenance.

District Maintenance crews cooperate with the Materials Division by providing:

- Traffic control when testing is performed on the highway.
- Maintenance equipment to assist with materials sampling.

The Materials Division cooperates with District Maintenance crews by:

- Assisting with roadway inspections.
- Providing recommendations and specifications on materials.
- Providing equipment to assist with maintenance operations.
- Certifying District Maintenance personnel to perform field viscosity testing.

COOPERATION WITH NDOT DIVISIONS AND OTHER AGENCIES

Traffic Operations Division

This division is responsible for signing, striping and traffic control, signals, lighting, and Intelligent Transportation Systems (ITS) design; operations and ITS programs; network and operational analysis; and statewide radio and ITS networks. Through these functions, the division applies the principles of traffic engineering and operations to enhance safety on state roadways.

District Maintenance crews cooperate with the Traffic Operations Division by:

- Maintaining radio, ITS and lighting devices.
- Notifying Traffic Operations when products on the Qualified Products List (QPL) do not meet standards.
- Working with Traffic Operations in testing and monitoring new products on the QPL.

The Traffic Operations Division cooperates with District Maintenance crews by:

- Addressing concerns with high maintenance/inferior products that do not meet standards.
- Providing information on new products for use.
- Providing sign design and standards as needed.
- Informing District Maintenance crews of the latest Traffic Control Standards.

Other Divisions

District Maintenance crews cooperate with other divisions by providing traffic control, labor, materials and equipment. These divisions cooperate with District Maintenance crews by providing program direction, technical assistance and by providing ample notification when assistance is needed.

STATE AGENCIES

The maintenance of highways often involves cooperation and communication with other State agencies. It is the policy of NDOT to cooperate with these agencies regarding transportation-related matters and to recognize and comply with their regulations. In some instances, cooperative efforts with other agencies may involve working outside of NDOT right-of-way. Supervisors should ensure that approval has been obtained for any work that will be off the right-of-way.

The following summarizes the responsibilities of key State agencies and the cooperation that needs to exist for a more productive and harmonious working relationship.

Nevada Highway Patrol (NHP)

The NHP (a division of the Nevada Department of Public Safety) is responsible for enforcing traffic regulations and investigating accidents.

The NHP cooperates with NDOT's District Maintenance crews by:

- Reporting to NDOT highway conditions that are potentially hazardous.

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- Providing support to District Maintenance personnel.
- Determining non-emergency road closures, and assisting NDOT on road closures by NDOT.
- Sharing facilities along the highway for vehicle check stations.
- Providing off-duty officers to assist with enforcing speed limits in work zones.

NDOT's District Maintenance crews assist the NHP by:

- Providing up-to-date information on road conditions, especially during the winter months.
- Providing traffic control and detour routing at major accident sites.
- Assisting during the winter months by responding to potentially dangerous areas, such as those needing additional plowing or sanding.
- Providing labor, materials and equipment for mutually beneficial projects.
- Performing minor maintenance at truck check sites including periodic sweeping and debris removal, maintaining lights and other electrical fixtures, and replacement of pavement markings.

Nevada Division of Forestry (NDF)

The NDF (a division of the Nevada Department of Conservation and Natural Resources) is responsible for all wildfire

prevention, suppression and/or rehabilitation activities outside of corporate limits of cities or towns. It is also responsible for supervising the NDF Inmate Crew Program throughout the State.

NDOT's District Maintenance crews should assist the NDF within the following guidelines:

- Reporting any uncontrolled fires.
- Initiating suppression of fires (where authorized) within or immediately adjacent to highway rights-of-way.
- Providing traffic control within fire zones.
- Providing appropriate equipment to NDF on a rental basis for fire suppression when it is in the best interests of the State. The District Engineer, Assistant District Engineer or Highway Maintenance Manager prior to being dispatched shall approve labor and equipment requested by the NDF. Equipment furnished to the NDF for fire support will be operated only by NDOT personnel.
- Operating NDOT equipment in a safe and responsible manner while under NDF control. NDOT employees should not get in a situation they feel is unsafe or one that may damage NDOT equipment.

The NDF normally initiates requests for use of NDOT labor and equipment. Requests from local fire departments or other local entities are usually not honored unless routed through the NDF.

The District Engineer, Assistant District Engineer or Highway Maintenance Manager may dispatch labor and equipment to a fire scene prior to a request from NDF, if necessary, to prevent injury or damage to State property. NDOT can also assist the NDF in re-seeding burned areas upon mutual agreement.

In the event an NDOT representative dispatches labor and equipment to a fire prior to a request from NDF, billing arrangements should be worked out with NDF.

Billing for labor and equipment includes the actual number of hours expended (plus fringe), including travel time. Repair costs for NDOT equipment damaged during fire suppression is also billed to NDF.

NDF Inmate Crews

The NDF Inmate crews, in addition to fire prevention, suppression and rehabilitation, assist State and local entities in other capacities such as:

- Fence construction and repair.
- Culvert cleaning.
- Tree removal and trimming.
- Litter removal.
- Rip-rap placement.
- Snow removal from maintenance station roofs.
- Other duties as assigned.

NDOT usually provides:

- Special tools.
- Project materials.
- Safety clothing (e.g., hats and vests).
- Traffic control items (e.g., signs).
- Personnel to oversee the work and ensure that materials and supplies are available.

NDOT and NDF have executed an Inter-Agency Agreement, which delineates the daily rates for Conservation Crew's labor and travel.

The District documents the work performed and resources expended by the Inmate crews on a daily basis. Documentation consists of a breakdown of the crew hours, materials used and project identification. Documentation can be accomplished by using Daily Force Account Sheets. The NDF should submit an itemized monthly bill for services provided by Inmate crews with the rates specified in the inter-agency agreement. District personnel review billings and an Interagency Billing Claim (Form SAS-A-1) is prepared for payment.

Nevada Division of State Parks (Nevada State Parks)

Nevada State Parks (a division of the Nevada Department of Conservation and Natural Resources) is responsible for all the state parks in Nevada. By agreement, NDOT is responsible for maintaining paved roads and parking areas within the State Park System.

COOPERATION WITH NDOT DIVISIONS AND OTHER AGENCIES

NDOT's District Maintenance staff cooperates with Nevada State Parks by:

- Requesting input on major work performed on state highways within a state park.
- Providing recommendations on road maintenance within the state park system when requested.

Nevada Division of Environmental Protection (NDEP)

The NDEP (a division of the Nevada Department of Conservation and Natural Resources) is responsible for enforcing applicable federal and state regulations.

NDOT's District Maintenance staff, through NDOT's Environmental Services Division, cooperates with the NDEP in addressing environmental issues pertinent to state highways and NDOT facilities.

NDOT's District Maintenance staff, through NDOT's Stormwater Division, cooperates with the NDEP in addressing water quality issues pertinent to state highways and NDOT facilities.

Nevada Division of Emergency Management (NDEM)

The NDEM (a division of the Department of Public Safety) coordinates operations that encompass emergencies from initial monitoring through post-disaster response and recovery. The NDEM provides interagency coordination to facilitate the delivery of state and federal assistance to local and tribal jurisdictions when emergency needs exceed their capability or have exhausted local resources.

The NDEM also provides a system for the assignment of missions to state agencies to address local needs for emergency assistance. The NDEM, through the development of the State Comprehensive Emergency Management Plan (SCEMP), also assigns specific functional responsibilities to appropriate state agencies, private sector groups and volunteer organizations.

The SCEMP lists NDOT as the primary agency for Emergency Support Function 1-Transportation (ESF-1) as well as a support agency for a number of other emergency support function areas that include Telecommunications, Public Works and Engineering, Public Safety and Security, and Community Recovery.

NDOT also assists the NDEM by:

- Providing emergency communications.
- Providing emergency maintenance and repair of highways to ensure that critical routes are usable.
- Providing assistance with traffic control.
- Assigning individuals to be a member of the disaster survey team, if needed.

Department of Motor Vehicles (DMV)

The DMV is responsible for registering vehicles and issuing driver's licenses. NDOT assists the DMV by testing and certifying NDOT drivers for the driving portion of the commercial driver's license.

COOPERATION WITH NDOT DIVISIONS AND OTHER AGENCIES

State of Nevada Purchasing Division

The State of Nevada Purchasing Division (a division of the Department of Administration) administers the State Purchasing Act, which provides a comprehensive central purchasing program for State agencies.

NDOT's District Maintenance staff cooperates with the State Purchasing Division by:

- Providing storage areas for excess materials and equipment until they can be disposed of by State Purchasing.
- Providing bid specifications and related information for NDOT purchases.

The State Purchasing Division assists NDOT by expediting critical purchases.

State of Nevada Public Works Division (SPWD)

The SPWD (a division of the Department of Administration) fulfills its role as the State's building official by regulating all construction on state lands to safeguard public health, safety and welfare.

NDOT's District Maintenance staff cooperates with the SPWD by:

- Obtaining permits (as needed) for small building repairs, replacement of equipment, remodeling or maintenance with an estimated cost of \$2,500 or less.
- Coordinating the required progress inspections and ensuring that the work remains accessible and

exposed for inspection purposes until approved.

The SPWD cooperates with NDOT's District Maintenance crews by:

- Performing the required progress inspections and final inspections to ensure compliance with all adopted codes.
- Issuing certificates of occupancy and/or accepting the work as substantially complete.
- Advising when additional permits and authorization are required by other agencies.

The Architecture Section serves as a liaison between the districts and the SPWD, and it can assist with the permitting process or help determine whether a permit is required.

COUNTY AND CITY AGENCIES**Public Works Departments**

County and city public works departments have highway maintenance goals and challenges similar to those of NDOT. And since jurisdictions abut in many areas, there are opportunities for cooperation and assistance.

District Maintenance crews and public works departments cooperate by:

- Communicating with the agencies on common maintenance problems.
- Sharing ideas and experiences.
- Sharing information on maintenance materials and procedures.

COOPERATION WITH NDOT DIVISIONS AND OTHER AGENCIES

- Cooperative agreements on maintenance responsibilities, equipment and materials.
- NDOT also works closely with local regional transportation commissions (RTCs) in coordinating their Highway Improvement Programs with NDOT's 5 Year Plan.

FEDERAL AGENCIES**Bureau of Land Management (BLM)**

As the BLM administers much of the public land in Nevada, it has control over many Department activities that occur on lands under their jurisdiction. These include:

- Material sites
- Highway right-of-way obtained by easement or withdrawal

NDOT cooperates with the BLM by:

- Abiding by regulations established for material sites and highway easements.
- Reviewing old material sites for possible relinquishment.
- Rehabilitating sites scheduled for relinquishment.

U.S. Forest Service

As the U.S. Forest Service administers portions of the public land in Nevada, it has control over many NDOT activities that occur on lands under their jurisdiction. These include:

- Material sites.

- Highway right-of-way obtained by easement or withdrawal.

NDOT cooperates with the U.S. Forest Service by:

- Abiding by the regulations established for material sites and highway easements,
- Reviewing old or unused material sites for possible relinquishment,
- Rehabilitating sites scheduled for relinquishment.
- Cutting and disposing of dead Service land.

National Park Service

As the only National Park in Nevada is the Great Basin National Park, Headquarters Maintenance is responsible for the cooperation and assistance between the National Park Service and NDOT. NDOT assists the National Park Service with such responsibilities as materials sources, and NDOT provides training for commercial driver's licenses. The National Park Service assists with periodic maintenance of the access road to the park.

Environmental Protection Agency (EPA)

The EPA is responsible for environmental issues on a national level. NDOT cooperates with the EPA by conforming to federal regulations regarding the environment. NDOT's Environmental Services Division is the liaison to the EPA and the Nevada Division of Environmental Protection.

COOPERATION WITH NDOT DIVISIONS AND OTHER AGENCIES

The EPA is responsible for water quality issues on a national level. NDOT cooperates with the EPA by conforming to federal regulations regarding water quality. NDOT's Stormwater Division is the liaison to the EPA and the Nevada Division of Environmental Protection.

Federal Highway Administration (FHWA)

The FHWA is responsible for administering the Federal-aid Highway Program. This includes monitoring the State's highway maintenance program to ensure that federal-aid routes are being adequately maintained.

The District Maintenance crews cooperate with this agency by:

- Periodically accompanying FHWA representatives on maintenance reviews.
- Answering or completing maintenance deficiencies listed on the inspection reports.
- Notifying the Headquarters Maintenance office of closures of Federal-aid Routes for relay to the FHWA.

The FHWA provides training and training materials through the "Pedestrian Safety Roadshow" program and the "Managing Technology Transfer" report.

U.S. Department of Defense (DOD)

The DOD is responsible for administration of government defense facilities in Nevada, such as the Fallon and Hawthorne facilities.

NDOT cooperates with the DOD by:

- Posting signs to warn the traveling public of military exercises.
- Providing assistance with traffic control when the agency works in close proximity to the highway.

OTHER TRANSPORTATION DEPARTMENTS, ASSOCIATIONS

State departments of transportation (DOTs) are working toward a common goal of providing an essential service for the traveling public. Since Nevada shares its borders with a number of states, there are opportunities for cooperation that can result in improved levels of service at minimal costs. Nevada and its adjoining state DOT's maintenance crews cooperate by:

- Attending periodic meetings to discuss and exchange information on maintenance.
- Providing assistance with traffic control at state lines.
- Providing up-to-date road condition information.
- Entering into cooperative agreements for facilities maintenance or construction.

The Chief Maintenance and Asset Management Engineer is NDOT's official representative to the American Association of State Highway and Transportation Officials (AASHTO) Subcommittee on Maintenance, and the Western Association of State Highway and Transportation Officials (WASHTO) Subcommittee on Maintenance. Information on maintenance techniques,

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problems and products is shared at annual meetings of these groups.

OTHER OUTSIDE AGENCIES

It is NDOT policy to cooperate with and assist other State and Federal agencies, counties and cities, provided there is no adverse impact on NDOT operations. Such assistance may include performing work for outside agencies that do not have the capability, and if the service is not readily available from the private sector. Work is performed only when authorized by the Director, Deputy Director, Assistant Director or District Engineer.

Work performed or services provided may include:

- Selling small amounts of maintenance materials.
- Renting maintenance equipment.
- Applying pavement markings to agency roads.
- Providing other maintenance work.

Work performed should be under authority of a written agreement between NDOT and the outside agency, with detailed information on cost responsibilities and billing procedures.

In the event that such work is performed without a written agreement, the outside agency shall make an advance deposit or submit a purchase order to cover the anticipated cost.

Services provided to an outside agency will normally be performed at a lower priority than work on the State Highway System. In the case of emergency work

for outside agencies, the priority of the work depends on the event.

Instructions for documenting labor and equipment should be sent to the Highway Maintenance Supervisor prior to initiating work for the outside agency.

Prior to selling maintenance materials to outside agencies, the State Purchasing Division needs to review the circumstances and concur with the sale.

CHAPTER 6: EMERGENCY AND INCIDENT MANAGEMENT

This chapter covers emergencies and incidents, and outlines response and related management procedures.

This chapter does not address vehicle accidents, employee injuries or employee safety concerns. Refer to Part II, Chapter 3 "Safety and Welfare" or Part III, Chapter 8 under "Vehicle Accidents" for more information.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

INCIDENTS AND EMERGENCIES

Highway/roadway incidents are localized incidents that cause traffic congestion. They are limited to a single incident and/or location that is managed on-site according to Traffic Incident Management (TIM) principles.

Emergencies or disasters are large-scale events that may involve multiple incidents and impact a large geographic region and may be coordinated from an Emergency Operations Center (EOC), depending on the severity. Incidents, emergencies or disasters use the Incident Command System (ICS) as the structure for response operations.

Incident Command System (ICS)

The ICS is a system in which local, State and Federal agencies can function as a coordinated unit during incidents and disasters. It can be used for small-scale incidents involving a single person or for large-scale incidents involving numerous jurisdictions and large numbers of people. The system consists of procedures for coordinating personnel, facilities, equipment and communications, and it is designed to operate from the time an incident occurs

until the requirement for management and operations no longer exists.

The structure of the ICS can be established and expanded depending on the changing conditions of the incident. It allows agencies to communicate using common terminology and operating procedures. It also allows for the timely combining of resources during the time of an emergency/incident.

For most highway incidents, the Nevada Highway Patrol (NHP) will be the lead agency to activate the ICS. Because of the overlap in jurisdictional responsibilities, NDOT shall be involved and an appropriate NDOT representative should be a member of the Unified Command (refer to "Command", in this chapter, for more information).

The primary objective of NDOT District Maintenance supervisors, when working within the Unified Command, is to safely open the road to traffic as soon as possible. First responder agencies such as the NHP, fire departments and emergency medical services (EMS) are committed to using the ICS for all incidents occurring in their jurisdiction.

Online ICS training is provided by the Federal Emergency Management Agency (FEMA) at no cost. ***It is highly recommended that all NDOT personnel complete FEMA IS-100, IS-200 and IS-700 online classes to develop a basic understanding of the ICS.*** Classes are available on the Nevada Employee Action and Timekeeping System (NEATS).

An ICS organization is composed of five major functional areas: (1) Command, (2) Operations, (3) Planning, (4) Logistics and (5) Finance.

Command

Command refers to the group having organizational jurisdiction for managing an incident. The command function within ICS may be conducted in one of two ways:

1. **Single Command** exists when an incident occurs entirely within one jurisdiction with no overlap of boundaries or responsibilities. One Incident Commander is designated by the agency to have overall management responsibility for the incident.
2. **Unified Command** exists when the incident is fully contained within a single jurisdiction, but more than one agency has management responsibilities because of the nature of the incident or types of resources required. In this type of structure, the representatives designated by their agency must jointly determine objectives, priorities and strategies. Agency representatives assigned to an incident should have full authority to

speak on all matters on behalf of their agency.

Operations

The Operations Section is directed by an Operations Chief who is directly responsible for management of all tactical activities related to the incident.

Planning

The Planning Section is responsible for collecting, evaluating and disseminating tactical information about the incident, including the current situation plus forecasts. This section maintains a record of the status of all resources assigned to the incident.

Logistics

The Logistics Section is responsible for providing all support needed to manage the incident. This includes facilities, transportation, supplies, equipment, maintenance, fuel, feeding, communications and medical services.

Finance

The Finance Section is established for incidents in which the agencies involved identify a specific need for such services. Not all incidents require a Finance Section.

EMERGENCY AND DISASTER MANAGEMENT

Emergency Operations

A disaster could severely damage the transportation infrastructure. The damage inflicted can influence the means and accessibility of relief services and supplies. Disaster

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responses will be difficult to coordinate effectively during the immediate post-disaster period due to damage of transportation corridors and the ability of undamaged areas to handle the increased traffic.

District Maintenance employees will be assigned to a specific incident by the District EOC, and they communicate with the District EOCs via their respective road operations/traffic management center.

The NDOT Departmental Emergency Operations Center (DEOC) is at NDOT Headquarters in Carson City. NDOT executive management and personnel from major divisions will staff the Operations, Planning, Logistics and Finance sections, and they will be the focal point for NDOT-required actions or responses requested by the District EOC or the Nevada Division of Emergency Management (NDEM). These procedures are detailed in the NDOT Emergency Operations Plan (EOP).

For more information on emergency management at the State level (through the Nevada Division of Emergency Management), refer to the Nevada *State Comprehensive Emergency Management Plan* (SCEMP). For more information on emergency management at the local level, refer to the impacted area's municipal and/or county government's emergency management plan.

Agency Responsibilities in Emergencies

In any local or statewide emergency, disaster or crisis, state agencies and other government agencies are

responsible for the delivery of specified services to the public. The responsibility of these agencies during a disaster or emergency is to continue delivering those services to the best of their ability, with immediate attention to lives and property and resumption of interrupted services. NDOT's major role is to assist other agencies with resources as requested, and to reopen roads as soon as possible.

NDOT Emergency Operations Plan (EOP)

The NDOT EOP provides details regarding NDOT's overall response during major emergencies or disasters. The plan provides a structure for emergency operations and provides guidance for management and staff during emergencies. The plan is maintained by the Maintenance and Asset Management Division (Headquarters Maintenance), and it is activated at the discretion of the Director.

A copy of the NDOT EOP is at the Director's Office, the Headquarters Maintenance office, and at each District Administration office and major maintenance station. Links to the NDOT EOP are posted on the NDOT SharePoint site and the Maintenance and Asset Management SharePoint site.

Nevada Division of Emergency Management (NDEM) Responsibilities

The NDEM (a division of the State of Nevada Department of Public Safety) is responsible for coordinating the activities of all state agencies for emergency and disaster planning and operations.

NDOT District Maintenance Response

Upon activation of the NDOT EOP, equipment and personnel (task organized) from District Maintenance crews outside the impacted area may be deployed to the impacted area to assist in emergency highway or transportation infrastructure repair and support.

Incident Response, by Type of Incident

Several state and local agencies play major roles in handling incidents. Even though the incident may occur on a state maintained highway, NDOT will not always be the primary department in resolving the problem. The following lists the more common incidents that may impact highway traffic are described with the generally accepted primary and secondary departments/agencies.

Avalanches*Response Objectives*

- To provide for avalanche control.
- To provide an effective response to avalanches that threaten lives and property, and significantly impact normal traffic flow.
- To provide for the rescue of avalanche victims.

Responsibility/Assistance

- NDOT is responsible for avalanche control and response (e.g., traffic control, road closure) as warranted.
- The State of Nevada Department of Public Safety (through the NDEM) is

responsible for coordinating support to assist with avalanche response, including searches and rescue.

- The State of Nevada Military Department has the capability to assist with avalanche control and response.
- The Nevada Department of Conservation and Natural Resources can provide assistance for response and rescue with manpower and equipment.
- The State of Nevada Department of Public Safety (through the NHP) can assist with traffic control and on-site communications.

Operations

- NDOT should be contacted in the event an avalanche threatens or occurs.
- The State of Nevada Department of Public Safety (through the NDEM) is responsible for the coordination among federal, state, local and private organizations as needed.

Earthquakes*Response Objectives*

- To provide for a coordinated response to the effects of earthquake disaster.
- To provide coordination of resources to assist with the necessary recovery efforts.

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Responsibility/Assistance

- The State of Nevada Department of Public Safety (through the NDEM) is responsible for the coordination among federal, state, local and private organizations in response to a major earthquake.
- The Nevada Governor's Office of Energy is responsible for response and recovery efforts relative to and utility outages.
- NDOT is responsible for emergency maintenance and repair of highways, assistance to local road departments to ensure that critical routes are usable, removal of debris from public and private lands, the establishment of emergency traffic regulation points and assistance with emergency communications.
- The State of Nevada Military Department is responsible for providing manpower and equipment support, aerial reconnaissance of an incident area, assistance with emergency transportation and emergency communications.
- The Nevada Department of Conservation and Natural Resources (through the NDEP) is responsible for controlling sanitation services in disaster-stricken areas.
- The Nevada Department of Conservation and Natural Resources (through the Nevada Division of Forestry) can assist in fighting fires resulting from earthquakes.
- The Nevada Department of Conservation and Natural Resources (through the Division of Water

Resources) is responsible for assisting with water related problems.

- The State of Nevada Department of Public Safety (through the NHP) can assist with traffic control and on-site communications.

Operations

- The State of Nevada Department of Public Safety (through the NDEM), under the control of the Governor, will provide the point of coordination among federal, state, local and private agencies for the response and recovery efforts.

Explosions*Response Objective*

- To provide a coordinated response by state, local and federal resources to minimize the adverse effects of public health/safety and property resulting from explosions.

Responsibility/Assistance

- The State of Nevada Department of Public Safety (through the NDEM) is responsible for providing the point of coordination for response and recovery efforts.
- The State of Nevada Military Department can assist with crowd control and cordoning off areas that constitute a threat to public safety.
- The State of Nevada Department of Public Safety (through the NHP) is responsible for initial response to incidents involving hazardous materials, and it can assist with

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traffic control and on-site communications.

- Southern Pacific Railroad will provide emergency response teams to handle railway incidents involving hazardous materials.
- NDOT is responsible for assisting the NHP with traffic control, and assisting the appropriate authorities with clean-up and disposal of non-hazardous accident debris.
- The Nevada Department of Conservation and Natural Resources (through the Nevada Division of Forestry) can assist in fighting fires resulting from explosions.

Operations

- Incidents involving hazardous materials should be reported to the NDEM, which, in turn, is responsible for notifying the appropriate agencies.

Fires*Response Objectives*

- To provide a coordinated application of state resources for firefighting service outside corporate limits of cities and towns.
- To assist local governments in controlling urban or wildland fires.

Responsibility/Assistance

- The Nevada Department of Conservation and Natural Resources (through the Nevada Division of Forestry) is the state agency with

primary responsibility for mitigation, planning, response and recovery efforts related to fires.

- The State of Nevada Department of Agriculture is responsible for animal and range response and recovery efforts.
- The U.S. Forest Service and Bureau of Land Management can provide fire response support to the Nevada Division of Forestry (coordinated by the State Forester). The NDEM is responsible, upon request, for support to the Nevada Division of Forestry and to provide recovery assistance coordination under emergency/disaster declarations.
- NDOT can assist with providing equipment and emergency communications.
- The State of Nevada Department of Public Safety (through the NHP) can assist with traffic control and on-site communications.

Operations

- Firefighting services will be initiated at the local operational level by the appropriate urban fire department, rural fire defense (RFD) crew or local unit of the Forestry Division. Requests for assistance will be directed to the State Forester. Fire situation reports for affected areas will be directed to the Nevada Division of Forestry, which:
 - Monitors fire suppression activities.
 - Provides fire, weather and damage forecasts.

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- Coordinates employment of fire control resources.
- Requests assistance from cooperating industries/agencies as needed.

Floods*Response Objective*

- To provide a coordinated response by state, local and federal resources for the mitigation, response and recovery efforts to flood situations.

Responsibility/Assistance

- The State of Nevada Department of Public Safety (through the NDEM) is responsible for the coordination among federal, state, local and private organizations to assist with flood mitigation, response and recovery measures.
- The Nevada Department of Conservation and Natural Resources is responsible for providing technical assistance concerning water and land use, and for controlling sanitation services in impacted areas.
- The Nevada Department of Conservation and Natural Resources (through the State of Nevada Division of Water Resources) is responsible for assisting with water testing and public health measures related to potable water.
- NDOT is responsible for clearance and restoration of highways, and can assist with aerial photography.

- The State of Nevada Department of Public Safety (through the NHP) can assist with traffic control and on-site communications.
- The National Weather Service provides weather forecasting and flood watches and warnings.

Operations

- Mitigation, preparation and response efforts are implemented by local jurisdictions.
- The State of Nevada Department of Public Safety (through the NDEM) will handle coordination of multiple assistance and recovery programs.

Hazardous Materials*Response Objective*

- To provide for a coordinated response by state, local and federal resources to minimize the adverse effects on public health/safety and environment resulting from uncontrolled release of, or exposure to, hazardous materials.

Responsibility/Assistance

- The State of Nevada Department of Public Safety (through the NDEM) is responsible for the coordination of planning and for the notification of appropriate agencies and organizations in response to incidents involving hazardous materials.
- The Nevada Department of Conservation and Natural Resources (through the NDEP) is responsible for supervising the disposal of

hazardous materials and for providing consultation regarding their containment and disposal. It can also assist with the analysis of unidentified hazardous materials.

- The Nevada Department of Conservation and Natural Resources (through the Nevada Division of Forestry) can assist in fighting fires resulting from incidents involving hazardous materials.
- NDOT is responsible for assisting the NHP with traffic control, and assisting the appropriate authorities with clean-up and disposal of accident debris.
- The State of Nevada Department of Public Safety (through the NHP) is responsible for initial response to incidents involving hazardous materials, and it can assist with traffic control and on-site communications.

Operations

- Incidents involving hazardous materials should be reported to the NDEP, which in turn has the responsibility of notifying appropriate agencies.
- The State of Nevada Department of Public Safety (through the NHP) will handle emergency response and safety measures on all highways until such time as the appropriate responsible parties arrive.

Terrorism

Response Objective

- To provide for a coordinated response by state, local and federal resources to combat the threat of terrorism to public safety and property.

Responsibility/Assistance

- Local law enforcement agencies have the primary responsibility for control of terrorist activities.
- The State of Nevada Department of Public Safety (through the NHP) will provide law enforcement support and coordination at the state level in response to terrorist activities.
- The Federal Bureau of Investigation has the primary responsibility at the federal level for terrorist activities.
- The State of Nevada Department of Public Safety (through the NDEM) will provide a point of coordination to request additional assistance as needed.
- The Nevada Department of Conservation and Natural Resources (through the Nevada Division of Forestry) can assist in fighting fires resulting from terrorist activities.
- NDOT is responsible for highway maintenance and repair to ensure that critical routes are usable, debris is removed from the roadway and emergency traffic regulation points are established. NDOT can also assist with emergency communications.

Operations

- The State of Nevada Department of Public Safety (through the NHP) will coordinate the law enforcement support and should be the primary contact at the state level.
- The Federal Bureau of Investigation has federal-level responsibility.
- The State of Nevada Department of Public Safety (through the NDEM) will provide the point of coordination for additional assistance as required.

Wind and Snow Storms*Response Objectives*

- To provide for a coordinated response to the effects of storm damage.
- To provide the coordination of resources to assist with the necessary recovery efforts.

Responsibility/Assistance

- The State of Nevada Department of Public Safety (through the NDEM) is responsible for the coordination among federal, state, local and private organizations in response to, and recovery from, major storm disasters.
- NDOT is responsible for emergency maintenance, repair, and clearance (including snow removal) on State

highways. Under an emergency declaration, NDOT will:

- Assist local road departments to insure that critical routes are usable.
- Handle the removal of debris from the roadway.
- Establish emergency traffic regulation points.
- Assist with emergency communications.

NDOT can also provide manned equipment to local jurisdictions to assist with the emergency. NDOT has the authority to declare a road closure as necessary (refer to "Road Closures" in this chapter for more information), and it will coordinate these closures with the NHP until the road is reopened.

- The State of Nevada Department of Public Safety (through the NHP) can assist with traffic control and on-site communications.
- The Nevada Department of Conservation and Natural Resources (through the Nevada Division of Forestry) can provide manpower and equipment, will handle and coordinate storm-related fire suppression in its jurisdictions, and can provide support to fire-fighting entities in other Nevada jurisdictions.
- The State of Nevada Office of the Military can provide manpower, equipment support and aerial reconnaissance in impacted areas. It can also assist with emergency transportation, emergency shelter

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and mass feedings. Military support requires approval from the Governor's office via the NDEM.

Operations

- The State of Nevada Department of Public Safety (through the NDEM), under the control of the Governor, will coordinate response and recovery efforts during emergencies or disasters.

Cost Responsibilities and Documentation

For more information on cost responsibilities and documentation, refer to Part III, Chapter 2 under "Damage to Roadway Facilities".

Disaster and Storm Damage Repairs

Because of the potential for federal reimbursement, disaster or storm damage repairs require that specific cost records are maintained in order to identify all applicable expenditures.

All maintenance activities that have the possibility of becoming declared disasters must be entered into the Maintenance Management System (MMS).

The District office should maintain adequate records so NDOT is able to distinguish disaster and storm damage repairs from routine maintenance work. Since there is sometimes a considerable time lapse between incidents or storm repairs and the time of the federal agency review of the repair records, it is imperative that records be kept current and in as much detail as possible. All coordination for a "Declared" Disaster's reimbursement is managed by the

Maintenance and Asset Management Division, Emergency Management Section. NDOT Emergency Management will coordinate with NDEM on drafting a "State Declaration", FHWA and FEMA on the reimbursement process and authorization. Financial Management and Project Accounting will be responsible for tracking and obligating reimbursements from FHWA and FEMA for declared emergencies.

INCIDENT MANAGEMENT

Incident management involves a systematic process to reduce the time needed to detect and verify that an incident has occurred, initiate the appropriate response, clear the incident and the roadway, provide information and manage traffic until full capacity of the highway is restored. Incidents may include:

- Vehicle accidents or breakdowns.
- Debris, spilled loads or released materials on the roadway.
- Floods and storms.

NDOT is typically notified of an incident by one of the following methods:

- An NDOT employee observes the incident and reports it to the District's road operations/traffic management center.
- A law enforcement agency reports an incident to the District's road operations/traffic management center.
- A private citizen reports an incident to an NDOT employee.

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When NDOT employees arrive on the scene of an incident, they should:

- Assess the situation to determine potential hazards and any assistance required.
- Be cautious and resist the urge to rush in.
- Notify the District's road operations/traffic management center.
- Provide traffic control, which can include closing a lane or the entire road.
- Provide assistance to the injured within the limits of the employee's training.

Traffic Incident Management (TIM)

TIM, through the ICS, brings together a coalition of state, county and municipal agency representatives and contractors to collaborate, raise awareness and develop policies and response guidelines when an incident occurs. Representatives include:

- NDOT District Maintenance and the District's road operations/traffic management center, the Traffic Safety Engineering Division and the Traffic Operations Division.
- NHP and local law enforcement agencies.
- Fire suppression, prevention and/or rehabilitation agencies including municipal and county fire departments, the Nevada Division of

Forestry and the U.S. Forest Service.

- Freeway Service Patrol contractors.
- Hazardous materials management contractors.
- EMS responders (e.g., Medic West, REMSA, Care Flight).
- Freeway and Arterial System of Transportation (FAST).
- Towing operators.

This coordinated, pre-planned use of personnel, equipment and material resources ensures quick, safe clearance and restores full capacity to the highway after an incident is cleared.

An essential component of TIM is the impacted District's road operations/traffic management center, where trained personnel analyze information and events as they occur. The road operations/traffic management center may also serve as a central location for dispatching motorist information and/or a support center for response and clearance activities.

Reporting Incidents

When reporting highway/roadway incidents that require assistance from the NHP or other law enforcement agencies, provide the following information to the impacted road operations/traffic management center:

- Location (route, milepost and direction)
- Injuries (if any)

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- Number and type of vehicles involved
- Whether the person calling in the information is standing by or providing assistance
- Whether any state vehicles or employees are involved

Do not broadcast the names of injured persons over the radio.

When reporting non-accident calls (e.g., disabled vehicle), provide the following information to the applicable road operations/traffic management center:

- Location (route, milepost and direction)
- Type of incident
- Type of vehicle (if a vehicle is involved)
- License plate number of vehicle
- Placard number and expiration date
- Any other pertinent information to aid the dispatcher in passing the message to the proper authorities

Road Closures

NDOT is responsible for determining when road closures are necessary or required due to weather or other highway/roadway incidents. The decision to close a road and arrange to send supplementary equipment and personnel for temporary assistance should be made at the highest level practical within District Maintenance.

Once the decision is made to close the road, the impacted District's road operations/traffic management center must be notified. The road operations/traffic management center will notify all required parties (e.g., District Engineer, Assistant District Engineer, Highway Maintenance Manager, Highway Maintenance Supervisor II, or NHP). Department volunteers may also be contacted to assist with the closure.

Occasionally a law enforcement agency (e.g., NHP, county sheriff's office) or fire department will request a road closure. If circumstances allow, a representative from the law enforcement agency will meet with a Supervisor from District Maintenance and review the section of roadway prior to closing the road. If a law enforcement agency closes a road and the closure does not appear to be warranted, the Assistant District Engineer or the District Engineer should be contacted as soon as possible with the details of the closure. If it appears that traffic could pass through the area without hindering the operations of the fire department, the Supervisor and the NHP should develop a solution in which the fire department can achieve its objectives and the traffic can proceed without undue delay.

After the incident is cleared, and based on the inspection and review of the closed section of roadway, the decision to safely reopen or partially open the road should be made at the highest level practical within District Maintenance.

Road closures due to floods, blowing snow and dust usually occur at known locations. New maintenance employees should be made aware of these areas

so they will be better prepared to handle the incident.

Incidents Involving Hazardous Materials

All reported incidents shall be routed through the impacted District's road operations/traffic management center to verify if the incident is within the NDOT right-of-way.

If the incident is outside the NDOT right-of-way, the road operations/traffic management center shall inform the caller that the incident is outside the NDOT jurisdiction.

The Nevada Statewide Hazmat Program (Hazmat Program) allows for the cleanup, classification, packaging, source removal, transportation, storage, waste disposal, associated regulatory agency reporting and other related activities associated with hazardous and illicit materials discharged within the NDOT right-of-way.

Hazardous materials, when released (intentionally or otherwise), can be solids, liquids, or gases that can cause health or physical harm to people, other living organisms or the environment. Hazardous materials can be found in many forms such as petroleum-related materials, bulk chemicals, manufacturing materials, septic waste, or common everyday products. Specific hazardous material determinations shall be made by qualified personnel who have been appropriately trained to Nevada Division of Environmental Protection (NDEP) standards. All released materials shall be considered

hazardous until positive material identification has been made.

Illicit materials refer to any substance that is discharged, or has the potential to discharge, into a receiving waterway or storm sewer system that is not comprised entirely of stormwater runoff.

Upon arrival to the scene, NDOT employees shall:

- Provide for traffic control, which can include closing a lane or the entire road.
- ***Be cautious and resist the urge to rush in.***
- ***Stay upwind of the site of the incident and keep the area clear until the material has been identified and/or removed.***
- ***Keep out of low areas.***
- ***Avoid walking in or touching spilled materials.***
- ***Avoid breathing fumes, smoke and vapors.***
- Refer to the latest edition of the *Emergency Response Guidebook* (ERG) to assist in determining protective action distances for isolation and evacuation. (Every NDOT vehicle should already have a copy of the ERG.)
- Not leave the site unattended.
- Without risking personal injury, record as much information as possible, including (but not limited to)

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placard number, type of vehicle and noticeable leaks.

- Wait until it is determined whether the hazardous material is a reportable release. A reportable release can be:
 - Any substance in any material form (e.g., gas, liquid or solid) released into NDOT right-of-way that cannot be positively identified.
 - Any petroleum product (e.g., diesel, gasoline, hydraulic fluid) released in quantities greater than 25 gallons.
 - Any petroleum product (e.g., diesel, gasoline, hydraulic fluid) in any quantity whose release impacts more than 3 cubic yards of soil/material.
 - Any hazardous material, regardless of quantity, that affects a waterway.
 - A reportable quantity (as defined by table 302.4 in the Code of Federal Regulations, Title 40 Section 302.4) release of any hazardous material.

If a reportable release is encountered, the responding agency shall notify the District's road operations/traffic management center to activate the Hazmat Program. A copy of the Hazmat Program is available from NDOT's Traffic Operations Division.

If a non-reportable release is encountered and a towing operator is responding to the scene, the towing operator shall be responsible for the

cleanup. If a towing operator is not responding to the scene, the responding agency may clean up the release or notify the District's road operations/traffic management center to activate the Hazmat Program.

INCIDENT AWARENESS, PREVENTION

Employees should be aware of any indicators of a possible security event. The most effective means to protect NDOT facilities and prevent incidents is for all NDOT employees to be watchful, and to report suspicious behavior, objects and/or incidents. Employees have an intimate knowledge of their work areas; and when they are aware of their surroundings, they are the most qualified people to recognize something unusual that might signify a security threat. Early detection by alert employees can avert a more serious event from taking place.

Key Security

Key security for vehicles assigned to individual people shall be the responsibility of the assigned individual. Keys, when not in use, should either be kept with the persons or secured in a locked facility with restricted access. If the assigned employee is on extended leave and the assigned vehicle will be used by others during their absence, a different individual should be assigned to secure the keys and maintain proper security.

Keys to vehicles that are used by multiple persons on a crew or in a division should be kept in a locked office or key box that only allows access to the individuals that operate the equipment on a regular basis or during off hours.

An inventory of the number of keys available should be maintained, and the quantity on hand should be verified on a regular basis.

A sign-out/sign-in sheet should be utilized to track current or past operator information.

If multiple sets of keys are missing, consider changing the keying on the vehicle.

NDOT Vehicle Theft

If a piece of mobile equipment is stolen, promptly report the theft to your immediate supervisor, NHP, NDOT Equipment Division, the Department's Loss Control Officer, and the Security Manager in the NDOT Maintenance and Asset Management Division.

Fueling Station Access/Security

Most NDOT fueling sites are controlled using a card lock system. Fueling rights are granted by the NDOT Equipment Division, who has the responsibility for monitoring and controlling the fuels. Fueling rights are granted to NDOT employees as well as employees of other agencies (e.g., NHP) as needed. Fueling sites are located within District Maintenance yards, which are generally secured by fencing. Those with the need to access the fuels are granted access into the maintenance yard and separately granted access to the fuel.

Security Training

Building Lockdown and Evacuation Training

Building lockdown and evacuation training is provided as needed by the

NDOT Human Resources Division's Safety and Loss Control Section during safety training sessions, and it is based on current best practices.

Homeland Security Awareness Training

Homeland Security Awareness training is provided as needed by the NDOT Maintenance and Asset Management Division's Emergency Management and Homeland Security Section.

NDOT Physical Security Plan

The NDOT Physical Security Plan, administered by the Maintenance and Asset Management Division, contains additional information on the following areas:

- NDOT Headquarters Lockdown Procedure
- Headquarters Evacuation Procedure
- NDOT Access Management System/Policy (TP 1-1-14) and the NDOT Card Access System
- List of NDOT Critical Structures
- Threat Conditions and Associated Protective Measures – Headquarters
- Threat Conditions and Associated Protective Measures – Districts
- "For Official Use Only" Handling Instructions
- Guidelines for Mail Handling
- Handling Bomb Threats

CHAPTER 7: COMMUNICATIONS AND PUBLIC RELATIONS

This chapter covers communications methods and procedures, reporting programs, public relations and outreach programs that provide additional benefits to the traveling public.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

COMMUNICATIONS

The term "communications", as used in this manual, includes written, electronic, social media and voice.

Written

The authority for signing specific types of correspondence and documents is described in Transportation Policy (TP) 1-1-4. It ensures that documents committing the Department are signed by a person with the authority to make the commitment for the Department. It applies to all documents, which affect the position or course of action of the Department, such as:

- Policy statements.
- Letters outside the Department.
- Expenditure of funds.
- Use of materials.
- Purchase of services.
- Use of personnel.

Normally, employees sign documents in their area of responsibility only. No one is authorized to sign another person's name to a document. When authorized

individual signs a document for an absent person, the individual signs their own name.

Immediate supervisors are authorized to sign:

- Time reports.
- Employee development reports.
- Applications and authorizations for leave.

Approval signatures are not delegated downward. When a signature is required and no authorized signer is present, the signature of another individual up that chain of command is authorized.

Correspondence may be in memorandum, Form 070-007 ("Write it...Don't Say It!" Interdivision Communication) or letter format. Correspondence to anyone outside of a state agency should be on Department letterhead.

Electronic

All Department divisions use e-mail and fax equipment for business correspondence, which is a more expedient method of correspondence.

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Social Media

Department employees who identify themselves as a Department employee or have a known association with the Department shall follow TP 1-6-33 when posting to any social media channels. Among other items as outlined in this policy, employees may not post confidential, discriminatory, profane or copyrighted materials and may not represent themselves as officially portraying the Department on any issue.

Voice

Telephone and radio equipment is provided for Department business. Personal use should be kept to a minimum, and personal use that results in a charge to the Department is not allowed. The telephone system should also be used in a manner that results in the least expense to the Department. Many areas of the state have access to the state's microwave telephone network. This system should be used whenever possible to reduce costs.

The two-way radios used by most District Maintenance personnel are the most efficient way for workers to communicate with each other and their respective offices.

For general rules on radio use or the maintenance and care of radios, refer to Part II, Chapter 1 under "Equipment Use".

HIGHWAY CONDITION REPORT

This reporting system makes up-to-date road information available to highway users. The objectives are to:

- Advise entities, such as school districts, fire and police agencies of road conditions.
- Reduce inconvenience to motorists to allow for planning alternative routes or delaying of trips until conditions improve.
- Reduce congestion and accidents.

Road condition reports containing information on road closures, detours, chain or snow tire requirements or other highway conditions are compiled in the dispatch centers from messages from District Maintenance personnel. Dispatch centers are located at District offices or major District Maintenance stations. During the summer, the regular office staff normally handles dispatching duties.

In the winter, personnel may be added for dispatching duties in some locations so the dispatch center can operate 24 hours a day, 7 days a week.

Information is assembled by dispatchers and disseminated to the public in the following ways:

- Through the 511 Nevada Travel Info phone and web site.
- Using Highway Advisory Radio (HAR) transmitters. HAR transmitters continually broadcast Road Condition Reports (AM frequencies). When HAR transmitters are used, advisory signs should be posted at

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the points where the signal from the station can be received by most AM radios.

- District II reports can also be accessed through AM radio (530 in the Reno-Sparks area; 1610 in the Carson City area).
- Changeable message boards.

Road information is also circulated to the Nevada Highway Patrol dispatch centers and other state maintenance organizations such as the California Department of Transportation.

PUBLIC RELATIONS

The success of maintenance programs is determined by how well other agencies and the public understand these programs. The public relations program assists the Department in providing information that creates a better understanding of the program by the public and other agencies. The Department circulates highway-related information through:

- Press releases.
- Participating in interviews with local radio and television stations.
- Inviting news media representatives to visit projects or program locations to obtain first-hand knowledge of a program or project.
- Allowing news media to ride in snow plows during severe storms. (Arrangements for riding in plow trucks should be made in advance through District Administration.)

- Meetings with interested agencies, civic organizations, businesses, etc.

Public Information Office

The Public Information Officer is responsible for providing information to the news media and assists the districts in providing information.

Employee Responsibilities

The attitude of the public toward the Department is influenced by the actions of Department employees. District Maintenance personnel should keep in mind that they are representatives of the State and the Department. Employees should conduct themselves in a friendly, courteous, and business-like manner in all their activities.

Attendance and participation at local community meetings by District Engineers and other District representatives enhance the Department's image and provides an opportunity to answer questions and explain the Department's position. Often by participating in local community meetings, the District is made aware of problems that previously were not apparent.

Highway Maintenance Supervisors should be encouraged to attend community meetings with the District Engineer or Assistant District Engineer. It is not intended that the Highway Maintenance Supervisor make commitments for the Department, but merely can become aware of local concerns.

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News Media

It is the Department's policy to provide information to the news media as accurately as possible. All employees should be cooperative with members of the news media or others seeking information concerning the Department. Employees should limit their comments to topics about which they are knowledgeable. If questions are asked for which an employee has limited knowledge, they should refer the media representative to a District Engineer, Supervisor or the Public Information Officer. When time and circumstances allow, employees are asked to notify their District Engineer and/or Supervisor and contact the public information office prior to a media interview.

If time does not allow this advance notification, employees may still proceed with the media interview and follow these guidelines:

- **Do not** speculate or discuss topics with which you are not familiar or are not qualified to discuss.
- **Do not** tell the media "No Comment." Instead, refer them to the district office or the Department's Public Information Office.
- **Do not** express opinions while talking with the media. Stick with facts within your specific area of expertise.
- **Do** correct a mistake as soon as possible.
- Remember that media interviews are often a positive opportunity to discuss and educate the public about the important functions NDOT fulfills.

Employees who are interviewed should notify their District Engineer and/or Supervisor and contact the Public Information Office at (775) 888-7000.

Complaint Procedure

The Department has established a complaint procedure intended to standardize the method of resolving complaints received from the public. Complaints are categorized by topic, and the topics are intended to keep District Administration and the Director's Office aware of specific types of complaints and their status.

Complaints for District follow-up are logged on Form 003-001 (Customer Services Work Order) under the following categories:

- **Safety:** Complaints concerning the safety of the traveling public, such as perilous road conditions, inadequate pavement markings, lighting or signing, broken guardrail or personal abuses of regulations or equipment.
- **Roadway and Aesthetics:** Complaints concerning deteriorating conditions that create discomfort or inconvenience for the traveling public. This includes items such as potholes, bumps, time delays, traffic control, litter, visual annoyance, graffiti, vandalism, unsightly landscaping or any rest area concerns.
- **Property Damage and Claims:** Complaints concerning possible property or vehicle damage, which may result in a claim against the Department such as windshield damage, oil on cars, dust problems and damaged mailboxes.

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- Emergency or Hazardous Condition: Complaints concerning serious deterioration, hazards, or situations requiring prompt and extensive actions. This includes natural disasters, road washouts, closures, slope erosion, inadequate drainage or hazardous spills.

Completed forms will be sent to the District office to be recorded and stored per procedures established by each District.

PUBLIC INFORMATION AND AWARENESS

Strategic Highway Safety Plan

Nevada's Strategic Highway Safety Plan (SHSP) is a statewide, comprehensive safety plan that provides a coordinated framework for reducing fatalities and serious injuries on all Nevada public roads by making improvements to and/or raising awareness of the following safety factors:

- Safety belts (always buckle up)
- Impaired driving
- Lane departures (road awareness/distracted driving)
- Intersections (stop on red)
- Motorcycle safety
- Pedestrian safety

The SHSP strategically establishes statewide goals and critical emphasis areas developed in consultation with federal, state, local and private sector safety stakeholders. In addition, several

public outreach campaigns and programs, such as Zero Fatalities, have been established to raise awareness and increase exposure to the SHSP and its goals.

Contact the Traffic Safety Engineering Division for more information on the SHSP.

Give 'Em A Brake Safety Campaign

In conjunction with partner agencies, the Department sponsors Nevada's Zero Fatalities traffic safety campaign, featuring traffic safety messages and more. The Department is also committed to making work zones as safe as possible and has adopted the Give 'em a Brake safety campaign slogan. The Give 'em a Brake safety campaign is a major public information program designed to make motorists more aware of potential dangers when driving through a work zone.

Contact the Traffic Safety Engineering Division for more information on the Give 'em a Brake safety campaign.

511 Nevada Travel Info

The Department's 511 Nevada Travel Info system posts current traffic and road incident, weather and construction reports to the 511 phone number and nvroads.com website.

The service allows Nevada motorists to log onto nvroads.com or dial 511 (or 1-877-NV-ROADS) toll-free, 24 hours a day. With both services, a state route number is selected for automated road conditions, weather forecasts, construction updates, as well as AMBER and other safety alerts when

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available, for designated sections of state roadways.

Contact the Traffic Operations Division for more information on the 511 Nevada Travel Info system.

COMMUNITY INVOLVEMENT

Volunteer Cleanup Groups

Since clean-up of the highway roadside is an important part of the highway maintenance program, the Department encourages community cooperation. In addition to using its own crews and assistance from NDF Inmate crews, the Department allows volunteer groups to assist with roadside cleanup activities. These groups periodically request permission to work along highways to clean specific segments of the highway that are not part of the Adopt-A-Highway program.

Maintenance Supervisors establish work zone traffic control measures as needed.

Permission should be granted in writing by the District or Assistant District Engineer, using Form 725 (Revocable Application and Permit for Occupancy of Nevada Department of Transportation Right-of-Way; the District Engineer or Assistant District Engineer can waive the permit fee.)

The Department typically provides:

- Safety orange vests and hats, (vests to be returned upon completion of the project).
- Garbage bags.

- Traffic control signs (to be returned upon completion of the project).
- Department employees to haul the collected debris to the dump. Since work by volunteer groups is normally performed on weekends, District Maintenance workers may pick up the debris on the following workday.

Community involvement may also include granting approval for an organization to landscape and maintain a section of highway. The landscaping should be covered by Form 725 and should conform to Department requirements.

Adopt-A-Highway Program

The Adopt-A-Highway program was started in Nevada to encourage volunteer groups to assist in cleaning Nevada's roadsides on a scheduled basis.

The program assists the Department by:

- Increasing public awareness of problems and appealing to community values and pride.
- Saving taxpayer dollars by supplementing Department resources.
- Operating with a minimum of governmental red tape and with minimum supervision by the Department.
- Freeing District Maintenance crews from dealing with the maintenance of pavement, structures, safety facilities and drainage.

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Prior to allowing an organization to formally adopt a section of highway, the Department and program participants execute an agreement in which the business or group and the Department's responsibilities are outlined.

Contact the Customer Service Office for more information on the Adopt-A-Highway program.

Sponsor-A-Highway Program

The Sponsor-A-Highway program involves a commercial firm (provider) performing litter removal while under contract to private firms or entities who are rewarded by being recognized for their highway beautification contribution through the placement of blue acknowledgment signs showing the firm's name and logo placed at the beginning of their sponsored segment of highway.

Costs of services provided under the Sponsor-A-Highway program are paid by sponsoring private entities seeking public recognition and goodwill for their efforts to beautify a highly visible, high traffic volume highway in a community in which they are operating. Levels of services and length of sponsored segments are the primary variables affecting a provider's cost of operation and a sponsor's cost of sponsorship.

Providers set sponsorship costs at a level that will cover their cost of operations and return a reasonable profit.

Contact the Customer Service Office for more information on the Sponsor-A-Highway program.

Highway LOGO Sign Program

The LOGO Sign Program provides directional guidance and information at interchanges and locations on Nevada highways where eligible service facilities provide gas, food, lodging, camping, attractions and services are located.

LOGO placards are placed on sign panels that are posted at locations in advance of interchanges and intersections. Each business is charged a fee for the placement of its service placard. The LOGO Sign Program also promotes safety by providing notice of specific services at each interchange.

Contact the Customer Service Office for more information on the LOGO Sign Program.

CHAPTER 8: EQUIPMENT

This chapter covers licensed and non-licensed equipment, operational procedures, renting and leasing of equipment, use of state vehicles, accidents involving Department vehicles, lost or stolen equipment, and transfer of equipment.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

NDOT LICENSED EQUIPMENT

- Licensed equipment is any self-propelled or towed vehicle owned by the Department which has a license plate and for which District Maintenance crews and other users are assessed an hourly rental rate. All licensed equipment is purchased through the Equipment Division and assigned to various divisions within the Department as needs dictate. Recently purchased non-licensed equipment is assigned a (FA) Fixed Asset inventory number and will be inventoried in accordance with Part III, Chapter 2, "Acquisition and Disposal of Equipment and Materials".

Refer to the *Maintenance Management System Manual of Instructions* for coding to the Maintenance Management System (MMS).

Equipment List

Class	Description
01	Sedan & SUV
03	Pickups (3/4 Ton) & (1 Ton)
04	Van
05	Pickup (1/2 Ton)
08	Miscellaneous Maintenance Units for Class 8 (Air Compressor, ATV, Cement Mixer, Concrete Saw, Fertilizer Injector Unit, Forklift, Herbicide Spray Trailer, Light
10	Crew Cab
11	Miscellaneous Maintenance Units for Class 11 (Aerial Lift Truck, Button Truck, Compactor Truck, Crane Truck, Flat Rack Truck with or without Attenuator, Flat Rack Truck with or without Lift Gate, Herbicide Spray Truck, Lube Truck, Service-Utility Truck, 1 Ton Dump Truck)
12	Single Axle Dump Truck W or WO Attenuator
13	Tandem Axle Dump Truck W or WO Attenuator
14	Transport
15	All Wheel Drive Dump Truck
20	Culvert Cleaner Truck, Trailer Mounted, Tunnel Washer
21	Self-Propelled Broom/Pull Broom
24	Street Sweeper & Vacuum Broom
25	Water Truck
28	Distributor Truck & Asphalt Patch Truck
30	Distributor Trailer
31	Motor Grader
33	Pulvimixer
35	Loader/Skid Steer
37	Conveyor
40	Crack Filling Machine

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Class	Description
41	Mowers, Chippers
42	Rotary Snow Blower
45	Steel Wheel Roller
47	Pneumatic Roller
48	Grade-All
54	Rubber Tired Tractor & Backhoe
55	Dozer/Snow Cat, Excavator
60	Trailer (Cargo, Tilt, Wren Tail, Side Dump, Fuel/Lube, Tow Plow)
63	Sign Trailer, Arrow Board, Programmable Message Board, Trailer Mounted Arrow Board with Attenuator
66	Chip Spreader
66A	Maintenance Grinder-Paver (Leeboy), Layton Paver, Asphalt Recycler
70A	Auger Truck, Guardrail Truck with Auger
72	Lab Trailer (Portable)
77	Paint Striper
81	Cold Planer (Roadtech RX60), Asphalt Zipper
83	Bridge Inspection Truck

Equipment Acquisition Criteria

The Equipment Division is responsible for acquisition of new equipment. Acquisition of equipment is carried out in conjunction with recommendations of the Specifications Committee unless directed otherwise by the Director's Office.

The Specifications Committee meets annually, prior to submitting the bid document, to review specification packets, make recommendations to improve the function, performance and quality of NDOT-licensed equipment and take/keep meeting minutes. The committee consists of representatives from:

- Each District.

- Each major user division.
- The Equipment Division.

Fiscal limitations may prohibit the Department from following some of the committee's recommendations.

Equipment Replacement List

Each year, the Equipment Division prepares, by class code, a list of equipment recommended for replacement during a given budget period. The list includes:

- Equipment class code.
- Equipment description.
- Priority number.
- Turn in unit number.
- Turn in unit class code.
- Make and year of turn in unit.
- Current miles or engine hours.
- Special equipment description where applicable.
- GVW rating when applicable.
- Location.
- Estimated replacement cost.

Upon completing its list of recommended replacements, the Equipment Division meets with each district and major user division. When all districts and user divisions have provided their input, a master list is compiled and submitted to the Director's

EQUIPMENT

Office for approval. Upon approval, the Equipment Division forwards the list to State Purchasing.

Equipment Replacement Criteria

Criteria for NDOT-licensed equipment replacement are based on the number of miles or hours, age, downtime, excessive repair/recapitalization cost and parts availability.

Mileage, hour and age guidelines for replacement are as follows:

Class	Description	Miles/ Hours	Months
10	Welder, Windrow Seizer, Scissor Lift-Electric)	150,000	96
11	Crew Cab Diesel Powered	200,000	144
11	Miscellaneous Maintenance Units for Class 11	150,000	96
	Diesel Powered (Aerial Lift Truck, Button Truck, Compactor Truck, Crane Truck, Flat Rack Truck with or without Attenuator, Flat Rack Truck with or without Lift Gate, Herbicide Spray Truck, Lube Truck, Service-Utility Truck, 1 Ton Dump Truck)	200,000	144
01	Sedan & SUV Purchased after FY03	100,000	96
03	Pickups (3/4 Ton) & (1 Ton) Diesel Powered	150,000	96
04	Van Diesel Powered	200,000	144
05	Pickup (1/2-Ton)	150,000	96
08	(Air Compressor, ATV, Cement Mixer, Concrete Saw, Fertilizer Injector Unit, Forklift, Herbicide Spray Trailer, Light Tower, Litter Pickup Machine, LPG Weed Burner, Portable Toilet, Pugmill Mixer, Roadside Rest Washer, Road Widener, Small Water Tank Trailer, Tool Cat, Trailer Mounted Welder, Windrow Seizer, Scissor Lift-Electric)	180	
12	Single Axle Dump Truck W or WO Attenuator	200,000	144
13	Purchased after FY03 Tandem Axle Dump Truck W or WO Attenuator	250,000	180
14	Purchased after FY03 Transport	400,000	180
15	Purchased after FY03 All Wheel Drive Dump Truck	5,000	180
20	Culvert Cleaner Truck, Trailer Mounted, Tunnel Washer		180
21	Self-Propelled Broom/Pull Broom	8,000	120
24	Street Sweeper & Vacuum Broom		72

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Class	Description	Miles/ Hours	Months	Class	Description	Miles/ Hours	Months
25	Water Truck Purchased after FY03	200,000 250,000	180 240	81	Cold Planer (Roadtech RX60), Asphalt Zipper		240
28	Distributor Truck & Asphalt Patch Truck		240	83	Bridge Inspection Truck	300,000	240
30	Distributor Trailer		180	Operator Requirements			
31	Motor Grader Purchased after FY03	6,000 10,000	204 300	All equipment operators are required to:			
33	Pulvimixer		360	<ul style="list-style-type: none"> • Carry a valid driver's license or CDL with appropriate endorsements. • Perform required pre-trip and post-trip inspections of equipment and complete required forms. • Detect and report the first signs of faulty or damaged equipment to the supervisor. • Follow appropriate lubrication schedules when servicing equipment. • When so trained, perform minor repairs and adjustments such as: <ul style="list-style-type: none"> ○ Changing light bulbs, fuses and lenses. ○ Replacing battery, cables and cleaning battery connections. ○ Replacing wiper blades. • Mark the end of any load projecting 4 feet or more beyond the end of a vehicle with an appropriate warning device in accordance with traffic laws. • Secure loads in accordance with approved procedures. 			
35	Loader/Skid Steer Purchased after FY03	5,000 7,500	204 240				
37	Conveyor		360				
40	Crack Filling Machine		120				
41	Mowers, Chippers		180				
42	Rotary Snow Blower	6,000	300				
45	Steel Wheel Roller	5,000	240				
47	Pneumatic Roller	5,000	240				
48	Grade-All		300				
54	Rubber Tired Tractor & Backhoe		240				
55	Dozer/Snow Cat, Excavator		300				
60	Trailer, Cargo, Tilt, Wren Tail, Side Dump, Fuel/Lube Trailer, Tow Plow		204				
63	Sign Trailer, Arrow Board, Programmable Message Board, Trailer Mounted Arrow Board with Attenuator		360 180 144 180				
66	Chip Spreader		180				
66A	Maintenance Grinder-Paver (Leeboy), Layton Paver		240				
70A	Auger Truck, Guardrail Truck with Auger		240				
72	Lab Trailer (Portable)		240				
77	Paint Striper Purchased after FY03		240				
		250,000	240				

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- Ensure that an over dimensional permit is present in a vehicle when required.
- Lock equipment left outside or unattended.
- Record any accident or incident information, if needed.
- Follow the Wheel Chock Policy (TP 1-1-13).
- Follow State of Nevada and Federal policy for placard vehicles.

For more information, refer to TP 1-6-19 and TP 1-6-20.

Pre-Trip, Post-Trip Inspections

These inspections ensure that equipment is reviewed on a daily basis. Pre- and post-trip inspections are performed by any employee operating equipment and include checking items such as:

- Visible signs of damage or vandalism.
- Fuel, water and oil levels and the condition of water and oil.
- Engine and drive train areas for leaks.
- Instruments to verify that they are functioning properly.
- Safety devices (e.g., seat belts, mirrors, horns, backup alarms, turn signals, lights and windshield wipers).
- Clutch and brakes to verify function.

- Steering, for looseness and response to steering wheel.
- Tires, for air pressure, wear, damage and loose lug nuts.
- The cab equipment cleanliness, inside and outside.
- Flares or reflectors.

Equipment Safety

Equipment operators are responsible for observing safety rules, which include:

- Using extreme caution when approaching children, pedestrians, bicyclists or other road hazards.
- When fueling, turning off the engine, extinguishing cigarettes and ensuring that fuel does not overflow.
- The use of seat belts, when operating equipment so equipped.
- Setting the parking brake, engaging the transmission in its lowest gear or in Park, and chocking the vehicle according to TP 1-1-13.
- Lowering the blade, bucket, plow, etc., to the ground when parking construction equipment.
- Operating equipment within legal speed limits and the manufacturer's rated speed limits.
- Physically checking behind the vehicle to ensure the area is clear or obtaining the help of a co-worker as an observer/spotter.

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- Leaving a reasonable distance between vehicles when parking vehicles in a line.
- Striving to park in areas that provide adequate distance to safely re-enter a traffic lane.
- Using safety devices, such as warning lights and four-way flashers, and moving as far as possible to the right side of the road when operating slow-moving equipment.
- When towing equipment, being certain that the hitch and lights are functioning properly on both vehicles and that safety chains are properly connected.
- Not towing equipment at highway posted speeds unless the towed unit is equipped with brakes controlled by the towing unit.
- Not allowing employees to ride in the beds of trucks or on the outside of vehicles when the vehicle is moving in excess of 5 mph unless they are riding in an approved safety protected device.
- Use of lights during daylight when visibility is poor.
- Crossing medians at constructed crossovers only.

Operators are cautioned to use good judgment, common sense and to follow Department-approved procedures when operating NDOT vehicles.

Statewide Equipment

Statewide equipment is licensed equipment purchased for a specific purpose and assigned to the Maintenance and Asset Management Division (Headquarters Maintenance). Statewide equipment includes:

- Cold planer/surface grinder.
- Grade-All excavator.

Requests for the cold planer/surface grinder and Grade-All must be sent to Maintenance and Asset Management Division and coordinated with the Equipment Division to confirm availability.

Service and Repair

The service and repair of NDOT equipment is performed at the District equipment shops located at the District complexes, major maintenance stations and maintenance stations where equipment mechanics are assigned (e.g., Fallon, Wells and Alamo). In addition, the Reno equipment shop is responsible for:

- Major repair work from all districts.
- Retrofitting of new equipment prior to statewide distribution.
- Rebuilding equipment, engines and transmissions.

District Responsibilities

Equipment servicing and repair responsibilities of the districts include:

- Administration of the District shops.

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- Scheduling equipment for servicing in accordance with the Department's Preventative Maintenance Program.
- Providing coordination with Highway Maintenance Supervisors to ensure that equipment is being repaired and serviced in accordance with their work schedules.
- Coordinating major repair work with the Reno equipment shop so that results are timely and maintenance operations are not restricted because of the lack of equipment.
- Coordinating the repair and servicing responsibilities for statewide equipment with the Reno repair shop.
- Ensuring that all repair and servicing documents are sent to the Equipment Division for input into appropriate cost tracking systems.
- Providing instruction to appropriate field personnel on the Preventative Maintenance Program.
- Monitoring field records to ensure compliance with the Preventative Maintenance Program.
- Revising preventative maintenance procedures.
- Providing equipment servicing and operation manuals to the districts.

NDOT NON-LICENSED EQUIPMENT

Non-licensed equipment is all equipment other than self-propelled and towed vehicles with license plates. Examples of non-licensed equipment include snow plows, sanders, jackhammers, vibratory compactors, welding torches, desks, file cabinets and lockers.

District Responsibilities

Each District's responsibilities for non-licensed equipment include:

Equipment Division Responsibilities

Equipment servicing and repair responsibilities of the Equipment Division include:

- Requesting training programs for repair and service personnel.
- Providing guidance in documenting service records.
- Monitoring repair order documentation to ensure compliance with Equipment Division procedures.
- Assisting service personnel in obtaining up-to-date equipment servicing information.
- Soliciting non-licensed equipment needs from maintenance supervisors.
- Prioritizing non-licensed equipment requests for submission to Headquarters Maintenance and the Financial Management Division.
- Completing Form 072-002 (Combination Request for Supplies, Equipment and Shipping Record, or "Form 51") and submitting them to the Equipment Division for purchase.

Supervisor Responsibilities

Supervisor I's and Supervisor II's are responsible for the care, use and storage of non-licensed equipment.

Equipment Division Responsibilities

The Equipment Division's responsibilities for non-licensed equipment include:

- Preparing specifications and purchase orders.
- Checking new equipment to ensure that it meets specifications.
- Checking equipment to ensure that it was not damaged in shipment.
- Pursuing replacements for damaged or lost non-rental equipment.

RENTING OR LEASING EQUIPMENT FROM OTHERS

Specialized or additional equipment is periodically needed to augment Department equipment. Department policy allows District Maintenance crews to rent or lease equipment when needs dictate. Equipment should be rented from outside sources only when it is not available from other sources within the Department and it is not practical to delay the work until Department equipment is available. Renting or leasing of equipment shall be through the Equipment Division and in accordance with the following guidelines:

- When an emergency situation exists and an Equipment Division employee cannot be reached, the equipment may be rented; however,

it is the District Engineer's responsibility to inform the Equipment Division as soon as possible.

- All requests for rental equipment should be submitted in writing to the Equipment Superintendent at least 10 days prior to need, except in emergency situations. Requests should include the type of equipment to be rented, the duration and location of the anticipated use, the nature of the task to be performed and an explanation of why the proposed rental is necessary to achieve the program goals.
- Equipment types not included under the NDOT Equipment Training and Certification Program are rented with a designated certified operator (DCO), and an owner-operator rental agreement is used.
- Rental contract agreements shall clearly indicate the maintenance, repair and insurance requirements of the contracting parties during the term of the agreement and shall be on the form approved by the Office of the Attorney General, Division of Transportation.
- In the selection of a rental source, obtain a minimum of three quotes. Quotes shall be documented and kept on file.
- All equipment rentals from outside sources shall be paid with an Equipment Division purchase order.

District Responsibilities

- Reviewing the work program and submitting rental requests to the

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Equipment Division and Headquarters Maintenance.

- Assisting the Equipment Division by suggesting rental sources for specific equipment.
- Ensuring that operators of rented or leased equipment are properly certified.
- Securing approval from the Equipment Division to rent equipment in an emergency situation; if the District is unable to contact a representative of the Equipment Division, the equipment may be rented. District representatives are responsible for contacting the Equipment Division as soon as possible.
- Ensuring that rented or leased equipment is properly maintained and promptly returned to the rental firm.
- Notifying the Equipment Division of breakdowns.
- Including a request for funding in the budget requests if the need for rental or leased equipment appears to be substantial.
- Providing the Equipment Division with information relative to usage times (on the prescribed forms) as soon as equipment is returned.

Equipment Division Responsibilities

- Providing timely responses to requests for rental equipment.

- Providing an Equipment Division representative to assist District personnel in locating and renting equipment during off-hours.
- Initiating agreements and securing appropriate approvals for the rental.
- Processing final payment to rental firms.

RENTING STATE EQUIPMENT TO OTHERS

Under some circumstances, the Department may rent equipment to other governmental entities. Rental of equipment to these entities should comply with the following guidelines:

- An emergency situation exists and suitable equipment is not available from outside sources. (District representatives will ensure there is no conflict with private enterprise.)
- NDOT equipment shall be rented with a DCO.
- NDOT will bill the entity at the Department's rental rate for the equipment plus the cost of labor with markups.
- The rental of a particular piece of equipment will not jeopardize an NDOT project.
- Rental periods shall be limited to short time periods.
- The District Engineer or Assistant District Engineer will review the request and make a recommendation to the Director.

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- The Director's Office approves the rental request.

During an incident/emergency, such as a fire, and the request for equipment is initiated by the Nevada Division of Forestry (NDF), the District Engineer, Assistant District Engineer or Highway Maintenance Manager may dispatch equipment and operators to the location designated by the NDF.

When equipment is dispatched, the Director's Office shall be notified as soon as reasonably possible.

When equipment is rented to NDF, the District is responsible for:

- Monitoring NDOT equipment usage to ensure that it is being used in a manner that provides for the safety of Department employees.
- Scheduling the rotation of operators to maintain reasonable shifts.
- Meeting with NDF representatives to ensure that NDOT operators and equipment are returned to NDOT projects at the earliest reasonable time.
- Assembling documentation on equipment, labor and materials and preparing billing.

USE OF STATE VEHICLES

Each year, the District Engineer submits a list of employees who are recommended to drive NDOT vehicles home. The recommendations must be based on the following guidelines, and they are reviewed and shall be approved by the Department Director and the State Budget Director:

- The employee is on-call and is required to respond on a 24-hour basis to problems that involve the safety of the traveling public. These include:
 - Natural disasters.
 - Debris cleanup.
 - Accidents.
 - Hazardous material spills.
 - Civil defense.
 - Traffic safety devices.
- To accomplish the maintenance tasks, the NDOT vehicle is necessary for:
 - Identification purposes.
 - Communications.
 - Use of vehicle safety devices.
- The employee has a personal telephone, which is listed with the District road operations/traffic center, so that the employee can be contacted for emergencies during off-hours. Phone numbers are maintained by the District's road

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operations/traffic management center.

- Only one individual from any crew may be allowed to take a vehicle home. (These persons do not include employees who provide support functions for NDOT operations such as mechanics and building tradesmen.)
- Personal use of Department-owned vehicles or equipment is not allowed.
- The Internal Revenue Service has determined that each employee who takes a vehicle home is receiving additional compensation; therefore, a \$3 per day vehicle charge is included on the employee's W-2 at the end of each year.

Stolen or Lost Equipment

The responsibility for safeguarding equipment from theft or vandalism rests primarily with the Highway Maintenance Supervisor I. The Supervisor I may delegate the security responsibilities to members of the crew. When theft or vandalism occurs to Department equipment, the following procedures should be followed to ensure that there will not be a reoccurrence and that law enforcement officials have the best opportunity to recover stolen items:

- Stolen or lost equipment should be promptly reported to the immediate supervisor.
- The Highway Maintenance Supervisor II should be notified of stolen or lost item(s) as soon as possible.

- Stolen items should be reported to the local law enforcement agency. If the theft is in doubt, the Highway Maintenance Supervisor II will determine the need for reporting to the local law enforcement agency.
- If it is suspected that something has been stolen or purposely broken, an attempt should be made not to touch anything on the equipment.
- If the incident is investigated by a law enforcement agency, a copy of its report should be forwarded through the Highway Maintenance Manager to the Assistant District Engineer and Equipment Superintendent.
- Provide law enforcement representatives with all available information relative to the incident.
- If the incident does not warrant an investigation by a law enforcement agency, the Highway Maintenance Supervisor II should prepare a report for the Highway Maintenance Manager.

Vehicle Accidents

Accidents, which in any way involve state-owned motor vehicles or a private vehicle being used for state business, must be promptly reported to:

- An immediate supervisor and the District Administration office.
- The Nevada Highway Patrol or other local law enforcement agency.
- The District Training Officer or Equipment Operation Instructor.

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- The Equipment Division.
- The Office of the Attorney General, Division of Transportation.

In addition, the employee shall not move the vehicle (unless it presents a hazard if left in place) and resolve any traffic citation or moving violation issued as a result of the accident.

If the employee was transported to the hospital and/or the vehicle was towed from the scene, contact Human Resources Division's Safety and Loss Control Section.

Department employees are not to discuss an accident with anyone other than law enforcement officials or members of the Department's investigating team or the Office of the Attorney General, Division of Transportation. The employee should report all information relative to the accident, including statements made by other parties involved in the accident, photos and videos.

Under no circumstances should a state employee make a private settlement with the adverse party. An employee involved in an accident should not discuss conditions of an accident with the adverse party or his representative, nor should the employee commit the state to repair any damage.

In no case, shall the employee tell the other party that the state will initiate action toward making repairs to the vehicle or property of the adverse party.

The employee may furnish the following information to the other party:

- Driver's name and license number

- License and ID numbers of the Department vehicle
- Name of vehicle owner (NDOT) and registration documents (in vehicle)
- Phone number of the Equipment Superintendent (775-834-8400)

If an employee receives any communication relating to damage to another party's vehicle in which an employee may have been involved, it should be immediately forwarded to the District Administration office.

Form A078-001 (Vehicle Accident, Incident & Damage Report) shall be completed, showing the names of drivers of the vehicles involved, the names of the witnesses, statements by drivers and a description of how the accident occurred. Statements from witnesses should be submitted on separate sheets. It is essential that the reports show the actual location of an accident, direction of travel of the vehicle(s), date, hour and weather conditions.

The District Training Officer or Equipment Operation Instructor and possibly the Office of the Attorney General, Division of Transportation, should investigate the accident.

For motor vehicle accidents involving an injury to a Department employee, refer to Part II, Chapter 3 under "Work-related Injuries" and TP 1-6-16.

For more information regarding vehicle accidents and employee responsibilities, refer to TP 1-6-15.

TRANSFER OF EQUIPMENT

Permanent transfer of equipment from one division to another for any reason requires completion of a transfer ticket. The purpose of the transfer ticket is to maintain an up-to-date inventory of equipment locations. Short-term transfers of a few days do not require the completion of a transfer ticket.

When a unit is transferred from one division to another, the responsible individual (usually the Highway Maintenance Manager) will complete Form 072-006 (Property Transfer Form), which shows the change of assignment. If a new unit is replacing an existing unit, shop personnel are responsible for completing the transfer form.

CHAPTER 9: MAINTENANCE FACILITIES

This chapter covers maintenance stations, their maintenance and upkeep, and safety inspections.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

MAINTENANCE STATIONS

Maintenance stations are District facilities that vary dramatically in degree of complexity, type, function and number of buildings.

Major Maintenance Stations

Major maintenance stations consist of multiple maintenance crews and serve as a location for equipment repairs beyond routine maintenance. Depending on their complexity and size, major maintenance stations may provide equipment repair facilities, stockroom facilities, testing facilities, equipment/storage facilities and/or administrative support for all District operations.

Major maintenance stations include:

- District Administration maintenance stations in Las Vegas (District I), Reno (District II) Elko (District III).
- Sub-district maintenance stations in Tonopah (District I), Ely (District III) and Winnemucca (District III).
- Maintenance yards in Las Vegas South (District I), Carson City (District II), Fallon (District II) and Wells (District III).

Minor Maintenance Stations

Minor maintenance stations are similar to major maintenance stations, but they do **not** meet at least one of the following criteria:

- Accommodate multiple maintenance crews.
- Perform equipment repairs beyond routine maintenance.

Minor maintenance stations can be manned or unmanned.

Maintenance Station Buildings, Facilities

Crew Office/Area Building

Crew areas vary considerably. They may consist of a detached office building or are a portion of a storage or equipment repair building.

Equipment Repair Buildings

The primary building in a maintenance station usually functions as an equipment repair and storage facility. Some rural maintenance stations have facilities that include hoists and additional lighting so that field mechanics have a suitable place to service and repair equipment. These buildings are normally heated. A crew area may be included in this building.

Fuel Depot

Each maintenance station has facilities for dispensing fuels and storing motor oils. Due to the nature of the materials stored and dispensed from these buildings, use extreme care in order to prevent spills.

Most maintenance stations also include one or more of the following facilities.

Equipment Storage Buildings

Equipment storage buildings are constructed to house maintenance equipment, provide for vehicle security and enhance vehicle life.

Depending on location and use, these buildings may have heating systems. Unheated buildings are referred to as "cold storage".

Materials Storage Buildings

These buildings are used for storage of materials and supplies such as traffic control devices, fencing materials, guideposts, crack-filling material or salt and sand.

Offsite Materials Storage/Stockpile Areas

Offsite material storage/stockpile areas are small, operational extensions of their parent maintenance station(s) that stockpile various Department materials.

Pump House

Since many maintenance stations are located in rural areas, their water sources are wells. This building typically houses the pump and water storage tank that serves the station.

Residences

In order to attract employees to work and live at remote locations where private housing is not reasonably available, the Department leases Department-owned residences or mobile home spaces to employees and their families. These residences are located within the confines of a maintenance station.

Miscellaneous Facilities

Facilities such as loading ramps, asphalt storage tanks, aggregate storage areas, and materials testing laboratories may be present.

DIVISION RESPONSIBILITIES**Maintenance and Asset Management Division Responsibilities**

Proposed building capital improvement requests are submitted to the Architecture Section for review, prioritization and transmittal to management. For more information on the Building Capital Improvements Program, refer to Transportation Policy (TP) 1-3-6.

The Architecture Section is also available, upon request, to assist in other construction, maintenance, and repair, and/or remodel projects that are not part of the Building Capital Improvements Program.

Architecture Section responsibilities include:

- Assembling a list of proposed capital improvement projects.
- Estimating project costs.

MAINTENANCE FACILITIES

- Reviewing proposed capital improvements with each District Engineer, the Chief Maintenance and Asset Management Engineer and the Deputy Director.
- Ensuring compliance with all adopted codes.
- Providing contract documents and specifications.
- Inspection of work for compliance with contract documents.
- Providing contractors and building inspection services.
- Capital improvements include the construction, maintenance, repair and/or remodel of new and existing buildings estimated to cost more than \$2500.
- Reviewing loss or damage facility reports from the districts and taking appropriate action to secure insurance reimbursement if applicable.
- Letting bids for construction contracts.
- Hiring and negotiating with private consultants, construction contractors, suppliers and trade professionals.
- Reviewing plans and specifications for building and remodeling projects and for periodic inspections of projects to ensure that the facilities are functional.
- Serving as a liaison between districts and the applicable State and Federal

permitting agencies and/or local planning agencies to ensure that the proper permits and authorization are obtained. (Examples of State and Federal agencies include but are not limited to the State of Nevada Public Works Division, the Nevada State Fire Marshal and the U.S. Army Corps of Engineers; local planning agency authority is limited to the provisions of NRS 278.)

District Responsibilities

District Maintenance staff responsibilities at maintenance stations include:

- Routine building maintenance and upkeep.
- Routine safety inspections.
- Station security.
- Obtaining water samples for public facilities not served by a municipal water system.
- Submitting water samples for testing and for taking appropriate steps if the water does not meet standards.
- Notifying the Architecture Section of any loss or damage to Department facilities.
- Submitting to the Architecture Section, no later than February 1 of each legislative year, a list of requested capital improvements for the biennium.
- Budgeting, funding and obtaining permits (as needed) for small building repairs, replacement of

MAINTENANCE FACILITIES

equipment, remodeling or maintenance with an estimated cost of \$2,500 or less. (Refer to Part III, Chapter 5 under "State of Nevada Public Works Division" for more information.)

- Coordinating with the Architectural Section for remodels, repairs and the replacement of equipment to ensure that all code requirements are met.
- Preparing Purchase Order and Voucher Payable forms (Form 060-067) and paying for work totaling \$2,500 or less.
- Follow the applicable Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) when performing certain tasks. Refer to Part IV, Chapter 6 under "Install /Repair/Replace Pollution Prevention Devices (Task No. 131.09.01)" or Part IV, Chapter 14 "Install /Repair/Replace Stockpile Pollution Prevention Devices (Task No. 270.07.01)" for more information.

MAINTENANCE STATION SAFETY**Station/Yard Safety Inspections**

Periodically, the Safety and Loss Control Section of the Human Resources Division schedules station inspections to check District Maintenance station upkeep and to check for safety hazards.

When inspections are made, District representatives should accompany the individuals from the Safety and Loss Control Section. Any defects found should be corrected as soon as possible. In the case of major defects,

interim measures should be taken until the defect is corrected. In some cases, major work may require the assistance from the Architecture Section in order to fund and properly correct a problem.

The State of Nevada Department of Labor's Safety Consultation and Training Section (SCATS) may assist the Safety and Loss Control Section to conduct safety or health surveys at all facility shops, garages and equipment storage buildings for compliance with OSHA regulations.

Environmental Inspections

The Environmental Services Division inspects each maintenance station to review proper water disposal systems, oil/fuel collection and disposal systems, and all hazardous waste collection. This includes storage, transport and disposal methods.

The Stormwater Division inspects maintenance stations for compliance with the Facilities Pollution Prevention Plans (FPPP's) and BMP implementation procedures. Inspection areas include material storage, equipment storage, on-site waste storage and disposal, and site discharge locations.

Underground Storage Tank Inspections

The Department has several underground storage tanks (USTs) as part of the fuel delivery system. All users of the NDOT fuel system are required to be trained as operators and comply with the national and state requirements.

The USTs are regulated by federal and state code, and the UST program is

administered by the Nevada Department of Environmental Protection (NDEP, a division of the State of Nevada Department of Conservation and Natural Resources). Routine UST inspections are conducted by the Clark County Health District and Washoe County District Health Department in their respective jurisdiction, and by the NDEP in all other counties. Any non-conformances resulting from a UST inspection are managed by the NDEP's Bureau of Corrective Actions.

State Fire Inspections

The Nevada State Fire Marshal performs routine, annual inspections of maintenance stations to determine the extent of compliance with the provisions of all laws or regulations adopted by the State to protect employees, the general public and property against fire. Inspections include all emergency exit lighting, sprinklers, and fire extinguishers, open penetration in walls and Americans with Disabilities Act (ADA) compliance issues. Inspections are of critical importance as they aid in the development of future request for capital improvement funding.

If any property fails to comply with an order of the State Fire Marshal for any change within 30 days, the Fire Marshal will report any failure to the State Public Works Division, which shall take the necessary steps to correct the situation.

CHAPTER 10: AGREEMENTS AND CONTRACTS

This chapter covers all types of highway agreements including contracts, permits, leases and licenses. A Highway Agreement is a legal document that binds the contracting parties to the terms, conditions and responsibilities in the agreement.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

DEPARTMENT AUTHORITY

Chapters 333 and 408 of the Nevada Revised Statutes (NRS) provide the Department with authority to enter into contracts and agreements with private entities and local agencies, and permits delegation of the Department's maintenance responsibilities on selected portions of state highways.

For information regarding agreement types and agreement numbers, refer to Part III, Chapter 1 "Accounting and Budgeting". The Agreement Coordinator assigns Service Provider Agreement numbers to the agreement after the document has been executed.

EMERGENCY CONTRACTS

NRS 408.323 provides that under emergency conditions, the Director may, with the approval of the Transportation Board, arrange to reroute, repair or replace any highway threatened or damaged by an event and the provisions of NRS 408.327 and 408.367 do not apply. Contact your District Agreement Liaison for more information.

INFORMAL CONTRACTS

Informal contracts can be used for projects not exceeding \$250,000 when approved by the Director. In accordance with NRS 408.367, the Director, with

approval of the Transportation Board, may receive informal bids and award contracts for highway construction, reconstruction, improvements, and maintenance on projects under the following conditions:

- If the estimated cost of the project is \$50,000 or less, solicit a bid from at least one properly licensed contractor per NRS 408.367. Contact your District Agreement Liaison for more information.
- If the estimated cost of the project is more than \$50,000 but not more than \$250,000, solicit bids from at least three properly licensed contractors per NRS 408.367. Contact your District Agreement Liaison for more information.

Informal contracts require preparation of plans and specifications to describe the work and the requirements. Bonding is required. Informal contracts usually require less time from inception to bid opening, since priorities for preparing contract documents are established in the District and the contract plans and specifications are less complex. Informal contracts result in lower costs when compared to the cost of a formal contract for the same work. Work normally bid under the formal bid procedure requires formalized plans, specifications and other requirements,

all of which require additional time and staff involvement.

Informal contracts have been used for:

- Rest area maintenance.
- Barrier rail repair.
- Constructing sander stands.
- Electrical installations.
- Drainage structure repairs.

Contract Requirements

Informal contracts require:

- Funding within the budget.
- Approval of the Director.
- Plans and specifications:
 - Solicit at least three potential contractors for contracts up to and not exceeding \$250,000 per NRS 408.367. (Contact your District Agreement Liaison for more information.)
 - Solicit at least one potential contractor for contracts \$50,000 or less per NRS 408.367. Please contact your District Agreement Liaison for more information.
- Bid opening and award.
- Bonding and insurance.
- A Service Provider Agreement.
- Monitoring of work progress.

- Payment to the contractor.

District Betterment Contracts

District Betterment contracts are a type of informal contract. Requested and approved district betterment work to be accomplished by contract can be either a District Contract or a Headquarters Contract. For a District Contract, funding can be in the District's betterment project budget developed at the District Administration office. It can also be developed by the Maintenance and Asset Management Division (Headquarters Maintenance) with funding placed in the Building Capital Improvement category of the Headquarters Maintenance budget. More complex projects, upon approval, can be a Headquarters Contract, where they will be scheduled with the Roadway Design Section and follow normal contract procedures as noted above. Contact your District Agreement Liaison for more information.

Funding

The District's work program should include anticipated informal contracts. Unanticipated projects will be justified and receive the Director's approval prior to beginning plans and specifications as the work may require a budget augmentation. Contact your District Agreement Liaison for more information.

Plans and Specifications

Once funds are included in the budget, the next step is to define the limits of work and its requirements so plans can be prepared.

Plans are normally prepared at the District level; however, the Design

Division can assist the District with plan preparation.

When drafting specifications, the Specifications Section of the Roadway Design Division and the Environmental Services Division should be contacted to:

- Solicit ideas on the number of working days for the particular project.
- Obtain the latest price information for preparation of a realistic cost estimate.
- Solicit ideas for drafting specifications for particular bid items. Previously drafted specifications may be adapted to the district project.
- Obtain information and guidance on environmental concerns.

Copies of bid proposals, bidder affidavits(s), blank contracts, contractor's bond documents and additional provisions can be obtained from the District Agreement Liaison. Minimum prevailing wage rates are not required for projects less than \$100,000 in accordance with the NRS.

All documents should be assembled into a bid package. For guidance on assembling the Informal Contract Bid Package, contact your District Agreement Liaison.

All documents are submitted to the District Agreement Liaison for a Final Bid Package to be sent to potential contractors.

Bid Opening and Award

The bid opening date must be established and included in the special provisions and advertisement document. As bids are delivered to the District Administration office, the District Agreement Liaison will make provisions to:

- Establish a method of documenting the identity of the firm picking up the bid packets as well as the time and date. As bids are returned to the District Administration office, they should be logged in with the same information.
- Alert office staff so sealed bids are not mistakenly opened with the regular mail.
- Place all sealed bids in a secure place until the specified date and time of bid opening.

The District Agreement Liaison should open the bids at the designated time. If bidders are present, unofficial bid results can be announced. The person opening the bids should make it clear that the information is unofficial and that bid documents must be checked for accuracy and compliance with contract provisions before the low bid can be determined.

Bid documents should be checked against the engineer's estimate and the results provided to the District Engineer or Assistant District Engineer for approval.

If the low bid is more than 7 percent above the engineer's estimate, the District Engineer shall obtain the Director's approval prior to notifying the

low bidder. All bidders should be notified in writing of the bid results.

Bonds and Insurance

In accordance with the NRS, the contractor's bond and insurance documents shall be executed in the name of the State of Nevada. Some bonding companies prefer to furnish the bond on their forms while others use the forms included with the bid packet. Either is acceptable.

Service Provider Agreements

The contractor and the District Engineer should execute the Service Provider Agreement. The completed package, including contract documents, Service Provider Agreement and bond and insurance documents should be sent to the District Agreement Liaison for processing and execution by the Director.

Monitoring Work Progress

Prior to the start of work, the District Engineer or designated individual should meet with the NDOT Inspector and contractor's representative for a pre-construction conference.

The NDOT Inspector performs inspection and documentation duties for the project. Documentation of bid items should be in the manner described in the *Nevada Department of Transportation Documentation Manual*. The inspector is responsible for arranging project testing when necessary.

Payments

If permitted by the agreement, progress payments (partial payments) and payments for materials on hand can be made to the contractor. Materials on hand must conform to specifications. Partial payments and payments for materials on hand must be according to Section 109 ("Measurement and Payment") of the *Standard Specifications for Road and Bridge Construction*.

Calculations for progress payments should be based on the amount of work accomplished, as indicated by the inspector's records. These payments should be prepared in the format shown in the *Nevada Department of Transportation Construction Manual*.

When the District Engineer approves a progress payment, Form 060-067 (Payment Voucher and Purchase Order) should be prepared and transmitted to the Accounting Division.

In order for the Department to track agreement costs, it is necessary to include the first five digits of the Service Provider Agreement number on all purchase orders submitted for payment.

MINOR REPAIRS AND MAINTENANCE SERVICES

Minor remodeling, repair and maintenance contracts are not available through the Nevada State Purchasing Division, as it is prevented by court order from letting bids on these types of projects.

In accordance with Transportation Policy (TP) 1-2-2, remodeling, repair and maintenance work requiring the use

AGREEMENTS AND CONTRACTS

of outside firms can be accomplished through a simplified quote or bid procedure:

- For minor remodeling, repair and maintenance work requiring the use of outside firms and having an estimated cost of less than \$25,000 (including parts and labor), the originator in a District or division shall solicit three proposals/bids for the anticipated work. Solicitation may be in the form of telephone or personal contacts. Documentation of the solicited quotes must be retained in the project files. Contact the Administrative Services Division for more information on compiling documents for executing the Service Provider Agreement and records retention.
- If the total estimated project cost is \$25,000 or more, a request for proposals/bids and advertising in the newspaper for two consecutive weeks is required. Advertising in a professional publication may also be desirable. Contact the Administrative Services Division for more information, compiling of documents for execution of the Service Provider Agreement, and records retention.

The following exceptions do not require that formal agreements be executed; however, three documented quotes/bids are still required as outlined in Section 6 ("Procedures") of TP 1-2-2:

- Automobile and light repairs not to exceed \$5,000, including parts and labor. (*State Administrative Manual*, 1552.0)
- Heavy equipment repairs including aircraft, heating and air conditioning

not to exceed \$15,000 including parts and labor. (*State Administrative Manual*, 1552.0)

- Equipment repairs other than that specified above not to exceed \$5,000 including parts, labor and shipping. (*State Administrative Manual*, 1552.0)

The following applies to construction on parcels outside of the highway right-of-way:

- The Department is required to obtain plan review and inspection services from the State Public Works Division (SPWD) to verify compliance with State building codes for all construction projects. (NRS 341.145)
- The SPWD is responsible for providing engineering and architectural services to NDOT for all NDOT construction projects, except for buildings used in maintaining highways. (NRS 341.141)

Department assistance for projects that involve minor repairs and maintenance services can be obtained from:

- Architectural Section: Drafting specifications, bid proposals and evaluating quotes/bids for work on buildings and related assets.
- Roadway Design Division: Specifications, design items and evaluating quotes/bids for roadway projects.
- Administrative Services Division: Advertising, contract documents and preparation of agreements and all related attachments.

- Equipment Division: Heavy equipment and equipment repairs.

COOPERATIVE AGREEMENTS WITH OTHER AGENCIES

The Department and/or the districts often enter into cooperative agreements with other State Agencies, where advertising or bidding are unnecessary. These mutual agreements describe the scope of work, payment amounts and a term of agreement, which often can be renewed by mutual consent. Contact the Administrative Services Division for more information.

CHAPTER 11: ADDITIONAL GUIDELINES RELATING TO HIGHWAY MAINTENANCE

This chapter provides guidelines for specialized circumstances and situations affecting highway maintenance activities. For more information on the applicable statutes or regulations, contact the Office of the Attorney General, Transportation Division.

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

ABANDONED OR DISABLED VEHICLES

Whenever a vehicle is abandoned within the State's right of way and/or such vehicle presents a traffic hazard or interferes with the performance of Department maintenance; contact the Nevada Highway Patrol (NHP) to request the removal of such vehicles.

TIRE CHAINS AND SNOW TIRES

Whenever the Department imposes chain or snow tire requirements upon motorists using the State's roadways, all drivers must comply with appropriate traction devices. If a maintenance worker observes a motorist failing to comply with the chain and/or snow tire requirements, they may note the offending vehicle and report it to the NHP.

STUDDED TIRES

Studded tires may only be used on State roadways between October 1 and April 30. Drivers failing to observe this restriction may be reported to the NHP.

CLOSING HIGHWAYS

The Director may restrict the use of or close any highway whenever it is determined the closing or restriction of use is necessary for:

- Protection of the public.
- Protection of the highway from damage or during construction; reconstruction, improvement or maintenance operations.
- Promotion of economic development, tourism or upon the request of the Executive Director of the Commission on Economic Development or the Commission on Tourism such as street fairs, making movies, etc.

Any motorist attempting to remove any barrier or sign closing the roadway or failing to obey barriers or signs closing the roadway should be reported to the NHP.

DUMPING ON THE HIGHWAY

It is unlawful for any person to throw or deposit on any public highway or within a distance of 1,000 feet from the center of any public highway, any dead animal, dirt, garbage or rubbish. Persons observed violating this law should be reported to the NHP.

ADDITIONAL GUIDELINES RELATING TO HIGHWAY MAINTENANCE

REMOVAL OF ILLEGAL ENCROACHMENTS

An encroachment is any tower, pole, pole line, wire, pipe, pipeline, fence, billboard, approach road, driveway, stand or building, crop, flora, or any structure placed upon, under or over any portion of the State highway's right-of-way.

Encroachments may be present in the State's right of way upon a permit issued from the Department. Any encroachment within the right-of-way without a valid permit from the Department may be removed after proper notice.

Proper notice must be served upon the owner of the encroachment as follows:

- Personal service to the owner
- Service of notice by registered or certified mail
- Service by posting a copy of the notice on the encroachment

The owner of the encroachment must remove the encroachment within 5 days after receiving notice. If the owner fails to timely remove the offending encroachment, the Department may remove the encroachment and may recover the costs of such removal. The Department may also charge the owner \$750 for each day past the first 5 days following service of notice per NRS 408.210.

WARNING LIGHTS

The warning lights that are attached to many Department vehicles are used to warn motorists of unusual traffic

conditions or hazards. These lights do not allow for a Department employee to ignore traffic signals or traffic laws while operating a State vehicle displaying warning lights.

INFORMAL CONTRACTS

Informal bids and the award of contracts for highway construction, reconstruction, improvements and maintenance of projects estimated not to exceed \$250,000 may be received by the Director upon approval of the Board of Transportation. Contact the District Agreement Liaison for more information.

OPEN RANGE

In Nevada, all unenclosed land outside of cities and towns where cattle, sheep or other domestic animals graze or are allowed to graze by custom, license, lease or permit are considered "open range".

No person, firm or corporation owning, controlling or in possession of any domestic animal running on the open range has a duty to keep any animal off any State highway.

The Department has a duty to adequately warn motorists traveling on State highways within open range of the possibility of animals in the roadway.

EXCAVATIONS

Excavations or demolitions conducted in areas containing known or reasonably known subsurface installations (e.g., pipelines, conduit cable, ducts, wire, sewer lines, storm drains, or other underground structures or utilities) require that the Department provide advance notice to the

ADDITIONAL GUIDELINES RELATING TO HIGHWAY MAINTENANCE

owner/association, at least 2 days and not more than 28 days, before the excavation/demolition begins. Each notice, whether written or by telephone, shall provide the name, address and telephone number of the party responsible for the excavation/demolition, the starting date, the expected duration, type of excavation/demolition to be conducted, the specific area of the project and whether explosives will be utilized.

The Department must also cooperate with the owner of the subsurface installation by meeting with representatives if requested and making reasonable efforts, consistent with industry best practices, to appropriately mark or label the proposed area of excavation/demolition.

The only exception to these requirements is in the case of emergency where there is a substantial likelihood of loss of life, health or property before the provisions discussed above can be fully complied with. The above notifications must be made as soon as practicable following the event.

SAFETY REST AREAS

Safety rest areas (i.e., rest areas, rest stops and welcome stations/centers) are established and maintained within or adjacent to the right-of-way by or under public control for the convenience of the traveling public. Safety rest areas include rest areas, rest stops and welcome stations/centers.

The maximum length of stay at a safety rest area in Nevada is 18 hours in any 2-week period. Fires are not permitted in safety rest areas except in outside fireplaces or grills in designated areas.

Trash or garbage must be deposited in trash containers provided by the Department. Disposal of waste is restricted to trash and garbage accumulated by persons traveling in vehicles; other trash or garbage is prohibited. A sewer hose may be used for dumping into any holding tank. Wastewater may not be disposed of in any portion of a safety rest area except in areas designated for disposal. Commercial vehicles must not dump waste in disposal areas.

When not confined in a vehicle, all animals in a safety rest area must be restrained or on a leash and confined to those areas designated for animals.

All vehicles may only park in designated areas in safety rest areas. Commercial vehicles are prohibited from parking in safety rest areas for commercial purposes such as loading, unloading, or changing cargo. No motorist or traveler may exhibit or use any firearm or other weapon. Loitering within and around the toilet areas is prohibited. Drunkenness is prohibited in all safety rest areas. The use of electricity in a restroom to operate an appliance other than those appliances used for personal grooming is prohibited. A towing vehicle may not detach a trailer except in the case of an emergency.

If any motorist violates the rules and regulations governing safety rest areas, report the violation to the NHP.

WORKING ON THE SURFACE OF THE ROADWAY

Whenever Department personnel are engaged in work affecting the surface of the roadway (e.g., striping, chip seals snow removal), the traffic provisions

ADDITIONAL GUIDELINES RELATING TO HIGHWAY MAINTENANCE

contained in NRS 484A, 484D and 484E do not apply within an active work zone. This allows Department staff, vehicles, and equipment, when specifically engaged in work upon the surface of the roadway, and after providing adequate warning to the traveling public, to suspend appropriate traffic laws within an active work zone. It does not allow Department employees to act in a negligent manner by failing to fully activate all warnings or post all required signage. Outside the work zone, all traffic regulations must be obeyed.

If at any time any maintenance worker has questions or concerns regarding these special circumstances/situations or requires further guidance regarding the laws and regulations governing these guidelines, contact the Office of the Attorney General, Division of Transportation.

BICYCLE FACILITIES MAINTENANCE PLAN

Under both State and Federal regulation, the Department has created an Agency Bicycle Coordinator, located in the Planning Division. This coordinator provides guidance to all districts as to the maintenance of all bicycle lanes and paths within the NDOT right-of-way.

All bicycle lanes and paths are required to be maintained to the same standards as the other roadways within the jurisdiction of the State. Any questions or concerns regarding specific issues regarding the care and maintenance of bicycle lanes and paths should be directed to the Agency Bicycle Coordinator.

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MAINTENANCE OPERATIONS

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CHAPTER 1: MAINTENANCE OVERVIEW

This chapter contains information that can apply to any District Maintenance task. Major topics include crew safety, traffic control, protecting the public, highway closure notifications, Underground Service Alert, lost and found, dead animals, documentation and the Maintenance Management System (MMS).

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

MAINTENANCE DEFINED

Maintenance is defined as the preservation of safe and usable roadway facilities. It is performed to delay, prevent or correct deterioration and to maintain facilities that are as close to their original or reconstructed condition as practical. Maintenance also includes emergency repairs as a result of accidents, weather conditions or other unexpected damage to a roadway, structure or facility.

Maintenance may be performed by:

- Department employees.
- Contractors.
- Other agencies authorized by the Director, such as the Nevada Division of Forestry, Nevada Department of Agriculture, etc.

Maintenance does not include:

- Construction of new transportation facilities.
- Reconstruction.
- Major overlays.

- Major improvements to a facility above the originally constructed or reconstructed condition.

CREW SAFETY

The Department provides District Maintenance employees with training, safety clothing, safety equipment and traffic control devices to help ensure crew safety and provide for the orderly and safe movement of traffic.

Methods used to reasonably protect employees working on or adjacent to the roadway may vary depending on location, type of work, speed and volume of traffic. Since it is not practical for this manual to contain detailed rules for every possible situation, the major topics are discussed with the intent to provide guidance and clarification for typical situations. It is each employee's responsibility to exercise judgment in the application of these principles. Supervisors should not, through the use of protective devices, create greater hazards to their crews by increasing the severity and/or duration of exposure.

Personal Protective Equipment (PPE)

Employees shall wear PPE for their safety. Supervisors are responsible for ensuring that employees use the proper tools, safety equipment and clothing for

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the work being performed. For more information, refer to Part II, Chapter 1 under "Work Attire", Transportation Policy (TP) 1-7-4 or contact the Human Resources Division's Safety and Loss Control Section.

Length of Shifts

In order to provide employees with adequate rest periods and distribute the work equitably, scheduled shifts shall not exceed 12 hours. Due to emergency situations or other unforeseen circumstances, the actual time worked may exceed 12 hours. When the hours worked must exceed 12 hours, every effort will be made to minimize the excess time by adjusting the operation or by providing relief personnel.

Workspace

Supervisors will, through safety meetings and discussions, ensure that workers know their responsibilities for positioning themselves so that each employee has adequate space in which to work safely and prevent being struck by flying objects or another worker's tools.

Project Inspections and Work Zone Safety

Supervisors should:

- Review each maintenance work zone to ensure that protective devices are properly installed in accordance with the *A Guide to Temporary Traffic Control in Work Zones, Manual on Uniform Traffic Control Devices* and *Standard Plans for Road and Bridge Construction*. All District Maintenance managers and supervisors should establish

work zone requirements and traffic control for each project.

- Plan the work of the crew to minimize the time employees have their backs to oncoming traffic. Employees working near traffic should strive to perform their work while facing oncoming traffic.

Facing traffic gives an employee a better opportunity to: (1) see and hear an approaching vehicle, (2) take evasive action and (3) warn fellow employees.

Workers may feel air turbulence within close proximity to high-speed vehicles; using protective face and eye equipment can help minimize this.

- Ensure that workers have adequate protection.
- Ensure that traffic is flowing smoothly and safely.
- Ensure that first-aid supplies required by applicable Safety Data Sheets (SDS) are on the job site.
- Ensure that all crewmembers are NDOT Certified Flaggers.

Roadside Safety

Crewmembers should be aware of traffic conditions when making sudden stops and when pulling off and on the roadway. Warning lights should be used when making stops for any roadside task. When it is unlikely that a natural break in traffic will occur, workers should request assistance from the Nevada Highway Patrol (NHP).

A break in traffic is defined as all lanes clear of traffic for a sufficient distance. Workers should not attempt to create a break by flagging or using hand signals.

Workers performing any roadside task should:

- Stay in their vehicle until there is a break in traffic.
- Face oncoming traffic.
- Plan an escape route.
- When on foot, walk on the outer edge of the shoulder, staying as far from moving traffic as possible.
- When on foot, keep their vehicle between themselves and traffic.
- Park the NDOT vehicle so it does not block the escape route. It should be parked ahead of the work area to allow sight distance for the employee as well as plenty of room to maneuver to take evasive action.

More Than One Maintenance Operation in an Area

Multiple maintenance operations on opposite sides of a highway can distract drivers and jeopardize worker safety. Maintenance work, including traffic control, on opposite sides of a conventional highway or on opposite sides of one roadway of a divided highway should be spaced no closer than 3,000 feet, unless an incident exists and traffic is under positive control (e.g., flagging operations).

Night Work

At night, special attention must be given to reduced visibility for both workers and motorists. Because of reduced visibility, nighttime operations should be minimized.

When night work is necessary, special precautions should be taken to provide sufficient illumination and signing to protect workers and motorists. Each worker should also be aware of hazards that may be anticipated during nighttime operations.

When planning night work:

- All employees shall wear either jackets or coverall/jumpsuits meeting Performance Class 3 requirements set forth in ANSI/ISEA 1007-2004.
- Sufficient lighting must be provided to allow drivers to identify the location of workers. Lights should be directed so that they do not shine in drivers' eyes.
- Each employee should be given as much advance notice as possible of shift changes to prevent unnecessary fatigue.
- Work zone signs and cones must be reflectorized with high intensity prismatic sheeting and be in compliance with NCHRP-350 or MASH standards.
- Arrow boards and changeable message signs should be used where appropriate. Supervisors should review these devices to ensure they are properly dimmed and do not impair drivers' vision.

Working in or Adjacent to Median Areas

When it is necessary to work in the median of a highway, workers should park in the median to prevent having to cross the roadway on foot unless it is more hazardous to park in the median (i.e., the median is too narrow, wet, sandy or difficult to accelerate from).

Workers should take the following precautions when crossing highway lanes on foot:

- Wait for a break in traffic in all lanes so that it is safe to cross on foot without having to run. If reaching the median is urgent and there is no break in traffic, workers should call for assistance to establish traffic control or request assistance from the Nevada Highway Patrol (NHP).
- Do not carry items or materials that might restrict mobility.

When it is necessary to cross medians with a vehicle, workers should use established crossovers.

Working near Energized Overhead/Electrical Lines

Supervisors responsible for work in the proximity of electrical lines will ensure that workers understand the Occupational Safety and Health Administration (OSHA) General Industry Electrical standards. When operating equipment near energized overhead/electrical lines, workers shall follow the equipment clearances tables listed in the standard.

Working from Ladders

Avoid the use of metal ladders while working on or near electrical equipment or circuits or where there is any possibility of contact with live wires. Ladders should be made of fiberglass or non-metal materials (to reduce any risks associated with electrical contact or conductivity), are placed on a solid base and used according to the manufacturer's recommendations.

Excavation Safety

Maintenance employees shall not work in or adjacent to any excavation that does not meet the Occupational Safety and Health Administration's (OSHA) Excavation Standard (Code of Federal Regulations Title 29, Part 1926 Subpart P "Excavations").

Blasting

Any work with explosives is typically performed by a qualified third party/contractor. Explosives may be required for:

- Reducing the size of rocks so that they can be moved with maintenance equipment.
- Avalanche control.
- Controlling cornices that develop from blowing snow.

Protective Vehicles

Protective vehicles include shadow vehicles, barrier vehicles and advance warning vehicles.

Shadow Vehicle

This is a moving vehicle, which follows a short distance behind a moving operation and provides physical protection from traffic. A shadow vehicle shall:

- Be equipped with a truck-mounted attenuator to minimize the impact to the driver and reduce the severity of the collision.
- Include a truck-mounted flashing arrow board to provide directional guidance for drivers.

The minimum size for a shadow vehicle is a Class 12 (single axle) or Class 13 (tandem axle) truck with a gross vehicle weight (GVW) of 27,500 pounds.

Barrier Vehicle

A barrier vehicle provides physical protection for crews and their equipment. It is parked in advance of a stationary or slow-moving operation, which includes tasks that may be moving continuously at slow speeds (25 mph or less) or ones that require frequent short stops of less than 15 minutes. The barrier vehicle must be carefully positioned to intercept errant vehicles without rolling into the work area. When it is parked at an angle, the front of the vehicle should be pointed away from traffic to prevent distracting drivers. It should also be positioned to prevent secondary collisions if it is struck and pushed ahead. The front

wheels should be turned away from the work zone and in a direction that would cause the unit to move away from the workers and traffic.

A barrier vehicle is required to be equipped with an attenuator. This vehicle should not be occupied while parked. The minimum size for a barrier vehicle is a Class 12 (single axle) or Class 13 (tandem axle) truck with a GVW rating of 27,500 pounds.

Advance-Warning Vehicle

This vehicle is stationed a considerable distance in advance of a moving or stationary operation. It is used to display signs or arrow board messages.

When the maintenance operation and the advance-warning vehicle are clear of the travel way, the arrow board should either display a message or be in the caution mode.

When the maintenance operation or the advance-warning vehicle encroaches a travel lane, it shall display the flashing arrow mode and be equipped with an attenuator.

Warning Lights

Most maintenance units are equipped with warning lights, which shall be used on:

- Specialized equipment such as motor graders, rotary snowplows, and other snow removal equipment, which is operated on the roadway at lower speeds than normal traffic.
- Trucks equipped with plows, even though traveling at posted speeds. (The flashing amber lights alert

MAINTENANCE OVERVIEW

drivers to be extra cautious of the overhanging snowplow.)

- Vehicles working on or adjacent to the roadway or vehicles traveling at speeds less than the normal traffic.

TRAFFIC CONTROL

Careful consideration of traffic and roadway conditions must be given to each work zone prior to selecting the traffic control set-up. The following guidance provides a rationale to assist with selection of appropriate traffic control and safety measures.

Remember, there is no single solution that fits all work zones. You are encouraged to modify the traffic control to fit your specific location and operation. Work may need to be delayed until the proper work zone equipment and devices are available.

When making work assignments, supervisors should be aware and consider the following conditions that may need additional traffic control:

- Whether the work will be a moving or stationary operation.
- Traffic lanes will be closed down for extended period of time.
- Where critical intersections are impacted or in complex highway geometry or traffic patterns with significant potential for driver confusion or worker risk from traffic exposure.
- Where traffic speed will be reduced.
- Nighttime work.

- Workers are exposed to nearby high-speed traffic at high volume urban roadways.
- Operations during peak hour traffic at areas with intense commuter use; or
- When a significant hazard exists for workers or the traveling public.

Supervisors may request a Law Enforcement officer be used at any time he or she deems appropriate.

Moving and Stationary Operations***Moving (Mobile) Operations***

Mobile operations include tasks within the project that move along the road, usually at slow speeds, without stopping. Vehicles should be equipped with flags, signs, flashing vehicle lights and truck-mounted attenuators. The advance warning area moves with the work area and portable traffic control devices should be moved to keep them near the work area.

With operations that move slowly (less than 3 mph), it may be practical to use stationary signing that is periodically repositioned ahead of the work area. At higher speeds, trucks are typically used as components of the traffic control zone. Appropriately colored and marked vehicles with signs, flashing or rotating lights and special lighting panels move as a train behind the work vehicles.

For some continuously moving operations such as street sweeping, a well-marked and signed vehicle may be adequate when traffic volume is light and visibility is good. When volumes or

speeds are higher, a shadow vehicle equipped with a flashing arrow panel should follow the work vehicle. Where practical, warning signs should be placed along the roadway and moved as the work progresses.

Mobile operations that move faster than 20 mph should use equipment with appropriate warning devices (flashing lights, signs, special lighting) or a shadow vehicle with appropriate warning devices.

Moving shoulder operations (e.g., shoulder grading, mowing, spraying), where the minimum drivable width of a two-lane conventional highway (including shoulders) is 18 feet or more, may, at the discretion of the supervisor, be carried out without a conventional lane or shoulder closure. Warning signs should be posted ahead of the work area.

If moving operations are in effect on a high-speed travel lane of a multi-lane divided highway, flashing arrow panels should be used.

Because of the very short duration and nature of these actions, there is a possibility that adequate work zone measures may not be fully considered. Even though these are very short duration actions, the key work zone elements must still be considered. High worker exposure locations such as in a live lane and undesirable traffic conditions would still dictate the decision as to the appropriate work zone.

Advance warning should be considered to traffic approaching very short duration work zones on freeways and high speed multi-lane highways when working in a

live lane with a spotter or using a very short duration lane closure.

It may be appropriate to perform some very short duration actions with the minimum required equipment and devices. It could be a strategically placed work vehicle with warning beacon and personal protective equipment. It is recommended to apply more work zone safety measures if the level of safety can be raised without adding to worker exposure time.

Stationary Operations

Most maintenance operations are short-term stationary work (daytime work that occupies a location up to 12 hours). During these operations, the crew is present to maintain and monitor the traffic control zone. Flaggers are used to provide additional emphasis for slowing, alerting or stopping traffic.

Maintenance operations with short work time, simplified traffic control set-ups may be used to reduce worker traffic exposure. The time it takes to set up a full complement of signs and devices could approach or exceed the time required to perform the work. Simplified traffic control may be offset by the use of more dominant devices such as changeable message signs.

Very short duration work zones are planned work activities that involve frequent stops of up to 15 minutes. These are for tasks such as litter or debris cleanup, pothole patching, surveying, field recon, etc. Warning signs, flashing vehicle lights, flags or channelizing devices may be used.

Safety Equipment

Truck-Mounted Attenuators

An attenuator is designed to absorb the impact of a collision and reduce injury and property damage. Attenuators are for the protection of Department employees and equipment as well as the public. They are not intended for use on city streets or in other low-speed traffic conditions, but may be so used at the discretion of the supervisor.

A truck-mounted attenuator reduces the stress on vehicles and their occupants in a collision. The proper position of a protective vehicle with respect to those it protects must be carefully judged. If it is too close, the protective vehicle may hit the workers; if it is too far back, traffic may go around it and hit the workers. Refer to Appendix A-2, Table A.2-17 "Theoretical Clearances between Workers and Protective Vehicle" for more information.

Arrow Boards

Arrow boards can be used to display an action message or a caution message. Arrow messages pointing left, right, or to both sides are action messages.

These are used when drivers are required to change lanes. Flashing lights without an arrow symbol displayed is a caution message. A caution message should be used only to warn motorists that some activity is ahead.

There are three types/sizes of arrow boards.

1. Type A: Minimum size is 48-by-24 inches and it must be legible from a distance of 1/2 mile and

appropriate for use on low speed urban streets.

2. Type B: Minimum size is 60-by-30 inches and it must be legible from a distance of 3/4 mile and appropriate for intermediate speed facilities and for maintenance or moving operations on high-speed roadways.
3. Type C: Minimum size 96-by-48 inches and it must be legible from a distance of 1 mile and intended for high-speed, high-volume construction projects.

It is not required that a barrier vehicle be equipped with an arrow board when used off the roadway or within a closed lane.

Any shadow vehicle working on the traveled way of a multi-lane highway should be equipped with an arrow board displaying an action message (arrow).

Work vehicles being shadowed should not use an arrow board in order to prevent driver confusion.

When arrow boards are used on two-lane roads, the caution mode of the arrow panel shall be used. The caution mode consists of four or more lights arranged in a pattern, which will not indicate a direction.

Changeable Message Signs

Changeable message signs should be used to warn motorists when:

- Work is being performed in high volume traffic areas.

MAINTENANCE OVERVIEW

- The road is closed or detours are in use and advance notification or directions will help traffic flow.
- Unusual conditions are present and the advance message will allow motorists to make decisions regarding routes.

Changeable message signs do not replace other traffic control devices; they supplement them. And because of their size, changeable message signs must be located in areas that provide adequate shoulder widths. Proper placement ensures that the unit displays the proper message to motorists and is not a hazard.

To retain credibility of the changeable message sign, it is best to avoid:

- Displaying inaccurate or unreliable information.
- Displaying information too late for drivers to make appropriate responses.
- Displaying messages that drivers do not understand.
- Displaying messages too long for drivers to read under prevailing highway speeds.
- Displaying information not related to roadway or traffic conditions or to routing.

OSHA STANDARDS

The State of Nevada and the Federal Occupational Safety and Health Standards for General Industry and Construction contain regulations covering health and safety in the

workplace. The Department's maintenance operations must conform to the regulations in this manual.

Topics covered in this publication include walking/working surfaces, means of egress, powered platforms, manlifts and vehicle-mounted work platforms, occupational health and environmental control, hazardous materials, personal protective equipment, fall prevention, general environmental controls, medical and first-aid, fire protection, compressed gas and compressed air equipment materials, handling and storage, machinery and machine guarding, hand and portable power tools and other hand-held equipment, welding, cutting and brazing, special industries, electrical, commercial diving operations and toxic and hazardous substances.

For more information, contact the Human Resources Division's Safety and Loss Control Section.

ENVIRONMENTAL CLEARANCE

Certain maintenance tasks require that a review is conducted and clearance is granted by the Environmental Services Division prior to starting any work to assess the environmental impact. Environmental issues include:

- Cultural resources.
- Biological resources.
- Air quality.
- Hazardous waste management.

Certain maintenance tasks require that a review is conducted and clearance is granted by the Stormwater Division prior

to starting any work to assess the water quality. Water quality issues include:

- Highway and runoff conveyance system repair and maintenance.
- Street sweeping.
- Snow and deicing practices and materials management.

Contact the Stormwater Division with any questions concerning possible water quality impacts. Refer to Part III, Chapter 4 "Environmental" for more information.

INCIDENT MANAGEMENT

Highway/Roadway incidents are localized incidents that cause traffic congestion. They are limited to a single incident and/or location that is managed on-site according to Traffic Incident Management (TIM) principles.

Incidents may include:

- Vehicle accidents or breakdowns.
- Debris, spilled loads or released materials on the roadway.
- Floods and storms.

For more information, refer to Part III, Chapter 6 under "Incident Management".

Reporting Incidents

For guidelines on reporting highway/roadway incidents, refer to

Part III, Chapter 6 under "Reporting Incidents".

Road Closures

The Department is responsible for determining when road closures are necessary or required due to weather or other highway/roadway incidents. The decision to close a road and arrange to send supplementary equipment and personnel for temporary assistance should be made at the highest level practical within District Maintenance.

For more information, refer to Part III, Chapter 6 under "Road Closures".

Reporting Damage to Department-owned Property

If an incident involves damage to Department-owned property or personal injury to Department employees, the District or major maintenance station office shall be notified promptly so the appropriate notifications and investigations can be made.

For more information, refer to Part III, Chapter 8 under "Vehicle Accidents", Transportation Policy (TP) 1-6-15, Part II, Chapter 3 under "Work-related Injuries" and TP 1-6-16.

Two-Way Radio Communication

The two-way radios used by most District Maintenance personnel are the most efficient way for workers to communicate with each other and their respective offices. In addition to routine maintenance and emergency communications, there are numerous calls for materials (e.g., salt, sand)

and/or assistance (e.g., moving disabled vehicles, large debris, etc.).

For general rules on radio use or the maintenance and care of radios, refer to Part II, Chapter 1 under "Equipment Use".

PROTECTING THE PUBLIC

The Department is responsible for repairing known unsafe conditions or providing sufficient warning of known unsafe conditions.

The Department is typically notified of unsafe conditions by one of the following methods:

- An employee observes the incident and reports it to the District Administration or major maintenance station office.
- A law enforcement agency reports an incident to the District Administration office.
- A private citizen reports an incident to a Department employee.

When the Department is notified, the Supervisor for the area should be notified to follow up. The reported condition/incident should be checked and, if it is verified, should be corrected or adequate warning should be provided. Each District will record, monitor and resolve each reported incident in accordance with District policy. For more information on the complaint procedure go to Part III, Chapter 7 under "Complaint Procedure".

ASSISTING MOTORISTS

Roads located outside metropolitan areas can be hazardous for stranded motorists, especially during severe weather. An offer to call for help promotes a good relationship with the public. As a normal practice, the Department does not allow maintenance vehicles to aid directly in towing or pushing stalled vehicles; however, there may be circumstances in which a stranded vehicle is a hazard and may cause property damage or personal injury if not moved promptly. In these cases, District Maintenance crewmembers should exercise their best judgment and move the disabled vehicle with the driver's approval.

In isolated instances, law enforcement officers may request assistance in moving stalled vehicles. In these situations employees should assist when it is possible to do so without damaging the vehicle.

WORKING WITH LAW ENFORCEMENT AGENCIES

Law enforcement agencies such as the NHP, county sheriff's offices and city police departments are responsible for:

- Enforcing traffic regulations.
- Investigating accidents.

With the above responsibilities, law enforcement agencies have the duty to report situations they feel are hazardous. As a result, District Maintenance crews will respond to many calls in order to provide a high level of service and minimize liability. Maintenance employees are subject to a

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certain number of callouts and callbacks to provide assistance such as:

- Additional sanding on a section of road.
- Removal of obstacles from the roadway.
- Traffic control assistance at major accident sites.

Maintenance supervisors should stress cooperation with law enforcement agencies and establish good lines of communication with the agencies that work within the crews' jurisdiction.

WORKING WITH OTHER MAINTENANCE ORGANIZATIONS

It is beneficial for all state, county and local highway maintenance organizations to have good lines of communication. Since they are all working toward a common goal of providing a service for the traveling public, there are opportunities for cooperation that result in an improved level of service with no additional cost. Sharing of ideas and experience often leads to improved service for the public.

UNDERGROUND SERVICE ALERT (USA NORTH 811)

811 or 1-800-227-2600

<http://usanorth811.org>

Underground Service Alert of Northern/Central California and Nevada (USA North 811), "Call Before You Dig", is a service that determines whether underground utilities are present prior to excavating and provides information on all known utilities in the work area. This

is a free notification service for contractors, homeowners and maintenance organizations that are planning any underground work.

It is unlawful to begin an excavation or demolition in an area that may contain subsurface installation without calling USA North 811. (NRS 455.080 - 455.180.)

Advance Notice

USA North 811 should be notified at least 2 working days, but not more than 14 calendar days, before excavation or any soil disturbance is scheduled to begin. Each location request is good for 28 calendar days to ensure marking integrity.

Emergency Notification

Excavation discovering or causing damage to a subsurface installation shall notify the operator of the installation and USA North 811.

Guidelines

A request can be made online or by calling. Advance notice of 2 working days up to 14 calendar days is required before starting an excavation project.

USA North 811 will notify its members of the excavation project.

The USA North 811 members will, by the legal notice, mark or stake the horizontal path of their facilities or provide information about the location of their facilities.

Color Code and Symbols Used by USA North 811 Members

Color	Name
White	Proposed Excavation
Red	Electric
Orange	Communication CATV
Purple	Reclaimed Water Irrigation Slurry
Pink	Temporary Survey Markings
Yellow	Gas, Oil, Steam
Blue	Water
Green	Sewer Storm Drain

For more information on program guidelines, service areas, program members, general excavation information, recommendations, marking guidelines, emergency notification and applicable regulations, refer to the *USA North Nevada Excavation Manual*.

WORK OUTSIDE THE RIGHT-OF-WAY

The Department discourages work outside the right-of-way unless there is a pressing and immediate requirement. Entry onto private property by Department employees or equipment for the purpose of working prior to obtaining written permission from the owner is prohibited. Form 523 (Entry Permit) or equivalent shall be completed and signed prior to starting any work outside the right-of-way.

For routine maintenance operations, supervisors should review the specific work tasks and determine if there are any alternatives to accomplishing the work without entering onto private property. The Highway Maintenance

Manager and the Assistant District Engineer should review the Supervisor's recommendations.

When emergency work is necessary, the Highway Maintenance Manager or Assistant District Engineer should be advised of the situation and the need to work on private property. This person may contact the property owner or delegate the responsibility for contacting the property owner to the Highway Maintenance Supervisor II or Supervisor I. ***An emergency situation may not be used as an excuse to conduct maintenance work that is not immediately necessary.***

If the work can be accomplished only by working on private property, the designated Department representative should do the following:

- Contact the property owner(s) and discuss the situation and the proposed work. If the work is permitted, complete Form 523 (or equivalent), with both the owner and the Department representative signing the form. The form/agreement should be filed with the Supervisor at the crew office.

For emergency work, strive to obtain written agreement on the proposed work and the condition in which the Department will leave the property upon completion. ***The agreement shall be documented in some form, even if it is a hand-written entry permit signed by the owner and the Department representative.***

- If the work involves excavation or any soil disturbance, contact USA North 811 to determine whether

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there are any underground utilities in the area of proposed work. Refer to "Underground Service Alert (USA North 811)", in this chapter, for more information.

For emergency work during normal working hours, call USA North 811 and await further instruction prior to starting excavation. For emergency work outside of normal working hours, discuss with the property owner any known utilities in the area of proposed work and strive to contact the utility companies directly prior to starting excavation.

- Contact the Department's Environmental Services Division and the Stormwater Division to discuss the proposed work and the exact location of the project. They will be able to advise whether there are any special conditions that will require their attention.

For emergency work that is necessary to eliminate a life-threatening condition, it may not be practical to obtain clearance from the Environmental Services Division and/or the Stormwater Division. The decision to proceed with work that may impact the environment will be determined by the Highway Maintenance Supervisor II or higher level and the Environmental Services Division and the Stormwater Division will be notified as soon as practical. This notification is critical, as the Department is responsible for any environmental impact in the work area.

- Perform the work in compliance with the signed entry permit or equivalent agreement. All work should be

confined to the authorized area. Any work performed by the Department other than what is agreed upon is prohibited. Damage, if any, must be reported to the appropriate regulatory agency; otherwise, the Department may be held liable.

In emergency situations, advise the Highway Maintenance Manager or Assistant District Engineer upon the completion of work.

Material Withdrawal Sites

Prior to using a material site, the maintenance supervisor should request that the Highway Maintenance Manager check with the Environmental Services Division and the Engineering Division's Right-of-Way Engineering Section to determine whether there are any restrictions on the use of the site.

LOST AND FOUND

Each District provides a lost and found service for the traveling public. Employees may not retain lost and found articles.

The following guidelines apply to the handling of property found anywhere within the right-of-way or on Department-owned properties:

- Employees should turn in all articles of value found while performing their duties to the District Administration office.
- The District Administration office should maintain a record of all items that were turned in.
- If the owner can be identified by means of identification on or in the

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item, a reasonable effort should be made to contact the owner.

Depending on arrangements made with local law enforcement agencies, articles may be turned over to them.

The final disposition should be noted in the lost and found Record and filed with the District Administration office.

INJURED ANIMALS

Injured animals found along the highway should be reported to the local animal control, sheriff's office or the Humane Society for assistance.

DEAD ANIMALS ON OR ALONG HIGHWAYS

Dead animals found along the highways shall be reported to the District. The information is forwarded to the Traffic Safety Engineering Division for use in prioritizing statewide fencing projects.

For safety and aesthetics, dead animals are removed from along the highways. Disposal of animals varies depending on the type.

Livestock

- If visible, identify the brand.
- Notify the county sheriff's office or the brand inspector.
- Arrange to have the animal picked up by a rendering service or haul the animal to a designated disposal site.

Pets and Small Animals

- If a collar is present, remove and turn it over to the local animal control

authority or retain at the maintenance station in case someone calls and asks about the pet.

- Haul the animal to a designated site or an animal control center.

Deer and Other Wild Game

- Haul animal to a designated site or the local animal control authority.
- If previously requested by the Nevada Department of Wildlife, record the roadkill on the appropriate log.

Birds of Prey

Notify the Nevada Department of Wildlife and request instructions for disposal.

DOCUMENTATION

Most pertinent data is recorded on Official Department forms such as time sheets, diaries, and accident reports by District Maintenance personnel. Work accomplishments are entered into the Maintenance Management System (MMS). Additional information relative to accidents, project signing, pertinent conversations with staff summaries of Department meetings and meetings with outside sources should be recorded in the Daily Diary. All crew supervisors should make regular use of the Daily Diary for documentation.

Daily diaries provide:

- A permanent record that can be used for reference.

- An acceptable document for court actions.

MAINTENANCE MANAGEMENT SYSTEM

This topic provides an overview of the Maintenance Management System (MMS).

The MMS is a collection of programs and tasks that support a uniform approach to maintaining the State Highway System. The Maintenance and Asset Management Division (Headquarters Maintenance) administers the MMS for all districts, and is available to assist maintenance managers and supervisors with any questions or concerns.

MMS System

The MMS is an automated Web application/database composed of interrelated management tools designed to provide a basis for recording program/task resources, work accomplished, budgeting, scheduling work, quality control, levels of service, performance standards and evaluation. Work performed is reported by the Supervisor in the MMS System. The program is structured to enable the crew Supervisor to record daily crew accomplishments with a minimum number of entries.

All highway maintenance supervisors and managers have access to the MMS system. In addition, the Performance Standards (maintenance tasks) are exported from the MMS System and stored on the Maintenance and Asset Management Division SharePoint so that any maintenance employee can access the information.

For additional information and details, refer to the *Maintenance Management System Manual of Instructions*. This publication is distributed to all highway maintenance supervisors and managers.

MMS System Features

The MMS contains several features and components, which are essential to the functioning of the system.

Performance Standards

A performance standard is a guideline for each task, which assist maintenance employees in achieving efficiency and quality in doing that task.

The standard provides the criteria for a specific maintenance task, such as:

- An outline of the specific work involved.
- A description of the resources required (labor, equipment and materials).
- A list of average accomplishment and productivity rates.
- The defined point at which the task is accomplished.
- The defined threshold level when maintenance should be undertaken.
- A description of the level of service that should be obtained.

Performance standards assist district management in the preparation of budgets and can assist supervisors in planning, scheduling, executing, reporting and evaluating maintenance

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work. Performance standards do not define the most favorable level of productivity, they reflect an average level. As an average level, they should be used as a guide for expected achievements and not as a hard rule. Additional training and improvements in equipment and materials are some factors that can reflect additional productivity above what is shown on the performance standard. On the other hand, breakdowns and weather can reflect lower productivity rates than those shown on the performance standard.

Performance standards include the following:

- Task Data: This identifies the basic elements of the task, including:
 - Task Number: The number used to report the work accomplishment in the MMS System.
 - Task Description: The description of the specific Task needed for the MMS System.
 - Accomplishment Unit: The unit of measurement reported in the MMS System (e.g., linear feet, each, cubic yard).
- Performance Data: This is the average productivity rate. There are four measurements of productivity:
 1. Unit/crew hour: The average number of accomplishment units, which can be performed every hour by the standard crew on the job, using the method, specified to accomplish the work.
 2. Unit/labor hour: The average number of accomplishment units, which can be performed every hour by each individual on the crew, using the method, specified to accomplish the work.
 3. Crew hour/unit: The average number of crew hours required for completing one accomplishment unit.
 4. Man hour/unit: The average number of labor hours required for completing one accomplishment unit.
- Equipment Requirements: This describes the number and type of equipment required to complete the Task.
- Material Requirements: This describes the quantity of materials required for the task. The quantity is based on the material requirement per accomplishment unit.
- Condition: This describes the condition of the facility and when maintenance work should begin to prevent further deterioration.
- Maintenance Level: This describes the level at which the highway system will be maintained.
- Method and Procedure: This defines a typical work method and procedure for accomplishing the task.
- Task Reporting: This assists supervisors in coding maintenance work into the MMS System. It includes short explanations to indicate coding for reporting location,

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labor, equipment and accomplishment.

- Quality Control: This indicates the satisfactory level to which the facility must be raised to adequately preserve its physical integrity.

MMS Reports

The reporting and evaluating process provides information for collecting work accomplishments, cost and productivity data, and it also allows comparison of work performed to work planned. This data includes:

- Labor, equipment, and material cost for each task performed
- Accomplishment units for each task performed
- The location where the work was performed by District, County, Roadway System, Route Number
- The milepost limits of the work (either from-to or a spot location).

The dates of work accomplished are also included in this data. The MMS uses Standard Unit Costs for equipment and materials, and actual labor cost in compiling cost data for managing highway maintenance. In order for actual labor costs to be representative of actual dollar expenditures, it is necessary to reconcile labor cost in the MMS to actual labor expenditures in the Accounting System (Integrated Financial System, IFS).

This reconciliation is performed by Headquarters Maintenance from Review of District and State Operations information in the MMS System and

Accounting Data in the IFS, and it is reviewed annually with each Supervisor on MMS field reviews.

System Evaluation

The MMS produces reports that can be used by maintenance managers and the Maintenance Office to:

- Monitor, evaluate and improve a wide number of elements in the maintenance program.
- Compare divisions and districts to standard production and unit costs and to statewide or district averages.
- Make objective comparison between performing work with State crews and contract work.
- Aid in efforts to eliminate ineffective practices.
- Improve methods of performing maintenance tasks.
- Provide reports to the Director's Office, the State Legislature, the Office of the Attorney General, Division of Transportation, and other entities as needed on what work was accomplished, when and where, and the associated costs.

Inventory

The MMS inventory is the count or measurement of the physical features of the highway system that encompass the maintenance workload. This includes but is not limited to:

- Lane miles of pavement.

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- Lengths and types of guardrail, ditches and fencing.
- Lengths, areas, and types of paint striping and pavement marking.
- Number of signs, culverts, structures, rest areas and other roadway system assets.

The inventory is used by District Maintenance managers for planning, scheduling and budgeting in developing the workload, and projecting estimated costs for each program. By applying productivity values (e.g., accomplishment units, man-hour), maintenance managers can estimate the time it will take to accomplish tasks and develop projected schedules. The inventory can also be used to develop the deferred maintenance workload and establish work priorities.

Maintenance Achievement Program (MAP)

The Maintenance Achievement Program (MAP) is an initiative that aims to objectively measure the Level of Service (LOS) provided by Department maintenance tasks. The LOS data is collected statewide and compared to established targets for each maintenance task, allowing NDOT to more effectively plan, budget and manage highway maintenance work.

The purpose of the MAP is to provide for the continual improvement of NDOT maintenance performance and to improve overall program planning effectiveness and efficiency.

For more information, refer to the *Maintenance Achievement Program Manual*.

CHAPTER 2: ADMINISTRATION

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

ADMINISTRATION PROGRAM (PROGRAM NO. 100.00.00)

Description

This program includes tasks for the necessary planning, development and implementation in order to ensure that:

- Documentation is current and correct.
- All inventories are complete and maintained.
- The Supervisor is organized and handles all situations in a professional manner.

Policy

The Department's objective is to make the most efficient and productive use of labor, materials and equipment in maintaining the State Highway System. Thorough and accurate documentation is an effective way of assuring productive use of resources.

Maintenance Priorities

The following priorities should be considered when planning and coordinating maintenance work under this program:

- Public safety
- Potential liability for the Department

Special Requirements

N/A

Contract Services

N/A

Approvals

N/A

Safety and Training

The Safety Data Sheets (SDS) required for products/materials should be obtained in advance so that handling procedures can be reviewed and, if necessary, safety equipment and protective clothing can be obtained ahead of time. The SDS shall be on the job site when the product/material is being used.

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is required, it is listed under the applicable task.

ADMINISTRATION

**Supervisory Office Duties
(Task No. 100.02.01)*****Description***

The Maintenance Supervisor:

- Reviews routine maintenance, betterment and stockpile needs within the Supervisor's jurisdiction.
- Sets up and records all inventories.
- Reviews the District Planning Chart.
- Prioritizes planning and scheduling.
- Prepares tentative schedules for future weeks to obtain materials and equipment, identifies environmental concerns and training opportunities.
- Maintain daily documentation; enter data into the MMS daily.
- Documents personnel problems and disciplinary issues.
- Submits employee appraisals and evaluates the performance of staff.
- Inspects completed tasks.
- Responds to inquiries and concerns relative to maintenance tasks.
- Ensures that equipment (including statewide), materials and labor are available and coordinated.
- Provides for alternate work projects in case of weather or other unusual circumstances.
- Provides project information for the crew.

- Schedules resources and crew time for upcoming betterment projects in which the crew will participate.

Purpose

The purpose of the work associated with this task is to ensure that documentation is current and correct, all inventories are complete and maintained, and the supervisor is organized and handles all situations in a professional manner.

Timing of Maintenance

The duties, responsibilities and requirements associated with this task are considered ongoing.

Equipment

N/A

Materials

- Crew supplies
- Personal protective equipment (PPE)
- Miscellaneous stockroom supplies

Ordering

The supplies associated with this task are requested and purchased in accordance with District policy.

Testing

N/A

Storage

N/A

***Supervisory Office Duties
(Task No. 100.02.01), cont'd.***

Disposal

N/A

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- Maintain daily documentation.
- Prioritize planning and scheduling.
- Train lead person(s).
- Set up and record all inventories.
- Inspect future tasks to be accomplished.
- Document personnel problems.
- Submit employee appraisals; evaluate staff performance.
- Inspect completed tasks.
- Request necessary training for staff.
- Respond to inquiries and concerns related to maintenance tasks.
- Acquire the necessary permits, approvals and clearance from their respective authority.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to:

- Enter the reported accomplishment as the total number of man-hours spent on this task.
- Enter all labor used for this task; ***do not enter location, equipment or material.***

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

CHAPTER 3: FLEXIBLE PAVEMENT

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

FLEXIBLE PAVEMENT PROGRAM (PROGRAM NO. 101.00.00)

Description

Flexible pavement includes those types that are constructed with asphalt and possess the required stability to support traffic. Stability is furnished by aggregate interlock and particle friction. Highways with Portland cement concrete (PCC) pavement that have a minimum 2-inch bituminous surface overlay and are a minimum length of 1 mile are categorized as flexible pavement.

Patching or surfacing is performed using a hot mix (plantmix bituminous surface) or a cold mix (premixed bituminous paving material).

This program includes tasks for:

- Base and surface repairs.
- Hand/Machine patching.
- Overlay/Inlay.
- Roadway capacity improvements.
- Seal coating (sand seal, fog/flush seal, chip seal, scrub seal).
- Crack filling.
- Surface profiling.

Policy

The Department's objective is to:

- Maintain a bituminous surface in a manner that provides a safe facility, preserves the State's capital investment and provides smooth ride quality.
- Follow the applicable Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) when performing certain tasks included in this program.

Maintenance Priorities

The following priorities should be considered when planning and coordinating maintenance work under this program:

- Roadbed deficiencies that affect motorist safety
- Roadbed defects that affect capital investment and ride quality
- Aesthetics

Since resources are limited, the priority level may vary. Routes with high traffic volumes and higher speed limits should be assigned a higher priority.

Deficiencies

Roadway deficiencies that immediately affect safety or have a long-range impact on capital investment and ride

***FLEXIBLE PAVEMENT PROGRAM
(PROGRAM NO. 101.00.00), CONT'D.***

quality should be considered when setting priorities for roadway maintenance. The following should be considered when establishing maintenance priorities.

Slippery Pavement

Slippery conditions may occur on pavement surfaces that have become smooth as a result of excess asphalt, wear or a dense surface texture. Corrective measures may include lightly grinding the pavement surface with the cold planer or placing a bituminous surface overlay. For bleeding pavements, sand may be used during hot weather to blot the excess asphalt. Sanding bleeding pavements is a temporary measure for an immediate problem.

Raveling

Raveling usually results from a dry mix, an old oxidized surface or poor quality aggregates, which degrade badly.

Corrective measures may include fog/flush sealing, sand sealing, chip sealing or scrub sealing, and for severe raveling, placing a bituminous overlay. All of the seals add asphalt to the surface and minimize additional raveling.

The seal selected for a particular section should be based on the condition of the roadway surface, age of the pavement, traffic, weather, roadway alignment, and time since last surface treatment.

Rutting, Corrugations

Rutting, corrugations and other surface distortions are generally due to an unstable or inadequate bituminous surface, or a poorly constructed base layer.

Unstable bituminous surfaces are usually the result of a poor mix design or excessive asphalt in the mix. Base instability will cause rutting when excessive heavy wheel loads (trucks) are applied.

Corrective measures may include surface profiling to even the roadway surface, tight-blading bituminous surfacing to fill rutted or corrugated areas, or base and surface repair. The maintenance strategy selected should be based on the cause and extent of the distress.

Potholes

Potholes result from a combination of moisture in or under the pavement and wheel loads from traffic. Freeze/Thaw cycles and truck traffic accelerate the development of potholes.

The best corrective measure is patching with a bituminous surface (plantmix bituminous surface is preferred). During periods of cold or wet weather, potholes may be patched with special proprietary mixes that do not require the pothole to be dry or to be primed.

When weather conditions permit, these temporary patches should be replaced with permanent patches.

Good compaction is necessary for proper pothole patching.

FLEXIBLE PAVEMENT PROGRAM (PROGRAM NO. 101.00.00), CONT'D.

Abrupt Vertical Variations

Typical causes of abrupt vertical variation are fill settlement; unstable cuts, expansive soils and unconsolidated original ground. Bridge approach settlement is an example, which usually results from fill settlement.

The most common corrective measure is to fill the depression with a bituminous surface (plantmix bituminous surface is preferred).

Pavement Cracks

Pavement cracks are generally caused by brittleness of the surface, expansion and contraction due to temperature changes, or the presence of moisture in the base or subgrade, which affects stability.

Corrective measures may include filling cracks with emulsion, rejuvenating agent or, in the case of wider cracks, by using rubberized asphalt or silicone sealants. When using emulsions or rejuvenating agents for crack repairs, sand should be applied to the sealed crack surface. Cracks should be cleaned with compressed air or a mechanical router before they are filled. Care should be taken when sealing cracks in areas of heavy stop and go traffic, as the material may pick up on hot automobile tires. If pickup is likely, a light application of sand should be placed over the sealed crack.

Shoulder Distress

Shoulder distress often results from a reduced thickness of pavement,

deterioration of the base along the shoulder area, or old dry and brittle pavement. These conditions are made worse by inadequate drainage along the shoulder.

Corrective measures may include machine or hand patching a paved shoulder with bituminous surface (plantmix is the preferred material) and shoulder seals. Unpaved shoulders require adding material and blade grading the shoulder with a smooth transition from pavement to shoulder.

Special Requirements

Environmental Clearance

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III, Chapter 4 under "Planning Maintenance Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

Stormwater Pollution Prevention, Best Management Practices

Certain tasks require special attention to stormwater pollution prevention and compliance with the maintenance facility's Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) that assist crews in reducing pollutant discharges associated with the tasks.

***FLEXIBLE PAVEMENT PROGRAM
(PROGRAM NO. 101.00.00), CONT'D.***

Refer to Part III, Chapter 4 under "Facility Pollution Prevention Plans" or the FPPP for the related maintenance facility, or contact the Stormwater Division for more information.

Work Outside the Right-of-Way

N/A

Underground Service Alert

Certain scheduled tasks under this program may be subject to review by Underground Service Alert of Northern/Central California and Nevada (USA North 811) to determine if work involves:

- Digging.
- Trenching.
- Drilling.
- Augering.
- Grading.
- Ripping.
- Boring.
- Other excavation tasks.

For more information and requirements, refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)".

Contract Services

For maintenance tasks that are contracted to private entities, the responsible Department/District representative should:

- Check the work for compliance with the contract provisions.
- Maintain a checklist to document deficiencies and problems.

Maintenance projects conducted by private entities may have a crew from the Construction Division assigned to perform the applicable inspections.

Approvals

Certain tasks may require approval, permit or special permission prior to starting work. Refer to "Approvals", under the applicable task, for more detail or requirements.

Prior approval from the Maintenance and Asset Management Division is required for tasks that are included in the Annual Work Program and the District's Planning Chart as a scheduled betterment. Projects listed in the Department's approved Annual Work Program cannot be changed without prior approval from the Director's Office. Refer to Part III, Chapter 1 under "District Administration Responsibilities" for more information.

Safety and Training

Supervisors will review safety and traffic routing plans with all workers responsible for traffic control.

Crewmembers should know the locations of emergency medical facilities

FLEXIBLE PAVEMENT

***FLEXIBLE PAVEMENT PROGRAM
(PROGRAM NO. 101.00.00), CONT'D.***

required, it is listed under the applicable task.

in case of an injury. Supervisors will ensure that first-aid supplies are on the job site.

The Safety Data Sheets (SDS) provided for products/materials used for tasks under this program should be reviewed so that everyone is aware of:

- Safety and health precautions.
- Personal protective equipment required when performing the work.

Any necessary safety and/or special instructions will be reviewed with crewmembers prior to starting so that everyone has an understanding of safety concerns and how the work will progress.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Certain tasks may require additional guidelines or requirements. Refer to "Special Handling" or "Training", under the applicable task, for more information.

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is

Base and Surface Repair (Task No. 101.01.01)

Description

Work covered under this task includes:

- Removing unstable or failed base and surface materials.
- Compacting the subgrade as necessary.
- Replacing base and surface materials with approved materials in accordance with accepted compaction and lift requirements.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to maintain the surface of the highway in a condition that is safe for motorists, preserves the State's capital investment and provides an acceptable ride quality. This task is used when distress in the pavement originates in the base material.

Timing of Maintenance

Periodic inspections should be made of roadway surfaces to determine locations and extent of base failures. There are many degrees of base failure as evidenced by cracking and distortion in the surface.

When base materials begin to affect the riding quality and structural integrity of the surface, the areas should be

removed and replaced as soon as possible.

When weather or other priorities prohibit permanent repairs, temporary repairs should be made. If repairs cannot be completed within a reasonable time frame, warning signs should be posted.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

***Base and Surface Repair
(Task No. 101.01.01), cont'd.***

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Arrangements for obtaining the required materials should be made prior to scheduling this task.

Testing

If small quantities are involved, testing of materials is not required. If large quantities are used, or a problem with the material is suspected, it should be sampled and tested in accordance with the frequencies listed in Part III, Chapter 3 "Materials Sampling and Testing". Base and surfacing materials should conform to the Department's specifications. Contact the Specifications Section of the Roadway Design Division for assistance.

Density tests for small areas are not required. Large areas may require a minimum of one density test per day.

Storage

Materials purchased from a commercial plant are usually hauled directly to the project site and incorporated into the work as it progresses. Base materials purchased in advance of the work, and stockpiled on the site, shall not be located within the 30-foot clear zone from the edge of the travel lane. Plantmix cannot be stored in advance of the work. Emulsions or cutback asphalts for tack and spot sealing should be taken from storage when available.

Special Handling

Plantmix bituminous surface that will be hauled long distances or will sit at the work site for extended periods of time may need to be covered to maintain the workability of the material. Base materials that have been stockpiled for long periods of time may need additional water added in order to achieve the required compaction.

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Training

In order to ensure that materials purchased meet specifications, District Maintenance personnel shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel (aggregates) and the Materials Division (oil/emulsion viscosity).

Disposal

Waste asphalt material and material that has been removed from the roadway should be disposed of at an approved site.

Approvals

This task involves work that may potentially generate hazardous waste. Refer to Part III, Chapter 4 under "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services

FLEXIBLE PAVEMENT

**Base and Surface Repair
(Task No. 101.01.01), cont'd.**

Division prior to starting this task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Cut the pavement outside of the distressed area.
- Dig out and dispose of failed material.
- Moisten the subgrade with water, then compact using the appropriate equipment.
- Place base material in uniform horizontal layers not exceeding a loose thickness of 8 inches. Moisten each layer of material with water,

then compact using the appropriate equipment.

- Apply a bituminous material tack coat.
- Place the plantmix or premix surface material in uniform layers not exceeding a thickness of 3 inches and compact using the appropriate equipment.
- Haul waste material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Report work to this task only when it is necessary to remove asphalt, gravel base, and/or sub-base to complete a patch.
- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.

***Base and Surface Repair
(Task No. 101.01.01), cont'd.***

- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of cubic yards placed. If 2 cubic yards are removed and 2 cubic yards are required to complete the repair, the reported accomplishment would be 2 cubic yards.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Hand Patching (Task No. 101.02.01)

Description

This task is used for filling potholes using hand tools. It includes restoration of surfacing lost due to pot-holing, raveling or other causes, as well as the construction and repair of shoulder dikes. The surface material (plantmix bituminous surface is the preferred material) is placed with hand tools.

Permanent patches should be placed when practical; however, during periods of cold or wet weather and when time does not permit, temporary patches may be placed. Temporary patches may be made with a cold mix (premixed bituminous paving material) or special proprietary mixes that do not require a pothole to be dry or primed. The special mixes are more expensive, but they tend to stay in the potholes longer. When conditions permit, a permanent patch should be placed.

Purpose

The purpose of the work associated with this task is to maintain the surface of the highway in a condition that is safe for motorists, preserves the State's capital investment and provides an acceptable ride quality.

Timing of Maintenance

Work should be scheduled when potholes are present and/or routine inspections reveal that the vertical difference in the pavement exceeds 1 inch in a 5-foot length in any direction.

Since potholes are subject to rapid enlargement and may pose a safety risk

for motorists, they should be repaired promptly. If weather or other priorities prohibit prompt repair of potholes, warning signs should be posted.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before

Hand Patching
(Task No. 101.02.01), cont'd.

purchasing or acquiring materials used for this task.

In some areas, plantmix bituminous surface, premixed bituminous paving material and aggregate base materials can be obtained from commercial sources. Arrangements for delivery of products should be made a minimum of 2 to 3 days in advance of scheduled work to ensure that materials are available.

Premixed bituminous paving material may be available from stock. It should be checked to ensure it is free of excess moisture and is suitable for the planned use. Refer to Part III, Chapter 3 "Materials Sampling and Testing" for more information.

Testing

N/A

Storage

Plantmix bituminous surface cannot be stored in advance of scheduled work. It is purchased from a commercial plant and hauled directly to the project site for incorporation into the work. Emulsions and cutback asphalts used for tack and spot sealing should be taken from stock locations as needed.

Special Handling

Plantmix bituminous surface, which will be hauled long distances or sit at the work site for extended periods of time, may need to be covered to maintain the workability of the material.

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Disposal

Waste patching material and material removed from the roadway should be disposed of at an approved site.

Approvals

This task involves work that may potentially generate hazardous waste. Refer to Part III, Chapter 4 under "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.

Temporary Patches

- Apply a bituminous material tack coat.
- Place the premix or plantmix surface material and rake level 1/2 to 3/4 inch above the pavement surface.

FLEXIBLE PAVEMENT

***Hand Patching
(Task No. 101.02.01), cont'd.***

- Compact the surface material using the appropriate equipment and apply a light layer of sand/abrasive material, if necessary, to prevent raveling.
- Haul waste material to an approved disposal site.
- Place temporary lane line delineation if the patch covers pavement markings.
- Remove traffic control.

Permanent Patches

- Square up and clean the area to be patched.
- Apply a bituminous material tack coat to the edges of the existing asphalt and the bottom of the hole (if necessary).
- Place the premix or plantmix surface material and rake level 1/2 to 3/4 inch above the pavement surface.
- Compact the surface material using the appropriate equipment.
- Haul waste material to an approved disposal site.
- Place temporary lane line delineation if the patch covers pavement markings.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Special Instructions

- Place the appropriate warning signs in areas where numerous potholes develop and patching operations are delayed.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and material used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of cubic feet of surface material used.
- If less than 1/3 cubic foot is used, it is not necessary to report materials or accomplishment. (A bag of patch is approximately 1/3 cubic foot.)

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

**Maintenance Patching: Less than 500 feet
(Task No. 101.02.02)**

Description

This task is for restoring surface lost to raveling, settlement or other causes in which the vertical difference in pavement exceeds 1 inch in a 10-foot length in any direction. Bituminous surface is placed by machine using a hot mix (plantmix bituminous surface is the preferred material) or a cold mix (premixed bituminous paving material).

Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.

Purpose

The purpose of the work associated with this task is to maintain the surface of the highway in a condition that is safe for motorists, preserves the State's capital investment and provides an acceptable ride quality.

Timing of Maintenance

Machine patching should be performed when the surface exceeds straight edge requirements, the ride is undesirable, or large areas are distressed to the point that extensive hand patching will be required if preventive action is not taken and seals are not an option.

Refer to Section 401 of the *Standard Specifications for Road and Bridge*

Construction for weather limitations using plantmix bituminous surface.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Maintenance Patching: Less than 500 feet (Task No. 101.02.02), cont'd.

In some areas, plantmix bituminous surface and aggregate base materials can be obtained from commercial sources. Arrangements for obtaining the required materials should be made a minimum 2 days in advance of scheduled work to ensure that materials are available.

Testing

N/A

Storage

Premixed bituminous paving material can be stored at approved sites. Stockpiles should be in locations which are inconspicuous, do not impact drainage areas nor result in traffic hazards. Stockpiles should be neatly stacked and kept free of contaminants.

Special Handling

Plantmix bituminous surface, which will be hauled long distances or sit at the work site for extended periods of time, may need to be covered to maintain its workability.

A copy of the SDS for the cutback asphalt or emulsion being used shall be on the job site.

Disposal

Waste asphalt material should be disposed of at an approved site.

Approvals

Non-betterment work requires the District Engineer's approval.

This task involves:

- Work that generates excessive noise, dust, emissions or other airborne pollutants.
- Work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Air Quality", "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Prepare the area to be patched; sweep away any loose material.
- Apply a bituminous material tack coat.

FLEXIBLE PAVEMENT

Maintenance Patching: Less than 500 feet
(Task No. 101.02.02), cont'd.

- Place the premix or plantmix surface material with a self-propelled paving machine or motor grader.
- Roll the patch with a minimum of one pneumatic and one tandem steel-wheeled roller.
- Place temporary lane line delineation if the patch covers pavement markings.
- Haul waste material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and material used for this task.
- Select any other material not included in the material pick list from its associated stockpile.

- Enter the reported accomplishment as the total number of cubic yards of surface material replaced. A truckload count may be used for reporting purposes.
- Convert cutback asphalt from tons to gallons. (Use 250 gallons per ton for most asphalt.)
- When sealing these patches, code to this Task No. 101.05.02 (Fog/Flush Seal).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

**Overlay/Inlay: More than 500 feet
(Task No. 101.02.03)**

Description

Work under this task restores the surface that is cracked, uneven, broken, permeable to water and/or susceptible to loss of material and the need is great enough for resurfacing. The surface length exceeds 500 feet with a depth of more than 3/4 inch. Bituminous surface is placed by machine using a hot mix (plantmix bituminous surface is the preferred material).

***Task No. 131.09.01
(Install/Repair/Replace Pollution
Prevention Devices) shall be
completed prior to starting any work
for this task.***

Purpose

The purpose of the work associated with this task is to maintain the surface of the highway in a condition that is safe for motorists, preserves the State's capital investment and provides an acceptable ride quality.

Timing of Maintenance

An overlay should be scheduled when routine inspections reveal that the surface is cracked, uneven, broken, permeable to water and susceptible to loss of material.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

In some areas, plantmix bituminous surface and aggregate base materials can be obtained from commercial sources. Arrangements for obtaining the required materials should be made minimum 2 days in advance of scheduled work to ensure that materials are available.

Overlay/Inlay: More than 500 feet (Task No. 101.02.03), cont'd.*Testing*

N/A

Storage

N/A

Special Handling

Plantmix bituminous surface, which will be hauled long distances or sit at the work site for extended periods of time, may need to be covered to maintain its workability.

A copy of the SDS for the cutback asphalt or emulsion being used shall be on the job site.

Disposal

Waste asphalt material should be disposed of at an approved site.

Approvals

Non-betterment work requires the District Engineer's approval.

This task involves:

- Work that generates excessive noise, dust, emissions or other airborne pollutants.
- Work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Air Quality", "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to

starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Prepare the area to be patched; sweep away any loose material.
- Apply a bituminous material tack coat.
- Place the premix or plantmix surface material with a self-propelled paving machine or motor grader.
- Roll the patch with a minimum of one pneumatic and one tandem steel-wheeled roller.
- Place temporary lane line delineation if the patch covers pavement markings.
- Haul waste material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

***Overlay/Inlay: More than 500 feet
(Task No. 101.02.03), cont'd.***

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and material used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of cubic yards of surface material replaced. A truckload count may be used for reporting purposes.
- Convert cutback asphalt from tons to gallons (Use 250 gallons per ton for most asphalt.)
- When sealing these patches, code to this Task No. 101.05.02 (Fog/Flush Seal).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Roadway Capacity Improvements (Task No. 101.02.04)

Description

This task involves widening roadways in order to relieve congestion or reduce accidents at intersections, or to provide a safe location for chain installation and removal for the traveling public.

**Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.**

Work under this task requires a determination of the nature and extent of the proposed improvement.

Purpose

The purpose of the work associated with this task is to ensure that the finished work has the same integrity of construction and appearance as expected from contract projects governed by the *Standard Specifications for Road and Bridge Construction*.

Timing of Maintenance

Work under this task should be scheduled when traffic patterns and safety trends indicate an opportunity to implement roadway improvements.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good

working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

In some areas, hot mix (plantmix bituminous surface is the preferred material) and aggregate base materials can be obtained from commercial sources. Arrangements for obtaining the required materials should be made a minimum of 2 days in advance of scheduled work to ensure that materials are available.

***Roadway Capacity Improvements
(Task No. 101.02.04), cont'd.***

Testing

N/A

Storage

N/A

Special Handling

Plantmix bituminous surface, which will be hauled long distances or sit at the work site for extended periods of time, may need to be covered to maintain its workability.

A copy of the SDS for the bituminous material being used shall be on the job site.

Disposal

Waste asphalt material should be disposed of at an approved site.

Approvals

Non-betterment work requires the District Engineer's approval.

This task involves work that may potentially generate hazardous waste. Refer to Part III, Chapter 4 under "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV,

Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Cut or fill the area as needed.
- Place the base material and compact using the appropriate equipment.
- Apply a bituminous material tack coat.
- Place the premix or plantmix surface material with a self-propelled paving machine or motor grader.
- Roll the patch with a minimum of one pneumatic and one tandem steel-wheeled roller.
- Place temporary lane line delineation if the patch covers pavement markings.
- Haul waste material to an approved disposal site.
- Remove traffic control.

**Roadway Capacity Improvements
(Task No. 101.02.04), cont'd.**

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Report all seal and sand operations to this task, including sweeping prior to or after completion of the sand seal. (In this instance, labor and equipment will be reported with 0 accomplishment.)
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of square yards of newly paved area.
- Convert liquid asphalt from tons to gallons (Use 250 gallons per ton for most asphalt.)

Sand Seal (Task No. 101.05.01)

Description

Work under this task involves applying an emulsion or cutback asphalt binder to the roadway surface at a prescribed rate and applying a sand cover.

Sand seals add asphalt to the surface of dry or weathered pavements, which:

- Prevents or delays raveling.
- Seals minor cracks to prevent intrusion of moisture into the pavement or base material.
- Delays surface deterioration.

Sand seals are not effective on pavement distress caused by base failure or badly raveled or deteriorated surfaces, and they may worsen overly rich pavement surfaces.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to apply sand seals on the roadway as part of a preventive maintenance strategy.

Timing of Maintenance

Sand seals should be placed when routine inspections reveal that surfaces exhibit early signs of raveling and minor cracking.

They should be used in situations where surface friction is not critical for skid resistance. Sand seals should be placed when:

- The pavement is clean and dry.
- When rain, snow or high winds are not predicted.

Refer to Section 407 of the *Standard Specifications for Road and Bridge Construction* for weather limitations on applying seal coats.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

FLEXIBLE PAVEMENT

***Sand Seal
(Task No. 101.05.01), cont'd.****Ordering*

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Arrangements for obtaining the required materials should be made prior to scheduling this task.

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Purchased sand and asphalt material should be ordered a minimum of 4 weeks in advance so that delivery is made prior to use.

Testing

Sand should be sampled and tested in accordance with frequencies set forth in Part III, Chapter 3 "Materials Sampling and Testing". Purchased sand shall meet the specifications included in the bid documents. Sand produced by District Maintenance crews should meet the same specifications.

An asphalt sample will be obtained from each truck and trailer load of material delivered. Testing of the asphalt material for Saybolt viscosity is performed at the job site by maintenance certified testers.

Samples obtained south of U.S. Route 6 should be sent for testing to Las Vegas and samples obtained north of U.S.

Route 6 should be sent for testing to Carson City.

Storage

Sand used for a sand seal is usually delivered to one or more stockpile sites located in the vicinity of the project. Stockpiles should be located with good access to and from the highway for the hauling units and at least 30 feet away from the edge of the travel lane.

Special Handling

A copy of the SDS for the cutback asphalt or emulsion being used shall be on the job site.

During construction of sand seals, the asphalt should not be spread too far in advance of the cover material. Cover material must be placed before the emulsion breaks and while the cutback asphalt is tacky in order to obtain adhesion. The roadway surface should be reviewed prior to the project to ensure that preparatory work is completed and to determine if the application rate of the binder should be varied because of the texture of the roadway surface.

Training

In order to ensure that materials purchased meet specifications, District Maintenance personnel shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel (aggregates) and the Materials Division (oil/emulsion viscosity).

FLEXIBLE PAVEMENT

Sand Seal
(Task No. 101.05.01), cont'd.*Disposal*

N/A

Approvals

Non-betterment work requires the District Engineer's approval.

This task involves:

- Work that generates excessive noise, dust, emissions or other airborne pollutants.
- Work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Air Quality", "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.

- Prepare the area to be sealed. Sweep, if necessary, and place temporary lane line delineators.
- Seal the surface using bituminous material and sand. Bituminous material is applied using a distributor truck. Sand is applied using a chip spreader or truck with sand spreader.
- Check the application rate of the distributor periodically to ensure the desired amount of asphalt is applied.
- One maintenance worker with a small maintenance truck loaded with sand should follow along to fill in areas not completely covered and rake out piles of sand.
- Roll the sanded area with pneumatic rollers. (Two to three rollers are required, depending on the size of the seal project.)
- Apply additional sand to areas with insufficient cover using a sander truck.
- When the emulsion is set, control dust by lightly dampening the sanded roadway.
- Depending on traffic volume and the gradation of sand, a light watering may need to continue into the evening.
- Lightly sweep the surface to remove excess sand. Re-sweep as necessary on successive days until the roadway is noticeably free of loose sand.

FLEXIBLE PAVEMENT

***Sand Seal
(Task No. 101.05.01), cont'd.***

- Remove tab covers from temporary lane line delineators.
- Remove traffic control.
- Place advisory signs (Advisory Speed, Loose Gravel, and Sanded Oil) throughout the project.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Report all seal and sand operations to this task, including sweeping prior to or after completion of the sand seal. (In this instance, labor and equipment will be reported with 0 accomplishment.)
- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.

- Enter the reported accomplishment as the total number of square yards of newly covered area.
- Convert cutback asphalt from tons to gallons (Use 250 gallons per ton for most asphalt.)

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Fog/Flush Seal (Task No. 101.05.02)

Description

Work covered under this task involves applying an emulsion or cutback asphalt to the roadway at a prescribed rate.

Fog/Flush seals add asphalt to the surface of pavements, which:

- Prevents intrusion of moisture into the asphalt surface.
- Holds aggregate in place.
- Delays surface deterioration such as raveling and cracking.
- Rejuvenates the asphalt on dried or oxidized surfaces.
- Improves the appearance of the roadway surface.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to apply fog/flush seals on the roadway as part of a preventive maintenance strategy.

Timing of Maintenance

Flush seals are for use on surfaces that are dry and have a somewhat open texture. They should not be used on rich pavements, pavements that have a very dense surface or pavements that will

exhibit a substantial loss of surface friction with the addition of a modest application of asphalt. Flush seals should be placed when:

- The pavement is clean and dry.
- When rain, snow or high winds are not predicted.

Refer to Section 407 of the *Standard Specifications for Road and Bridge Construction* for weather limitations on applying seal coats.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Fog/Flush Seal
(Task No. 101.05.02), cont'd.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Arrangements for obtaining the required materials should be made prior to scheduling this task.

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

The cutback asphalt or emulsion may be obtained from existing stock supplies. Maintenance stations in the rural areas may need to obtain material from the major maintenance station. The Supervisor should ensure that the cutback asphalt or emulsion is available from stock.

Purchased sand and asphalt material should be ordered a minimum of 4 weeks in advance so that delivery is made prior to use.

Testing

An asphalt sample will be obtained from each truck and trailer load of material.

Samples obtained south of U.S. Route 6 should be sent for testing to Las Vegas and samples obtained north of U.S. Route 6 should be sent for testing to Carson City. All emulsion samples shall be submitted to the Materials Division as soon as possible, preferably the next working day.

Storage

Emulsions and cutback asphalt should be stored in heated storage tanks.

Special Handling

The flush seal should be applied in a manner that causes the least inconvenience to traffic. One way piloted traffic should be provided as a minimum, until the material has cured sufficiently so it will not pick up or track.

The roadway surface should be reviewed prior to the seal to determine if there are any areas where the application of asphalt should vary due to variations in pavement surface texture. If travel lanes are flush sealed, a light application of sand should be applied before the seal sets in order to improve skid resistance. A copy of the SDS for the cutback asphalt or emulsion being used shall be on the job site.

Training

In order to ensure that materials purchased meet specifications, District Maintenance personnel shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel (aggregates) and the Materials Division (oil/emulsion viscosity).

Disposal

N/A

Approvals

Non-betterment work requires the District Engineer's approval.

FLEXIBLE PAVEMENT

***Fog/Flush Seal
(Task No. 101.05.02), cont'd.***

This task involves work that may potentially generate hazardous waste. Refer to Part III, Chapter 4 under "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Prepare the area to be sealed. Sweep, if necessary, and place temporary lane line delineators.
- Apply emulsion, rejuvenating agent or cutback asphalt at the prescribed rate (based on the surface texture of the pavement and the material selected).
- Check the application rate of the distributor periodically to ensure the desired amount of asphalt is being applied.
- Apply sand at road crossings, approaches, slippery spots on

grades and other locations as needed.

- Remove tab covers from temporary lane line delineators.
- Open the roadway to traffic when the seal is sufficiently cured and tracking is not evident.
- Remove traffic control.
- Place advisory signs (Advisory Speed, Fresh Oil) throughout the project.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Report work to this task when sealing approaches, dikes, asphalt ditches and roadside parks.
- Select any other material not included in the material pick list from its associated stockpile.

Fog/Flush Seal
(Task No. 101.05.02), cont'd.

- Enter the reported accomplishment as the total number of square yards of newly covered area.
- Convert cutback asphalt from tons to gallons (Use 250 gallons per ton for most asphalt.)
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Chip Seal (Task No.101.05.03)

Description

Work under this task involves applying an emulsion or cutback asphalt binder to the roadway surface at a prescribed rate and applying a sand cover, and covering the binder with rock screenings (chips).

Chip seals are the highest quality of the seals used for preventive maintenance. They add asphalt to the surface of dry or weathered pavements which:

- Prevents or delays raveling.
- Seals minor cracks to prevent intrusion of moisture into the pavement or base material.
- Delays surface deterioration.

Because of aggregate size and shape, chip seals provide a skid resistant surface.

**Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.**

Purpose

The purpose of the work associated with this task is to apply chip seals on the roadway as part of a preventive maintenance strategy.

Timing of Maintenance

Chip seals should be placed when routine inspections reveal that surfaces exhibit early signs of raveling and minor cracking.

They should be used in situations where surface friction is critical for skid resistance. Chip seals should be placed when:

- The pavement is clean and dry.
- When rain, snow or high winds are not predicted.

Refer to Section 408 of the *Standard Specifications for Road and Bridge Construction* for weather limitations on applying seal coats.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Chip Seal
(Task No. 101.05.03), cont'd.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Arrangements for obtaining the required materials should be made prior to scheduling this task.

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Due to the time required to produce quality chips, the chips should be ordered a minimum of 4 weeks ahead of time so that the delivery is made prior to the start of the project.

Often, a District will have chips made on an upcoming contract and stockpiled for a chip seal project in a future work year. These projects are requested in the District's Planning Chart.

Testing

Chips should be sampled and tested in accordance with frequencies set forth in Part III, Chapter 3 "Materials Sampling and Testing". Chips shall meet the specifications included in the bid documents.

Testing of the oil for Saybolt viscosity is performed at the job site by maintenance certified testers.

Asphalt samples should be obtained from each truck and trailer load.

Samples obtained south of U.S. Route 6 should be sent for testing to Las Vegas and samples obtained north of U.S. Route 6 should be sent for testing to Carson City.

All emulsion samples shall be submitted to the Materials Division as soon as possible, preferably the next working day.

Storage

Chips used for a chip seal are usually delivered to one or more stockpile sites located in the vicinity of the project. Stockpiles should be located with good access to and from the highway for the hauling units and situated with a minimum 30-foot clear zone between the stockpile and the edge of the travel lane.

Special Handling

Several weeks prior to the chip seal, the section of roadway scheduled for the seal should be reviewed to ensure that all areas which required patching have been patched and the patches are properly cured. Premixed material patches need to cure a minimum of 30 days prior to placing a chip seal. Premixed material patches placed just prior to the seal may cause problems because they are not properly cured. Plantmix bituminous surface patches should cure for 1 week prior to the seal.

When an emulsion is used as the binder, the stockpile of chips must be thoroughly dampened prior to placing them on the roadway.

The roadway surface should be reviewed prior to the seal to ensure that preparatory work is completed and to

Chip Seal
(Task No. 101.05.03), *cont'd.*

determine if there are any areas where the application of the asphalt should be varied due to variations in pavement surface texture.

Traffic may be routed over the newly placed chips after they have been rolled, but should be restricted to slow speeds under the control of a pilot car until the binder and the chips have set and the surface has been thoroughly swept.

During application of a chip seal, care should be exercised so that the emulsion is not spread too far in advance of the cover aggregate. Cover aggregate must be placed before the emulsion breaks in order to obtain adhesion.

Since vehicle window damage is one of the major concerns when chip seals are applied, supervisors should ensure that the following operations are not adding to the problem:

- Improper sweeping operations
- Overloaded trucks that have chips/screenings falling off the loads en route to the spreading unit
- Speeding vehicles that may be throwing chips/screenings

A copy of the SDS for cutback asphalt or emulsion being used shall be on the job site.

Training

In order to ensure that materials purchased meet specifications, District Maintenance personnel shall be

properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel (aggregates) and the Materials Division (oil/emulsion viscosity).

Disposal

Waste such as tar paper used at the joints should be disposed of at an approved location.

Approvals

Non-betterment work requires the District Engineer's approval.

This task involves:

- Work that generates excessive noise, dust, emissions or other airborne pollutants.
- Work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Air Quality", "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road*

Chip Seal
(Task No. 101.05.03), cont'd.

and *Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.

- Prepare the area to be sealed. Sweep, if necessary, and place temporary lane line delineators.
- Apply the bituminous material binder at the prescribed minimum/maximum rate (in gallons per square yard), depending on surface texture and chip size. Apply tar paper to all joints created where the distributor stops.
- Check the application rate of the distributor periodically to ensure that the desired amount of binder material is applied.
- Apply chips to sealed area using a self-propelled aggregate spreader. Chips should be applied at the lowest prescribed minimum/maximum application rate (in pounds per square yard).
- One maintenance worker with a small maintenance truck loaded with chips should follow along to fill in voids and rake out piles of chips.
- Roll chips with pneumatic rollers. (Three rollers are usually required.)
- When the binder is set sufficiently (i.e., sweeping does not dislodge chips from the binder), lightly sweep the surface to remove excess chips.
- Re-sweep as necessary on successive days until the roadway is free of excess chips. If traffic volume

is high, control traffic with flaggers and pilot cars.

- Remove traffic control.
- Place advisory signs (Advisory Speed, Loose Gravel, Fresh Oil) throughout the project.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task. Materials may be estimated by truckload count.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of square yards of surface that received the seal.
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Chip Seal
(Task No. 101.05.03), cont'd.

- This task includes any preparation work (tabbing, wetting piles, etc.) and post application clean-up work with 0 for the number of accomplishment units.
- On an approved betterment, the application of the chip retention oil will be 0 for the number of accomplishment units for this task.
- Convert cutback asphalt from tons to gallons (Use 250 gallons per ton for most asphalt.)
- Enter the approved betterment number for each applicable task entry.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Scrub Seal (Task No. 101.05.04)

Description

This task involves applying an emulsion or cutback asphalt binder to a roadway at a prescribed rate, sweeping or squeegee the binder and covering the binder with sand.

Scrub seals add asphalt to the surface of pavements which:

- Prevents intrusion of moisture into the asphalt surface by sealing existing cracks.
- Delays surface deterioration such as raveling and cracking.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to apply scrub seals on the roadway as part of a preventive maintenance strategy.

Timing of Maintenance

Chip seals should be placed when routine inspections reveal that surfaces exhibit early signs of raveling and minor cracking. They should not be used on rich pavements, pavements that have a very dense surface or pavements that will exhibit a substantial loss of surface friction with the addition of a modest application of asphalt.

Scrub seals should be placed when:

- The pavement is clean and dry.
- When rain, snow or high winds are not predicted.

Refer to Section 407 of the *Standard Specifications for Road and Bridge Construction* for weather limitations on applying seal coats.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Scrub Seal
(Task No. 101.05.04), cont'd.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Arrangements for obtaining the required materials should be made prior to scheduling this task.

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Purchased sand, chips and asphalt material should be ordered a minimum of 4 weeks in advance so that delivery is made prior to use.

Testing

An asphalt sample must be obtained from each truck and trailer load of material. Testing of the oil for Saybolt viscosity is performed at the job site by maintenance certified testers.

Samples obtained south of U.S. Route 6 should be sent for testing to Las Vegas and samples obtained north of U.S. Route 6 should be sent for testing to Carson City.

All emulsion samples must be submitted to the Materials Division as soon as possible, preferably the next working day.

Storage

Emulsions and cutback asphalt should be stored in heated storage tanks.

Special Handling

The scrub seal should be applied in a manner that causes the least inconvenience to traffic. One-way piloted traffic should be provided as a minimum, until the material has cured sufficiently so it will not pick up or track.

The roadway surface should be reviewed prior to the seal to determine if there are any areas where the application of asphalt should vary due to variations in pavement surface texture. If travel lanes are scrub sealed, a light application of sand should be applied before the seal sets in order to improve skid resistance. A copy of the SDS for the cutback asphalt or emulsion being used shall be on the job site.

Training

In order to ensure that materials purchased meet specifications, District Maintenance personnel shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel (aggregates) and the Materials Division (oil/emulsion viscosity).

Disposal

N/A

Approvals

Non-betterment work requires the District Engineer's approval.

Scrub Seal
(Task No. 101.05.04), cont'd.

This task involves:

- Work that generates excessive noise, dust, emissions or other airborne pollutants.
- Work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Air Quality", "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Prepare the area to be sealed. Sweep, if necessary, and place temporary lane line delineators.
- Apply the bituminous material binder at the prescribed minimum/maximum rate (in gallons per square yard), depending on the surface texture of the pavement and the material selected.

- Scrub material into the road surface using a broom or similar device, filling all voids.
- Check the application rate of the distributor periodically to ensure the desired amount of binder material is being applied.
- Apply a light coating of sand or chips to provide a non-skid surface and prevent tracking.
- Roll the material with pneumatic rollers. (Three rollers are usually required.)
- When the binder is set sufficiently (i.e., sweeping does not dislodge material from the binder), lightly sweep the surface to remove excess material.
- Re-sweep as necessary on successive days until the roadway is free of excess material.
- Remove traffic control.
- Place advisory signs (Advisory Speed, Loose Gravel, and Fresh Oil) throughout the project.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was

Scrub Seal
(Task No. 101.05.04), cont'd.

accomplished, enter the total number of man-hours for that task in addition to this task.

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of square yards of surface that received the seal.
- Convert undiluted asphalt from tons to gallons (Use 250 gallons per ton for most asphalt.)

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Crack Filling (Task No. 101.07.01)

Description

This task covers cleaning cracks in the pavement surface and filling them with rubberized asphalt.

Purpose

The purpose of the work associated with this task is to prevent moisture from entering the pavement and base. Deterioration accelerates when excessive moisture is present in the pavement or base material.

Timing of Maintenance

Work should be scheduled when routine inspections reveal that 60 percent of the asphalt surface cracks in any 1,000-foot section exceed a width of 1/2 inch.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Special Handling

Since rubberized asphalt crack filler is placed at very high temperatures

(greater than 300°F), this task requires special handling such as:

- Keeping the crack-filling machine outside, in an open area when heating.
- Not leaving the crack-filling machine unattended while heating.
- Not heating the heat transfer oil in the crack-filling machine to greater than 500°F.
- Preventing getting water into the crack-filling machine, as asphalt/rubber compounds at high temperatures react violently with water.
- Being cautious when using the hot air lance due to high temperatures.
- If the material is being heated and the equipment is not on the roadway, the crack-filling machine should not be hooked to a truck.

Training

Certain equipment used for this task may require formal training prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined

Crack Filling
(Task No. 101.07.01), cont'd.

in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Arrangements for obtaining the required materials should be made prior to scheduling this task.

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Rubberized asphalt crack-filling material is purchased on open-term contracts administered by the State Purchasing Division or taken from stock.

Testing

N/A

Storage

Rubberized crack-filling materials should be stored in a covered area; however, for short periods, it may be stored outdoors. Covered storage minimizes slumping of the material, which occurs when it is stored in the sun for an extended period of time. Slumping does not affect the ability of the material to perform; it makes it more difficult to remove from the shipping boxes.

Special Handling

Use the correct filling material for the climate in which the material is used. One of the following materials may be used for minor cracks:

- Emulsion

- Rejuvenating agent
- Cutback asphalt

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Since rubberized asphalt crack filler is placed at very high temperatures (greater than 300°F), this task requires special handling such as:

- Wearing gloves, long sleeved shirts or coats and leather boots. Coveralls should be considered to protect personal clothing.
- Wearing face shields when loading the crack-filling machine and cleaning out the cracks with compressed air.
- Reviewing the product's SDS with the crew so they will be aware of any special handling that may need to be observed.
- Ensuring first-aid supplies are on the job site.
- Being careful of hot material splash when filling the crack-filling machine.
- Performing daily safety inspections of the hose through which the material is applied.
- Preventing water from being introduced into the crack-filling machine, as asphalt/rubber compounds at high temperatures react violently with water.

Crack Filling
(Task No. 101.07.01), cont'd.

Disposal

Cardboard shipping containers should be disposed of at an approved site.

Approvals

This task involves work that may potentially generate hazardous waste. Refer to Part III, Chapter 4 under "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Heat the crack-filling material prior to the scheduled work.
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Clean cracks using compressed air or a router and compressed air.
- Fill cracks with crack-filling material. Do not overfill and keep the material from being spread widely on the pavement surface. Use a U-shaped squeegee or special tip on the filler tube to level the material.
- Sand the sealed cracks to eliminate tracking in areas of stop-and-go

traffic or apply liquid de-tack material.

- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of pounds of material used during the work period.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Surface Profiling (Task No. 101.10.01)

Description

This task includes removing surface irregularities and deteriorated pavements using a cold planer/surface grinder.

Surface profiling provides an improved base for machine patches by removing large areas of deteriorated pavement. Surfaces ground with the cold planer do not provide a good driving surface for motorcycles and some other vehicles, and it should have a surface treatment applied prior to opening the road to traffic.

**Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.**

A fog/flush seal is recommended after profiling is completed. Refer to Task No. 101.05.02 (Fog/Flush Seal) for instructions.

Purpose

The purpose of the work associated with this task is to provide an improved riding surface by eliminating surface irregularities and improving skid-resistance.

Timing of Maintenance

Surface profiling should be scheduled when routine inspections reveal that the asphalt surface is distorted by corrugations, rolls or ruts.

Because the cold planer uses water, it must be operated when temperatures are above freezing.

The deteriorated or irregular pavement should be removed when weather and temperatures permit patching with plantmix bituminous surface.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Special Equipment

- The cold planer/surface grinder is a statewide piece of equipment and is assigned to the Maintenance and Asset Management Division (Headquarters Maintenance) and managed by District II Maintenance. Requests for the cold planer/surface grinder must be sent to a District II Maintenance Manager to confirm availability.

Training

Certain equipment used for this task may require formal training prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Surface Profiling
(Task No. 101.10.01), cont'd.

Materials

N/A

Approvals

This task involves:

- Work that generates excessive noise, dust, emissions or other airborne pollutants.
- Work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Air Quality", "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Mark out the areas to be removed.
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Remove surface irregularities using the cold planer/surface grinder.

- Sweep and clean the area.
- Removed material used for shouldering should be uniformly spread.
- Seal the resurfaced area, if necessary.
- Haul waste material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a from-to milepost or a spot location.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of square yards of surface that has been profiled.
- If a seal coat is required, report to this task; enter 0 for the number of accomplishment units.

Surface Profiling
(Task No. 101.10.01), cont'd.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

CHAPTER 4: RIGID PAVEMENT

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

RIGID PAVEMENT PROGRAM (PROGRAM NO. 111.00.00)

Description

Rigid pavements are constructed with Portland cement concrete (PCC). This program includes tasks for the maintenance and repair of PCC roadway surfaces and shoulders including:

- Temporary patching of PCC pavements.
- Permanent patching of PCC pavements.
- Paved shoulder repair.
- Crack and joint sealing.

Policy

The Department's objective is to maintain PCC pavements in a manner that provides a safe facility, preserves the State's capital investment and maintains a satisfactory ride quality.

Maintenance Priorities

When practical, permanent (rather than temporary) repairs should be made. The following priorities should be considered when planning and coordinating maintenance work under this program:

- Roadbed deficiencies that affect motorist safety

- Roadbed defects that affect capital investment and ride quality
- Aesthetics

Deficiencies

The following should be considered when establishing priorities for correcting PCC pavement deficiencies.

Slippery Pavement

When aging and wear cause changes in pavement texture, the surface may become slick from moisture or frost. Routine inspection of pavement surface texture should be made and suspected problem areas reported promptly.

Cracks

Cracking of the pavement surface occurs because of base material failure, temperature expansion and contraction or excessive loads. Cracks in the pavement allow water and foreign material to enter the structural section and can cause further failure of the pavement. Cracks should be filled when they are a width of 1/4 inch or more, or when an area has extensive fine cracking.

Settlement, Heave and Distortion

This type of roadbed defect often results in poor riding quality. Typical causes are filling settlement, unstable cuts, expansive soils, unconsolidated basement soils and insufficient

***RIGID PAVEMENT PROGRAM
(PROGRAM NO. 111.00.00), CONT'D.***

structural section. Bridge approach slab settlement is included in this category and requires routine inspection. A void often exists under the approach slab long before the slab settles. If a void is suspected under the approach slab, it should be reported to the Structures Division. This type of distress usually requires correction of problems under the concrete pavement; however, temporary repairs may be made by asphalt surfacing to improve the ride quality.

Spalling

Spalled joints are caused by a joint surface edge breaking, resulting in a hole in the pavement. Surface spalling may be caused by freeze-thaw cycles or by the continued use of metal (such as tire chains) coming in contact with the pavement surface. Spalled joints should be repaired using a specialized patching material. Minor surface spalling does not require maintenance. More severe spalling may require temporary patching with asphalt or permanent patching using partial depth concrete patches.

Joint Separation

Joint separation and the loss of the joint seal allow water to reach underlying base materials and may result in faulting.

Joints in the concrete pavement and joints between the concrete pavement and the asphalt shoulders should be filled when they exceed a width of 1/4 inch.

Joint Faulting

This often results when the joint seals fail which allows water under the concrete slab. Heavy traffic loading may cause a concrete slab to rock and fine particles of the underlying material may be pumped up through the joint creating a void under a slab and different heights of adjacent slabs. Joints and cracks should be kept sealed to prevent joint faulting.

Special Requirements

Environmental Clearance

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III, Chapter 4 under "Planning Maintenance Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

***Stormwater Pollution Prevention,
Best Management Practices***

Certain tasks require special attention to stormwater pollution prevention and compliance with the maintenance facility's Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) that assist crews in reducing pollutant discharges associated with the tasks.

Refer to Part III, Chapter 4 under "Facility Pollution Prevention Plans" or

**RIGID PAVEMENT PROGRAM
(PROGRAM NO. 111.00.00), CONT'D.**

the FPPP for the related maintenance facility, or contact the Stormwater Division for more information.

Hydraulics

N/A

Work Outside the Right-of-Way

N/A

Underground Service Alert

N/A

Contract Services

N/A

Approvals

Certain tasks may require approval or special permission prior to starting work. Refer to "Approvals", under the applicable task, for more detail or requirements.

Prior approval from the Maintenance and Asset Management Division is required for tasks that are included in the Annual Work Program and the District's Planning Chart as a scheduled betterment. Projects listed in the Department's approved Annual Work Program cannot be changed without prior approval from the Director's Office. Refer to Part III, Chapter 1 under "District Administration Responsibilities" for more information.

Safety and Training

Supervisors will review safety and traffic routing plans with all workers responsible for traffic control.

Crewmembers should know the locations of emergency medical facilities in case of an injury. Supervisors will ensure that first-aid supplies are on the job site.

The Safety Data Sheets (SDS) required for products/materials used for tasks under this program should be reviewed so that everyone is aware of:

- Safety and health precautions.
- Personal protective equipment required when performing the work.

Any necessary safety and/or special instructions will be reviewed with employees prior to starting so that everyone has an understanding of safety concerns and how the work will progress.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Certain tasks may require additional guidelines or requirements. Refer to "Special Handling" or "Training", under the applicable task, for more information.

***RIGID PAVEMENT PROGRAM
(PROGRAM NO. 111.00.00), CONT'D.***

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is required, it is listed under the applicable task.

RIGID PAVEMENT

**Temporary Patching/Spall Repair: PCC Pavement
(Task No. 111.01.01)**

Description

Temporary patching of PCC pavements is performed when broken or spalled areas in the roadway surface have a vertical differential of 1 inch or more in a 5-foot length in any direction and when weather or time will not allow permanent repairs. Temporary patching is performed using a hot mix (plantmix bituminous surface) or a cold mix (premixed bituminous paving material) if a hot mix is not available.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to provide a safe pavement surface, prevent surface deterioration and provide an acceptable ride quality until time and weather allow permanent patching.

Timing of Maintenance

Work should be scheduled when potholes are present and/or routine inspections reveal that the vertical difference in the pavement exceeds 1 inch in a 5-foot length in any direction. Early spring and periods of wet weather result in the most deterioration.

In order to extend the life of the patches, minimize traffic impact and provide an

efficient operation, patching should be performed:

- When weather conditions allow the surface to be well cleaned and primed.
- During non-peak hours on heavy traffic volume routes.
- When traffic control can be established for patching several defects at a time within one control zone.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

***Temporary Patching/Spall Repair:
PCC Pavement
(Task No. 111.01.01), cont'd.***

Ordering

Materials/supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Arrangements for purchasing patching materials should be made prior to scheduling work. If premixed material is used, it should be relatively fresh and exhibit good life.

Testing

Because small quantities of materials are usually involved, and the patches are temporary, testing of the patching material is not required; however, if a problem with the material is suspected, it should be sampled and tested in accordance with Part III, Chapter 3 "Materials Sampling and Testing".

Storage

Plantmix bituminous surface cannot be stored prior to use.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Training

In order to ensure that materials purchased meet specifications, District Maintenance employees shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel (aggregates) and the Materials Division (oil/emulsion viscosity).

Disposal

Waste asphalt materials, along with waste resulting from the preparation process, should be cleaned up and hauled to an appropriate disposal site.

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Remove loose material from the area that is being patched.
- If using a bituminous patching material, apply a tack coat.

RIGID PAVEMENT

***Temporary Patching/Spall Repair:
PCC Pavement
(Task No. 111.01.01), cont'd.***

- Place the patching material; large patches should be brought to grade using the appropriate equipment.
- If using concrete patching material, smooth the patch surface using hand tools.
- If using bituminous patching material, compact the patch surface using the appropriate equipment.
- Place temporary lane line delineation if the patch covers pavement markings.
- Haul waste material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.

- Enter the reported accomplishment as the total number of square feet of temporary patch.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

RIGID PAVEMENT

**Permanent Patching/Spall Repair: PCC Pavement
(Task 111.01.02)**

Description

Permanent patching requires that the pavement surfacing be maintained true to type; therefore, repairs made with asphalt patching material do not qualify as permanent patches. A permanent patch material, such as high early strength PCC or a rapid-setting concrete product, is required. Permanent patches may be partial or full depth.

Supervisors should review product SDS and other safety concerns with all employees so that personal protective equipment is available and being used when performing the work for this task.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to ensure motorist safety, prevent further deterioration of the pavement and maintain a satisfactory ride.

Timing of Maintenance

Placement of permanent patches should be performed when:

- Broken or spalled areas in the roadway surface have a vertical differential of 1 inch or more in a 5-foot length in any direction.

- Weather conditions are satisfactory for proper cure of the material.
- Traffic flow can be restored prior to peak times on heavy volume routes.
- Traffic control can be established so several areas can be patched at a time within one control zone.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Materials that can be used for permanent patches depend on the

RIGID PAVEMENT

***Permanent Patching/Spall Repair:
PCC Pavement
(Task No. 111.01.02), cont'd.***

extent and type of damage. The most common materials are:

- PCC made with a high early strength cement. It can be used for most permanent repairs. In order to obtain a good joint between the old and the new concrete, an epoxy adhesive should be used.
- Rapid-setting products are available for patching concrete surfaces and may provide improved performance over PCC.

Ordering

Materials/supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

PCC is normally obtained from a commercial source. Arrangements for delivery of products should be made a minimum of 2 to 3 days in advance of scheduled work to ensure that materials are available.

Rapid-setting products are normally obtained in small quantity containers. Product brochures should be obtained to determine the best product for the planned repair.

Testing

If small quantities are involved, testing of the material is not required. If large quantities are involved or if problems are suspected, the material should be sampled and tested in accordance with Part III, Chapter 3 "Materials Sampling and Testing".

Storage

If a rapid-setting product is used, it should be stored in accordance with the manufacturer's recommendations.

Special Handling

If epoxy adhesive is used as a bonding agent between the old and the new concrete, or if a rapid-setting product is used, these shall be handled and applied in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

When working with epoxy adhesives or rapid-setting patch materials, supervisors should be aware of safety precautions, pot life of the mixed materials and recommended application temperatures.

Training

In order to ensure that materials purchased meet specifications, District Maintenance employees shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel (aggregates) and the Materials Division (oil/emulsion viscosity).

RIGID PAVEMENT

***Permanent Patching/Spall Repair:
PCC Pavement
(Task No. 111.01.02), cont'd.***

Disposal

Concrete debris should be hauled to the station for disposal with similar materials or hauled directly to a disposal site. Disposal of excess epoxy adhesive, rapid-setting product and their containers must be according to the manufacturer's recommendations and the SDS.

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Cut the perimeter of the patch with a concrete saw.
- For a full-depth patch, do not disturb the cement treated base or other base course under the concrete pavement. In most cases, the slab should be removed in one piece and broken up outside of the patch area so the debris can be handled by a loader or backhoe.

- Sweep away any loose material from the area being patched.

Patching with PCC

- Apply epoxy adhesive material to surfaces of old concrete.
- Place the concrete mixture using tamping or vibratory equipment.
- Screed the patch even with surrounding concrete.
- Broom the fresh concrete to provide texture.
- Apply a curing seal.
- Place temporary lane line delineation if the patch covers pavement markings.
- Haul waste material to an approved disposal site.
- After the patch meets strength requirements, remove traffic control.

Patching with Rapid-Setting Patching Material

- Apply the bonding agent.
- Place the patching material.
- Screed the patch even with surrounding concrete.
- Broom the fresh concrete to provide texture.
- Apply a curing seal, if recommended by the product manufacturer.

RIGID PAVEMENT

***Permanent Patching/Spall Repair:
PCC Pavement
(Task No. 111.01.02), cont'd.***

- Place temporary lane line delineation if the patch covers pavement markings.
- Haul waste material to an approved disposal site.
- After the material has cured sufficiently, remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location. If a multiple number of patches are made across a wide area, enter the location as a from-to milepost.
- Enter all labor, equipment and material used for this task.
- Select any other material not included in the material pick list from its associated stockpile.

- Enter the reported accomplishment as the total number of square feet of PCC used in the permanent patch.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

RIGID PAVEMENT

**Concrete Joint/Crack Filling:
Weakened Sawed Joints, Random
Cracks
(Task No. 111.04.01, 111.04.02)**

Description

Joint/crack filling of PCC pavement is performed when joint separation, cracks in the concrete and/or the loss of the joint seal allow water to reach underlying base materials and may result in faulting.

Purpose

The purpose of the work associated with this task is to ensure motorist safety and prevent further deterioration of the joint.

Timing of Maintenance

Joint/crack filling should be scheduled when routine inspections reveal that joints/cracks in the concrete pavement and joints between the concrete pavement and the asphalt shoulders exceed a width of 1/4 inch or when 60 percent of the cracks in a 1,000-foot section exceed a width of 1/2 inch.

Timing of this task depends on the type of joint sealing material being used. If rubberized asphalt joint filler is used, it should be placed between October and March while the cracks are the widest due to the contraction of the concrete and the asphalt and to reduce the possibility of material being pulled out of the joints by hot tires.

Rubberized asphalt joint/crack-filling material should not be applied to joints or cracks in concrete pavement if the roadway is scheduled for rehabilitation within 3 years.

When rubberized asphalt is used, it should be placed when the pavement is dry and above freezing. A hot air lance can be used to dry and warm the pavement.

If silicone is used for joints, it should be placed:

- In accordance with the manufacturer's recommendations.
- When weather conditions are satisfactory for proper cure of the material.
- When traffic flow can be restored prior to peak times on heavy volume routes.
- When traffic control can be established so several joints can be filled at a time within a traffic control zone.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II,

**Concrete Joint/Crack Filling:
Weakened Sawed Joints, Random
Cracks
(Task No. 111.04.01, 111.04.02),
cont'd.**

Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

The joint between the concrete pavement and asphalt shoulder should be filled with rubberized asphalt crack filler. The filler material should:

- Maintain a good bond to both the concrete and asphalt walls of the joint.
- Have good qualities of expansion and contraction.
- Seal the joint from the intrusion of water and non-compressible materials.
- Allow installation by practicable methods.

Silicone is the preferred sealant for concrete-to-concrete joints or cracks. Contact the Materials Division for recommendations on materials specifications. Under some conditions, rubberized asphalt joint sealing material may be used for concrete-to-concrete joints or cracks.

Ordering

Materials/supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Rubberized asphalt joint/crack-filling material is normally ordered under an open-term contract awarded by the State Purchasing Division.

Silicone is ordered through the State Purchasing Division. Supervisors should ensure that joint/crack-filling materials are on hand before scheduling the work.

Testing

N/A

Storage

Rubberized joint/crack-filling material should be stored in a covered area; however, for a short time, it may be stored outdoors. Covered storage minimizes slumping of the material, which occurs when it is stored in the sun for extended periods of time. Slumping does not affect the ability of the material to perform. It does, however, make the material more difficult to remove from shipping boxes.

Special Handling

Rubberized asphalt joint/crack filler is very difficult to clean from cracks and joints, which makes the rehabilitation more difficult and expensive.

RIGID PAVEMENT

**Concrete Joint/Crack Filling:
Weakened Sawed Joints, Random
Cracks
(Task No. 111.04.01, 111.04.02),
cont'd.**

Since rubberized asphalt joint/crack filler is placed at very high temperatures (greater than 300°F), this task requires special handling such as:

- Wearing gloves, long sleeved shirts or coats and leather boots. Coveralls should be considered to protect personal clothing.
- Wearing face shields when loading the crack-filling machine and cleaning out the cracks with compressed air.
- Reviewing the product's SDS with the crew so they will be aware of any special handling that may need to be observed.
- Ensuring first-aid supplies are on the job site.
- Keep the crack-filling machine outside, in an open area when it is heating.
- Do not leave the crack-filling machine unattended while it is heating.
- If the material is being heated and the equipment is not on the roadway, the crack-filling machine should not be hooked to a truck.
- Do not heat the heat transfer oil in the crack-filling machine greater than 500°F.

- Supervisors should ensure that operators of the crack-filling machine are aware of the flash point of the material so it is not heated in excess of manufacturer's recommendations.
- Being careful of hot material splash when filling the crack-filling machine.
- Performing daily safety inspections of the hose through which the material is applied.
- Preventing water from being introduced into the crack-filling machine, as asphalt/rubber compounds at high temperatures react violently with water.

Disposal

Concrete debris should be hauled to the station for disposal with similar materials or hauled directly to a disposal site. Disposal of excess epoxy adhesive, rapid-setting product and their containers must be according to the manufacturer's recommendations and the SDS.

Approvals

This task involves work that may potentially generate hazardous waste. Refer to Part III, Chapter 4 under "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

RIGID PAVEMENT

**Concrete Joint/Crack Filling:
Weakened Sawed Joints, Random
Cracks
(Task No. 111.04.01, 111.04.02),
cont'd.**

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Heat the joint/crack-filling material prior to the scheduled work.
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Clean concrete-to-asphalt joints and concrete cracks with a router and compressed air.
- Warm and dry the joints and cracks (if necessary) with a hot air lance.
- Fill the joints and cracks with joint/crack-filling material. Do not overfill and keep the material flush with the pavement.
- Sand the sealed cracks to eliminate tracking in areas of stop-and-go traffic or apply liquid de-tack material.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment for the applicable task:
 - 111.04.01: Total linear feet
 - 111.04.02: Total pounds (filler material)

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

CHAPTER 5: MISCELLANEOUS CONCRETE REPAIR

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

MISCELLANEOUS CONCRETE REPAIR PROGRAM (PROGRAM NO. 112.00.00)

Description

This program includes tasks for maintaining and preserving the usefulness, appearance and structural integrity of all concrete assets with the exception of bridges with a span in excess of 20 feet.

Policy

The Department's objective is to:

- Maintain miscellaneous concrete assets to as near as possible the standards to which they were constructed or to current standards to provide a safe facility.
- Preserve the Department's capital investment and provide a visually appealing facility.
- Follow the applicable Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) when performing certain tasks included in this program.

Maintenance Priorities

The following priorities should be considered when planning and

coordinating maintenance work under this program:

- Public safety
- Potential liability for the Department
- Deficiencies that, if left unrepaired, may accelerate deterioration or cause damage to other roadway facilities
- Aesthetics

Deficiencies

The following should be considered when establishing maintenance priorities for tasks included in this program:

- Damage or deterioration to assets to the degree that they do not function as designed
- Damage or deterioration to assets to the degree that they pose a potential hazard to the public

Special Requirements

Environmental Clearance

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air

MISCELLANEOUS CONCRETE REPAIR

MISCELLANEOUS CONCRETE REPAIR PROGRAM (PROGRAM NO. 112.00.00), CONT'D.

quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III, Chapter 4 under "Planning Maintenance Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

Stormwater Pollution Prevention, Best Management Practices

Certain tasks require special attention to stormwater pollution prevention and compliance with the maintenance facility's Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) that assist crews in reducing pollutant discharges associated with the tasks.

Refer to Part III, Chapter 4 under "Facility Pollution Prevention Plans" or the FPPP for the related maintenance facility, or contact the Stormwater Division for more information.

Hydraulics

Certain tasks under this program require special attention to the proper flow and containment of water/stormwater, and ensuring that the drainage facilities, applications and/or materials used are in good condition, free of obstructions and working properly. Regular inspections are critical in preventing or delaying flooding, erosion, damage or deterioration.

Work Outside the Right-of-Way

Work is typically not performed outside the right-of-way. If unusual circumstances require work outside the right-of-way and onto private property, written permission is required from the property owner.

Circumstances and work performed shall comply with procedures outlined in Part IV, Chapter 1 under "Work Outside the Right-of-Way".

Underground Service Alert

Certain scheduled tasks under this program may be subject to review by Underground Service Alert of Northern/Central California and Nevada (USA North 811) to determine if work involves:

- Digging.
- Trenching.
- Drilling.
- Augering.
- Grading.
- Ripping.
- Boring.
- Other excavation tasks.

For more information and requirements, refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)".

Contract Services

N/A

MISCELLANEOUS CONCRETE REPAIR PROGRAM (PROGRAM NO. 112.00.00), CONT'D.

Approvals

Certain tasks may require approval or special permission prior to starting work. Refer to "Approvals", under the applicable task, for more detail or requirements.

Prior approval from the Maintenance and Asset Management Division is required for tasks that are included in the Annual Work Program and the District's Planning Chart as a scheduled betterment. Projects listed in the Department's approved Annual Work Program cannot be changed without prior approval from the Director's Office. Refer to Part III, Chapter 1 under "District Administration Responsibilities" for more information.

Safety and Training

Supervisors shall review safety and traffic routing plans with all workers responsible for traffic control.

Crewmembers should know the locations of emergency medical facilities in case of an injury. Supervisors shall ensure that first-aid supplies are on the job site.

The Safety Data Sheets (SDS) required for products/materials used for tasks under this program should be reviewed so that everyone is aware of:

- Safety and health precautions.
- Personal protective equipment required when performing the work.

Any necessary safety and/or special instructions will be reviewed with employees prior to starting so that everyone has an understanding of safety concerns and how the work will progress.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Certain tasks may require additional guidelines or requirements. Refer to "Special Handling" or "Training", under the applicable task, for more information.

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is required, it is listed under the applicable task.

Repair Miscellaneous Concrete Assets

(Task No. 112.03.01, 112.05.01, 112.06.01, 112.08.01)

Description

These tasks include repairing and replacing miscellaneous concrete assets using accepted methods and materials. It includes maintaining and preserving the usefulness, appearance and structural integrity of concrete assets such as concrete barrier rail, rip-rap, curbs, gutters, drop inlets, headwalls, sidewalks, retaining walls and slope pavement. It also includes installing new wheelchair ramps.

Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for these tasks.

Purpose

The purpose of the work associated with these tasks is to:

- Provide for a safe facility.
- Prevent further damage to highway facilities and adjacent properties.
- Provide a neat and visually appealing roadside area.

Timing of Maintenance

Unless the repair is critical in nature, these tasks should be performed when:

- Weather conditions allow concrete work without requiring the use of cold weather protection.

- Drainage areas are free of running water or water can be diverted to allow work on drainage facilities.

Inspections of drainage facilities should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and to prevent/delay flooding, erosion, damage or deterioration.

Curbs and Gutters

Curbs and gutters that are damaged or deteriorated to the degree that they do not function as designed or pose a potential hazard to the public should be repaired or replaced as soon as possible. Less severely damaged curbs or gutters that function properly need not be repaired unless aesthetics and other factors impose a higher priority.

Concrete Boxes

Inspections of concrete boxes should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and to prevent/delay flooding, erosion, damage or deterioration.

Based on visual inspections and priorities for maintaining drainage facilities, it may be necessary to:

- Immediately repair, replace or add an extension to a concrete box.
- Prioritize the repair/replacement with other tasks.

Concrete Barrier Rail

Any barrier rail, which has been damaged to the degree that it may not function as designed, should be

Repair Miscellaneous Concrete Assets

(Task No. 112.03.01, 112.05.01, 112.06.01, 112.08.01), cont'd.

repaired or replaced as soon as possible. Less severely damaged barrier rail should be repaired as priorities permit.

Drop Inlets, Manholes, Headwalls, Rip-Rap and Concrete Dikes

Inspections of these facilities should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and to prevent/delay flooding, erosion, damage or deterioration.

Damaged drop inlets, manholes, headwalls, rip-rap and/or concrete dikes that pose a safety hazard or may cause damage to any adjacent property should be repaired or replaced as soon as possible. Damage or defects, which may cause drainage and erosion problems, should be repaired as soon as practical.

Sidewalks and Wheelchair Ramps

Damage or deterioration to sidewalks or wheelchair ramps that may pose a safety hazard should be repaired as soon as possible. Large cracks or abrupt changes in vertical elevation of more than 1 inch should be repaired as soon as possible.

Deterioration that is not a safety hazard should be prioritized with other tasks. Many sidewalks or wheelchair ramps, by Highway Agreement or local ordinance, are the responsibility of the owners of abutting properties. Prior to repairing sidewalks or wheelchair ramps, the supervisor should research the sector to

make sure that it is the responsibility of the Department. When sidewalks are repaired, Americans with Disabilities Act (ADA)-compliant facilities shall be installed where appropriate.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for these tasks.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Repair Miscellaneous Concrete Assets
(Task No. 112.03.01, 112.05.01, 112.06.01, 112.08.01), cont'd.

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for these tasks.

Usually, small amounts of materials can be obtained from stock stored at the maintenance station. If concrete must be purchased from a commercial source, arrangements should be made far enough in advance to ensure it will be available when needed. Refer to Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials" for information on purchasing.

Testing

Because of the small quantities of materials normally required for this type of repair, there are no testing requirements. If large quantities of materials are used, they should be sampled in accordance with Part III, Chapter 3 "Materials Sampling and testing".

Storage

N/A

Special Handling

The products/materials used for these tasks shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

When working with epoxy adhesive or rapid-setting patch materials, supervisors should be aware of the pot life of the mixed materials and recommended application temperatures.

Training

In order to ensure that materials purchased meet specifications, District Maintenance employees shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel (aggregates).

Disposal

Concrete debris that results from preparing an area for repair should be hauled to a disposal site. Dispose of waste epoxy adhesive, curing compound and rapid-setting products and their containers in accordance with the manufacturer's recommendations and the SDS for the product.

Approvals

These tasks may involve:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any

MISCELLANEOUS CONCRETE REPAIR

Repair Miscellaneous Concrete Assets

(Task No. 112.03.01, 112.05.01, 112.06.01, 112.08.01), cont'd.

pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting this task for more information and guidelines.

These tasks may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for these tasks includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Build any forms that are needed.
- If this is a new installation or extension, follow the *Standard Plans for Road and Bridge Construction*.
- Add or splice in new section of reinforcing steel as required.
- Apply epoxy adhesive to surfaces of old concrete.
- Place concrete and vibrate or hand tamp.
- Finish concrete surface and apply curing compound.
- Place cones, where applicable, to protect the work during the cure period; place cold weather protection if temperatures are predicted to fall below 50°F.
- Haul waste material, products and/or containers to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Special Instructions

- After the concrete has cured, forms and barricades should be removed. Any minor imperfections should be

Repair Miscellaneous Concrete Assets
(Task No. 112.03.01, 112.05.01, 112.06.01, 112.08.01), cont'd.

patched in accordance with accepted practices.

Reporting

Reporting for these tasks in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location. If repairs are made at intermittent locations, enter the location as a from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment for the applicable task:
 - 112.03.01: Total cubic yards
 - 112.05.01, 112.06.01: Total linear feet
 - 112.08.01: Each
- For Task No. 112.06.01, enter normal maintenance as the cause of maintenance for all work except graffiti removal.

- When applicable, identify new installation as a betterment project, enter the assigned betterment number and select planned betterment as the cause of maintenance.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

CHAPTER 6: ROADSIDE MAINTENANCE

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

ROADSIDE MAINTENANCE PROGRAM (PROGRAM NO. 131.00.00)

Description

This program includes tasks for:

- Repairing, replacing and cleaning drainage facilities.
- Maintaining roadway slopes.
- Controlling vegetation growing within the right-of-way.
- Removing storm deposited debris and drift material from the roadway.
- Blading shoulders.
- Installing, repairing or replacing pollution prevention devices (PPDs).

Policy

The Department's objective is to:

- Maintain drainage facilities in a manner that prevents water damage to the roadway or property of others.
- Control roadside vegetation in a manner compatible with safe highway use, acceptable appearance and adjoining land use.
- Keep the roadway and roadside clear of storm-deposited debris that may impair driving conditions.

- Provide a smooth recovery shoulder width that drains properly and is visually appealing.
- Follow the applicable stormwater pollution prevention plan (SWPPP), Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) when performing certain tasks included in this program.

Maintenance Priorities

The following priorities should be considered when planning and coordinating maintenance work under this program:

- Public safety
- Protecting highway facilities
- Protecting abutting property
- Potential liability for the Department
- Aesthetics

Deficiencies

The following should be considered when establishing maintenance priorities for tasks included in this program:

- Plugged or partially plugged culverts and drop inlets that may result in flooding of the highway and abutting properties.

ROADSIDE MAINTENANCE PROGRAM (PROGRAM NO. 131.00.00), CONT'D.

- Ditches filled with silt and debris that impact drainage and may cause flooding or erosion of Department property or abutting property.
- Roadside vegetation that obscures highway assets (e.g., guardrail, signs, guideposts) or may cause sight distance problems for drivers.
- Vegetation that is diseased or infested by insects, or may be detrimental to the health of surrounding vegetation, or becomes a nuisance for drivers and/or owners of abutting properties.
- Material deposited on the highway by storms that may create a hazard.
- Irregular, loose or vertically displaced shoulders.
- Temporary or permanent PPD installations that are torn, buried or otherwise damaged or deteriorated.

Special Requirements

Environmental Clearance

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III, Chapter 4 under "Planning Maintenance

Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

Stormwater Pollution Prevention, Best Management Practices

Certain tasks require special attention to stormwater pollution prevention and compliance with the stormwater pollution prevention plan (SWPPP) the maintenance facility's Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) that assist crews in reducing pollutant discharges associated with the tasks.

Refer to Part III, Chapter 4 under "Regulations" for more information on the stormwater pollution prevention plan, or contact the Stormwater Division for more information.

Refer to Part III, Chapter 4 under "Facility Pollution Prevention Plans" or the FPPP for the related maintenance facility, or contact the Stormwater Division for more information.

Hydraulics

Certain tasks under this program require special attention to the proper flow and containment of water/stormwater, and ensuring that the drainage facilities, applications and/or materials used are in good condition, free of obstructions and working properly. Regular inspections are critical in preventing or delaying flooding, erosion, damage or deterioration.

Work Outside the Right-of-Way

Work is typically not performed outside the right-of-way. If unusual

**ROADSIDE MAINTENANCE
PROGRAM
(PROGRAM NO. 131.00.00), CONT'D.**

circumstances require work outside the right-of-way and onto private property, written permission is required from the property owner.

Circumstances and work performed shall comply with procedures outlined in Part IV, Chapter 1 under "Work Outside the Right-of-Way".

Underground Service Alert

Certain scheduled tasks under this program may be subject to review by Underground Service Alert of Northern/Central California and Nevada (USA North 811) to determine if work involves:

- Digging.
- Trenching.
- Drilling.
- Augering.
- Grading.
- Ripping.
- Boring.
- Other excavation tasks.

For more information and requirements, refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)".

Contract Services

For maintenance tasks that are contracted to private entities, the responsible Department/District representative should:

- Check the work for compliance with the contract provisions.
- Maintain a checklist to document deficiencies and problems.
- Provide input to District Administration or the Maintenance and Asset Management Division (depending on the contract terms), based on the reviews and documented performance of the contractor.

Approvals

Certain tasks may require approval or special permission prior to starting work. Refer to "Approvals", under the applicable task, for more detail or requirements.

Prior approval from the Maintenance and Asset Management Division is required for tasks that are included in the Annual Work Program and the District's Planning Chart as a scheduled betterment. Projects listed in the Department's approved Annual Work Program cannot be changed without prior approval from the Director's Office. Refer to Part III, Chapter 1 under "District Administration Responsibilities" for more information.

Maintenance projects conducted by private entities may have a crew from the Construction Division assigned to perform the applicable inspections.

**ROADSIDE MAINTENANCE
PROGRAM
(PROGRAM NO. 131.00.00), CONT'D.**

Safety and Training

Supervisors shall review safety and traffic routing plans with all workers responsible for traffic control.

Crewmembers should know the locations of emergency medical facilities in case of an injury. Supervisors shall ensure that first-aid supplies are on the job site.

The Safety Data Sheets (SDS) required for products/materials used for tasks under this program should be reviewed so that everyone is aware of:

- Safety and health precautions.
- Personal protective equipment required when performing the work.

Any necessary safety and/or special instructions will be reviewed with crewmembers prior to starting so that everyone has an understanding of safety concerns and how the work will progress.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Certain tasks may require additional guidelines or requirements. Refer to "Special Handling" or "Training", under the applicable task, for more information.

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is required, it is listed under the applicable task.

Clean Culverts (Task No.131.01.01)

Description

This task includes removing debris, sand and silt, which restrict culvert capacity.

**Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.**

Purpose

The purpose of the work associated with this task is to provide a safe facility for motorists by:

- Allowing water to flow freely from a channel through the culvert.
- Preventing damage to a roadway or roadside area caused by a plugged culvert.
- Preventing erosion or flood damage to abutting properties.

Timing of Maintenance

Inspections of culverts and other drainage facilities should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and to prevent/delay flooding, erosion, damage or deterioration.

Based on visual inspections and priorities for maintaining drainage structures, it may be necessary to:

- Immediately clean some drainage structures.

- Prioritize cleaning of other culverts, based on the availability of culvert cleaning equipment and other maintenance priorities.

The Maintenance and Asset Management Division (Headquarters Maintenance) administers culvert-cleaning contracts in the Las Vegas and Tahoe Basin areas. District Maintenance managers should inventory their culverts annually to advise Headquarters Maintenance as to what culverts or sections need to be included in these contracts.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall be approved in accordance with procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the

Clean Culverts
(Task No. 131.01.01), *cont'd.*

MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

N/A

Storage

N/A

Disposal

Material collected from culvert cleaning should be hauled to approved disposal sites. Material may be stockpiled along the roadway, outside of the 30-foot clear zone. Material should be removed as soon as practical.

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater Division prior to starting this task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811

shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Clean culverts using the appropriate equipment.
- Haul material removed from the culverts to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total

Clean Culverts
(Task No.131.01.01), cont'd.

number of man-hours for that task in addition to this task.

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of linear feet of culverts cleaned.
- When making routine inspections, report the work to Task No. 141.10.01 (Patrol/Inspect Miscellaneous Assets).
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.
- Any roadway crossing (culvert, bridge, pipe etc.) that spans more than 20 feet along the centerline is a bridge structure. ***If multiple pipes run parallel, they are considered the same structure if the distance that separates them is less than half the diameter of the pipe*** (two 3 foot diameter pipes separated by 1 feet would be considered the same structure); report the work to Task No. 161.01.05 (Clean/Repair Structure Drainage).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

**Clean Drop Inlets, Slotted Drains,
Culvert Openings
(Task No. 131.01.02, 131.01.03,
131.01.04)**

Description

This task includes removing debris, sand and silt which restrict culvert openings or drop inlets. Cleaning culvert openings is restricted to an area within 30 feet of the culvert.

***Task No. 131.09.01
(Install/Repair/Replace Pollution
Prevention Devices) shall be
completed prior to starting any work
for these tasks.***

Purpose

The purpose of the work associated with this task is to provide a safe facility for motorists by:

- Allowing water to flow freely from a channel through a culvert.
- Preventing damage to the roadway or roadside caused by plugged openings, drop inlets and slotted drains.
- Preventing erosion or flooding damage to abutting properties.

Timing of Maintenance

Inspections of culvert openings, drop inlets and slotted drains should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and

to prevent/delay flooding, erosion, damage or deterioration.

Based on visual inspections and maintenance priorities, it may be necessary to:

- Immediately clean some culvert openings, drop inlets and slotted drains.
- Prioritize cleaning of other culvert openings, drop inlets and slotted drains based on the availability of the appropriate equipment and other maintenance priorities.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the

ROADSIDE MAINTENANCE

Clean Drop Inlets, Slotted Drains, Culvert Openings
(Task No. 131.01.02, 131.01.03, 131.01.04), cont'd.

MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

N/A

Storage

N/A

Disposal

Excess material should be hauled to approved disposal sites. Material may be stockpiled along the roadway, outside of the 30-foot clear zone. Material should be removed as soon as practical.

Approvals

These tasks may involve:

- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.
- Burning vegetation (if allowed) and a permit is required for all open burning.

Refer to Part III, Chapter 4 under "Water Quality", "Burning" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting any task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for these tasks includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Clean culvert openings, drop inlets and slotted drains using the appropriate equipment.
- Haul material removed from the project to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

***Clean Drop Inlets, Slotted Drains,
Culvert Openings
(Task No. 131.01.02, 131.01.03,
131.01.04), cont'd.***

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- For Task No. 131.01.02:
 - Enter the reported accomplishment as each drop inlet cleaned.
 - Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.
- For Task No. 131.01.03:
 - When making routine inspections, report the work to Task No. 141.10.01 (Patrol/Inspect Miscellaneous Assets).
 - Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

- For Task No. 131.01.04:
 - If the cleaning operation extends from culvert wing or headwall, report the work to Task No. 131.05.05 (Clean Cuts/Ditches up to Culvert Wings).
 - When making routine inspections, report the work to Task No. 141.10.01 (Patrol/Inspect Miscellaneous Assets).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Clean Sand/Oil Separators (Task No. 131.01.05)

Description

This task involves removing waste (e.g., sediment, debris, oil/grease) and/or removing/replacing saturation pillows and disposing to an approved site.

Because any waste removed from sand/oil separators is potentially hazardous, not all crews are equipped and/or authorized to perform this task and the work may need to be contracted to a qualified private entity.

**Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.**

Purpose

The purpose of the work associated with this task is to:

- Check waste level/depth to determine whether the sand/oil separator requires cleaning.
- Keep separator openings free of waste.

Timing of Maintenance

Inspections of sand/oil separators should be performed annually and after major storms to ensure that:

- They are free of obstructions and working properly.
- The waste materials are below the level in which they can exit to the wastewater system.

Based on visual inspections and maintenance priorities, it may be necessary to:

- Immediately clean the separators.
- Prioritize cleaning of other separators based on availability of appropriate equipment and other maintenance priorities.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

***Clean Sand/Oil Separators
(Task No. 131.01.05), cont'd.***

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

N/A

Storage

N/A

Disposal

All waste removed from sand/oil separators shall first be hauled to a designated retention basin until the moisture has evaporated, then hauled to a disposal site that is authorized to accept the waste.

Approvals

This task involves:

- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.
- Work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Water Quality", "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting any

task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Contact the Environmental Services Division to test waste material prior to removal.
- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Clean sand/oil separators using the appropriate equipment.
- Haul waste removed from the sand/oil separators to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was

***Clean Sand/Oil Separators
(Task No. 131.01.05), cont'd.***

accomplished, report the total number of man-hours for that task in addition to this task.

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of cubic yards.
- When making routine inspections, report the work to Task No. 141.10.01 (Patrol/Inspect Miscellaneous Assets).
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Clean Sediment or Retention Basins (Task No.131.01.07)

Description

This task involves cleaning sediment, sand, silt or other debris from sediment or retention basins.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to keep sediment, sand, silt or other debris below the level of the outlet.

Timing of Maintenance

Inspections of sediment or retention basins should be made annually and after major storms to ensure that sediment, sand, silt or other debris is below the level of the outlet.

Based on visual inspections and maintenance priorities, it may be necessary to:

- Immediately clean the sediment or retention basins.
- Prioritize cleaning of other sediment or retention basins based on availability of appropriate equipment and other maintenance priorities.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the

MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

N/A

Storage

N/A

Clean Sediment or Retention Basins (Task No. 131.01.07), cont'd.

Disposal

Excess material should be hauled to approved disposal sites.

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater Division for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control*

Devices (MUTCD); use flagger stations and/or pilot car as needed.

- Clean sediment or retention basins using the appropriate equipment.
- Haul material removed from the project to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of cubic yards removed.
- If the cleaning operation extends out of the retention basin and into a different type of drainage facility, code to the task that most closely matches.
- When making routine inspections, report the work to Task

***Clean Sediment or Retention Basins
(Task No. 131.01.07), cont'd.***

No. 141.10.01 (Patrol/Inspect
Miscellaneous Assets).

- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Repair/Replace/Extend/Install Culverts (Task No. 131.05.01)

Description

This task includes:

- Repairing and replacing culverts that have been damaged or are deteriorated to the point of being structurally deficient.
- Adding minor extensions to culverts that were of insufficient length when they were originally installed. (A minor extension is defined as one that is a length of 6 feet or less.)
- Incorporating new or used materials to make repairs.

***Task No. 131.09.01
(Install/Repair/Replace Pollution
Prevention Devices) shall be
completed prior to starting any work
for this task.***

Installation shall be according to the *Standard Specifications for Road and Bridge Construction*.

If more than two 6-foot extensions within a continuous 10-mile section are required, they must be included in projects submitted for the Annual Work Program and the District's Planning Chart as a scheduled betterment.

Supervisors should be aware of and enforce safety regarding employees working in trenches (OSHA requirements).

Purpose

The purpose of the work associated with this task is to provide a safe facility for motorists by:

- Restoring them to a structurally sound condition.
- Restoring proper drainage.
- Protecting the roadway facility from damage.

Timing of Maintenance

Culverts should be inspected annually to ensure that they are free of obstructions and working properly, and to prevent/delay flooding, erosion, damage or deterioration.

Based upon visual inspections and priorities for maintaining drainage structures, it may be necessary to:

- Immediately repair or replace a culvert or portion of a culvert.
- Add an extension to a culvert.
- Prioritize the repair or replacement of culverts with other tasks.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

***Repair/Replace/Extend/Install
Culverts***
(Task No. 131.05.01), cont'd.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

The project site should be reviewed to determine material requirements, including the size of the culvert, approximate quantity of backfill and patching materials.

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Materials not on hand should be ordered 2 to 3 days in advance of the scheduled work.

Testing

N/A

Storage

Materials should be stored in an area where they will be reasonably safe from damage and, if possible, marked or tagged for the specific project intended.

Disposal

Waste items such as damaged culvert should be disposed of at an approved site.

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting any task for more information and guidelines.

Prior to replacing culverts, the Hydraulics Section of the Roadway

ROADSIDE MAINTENANCE

***Repair/Replace/Extend/Install
Culverts
(Task No. 131.05.01), cont'd.***

Design Division should review the proposed installation and make recommendations on size and location.

The Materials Division must also review the installation location to recommend the type of culvert to be used.

This task may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.

- Make the necessary excavation for the type of repair or installation needed.
- Prepare culvert bedding with approved material and compact to specifications.
- Place the culvert and make the required connections.
- Backfill the excavation and compact in accordance with the *Standard Plans for Road and Bridge Construction*.
- Place surface material in uniform layers not exceeding a thickness of 3 inches; compact each layer using the appropriate equipment.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location.
- Enter all labor, equipment and materials used for this task.

***Repair/Replace/Extend/Install
Culverts
(Task No. 131.05.01), cont'd.***

- Select any other material not included in the material pick list from its associated stockpile.
- Report all connecting bands and hardware to Material Class 99 (Miscellaneous Cost) with the actual dollar amount.
- Enter the reported accomplishment as the total number of linear feet of culvert used.
- Report the proper cause of maintenance and the approved betterment number if applicable.
- Report any work done on reinforced concrete boxes to Task No. 112.05.01 (Repair/Replace/Extend Reinforced Concrete Boxes).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Repair/Reshape/Construct Ditches or Channels
(Task No. 131.05.03)

Description

This task includes dressing and shaping ditches to the depth and cross section to which they were originally constructed or were subsequently improved.

Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.

Purpose

The purpose of the work associated with this task is to allow water to flow without restriction. Restrictions in ditches may result in flooding or erosion of Department or abutting property.

Timing of Maintenance

Ditches should be inspected periodically and after major storms to ensure that they are free of obstructions and working properly and to prevent/delay flooding, erosion, damage or deterioration.

Based on visual inspections and priorities for maintaining drainage facilities it may be necessary to:

- Immediately reshape some ditches.
- Prioritize the dressing and shaping of ditches with other tasks.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the

MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

N/A

Testing

N/A

Storage

N/A

Disposal

Excess material should be hauled to approved disposal sites.

Repair/Reshape/Construct Ditches or Channels
(Task No. 131.05.03), cont'd.

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.
- Work that generates excessive noise, dust, emissions or other airborne pollutants.
- Burning vegetation (if allowed) and a permit is required for all open burning.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality", "Air Quality", "Noise from Maintenance Operations", "Burning" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting any task for more information and guidelines.

This task may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Repair/reshape the ditch or channel, using the appropriate equipment, to obtain the desired flow line.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

***Repair/Reshape/Construct Ditches
or Channels***
(Task No. 131.05.03), cont'd.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of linear feet.
- If substantial material is hauled from the ditch, report the work to Task No. 131.05.05 (Cleaning Cuts/Ditches up to Culvert Wings).
- If material removed is used to repair fill slope, enter the reported accomplishment as the total number of cubic yards and report the work to Task No. 131.06.01 (Fill Slopes or Cut Slopes). Distribute all labor and equipment charges between the two tasks appropriately.

Clean Cuts/Ditches up to Culvert Wings
(Task No. 131.05.05)

Description

This task involves removing debris, silt and other foreign material from ditches to the depth and cross section to which they were originally constructed or have been improved. Ditch cleaning requires material to be hauled away.

Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.

Purpose

The purpose of the work associated with this task is to allow water to flow without restriction. Restrictions in ditches may cause flooding or erosion of Department or abutting property.

Timing of Maintenance

Ditches should be inspected periodically and after major storms to ensure that they are free of obstructions and working properly and to prevent/delay flooding, erosion, damage or deterioration.

Based on visual inspections and maintenance priorities it may be necessary to:

- Immediately clean selected ditches.
- Prioritize ditch cleaning with other tasks.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

N/A

Testing

N/A

Storage

N/A

Clean Cuts/Ditches up to Culvert Wings
(Task No. 131.05.05), cont'd.

Disposal

When practical, material removed while cleaning ditches should be:

- Used to widen shoulders, parking areas, etc. Disposal must not endanger the environment. Refer to Part III, Chapter 4, "Environmental", or contact the Environmental Services Division for assistance. In the Lake Tahoe Basin, all material removed while cleaning ditches shall be hauled out of the basin.
- Hauled to approved disposal sites. In an emergency situation, material may be stockpiled along the roadway, outside of the 30-foot clear zone. When the event passes, the material should be removed.

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any

pollutant/contaminant discharge resulting from maintenance work.

- Work that generates excessive noise, dust, emissions or other airborne pollutants.
- Burning vegetation (if allowed) and a permit is required for all open burning.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality", "Air Quality", "Burning", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting any task for more information and guidelines.

This task may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Clean Cuts/Ditches up to Culvert Wings
(Task No. 131.05.05), cont'd.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Clean cuts/ditches, using the appropriate equipment, to obtain the desired flow line.
- Haul excess material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of cubic yards of material removed. A truckload count may be used for reporting purposes.
- Ditches included under this task are roadway ditches, V-type ditches and flat bottom ditches.
- Report all materials removed from ditch and cuts right up to the culvert wing or headwall.
- If the material removed is used to repair fill slopes, the cubic yard quantity should also be shown as accomplishment and charged to Task No. 131.06.01 (Fill Slopes or Cut Slopes). Distribute all labor and equipment charges between the two tasks appropriately.
- If debris, such as trees or limbs, is removed from around the columns of a structure or within 30 feet of the bridge, report the work to Task No. 161.01.05 (Clean/Repair Structure Drainage).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Fill Slopes or Cut Slopes (Task No. 131.06.01)

Description

This task is for repairing roadway fill and/or cut slopes that have deteriorated from erosion or have been damaged by floods. Fill and cut slopes are repaired by adding or removing material in order to obtain the desired slope.

This task may also include incidental or minor widening of fill slopes using excess material from another maintenance operation.

**Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.**

Purpose

The purpose of the work associated with this task is to:

- Increase motorist safety by eliminating ruts and irregularities adjacent to the pavement edge.
- Provide uniform drainage from the roadway.
- Provide visually appealing slopes.

Timing of Maintenance

Fill and cut slopes should be inspected periodically and after major storms to ensure that they are free of obstructions

and to prevent/delay flooding, erosion, damage or deterioration.

Based on inspections and priorities for maintaining roadway facilities, it may be necessary to:

- Immediately repair selected fill or cut slopes.
- Schedule repairs so they can be performed in conjunction with other tasks.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

***Fill Slopes or Cut Slopes
(Task No. 131.06.01), cont'd.***

Ordering

N/A

Testing

N/A

Storage

If materials are stockpiled on a job site, they should be located in an area that allows sufficient access for maintenance vehicles and maintains the 30-foot clear zone.

Disposal

Excess material should be hauled to approved disposal sites.

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

- Work that generates excessive noise, dust, emissions or other airborne pollutants.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality", "Air Quality", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting any task for more information and guidelines.

This task may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control*

ROADSIDE MAINTENANCE

**Fill Slopes or Cut Slopes
(Task No. 131.06.01), cont'd.**

Devices (MUTCD); use flagger stations and/or pilot car as needed.

- Remove excess material from the cut slope using the appropriate equipment.
- Place the material onto the fill slope with the appropriate equipment.
- Wet the fill material with water to aid in compaction and to control dust.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If ditches are reshaped with a motor grader and do not involve hauling material, report the work to Task No. 131.05.03 (Repair /Reshape/Construct Ditches or Channels).
- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.

- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of cubic yards of material removed from ditch. A truckload count may be used for reporting purposes.
- Report the removal of dirt and rocks deposited on the roadway surface as a result of floods to Task No. 133.01.05 (Remove Storm Deposited Debris).
- If the material placed is obtained from roadway ditches, V-type or flat bottom, report to Task No. 131.05.05 (Clean Cuts/Ditches up to Culvert Wings) with the reported accomplishment as the total number of cubic yards. Distribute all labor and equipment charges between the two tasks appropriately.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Blade Shoulders (Task No. 131.07.01)

Description

This task is for blading unpaved shoulders with a motor grader.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to:

- Eliminate the drop from the edge of the pavement to the unsurfaced shoulder area.
- Provide for uniform drainage from the roadway.
- Eliminate ruts and irregularities in the unpaved shoulder.
- Provide visually appealing roadway shoulders.

Timing of Maintenance

Shoulder areas should be inspected periodically and after major storms to ensure that they are free of obstructions and to prevent/delay flooding, erosion, damage or deterioration. They should be smooth and free of ruts, and the drop

from the edge of the pavement should not exceed 1 inch.

Based on visual inspections and the priorities for maintaining roadway facilities it may be necessary to:

- Immediately repair selected shoulders.
- Prioritize shoulder blading with other tasks.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Blade Shoulders
(Task No. 131.07.01), cont'd.

Ordering

N/A

Testing

N/A

Storage

N/A

Disposal

Excess material should be hauled to approved disposal sites.

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.
- Work that generates excessive noise, dust, emissions or other airborne pollutants.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality", "Air Quality", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting any task for more information and guidelines.

This task may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.

Blade Shoulders
(Task No. 131.07.01), cont'd.

- Remove marker posts. Make sure all sign breakaway bases are clear of material and can function as designed.
- Blade the shoulder to eliminate irregularities.
- Replace all marker posts and signs as necessary.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If a substantial amount of material is required to repair the slope, report the work to Task No. 131.06.01 (Fill Slopes or Cut Slopes).
- Include reporting blading dirt/gravel roads to this task.
- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.

- Enter the reported accomplishment as the total number of shoulder miles that were bladed. (If a 5-mile stretch of two-lane roadway is bladed on both slopes, the reported accomplishment would be 10 shoulder miles.)

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Vegetation Control: Flailing/Mowing (Task No. 131.08.01)

Description

This task involves removing roadside vegetation along the shoulder by flailing or mowing.

When mowing or flailing, use extra caution to prevent flying rocks or debris that can damage property.

***Task No. 131.09.01
(Install/Repair/Replace Pollution
Prevention Devices) shall be
completed prior to starting any work
for this task.***

Purpose

The purpose of the work associated with this task is to:

- Improve safety by removing vegetation that covers roadside assets such as guardrail, signs, guideposts or other roadside assets.
- Reduce fire hazard.
- Reduce obstruction of drainage facilities.
- Provide a visually appealing roadway.

Timing of Maintenance

Vegetation removal should be performed prior to vegetation becoming a fire hazard, restricting sight distance or obstructing signs, guideposts or other roadside assets.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

N/A

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.

***Vegetation Control: Flailing/Mowing
(Task No. 131.08.01), cont'd.***

- Work that generates excessive noise, dust, emissions or other airborne pollutants.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Air Quality", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services Division for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Mow or flail on a course parallel to the roadway and in the same direction as the traffic flow.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Special Instructions

The District Engineer must approve mowing or flailing in excess of one mower width on each shoulder.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of shoulder miles that were flailed, mowed or dragged. (If a 5-mile stretch of roadway is mowed on both slopes, the reported accomplishment would be 10 shoulder miles.)

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Vegetation Control: Chemical Weed Spray
(Task No. 131.08.05)

Description

This task involves controlling roadside vegetation with approved chemicals applied at a prescribed rate and with approved, calibrated equipment.

Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.

Purpose

The purpose of the work associated with this task is to reduce growth of unwanted vegetation along pavements in order to:

- Improve sight distances.
- Provide visibility for roadside assets such as guardrail, signs and guideposts.
- Reduce vegetation that plugs waterways.
- Reduce fire hazard.
- Reduce noxious weeds, diseased or insect-infested vegetation.
- Improve roadway appearance.

Timing of Maintenance

This task shall be performed when vegetation around posts, guardrail and

shoulders, or on slopes, reaches a height of 4 to 6 inches.

Chemical vegetation control can be accomplished in two ways:

1. Pre-emergent: Applied from fall to early spring prior to germination.
2. Contact: Applied to vegetation after germination but before maturity.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Special Handling

Use caution when filling and washing the equipment to ensure that chemicals are not deposited in locations that can harm vegetation, humans or animals. Neutralizing agents should be used when appropriate.

Vegetation Control: Chemical Weed Spray
(Task No. 131.08.05), cont'd.

Equipment that requires repair work or normal servicing should be thoroughly cleaned with a neutralizing agent before it is taken to a shop.

Employees who service equipment must be informed about the materials and the hazards associated with them. Service employees should become familiar with the products and wear appropriate protective clothing when working on the spray equipment. The SDS for products used should accompany equipment that is being serviced.

All application equipment must have appropriate gauges and application charts, and hand-held wind gauges should be available with the equipment.

For work within national forest boundaries, the Department should work with the U.S. Forest Service in advance of the planned work to develop a program for controlling unwanted vegetation and reducing wild fire fuel along the highway right-of-way.

When vegetation control work is planned in urban areas, the Supervisor should review the areas to determine if there are steep fill slopes that may cause the chemical to be washed onto adjacent private property or if there are areas of private landscaping abutting the highway right-of-way. In these and similar cases, the Supervisor should consult with District management for a determination.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Chemicals should be ordered in containers that are the most practical for the operation.

The following are guidelines for ordering:

- Review all areas designated for control to determine products and quantities needed.
- Identify product names, stock numbers and concentrations needed.
- If only one product is acceptable due to special conditions, this information should be noted on the order with the specification that substitutions will not be accepted.
- Lead-time of approximately 4 months is usually sufficient to ensure that chemicals will be delivered prior to starting work.

ROADSIDE MAINTENANCE

Vegetation Control: Chemical Weed Spray
(Task No. 131.08.05), cont'd.

Testing

N/A

Storage

Chemicals should be accessible only to authorized personnel and should be stored in accordance with the following guidelines:

- Lock all items in a dry and well-ventilated room.
- Post signs at the entrance to the storage room indicating which materials are stored.
- Follow the manufacturer's storage recommendations.
- Maintain and review inventory sheets monthly for proper accountability.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

For a chemical vegetation control program to be successful, the proper product must be used. The product must be capable of obtaining the desired control and be economical when compared to other methods of control.

Materials should be:

- Safe for the applicator to use.

- Safe for highway users and adjacent land owners.
- Safe for animals that come in contact with the treated areas.
- Safe for use around waterways.

Materials selection should be reviewed annually to evaluate effectiveness of new and existing products.

Training

The Nevada Department of Agriculture provides training and certification for those who work with chemicals and herbicides. All employees who work with chemicals must attend the training established and approved for chemical applicators.

Training consists of several subject areas. Each subject or task area requires that the employee pass a written examination for certification. The following rules should be observed:

- Employees must receive appropriate training prior to use of chemical products.
- Employees may use only products for which they are certified.
- Certification is valid for 2 years. Prior to expiration of certificates, employees should be scheduled for recertification.

Disposal

Disposal of empty material containers should be according to the manufacturer's recommendations. If disposal information is not on the container or the SDS, the Supervisor

Vegetation Control: Chemical Weed Spray
(Task No. 131.08.05), cont'd.

should request written instructions from the manufacturer. Containers taken to a landfill should be:

- Empty.
- Triple rinsed.
- Punctured to facilitate drying and prevent reuse.

Mixing only the amount of material that can be stored in the spray tank(s) or that which will be used the same day will reduce the chances of having to dispose of unused material.

Approvals

This task involves:

- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.
- Work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Biological Resources", "Water Quality", "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services

Division and the Stormwater Division prior to starting any task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Review the project site to determine if any special application condition exists.
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use shadow vehicle with truck-mounted attenuator as needed.
- Check application equipment (tanks, hoses, spray wands, nozzles) daily for safety and proper application.
- Mix and apply chemicals in accordance with the manufacturer's recommendations.
- Do not apply chemicals when wind is blowing above the manufacturer's recommended wind speed.
- When hand-spraying, mix dye into the chemicals in order to ensure proper coverage.
- Remove traffic control.
- Clean and service spray units in preparation for future applications.

Vegetation Control: Chemical Weed Spray
(Task No. 131.08.05), cont'd.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of shoulder miles that were sprayed. (If a 5-mile stretch of roadway is sprayed on both slopes, the reported accomplishment would be 10 shoulder miles.)
- Report hand-spraying sections other than landscaped areas to this task.
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Documentation

A record of all chemical applications must be kept. The record should contain the following as a minimum:

- Name of applicator
- Date and time of application
- Location
- Application equipment
- Type and name of chemical
- Quantity of chemical used
- Application rate
- Target species
- Weather conditions, including wind, at application

This record must be maintained at the District Administration office for 5 years. In order for the information to be readily available, chemical application records should be maintained on a computer database.

**Vegetation Control: Hand Weeding/Burning
(Task No. 131.08.06)**

Description

This task involves removing unwanted vegetation around roadside assets (e.g., guardrail, signs, and guideposts) by hand where removal by chemicals or mechanical methods is not practical or advised. This task also includes trimming trees within the right-of-way.

When burning vegetation (if allowed), supervisors should arrange for a water truck and they should be conscious of the hazards caused by smoke drifting across roadways.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to remove vegetation from around roadside assets in order to:

- Improve sight distance.
- Improve visibility of roadside assets.
- Reduce fire hazard.
- Promote safety.
- Improve roadway appearance.

Timing of Maintenance

Weeds or other unwanted vegetation should be removed when they begin to

reduce sight distance or visibility of signs or other highway assets, or become a fire hazard or nuisance.

Light pruning (cutting back of lateral branches or misdirected shoots) can be performed any time during the year. Heavy trimming or removal of shrubs and trees, unless they present a hazard and require immediate trimming or removal, should be performed between October and March when they are dormant and to protect nesting birds.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

N/A

Vegetation Control: Hand Weeding/Burning
(Task No. 131.08.06), cont'd.

Approvals

This task involves:

- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work that generates excessive noise, dust, emissions or other airborne pollutants.
- Burning vegetation and a permit is required for all open burning.

Refer to Part III, Chapter 4 under "Biological Resources", "Air Quality", "Burning", "Noise from Maintenance Operations", and "Planning Maintenance Tasks", or contact the Environmental Services Division for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
 - Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.

- Remove unwanted vegetation using appropriate hand tools or burning as permitted.
- Clean up cuttings and dispose of them in accordance with accepted methods.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions*, *Standard Plans for Road and Bridge Construction* or *Standard Specifications for Road and Bridge Construction* for the latest information and/or additional guidelines.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Include trimming trees within the Department right-of-way and other landscaped areas when reporting to this task.
- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of man-hours spent on this task.

Vegetation Control: Hand Weeding/Burning
(Task No. 131.08.06), cont'd.

- Report all hand weeding that takes place at a rest area, rest stop, welcome center or a landscaped area to the applicable task in the 134 program series (Roadside Facility Maintenance).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Vegetation Control: Reseeding (Task No. 131.08.07)

Description

This task involves restoring native roadside vegetation along the shoulder or median that was removed, burned or otherwise damaged.

***Task No. 131.09.01
(Install/Repair/Replace Pollution
Prevention Devices) shall be
completed prior to starting any work
for this task.***

Purpose

The purpose of the work associated with this task is to:

- Improve safety by reseeding native vegetation that covers the roadside.
- Reduce dust hazard.
- Reduce obstruction of drainage channels.
- Provide a visually appealing roadway.

Timing of Maintenance

Native vegetation reseeding should take place:

- Soon after any final grading, contouring or other major site work is completed to minimize soil erosion.
- Before weeds develop a niche to get established.

- At the time of the year most appropriate for the particular species.
- At the time of year when a lot of moisture is available. For many areas, this is fall or spring.

When reseeding, supervisors should schedule for a calm day and be conscious of the hazards caused by dust drifting across roadways.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

**Vegetation Control: Reseeding
(Task No. 131.08.07), cont'd.**

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Materials are obtained from suppliers that provide the NDOT-approved seed mix for the affected area.

Testing

N/A

Storage

N/A

Disposal

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Reseed parallel to the roadway and in the same direction as the traffic flow.

- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Special Instructions

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater Division prior to starting this task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Include reseeded within the Department right-of-way and other landscaped areas when reporting to this task.
- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.

***Vegetation Control: Reseeding
(Task No. 131.08.07), cont'd.***

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of man-hours spent on this task.
- All reseeded that involves working with another agency on the NDOT right-of-way is reported to this task with a work order number.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

**Install/Repair/Replace Pollution Prevention Devices
(Task No. 131.09.01)**

Description

This task involves the installation, repair or replacement of pollution prevention devices (PPDs), in accordance with stormwater prevention best management practices (BMPs), prior to performing any maintenance task that may affect drainage facilities (e.g., culvert cleaning).

Purpose

The purpose of the work associated with this task is to ensure that all surrounding drainage facilities have proper erosion control products installed and maintained (per the stormwater prevention BMPs) prior to the start of maintenance work.

Timing of Maintenance

Work should be scheduled in advance of any maintenance task that may affect drainage facilities or when the PPD has either lost 50 percent of its design capacity or can no longer function as designed.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Testing

N/A

Storage

N/A

Training

In order to install pollution prevention products/devices, all maintenance employees shall be trained on the proper installation techniques by the Stormwater Division. Refer to Part III, Chapter 4 under "Training" for more information.

ROADSIDE MAINTENANCE

Install/Repair/Replace Pollution Prevention Devices
(Task No. 131.09.01), cont'd.

Disposal

N/A

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Install the proper PPDs at each drainage facility as needed and in accordance with stormwater pollution prevention best management practices.
- Replace/Repair any PPDs that cannot function as designed.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost.

- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of man-hours spent on pollution prevention.
- Select normal maintenance as the cause of maintenance.
- When making routine inspections, report the work to Task No. 141.10.01 (Patrol/Inspect Miscellaneous Assets).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

CHAPTER 7: ROADSIDE CLEANUP

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

ROADSIDE CLEANUP PROGRAM (PROGRAM NO. 133.00.00)

litter, debris and trash from sections of highway.

Description

This program includes tasks for:

- Removing debris, litter and trash.
- Emptying litter barrels.
- Sweeping or flushing the roadway, shoulders and paved ditches.

Policy

The Department's objective is to:

- Remove large objects from the roadway surface as soon as possible and clean roadsides as needed to preserve a clean and attractive appearance.
- Conserve resources by encouraging organizations to adopt sections of the highway for litter and debris removal as part of the Adopt-A-Highway or Sponsor-A-Highway program.
- Follow the applicable Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) when performing certain tasks included in this program.

Nevada Division of Forestry (NDF) Conservation Camp crews should be used whenever practical for removing

Maintenance Priorities

The following priorities should be considered when planning and coordinating maintenance work under this program:

- Public safety
- Potential health hazards
- Potential liability for the Department
- Air quality
- Cleanliness
- Aesthetics

Deficiencies

The following should be considered when establishing maintenance priorities for tasks included in this program:

- Areas that are known to be a problem for large litter on the roadway such as tire casings, boxes, bags of garbage, automobile parts
- Dead animals alongside the roadway
- Areas with accumulated debris
- Areas known to require extra sweeping

ROADSIDE CLEANUP

**ROADSIDE CLEANUP PROGRAM
(PROGRAM NO. 133.00.00), CONT'D.****Special Requirements*****Environmental Clearance***

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III, Chapter 4 under "Planning Maintenance Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

Stormwater Pollution Prevention, Best Management Practices

Certain tasks require special attention to stormwater pollution prevention and compliance with the maintenance facility's Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) that assist crews in reducing pollutant discharges associated with the tasks.

Refer to Part III, Chapter 4 under "Facility Pollution Prevention Plans" or the FPPP for the related maintenance facility, or contact the Stormwater Division for more information.

Hydraulics

Certain tasks under this program require special attention to the proper flow and containment of water/stormwater, and ensuring that the drainage facilities,

applications and/or materials used are in good condition, free of obstructions and working properly. Regular inspections are critical in preventing or delaying flooding, erosion, damage or deterioration.

Work Outside the Right-of-Way

Work is typically not performed outside the right-of-way. If unusual circumstances require work outside the right-of-way and onto private property, written permission is required from the property owner.

Circumstances and work performed shall comply with procedures outlined in Part IV, Chapter 1 under "Work Outside the Right-of-Way".

Underground Service Alert

Certain scheduled tasks under this program may be subject to review by Underground Service Alert of Northern/Central California and Nevada (USA North 811) to determine if work involves:

- Digging.
- Trenching.
- Drilling.
- Augering.
- Grading.
- Ripping.
- Boring.
- Other excavation tasks.

ROADSIDE CLEANUP

**ROADSIDE CLEANUP PROGRAM
(PROGRAM NO. 133.00.00), CONT'D.**

For more information and requirements, refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)".

Contract Services

For maintenance tasks that are contracted to private firms, the responsible Department/District representative should:

- Check the work for compliance with the contract provisions.
- Maintain a checklist to document deficiencies and problems.
- Provide input to District Administration or the Maintenance and Asset Management Division (depending on the contract terms), based on the reviews and documented performance of the contractor.

Approvals

Certain tasks may require approval or special permission prior to starting work. Refer to "Approvals", under the applicable task, for more detail or requirements.

Prior approval from the Maintenance and Asset Management Division is required for tasks that are included in the Annual Work Program and the District's Planning Chart as a scheduled betterment. Projects listed in the Department's approved Annual Work Program cannot be changed without prior approval from the Director's Office. Refer to Part III, Chapter 1 under

"District Administration Responsibilities" for more information.

Safety and Training

Supervisors will review safety and traffic routing plans with all workers responsible for traffic control.

Crewmembers should know the locations of emergency medical facilities in case of an injury. Supervisors will ensure that first-aid supplies are on the job site.

Any necessary safety and/or special instructions will be reviewed with employees prior to starting so that everyone has an understanding of safety concerns and how the work will progress.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Certain tasks may require additional guidelines or requirements. Refer to "Special Handling" or "Training", under the applicable task, for more information.

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is required, it is listed under the applicable task.

ROADSIDE CLEANUP

**Remove Debris
(Task No. 133.01.01)****Description**

This task includes:

- Removing litter, debris and trash from the right-of-way when the task is continuous.
- Removing intermittent debris such as rubber from truck tires along the roadway.

Workers should be advised of safety and health precautions related to picking up and disposing of roadside debris. They should wear appropriate personal protective equipment and use caution when picking up and disposing of debris from roadside facilities. Litter and trash may contain dangerous articles such as broken glass or biohazardous waste. Use extreme care so trash bags do not brush against anyone.

Workers should report any containers with non-identifiable contents to their supervisor. Potentially hazardous material should be identified before it is properly disposed.

Employees picking up debris should:

- Use proper lifting techniques.
- Be cautious of litter bags containing biohazardous waste.
- Stay in their vehicle until there is a break in traffic.
- When on foot, keep their vehicle between themselves and traffic, but not close enough that the employee

would be struck if the NDOT vehicle is hit and pushed forward.

- When on foot, walk on the outer edge of the shoulder, staying as far from moving traffic as possible.
- Face oncoming traffic.
- Plan an escape route.

Do not allow the vehicle to block an escape route. It should be parked in advance of the work area to allow sight distance for the employee as well as plenty of room to maneuver and take evasive action.

Purpose

The purpose of the work associated with this task is to remove debris from the highway that could cause a driving hazard and to provide a right-of-way that is clear and safe for the traveling public.

Timing of Maintenance

In areas where large roadway debris is known to be a problem, periodic patrols should be established to remove roadway debris. The frequency of the patrols should be based on the seriousness of the problem. When patrols are necessary, one person should be assigned to the task. In areas where roadway debris is not a frequent problem, it should be removed when encountered while performing other tasks.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Remove Debris
(Task No. 133.01.01), cont'd.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

N/A

Testing

N/A

Storage

N/A

Special Handling

Full trash bags should be left far enough from the traffic lane that they can be loaded at a later time and with minimum exposure to traffic.

Disposal

All debris shall be hauled to an approved disposal site.

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Pick up litter and debris along the roadway shoulder or median.
- Remove traffic control.
- Haul litter and debris to an approved disposal site.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Special Instructions

- Trucks should be parked between the workers and oncoming traffic. If possible, full trash bags should be left far enough from the traffic lane that they can be loaded at a later time with a minimum of exposure to traffic for employees. The practice of walking beside a truck while loading items with a pitchfork should be avoided.
- When retrieving debris from any travel lane where it is unlikely that a natural break in traffic will occur, employees should request assistance from the NHP. A break in traffic is defined as all lanes clear of

***Remove Debris
(Task No. 133.01.01), cont'd.***

traffic for a sufficient distance to complete the task safely. Employees should not attempt to create a break by flagging or using hand signals.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Include picking up private and/or political signs posted along the right-of-way when reporting to this task.
- Enter the task location as a spot location or from-to milepost.
- All labor, equipment and materials will be reported.
- Enter the reported accomplishment as the total number of cubic yards of debris that was picked up.
- If an NDF Inmate Crew was used, enter 0 for the number of accomplishment units.
- Report picking up dead animals on highway or right-of-way to this task.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

ROADSIDE CLEANUP

**Empty Litter Barrels
(Task No. 133.01.03)**

influence the amount of trash deposited in litter containers.

Description

This task includes:

- Emptying litter containers located along highways.
- Picking up litter around the containers.

Workers should be advised of safety and health precautions related to picking up and disposing of roadside debris. They should wear appropriate personal protective equipment and use caution when picking up and disposing of debris from roadside facilities. Litter and trash may contain dangerous articles such as broken glass or biohazardous waste. Use extreme care so trash bags do not brush against anyone.

Workers should report any containers with non-identifiable contents to their supervisor. Potentially hazardous material should be identified before it is properly disposed.

To reduce the risk of personal injury, workers should use proper lifting techniques or equipment when emptying litter barrels.

Purpose

The purpose of the work associated with this task is to dispose of litter collected in containers at designated areas before it overflows and scatters.

Timing of Maintenance

Timing of this task should be adjusted to meet seasonal and other factors that

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

N/A

Testing

N/A

Storage

N/A

Disposal

All litter bags shall be hauled to an approved disposal site.

***Empty Litter Barrels
(Task No. 133.01.03), cont'd.***

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- Remove and replace litter bags from containers at designated locations.
- Haul litter bags and debris to an approved disposal site.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of litter barrels emptied.
- If barrel liners (trash bags) are used, make sure they are selected on the Materials page.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Pick Up Trash Bags (Task No. 133.01.04)

Description

This task includes the pickup and disposal of trash bags located along the roadway.

Workers should be advised of safety and health precautions related to picking up and disposing of roadside debris. They should wear appropriate personal protective equipment and use caution when picking up and disposing of debris from roadside facilities. Litter and trash may contain dangerous articles such as broken glass or biohazardous waste. Use extreme care so trash bags do not brush against anyone.

Workers should report any containers with non-identifiable contents to their supervisor. Potentially hazardous material should be identified before it is properly disposed.

To reduce the risk of personal injury, workers should use proper lifting techniques when picking up trash bags.

Purpose

The purpose of the work associated with this task is to collect and dispose of trash bags before they rupture and litter is scattered.

Timing of Maintenance

Timing of this task should be adjusted to meet seasonal and other factors that influence the amount of trash deposited in trash bags.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

N/A

Testing

N/A

Storage

N/A

Disposal

All litter bags shall be hauled to an approved disposal site.

Pick Up Trash Bags
(Task No. 133.01.04), cont'd.

Procedure

The procedure for this task includes but is not limited to the following:

- Travel along the roadway and pick up litter sacks.
- Haul litter bags and debris to an approved disposal site.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Report the pick-up and disposal of litter sacks filled by other entities (Sponsor-a-Highway, NDF Inmate Crew, etc.) to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of cubic yards picked up.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Remove Storm Deposited Debris (Task No. 133.01.05)

Description

This task includes the removal of debris that has been washed on/near the roadway by a storm event.

**Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.**

Workers should be advised of safety and health precautions related to picking up and disposing of roadside debris. They should wear appropriate personal protective equipment and use caution when picking up and disposing of debris from roadside facilities. Litter and trash may contain dangerous articles such as broken glass or biohazardous waste. Use extreme care so trash bags do not brush against anyone.

Workers should report any containers with non-identifiable contents to their supervisor. Potentially hazardous material should be identified before it is properly disposed.

To reduce the risk of personal injury, workers should use proper lifting techniques when picking up debris.

Purpose

The purpose of the work associated with this task is to:

- Remove storm deposited debris from the roadway to make the road safe.
- Clean drifted material from drainage facilities to ensure proper function.

Timing of Maintenance

Inspections of roadway and drainage facilities should be performed during and/or after storm events to ensure that they are free of obstructions and working properly, and to prevent/delay flooding, erosion, damage or deterioration.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

N/A

***Remove Storm Deposited Debris
(Task No. 133.01.05), cont'd.***

Testing

N/A

Storage

N/A

Disposal

All debris shall be hauled to an approved disposal site.

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.
- Work that generates excessive noise, dust, emissions or other airborne pollutants.
- Work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality", "Air Quality", "Noise from Maintenance Operations", "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting this task for more information and guidelines.

This task may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.

ROADSIDE CLEANUP

***Remove Storm Deposited Debris
(Task No. 133.01.05), cont'd.***

- Remove storm debris from the roadway using the appropriate equipment.
- Haul debris to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- ***Do not report snow removal of any kind to this activity;*** use Task No. 151.01.01 (Snow and Ice Removal).
- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total cubic yards of material removed. A truckload count may be used for reporting purposes.

- When repairing slopes because of storm related erosion, use Task No. 131.06.01 (Fill Slopes or Cut Slopes).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Sweeping: Pull Broom/Self Propelled Broom
(Task No. 133.03.01)

Description

This task includes clearing sand, dirt and aggregate from the roadway, shoulders and paved ditches by sweeping.

Purpose

The purpose of the work associated with this task is to:

- Maintain a clean, safe roadway.
- Minimize roadway hazards.
- Maintain proper function of drainage facilities and paved ditches.
- Improve air quality.
- Improve roadway appearance.

Timing of Maintenance

- Sand, dirt or aggregate on the roadway that may be a safety hazard should be removed as soon as possible.
- Sand, dirt, and aggregate accumulated along curbs, gutters, dikes, etc., that may disrupt drainage or contribute to sediments in storm drains and water pollution should be removed promptly.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the

MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

N/A

Approvals

This task involves work that generates excessive noise, dust, emissions or other airborne pollutants. Refer to Part III, Chapter 4 under "Air Quality", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control*

**Sweeping: Pull Broom/Self
Propelled Broom
(Task No. 133.03.01), cont'd.**

Devices (MUTCD); use flagger stations and/or shadow vehicle with truck-mounted attenuator truck as needed.

- Sweep surfaces until the roadway is clear of excess material or debris.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of miles swept. (A 5-mile, two-way road that is swept by making three passes in each direction would be a 30-mile accomplishment.)
- Report sweeping as a result of any other task (e.g., chip seal) to that task.
- Sweeping of a rest area, maintenance yard, etc., in which a rest park or maintenance yard number would be reported.

- Report sweeping on bridges and related structures to Task No. 161.02.02 (Sweep and Remove Debris from Structures).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

ROADSIDE CLEANUP

**Pick-Up Broom Sweeping
(Task No. 133.05.01)****Description**

This task is for sweeping up sand, dirt, aggregate and debris from the roadway, curbs and/or gutters with a pickup broom.

Purpose

The purpose of the work associated with this task is to:

- Maintain a clean, safe roadway.
- Minimize roadway hazards.
- Maintain proper function of drainage facilities and paved ditches.
- Improve air quality.
- Improve roadway appearance.

Depending on the sweeping schedule, backup or shadow vehicles may be required for areas of heavy traffic volumes or with poor sight distances. Nighttime sweeping schedules may need to be adjusted when the task is being performed in residential areas.

Federal, state or local restrictions may prohibit the use of temporary disposal sites. If temporary disposal sites are authorized, supervisors should ensure that:

- There is minimal environmental impact. (Refer to Part III, Chapter 4 "Environmental" or contact the Environmental Services Division for more information.)

- The timely pickup and disposal of the stored sweepings is performed in accordance with District policy.

Timing of Maintenance

- This task should be ongoing in urban areas.
- Sand, dirt or aggregate on the roadway that may be a safety hazard should be removed as soon as possible.
- Since all dirt or sand on the roadway contributes to degrading air quality, it should be removed as soon as practical and/or to ensure compliance with PM-10 or other local, state or federal air quality regulations or standards (where applicable).
- Areas of heavy bicycle and pedestrian traffic may require additional sweeping.
- Sweeping schedules may need to be adjusted if freezing temperatures are predicted.
- Sand, dirt, aggregate and debris accumulated along curbs, gutters, dikes, etc., that may disrupt drainage or contribute to sediments in storm drains and water pollution should be removed promptly.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good

***Pick-Up Broom Sweeping
(Task No. 133.05.01), cont'd.***

working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Sweeping on high-speed roadways may require the use of a shadow vehicle with a truck-mounted attenuator (also known as an attenuator truck).

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

If fire hydrants are used as a source of water for the sweepers, crewmembers should receive proper orientation on the care and use of the hydrants.

Materials

N/A

Approvals

Before fire hydrants can be used, approval shall be obtained from the local entity responsible for the hydrants.

This task involves work that generates excessive noise, dust, emissions or other airborne pollutants. Refer to Part III, Chapter 4 under "Air Quality", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services

Division prior to starting this task for more information and guidelines.

Procedure

Reporting for this task in the MMS System includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or shadow vehicle with truck-mounted attenuator truck as needed.
- Sweep area.
- Control dust levels in accordance with District policy.
- Dispose of sweeping material in accordance with District policy.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the number of cubic yards of

***Pick-Up Broom Sweeping
(Task No. 133.05.01), cont'd.***

material picked up. For reporting purposes a dump box load count may be used to determine cubic yards of materials picked up.

- Report labor and equipment used to load and dispose of swept debris at a dump site to this task with 0 for the number of accomplishment units.
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

CHAPTER 8: ROADSIDE FACILITY MAINTENANCE

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

ROADSIDE FACILITY MAINTENANCE PROGRAM (PROGRAM NO. 134.00.00)

Description

This program includes tasks for:

- Maintaining/Repairing landscape vegetation, features and irrigation systems.
- Maintaining rest areas, rest stops and welcome stations/centers, including buildings and related assets.
- Maintaining/repairing truck escape ramps.

Policy

The Department's objective is to:

- Maintain neat, clean and sanitary rest areas, rest stops and welcome stations/centers.
- Maintain clean and attractive landscaped areas.
- Follow the applicable Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) when performing certain tasks included in this program.

Maintenance Priorities

The following should be considered when planning and coordinating maintenance work under this program:

- Public safety
- Potential health hazards
- Potential liability for the Department
- Areas that have historically resulted in complaints
- Aesthetics

Deficiencies

The following should be considered when establishing maintenance priorities for tasks included in this program:

- Landscape vegetation is beginning to obscure sight distance or roadside assets.
- Welcome centers, rest areas and rest stops are unsightly, unsanitary or in disrepair/disarray.
- Landscaped areas contain unsightly, overgrown, dead or invasive vegetation.
- Landscape features or systems are unsightly or in disrepair/disarray.

**ROADSIDE FACILITY
MAINTENANCE PROGRAM
(PROGRAM NO. 134.00.00), CONT'D.**

- Truck escape ramps are in disrepair or disarray, and/or arrestor beds contain vegetation.

Special Requirements

Environmental Clearance

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III, Chapter 4 under "Planning Maintenance Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

Stormwater Pollution Prevention, Best Management Practices

Certain tasks require special attention to stormwater pollution prevention and compliance with the maintenance facility's Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) that assist crews in reducing pollutant discharges associated with the tasks.

Refer to Part III, Chapter 4 under "Facility Pollution Prevention Plans" or the FPPP for the related maintenance facility, or contact the Stormwater Division for more information.

Hydraulics

Certain tasks under this program require special attention to the proper flow and containment of water/stormwater, and ensuring that the drainage facilities, applications and/or materials used are in good condition, free of obstructions and working properly. Regular inspections are critical in preventing or delaying flooding, erosion, damage or deterioration.

Work Outside the Right-of-Way

N/A

Underground Service Alert

Certain scheduled tasks under this program may be subject to review by Underground Service Alert of Northern/Central California and Nevada (USA North 811) to determine if work involves:

- Digging.
- Trenching.
- Drilling.
- Augering.
- Grading.
- Ripping.
- Boring.
- Other excavation tasks.

For more information and requirements, refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)".

**ROADSIDE FACILITY
MAINTENANCE PROGRAM
(PROGRAM NO. 134.00.00), CONT'D.**

Contract Services

When the maintenance of roadside facilities is contracted to private entities, the responsible Department/District representative should:

- Check the work for compliance with the contract provisions.
- Maintain a checklist to document deficiencies and problems.
- Provide input to District Administration or the Maintenance and Asset Management Division (depending on the contract terms), based on the reviews and documented performance of the contractor.

Maintenance projects conducted by private entities may have a crew from the Construction Division assigned to perform the applicable inspections.

Approvals

Certain tasks may require approval or special permission prior to starting work. Refer to "Approvals", under the applicable task, for more detail or requirements.

Prior approval from the Maintenance and Asset Management Division is required for tasks that are included in the Annual Work Program and the District's Planning Chart as a scheduled betterment. Projects listed in the Department's approved Annual Work Program cannot be changed without prior approval from the Director's Office.

Refer to Part III, Chapter 1 under "District Administration Responsibilities" for more information.

Safety and Training

Supervisors will review safety and traffic routing plans with all workers responsible for traffic control.

Crewmembers should know the locations of emergency medical facilities in case of an injury. Supervisors will ensure that first-aid supplies are on the job site.

The Safety Data Sheets (SDS) required for products/materials used for tasks under this program should be reviewed so that everyone is aware of:

- Safety and health precautions.
- Personal protective equipment required when performing the work.

Any necessary safety and/or special instructions will be reviewed with employees prior to starting so that everyone has an understanding of safety concerns and how the work will progress.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Certain tasks may require additional guidelines or requirements. Refer to "Special Handling" or "Training", under the applicable task, for more information.

***ROADSIDE FACILITY
MAINTENANCE PROGRAM
(PROGRAM NO. 134.00.00), CONT'D.***

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is required, it is listed under the applicable task.

Maintain Rest Areas and Welcome Centers (Task No. 134.01.01)

Description

This task includes providing all services necessary for maintaining rest areas (i.e., rest areas, rest stops and welcome stations/centers), such as removing litter from the ground or litter containers, cleaning and repairing tables or benches, cleaning restrooms, maintaining buildings, and RV dump stations, watering, mowing and fertilizing turf areas, trimming and fertilizing landscaped areas.

Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.

When maintaining rest areas, workers should be aware of conditions that might result in increased liability for the Department. Areas that need special attention include:

- Wet floors in restrooms.
- Washing sidewalks when temperatures are at or near freezing.

Purpose

The purpose of the work associated with this task is to provide clean and attractive facilities for the traveling public.

Timing of Maintenance

Rest areas should be checked frequently and services should be performed as needed. Maintenance

should be scheduled to conform to usage, particularly weekends, holidays and seasonal demands. When possible, maintenance of rest room facilities should be done during non-peak hours, (e.g., early morning and late afternoon).

Inspections of drainage facilities should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and to prevent/delay flooding, erosion, damage or deterioration.

If a rest area is maintained by contract, the agreement should include a schedule of times and days that maintenance will be performed to accommodate usage demands.

Mowing frequency varies by season, climate, soil, moisture, fertilization and variety of grass. In areas visible to pedestrians and slow traffic, walks and curbs should be edged frequently to prevent grass from hanging over the edges.

Watering depends on the season, climate, soil and variety of grass. A deep root system is developed with deep watering and ensures a healthier and more drought-resistant lawn.

Light pruning (cutting back of lateral branches or misdirected shoots) can be performed any time during the year. Heavy trimming or removal of shrubs and trees should be performed between October and March when they are dormant and to protect nesting birds.

Fertilizers, herbicides and insecticides shall be applied in accordance with the manufacturer's recommendations. ***Do not exceed the application rates.***

Maintain Rest Areas and Welcome Centers
(Task No. 134.01.01), cont'd.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Employees who apply chemicals shall be trained and certified in accordance with the procedures outlined in Task No. 131.08.05 (Vegetation Control: Chemical Weed Spray).

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

N/A

Storage

Supervisors should ensure that cleaning materials, fertilizers, herbicides, insecticides, etc. are stored so only authorized personnel have access to them.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Employees should wear appropriate personal protective equipment and use caution when picking up and disposing of debris from roadside facilities. Litter and trash may contain dangerous articles such as broken glass or biohazardous waste. Use extreme care in order to prevent trash bags from brushing against anyone.

Employees who discover containers that have non-identifiable contents should report the information to their supervisor. The material should not be removed unless it is determined to be non-hazardous.

When emptying litter containers, especially those that contain large or heavy items, employees should use proper lifting techniques or equipment to reduce the risk of personal injury.

Maintain Rest Areas and Welcome Centers
(Task No. 134.01.01), cont'd.

Disposal

The disposal of empty material containers shall be according to the manufacturer's recommendations.

Approvals

This task involves work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division prior to starting this task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Remove graffiti.
- Pick up and dispose of litter.
- Mow, water, fertilize and/or prune lawn, shrubs and trees.

- Inspect and clean, repair or replace as needed:
 - Restroom fixtures (e.g., sinks, toilets, toilet seats, urinals, partitions, mirrors, walls, plumbing connections, paper holders).
 - Drinking fountains.
 - Outside walls.
 - Tables and benches.
 - Wells, pumps and irrigation systems.
 - Buildings.
 - RV dump stations.
 - Lights/Lighting systems.
- Replenish supplies in rest rooms.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Report this task to the rest area or welcome center location; only locations that start with an RP or WS followed by a three-digit number in

Maintain Rest Areas and Welcome Centers***(Task No. 134.01.01), cont'd.***

the MMS are considered rest areas and welcome centers.

- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of man-hours spent on this task.
- Report any work inside a rest area or welcome center separate from routine maintenance (i.e., a betterment) to the applicable task number along with the approved betterment number and the RP or WS location.
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Maintain Landscape Features (Task No. 134.02.01)

Description

This task involves restoring decorative features (e.g., turtles, horses, boulders, silhouettes, sculptures) that have deteriorated, damaged or have been altered as the result of an accident or act of vandalism.

Steep slopes and loose footing are likely to be encountered while performing this task, so use extra caution to prevent falls.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to repair/restore decorative features to as close to their original condition or appearance.

Timing of Maintenance

Inspections of decorative features should be performed monthly to assess their condition or in response to complaints.

Based on visual inspections, it may be necessary to:

- Immediately repair damaged/deteriorated features.
- Schedule the repair work with other maintenance priorities.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

N/A

Storage

N/A

***Maintain Landscape Features
(Task No. 134.02.01), cont'd.***

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Disposal

All debris will be hauled to an approved disposal site.

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Repair/restore decorative features as needed.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Report this task as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of man-hours spent on this task.
- Select the applicable cause of maintenance for the work performed.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Maintain Rock Mulch (Task No. 134.02.02)

Description

This task involves restoring areas containing rock mulch that has been displaced, altered or scattered.

Steep slopes and loose footing are likely to be encountered while performing this task, so use extra caution to prevent falls.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to:

- Clear the area of debris and litter.
- Restore/Replace materials to as close to their original condition or appearance.

Timing of Maintenance

Inspections of areas containing rock mulch should be performed monthly to assess their condition or in response to complaints.

Based on visual inspections, it may be necessary to:

- Immediately restore the disturbed area.
- Schedule the repair work with other maintenance priorities.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

N/A

Storage

N/A

Maintain Rock Mulch
(Task No. 134.02.02), cont'd.

number of man-hours for that task in addition to this task.

Disposal

- Report this task as a spot location or from-to milepost.

N/A

Approvals

- Enter all labor, equipment and materials used for this task.

N/A

- Select any other material not included in the material pick list from its associated stockpile.

Procedure

The procedure for this task includes but is not limited to the following:

- Enter the reported accomplishment as the total number of man-hours spent on this task.

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Collect and relocate rocks to their proper place in the pattern.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total

Landscape Areas with Turf (Task No.134.03.01)

Description

This task includes mowing, watering, fertilizing, weeding, pruning, controlling insects and replacing grass in landscaped areas that are primarily turf.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to provide an attractive facility for the traveling public and to help preserve the value of abutting properties.

Timing of Maintenance

Mowing frequency varies by season, climate, soil, moisture, fertilization and variety of grass. In areas visible to pedestrians and slow traffic, walks and curbs should be edged frequently to prevent grass from hanging over the edges.

Light pruning (cutting back of lateral branches or misdirected shoots) can be performed any time during the year. Heavy trimming or removal of shrubs and trees should be performed between October and March when they are dormant and to protect nesting birds. In areas that are highly visible, walks and curbs should be edged frequently to improve visual appeal.

Watering depends on the season, climate, soil and variety of grass. A deep

root system is developed with deep watering and ensures a healthier and more drought-resistant lawn.

Inspections of drainage facilities should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and to prevent/delay flooding, erosion, damage or deterioration.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

N/A

***Landscape Areas with Turf
(Task No.134.03.01), cont'd.***

Testing

N/A

Storage

N/A

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Disposal

Empty material containers shall be disposed of in accordance with the manufacturer's recommendations.

Approvals

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Mow, water, prune, fertilize or control weeds as needed.
- Repair or replace drip or irrigation systems as needed.
- Dispose of empty material containers in accordance with the manufacturer's recommendations.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If turf is not present, report the work to Task No. 134.03.02 (Landscape Areas without Turf).
- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Report this task as a spot location or from-to milepost. If the area being maintained is parallel to the roadway, report a from-to milepost. If the area being maintained is at a

***Landscape Areas with Turf
(Task No.134.03.01), cont'd.***

specific location, report a spot location.

- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of man-hours spent on this task.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Landscape Areas without Turf (Task No. 134.03.02)

to prevent/delay flooding, erosion, damage or deterioration.

Description

This task includes watering, fertilizing, weeding, pruning, and controlling insects in areas that are landscaped with shrubs, trees and ground covers, but no turf.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Purpose

The purpose of the work associated with this task is to provide an attractive facility for the traveling public and to help preserve the value of abutting properties.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Timing of Maintenance

Light pruning (cutting back of lateral branches or misdirected shoots) can be performed any time during the year. Heavy trimming or removal of shrubs and trees should be performed between October and March when they are dormant and to protect nesting birds.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Watering requirements vary by season, climate, soil, variety of vegetation and drainage. In areas where water restrictions are in effect, irrigation systems should be set to coincide with the permitted watering times and days.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Inspections of drainage facilities should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and

Ordering

N/A

Testing

N/A

Storage

N/A

***Landscape Areas without Turf
(Task No. 134.03.02), cont'd.***

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Disposal

Empty material containers shall be disposed of in accordance with the manufacturer's recommendations.

Approvals

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.

- Water, prune, fertilize or control weeds as needed. Use herbicides in open areas around plantings outlined in Task No. 131.08.05 (Vegetation Control: Chemical Weed Spray).
- Repair or replace drip or irrigation systems as needed.
- Dispose of empty material containers in accordance with the manufacturer's recommendations.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If turf is present, report the work to Task No. 134.03.01 (Landscape Areas with Turf).
- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Report this task as a spot location or from-to milepost. If the area being maintained is parallel to the roadway, report a from-to milepost. If the area being maintained is at a specific location, report a spot location.
- Enter all labor, equipment and materials used for this task.

***Landscape Areas without Turf
(Task No. 134.03.02), cont'd.***

- Enter the reported accomplishment as the total number of man-hours spent on this task.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

**Maintain/Repair Truck Escape Ramps with Arrestor Bed
(Task No. 134.04.01)**

Description

Any vegetation on the surface of a truck escape ramp arrestor bed and/or the infiltration of fines can reduce tire penetration into the bed and diminish the decelerating capacity of the arrestor bed. This task involves restoring escape ramp arrestor beds to the design-specified depth and cross-section by removing debris, silt, vegetation and other foreign materials. The reconditioning, or "fluffing", of arrestor beds involves working the bed with a vehicle that has an attached scarifying rake or cultivator. The vehicle can work from the side of the arrestor bed or travel up and down the bed as needed.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to ensure that the arrestor bed operates at an optimum level. Cleaning and fluffing the arrestor bed maintains the effectiveness of the aggregate to slow runaway vehicles.

Timing of Maintenance

To ensure that the aggregate remains loose, arrestor beds shall be fluffed every 6 months (preferably in the spring and fall) and reworked after every use to level out ruts. Maintenance work should be performed within 3 working days of the ramp's use, weather permitting.

The aggregate inside the bed should be completely removed, screened and returned to the bed at a minimum of every 5 years to:

- Remove fines and crushed rock that are no longer the proper size or specification.
- Wash/Rinse off attached dirt/debris.

Aggregate is added to the bed, as needed, to restore the desired depth and cross-section.

Periodic field checks, as well as review of accumulated Incident Log data, may require removing and cleaning the aggregate sooner than every 5 years.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Maintain/Repair Truck Escape Ramps with Arrestor Bed (Task No. 134.04.01), cont'd.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

Before any aggregate is added or replaced, it should be sampled and tested in accordance with the frequencies listed in Part III, Chapter 3 "Materials Sampling and Testing". Materials shall conform to the Department's specifications.

Storage

N/A

Special Handling

If the aggregate attenuation mounds located at the end of the arrestor bed are disturbed or destroyed during the fluffing process, they should be reworked to their original size and shape. Refer to the *Standard Plans for Road and Bridge Construction* for the recommended mound dimensions.

Training

In order to ensure that materials purchased meet specifications, District

Maintenance employees will be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel.

Disposal

When practical, vegetation and debris removed while cleaning arrestor beds should be disposed of in conformance with the following:

- Disposal shall not endanger the environment. (Refer to Part III, Chapter 4 "Environmental", or contact the Environmental Services Division for more information.)
- In the Lake Tahoe Basin, all material removed will be hauled out of the basin.
- Haul materials to approved disposal sites. Materials may be stockpiled along the roadway, outside of the 30-foot clear zone. Material should be removed as soon as practical.

Approvals

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01

Maintain/Repair Truck Escape Ramps with Arrestor Bed (Task No. 134.04.01), cont'd.

(Install/Repair/Replace Pollution Prevention Devices).

- Set up the appropriate traffic control devices and flaggers in accordance with the "Safety/Traffic Control" section of the *Truck Escape Ramp Manual*.
- Arrange for appropriate vehicle with scarifying attachment.
- Complete the Incident Log form and the Maintenance Checklist prior to performing any work in the arrestor bed.
- Clear and fluff the arrestor bed using the appropriate equipment and according to the procedures specified in the *Truck Escape Ramp Manual*.
- Haul excess vegetation and foreign debris to approved disposal sites.
- Clean up the area, including sweeping up any excess aggregate/debris from the maintenance road and disposing of properly. Aggregate discharged out of the bed during usage may be returned only after cleaning so that no fines or other dirt and debris are introduced into the arrestor bed.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Report only the work performed inside the arrestor bed area to this task; report any work performed outside of the arrestor bed area to the applicable task number.
- Report this task as a spot location.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total man-hours spent on this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter details on the work that was performed in the Comments field (mandatory).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Documentation

- Complete and file the Checklist and Incident Log.

CHAPTER 9: ROADSIDE ASSET MAINTENANCE

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

ROADSIDE ASSET MAINTENANCE PROGRAM (PROGRAM NO. 135.00.00)

Description

This program includes tasks for inspecting, repairing, replacing or installing:

- Right-of-way fences and gates.
- Snow fence.
- Glare screen/fence.
- Tortoise fence.
- Cattle guards.

Policy

The Department's objective is to:

- Maintain roadside assets to as close to the standard to which they were constructed or to current standards.
- Provide a highway that is safe for the traveling public and is visually appealing.
- Follow the applicable Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) when performing certain tasks included in this program.

Maintenance Priorities

The following priorities should be considered when planning and coordinating maintenance work under this program:

- Public safety
- Potential liability for the Department
- Protecting the Department's capital investment
- Protecting abutting property
- Aesthetics

Deficiencies

The following should be considered when establishing maintenance priorities for tasks included in this program:

- Damage to any asset

Special Requirements

Environmental Clearance

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III,

**ROADSIDE ASSET MAINTENANCE PROGRAM
(PROGRAM NO. 135.00.00), CONT'D.**

Chapter 4 under "Planning Maintenance Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

Stormwater Pollution Prevention, Best Management Practices

Certain tasks require special attention to stormwater pollution prevention and compliance with the maintenance facility's Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) that assist crews in reducing pollutant discharges associated with the tasks.

Refer to Part III, Chapter 4 under "Facility Pollution Prevention Plans" or the FPPP for the related maintenance facility, or contact the Stormwater Division for more information.

Hydraulics

Certain tasks under this program require special attention to the proper flow and containment of water/stormwater, and ensuring that the drainage facilities, applications and/or materials used are in good condition, free of obstructions and working properly. Regular inspections are critical in preventing or delaying flooding, erosion, damage or deterioration.

Work Outside the Right-of-Way

Work is typically not performed outside the right-of-way. If unusual circumstances require work outside the right-of-way and onto private property,

written permission is required from the property owner.

Circumstances and work performed shall comply with procedures outlined in Part IV, Chapter 1 under "Work Outside the Right-of-Way".

Underground Service Alert

Certain scheduled tasks under this program may be subject to review by Underground Service Alert of Northern/Central California and Nevada (USA North 811) to determine if work involves:

- Digging.
- Trenching.
- Drilling.
- Augering.
- Grading.
- Ripping.
- Boring.
- Other excavation tasks.

For more information and requirements, refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)".

Contract Services

For maintenance tasks that are contracted to private entities, the

ROADSIDE ASSET MAINTENANCE PROGRAM
(PROGRAM NO. 135.00.00), CONT'D.

responsible Department/District representative should:

- Check the work for compliance with the contract provisions.
- Maintain a checklist to document deficiencies and problems.

Maintenance projects conducted by private entities may have a crew from the Construction Division assigned to perform the applicable inspections.

Approvals

Certain tasks may require approval or special permission prior to starting work. Refer to "Approvals", under the applicable task, for more detail or requirements.

Prior approval from the Maintenance and Asset Management Division is required for tasks that are included in the Annual Work Program and the District's Planning Chart as a scheduled betterment. Projects listed in the Department's approved Annual Work Program cannot be changed without prior approval from the Director's Office. Refer to Part III, Chapter 1 under "District Administration Responsibilities" for more information.

Safety and Training

Supervisors will review safety and traffic routing plans with all workers responsible for traffic control.

Crewmembers should know the locations of emergency medical facilities

in case of an injury. Supervisors will ensure that first-aid supplies are on the job site.

The Safety Data Sheets (SDS) required for products/materials used for tasks under this program should be reviewed so that everyone is aware of:

- Safety and health precautions.
- Personal protective equipment required when performing the work.

Any necessary safety and/or special instructions will be reviewed with employees prior to starting so that everyone has an understanding of safety concerns and how the work will progress.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Certain tasks may require additional guidelines or requirements. Refer to "Special Handling" or "Training", under the applicable task, for more information.

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is required, it is listed under the applicable task.

**Repair/Install Barbed Wire, Woven Wire Fences and Gates
(Task No. 135.01.01)**

Description

This task includes:

- Repairing and replacing existing right-of-way and control of access fencing and gates.
- Preserving the usefulness of wire mesh and barbed wire fencing.

Refer to *Standard Plans for Road and Bridge Construction* for standards and guidelines.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Right-of-way fences are constructed on the Department's property lines, delineate the right-of-way and help prevent livestock from entering the highway. Control of access fences are built along the right of way to safeguard against traffic hazards caused by intrusion of people, animals, vehicles, machines, etc., from outside the right of way.

Purpose

The purpose of the work associated with this task is to:

- Increase safety by keeping livestock off the highway and by ensuring that access is controlled.
- Prevent trespass onto or away from the highway.

Timing of Maintenance

Routine inspections or an emergency situation may indicate damage to fences and gates that require repair. In areas where livestock is present, fences and gates shall be repaired immediately. (This may require contacting crewmembers to work during non-scheduled hours.) In non-livestock areas, fences and gates should be scheduled for repair as soon as practical.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Repair/Install Barbed Wire, Woven Wire Fences and Gates
(Task No. 135.01.01), cont'd.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Fencing materials for routine and emergency repairs should be stocked at the maintenance yards. Materials can be obtained through the District's stockroom or other outside sources.

Planned work should be reviewed and an estimate of materials should be prepared on a project-by-project basis. Materials for large projects will be obtained through the State Purchasing Division. If concrete is purchased from a commercial source, arrangements should be made in advance to ensure the mix is available when needed. Purchasing documents furnished to State Purchasing should contain the most current Department specifications.

For more information, contact the Specifications Section of Roadway Design and refer to Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials" for purchasing information.

Testing

N/A

Storage

Materials purchased for routine and emergency repairs should be stored at each maintenance station. Materials purchased for large projects should be

stockpiled in a separate area to ensure that they will be available when needed.

Special Handling

Supervisors should review with employees any safety concerns when stretching wire or using the post pounder. Protective clothing such as gloves and long sleeve shirts should be worn when working on fences.

Disposal

When fencing is repaired, the damaged or non-usable material should be disposed of at an approved disposal site.

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality" and "Planning Maintenance Tasks", or contact the Environmental Services

Repair/Install Barbed Wire, Woven Wire Fences and Gates
(Task No. 135.01.01), cont'd.

Division and the Stormwater Division prior to starting this task for more information and guidelines.

This task may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Install new fencing or gates in accordance with the *Standard Plans for Road and Bridge Construction*.
 - Haul non-usable material to an approved disposal site.
 - Remove traffic control.
- Refer to the *Maintenance Management System Manual of Instructions* for the latest information.
- Reporting***
- Reporting for this task in the MMS System includes but is not limited to the following:
- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
 - Enter the task location as a spot location or from-to milepost. If the area being repaired is parallel to the road, report a from-to milepost. If the area being repaired is at a specific location, report a spot location.
 - Enter all labor, equipment and materials used for this task.
 - Enter the reported accomplishment as the total number of linear feet of fence being repaired or installed. (If the section is 100 feet long with four strands of wire, it is a 400-foot accomplishment.
 - Report new fence constructed under this task with the applicable cause of
- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
 - Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
 - Repair or replace the damaged portions of fencing or gates.

***Repair/Install Barbed Wire, Woven Wire Fences and Gates
(Task No. 135.01.01), cont'd.***

maintenance selected and the correct betterment number entered.

- Report any materials not found in the material list as Material Class 99 (Miscellaneous Cost) with the actual dollar amount.
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Repair/Install Chain Link, Snow Fence and Gates (Task No. 135.01.02)

Description

This task includes:

- Repairing and replacing existing right-of-way and control of access fencing and gates.
- Preserving the usefulness of chain link and snow fencing.

Refer to the *Standard Plans for Road and Bridge Construction* for standards and guidelines.

**Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.**

Right-of-way fences are constructed on the Department's property lines, which serve to delineate the right-of-way and to keep livestock away from the highway. Control of access fences are built along the right of way to safeguard against traffic hazards caused by intrusion of people, animals, vehicles, machines, etc., from outside the right of way. Snow fence is maintained for the control of snow that is windblown or in a location that has a build-up problem and is a safety concern for the traveling public.

Purpose

The purpose of the work associated with this task is to:

- Increase safety by keeping livestock off the highway and by ensuring that access is controlled.
- Preserve the Department's investment in fences and gates.
- Safety of the traveling public.

Timing of Maintenance

Routine inspections or an emergency situation may indicate damage to fences and gates that require repair. In areas where livestock is present, fences and gates shall be repaired immediately. (This may require contacting crewmembers to work during non-scheduled hours.) In non-livestock areas, fences and gates should be scheduled for repair as soon as practical.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training

Repair/Install Chain Link, Snow Fence and Gates
(Task No. 135.01.02), cont'd.

and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Fencing materials for routine and emergency repairs should be stocked at the maintenance yards. Materials can be obtained through the District's stockroom or other outside sources.

Planned work should be reviewed and an estimate of materials should be prepared on a project-by-project basis. Materials for large projects must be obtained through the State Purchasing Division. If concrete is purchased from a commercial source, arrangements should be made in advance to ensure the mix is available when needed. Purchasing documents furnished to State Purchasing should contain the most current Department specifications.

For more information, contact the Specifications Section of Roadway Design and refer to Part III, Chapter 2, "Acquisition and Disposal of Equipment and Materials", for purchasing information.

Testing

N/A

Storage

Materials purchased for routine and emergency repairs should be stored at each maintenance station. Materials purchased for large projects should be stockpiled in a separate area to ensure they will be available when needed.

Special Handling

Supervisors should review with employees any safety concerns when stretching wire or using the post pounder. Protective clothing such as gloves and long sleeve shirts should be worn when working on fences.

Disposal

When fencing is repaired, the damaged or non-usable material should be disposed of at an approved disposal site.

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs,

Repair/Install Chain Link, Snow Fence and Gates
(Task No. 135.01.02), cont'd.

wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting this task for more information and guidelines.

This task may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Repair or replace the damaged portion of fencing or gates.
- Install new fencing or gates in accordance with the *Standard Plans for Road and Bridge Construction*.
- Haul non-usable material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost. If the area being repaired is parallel to the road, report a from-to milepost. If the area being repaired is at a specific location, report a spot location.
- Enter all labor, equipment and materials used for this task.

Repair/Install Chain Link, Snow Fence and Gates
(Task No. 135.01.02), cont'd.

- Enter the reported accomplishment as the total number of linear feet of fence being repaired or installed.
- Report new fence construction under this task with the applicable cause of maintenance correct betterment number.
- Report any materials not found in the material pick list as Material Class 99 (Miscellaneous Cost) with the actual dollar amount.
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Repair/Install Glare Screen or Glare Fence
(Task No. 135.01.03)

Description

This task includes:

- The repair or replacement of damaged or missing sections of glare screen.
- Delineation for glare screen/fencing to ensure the safety of the traveling public.

Refer to the *Standard Plans for Road and Bridge Construction* for standards and guidelines.

Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.

Purpose

The purpose of the work associated with this task is to assess glare screen/fencing to determine their condition, make minor repairs and prioritize other repairs.

Timing of Maintenance

This task is performed when studies or complaints in areas determine the need for glare screens/fences or when periodic inspections reveal any damage or deterioration to existing screen/fencing.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the

MMS System for the list of standard equipment used for this task.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Screen/Fencing materials for routine and emergency repairs should be stocked at the maintenance yards. Materials can be obtained through the District's stockroom or other outside sources.

Testing

N/A

Storage

Materials purchased for routine and emergency repairs should be stored at each maintenance station. Materials purchased for large projects should be stockpiled in a separate area to ensure they will be available when needed.

Disposal

When screen/fence is repaired, the damaged or non-usable material should

Repair/Install Glare Screen or Glare Fence
(Task No. 135.01.03), cont'd.

be disposed of at an approved disposal site.

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater Division prior to starting this task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.

- Remove all damaged screen/fencing.
- Install new fencing or gates in accordance with the *Standard Plans for Road and Bridge Construction*.
- Haul damaged or non-usable material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Report this task as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of linear feet of fence being repaired or installed.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Inspect/Repair/Install Tortoise Fence (Task No. 135.01.05)

MMS System for the list of standard materials/supplies used for this task.

Description

Ordering

This task involves inspecting and repairing or installing areas of the fence that are broken, down or washed out, or where posts are damaged.

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Refer to the *Standard Plans for Road and Bridge Construction* for standards and guidelines.

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Fencing materials for routine and emergency repairs should be stocked at the maintenance yards. Materials can be obtained through the District's stockroom or other outside sources.

Purpose

Testing

The purpose of the work associated with this task is to ensure that inspections are complete and the fence retains its structural integrity.

N/A

Timing of Maintenance

Storage

This task is performed when studies or complaints in areas determine the need for tortoise fencing or when periodic inspections reveal any damage or deterioration to existing fences.

Materials purchased for routine and emergency repairs should be stored at each maintenance station. Materials purchased for large projects should be stockpiled in a separate area to ensure they will be available when needed.

Equipment

Disposal

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

When fencing is repaired, the damaged or non-usable material should be disposed of at an approved disposal site.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the

Inspect/Repair/Install Tortoise Fence
(Task No. 135.01.05), cont'd.

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting this task for more information and guidelines.

This task may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Perform the necessary inspections as instructed by the Environmental Services Division and/or the Stormwater Division.
- Make the necessary installation and/or repairs.
- Haul damaged or non-usable material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

***Inspect/Repair/Install Tortoise
Fence
(Task No. 135.01.05), cont'd.***

Special Instructions

- Contact the Environmental Services Division to arrange for the moving or relocation of any tortoise found within the right-of-way.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost. If the area being repaired is parallel to the road, report a from-to milepost. If the area being repaired is at a specific location, report a spot location.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of man-hours spent on inspections and repairs.
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Repair/Replace/Install Cattle Guard (Task No. 135.02.02)

Description

This task includes:

- Repairing and installing cattle guard wings.
- Flushing/cleaning dirt and debris from inside the cattle guard.
- Placing additional connectors to tie the grate to the foundation.
- Welding portions of the steel grate.
- Replacing the steel grate.
- Patching broken or deteriorated areas of the concrete foundation.

Refer to the *Standard Plans for Road and Bridge Construction* for standards and guidelines.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

When it is necessary to work on the pavement surface to eliminate irregularities adjacent to a cattle guard or provide for a smooth ride over the cattle guard, this work should be accomplished and reported under Task No. 101.02.01 (Hand Patching) or 101.02.02 (Maintenance Patching: Less than 500 feet).

Supervisors should ensure that all crewmembers wear the proper personal protective equipment for traffic control.

Purpose

The purpose of the work associated with this task is to:

- Promote motorist safety.
- Preserve the Department's investment in the cattle guard.

Timing of Maintenance

Cattle guards should be inspected periodically for signs of deterioration such as:

- Loose, cracked or broken grates.
- Damaged foundations.
- Damaged wingwalls.
- Extensive settlement of the grate, creating an uneven road surface.

If signs of deterioration are present, the Supervisor should evaluate and provide recommendations to the Highway Maintenance Supervisor II. Timing and priority of maintenance depends on the severity of the deterioration. If extensive work is anticipated, or a number of cattle guards require replacement, this task may be put to a State Forces Project or a District Contract in the Betterment Program.

Inspections of drainage facilities should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and to prevent/delay flooding, erosion, damage or deterioration.

***Repair/Replace/Install Cattle Guard
(Task No. 135.02.02), cont'd.***

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before

purchasing or acquiring materials used for this task.

With the exception of the steel grate, materials used for repairs may be obtained through the District's stockroom or by a local purchase under the Direct Purchase Authorization. Steel grates shall be obtained through the State Purchasing Division.

Testing

N/A

Storage

Materials should be stored in an area where they will be reasonably safe from damage and, if possible, marked or tagged for the specific project intended.

Disposal

Damaged or non-usable material should be disposed of at an approved disposal site.

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable

***Repair/Replace/Install Cattle Guard
(Task No. 135.02.02), cont'd.***

to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting this task for more information and guidelines.

This task may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road*

and Bridge Construction and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.

- Repair, replace or paint (if necessary) damaged cattle guard and/or wings.
- Install new cattle guard and/or wings in accordance with the *Standard Plans for Road and Bridge Construction*.
- Haul damaged or non-usable material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Special Instructions

Prior to beginning work, supervisors should inspect the cattle guard and determine what repairs are needed and ensure that all the materials are available. Certified welders should do welding. When non-certified welders are used, permanent repairs should be made by a certified welder as soon as practical.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number

***Repair/Replace/Install Cattle Guard
(Task No. 135.02.02), cont'd.***

of man-hours for that task in addition to this task.

- Report this task as a spot location.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as each cattle guard replaced. This can include replacement of the grates, footing or wings.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

CHAPTER 10: TRAFFIC SERVICES

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

TRAFFIC SERVICES PROGRAM (PROGRAM NO. 141.00.00)

Description

This program includes tasks for:

- Traffic sign installation, repair or replacement.
- Guardrail installation, repair or replacement.
- Attenuator installation, repair or replacement.
- Cable barrier installation, repair or replacement.
- Pavement marking removal or replacement.
- Raised pavement marker removal or installation.
- Roadway lighting (highway, bridge, tunnel and sign lighting).
- Patrolling for deficient roadway assets.
- Maintaining guideposts, milepost markers and other roadway markers.
- Incident response/road closure.
- Special events traffic control.

Specifications and requirements for installation and placement of traffic devices are covered in the *Standard*

Plans for Road and Bridge Construction and the *Manual on Uniform Traffic Control Devices* (MUTCD). Supervisors should periodically review the installation/placement standards to ensure that items such as signs, guardrail and striping are being installed in accordance with Department standards. Supervisors should ensure that all employees are aware of these standards.

Policy

The Department's objective is to:

- Maintain roadway assets for the safety of the traveling public.
- Follow the applicable Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) when performing certain tasks included in this program.

Maintenance Priorities

The following priorities should be considered when planning and coordinating maintenance work under this program:

- Public safety
- Potential liability for the Department
- Protecting the Department's investment in the facility
- Aesthetics

TRAFFIC SERVICES

**TRAFFIC SERVICES PROGRAM
(PROGRAM NO. 141.00.00), CONT'D.**

Since resources are limited, the priority level may vary. Routes with high traffic volumes and higher speed limits should be assigned a high priority level.

Deficiencies

The following should be considered when establishing maintenance priorities for tasks included in this program:

- Damaged, missing or malfunctioning traffic control, informational and/or safety devices (e.g., signs, guardrail, cable barrier, end treatments, pavement markings/stripes, roadway markers, lights)
- Reduced retroreflectivity of traffic control devices (e.g., signs, pavement markings/stripes, roadway markers)
- Non-working or improperly working lights (e.g., street lights, structure and tunnel lights, overhead sign lights, solar lighting)

Special Requirements***Environmental Clearance***

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III, Chapter 4 under "Planning Maintenance

Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

Stormwater Pollution Prevention, Best Management Practices

Certain tasks require special attention to stormwater pollution prevention and compliance with the maintenance facility's Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) that assist crews in reducing pollutant discharges associated with the tasks.

Refer to Part III, Chapter 4 under "Facility Pollution Prevention Plans" or the FPPP for the related maintenance facility, or contact the Stormwater Division for more information.

Hydraulics

N/A

Work Outside the Right-of-Way

N/A

Underground Service Alert

Certain scheduled tasks under this program may be subject to review by Underground Service Alert of Northern/Central California and Nevada (USA North 811) to determine if work involves:

- Digging.
- Trenching.
- Drilling.
- Augering.

TRAFFIC SERVICES

**TRAFFIC SERVICES PROGRAM
(PROGRAM NO. 141.00), CONT'D.**

- Grading.
- Ripping.
- Boring.
- Other excavation tasks.

For more information and requirements, refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)".

Contract Services

When the maintenance of roadside facilities is contracted to private firms, the responsible Department/District representative should:

- Check the work for compliance with the contract provisions.
- Maintain a checklist to document deficiencies and problems.
- Provide input to District Administration or the Maintenance and Asset Management Division (depending on the contract terms), based on the reviews and documented performance of the contractor.

Maintenance projects conducted by private entities may have a crew from the Construction Division assigned to perform the applicable inspections.

Approvals

Certain tasks may require approval or special permission prior to starting work.

Refer to "Approvals", under the applicable task, for more detail or requirements.

Prior approval from the Maintenance and Asset Management Division is required for tasks that are included in the Annual Work Program and the District's Planning Chart as a scheduled betterment. Projects listed in the Department's approved Annual Work Program cannot be changed without prior approval from the Director's Office. Refer to Part III, Chapter 1 under "District Administration Responsibilities" for more information.

Safety and Training

Supervisors will review safety and traffic routing with all employees responsible for traffic control.

Workers should be aware of safety concerns when performing tasks in the median area of divided highways. Refer to Part IV, Chapter 1 under "Working in or Adjacent to Median Areas" for guidelines when working in the median.

Crewmembers should know the locations of emergency medical facilities in case of an injury. Supervisors will ensure that first-aid supplies are on the job site.

The Safety Data Sheets (SDS) required for products/materials used for tasks under this program should be reviewed so that everyone is aware of:

- Safety and health precautions.
- Personal protective equipment required when performing the work.

TRAFFIC SERVICES

**TRAFFIC SERVICES PROGRAM
(PROGRAM NO. 141.00.00), CONT'D.**

Any necessary safety and/or special instructions will be reviewed with employees prior to starting so that everyone has an understanding of safety concerns and how the work will progress.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Certain tasks may require additional guidelines or requirements. Refer to "Special Handling" or "Training", under the applicable task, for more information.

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is required, it is listed under the applicable task.

TRAFFIC SERVICES

**Repair/Replace Traffic Signs
(Task No. 141.01.01)**

replacement or repair are regulatory and warning signs.

Description

This task covers the repair and replacement of existing traffic signs, including posts and sign panels. It also includes the repair and replacement of barricades, washing signs, straightening signs and placing flashers and object markers.

Sign deficiencies not critical to traffic safety or operations should be corrected as soon as practical. Night inspections of signs should be conducted under Task No. 141.10.01 (Patrol/Inspect Miscellaneous Assets) every 2 years to determine the retroreflectivity of sign faces. When a sign inspector, during a visual nighttime assessment, determines that the reflectivity for the sign type/color is less than the calibration sign (i.e., "poor"), it will be scheduled for replacement.

The proper position, cleanliness, legibility and daytime/nighttime visibility of signs should be considered. Damaged or deteriorated signs should be replaced.

Equipment

If any soil disturbance around the project area is warranted (e.g., replacing sign base), Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Purpose**Special Equipment**

The purpose of the work associated with this task is to maintain regulatory, warning and guide signs along the highway in a condition that is safe for motorists and preserves the State's capital investment.

Employees should be aware of the hazards and observe necessary precautions when using equipment (e.g., post hole augers, aerial lift equipment), especially around electrical lines.

Timing of Maintenance

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Signs critical to traffic safety should be repaired or replaced promptly. If prompt action is not possible, a temporary sign should be installed until a permanent repair or replacement can be made. Signs that have a high priority for

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Special Handling

All signpost bases require some type of excavation work. Supervisors shall

TRAFFIC SERVICES

***Repair/Replace Traffic Signs
(Task No. 141.01.01), cont'd.***

make sure they contact the Underground Service Alert (USA North 811) to ensure the area is clear of utilities prior to excavating for posts.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter II "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

- Orders for replacement sign panels are initiated by the maintenance crews and submitted through the District Traffic Engineer or Assistant District Engineer to the Department's Sign Shop.

Sign orders are placed using Form 072-002 (Combination Request for Supplies, Equipment and Shipping

Record, or "Form 51"). The request must contain:

- The name and address of the ordering division.
- The quantity.
- The sign code, per the MUTCD's *Standard Highway Signs* publication or NDOT's *Highway Sign Supplement* manual.
- The sign size.
- The sign logo or description.
- The requestor's signature.
- The date of the order.
- The approval signature (when required).
- The cost accounting charges.

Signposts are normally purchased through the District's stockroom under an open-term contract awarded by the State Purchasing Division.

Miscellaneous sign hardware (e.g., nuts and bolts) is purchased through the stockroom.

Testing

N/A

Storage

Supervisors should make sure that sign panels and posts are stored in a safe and secure area in accordance with manufacturer's recommendations.

TRAFFIC SERVICES

**Repair/Replace Traffic Signs
(Task No. 141.01.01), cont'd.****Special Handling**

Individuals working with sign panels should use caution when handling so they do not damage the sheeting.

Disposal

Damaged or deteriorated sign panels and posts should be returned to the yard and stockpiled for sale as scrap.

Approvals

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Remove any temporary items that were installed.
- Repair signs, posts or bases. (Signs that cannot be adequately repaired or do not have a minimum of 50 percent retroreflectivity should be replaced.)
- Depending on the nature of the repair/replacement, the signposts may need to be set in concrete and cure for a few days prior to the installation of the sign panel.
- The date of installation (month and year) should be placed on the back of each new sign panel by an approved method and is to be placed in the lower right-hand corner when facing the rear of the sign.
- Haul damaged or deteriorated sign panels to the maintenance yard.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.

***Repair/Replace Traffic Signs
(Task No. 141.01.01), cont'd.***

- Enter the reported accomplishment as the total number of square feet of sign panel maintained.
- Report any preparation work (e.g., marking locations for USA North 811, temporary removal for repair) to this task with 0 for the number of accomplishment units.
- Report assembling signs for a specific location to this task with 0 for the number of accomplishment units.
- Report new signs that were installed, (i.e., where none had previously existed) to Task No. 141.01.02 (Install New Traffic Signs).
- Report night inspections of signs for reflectivity to Task No. 141.10.01 (Patrol/Inspect Miscellaneous Assets).
- For graffiti removal, select graffiti as the cause of maintenance. For any other type of malicious damage, use vandalism as the cause of maintenance.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Install New Traffic Signs (Task No. 141.01.02)

Description

This task includes the installation of traffic signs in locations where signs did not previously exist. Even though this program is within the betterment series, new traffic signs do not need to be included and approved in the Annual Work Program.

***Task No. 131.09.01
(Install/Repair/Replace Pollution
Prevention Devices) shall be
completed prior to starting any work
for this task.***

Purpose

The purpose of the work associated with this task is to maintain traffic signs that provide reasonable warning, guidance and notice of regulations in a condition that is safe for motorists and preserves the State's capital investment.

Timing of Maintenance

Signs critical to traffic safety (e.g., regulatory and warning signs) should be installed as soon as possible. In some instances, the District Traffic Engineer may recommend a temporary sign if the new sign cannot be made in time. Informational and other non-critical signs should be scheduled with other work priorities.

Since resources are limited, the priority level may vary. Routes with high traffic volumes and higher speed limits should be assigned a high priority level.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter II "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

TRAFFIC SERVICES

***Install New Traffic Signs
(Task No. 141.01.02), cont'd.***

Once the new sign installation has been approved, the order is forwarded to the Department's Sign Shop for fabrication. Once the sign is fabricated, the District Sign Crew will receive information on location.

Arrangements for obtaining materials for these tasks will be made prior to scheduling work. Arrangements should be made 2-3 days in advance to ensure that materials are available for use. Signposts for new installations are taken from stock. Miscellaneous sign hardware (nuts and bolts), if not in stock, is purchased through the District's stockroom.

Testing

Testing and obtaining test certificates required for sign materials (sheeting and aluminum panels) is the responsibility of the Department's Sign Shop.

Storage

Supervisors must make sure that signposts and panels are stored where they are secure from vandalism and damage and in conformance with the manufacturer's recommendations.

Disposal

N/A

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any

pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater Division prior to starting this task for more information and guidelines.

The District Traffic Engineer, District Engineer or the Traffic Operations Division shall approve new sign installations.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Mark the location of sign bases and notify Underground Service Alert (USA North 811) so that the area can be cleared.
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Depending on the size and location of the new installation, signposts

TRAFFIC SERVICES

***Install New Traffic Signs
(Task No. 141.01.02), cont'd.***

may need to be set in concrete and cure for a few days prior to installing the sign panel.

- Install signs, posts and bases in accordance with the *Standard Plans for Road and Bridge Construction*.
- The date of installation (month and year) should be placed on the back of each new sign panel by an approved method and is to be placed in the lower right-hand corner when facing the rear of the sign.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of square feet of sign panel maintained.

- Report assembling signs for a specific location to this task with 0 for the number of accomplishment units.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Repair/Replace/Install Guardrail (Task No. 141.02.01)

permanent repairs or replacements can be made.

Description

This task involves installing, repairing or replacing damaged or deteriorated panels, replacing damaged posts and straightening/aligning posts and panels.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

If any soil disturbance around the project area is warranted (e.g., replacing posts), Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Purpose

The purpose of the work associated with this task is to preserve and maintain the guardrail system in a condition that is safe for motorists and preserves the State's capital investment.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Timing of Maintenance

If a damaged guardrail presents a hazardous condition for motorists, temporary repairs shall be made promptly. Hazardous conditions include but are not limited to:

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

- Guardrail panel(s) encroaching on the pavement surface.
- Guardrail panels that, if hit, could severely damage a vehicle.
- Damage to the guardrail that might allow a vehicle to pass through.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

In instances of less severe damage, the guardrail shall be repaired as soon as practical. In the interim, temporary traffic control devices should be installed until

Guardrail materials are normally obtained from stock or through the State Purchasing Division. Supervisors will review their inventory of guardrail

TRAFFIC SERVICES

***Repair/Replace/Install Guardrail
(Task No. 141.02.01), cont'd.***

materials semiannually to determine if enough supplies are available for anticipated repairs.

If the inventory is not adequate, each Supervisor will submit a request to the Maintenance Manager to compile a District-wide order and submit it to the Equipment Division for transmittal to the State Purchasing Division.

Testing

N/A

Storage

Guardrail material should be stockpiled at each maintenance station so that emergency repairs can be made quickly. Materials must be stored in locations where they will be secure from loss or damage.

Disposal

Damaged rail and steel posts should be returned to the maintenance yard and stockpiled for sale as scrap. Damaged wood posts will be disposed of at an approved disposal site.

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater

Division prior to starting this task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Remove any temporary items that were installed.
- Remove damaged rail, blocks, posts, end pieces and loosen adjacent rail.
- Install new rail, blocks and posts in accordance with the *Standard Plans for Road and Bridge Construction*; align rail and straighten posts.
- Compact fill material around posts.
- Haul damaged rail and steel posts to the maintenance yard; haul damaged wood posts to an approved disposal site.

***Repair/Replace/Install Guardrail
(Task No. 141.02.01), cont'd.***

- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total linear feet repaired, replaced, or installed.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

TRAFFIC SERVICES

Repair/Replace/Install End Treatment or Impact Attenuator (Task No. 141.02.03)

Description

This task involves installing, repairing, replacing or straightening/aligning damaged posts and/or panels for guardrail end treatments or attenuators.

When repairing or replacing the attenuator, care should be taken to ensure that debris and other accumulations are cleaned from around the unit. Accumulation of debris, etc. can hinder the sliding action and impair the functioning of the device. Special attention will be given to ensuring that the attenuator is installed according to the manufacturer's recommendations.

If any soil disturbance around the project area is warranted (e.g., replacing posts), Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.

Purpose

The purpose of the work associated with this task is to repair or replace damaged or deteriorated panels, replace damaged posts and straighten or align posts and panels in a condition that is safe for motorists and preserves the State's capital investment.

Timing of Maintenance

If a damaged end treatment or attenuator presents a hazardous condition for motorists, temporary repairs shall be made immediately.

Hazardous conditions include but are not limited to:

- End treatments encroaching on the pavement surface.
- Missing treatment panels that, if hit, could severely damage a vehicle.
- Damage or debris that impairs the functional integrity of an attenuator.

In instances of less severe damage, the end treatment or attenuator will be repaired as soon as practical. In the interim, temporary traffic control devices should be installed or temporary barriers and warning devices should be placed until permanent repairs or replacements can be made.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the

TRAFFIC SERVICES

Repair/Replace/Install End Treatment or Impact Attenuator (Task No. 141.02.03), cont'd.

MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials or parts used for this task.

End treatment and attenuator materials and associated parts are normally obtained from stock, the Equipment Division or the State Purchasing Division.

For end treatments, supervisors shall review their inventory of materials semiannually to determine if enough supplies are available for anticipated repairs. If the inventory is not adequate, each Supervisor will submit a request to the Maintenance Manager to compile a District-wide order and submit it to the Equipment Division for transmittal to the State Purchasing Division.

Supervisors who have attenuators in their jurisdiction should have:

- A complete unit of the proper size in stock.
- An assortment of parts and cushions to allow minor repairs without using the complete replacement.

If a complete unit is used from stock to repair a damaged unit, an order for a new attenuator shall be processed promptly. Supervisors will forward their request for new parts or a complete unit to the Maintenance Manager who will prepare the order and forward it to the Equipment Division for transmittal to the State Purchasing Division.

Storage

End treatment and attenuator materials shall be stockpiled at each maintenance station so that emergency repairs can be made quickly. Materials will be stored in locations where they will be secure from loss or damage.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations.

Disposal

Damaged rail and steel posts should be returned to the maintenance yard and stockpiled for sale as scrap. Damaged wood posts and cushions will be disposed of at an approved disposal site.

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater

TRAFFIC SERVICES

Repair/Replace/Install End Treatment or Impact Attenuator (Task No. 141.02.03), cont'd.

Division prior to starting this task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Remove any temporary items that were installed.
- Remove damaged attenuator or end treatment and loosen adjacent rail.
- Install new attenuator or end treatment in accordance with the manufacturer's instructions or the *Standard Plans for Road and Bridge Construction*; align rail and straighten posts.
- Compact fill material around end treatment posts.
- Haul damaged rail and steel posts to the maintenance yard; haul damaged wood posts to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as each.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Repair/Replace/Install Cable Barrier (Task No. 141.02.06)

Description

This task involves replacing or straightening/aligning damaged posts, replacing cables or restoring cable tension in the cable barrier system. Maintenance is not limited to repair after impacts, but also to check height and proper tension in the cables.

If any soil disturbance around the project area is warranted (e.g., replacing post sleeve), Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.

Purpose

The purpose of the work associated with this task is to maintain the cable barrier system in a condition that is safe for motorists and preserves the State's capital investment.

Timing of Maintenance

Damage to any part of cable barrier system will be repaired as soon as practical. Temporary traffic control devices should be installed until permanent repairs or replacement can be made.

Annual and semiannual checks are necessary because the cable system can lose tension over time due to stretching and/or settlement or movement of the system.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Special Equipment

A cable tensioner may be necessary to restore proper cable tension in accordance with the manufacturer's specification.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

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***Repair/Replace/Install Cable Barrier
(Task No. 141.02.06), cont'd.***

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Testing

N/A

Storage

Cable barrier system components should be stockpiled at each maintenance station so that emergency repairs can be made quickly. Materials must be stored in locations where they will be secure from loss or damage.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations.

Disposal

Damaged steel posts or cable should be returned to the maintenance yard and stockpiled for sale as scrap.

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater

Division prior to starting this task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Remove and replace all damaged posts and cables.
- Adjust the cable tension to the manufacturer's specifications.
- Install new posts and cable in accordance with the *Standard Plans for Road and Bridge Construction*.
- Haul damaged posts and cable to the maintenance yard.
- Remove traffic control.

***Repair/Replace/Install Cable Barrier
(Task No. 141.02.06), cont'd.***

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of linear feet repaired, replaced, or installed.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

TRAFFIC SERVICES

**Paint Broken and Solid Lines
(Task No.141.04.01)**

adverse weather and low visibility conditions.

Description

This task includes painting solid and broken lines on pavement surfaces and applying glass beads.

For night inspections of striping for reflectivity and effectiveness, refer to Task No. 141.10.01 (Patrol/Inspect Miscellaneous Assets).

Normal line widths for center lines, lane lines and pavement edge lines are 8 inches wide for freeways and 4 inches wide for all other roadways.

The types of painted solid, broken and dashed lines and the guidelines for application are provided below. For additional information, refer to the Standard Plans for Road and Bridge Construction (latest edition) or the Manual on Uniform Traffic Control Devices (latest edition).

Centerlines

Center line pavement markings are used to delineate the separation of traffic lanes that have opposite directions of travel and shall be yellow.

Lane Lines

Lane lines separate lanes of traffic traveling in the same direction and shall be white. They are used on all interstate and multi-lane highways.

Pavement Edge Lines

- Pavement edge line markings provide a guide for drivers during

Purpose

The purpose of the work associated with this task is to:

- Provide guidance and warning for motorists without diverting attention from the roadway.
- Provide supplemental regulations or warnings of other devices such as traffic signs or signals.

Timing of Maintenance

Pavement stripes will be renewed when they have lost approximately 50 percent of their retroreflectivity. Missing or ineffective markings should be replaced as soon as possible.

When pavement striping is worn away or covered over, it will be replaced as soon as possible. When it is not practical to immediately replace the striping, traffic tape or temporary raised reflective markers may be used. Work performed in urban areas should normally be accomplished during off-peak hours.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

TRAFFIC SERVICES

***Paint Broken and Solid Lines
(Task No.141.04.01), cont'd.***

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Traffic paint is purchased under an open term contract administered by the State Purchasing Division and the Maintenance and Asset Management Division. Quantities can be ordered for delivery in accordance with the open term contract. Supervisors should place orders far enough in advance to ensure that paint will be available when needed.

Testing

As paint and beads are delivered, samples will be taken and sent to the Materials Division for testing.

Sampling of paint and beads shall be according to Part III, Chapter 3 "Materials Sampling and Testing".

As a part of the normal operation a metal plate is placed on the pavement ahead of the striper, an application of paint (without beads) is placed on the metal plate and used to verify the paint mil thickness.

Storage

Paint will be stored in a covered area, if possible. Water-borne paint requires a heated storage area. All paint storage shall conform to applicable fire codes and:

- Totes should be protected from damage.
- Totes should not be stacked.
- A 6-foot access way shall be provided for fire protection between every 1,100 gallons of stored paint.

Glass beads should be stored in a dry, covered area.

Supervisors should ensure that crewmembers are instructed on techniques for moving totes and using the appropriate lifting equipment.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations

TRAFFIC SERVICES

***Paint Broken and Solid Lines
(Task No.141.04.01), cont'd.***

and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Training

In order to ensure that materials purchased meet specifications, District Maintenance crewmembers shall be properly trained in sampling procedures.

Disposal

Empty paint totes will be stored in a protected area for pickup by the supplier. Empty bead containers should be disposed of at an approved site.

Approvals

This task involves work that generates excessive noise, dust, emissions or other airborne pollutants. Refer to Part III, Chapter 4 under "Air Quality" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Set each paint guns to match the line width(s) on the roadway, then load the paint and glass beads and test the equipment.
- For mobile striping operations, use a shadow truck with attenuator in rear, strobes, truck-mounted signs and

two truck-mounted, MUTCD-compliant arrow boards.

- Material application rates: Traffic paint will be applied at a rate that will provide a minimum dry film thickness of 18 mils. Glass beads will be applied at a rate of 9 pounds per gallon of paint. Approximate quantities per striped mile that will meet this requirement are:
 - Non-Interstate: 4-inch solid line at 25 gallons of paint, 250 pounds of beads.
 - Interstate: 8-inch solid line at 50 gallons of paint, 500 pounds of beads.
- The MUTCD's recommended distance between the work truck and shadow vehicles may vary depending on terrain and other factors.
- Dry film thickness shall be tested in accordance with Nevada Test Method T509 at a frequency of one test per 1,000 centerline miles of striping (minimum dry film thickness of 18 mils).
- Haul waste material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

TRAFFIC SERVICES

***Paint Broken and Solid Lines
(Task No.141.04.01), cont'd.***

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

- Enter the task location as a from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the
- Enter the reported accomplishment as the total miles of striping. If the striping machine makes a 1-mile pass on centerline and 1-mile pass on the edge line, report two 2 striping miles as the accomplishment. If 1 mile of double line is striped, report 2 miles of accomplishment. Report all auxiliary lines to this task.
- Report any testing of paint that has been stored for an extended period of time to Task No. 270.06.01 (Stockpile Purchasing).
- If this task is performed by a contractor or other entity, do not report the work in the MMS System. If any services are performed by maintenance crews, use the 1440 activity code on the time sheet/Daily Diary for federal contracts and use the 9440 activity code on the time sheet/Daily Diary for State contracts. Use the same contract number/project number as the Resident Engineer.
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Remove/Install Raised Pavement Markings (Task No. 141.06.01)

Description

This task includes the installation of raised traffic markings, buttons and reflective pavement markers. Markers can be reflective or non-reflective and are installed using either epoxy or bitumen adhesives.

Purpose

The purpose of the work associated with this task is to:

- Improve delineation of traffic lanes during wet pavement conditions.
- Provide additional delineation for curbs, traffic islands, concrete barrier rail and guardrail.
- Provide additional element of safety by warning motorists with a rumble effect that is caused when vehicle tires ride over the markers.

Timing of Maintenance

Raised markers should be replaced when existing markers are broken, missing or otherwise ineffective. Because of the adhesive used, they should be installed during favorable weather and low traffic volume.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Special Equipment

Special equipment may be required to mix and apply adhesive materials; special products may be required to clean tools after using epoxy.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Orders should be placed far enough in advance to ensure that the materials would be available when needed.

Requests should be forwarded to the Maintenance Manager, who will compile

Remove/Install Raised Pavement Markings
(Task No. 141.06.01), cont'd.

a District-wide order for submission to the Equipment Division for transmittal to the State Purchasing Division.

Storage

The markers should be stored under cover, in areas where they will not be subject to vandalism, damage or theft.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

When working with adhesives, supervisors will review the following with the crew:

- Application temperature for adhesive materials
- Set time of adhesive material

Traffic control may be required until the adhesive sets.

Disposal

Adhesive containers and damaged or broken markers shall be disposed of in the manner recommended by the manufacturer/supplier or the SDS for the product. If there are no specific directions on disposal, they should be disposed of at an approved site.

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Remove damaged buttons.
- Prepare adhesive, measure spacing, apply adhesive and buttons.
- Allow sufficient time for adhesive to set before removing traffic control and allowing traffic to run over the new buttons.
- Haul waste material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.

Remove/Install Raised Pavement Markings
(Task No. 141.06.01), cont'd.

- Enter the reported accomplishment as each; add up the total number of buttons installed or replaced.
- Report reflective delineators installed on curbs, traffic islands, concrete barrier rail and tri-beam to Task 141.11.01 (Maintain Roadway Markers).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

TRAFFIC SERVICES

**Remove/Replace Pavement Markings
(Task No. 141.08.01)****Description**

This task includes the placement of various markings, legends and symbols on the pavement surface. Markings placed on the pavement surface include crosswalks and stop bars. Symbols and legends include directional arrows, word messages and letters for railroad crossings.

Purpose

The purpose of the work associated with this task is to:

- Provide guidance and/or warning for motorists without diverting attention from the road.
- Supplement regulations or warnings of other devices such as traffic signs or signals.

Timing of Maintenance

Pavement markings will be renewed when they have lost approximately 50 percent of their retroreflectivity. Missing or ineffective markings should be replaced as soon as possible.

Since resources are limited, the priority level may vary. Routes with high traffic volumes and higher speed limits should be assigned a high priority level.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Storage

Paint should be stored in a covered area. All paint storage must conform to applicable fire codes and:

- Totes should be protected from damage.
- Totes should not be stacked.
- A 6-foot access way shall be provided for fire protection between every 1,100 gallons of stored paint.

Preformed plastic tape and preformed thermoplastic products should be stored under cover or in a heated building to protect them from the weather and damage.

TRAFFIC SERVICES

Remove/Replace Pavement Markings
(Task No. 141.08.01), cont'd.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Since preformed thermoplastic material is placed at very high temperatures, it requires special precautions such as:

- Being careful of hot material.
- When heating thermoplastic material, keeping the heating unit outside in an open area.
- Not leaving the preformed thermoplastic heating equipment unattended (i.e., out of sight) while heating.
- Performing daily safety inspections of the heating and applicator units, and reporting deficiencies (e.g., frayed hoses, broken lines, etc.) to the Supervisor. Defective equipment must not be used until checked by the repair shop.

Pavement markings should not be applied when:

- Temperatures are below recommended application zones.
- There are strong or gusty winds.
- The pavement is wet.

Preformed thermoplastic markings should not be applied when:

- The pavement surface is deteriorated and in poor condition.
- Pavement reconstruction is anticipated within the next 2 years.
- Pavement seal coating is anticipated within the next 2 years.

Since preformed thermoplastic material is placed at very high temperatures, it requires precautions such as:

- Gloves, long sleeved shirts or coats and boots.
- Coveralls for protection of personal clothing.

Disposal

Empty bead, cold plastic tape and thermoplastic containers should be disposed of at an approved site.

Approvals

This task involves work that generates excessive noise, dust, emissions or other airborne pollutants. Refer to Part III, Chapter 4 under "Air Quality" and "Planning Maintenance Tasks", or contact the Environmental Services Division for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the

TRAFFIC SERVICES

Remove/Replace Pavement Markings
(Task No. 141.08.01), cont'd.

Manual on Uniform Traffic Control Devices (MUTCD); use flagger stations and/or pilot car as needed.

- Prepare the pavement marking operation: load all stencils and spray guns, paint, thermal plastic lines, thermal plastic legends and propane.
- Measure the area to be marked and place the proper marking using suitable material.
- Haul waste material to an approved disposal site.
- Remove traffic control.
- Clean all equipment and tools, using the proper cleaning agents. Clean up the area and move to next site.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.

- Enter the reported accomplishment as the total number of square feet installed.
- Report all curb painting to this task.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Street Lights, Structure and Tunnel Lights, High Mast Lights, Overhead Sign Lighting, Solar Lighting (Task No. 141.09.01, 141.09.02, 141.09.03, 141.09.05, 141.09.06)

Description

These tasks include:

- Replacing burned-out lights.
- Cleaning dirty lenses.
- Replacing dirty or damaged lenses.
- Repairing or replacing damaged fixtures.
- Repairing or replacing corroded, broken or shorted wires.

Only certified crewmembers are authorized to work with electrical connections. Supervisors responsible for work performed in the proximity of high voltage lines shall:

- Ensure that all crewmembers performing such work understand the nature of the work.
- Ensure that the work is accomplished in compliance with applicable safety standards.
- Ensure that crewmembers use equipment that has been approved for operation in the vicinity of the electrical lines.

Certain circumstances may require the services of a licensed electrician to provide major electrical repairs.

Maintenance of signals and related intersection lighting is usually the responsibility of the local entity. Maintenance responsibilities, schedules and emergency work procedures are detailed in a Highway Agreement executed between the Department and the local entity.

Purpose

The purpose of the work associated with these tasks is to provide illumination, improve visibility and increase safety.

Timing of Maintenance

Nighttime inspections should be made monthly to ensure that lights are working properly. This activity is recorded under Task No. 141.10.01 (Patrol/Inspect Miscellaneous Assets). Nighttime inspections should include all lights that are within the Department's right-of-way, even though some lights are maintained by other entities.

Any damaged or non-working lights will be repaired/replaced as soon as practical. Damaged or non-working lights that are the responsibility of others should be reported to the appropriate agency as soon as possible.

Emergency repairs for items damaged by accidents should be performed as soon as practical. Emergency repairs may consist of securing electrical wires and removing damaged poles or other materials/items from the roadway.

TRAFFIC SERVICES

Street Lights, Structure and Tunnel Lights, High Mast Lights/Overhead Sign Lighting, Solar Lighting (Task No. 141.09.01, 141.09.02, 141.09.03, 141.09.05, 141.09.06), cont'd.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for each task.

Supervisors will ensure that the equipment used for these tasks is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for each task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for these tasks.

Lighting repairs usually involve small quantities that can be purchased through the District's stockroom or locally under the Direct Purchase Authorization. Emergency lighting repairs may require specialized items, such as poles, mast arms or cobra heads. In these cases, the stockroom or the Equipment Division can help obtain the materials.

The supplier shall provide the Department with certificates of compliance in accordance with purchase documents and/or Department specifications.

Testing

N/A

Storage

Items such as poles and mast arms can be stored outside in areas where they are protected from damage. Lights should be stored indoors. Wire and hardware should be stored in areas that are secure from weather, vandalism and/or theft.

Special Handling

Certain products/materials used for these tasks shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Disposal

Damaged roadway lighting, supplies and equipment should be returned to the station for disposal.

TRAFFIC SERVICES

Street Lights, Structure and Tunnel Lights, High Mast Lights/Overhead Sign Lighting, Solar Lighting (Task No. 141.09.01, 141.09.02, 141.09.03, 141.09.05, 141.09.06), cont'd.

Damaged poles and mast arms, if not usable for other purposes, should be placed in a pile for sale as scrap.

In some cases, poles and related items are salvaged by the District from construction contracts.

Approvals

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Clean or replace refractor, reflector, lamp, photocell and/or luminaire.
- Replace damaged post, junction box(es) or power source.
- Number each light standard, mark each junction box, locate each power source and maintain an inventory.

- In emergency situations, remove damaged items and secure electrical wiring.
- Haul damaged material/parts to the maintenance yard.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Special Instructions

- When working in the Carlin Canyon tunnels, it may be necessary to provide special work zone traffic control measures, such as detouring traffic.

Reporting

Reporting for these task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost. If a significant amount of time is spent at one location, enter a spot location.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as each.
- Report any night roadway light inspection to Task No. 141.10.01 (Patrol/Inspect Miscellaneous Assets).
- Report all materials to Material Class 99 (Miscellaneous Cost) with the actual dollar amount.

***Street Lights, Structure and Tunnel
Lights, High Mast Lights/Overhead
Sign Lighting, Solar Lighting
(Task No. 141.09.01, 141.09.02,
141.09.03, 141.09.05, 141.09.06),
cont'd.***

Refer to the *Maintenance Management
System Manual of Instructions* or the
MMS System for the latest information.

Patrol/Inspect Miscellaneous Assets (Task No. 141.10.01)

Description

This task includes:

- Detecting, reporting and correcting minor highway deficiencies caused by storms, heavy traffic, rock slides and accidents.
- Inspecting all Department assets, which may include fencing, lighting, signs, striping, pavement marking, drainage facilities and structures.
- Scheduling any necessary repairs.

Patrolling the highway for the protection of the traveling public is done in accordance with State policies and at the direction of the District Engineer. While in the process of patrolling, crewmembers should be alert and notice any roadway hazards that could jeopardize the safety of the traveling public.

Purpose

The purpose of the work associated with this task is to detect roadway deficiencies and correct them so that the roadway is free of hazards and all assets are operational for the traveling public.

Timing of Maintenance

Timing of this task is part of a routine inspection schedule or in response to deficiencies that may result from storms, accidents or special events.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Materials

N/A

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- Patrol the highway in accordance with Department policy and at the direction of the District Engineer.
- Report roadway deficiencies to the Supervisor for further action.
- Schedule night inspections for roadway lighting, sign retroreflectivity and/or striping and pavement marking reflectivity.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.

***Patrol/Inspect Miscellaneous Assets
(Task No. 141.10.01), cont'd.***

- Enter the reported accomplishment as the total number of man-hours spent on this task.
- Report the removal of rocks from the roadway (rock plowing) to this task.
- Report any patrolling for snow or ice pack areas to Task No. 151.01.01 (Snow and Ice Removal).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Maintain Roadway Markers (Task No. 141.11.01)

Description

This task includes:

- Replacing damaged or missing sight plates.
- Repairing or replacing bent or broken guideposts.
- Repairing and installing sight plates on the guardrail.
- Replacing damaged or missing milepost panels.
- Repairing or replacing bent or broken mileposts.
- Maintenance of right-of-way markers.

Purpose

The purpose of the work associated with this task is to delineate the highway right-of-way and to provide a method of identifying specific locations along the highway.

Timing of Maintenance

Guideposts

Guidepost repairs should be scheduled periodically depending on the frequency of damage and the nature of the roadway.

Mileposts

Periodic inspections should be conducted to locate damaged or missing

mileposts. Each damaged milepost panel needs to be identified and a replacement ordered from the Department's Sign Shop. When new milepost markers are installed or a realignment or re-paneling of existing milepost markers is scheduled, the Roadway Systems Division will be notified.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Sight plates for guideposts and replacement milepost panels will be ordered through the Department's Sign Shop. Depending on the type of sight plate/delineator used for the guardrail or

***Maintain Roadway Markers
(Task No. 141.11.01), cont'd.***

barrier rail, the materials may need to be ordered through the District's stockroom or the Sign Shop.

When orders for guideposts and flexible delineators are delivered, the supplier shall provide the Department with certificates of compliance in accordance with purchase documents and/or Department specifications.

Testing

N/A

Storage

N/A

Disposal

Damaged metal posts should be taken to the station and placed in a stockpile for sale as scrap. Damaged flexible markers should be disposed of at an approved site.

Approvals

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Clean, repair or replace panels and/or posts.
- If the marker cannot be repaired to acceptable levels, replace the plate, post or reflective tape.
- Haul damaged posts to the maintenance yard; haul damaged markers to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Include the maintenance of reflective delineators on guardrail, barrier rail, islands and curbs with this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.

***Maintain Roadway Markers
(Task No. 141.11.01), cont'd.***

- Enter the reported accomplishment as the total number of installations maintained (each). An installation is defined as a single location where the post, plate or reflective tape has been repaired or replaced.
- Report each mile marker panel as Material Class 24 (Sign) in square feet.
- Report each object marker panel as Material class 24 (Sign) in square feet.
- Report each strip of reflective post tape (any color) as Material Class 52 (Reflective Tape - All Colors).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Special Events Traffic Control (Task No. 141.15.01)

Description

This task involves maintenance crews performing traffic control duties for special events, contracted services or other activities performed by other Department divisions or non-NDOT entities.

Purpose

The purpose of the work associated with this task is to ensure that traffic is safe for event participants and/or the traveling public.

Timing of Maintenance

Timing of this task is in response to a request for traffic control services by other Department divisions or non-NDOT entities.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

N/A

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- Notify the District's road operations/traffic management center of the incident and the traffic control that will be implemented.
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Perform any required functions to make the site safe for event participants and/or the traveling public.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.

***Special Events Traffic Control
(Task No. 141.15.01), cont'd.***

- Enter the reported accomplishment as the total number of man-hours spent on the event, service or activity.
- Enter the work order number (if applicable) for tracking purposes.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

CHAPTER 11: SNOW AND ICE CONTROL

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter. Refer to Appendix A-3 for the applicable District Snow and Ice Control Plan.

SNOW AND ICE CONTROL PROGRAM (PROGRAM NO. 151.00.00)

Description

Due to Nevada's geography, elevation and topography, snow and ice occur in varying amounts over most of the state. Nevada's tourism-based economy places added emphasis on snow and ice control, because visitors traveling by motor vehicle rely on open and safe roadways. In order to be responsive to the needs of the public, consideration should be given to routes with high traffic volumes and to peak traffic periods on commute routes.

The Snow and Ice Control Program summarizes the general principals of each District's Snow and Ice Control Plan. Refer to Appendix A-3 for the applicable District Snow and Ice Control Plan.

The Statewide Snow and Ice Control Program (Plan) defines operational procedures for items such as:

- Levels of service.
- Snow removal tasks.
- Snow pole installation.
- Abrasives.
- Road closures.

Purpose

Snow and ice control plans:

- Define operational procedures.
- Define the levels of service that maintenance strives to provide.
- Establish priorities that are independent of the level of service.

Policy

It is Department policy that the orderly movement of traffic during storm conditions takes precedence over all other maintenance operations except the protection of life and property.

Responsibilities

The District Engineer is responsible for providing a reasonably safe level of service as outlined in this Snow and Ice Control Program. The District Engineer is authorized to modify the District plan as necessary.

The Assistant District Engineer over maintenance and the Maintenance Managers, with assistance from Maintenance Supervisors, are responsible for annually reviewing and modifying the District Snow and Ice Control Plan.

Supervisory personnel are responsible for being familiar with the statewide and their respective District Plan.

**SNOW AND ICE CONTROL
PROGRAM
(PROGRAM NO. 151.00.00), CONT'D.**

Level of Service

The Department's snow and ice control operations are limited by resources (budget limitations on personnel, equipment and materials) available for winter maintenance operations. Due to these limited resources, five levels of service have been established.

For more information on level of service and how each district defines level of service. Refer to Appendix A-3 for the applicable District Snow and Ice Control Plan.

Maintenance Priorities

The following maintenance priorities are a guide and should be reviewed annually and updated when necessary by District management.

Construction Projects

Snow and ice removal on construction projects should be performed only if the projects are open to traffic and the Department has winter maintenance responsibility.

Work for Other Governmental Agencies

Snow plowing may be performed for cities, counties and other governmental agencies if resources are available. Such work will be done at cost and only upon a written highway agreement executed by the Director's Office. This service is performed at a lower priority than work on the State Highway System.

Private Approach Roads

Removal of normal snowfall on private approach roads, both on and off the highway right-of-way, is the responsibility of the property owner. Maintenance crews should remove snow windrows blocking private approaches and mailbox turnouts as a part of post-storm cleanup operations.

Property owners may not move snow onto the paved highway surface. If a property owner continues to move snow onto a highway after being asked not to by a supervisor, the District's Maintenance Manager and the NHP should be notified to assist in stopping the practice.

Planning

Pre-season preparation for snow and ice control should begin no later than October 1 and completed by November 1 of each year.

Plan Revisions

The Snow and Ice Control Plan developed for each District and individual crew helps guide managers, supervisors and crewmembers.

Preparation

District Administration and District Maintenance supervisors need to make preparations for snow removal operations prior to the first storm.

Plans should be made for winter work so that the roadway, equipment operators, snow plowing equipment, sanding equipment, radio equipment, sanding materials and supplies.

**SNOW AND ICE CONTROL
PROGRAM
(PROGRAM NO. 151.00.00), CONT'D.**

Chain or Snow Tire Requirements

Chain or snow tire requirements are posted when, in the judgement of the maintenance crew, snow or ice makes controlling a vehicle somewhat difficult for an average driver. Chain or snow tire requirements should be removed when conditions improve enough to allow the average driver to control a vehicle without chains or snow tires.

The Department allows chain installers to work on selected routes by occupancy permit. Maintenance supervisors should have a copy of the permit.

Chain installers are issued numbered bibs for identification and they are not allowed to interfere in the orderly movement of traffic by flagging traffic or any other actions that could be confusing or disruptive.

Incident Management

During the winter, incidents such as vehicle collisions, hazardous material spills and abandoned vehicles become more critical due to intensified adverse road conditions. Accumulating snow or ice and poor visibility during storms can also increase the potential for an incident.

For more information, refer to Part III, Chapter 6 under "Incident Management" and "Reporting Incidents".

Road Closures

The Department is responsible for determining when road closures are necessary or required due to weather or other highway/roadway incidents.

For more information on road closures and the notification procedure, refer to Part III, Chapter 6 under "Road Closures"

Highway Condition Report

Road condition reports containing information on road closures, detours, chain or snow tire requirements or other highway conditions are compiled in the dispatch centers from messages from District Maintenance personnel.

For more information, refer to Part III, Chapter 7 under "Highway Condition Report".

Public Relations

In order to ensure that a good understanding exists, District Administration should keep other agencies and the public well informed.

Both formal and informal meetings with law enforcement agencies and other maintenance organizations are useful.

For more information, refer to Part III, Chapter 7 under "Public Relations".

Special Requirements

Environmental Clearance

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to

SNOW AND ICE CONTROL

**SNOW AND ICE CONTROL PROGRAM
(PROGRAM NO. 151.00.00), CONT'D.**

starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III, Chapter 4 under "Planning Maintenance Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

Stormwater Pollution Prevention, Best Management Practices

N/A

Hydraulics

Certain tasks under this program require special attention to the proper flow and containment of water/stormwater, and ensuring that the drainage facilities, applications and/or materials used are in good condition, free of obstructions and working properly. Regular inspections are critical in preventing or delaying flooding, erosion, damage or deterioration.

Work Outside the Right-of-Way

N/A

Underground Service Alert

Certain scheduled tasks under this program may be subject to review by Underground Service Alert of Northern/Central California and Nevada (USA North 811) to determine if work involves:

- Digging.
- Trenching.
- Drilling.
- Augering.
- Grading.
- Ripping.
- Boring.
- Other excavation tasks.

For more information and requirements, refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)".

Contract Services

N/A

Approvals

N/A

Safety and Training

The Safety Data Sheets (SDS) required for products/materials used for tasks under this program should be reviewed so that everyone is aware of:

- Safety and health precautions.
- Personal protective equipment required when performing the work.

Any necessary safety and/or special instructions will be reviewed with employees prior to starting so that everyone has an understanding of

**SNOW AND ICE CONTROL
PROGRAM
(PROGRAM NO. 151.00.00), CONT'D.**

safety concerns and how the work will progress.

Personal Protective Equipment

Because of varied and unpredictable circumstances that occur during the winter, employees should have personal protective equipment with them when they begin their shift.

For more information, refer to Part II, Chapter 1 under "Work Attire" for more information.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is required, it is listed under the applicable task.

Snow and Ice Removal (Task No. 151.01.01)

Description

At the beginning of each winter, the Maintenance Supervisor I should provide training for crew members on snow removal and abrasive application. New policies or goals may require additional emphasis and training. Maintenance employees should be reminded of areas that may present special problems (e.g., bridge decks icing up before other sections of the highway).

This task includes:

- Removing snow and ice from the pavement surface using push plows, tow plows or motor graders.
- Removing snow from the travel way using rotary snow plows.
- Removing snow that has accumulated alongside the travel way and cannot be removed by push plows or motor graders.
- Reporting chain/snow tire requirements to the road operations center and posting chain/snow tire requirements.
- Applying abrasive materials to improve traction.
- Applying anti-icing materials.
- Widening to provide storage space for snow accumulations.
- Hauling accumulated snow to designated sites.

- Cleaning snow and ice from drainage facilities.

Purpose

The purpose of the work associated with this task is to remove snow and ice from the surface of the highway to comply with the route's assigned level of service.

Timing of Maintenance

Applying Abrasives or anti-icing material should be applied to the roadway before snow begins to stick and snow removal should begin when snow or ice makes controlling a vehicle somewhat difficult for an average driver. Timing of work under this task depends on storm intensity, duration of the storm, lane miles per maintenance worker and level of service of the routes being maintained. For more information on each routes level of service Refer to Appendix A-3 for the applicable District Snow and Ice Control Plan.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

The spreader box controller should be calibrated prior to applying abrasives to the roadway surface. Refer to Appendix A-2, Table A.2-16: Sander Calibration for more information.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Snow and Ice Removal (Task No. 151.01.01), cont'd.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

In addition to the routine equipment operation training, employees will be trained on the use of spreader box controllers. Spreader box controlled sanders and anti-icing units should be calibrated. Refer to Appendix A-2, Table A.2-16: Sander Calibration for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or *Appendix A-3 for the applicable District Snow and Ice Control Plan* for the standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Prior to ordering deicing/anti-icing materials, the supplier shall meet the Municipal Separate Storm Sewer Systems (MS4) Permit requirements

and materials shall be tested by a Nevada-certified laboratory. Refer to Part III, Chapter 3 under "Deicing/Anti-icing Materials" and Table III.3-7 for more information.

Maintenance supervisors should review the crew needs to ensure that the required materials for snow removal operations are on hand in sufficient quantities and available for use.

Testing

As abrasives are delivered, they should be sampled and tested to ensure compliance with the specifications in the contract. For more information, refer to Part III, Chapter 3 "Materials Sampling and Testing".

Deicing/Anti-icing Materials

Salt is the commonly used deicing/anti-icing material.

Alternative deicing/anti-icing products are also available depending on the geographic location.

Storage

Proper location of stockpiles for abrasive mixtures is critical to an efficient snow removal operation.

The location of stockpile sites should:

- Minimize non-productive travel time.
- Be situated to maximize use by multiple crews.
- Be located to minimize environmental impact.

***Snow and Ice Removal
(Task No. 151.01.01), cont'd.***

- Be stored in covered storage buildings when possible. When buildings are not available, attention should be given to drainage and prohibiting salt from migrating into watercourses and impacting the environment.

Salt and sand stockpile locations should be reviewed to ensure that:

- The stockpile is not placed within 30 feet of the edge of a travel lane.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Training

In order to ensure that materials purchased meet specifications, District Maintenance employees shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel and the Materials Division.

Snow Storage and Disposal

Snow is usually stored by pushing it off the roadway or onto a median area. In areas susceptible to heavy snow accumulations, places for snow storage should be reviewed at the beginning of each winter.

In areas where snow cannot be blown or plowed off the roadway and there is sufficient roadway width, snow may be plowed to the center of the roadway for later removal. When plowing snow to the center of the roadway, consideration must be given to providing openings for left turn and cross traffic.

District management and maintenance supervisors should agree upon sites where snow can be disposed of if it needs to be hauled from the roadway.

Because of the chemicals used in snow and ice removal, locations of snow storage areas should be evaluated for possible environmental effects. Contact the Environmental Services Division for more information and guidelines.

Approvals

This task involves work that generates excessive noise, dust, emissions or other airborne pollutants.

Refer to Part III, Chapter 4 under "Air Quality", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services Division for more information and guidelines.

Procedure

- Follow the instructions in the approved Snow and Ice Control Plan prepared by each District.
- Remove snow from the pavement surface for the full width of the roadway.
- Spread abrasives to increase skid resistance and to facilitate snow and ice removal.

***Snow and Ice Removal
(Task No. 151.01.01), cont'd.***

Road Weather Information Systems

To use anti-icing materials effectively, the Supervisor needs accurate weather forecasts as well as the necessary materials. This is accomplished by a number of NDOT-installed Road Weather Information Systems (RWIS) sites. Via sensors and gauges, these sites record extensive weather related information to assist in forecasting temperatures and freezing times at specific locations. Supervisors can then determine when to apply the anti-icing materials and develop the schedule of when plowing or salt-sand applications should begin.

Refer to the *Maintenance Management System Manual of Instructions* or the District's Snow and Ice Control Plan for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a from-to milepost. The snow removal of interchange areas are included in charges made against the mainline milepost.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.

- Enter the reported accomplishment as the total number of man-hours spent on this task.
- Report the mounting/dismounting of plows and sanders to this task and charge it to the main route.
- Report to this task any clean-up of abrasives (by hand) that were distributed around miscellaneous highway assets.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

**Pre-treatment
(Task No. 151.02.01)**

Description

This task involves the necessary road surface preparation in advance of a winter storm event.

Purpose

The purpose of the work associated with this task is to provide a breaker between the road surface and the snow pack when spread before the snow has bonded to the roadway surface.

Timing of Maintenance

Applying anti-icing material should begin when weather reports indicate an impending winter storm event.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Prior to ordering deicing/anti-icing materials, the supplier shall meet the MS4 Permit requirements and materials shall be tested by a Nevada-certified laboratory. Refer to Part III, Chapter 3 under "Deicing/Anti-icing Materials" and Table III.3-7 for more information.

Testing

As the salt or dry chemical is delivered, it should be sampled and tested to ensure compliance with Department specifications. For additional information on sampling and testing, refer to Part III, Chapter 3 "Materials Sampling and Testing".

Alternative deicing/anti-icing products are available; specifications are developed as necessary. For more information sampling and testing, refer to Part III, Chapter 3 "Materials Sampling and Testing".

Pre-treatment
(Task No. 151.02.01), cont'd.

Storage

The location of stockpile sites should:

- Minimize non-productive travel time.
- Be situated to maximize use by multiple crews.
- Be located to minimize environmental impact.
- Be stored in covered storage buildings when possible. When buildings are not available, attention should be given to drainage and prohibiting salt from migrating into watercourses and impacting the environment.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Supervisors should review safety and related concerns with all workers responsible for mixing abrasives.

Training

In order to ensure that materials purchased meet specifications, District Maintenance employees shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel.

Disposal

N/A

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- Follow the instructions in the approved Snow and Ice Control Plan prepared by each District.
- Apply the product to the roadway in advance of a predicted winter storm.
- Refer to the District's Snow and Ice Control Plan for the latest information.

Refer to the *Maintenance Management System Manual of Instructions* or the District's Snow and Ice Control Plan for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a from-to milepost. Charge any interchange areas against the mainline mileposts
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.

***Pre-treatment
(Task No. 151.02.01), cont'd.***

- Enter the reported accomplishment as the total number of treated lane miles for this task.

Refer to the Maintenance Management System Manual of Instructions or the MMS System for the latest information.

Install/Remove Snow Markers (Task No. 151.04.01)

Description

Work covered under this task includes installation and maintenance of snow poles in areas subject to snowfall and heavy drifting.

Purpose

The purpose of the work associated with this task is to:

- Mark the roadway.
- Mark culverts and drains.
- Mark beginning and ends of curbs, dikes and guardrail.
- Delineate ramp gores and median islands.
- Mark miscellaneous items or obstructions (such as rock outcroppings) that could damage plows.
- Delineate objects that could be damaged by flying snow (signs, homes, power lines, etc.) when a rotary plow is used.

Timing of Maintenance

Snow poles removed at the end of the previous season or damaged poles needing replacement should be in place prior to November 1. In areas that have low annual snowfall, snow poles will not be placed. Existing guideposts will be adequate in most situations.

District Snow and Ice Control Plans designate which routes require snow poles. Snow poles do not need to be removed during the summer months unless there are extenuating circumstances.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Snow poles should be of an approved type with one to three bands of blue, white or orange reflective sheeting for delineation. In some areas it may be necessary to use longer markers. Wood poles of the appropriate size may be

***Install/Remove Snow Markers
(Task No. 151.04.01), cont'd.***

substituted and marked with reflective sheeting in the same way.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Color Coding

Snow poles should be handled in a manner that will not damage the reflective sheeting. All snow poles will be color-coded with one or more bands of retro-reflective sheeting (tape) wrapped around the pole with a minimum 1-inch overlap.

References for placement of tape on poles are at the top of the tape. Color-coding on the snow poles is as follows:

- Standard Snow Pole

White or yellow tape is placed at the top of the pole.

- Drop Inlets and Culverts

Tape should be placed from the top of the pole in the following combination white/blue/white with no separation between colors.

- Roadside Obstructions (bridges, guardrail, curbs, dikes, etc.)

On poles at the beginning of the obstruction and continuing through the obstruction, tape should be placed from the top of the pole in the

following combination white/blue with no separation between colors.

- Rotary Plow Obstructions, (cabins, homes, advertising signs, high voltage lines, transformers, frontage roads, ski trails, etc.)

Tape should be placed from the top of the pole in the following combination orange/white/orange with no separation between colors.

- Cattle Guards and Railroad Crossings

The pole at 300 feet ahead of the obstruction should have tape placed from the top of the pole in the following combination blue/white/blue with no separation between colors.

The pole at the obstruction should have tape placed from the top of the pole in the following combination blue/blue/blue with no separation between colors.

If the snow pole is mounted on a regular guidepost, the sight plate will substitute for the white tape that is 4 feet 6 inches from the ground. A blue tape strip or blue cat's eye reflector may be used to mark drop inlets and culverts in areas where snow poles are not installed. The blue tape strip or blue cat's eye reflector should be installed on the regular sight plate.

Snow poles used to mark cattle

***Install/Remove Snow Markers
(Task No. 151.04.01), cont'd.***

guards and railroads crossings are not restricted to any particular route.

Disposal

[N/A |

Approvals

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- Follow the instructions in the District's Snow and Ice Control Plan.
- Replace any marker that cannot be adequately repaired.
- Install new snow poles in conformance with installation specifications.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* or the

District's Snow and Ice Control Plan for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of installations maintained (each). An installation is defined as a single location where the marker has been repaired or replaced.
- Record reflective tape as Material Class 52 (Reflective Tape - All Colors).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

CHAPTER 12: STRUCTURE MAINTENANCE

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

STRUCTURE MAINTENANCE PROGRAM (PROGRAM NO. 161.00.00)

Description

Structures are bridges, overpasses, underpasses, viaducts or box culverts that are in excess of 20 feet between the inside faces of the end abutments when measured along the centerline of the roadway.

Nevada Bridge Inspection Program

Bridges are designed and constructed in accordance with NDOT and American Association of State Highway and Transportation Officials (AASHTO) specifications. This is accomplished through the application of stringent design criteria and construction specifications. As structural elements deteriorate over time and may eventually present a hazard to bridge users, a systematic program of bridge inspections is necessary to detect structural problems and minimize the probability of a structure failure.

The Bridge Inspection team normally consists of two representatives assigned through the Structures Division. The Department's bridge inspection vehicle and operator are assigned through the Equipment Division. The bridge inspection vehicle has greatly enhanced the Department's ability to perform detailed inspections, especially on high-level structures. When the bridge inspection vehicle is used to inspect

structures that are over high-speed, high-volume roads, lane closures are required as follows when inspecting over these lanes:

- Median Lanes: The median lanes of divided highways and highways with median barriers must be closed in each direction.
- Exterior Lanes: Exterior lanes (those adjacent to the shoulders) must be closed except where such lanes are ramp or merge lanes.
- Interior Lanes: Where three or more lanes carry high-speed traffic under a structure either in one direction for divided highways or both directions for undivided highways, the interior lanes(s) must not be closed for normal structure inspections.
- Ramps: Ramp, merge and interior lanes must be closed for inspection of overpass structures only when direct evidence indicates that a problem may exist over these lanes.

Maintenance crews play an important role in the inspection program, as they are responsible for providing traffic control.

The Structures Division establishes the priority for the maintenance work to be performed by the districts.

STRUCTURE MAINTENANCE PROGRAM
(PROGRAM NO. 161.00.00), CONT'D.

District Structure Maintenance Program

Each District has a Bridge Specialist and a Bridge Maintenance crew. The Bridge Specialist is responsible for:

- Providing an orientation to Highway Maintenance supervisors on the Bridge Maintenance Program.
- Reviewing bridge inspection reports prepared by the Structures Division.
- Submitting reports of completed projects to the Structures Division.
- Coordinating with District Administration in prioritizing maintenance work. Structure maintenance is divided into the following categories:
 - Work that is typically performed by maintenance crews such as traffic control, replacing joints, installing elastomeric concrete, cleaning drains, repairing high-load hits, erosion control, crack filling, debris removal, crack sealing, slope repairs, drift removal and wearing surface repairs. A memo outlining the necessary work is submitted to the Highway Maintenance Supervisor who has responsibility for the particular structure.

The District Bridge Specialist will be notified in writing of all scheduled and completed maintenance done on structures to ensure accuracy for the

planning and coordination of contract documents.

- Work that requires special materials equipment or expertise will receive assistance from the District Bridge Specialist.
- Work that requires specialized skills/equipment will normally be contracted to firms that specialize in the field. The District Bridge Specialist will prepare contract documents, advertise and recommend awarding of bids to the Assistant District Engineer (Maintenance).

Emergency work should be performed as soon as practical.

Policy

The Department's objective is to:

- Maintain structures to as near as possible the standards to which they were constructed or to current standards.
- Preserve the Department's capital investment.
- Provide a visually appealing facility.
- Follow the applicable Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) when performing certain tasks included in this program.

Maintenance Priorities

The following priorities should be considered when planning and

STRUCTURE MAINTENANCE PROGRAM (PROGRAM NO. 161.00.00), CONT'D.

coordinating maintenance work under this program:

- Public safety
- Structural integrity
- Protecting the Department's capital investment
- Aesthetics

Deficiencies

Deficiencies to be considered when establishing maintenance priorities for tasks in this program include:

- Damage from vehicle accidents or high load hits.
- Bridge deck and joint deterioration.
- Materials/debris accumulated around piers and abutments.
- Removing trees or brush growing under or within 30 feet of structures.
- Plugged or partially plugged deck drains.
- Damaged or missing bridge rail.
- Lack of paint or preservative on steel, wood or concrete.
- Vegetation that limits sight distance.
- Other items as noted on the bridge inspection sheets or by the District Bridge Specialist.

Special Requirements

Environmental Clearance

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III, Chapter 4 under "Planning Maintenance Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

Stormwater Pollution Prevention, Best Management Practices

Certain tasks require special attention to stormwater pollution prevention and compliance with the maintenance facility's Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) that assist crews in reducing pollutant discharges associated with the tasks.

Refer to Part III, Chapter 4 under "Facility Pollution Prevention Plans" or the FPPP for the related maintenance facility, or contact the Stormwater Division for more information.

Hydraulics

Certain tasks under this program require special attention to the proper flow and containment of water/stormwater, and ensuring that the drainage facilities, applications and/or materials used are in good condition, free of obstructions and working properly. Regular inspections

STRUCTURE MAINTENANCE

**STRUCTURE MAINTENANCE PROGRAM
(PROGRAM NO. 161.00.00), CONT'D.**

are critical in preventing or delaying flooding, erosion, damage or deterioration.

Work Outside the Right-of-Way

Work is typically not performed outside the right-of-way. If unusual circumstances require work outside the right-of-way and onto private property, written permission is required from the property owner.

Circumstances and work performed shall comply with procedures outlined in Part IV, Chapter 1 under "Work Outside the Right-of-Way".

Underground Service Alert

N/A

Contract Services

For maintenance tasks that are contracted to private entities, the responsible Department/District representative should:

- Check the work for compliance with the contract provisions.
- Maintain a checklist to document deficiencies and problems.
- Provide input to District Administration or the Maintenance and Asset Management Division (depending on the contract terms), based on the reviews and documented performance of the contractor.

Maintenance projects conducted by private entities may have a crew from the Construction Division assigned to perform the applicable inspections.

Approvals

Repair strategies for repairing structure members shall be approved by the Structures Division.

Certain tasks may require approval or special permission prior to starting work. Refer to "Approvals", under the applicable task, for more detail or requirements.

Prior approval from the Maintenance and Asset Management Division is required for tasks that are included in the Annual Work Program and the District's Planning Chart as a scheduled betterment. Projects listed in the Department's approved Annual Work Program cannot be changed without prior approval from the Director's Office. Refer to Part III, Chapter 1 under "District Administration Responsibilities" for more information.

Safety and Training

Supervisors must review safety and traffic routing plans with all workers responsible for traffic control.

Crewmembers should know the locations of emergency medical facilities in case of an injury. Supervisors will ensure that first-aid supplies are on the job site.

The Safety Data Sheets (SDS) required for products/materials used for tasks

**STRUCTURE MAINTENANCE
PROGRAM
(PROGRAM NO. 161.00.00), CONT'D.**

under this program should be reviewed so that everyone is aware of:

- Safety and health precautions.
- Personal protective equipment (PPE) required when performing the work.

Any necessary safety and/or special instructions will be reviewed with employees prior to starting so that everyone has an understanding of safety concerns and how the work will progress.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Certain tasks may require additional guidelines or requirements. Refer to "Special Handling" or "Training", under the applicable task, for more information.

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is required, it is listed under the applicable task.

STRUCTURE MAINTENANCE

**Repair Bridge Superstructure
(Task No. 161.01.01)*****Description***

This task includes:

- Repairing damage or deterioration in the bridge's superstructures.
- Lubricating bearing seats.
- Cleaning and painting structural steel.
- Tightening or replacing bolts and nuts.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to provide a safe facility, maintain structural integrity and protect the Department's investment.

Timing of Maintenance

With the different maintenance and repair strategies required, the timing of individual maintenance tasks vary:

- Patching or repairing minor concrete areas should be performed when weather conditions permit the cleaning, priming and placement of concrete or concrete patching material.

- Removing debris and drifted material deposited around piers should be done as soon as possible.
- Structural damage must be repaired as soon as practical, consistent with the severity of the damage.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Planned repairs should be reviewed and an estimate of materials should be prepared. Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Repair Bridge Superstructure (Task No. 161.01.01), cont'd.

Testing

N/A Storage

Materials such as paint, primer and the rapid-setting patch material should be stored indoors.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Supervisors should ensure that the proper PPE is used when performing the work.

Disposal

Concrete debris from cleaning an area prior to repair should be hauled to an approved disposal site. Disposal of waste epoxy adhesive, curing compound and rapid-setting patch products and their containers shall be according to the manufacturer's recommendations and the SDS.

Approvals

This task involves:

- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.

- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.
- Work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Biological Resources", "Water Quality", "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Clean, paint or replace railing, fencing and structural members according to type.
- Clean, sand-blast and paint structural steel if rust or other corrosive is present.
- Haul removed material to an approved disposal site.

***Repair Bridge Superstructure
(Task No. 161.01.01), cont'd.***

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of man-hours spent on the maintenance or repair of the structure.
- This task includes maintenance or repair of the superstructure and railings.
- If painting is done to remove graffiti, select graffiti as cause of Maintenance.
- Report to this task the removal of any vegetation or debris within 30 feet of the structure.

Repair Bridge Deck/Approach Slabs (Task No. 161.01.02)

Description

This task includes:

- Repairing damage or deterioration in bridge's deck/approach slab.
- Cleaning and painting structural steel.
- Tightening or replacing bolts and nuts.

***Task No. 131.09.01
(Install/Repair/Replace Pollution
Prevention Devices) shall be
completed prior to starting any work
for this task.***

Purpose

The purpose of the work associated with this task is to provide a safe facility, maintain structural integrity and protect the Department's investment.

Timing of Maintenance

With the different maintenance and repair strategies required, the timing of individual maintenance tasks vary:

- Patching or repairing minor concrete areas should be performed when weather conditions permit the cleaning, priming and placement of concrete or concrete patching material.
- Structural damage must be repaired as soon as practical, consistent with the severity of the damage.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Planned repairs should be reviewed and an estimate of materials should be prepared. Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before

***Repair Bridge Deck/Approach Slabs
(Task No. 161.01.02), cont'd.***

purchasing or acquiring materials used for this task.

Testing

N/A

Storage

Materials such as primer and the rapid-setting patch material should be stored indoors.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Supervisors should ensure that the proper PPE is used when performing the work.

Disposal

Concrete debris from cleaning an area prior to repair should be hauled to an approved disposal site. Disposal of waste epoxy adhesive, curing compound and rapid-setting patch products and their containers shall be according to the manufacturer's recommendations and the SDS.

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any

pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Remove loose material from the area that is being patched.

Patching with Bituminous Material

- Apply a tack coat.
- Apply the patching material.
- Smooth the patch surface with hand tools. Large patches should be placed and brought to grade using appropriate equipment; compact material if necessary.
- Place temporary lane line delineation if the patch covers pavement markings.

***Repair Bridge Deck/Approach Slabs
(Task No. 161.01.02), cont'd.***

- Haul removed material to an approved disposal site.
- Remove traffic control.

Patching with PCC

- Apply epoxy adhesive material to surfaces of old concrete.
- Place the concrete mixture using tamping or vibratory equipment.
- Screed the patch even with surrounding concrete.
- Broom fresh concrete to provide texture.
- Apply a curing seal.
- Place temporary lane line delineation if the patch covers pavement markings.
- Haul removed material to an approved disposal site.
- After the material has cured sufficiently, remove traffic control.

Patching with Rapid-Setting Patch Material

- Apply the bonding agent.
- Place the patch material.
- Screed the patch even with surrounding concrete.
- Broom fresh concrete to provide texture.

- Apply a curing seal, if recommended by the product manufacturer.
- Place temporary lane line delineation if the patch covers pavement markings.
- Haul removed material to an approved disposal site.
- After the product has cured sufficiently, remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the m
- Enter the reported accomplishment as the total man-hours spent on the structure.
- Use the 9185 activity code on the time sheet/Daily Diary for any

***Repair Bridge Deck/Approach Slabs
(Task No. 161.01.02), cont'd.***

inspection of contracted
maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Repair/Replace Bridge Expansion Joints, Compression Seals (Task No. 161.01.03)

working condition and/or properly calibrated.

Description

This task involves cleaning out deteriorated bridge expansion joints and replacing with expansion joint material.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.

Ordering

Planned repairs should be reviewed and an estimate of materials should be prepared.

Purpose

The purpose of the work associated with this task is to prevent entry of water or foreign material into joints and to prevent spalling.

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Timing of Maintenance

This task should be performed when:

- Existing joint material has settled or has seriously deteriorated or eroded.
- Existing joints fill with water or foreign material and cannot expand or contract properly.
- Concrete edges at joints are spalling due to settling of joint material.

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Testing

N/A

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Storage

All pre-ordered materials should be stored indoors and kept dry.

Supervisors will ensure that the equipment used for this task is in good

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

When placing hot pour crack sealers, supervisors should ensure that gloves,

Repair/Replace Bridge Expansion Joints, Compression Seals (Task No. 161.01.03), cont'd.

boots, eye protection goggles and skin protective clothing are worn.

Disposal

Concrete debris from cleaning an area prior to repair, along with any joint sealant material removed, should be hauled to an approved disposal site. Disposal of waste epoxy adhesive, curing compound, sealers and rapid-setting patch products and their containers or packages shall be according to the manufacturer's recommendations and the SDS.

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road*

and Bridge Construction and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.

- Clean the expansion joint and remove all deteriorated material.
- Place the new expansion joint material, align the joint and level the surface.
- Haul removed material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.

***Repair/Replace Bridge Expansion
Joints, Compression Seals
(Task No. 161.01.03), cont'd.***

- Enter the reported accomplishment as the total number of linear feet repaired or replaced.
- Record any other material as Material Class 99 (Miscellaneous Cost) with the actual dollar amount.
- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Repair Slope Paving (Task No. 161.01.04)

Description

This task includes:

- Repair of concrete bridge slope paving.
- Filling of paving joints.

***Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.***

Purpose

The purpose of the work associated with this task is to provide a safe facility, maintain structural integrity and protect the Department's investment.

Timing of Maintenance

With the different maintenance and repair strategies required, the timing of individual maintenance tasks vary:

- Patching or repairing minor concrete areas should be performed when weather conditions permit the cleaning, priming and placement of concrete or concrete patching material.
- Panels are disjointed or broken, and drainage runoff is disputed.
- Major concrete repair or panel replacements are usually done by a private contractor.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Planned repairs should be reviewed and an estimate of materials should be prepared.

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

N/A

Storage

Materials such as paint, primer and the rapid-setting patch material should be stored indoors.

***Repair Slope Paving
(Task No. 161.01.04), cont'd.***

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Supervisors should ensure that the proper PPE is used when performing the work.

Disposal

Concrete debris from cleaning an area prior to repair should be hauled to an approved disposal site. Disposal of waste epoxy adhesive, curing compound and rapid-setting patch products and their containers shall be according to the manufacturer's recommendations and the SDS.

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater Division prior to starting this task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV,

Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Clean and remove any damaged slope.
- Build any forms required for the repairs.
- Apply special adhesive agent to surfaces being repaired.
- Place concrete, vibrate, tamp, finish and apply curing compound.
- Place barricades to protect the repair during cure period.
- Haul removed material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

***Repair Slope Paving
(Task No. 161.01.04), cont'd.***

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location. If repairs are made at intermittent locations, from-to milepost may be used.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of cubic yards repaired.
- For graffiti removal, select graffiti as the cause of maintenance.
- If using the 100# bags of Portland cement, report to Materials Class 99 (Miscellaneous Cost) with the actual dollar amount.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Clean/Repair Structure Drainage (Task No. 161.01.05)

Description

This task includes:

- Cleaning drains.
- Tightening or replacing bolts and nuts.

***Task No. 131.09.01
(Install/Repair/Replace Pollution
Prevention Devices) shall be
completed prior to starting any work
for this task.***

Purpose

The purpose of the work associated with this task is to provide a safe facility, maintain structural integrity and protect the Department's investment.

Timing of Maintenance

Inspections of drainage facilities should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and to prevent/delay flooding, erosion, damage or deterioration.

With the different maintenance and repair strategies required, the timing of individual maintenance tasks vary:

- Cleaning deck drains should be performed when temperatures are above freezing, as water is normally used for this work.
- Removing streambed vegetation from under or within 30 feet of a structure should be performed in the fall, when stream flow is at its lowest.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Planned repairs should be reviewed and an estimate of materials should be prepared.

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

N/A

***Clean/Repair Structure Drainage
(Task No. 161.01.05), cont'd.***

Storage

N/A

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Supervisors should ensure that the proper PPE is used when performing the work.

Disposal

Concrete debris from cleaning an area prior to repair should be hauled to an approved disposal site. Disposal of waste epoxy adhesive, curing compound and rapid-setting patch products and their containers shall be according to the manufacturer's recommendations and the SDS.

Approvals

This task involves:

- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any

pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Biological Resources", "Water Quality and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting this task for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Clean/Unplug drains of any foreign material.
- Replace any damaged drainage structure, pipe, culvert, concrete or asphalt.
- Place barricades to protect the repair during the curing period.
- Haul removed material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

***Clean/Repair Structure Drainage
(Task No. 161.01.05), cont'd.***

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as each.
- Report to this task any work on remote sensors for flood control devices.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Clean/Repair Tunnels (Task No. 161.01.06)

Description

This task includes:

- Repairing damage or deterioration in various Tunnel components.
- Cleaning drains.
- Cleaning and painting.
- Tightening or replacing bolts and nuts.
- Concrete/Asphalt deck surface repairs.

***Task No. 131.09.01
(Install/Repair/Replace Pollution
Prevention Devices) shall be
completed prior to starting any work
for this task.***

Purpose

The purpose of the work associated with this task is to provide a safe facility, maintain structural integrity and protect the Department's investment.

Timing of Maintenance

With the different maintenance and repair strategies required, the timing of individual maintenance tasks vary.

- Cleaning deck drains should be performed when temperatures are above freezing, as water is normally used for this work.
- Patching or repairing minor concrete areas should be performed when

weather conditions permit the cleaning, priming and placement of concrete or concrete patching material.

- Structural damage must be repaired as soon as practical, consistent with the severity of the damage.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Planned repairs should be reviewed and an estimate of materials should be prepared.

Clean/Repair Tunnels
(Task No. 161.01.06), cont'd.

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

N/A

Storage

Materials such as paint, primer and the rapid-setting patch material should be stored indoors.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Supervisors should ensure that the proper PPE is used when performing the work.

Disposal

Concrete debris from cleaning an area prior to repair should be hauled to an approved disposal site. Disposal of waste epoxy adhesive, curing compound and rapid-setting patch products and their containers shall be according to the manufacturer's recommendations and the SDS.

Approvals

This task involves:

- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Biological Resources", "Water Quality and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting this task for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.

Clean/Repair Tunnels
(Task No. 161.01.06), cont'd.

the 133 program series (Roadside Cleanup).

- Clean/Unplug drains and make any necessary repairs to the tunnel.
- Haul removed material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of man-hours spent on this task.
- Report any graffiti removal within the limits of the tunnel to this task and select graffiti as the cause of maintenance.
- Report any maintenance to the roadway surface inside the limits of the tunnel to the applicable task in

STRUCTURE MAINTENANCE

**Repair Retaining, Sound or Bin Walls
(Task No. 161.01.07)**

cleaning, priming and placement of concrete or concrete patching material.

Description

This task includes:

- Repairing damage or deterioration in various wall components.
- Cleaning and painting.
- Tightening or replacing bolts and nuts.

- Structural damage must be repaired as soon as practical, consistent with the severity of the damage.
- Major structural damage should be reported to the Structures Division and District Bridge Specialist.

**Task No. 131.09.01
(Install/Repair/Replace Pollution Prevention Devices) shall be completed prior to starting any work for this task.**

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Purpose

The purpose of the work associated with this task is to provide a safe facility, maintain structural integrity and protect the Department's investment.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Timing of Maintenance

Retaining walls should be inspected periodically for signs of distress such as cracking, rusting of metal, displacement and spalling. If signs of distress are present, contact the Structures Division to evaluate the situation and recommend solutions. Repairs should be scheduled based on the Structures Division's recommendations.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

With the different maintenance and repair strategies required, the timing of individual maintenance tasks vary:

- Patching or repairing minor concrete areas should be performed when weather conditions permit the

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Repair Retaining, Sound or Bin Walls
(Task No. 161.01.07), cont'd.

Ordering

Planned repairs should be reviewed and an estimate of materials should be prepared.

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Testing

N/A

Storage

N/A

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Supervisors should ensure that the proper PPE is used when performing the work.

Disposal

Concrete debris from cleaning an area prior to repair should be hauled to an approved disposal site. Disposal of

waste epoxy adhesive, curing compound and rapid-setting patch products and their containers shall be according to the manufacturer's recommendations and the SDS.

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater Division prior to starting this task for more information and guidelines.

This task may involve work in areas with a limited right-of-way, and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01

STRUCTURE MAINTENANCE

Repair Retaining, Sound or Bin Walls
(Task No. 161.01.07), cont'd.

(Install/Repair/Replace Pollution Prevention Devices).

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Clean and repair any damaged walls and replace the delineation in accordance with the *Standard Plans for Road and Bridge Construction*.
- Haul removed material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.

- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of man-hours spent on this task.
- This task includes the painting of retaining, sound or bin walls. If painting is done to remove graffiti, select graffiti as the cause of maintenance.
- Report any repair or replacement of gabion walls to this task.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Maintain/Repair Pedestrian Structures (Task No. 161.01.08)

Description

This task includes:

- Repairing damage or deterioration in various bridge components.
- Removing debris and drift adjacent to piers.
- Lubricating bearing seats.
- Cleaning drains.
- Cleaning and painting structural steel.
- Tightening or replacing bolts and nuts.
- Concrete bridge deck surface repairs.

***Task No. 131.09.01
(Install/Repair/Replace Pollution
Prevention Devices) shall be
completed prior to starting any work
for this task.***

Purpose

The purpose of the work associated with this task is to provide a safe facility, maintain structural integrity and protect the Department's investment.

Timing of Maintenance

With the different maintenance and repair strategies required, the timing of individual maintenance tasks vary:

- Cleaning drains should be performed when temperatures are above freezing, as water is normally used for this work.
- Patching or repairing minor concrete areas should be performed when weather conditions permit the cleaning, priming and placement of concrete or concrete patching material.
- Removing streambed vegetation from under or within 30 feet of a structure should be performed in the fall, when stream flow is at its lowest.
- Removing debris and drifted material deposited around piers should be removed as soon as possible.
- Structural damage must be repaired as soon as practical, consistent with the severity of the damage.
- Major structural damage should be reported to the Structures Division and the District Bridge Specialist.

Light pruning (cutting back of lateral branches or misdirected shoots) can be performed any time during the year. Heavy trimming or removal of shrubs and trees should be performed between October and March when they are dormant and to protect nesting birds. Fertilizers, herbicides and insecticides shall be applied in accordance with the manufacturer's recommendations.

Maintain/Repair Pedestrian Structures
(Task No. 161.01.08), cont'd.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Planned repairs should be reviewed and an estimate of materials should be prepared.

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Testing

N/A

Storage

N/A

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Prior to preparing a structure for repainting, existing paint on steel components should be tested to determine if it is lead-based or contains other heavy metals.

If the paint contains lead or other heavy metals, contact the Structures Division and the Environmental Services Division for recommendations.

Supervisors should ensure that the proper PPE is used when performing the work.

Disposal

Concrete debris from cleaning an area prior to repair should be hauled to an approved disposal site. Disposal of waste epoxy adhesive, curing compound and rapid-setting patch products and their containers shall be according to the manufacturer's recommendations and the SDS.

Approvals

This task involves work around water bodies (e.g., rivers, streams, lakes,

STRUCTURE MAINTENANCE

Maintain/Repair Pedestrian Structures
(Task No. 161.01.08), cont'd.

reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.

Refer to Part III, Chapter 4 under "Water Quality" and "Planning Maintenance Tasks", or contact the Stormwater Division prior to starting this task for more information and guidelines.

This task may involve work in areas with a limited right-of-way, and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices).
- Ensure that material and required specialized equipment is available prior to starting work.
- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.

- Clean, paint or replace railing, fencing and structural members according to type.
- Clean, sand-blast and paint structural steel if rust or other corrosive is present.
- Haul removed material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Enter the task location as a spot location.
- Enter all labor, equipment and materials used for this task.
- Select any other material not included in the material pick list from its associated stockpile.
- Enter the reported accomplishment as the total number of man-hours spent on the maintenance or repair of the structure.

Maintain/Repair Pedestrian Structures
(Task No. 161.01.08), cont'd.

- Use the 9185 activity code on the time sheet/Daily Diary for any inspection of contracted maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

STRUCTURE MAINTENANCE

Inspect Structures (Task No. 161.02.01)

Description

This task covers the visual inspection of structures.

Purpose

The purpose of the work associated with this task is to:

- Determine maintenance needs.
- Prioritize deficiencies into two maintenance groups: urgent and routine.
 - The routine group includes deficiencies in which there is no safety risk or risk of structure failure; maintenance can be scheduled as labor, equipment and funding are available.
 - The urgent group includes deficiencies that may affect the safety or the integrity of the structure and should be repaired as soon as possible.

Timing of Maintenance

Inspection of structures should be made annually, usually in the fall, with additional inspections after major storms.

Based on the inspections, it may be necessary to:

- Immediately clean debris, sand, rocks and silt from some of the structures and culverts.

- Prioritize cleaning of others based on the availability of the appropriate equipment and other maintenance priorities.
- Report damage to Highway Maintenance Supervisor II, Highway Maintenance Manager and District Bridge Specialist.
- Schedule labor and equipment to assist in making structure repairs as recommended by the District Bridge Specialist.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

N/A

Inspect Structures
(Task No. 161.02.01), cont'd.

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices (MUTCD)*; use flagger stations and/or pilot car as needed.
- During structure inspection, take special notice of drainage flow, structural integrity and any hazards that would impede the traveling public.
- Document all problems and schedule, in priority, the task to be accomplished.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.

- Enter the reported accomplishment as the total number of man-hours spent on this task.
- Report to this task any structure inspection.
- If this task is part of an approved betterment project, select planned betterment as the cause of maintenance and enter the approved betterment number.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

Documentation

Each Supervisor should maintain documentation of structure inspections. The documentation should contain:

- The date of inspection.
- The route.
- The location of culvert/bridge by milepost.
- The observed condition of structure/ culvert.
- Any remarks or comments pertaining to the individual structure/culvert.

Sweep and Remove Debris from Structures (Task No. 161.02.02)

Description

This task covers removing deposited debris and sand from structures.

Since this work may be performed during times of inclement weather or at night, supervisors should provide appropriate traffic control devices.

Workers should be advised of safety and health precautions related to picking up and disposing of roadside debris. They should wear appropriate PPE and use caution when picking up and disposing of debris from roadside facilities. Litter and trash may contain dangerous articles such as broken glass or biohazardous waste. Use extreme care so trash bags do not brush against anyone.

Workers should report any containers with non-identifiable contents to their supervisor. Potentially hazardous material should be identified before it is properly disposed.

Purpose

The purpose of the work associated with this task is to:

- Provide a structure that is clear and safe for motorists.
- Ensure that roadway structure drains function properly.

Timing of Maintenance

Debris should be removed during or immediately after a storm. Drifting sand

should be removed when it encroaches the highway or structure drain, or if it causes other problems.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors will ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

N/A

Testing

N/A

Sweep and Remove Debris from Structures
(Task No. 161.02.02), cont'd.

Storage

N/A

Disposal

Waste material should be hauled to an approved disposal site.

Approvals

This task involves work that generates excessive noise, dust, emissions or other airborne pollutants. Refer to Part III, Chapter 4 under "Air Quality", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services Division for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Set up traffic control in accordance with the *Standard Plans for Road and Bridge Construction* and the *Manual on Uniform Traffic Control Devices* (MUTCD); use flagger stations and/or pilot car as needed.
- Sweep and remove all debris.
- Haul removed material to an approved disposal site.
- Remove traffic control.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Enter the task location as a spot location or from-to milepost.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total man-hours spent on this task.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

CHAPTER 13: DISTRICT FACILITY MAINTENANCE

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

DISTRICT FACILITY MAINTENANCE PROGRAM (PROGRAM NO. 182.00.00)

Description

This program includes tasks for:

- Yard work.
- Facilities maintenance.

Yards or facilities include District office complexes and other locations where miscellaneous items are stored (e.g., guardrail, light poles, culvert pipe, equipment).

Policy

The Department's objective is to:

- Maintain the maintenance station's facilities, yard and surrounding property in a neat, orderly and sanitary condition.
- Follow the applicable Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) when performing certain tasks included in this program.

Maintenance Priorities

The following priorities should be considered when planning and

coordinating maintenance work under this program:

- Protecting the Department's investment in the facility
- Potential liability for the Department
- Environmental impact
- Aesthetics

Deficiencies

The following should be considered when establishing maintenance priorities for tasks included in this program:

- Plugged or partially plugged drainage facilities.
- Maintenance station facilities are unsightly or in disarray.
- Maintenance station facilities are in need of general housekeeping and pickup of litter.
- Landscaped areas are in need of insecticides, herbicides, trimming, removal, replacement of dead or damaged trees or shrubs, watering, fertilizing, weeding or repair of irrigation systems.
- Damaged or missing traffic control, informational and/or safety devices (e.g., signs, pavement markings/stripes, lights).

***DISTRICT FACILITY MAINTENANCE PROGRAM
(PROGRAM NO. 182.00.00), CONT'D.***

Special Requirements

Environmental Clearance

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III, Chapter 4 under "Planning Maintenance Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

Stormwater Pollution Prevention, Best Management Practices

Certain tasks require special attention to stormwater pollution prevention and compliance with the maintenance facility's Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) that assist crews in reducing pollutant discharges associated with the tasks.

Refer to Part III, Chapter 4 under "Facility Pollution Prevention Plans" or the FPPP for the related maintenance facility, or contact the Stormwater Division for more information.

Hydraulics

Certain tasks under this program require special attention to the proper flow and containment of water/stormwater, and

ensuring that the drainage facilities, applications and/or materials used are in good condition, free of obstructions and working properly. Regular inspections are critical in preventing or delaying flooding, erosion, damage or deterioration.

Work Outside the Right-of-Way

Work is typically not performed outside the right-of-way. If unusual circumstances require work outside the right-of-way and onto private property, written permission is required from the property owner.

Circumstances and work performed shall comply with procedures outlined in Part IV, Chapter 1 under "Work Outside the Right-of-Way".

Underground Service Alert

Certain scheduled tasks under this program may be subject to review by Underground Service Alert of Northern/Central California and Nevada (USA North 811) to determine if work involves:

- Digging.
- Trenching.
- Drilling.
- Augering.
- Grading.
- Ripping.
- Boring.
- Other excavation tasks.

DISTRICT FACILITY MAINTENANCE PROGRAM (PROGRAM NO. 182.00.00), CONT'D.

For more information and requirements, refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)".

Contract Services

When the maintenance of facilities is contracted to private firms, the responsible Department/District representative should:

- Check the work for compliance with the contract provisions.
- Maintain a checklist to document deficiencies and problems.
- Provide input to the district employee responsible for contract administration based on the periodic reviews and documented performance of the contractor.

Maintenance projects conducted by private entities may have a crew from the Construction Division assigned to perform the applicable inspections.

Approvals

Certain tasks may require approval or special permission prior to starting work. Refer to "Approvals", under the applicable task, for more detail or requirements.

Prior approval from the Maintenance and Asset Management Division is required for tasks that are included in the Annual Work Program and the District's Planning Chart as a scheduled betterment. Projects listed in the

Department's approved Annual Work Program cannot be changed without prior approval from the Director's Office. Refer to Part III, Chapter 1 under "District Administration Responsibilities" for more information.

Safety and Training

Crewmembers should know the locations of emergency medical facilities in case of an injury. Supervisors shall ensure that first-aid supplies are on the job site.

The Safety Data Sheets (SDS) required for products/materials used for tasks under this program should be reviewed so that everyone is aware of:

- Safety and health precautions.
- Personal protective equipment required when performing the work.

Any necessary safety and/or special instructions will be reviewed with employees prior to starting so that everyone has an understanding of safety concerns and how the work will progress.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Certain tasks may require additional guidelines or requirements. Refer to "Special Handling" or "Training", under the applicable task, for more information.

***DISTRICT FACILITY MAINTENANCE
PROGRAM
(PROGRAM NO. 182.00.00), CONT'D.***

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is required, it is listed under the applicable task.

**Yard Work
(Task No. 182.01.01)*****Description***

Periodically, a maintenance station yard has items that need to be stacked or moved. Buildings or truck bays need cleaning, yard inspections, fire extinguishers and acquiring supplies for the yard.

Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) and Task No. 270.07.01 (Install/Repair/Replace Stockpile Pollution Prevention Devices) shall be completed prior to starting any work for this task.

Workers should be advised of safety and health precautions related to picking up and disposing of roadside debris. They should wear appropriate personal protective equipment and use caution when picking up and disposing of debris from roadside facilities. Litter and trash may contain dangerous articles such as broken glass or biohazardous waste. Use extreme care so trash bags do not brush against anyone.

Workers should report any containers with non-identifiable contents to their supervisor. Potentially hazardous material should be identified before it is properly disposed.

Purpose

The purpose of the work associated with this task is to fix issues that are observed by management or other employees.

Timing of Maintenance

Inspections of drainage facilities should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and to prevent/delay flooding, erosion, damage or deterioration.

Inspection of maintenance yards are to be performed in order to complete FPPPs for annual/quarterly reporting.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

DISTRICT FACILITY MAINTENANCE

Yard Work
(Task No. 182.01.01), cont'd.*Ordering*

Materials/supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Testing

N/A

Storage

N/A

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Disposal

Waste material should be hauled to approved disposal sites.

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.

- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work around water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) that are vulnerable to stormwater runoff or any pollutant/contaminant discharge resulting from maintenance work.
- Work that generates excessive noise, dust, emissions or other airborne pollutants.
- Burning vegetation (if allowed) and a permit is required for all open burning.
- Work that may potentially generate hazardous waste.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Water Quality", "Air Quality", "Burning", "Noise from Maintenance Operations", "Hazardous Waste Management" and "Planning Maintenance Tasks", or contact the Environmental Services Division and the Stormwater Division prior to starting this task for more information and guidelines.

This task may involve work in areas with a limited right-of-way and it may be necessary to enter private property. Prior written approval is required from property owners before working on private property. Refer to Part IV, Chapter 1 under "Work Outside the Right-of-Way" for more information and guidelines.

Yard Work***(Task No. 182.01.01), cont'd.***

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) or Task No. 270.07.01 (Install/Repair/Replace Stockpile Pollution Prevention Devices), depending on the project location.
- Clean office, restrooms, and crew meeting rooms.
- Clean truck bay stalls/shops.
- Perform yard inspections (e.g., fire extinguishers, fuel station readings/inspections).
- Acquire the necessary equipment, supplies and products for the facility/yard.
- Select the task that best suits the work being done at the facility/yard.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 131.09.01 (Install/Repair/Replace Pollution Prevention Devices) or Task No. 270.07.01 (Install/Repair/Replace Stockpile Pollution Prevention Devices) was accomplished, report the total number of man-hours for that task in addition to this task.
- Enter the task location as the maintenance yard.
- Enter all labor, equipment and materials used for this task.
- The Enter the reported accomplishment as the total number of man-hours spent on this task.
- For betterment projects, report any work performed inside a specific yard or facility to the applicable task; include the betterment number and maintenance yard location.
- ***Do not report any paperwork to this task.*** Report any office paperwork to Task No. 100.02.01 (Supervisory Office Duties). Report any paperwork associated with a specific task to that task.
- Report any work done at stockpile sites to the applicable task in the 270 program series (Stockpiling).
- Use the 9185 activity code on the time sheet/Daily Diary for any

Yard Work
(Task No. 182.01.01), cont'd.

inspection of contracted
maintenance work.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

CHAPTER 14: STOCKPILING

Refer to Appendix A-1 "References" for descriptions and links (if available) to any publication or related resource addressed in this chapter.

STOCKPILING PROGRAM (PROGRAM NO. 270.00.00)

Description

This program includes the purchase, production and/or hauling of:

- Aggregates.
- Premix.
- Salt and sand mixture.
- Salt brine/anti-icing material.

Policy

The Department's objective is to:

- Purchase material, when practical, from commercial sources.
- Produce material when commercial sources are not available or the cost of obtaining material from commercial sources is prohibitive.
- Store unused material for later use.
- Follow the applicable Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) when performing certain tasks included in this program.

Maintenance Priorities

The following priorities should be considered when planning and

coordinating maintenance work under this program:

- Public safety
- Protecting highway facilities

Deficiencies

The following should be considered when establishing maintenance priorities for tasks included in this program:

- Limited material supply or availability

Special Requirements

Environmental Clearance

For certain tasks under this program, review and clearance shall be granted by the Environmental Services Division and/or the Stormwater Division prior to starting any maintenance work to assess the impact on cultural resources, biological resources, water quality, air quality and/or hazardous waste management, and to secure the necessary permits. Refer to Part III, Chapter 4 under "Planning Maintenance Tasks" or contact the Environmental Services Division and/or the Stormwater Division for more information and guidelines.

Stormwater Pollution Prevention, Best Management Practices

Certain tasks require special attention to stormwater pollution prevention and

STOCKPILING

**STOCKPILING PROGRAM
(PROGRAM NO. 270.00.00), CONT'D.**

compliance with the maintenance facility's Facilities Pollution Prevention Plan (FPPP) and best management practices (BMPs) that assist crews in reducing pollutant discharges associated with the tasks.

Refer to Part III, Chapter 4 under "Facility Pollution Prevention Plans" or the FPPP for the related maintenance facility, or contact the Stormwater Division for more information.

Hydraulics

Certain tasks under this program require special attention to the proper flow and containment of water/stormwater, and ensuring that the drainage facilities, applications and/or materials used are in good condition, free of obstructions and working properly. Regular inspections are critical in preventing or delaying flooding, erosion, damage or deterioration.

Work Outside the Right-of-Way

N/A

Underground Service Alert

Certain scheduled tasks under this program may be subject to review by Underground Service Alert of Northern/Central California and Nevada (USA North 811) to determine if work involves:

- Digging.
- Trenching.
- Drilling.

- Augering.
- Grading.
- Ripping.
- Boring.
- Other excavation tasks.

For more information and requirements, refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)".

Contract Services

N/A

Approvals

Certain tasks may require approval or special permission prior to starting work. Refer to "Approvals", under the applicable task, for more detail or requirements.

Prior approval from the Maintenance and Asset Management Division is required for tasks that are included in the Annual Work Program and the District's Planning Chart as a scheduled betterment. Projects listed in the Department's approved Annual Work Program cannot be changed without prior approval from the Director's Office. Refer to Part III, Chapter 1 under "District Administration Responsibilities" for more information.

Safety and Training

Crewmembers should know the locations of emergency medical facilities in case of an injury. Supervisors shall

STOCKPILING

**STOCKPILING PROGRAM
(PROGRAM NO. 270.00.00), CONT'D.**

required, it is listed under the applicable task.

ensure that first-aid supplies are on the job site.

The Safety Data Sheets (SDS) required for products/materials used for tasks under this program should be reviewed so that everyone is aware of:

- Safety and health precautions.
- Personal protective equipment required when performing the work.

Any necessary safety and/or special instructions will be reviewed with employees prior to starting so that everyone has an understanding of safety concerns and how the work will progress.

Certain tasks under this program allow for on-the-job equipment training. Equipment use should be reviewed when schedules are prepared to determine if training is appropriate. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Certain tasks may require additional guidelines or requirements. Refer to "Special Handling" or "Training", under the applicable task, for more information.

Reporting

All tasks under this program shall comply with the task reporting instructions in the *Maintenance Management System Manual of Instructions* and be entered in the MMS System. If special documentation is

STOCKPILING

**Aggregate Production
(Task No. 270.01.01)****Description**

This task includes:

- Stripping the material deposit.
- Screening and stacking material.
- Sampling and testing material produced.
- Reshaping the material deposit.

Prior to starting work in a material site, supervisors should ensure that the boundaries of the pit are known.

**Task No. 270.07.01
(Install/Repair/Replace Stockpile
Pollution Prevention Devices) shall
be completed prior to starting any
work for this task.**

Purpose

The purpose of the work associated with this task is to produce aggregates when:

- Commercial material sources are not available.
- Material suppliers have not submitted bids for required areas of the state.
- Cost of commercially produced material is excessive.

Timing of Maintenance

Work for this task should be scheduled when material supply is low.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

N/A

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Arrangements for obtaining materials should be made 7 to 10 days prior to scheduling the task.

Aggregate Production (Task No. 270.01.01), cont'd.

Testing

Material produced by maintenance crews should be sampled and tested in accordance with Part III, Chapter 3 "Materials Sampling and Testing".

Storage

Areas used for storage of material should be reviewed to ensure that:

- The stockpile is not placed within 30 feet of the edge of a travel lane.
- The stockpile is not in a drainage area.

Training

Supervisors should review the material production operation with the crew to ensure that:

- A circulation pattern of the trucks and other equipment is established to reduce the risk of accidents in the pit area. One-way circulation is the preferred pattern within a pit.

Appropriate personal protective equipment (PPE) is being used.

In order to ensure that materials purchased meet specifications, District Maintenance employees shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel (aggregates).

Disposal

N/A

Approvals

Prior to starting work in a material site, supervisors should ensure that the pit has been cleared through the Right-of-Way Division, Engineering Section. Even if the pit was previously used, but has not recently been active, it must be checked through the Right-of-Way Division.

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work that generates excessive noise, dust, emissions or other airborne pollutants.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Air Quality", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services Division for more information and guidelines.

Because of possible utility installations within the right-of-way, USA North 811 shall be contacted and areas must be marked before starting any excavation work/soil disturbance. Refer to Part IV, Chapter 1 under "Underground Service Alert (USA North 811)" for more information and guidelines.

STOCKPILING

Aggregate Production
(Task No. 270.01.01), cont'd.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 270.07.01 (Install/Repair/Replace Stockpile Pollution Prevention Devices).
- Screen the required materials.
- Sample and test material being produced.
- Stockpile or load material directly into trucks for hauling to designated site.
- Clean up the area including sloping of any steep banks created by the operation.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 270.07.01 (Install/Repair/Replace Stockpile Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Report this task to the stockpile being built.

- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of man-hours spent on the stockpile task.
- If the produced material is hauled to a different stockpile site, report the work to Task No. 270.04.01 (Haul Materials).
- Report all preparatory work (e.g., pit stripping, plant setup) to this task.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

STOCKPILING

**Premix Production
(Task No. 270.02.01)**

Description

This task involves mixing cutback asphalt with a specification aggregate to produce premixed bituminous paving material.

**Task No. 270.07.01
(Install/Repair/Replace Stockpile
Pollution Prevention Devices) shall
be completed prior to starting any
work for this task.**

Purpose

The purpose of the work associated with this task is to produce premixed bituminous paving material in locations where suitable commercially produced surface materials are not available or costs are prohibitive.

Timing of Maintenance

Work for this task should be scheduled when material supply is low.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Materials required to produce premixed bituminous paving material include:

- Aggregates that conform to current specifications for plantmix bituminous surface aggregate types. (Refer to Section 705 of *Standard Specifications for Road and Bridge Construction* for detailed information on aggregates.)
- The appropriate cutback asphalt (Grade MC or SC) for the geographic region.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Arrangements for obtaining materials should be made 7 to 10 days prior to scheduling the task.

STOCKPILING

**Premix Production
(Task No. 270.02.01), cont'd.***Testing*

Aggregates for premix production should have been sampled and tested when it was produced or purchased. If the aggregate was not previously sampled, it should be sampled and tested in accordance with frequencies set forth in Part III, Chapter 3 "Materials Sampling and Testing".

An asphalt sample must be obtained from each truck and trailer load of material delivered. Cutback asphalt samples must be submitted to the Materials Division within 10 days of the sampling.

Samples obtained south of U.S. Route 6 should be sent to Las Vegas and samples obtained north of U.S. Route 6 should be sent to Carson City. Properly completed transmittals must accompany the samples. For additional information on transmittals, refer to Part III, Chapter 3 "Materials Sampling and Testing".

Storage

Premix stockpile locations should be reviewed to ensure that:

- The stockpile is not placed within 30 feet of the edge of a travel lane.

The stockpile is not in a drainage area.

Special Handling

Supervisors should review premix production with the crew to ensure that:

- The circulation of trucks and other equipment is set up in a pattern to reduce the risk of accidents. One-way circulation is preferred in the pit.
- Appropriate personal protective equipment (PPE) is being used.

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Disposal

N/A

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.
- Work that generates excessive noise, dust, emissions or other airborne pollutants.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Air Quality", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services Division for more information and guidelines.

STOCKPILING

Premix Production
(Task No. 270.02.01), cont'd.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 270.07.01 (Install/Repair/Replace Stockpile Pollution Prevention Devices).
- At the mixing table, place aggregate in windrow.
- If the aggregate contains substantial moisture, dry the aggregate by working it with a motor grader.
- Spread the aggregate using a motor grader so that the cutback asphalt can be added with a distributor. Thoroughly mix the aggregate and cutback asphalt using a motor grader and Pulvimixer to evenly coat the aggregate.
- If a pugmill is used, mix cutback asphalt and aggregate to evenly coat the aggregate.
- Windrow the completed product using a motor grader.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 270.07.01 (Install/Repair/Replace Stockpile

Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.

- Report this task to the stockpile being built.
- Enter all labor, equipment and materials used for this task.
- For a premix stockpile, report the component materials to ensure the proper unit cost of the premix.
- Transfer any material from its source stockpile to the stockpile being built.
- Enter the reported accomplishment as the total number of man-hours spent on this task daily.
- Report spreading and turning aggregate for curing to this task and enter the reported accomplishment as the total number of man-hours spent.
- If asphalt is added to rejuvenate a previously mixed and reported pile, report all labor, equipment and material to this task and enter the reported accomplishment as the total number of man-hours spent.
- If a mixing pad was constructed, report all labor, equipment and materials to this task and enter the reported accomplishment as the total number of man-hours spent.
- If the produced material is hauled to a different stockpile site, report the work to Task No. 270.04.01 (Haul Materials).

Premix Production
(Task No. 270.02.01), cont'd.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

STOCKPILING

Mix Salt/Sand (Task No. 270.03.01)

Description

This task includes:

- Mixing salt and sand to obtain a uniform mixture.
- Stockpiling the mixture for future use.

**Task No. 270.07.01
(Install/Repair/Replace Stockpile
Pollution Prevention Devices) shall
be completed prior to starting any
work for this task.**

Purpose

The purpose of the work associated with this task is to mix salt and sand in order to form an abrasive product that will provide:

- Traction for motorists driving on snow and ice.
- A means of melting snow and ice.
- A bond breaker between the road surface and the snow pack when spread before the snow has bonded to the roadway surface.

Timing of Maintenance

Work for this task should be scheduled when material supply is low.

When practical, abrasive materials should be mixed and placed in stockpiles starting no later than October 1 and prior to November 1. Materials mixed after this date have the

potential for containing excessive moisture and may present more handling problems.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

N/A

Ordering

Arrangements for obtaining materials should be made 7 to 21 days prior to scheduling the task. Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before

STOCKPILING

**Mix Salt/Sand
(Task No. 270.03.01), cont'd.**

purchasing or acquiring materials used for this task.

A list of stockpile locations and quantities should be prepared and submitted to the State Purchasing Division via the Equipment Division prior to the expiration date of the open-term contract.

Testing

Salt and sand should be sampled and tested in accordance with Part III, Chapter 3 under "Deicing/Anti-icing Materials".

Storage

The location of stockpile sites should:

- Minimize non-productive travel time.
- Be situated to maximize use by multiple crews.
- Be located to minimize environmental impact.
- Be stored in covered storage buildings when possible. When buildings are not available, attention should be given to drainage and prohibiting salt from migrating into watercourses and impacting the environment.

Salt and sand stockpile locations should be reviewed to ensure that:

- The stockpile is not placed within 30 feet of the edge of a travel lane.

- The stockpile is not in a drainage area.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Supervisors should review safety and related concerns with all workers responsible for mixing abrasives.

Training

In order to ensure that materials purchased meet specifications, District Maintenance employees shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel.

Disposal

N/A

Approvals

This task involves:

- Work around areas of cultural (e.g., Native American), archaeological, historical and/or paleontological significance.
- Work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.

STOCKPILING

Mix Salt/Sand
(Task No. 270.03.01), cont'd.

- Work that generates excessive noise, dust, emissions or other airborne pollutants.

Refer to Part III, Chapter 4 under "Cultural Resources", "Biological Resources", "Air Quality", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services Division for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 270.07.01 (Install/Repair/Replace Stockpile Pollution Prevention Devices).
- Using a loader, conveyor or other appropriate means, mix the salt and sand at the District's prescribed mix ratio.
- Stockpile the mixture in areas that are easily accessible for loading and hauling equipment.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 270.07.01 (Install/Repair/Replace Stockpile Pollution Prevention Devices) was

accomplished, enter the total number of man-hours for that task in addition to this task.

- Report this task to the stockpile being built.
- Enter all labor, equipment and materials used for this task. Report salt, magnesium chloride and sand to ensure the proper cost of the mixed material.
- Transfer any material from its source stockpile to the stockpile being built.
- Enter the reported accomplishment as the total number of man-hours spent on this task.
- If salt/sand mix is hauled to a different stockpile site, report the work to Task No. 270.04.01 (Haul Materials).
- If a mixing pad was constructed, report all labor, equipment and materials to this task and enter the reported accomplishment as the total number of man-hours spent.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

STOCKPILING

Haul Materials (Task No. 270.04.01)

Description

This task involves hauling materials to designated sites for maintenance or betterment operations. This hauling task may be used in conjunction with the movement of the following materials:

- Aggregate
- Screenings (chips)
- Sand
- Cinders
- Premix
- Salt and sand

Purpose

The purpose of the work associated with this task is to move material from one stockpile location to another.

Timing of Maintenance

Work for this task should be scheduled when materials are ready for transport.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

N/A

Approvals

This task involves work that generates excessive noise, dust, emissions or other airborne pollutants. Refer to Part III, Chapter 4 under "Air Quality", "Noise from Maintenance Operations" and "Planning Maintenance Tasks", or contact the Environmental Services Division for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- Each driver operates the loader and loads their truck; some cases may warrant a designated loader operator.
- Haul material to new site and dump in the designated manner.
- Stockpile material with a loader or motor grader.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Haul Materials
(Task No. 270.04.01), cont'd.

Special Instructions

- Materials hauled for immediate placement in the work task should be charged to the task that is being performed.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Report this task only when moving material from one stockpile to another.
- Report this task to the stockpile being built.
- Enter all labor, equipment and materials used for this task. Material shall be transferred out of the source stockpile.
- Enter the reported accomplishment as the total number of man-hours spent on this task.
- For hauling pit run material for use at a later date, charge the material to the applicable aggregate or sand stockpile.
- Report any salt brine hauled from the source stockpile to satellite tanks to this task and enter the reported accomplishment as the total number of man-hours spent.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

STOCKPILING

**Salt Brine/Anti-icing Production
(Task No. 270.05.01)**

to prevent/delay flooding, erosion, damage or deterioration.

Description

This task includes:

- Mixing salt and water to obtain a uniform mixture.
- Stockpiling the mixture for future use as an anti-icing agent.

**Task No. 270.07.01
(Install/Repair/Replace Stockpile
Pollution Prevention Devices) shall
be completed prior to starting any
work for this task.**

Purpose

The purpose of the work associated with this task is to mix salt and water in order to form a product that provides:

- A means of melting snow and ice.
- A bond breaker between the road surface and the snow pack when spread before the snow has bonded to the roadway surface.

Timing of Maintenance

Work for this task should be scheduled when material supply is low.

When practical, materials should be mixed and placed in stockpiles prior to November 1 and continuously throughout the season.

Inspections of drainage facilities should be performed annually and after major storms to ensure that they are free of obstructions and working properly, and

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Rented equipment shall comply with the procedures in Part III, Chapter 8 under "Renting or Leasing Equipment from Others".

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Arrangements for obtaining materials should be made 7 to 21 days prior to scheduling the task. Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

STOCKPILING

***Salt Brine/Anti-icing Production
(Task No. 270.05.01), cont'd.***

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

A list of stockpile locations and quantities should be prepared and submitted to the State Purchasing Division via the Equipment Division prior to the expiration date of the open-term contract.

Testing

Salt and sand should be sampled and tested in accordance with Part III, Chapter 3 under "Deicing/Anti-icing Materials".

Storage

The location of stockpile sites should:

- Minimize non-productive travel time.
- Be situated to maximize use by multiple crews.
- Be contained in order to prohibit salt brine from migrating into watercourses and impacting the environment.

Special Handling

The products/materials used for this task shall be handled in accordance with the manufacturer's recommendations and the SDS. A copy of the SDS for the products/materials that require them must be on the job site.

Supervisors should review safety and related concerns with all workers responsible for mixing the anti-icing liquid mixture.

Training

In order to ensure that materials purchased meet specifications, District Maintenance employees shall be properly trained in sampling and testing procedures. Training is conducted by the Construction Division's Independent Assurance personnel.

Disposal

N/A

Approvals

This task involves work around areas with threatened and endangered species, or where the protection of plant life, animal life, wetlands and water bodies (e.g., rivers, streams, lakes, reservoirs, wash channels) is a priority.

Refer to Part III, Chapter 4 under "Biological Resources" and "Planning Maintenance Tasks", or contact the Environmental Services Division for more information and guidelines.

Procedure

The procedure for this task includes but is not limited to the following:

- If drainage facilities are present, complete Task No. 270.07.01 (Install/Repair/Replace Stockpile Pollution Prevention Devices).
- Add salt and water to the mixing tank.

STOCKPILING

***Salt Brine/Anti-icing Production
(Task No. 270.05.01), cont'd.***

- Mix materials until desired percent saturation is achieved.
- Stockpile the mixture in areas that are easily accessible for loading and hauling equipment.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- If Task No. 270.07.01 (Install/Repair/Replace Stockpile Pollution Prevention Devices) was accomplished, enter the total number of man-hours for that task in addition to this task.
- Report this task to the stockpile being built.
- Enter all labor, equipment and materials used for this task. Report salt to ensure the proper cost of the mixed material.
- Transfer any material from its source stockpile to the stockpile being built.
- Enter the reported accomplishment as the total number of man-hours spent on this task daily.
- Enter the reported accomplishment as the total number of man-hours spent on the task by all workers combined.

- If salt brine or anti-icing mix is hauled to another stockpile site, report the work to Task No. 270.04.01 (Haul Materials).

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

STOCKPILING

**Stockpile Purchasing
(Task No. 270.06.01)****Description**

This task includes:

- Transfer or purchase stockpile material.
- Unload and store material.

Purpose

The purpose of the work associated with this task is to provide:

- A means to stockpile purchased or transferred material.
- An immediate record for specialty stockpile material.

Timing of Maintenance

When practical, materials should be stockpiled before material is needed for a task or emergency work.

Equipment

N/A

Materials

N/A

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- Purchase material using Form 072-002 (Combination Request for Supplies, Equipment and Shipping Record, or "Form 51") or Form O-3725 (Asphalt/Aggregate/Paint Purchase Requisition, APR).
- At the delivery site, assign people to assist in unloading material.
- Unload and store all incoming product.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Report this task to the stockpile being built.
- Enter all labor and equipment, and report the purchased material to the applicable stockpile.
- Enter the reported accomplishment as the total number of man-hours spent on this task.
- Transfer any material from its source stockpile to the stockpile being built.
- Report any paint testing and/or circulating to this task and select the applicable stockpile.

Stockpile Purchasing
(Task No. 270.06.01), cont'd.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

STOCKPILING

Install/Repair/Replace Stockpile Pollution Prevention Devices (Task No. 270.07.01)

Description

This task involves the installation, repair or replacement of pollution prevention devices (PPDs), in accordance with stormwater prevention best management practices (BMPs), when establishing or maintaining material stockpiles.

Purpose

The purpose of the work associated with this task is to ensure that all surrounding drainage facilities have proper erosion control products installed and maintained (per the stormwater prevention BMPs) prior to the start of maintenance work.

Timing of Maintenance

Work should be scheduled in advance of any maintenance task that may affect drainage facilities or when the PPD has either lost 50 percent of its design capacity or can no longer function as designed.

Equipment

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard equipment used for this task.

Supervisors shall ensure that the equipment used for this task is in good working condition and/or properly calibrated.

Training

Certain equipment used for this task may require formal training and/or certification prior to use. Refer to Part II, Chapter 2 under "Equipment Training and Certification Program" for more information.

Materials

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the list of standard materials/supplies used for this task.

Ordering

Materials/Supplies shall be purchased in accordance with the procedures outlined in Part III, Chapter 2 "Acquisition and Disposal of Equipment and Materials".

Supervisors should first check with the associated open-term contract or the Qualified Products List (QPL) before purchasing or acquiring materials used for this task.

Testing

N/A

Storage

N/A

Training

In order to install pollution prevention products/devices, all maintenance employees shall be trained on the proper installation techniques by the Stormwater Division. Refer to Part III, Chapter 4 under "Training" for more information.

STOCKPILING

***Install/Repair/Replace Stockpile
Pollution Prevention Devices
(Task No. 270.07.01), cont'd.***

Disposal

N/A

Approvals

N/A

Procedure

The procedure for this task includes but is not limited to the following:

- Install the proper PPDs at each stockpile as needed and in accordance with stormwater pollution prevention best management practices.
- Replace/repair any PPDs that cannot function as designed.

Refer to the *Maintenance Management System Manual of Instructions* for the latest information.

Reporting

Reporting for this task in the MMS System includes but is not limited to the following:

- Report this task to the stockpile being worked on.
- Enter all labor, equipment and materials used for this task.
- Enter the reported accomplishment as the total number of man-hours used for stockpile pollution prevention.

- Select pollution prevention as the cause of maintenance.
- If using a pick-up broom at a stockpile location, enter the number of cubic yards picked up in the Comments field.
- Record the location name of all satellite stockpiles in the Comments field.

Refer to the *Maintenance Management System Manual of Instructions* or the MMS System for the latest information.

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APPENDIX A-1: REFERENCES

This chapter describes federal/national, State and Department publications and other print or online resources that contain policies, procedures and guidelines. The information presented in this chapter is not intended to replace or supersede any personnel manual or policy. It is intended to summarize information from these publications in order to provide an overview. For detailed information, refer to the actual publication/resource. All publications listed are the current or latest edition/version, unless otherwise noted.

FEDERAL/NATIONAL PUBLICATIONS, RESOURCES

Manual on Uniform Traffic Control Devices (MUTCD)

<http://mutcd.fhwa.dot.gov/>

The MUTCD defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel. The MUTCD is published by the Federal Highway Administration (FHWA) under the Code of Federal Regulations (CFR), Title 23 Part 655, Subpart F.

A Guide to Temporary Traffic Control in Work Zones

https://www.workzonesafety.org/files/documents/training/fhwa_wz_grant/atssa_pocket_guide_traffic_control.pdf

This guide, published by the American Traffic Safety Services Association (ATSSA) and based on MUTCD standards and guidelines, presents the basic standards and guidelines for temporary traffic control in highway work zones including the installation, maintenance and removal of traffic control devices.

Flagger's Handbook

<https://itre.ncsu.edu/technical-services/highways/>

This publication, provided by the Technology Transfer Program at North Carolina State University, is intended to assist the flagger in understanding his or her duties to protect project personnel and provide safe, courteous and authoritative directions to traffic seeking passage through the work area.

Standard Highway Signs (SHS)

http://mutcd.fhwa.dot.gov/ser-shs_millennium_eng.htm

This publication, which is a supplement to the MUTCD, contains the design specifications and sign codes for highway signs recognized by the FHWA.

Emergency Response Guidebook (ERG)

<http://www.phmsa.dot.gov/hazmat/outreach-training/erg>

This publication is used as an aid during a transportation emergency involving hazardous materials. It helps to quickly identify the specific or generic hazards of the material(s) involved in an incident and to take the necessary action or

REFERENCES

precaution in the initial response phase of an incident.

USA North 811

<http://usanorth811.org/>

Underground Service Alert of Northern/Central California and Nevada (USA North 811) is a free notification service for contractors, homeowners and maintenance organizations that are planning any underground work operations. USA North 811 provides information on all known utilities located in the work area.

USA North Nevada Excavation Manual

<http://usanorth811.org/wp-content/uploads/2013/11/NEVADA-Excavation-Manual.pdf>

This publication provides a program overview and guidelines for USA North 811.

U.S. General Services Administration (GSA) Per Diem Rates Lookup

<http://www.gsa.gov/portal/category/100120>

GSA establishes the per diem rates for the lower 48 Continental United States (CONUS), which are the maximum allowances that federal employees are reimbursed for expenses incurred while on official travel.

The CONUS per diem rate for an area is actually three allowances: the lodging allowance, the meals allowance and the incidental expense allowance.

STATE PUBLICATIONS, RESOURCES

State Administrative Manual (SAM)

<http://budget.nv.gov/uploadedFiles/budgetnvgov/content/Documents/State%20Administrative%20Manual.pdf>

This is a compilation of all the basic policy statements for State government. Policies included in the manual are based on Nevada Revised Statutes or other approved regulations and as such is used as a guide in conducting State business. SAM was developed to provide all State agencies with a standardized approach to a variety of management problems

Rules for State Personnel Administration

http://hr.nv.gov/uploadedFiles/hrnvgov/Content/Resources/Publications/Rules_NAC.pdf

This manual provides the rules for personnel administration and is based on Chapter 284 of the Nevada Revised Statutes (NRS). It was developed to provide all State agencies with a standardized approach to administering personnel policies.

State of Nevada Employee Handbook

http://hr.nv.gov/uploadedFiles/hrnvgov/Content/Resources/Publications/Employee_Handbook.pdf

The employee handbook, published by the Department of Administration, Division of Human Resources Management, provides a ready reference for new and experienced State of Nevada employees when

REFERENCES

questions arise relating to the terms and conditions of employment.

Nevada Commercial Driver License Manual

<http://driving-tests.org/nevada/nv-cdl-handbook/>

This publication provides detailed testing information for drivers who want to pursue their commercial driver license (CDL).

Nevada State Comprehensive Emergency Management Plan (SCEMP)

<http://dem.nv.gov/Resources/SCEMP/>

The SCEMP is the master emergency operations document for the State in the prevention of, preparation for, response to and recovery from an emergency or disaster. This plan includes:

- Disaster response.
- Descriptions of various disasters and the responsibility of each agency. Agency assignments.
- Emergency management responsibilities of each agency.
- Recovery.
- The declaration process and summary of the more commonly used assistance programs.

The programs are addressed in two categories: with a Presidential Declaration and without a Presidential Declaration.

State Human Resources Management Employee Assistance Portal

[http://hr.nv.gov/StateEmployees/Employee_Assistance_Program\(EAP\)](http://hr.nv.gov/StateEmployees/Employee_Assistance_Program(EAP))

The State's Employee Assistance Program (EAP) provides support, resources and information for personal and work issues. Services are confidential and provided at no charge to qualifying employees and their dependents.

NDOT PUBLICATIONS, RESOURCES

Transportation Policies and Procedures

<http://shptsrv1/002/Shared%20Documents/Transportation%20Policies%20and%20Procedures>

This directory contains policy statements and related procedural instructions for NDOT, commonly referred to as TPs.

Employee's Guide to Prohibitions and Penalties

<http://shptsrv1/076/PROHIBITIONS%20%20PENALTIES/EMPLOYEE%20GUIDE%20TO%20PROHIBITIONS%20AND%20PENALTIES>

This publication describes those activities that are incompatible or in conflict with NDOT duties. It does not cover all the situations that may occur. It does, however, provide a tool for consistent application of the personnel rules. Included within the publication is the procedure and timetable for filing and preparing responses to an employee grievance.

REFERENCES

A copy of this publication is provided to each employee upon hire.

Supervisor's Supplemental Guide to Prohibitions and Penalties

<http://shptsrv1/076/PROHIBITIONS%20%20PENALTIES/SUPERVISOR%20GUIDE%20TO%20PROHIBITIONS%20AND%20PENALTIES>

This is a supplement to the *Employee's Guide to Prohibitions and Penalties* and it is intended to assist supervisors.

A copy of this publication is provided to supervisors upon attending the "Progressive Disciplinary Procedures" course.

Nevada Department of Transportation Chart of Accounts Coding Manual

<http://shptsrv1/060/Shared%20Documents/Manuals>

This manual, published by the Accounting Division, provides the updated accounting codes for Department funds, organizations, activities, appropriation, projects, agreements, jobs and facilities across all Department districts and divisions.

Nevada Department of Transportation Employee Payroll Manual

<http://shptsrv1/060/Shared%20Documents/Manuals>

This publication provides an overview of the payroll process and assists Department employees in preparing a bi-weekly timesheet.

NDOT Affirmative Action Plan

<http://shptsrv1/005/Shared%20Documents>

This plan affirms the actions the Department will take in order to assure equal opportunity for all employees and applicants.

Employee Safety Manual

<http://sharepoint/078/NDOT%20Safety%20Manual>

The Department's *Employee Safety Manual* is a compilation of safety practices and codes. The object of the manual is to help safeguard the lives and physical welfare of every Department employee, as well as the public with whom contact is made in the course of the Department's operations.

Global Harmonization System

<http://sharepoint/078/Global%20Harmonization%20System/Forms/AllItems.aspx>

For the protection of employees from chemical hazards and to comply with Occupational Safety and Health Administration (OSHA) standards, NDOT developed the Hazard Communication Program Binder. This publication contains the following information:

- Summary of the OSHA Hazard Communication standards
- The health hazards of chemicals
- The physical hazards of chemicals
- Chemical container labeling

- Safety Data Sheets
- Chemical information summary
- Protective equipment

This publication is readily available to employees in their work area and can be obtained from the Safety and Loss Control Section.

Maintenance Management System Manual of Instructions

This manual is the official printed version of the collection of maintenance programs and their associated tasks contained in the MMS System. Task details include performance standards, required equipment and materials, the need/condition that warrants the task, the degree to which the task needs to be executed, the associated procedure, reporting requirements and quality control standards.

The Maintenance and Asset Management Division SharePoint maintains a collection of the latest programs and tasks stored in the MMS System. Go to <http://shptsrv1/050/Maintenance%20Tasks%20Performance%20Standards/Maintenance%20Tasks%20Performance%20Standards> for more information.

Nevada Department of Transportation Documentation Manual

http://www.nevadadot.com/About_NDOT_Divisions/Operations/Construction/Documentation_Manual.aspx

This publication is a collection of previous documentation manuals that have been updated to meet the latest standards in documenting work

REFERENCES

performed by contractors on highway construction projects. It is used by Resident Engineers, field office personnel, inspectors and construction survey crews, and it is based on the *Standard Specifications for Road and Bridge Construction*.

State Maintained Highways of Nevada, Descriptions and Maps

http://www.nevadadot.com/About_NDOT_Divisions/Planning/Roadway_Systems/State_Maintained_Highways_Descriptions_Index_Maps.aspx

This publication (aka Description Index), maintained by the Planning Division, provides a central reference for descriptions, mileage and maps for the state-maintained routes. The publication also contains a cross reference of the current routes to those in existence prior to 1991, as well as a list of the National Highway System routes.

Milepost Index

http://intra/MPI_Web_Report

The Milepost Index is published by the Roadway Systems Division of Planning and is updated quarterly. This index contains the milepost listing on all NDOT maintained, State and US routes with the milepost beginning at "0" at the south or west end of a county. Interstate Routes are cumulative across their route and start at "0" at the west state line or south state line and continue to the end of the route in cumulative miles. It is used by maintenance staff and design staff to locate projects and by emergency personnel to identify road incidents.

REFERENCES

Environmental Services Procedures Guide

<http://shptsrv1/013/ENVIRONMENTAL%20SERVICES%20MANUAL/Forms/AllItems.aspx>

This publication provides uniform environmental practices for Department and consultant personnel preparing contract plans for Department projects.

NDOT Water Quality Manuals

http://www.nevadadot.com/About_NDOT/NDOT_Divisions/Engineering/Hydraulics/Water_Quality_BMP_Manuals.aspx

These publications assist in compliance with the Clean Water Act, as well as State and local regulations. The *Planning and Design Guide* (PDG), part of The Department's water quality, erosion and sediment control program, provides information and procedures related to the design of permanent water quality improvements. The *Construction Site Best Management Practices Manual*, part of the Department's statewide effort to prevent pollution in stormwater runoff from construction projects, maintenance activities, addresses minimum contractor requirements for selecting, implementing and maintaining construction sites.

Facility Pollution Prevention Plans (FPPPs)

http://sharepoint/018/SW%20Maintenance%20Documents/FPPP_2016_Final.pdf

This is a directory of each Maintenance Facility Pollution Prevention Plan (FPPP) as required by a Municipal

Separate Storm Sewer Systems Permit by the Nevada Division of Environmental Protection as authorized by the U.S. Environmental Protection Agency. FPPPs are developed for each designated "major" maintenance facility, which are those that accommodate multiple maintenance crews and serve as a location for equipment repairs beyond routine maintenance and a single FPPP is developed for each "minor" maintenance facility designation (maintenance stations/yards and offsite material storage/stockpile areas).

Maintenance Facility Stormwater Best Management Practices Manual

http://www.nevadadot.com/uploadedFiles/NDOT/Micro-Sites/StormWater/NDOT_Maint_Facility_SW%20BMP%20Manual_20150803.pdf

This publication provides information regarding the proper use and application of maintenance facility best management practices (BMPs) which are designed to reduce the potential for the discharge of stormwater pollutants at maintenance facilities.

Stormwater Management

<http://nevadadot.com/uploadedFiles/NDOT/Micro-Sites/StormWater/NDOT%20SWMP%20March%202013.pdf>

This publication provides the Department's Stormwater Management Program (SWMP) and practices, addressing the continued administration, implementation and enforcement of the SWMP to mitigate pollution in stormwater runoff from Department

REFERENCES

facilities, roadways and right-of-ways throughout the state.

Maintenance and Asset Management Division SharePoint

<http://shptsrv1/050>

This is the Division's Intranet site, which includes the Architecture Section and the Emergency Management and Homeland Security Section.

Truck Escape Ramp Manual

<http://sharepoint/050/Truck%20Escape%20Ramp%20Documentation>

This publication details the District Maintenance task that involves removing debris, silt, vegetation, and other foreign material from truck escape ramp aggregate beds to the depth and cross section to which they were originally constructed or have been improved.

Maintenance Achievement Program Manual

<http://shptsrv1/050/Lists/Maintenance%20Accountability%20Program>

This publication is a detailed account of the Maintenance Achievement Program (MAP), an initiative that aims to objectively measure the Level of Service (LOS) provided by NDOT highway maintenance tasks. LOS data is collected statewide and compared to established targets for each maintenance task, allowing NDOT to more effectively plan, budget and manage highway maintenance work.

The purpose of MAP is to provide for the continual improvement of NDOT

maintenance performance and improve overall program effectiveness and efficiency.

NDOT Emergency Operations Plan (EOP)

<http://sharepoint/050/EmergencyManagement/Emergency%20Operations%20Plan/NDOT%20EOP%20Signed%20by%20Director%20FINAL.pdf>

The NDOT EOP, published by the Maintenance and Asset Management Division, provides details regarding NDOT's overall response during major emergencies or disasters. The plan provides a structure for emergency operations and provides guidance for management and staff during emergencies.

NDOT 5 Year Plan

file:///datsrv1/010ProjSchedEst/SharePoint/NDOT_home/NDOT%205%20Year%20Project%20Plan.pdf

This is a summary document that outlines the major projects over the next five fiscal years.

NDOT Fact Book

http://www.nevadadot.com/About_NDOT/NDOT_Divisions/Planning/Performance_Analysis/NDOT_Factbook.aspx

This publication provides historical and current statistical information describing the Department's operations and factors that drive Nevada's multimodal transportation programs.

REFERENCES

**Nevada Department of Transportation
Standard Plans for Road and Bridge
Construction**

http://www.nevadadot.com/About_NDOT_Divisions/Engineering/Specifications/Standard_Specifications_and_Plans_for_Road_and_Bridge_Construction.aspx

This publication contains drawings or illustrations that are accurate and comprehensive enough to be used on different projects with little or no change.

**Nevada Department of Transportation
Standard Specifications for Road and
Bridge Construction**

http://www.nevadadot.com/About_NDOT_Divisions/Engineering/Specifications/Standard_Specifications_and_Plans_for_Road_and_Bridge_Construction.aspx

This document contains the body of directions, provisions and requirements authorized and printed by the Department, together with written agreements and all documents of any description made or to be made regarding the method or manner of performing work, the quantities or the quality of materials to be furnished under the contract.

**Nevada Department of Transportation
Construction Manual**

http://www.nevadadot.com/About_NDOT_Divisions/Operations/Construction/Construction_Manual.aspx

This publication establishes uniform policies and procedures for the administration of the Department's construction contracts and provides

guidance and direction to the personnel administering them.

Materials Division Testing Manual

http://www.nevadadot.com/About_NDOT_Divisions/Operations/Materials/Materials_Division_Testing_Manual.aspx

This publication standardizes the test procedures used in the laboratories of the Department's Materials Division.

Nevada Sign Supplement

http://www.nevadadot.com/About_NDOT_Divisions/Planning/Traffic_Safety_Engineering/Highway_Sign_Supplement.aspx

This publication, which is a supplement to the FHWA's *Standard Highway Signs* manual, provides the design specifications and sign codes for highway signs recognized by NDOT.

Right-of-Way Manual

http://www.nevadadot.com/About_NDOT_Divisions/Engineering/ROW/Right_of_Way.aspx

This publication provides uniformity in the interpretation and administration of applicable State and federal Laws, Department policies and the implementation of the Code of Federal Regulations as they apply to Right-of-Way acquisition.

**Nevada Department of Transportation
Structure Index**

<http://sharepoint/011/Shared%20Documents/Structure%20Index%202006.pdf>

This publication contains information relative to each bridge structure in Nevada. Included are critical restrictions such as weight and height restrictions for each structure.

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TABLE A.2-1: ASPHALT RATES, CUTBACK ASPHALT (TONS PER MILE)

W (ft.)	1/4 gal app, t/MI				1/2 gal app, t/MI				1 gal app, t/MI			
	Grade of Cutback Asphalt				Grade of Cutback Asphalt				Grade of Cutback Asphalt			
	70	250	800	3000	70	250	800	3000	70	250	800	3000
2.0	1.1594	1.1780	1.1973	1.2172	2.3188	2.3561	2.3946	2.4343	4.6377	4.7122	4.7891	4.8686
4.0	2.3188	2.3561	2.3946	2.4343	4.6377	4.7122	4.7891	4.8686	9.2754	9.4244	9.5782	9.7372
6.0	3.4782	3.5341	3.5918	3.6514	6.9565	7.0682	7.1836	7.3029	13.913	14.137	14.367	14.606
8.0	4.6376	4.7121	4.7891	4.8686	9.2753	9.4244	9.5782	9.7372	18.551	18.849	19.156	19.474
10.0	5.7971	5.8902	5.9863	6.0857	11.594	11.780	11.973	12.172	23.188	23.561	23.946	24.343
12.0	6.9565	7.0683	7.1837	7.3029	13.913	14.137	14.367	14.606	27.826	28.273	28.735	29.212
13.0	7.5362	7.6573	7.7823	7.9115	15.072	15.315	15.564	15.823	30.145	30.629	31.129	31.645
14.0	8.1159	8.2463	8.3810	8.5200	16.232	16.493	16.762	17.040	32.464	32.985	33.524	34.080
16.0	9.2753	9.4244	9.5782	9.7372	18.551	18.849	19.156	19.474	37.101	37.697	38.313	38.949
18.0	10.435	10.602	10.775	10.954	20.870	21.205	21.551	21.909	41.739	42.410	43.102	43.817
20.0	11.594	11.780	11.972	12.172	23.188	23.561	23.946	24.343	46.377	47.121	47.891	48.686
22.0	12.754	12.959	13.170	13.389	25.507	25.917	26.340	26.777	51.015	51.834	52.680	53.555
24.0	13.913	14.137	14.367	14.606	27.826	28.273	28.735	29.212	55.652	56.546	57.469	58.423
26.0	15.072	15.315	15.564	15.823	30.145	30.629	31.129	31.646	60.290	61.258	62.259	63.292
28.0	16.232	16.493	16.762	17.040	32.464	32.985	33.524	34.080	64.928	65.970	67.048	68.160
30.0	17.391	17.671	17.959	18.257	34.783	35.341	35.918	36.514	69.565	70.683	71.837	73.029
32.0	18.550	18.849	19.156	19.474	37.101	37.697	38.313	38.949	74.203	75.395	76.626	77.898
34.0	19.710	20.027	20.354	20.692	39.420	40.054	40.707	41.383	78.841	80.107	81.415	82.766
36.0	20.870	21.205	21.551	21.909	41.739	42.410	43.102	43.817	83.478	84.819	86.204	87.635
38.0	22.029	22.382	22.748	23.126	44.058	44.765	45.497	46.252	88.116	89.531	90.993	92.503

Quantities Used:

Grade 70 = 253 *
 Grade 250 = 249 *
 Grade 800 = 245 *
 Grade 3000 = 241 *
 * -- Gal/Ton @ 60°F.

Example:

Apply MC-250 at the rate of 0.35 gal on a roadway 32-ft wide and 5.1 MI long.

From Table:

One gal MC-250 32 ft. wide requires 75.395 t/mi. For 5.1 MI; 75.395 X 5.1 = 384.515 tons required at the application rate of 1 gal/yd². For the application rate of 0.35gal/yd², 384.515 X 0.35 = 134.58 t X 249 = 33,510 gal.

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TABLE A.2-2: ASPHALT RATES, EMULSIONS (GALLONS PER MILE)

Application Rates												
W (ft.)	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	1.0
2.0	117	176	235	293	352	411	469	528	587	645	704	1173
4.0	1235	352	469	587	704	821	939	1056	1173	1291	1408	2347
6.0	352	528	704	880	1056	1232	1408	1584	1760	1936	2112	3520
8.0	469	704	939	1173	1408	1643	1877	2112	2347	2581	2816	4693
10.0	587	880	1173	1467	1760	2053	2347	2640	2933	3227	3527	5867
11.0	645	968	1291	1613	1936	2259	2582	2904	3227	3550	3872	6454
12.0	704	1056	1408	1760	2112	2464	2816	3168	3520	3872	4224	7040
13.0	763	1144	1526	1907	2288	2670	3051	3432	3814	4195	4576	7626
14.0	821	1232	1643	2053	2464	2875	3285	3696	4107	4517	4928	8213
16.0	939	1408	1877	2347	2816	3285	3755	4224	4693	5163	5632	9387
18.0	1056	1584	2112	2640	3168	3696	4224	4752	5280	5808	6336	10560
20.0	1173	1760	2347	2933	3520	4107	4693	5280	5867	6453	7040	11733
22.0	1291	1936	2581	3227	3872	4517	5163	5808	6453	7099	7744	12907
24.0	1408	2112	2816	3520	4224	4928	5632	6336	7040	7744	8448	14080
26.0	1525	2288	3051	3813	4576	5339	6101	6864	7627	8389	9152	15253
28.0	1643	2464	3285	4107	4928	5749	6571	7392	8213	9035	9856	16427
30.0	1760	2640	3520	4400	5280	6160	7040	7920	8800	9680	10560	17600
32.0	1877	2816	3755	4693	5632	6571	7509	8448	9387	10325	11264	18773
34.0	1995	2992	3989	4987	5984	6981	7979	8976	9973	10971	11968	19947
36.0	2112	3168	4224	5280	6336	7392	8448	9504	10560	11616	12672	21120
38.0	2229	3344	4459	5573	6688	7803	8917	10032	11147	12261	13376	22293

Quantities Used to Calculate tons:

240 gal/t @ 60°F.
gal / 240 = t.

Example:

Apply 0.40 gal on a roadway 24 ft. wide and 3.6 MI long.

Example:

Apply 0.33 gal on a roadway 20 ft. wide and 3.3 MI long.

From Table:

Application Rate 0.40 gal, 24 ft. wide requires 5,632 gal. For 3.6 MI; 5,632 X 3.6 = 20,275 gal of emulsion.

From Table:

Application Rate of 1.0 gal, 20 ft. wide requires 11,733 gal of emulsion/mi. For 3.3 MI, 11,733 X 3.3 = 38,719 gal of emulsion at the rate of 1.0 gal/yd². For the application rate of 0.33 gal/yd². - 38,719 X 0.33 = 12,777 gal of emulsion.

LIST OF TABLES

TABLE A.2-3: ASPHALT RATES, EMULSIONS (TONS PER MILE)

Application Rates												
W (ft.)	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	1.0
2.0	0.4889	0.7333	0.9778	1.2222	1.4667	1.7111	1.9556	2.2000	2.4444	2.6889	2.9333	4.8889
4.0	0.9778	1.4667	1.9556	2.4444	2.9333	3.4222	3.9111	4.4000	4.8889	5.3778	5.8667	9.7778
6.0	1.4667	2.2000	2.9333	3.6667	4.4000	5.1333	5.8667	6.6000	7.3333	8.0667	8.8000	14.666
8.0	1.9556	2.9333	3.9111	4.8889	5.8667	6.8444	7.8222	8.8000	9.7778	10.756	11.733	19.556
10.0	2.4444	3.6667	4.8889	6.1111	7.3333	8.5556	9.7778	11.000	12.222	13.444	14.668	24.444
11.0	2.6889	4.0335	5.3775	6.7222	8.0665	9.4110	10.756	12.100	13.445	14.789	16.134	26.889
12.0	2.9333	4.4000	5.8667	7.3333	8.8000	10.267	11.733	13.200	14.667	16.133	17.600	29.333
13.0	3.1778	4.7666	6.3555	7.9445	9.5335	11.122	12.711	14.300	15.889	17.478	19.083	31.778
14.0	3.4222	5.1333	6.8444	8.5556	10.266	11.978	13.689	15.400	17.111	18.822	20.533	34.222
16.0	3.9111	5.8667	7.8222	9.7778	11.733	13.689	15.644	17.600	19.556	21.511	23.467	39.111
18.0	4.4000	6.6000	8.8000	11.000	13.200	15.400	17.600	19.800	22.000	24.200	26.400	44.000
20.0	4.8889	7.3333	9.7778	12.222	14.667	17.111	19.556	22.000	24.444	26.889	29.333	48.889
22.0	5.3778	8.0667	10.755	13.444	16.133	18.822	21.511	24.200	26.889	29.578	32.267	53.778
24.0	5.8667	8.8000	11.733	14.667	17.600	20.533	23.467	26.400	29.333	32.267	35.200	58.667
26.0	6.3556	9.5333	12.711	15.889	19.067	22.244	25.422	28.600	31.778	34.956	38.133	63.556
28.0	6.8444	10.267	13.689	17.111	20.533	23.956	27.379	30.800	34.222	37.644	41.067	68.444
30.0	7.3333	11.000	14.667	18.333	22.000	25.667	29.333	33.000	36.667	40.333	44.000	73.333
32.0	7.8222	11.733	15.644	19.556	23.467	27.378	31.289	35.200	39.111	43.022	46.933	78.222
34.0	8.3111	12.467	16.622	20.778	24.933	29.089	33.244	37.400	41.556	45.711	49.867	83.111
36.0	8.8000	13.200	17.600	22.000	26.400	30.800	35.200	39.600	44.000	48.400	52.800	88.000
38.0	9.2889	13.933	18.578	23.222	27.867	32.511	37.156	41.800	46.444	51.089	55.733	92.889

Quantity used to calculate tons:

240 gal/t @ 60°F.

To obtain gal from above table; t X 240 = gal.

Example:

Apply emulsion at the rate of 0.25 gal on a roadway 20 ft. wide and of 3.3 miles long.

Example:

Apply emulsion at the rate of 0.33 gal on roadway 20-ft wide and 3.3 miles long.

From Table:

Application rate of 0.25 gal, 20 ft. wide requires 12.222 tons of emulsion/mi. For 3.3 MI, 12.222 X 3.3 = 40.3326 t of emulsion.

From Table:Application rate of 1.0 gal, 20 ft. wide requires 48.889 t of emulsion/mi. For 3.3 MI, 48.889 X 3.3 = 161.3337 t of emulsion at the rate of 1.0 gal/yd². For an application rate of 0.33 gal, 161.3337 X 0.33 = 53.2401 t.

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TABLE A.2-4A: TEMPERATURE CORRECTION OF CUTBACK ASPHALT

For Converting Volumes of Cutback Asphalt Grades 250 to 3000, and Paving Asphalt Grades PG 58-28, PG 64-16, PG 64-22, PG 64-28NV, PG 64-28NVTR, PG 70-16, PG 76-22NV, PG 76-22NVTR

t=observed temperature in °F.

M=multiplier for reducing volumes to the basis of 60°F.

t	M	t	M	t	M	t	M	t	M	t	M
0	1.0211	40	1.0070	80	0.9930	120	0.9792	160	0.9655	200	0.9520
1	1.0208	41	1.0067	81	0.9927	121	0.9788	161	0.9652	201	0.9516
2	1.0204	42	1.0063	82	0.9923	122	0.9785	162	0.9648	202	0.9513
3	1.0201	43	1.0060	83	0.9920	123	0.9782	163	0.9645	203	0.9509
4	1.0197	44	1.0056	84	0.9916	124	0.9778	164	0.9641	204	0.9505
5	1.0194	45	1.0053	85	0.9913	125	0.9775	165	0.9638	205	0.9503
6	1.0190	46	1.0049	86	0.9909	126	0.9771	166	0.9635	206	0.9499
7	1.0186	47	1.0046	87	0.9906	127	0.9768	167	0.9631	207	0.9496
8	1.0183	48	1.0042	88	0.9902	128	0.9764	168	0.9628	208	0.9493
9	1.0179	49	1.0038	89	0.9899	129	0.9761	169	0.9624	209	0.9489
10	1.0176	50	1.0035	90	0.9896	130	0.9758	170	0.9621	210	0.9486
11	1.0172	51	1.0031	91	0.9892	131	0.9754	171	0.9618	211	0.9483
12	1.0169	52	1.0028	92	0.9889	132	0.9751	172	0.9614	212	0.9479
13	1.0165	53	1.0024	93	0.9885	133	0.9747	173	0.9611	213	0.9476
14	1.0162	54	1.0021	94	0.9882	134	0.9744	174	0.9607	214	0.9472
15	1.0158	55	1.0017	95	0.9878	135	0.9740	175	0.9604	215	0.9469
16	1.0155	56	1.0014	96	0.9875	136	0.9737	176	0.9601	216	0.9466
17	1.0151	57	1.0010	97	0.9871	137	0.9734	177	0.9597	217	0.9462
18	1.0148	58	1.0007	98	0.9868	138	0.9730	178	0.9594	218	0.9459
19	1.0144	59	1.0003	99	0.9864	139	0.9727	179	0.9590	219	0.9456
20	1.0141	60	1.0000	100	0.9861	140	0.9723	180	0.9587	220	0.9452
21	1.0137	61	0.9997	101	0.9857	141	0.9720	181	0.9584	221	0.9449
22	1.0133	62	0.9993	102	0.9854	142	0.9716	182	0.9580	222	0.9446
23	1.0130	63	0.9990	103	0.9851	143	0.9713	183	0.9577	223	0.9442
24	1.0126	64	0.9986	104	0.9847	144	0.9710	184	0.9574	224	0.9439
25	1.0123	65	0.9983	105	0.9844	145	0.9706	185	0.9570	225	0.9436
26	1.0119	66	0.9979	106	0.9840	146	0.9703	186	0.9567	226	0.9432
27	1.0116	67	0.9976	107	0.9837	147	0.9699	187	0.9563	227	0.9429
28	1.0112	68	0.9972	108	0.9833	148	0.9696	188	0.9560	228	0.9426
29	1.0109	69	0.9969	109	0.9830	149	0.9693	189	0.9557	229	0.9422
30	1.0105	70	0.9965	110	0.9826	150	0.9689	190	0.9553	230	0.9419
31	1.0102	71	0.9962	111	0.9823	151	0.9686	191	0.9550	231	0.9416
32	1.0098	72	0.9958	112	0.9819	152	0.9682	192	0.9547	232	0.9412
33	1.0095	73	0.9955	113	0.9816	153	0.9679	193	0.9543	233	0.9409
34	1.0091	74	0.9951	114	0.9813	154	0.9675	194	0.9540	234	0.9405
35	1.0088	75	0.9948	115	0.9809	155	0.9672	195	0.9536	235	0.9402
36	1.0084	76	0.9944	116	0.9806	156	0.9669	196	0.9533	236	0.9399
37	1.0081	77	0.9941	117	0.9802	157	0.9665	197	0.9530	237	0.9395
38	1.0077	78	0.9937	118	0.9799	158	0.9662	198	0.9526	238	0.9392
39	1.0074	79	0.9934	119	0.9795	159	0.9658	199	0.9523	239	0.9389

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TABLE A.2-4B: TEMPERATURE CORRECTION OF CUTBACK ASPHALT

For Converting Volumes of Cutback Asphalt, Grade 70

t=observed temperature in °F.

M=multiplier for reducing volumes to the basis of 60°F.

t	M	t	M	t	M	t	M	t	M	t	M
0	1.0241	40	1.0080	80	0.9921	120	0.9763	160	0.9609	200	0.9456
1	1.0237	41	1.0076	81	0.9917	121	0.9760	161	0.9605	201	0.9452
2	1.0233	42	1.0072	82	0.9913	122	0.9756	162	0.9601	202	0.9448
3	1.0229	43	1.0068	83	0.9909	123	0.9752	163	0.9597	203	0.9444
4	1.0225	44	1.0064	84	0.9905	124	0.9748	164	0.9593	204	0.9441
5	1.0221	45	1.0060	85	0.9901	125	0.9744	165	0.9589	205	0.9437
6	1.0217	46	1.0056	86	0.9897	126	0.9740	166	0.9585	206	0.9433
7	1.0213	47	1.0052	87	0.9893	127	0.9736	167	0.9582	207	0.9429
8	1.0209	48	1.0048	88	0.9889	128	0.9732	168	0.9578	208	0.9425
9	1.0205	49	1.0044	89	0.9885	129	0.9728	169	0.9574	209	0.9422
10	1.0201	50	1.0040	90	0.9881	130	0.9725	170	0.9570	210	0.9418
11	1.0197	51	1.0036	91	0.9877	131	0.9721	171	0.9566	211	0.9414
12	1.0193	52	1.0032	92	0.9873	132	0.9717	172	0.9562	212	0.9410
13	1.0189	53	1.0028	93	0.9869	133	0.9713	173	0.9559	213	0.9407
14	1.0185	54	1.0024	94	0.9865	134	0.9709	174	0.9555	214	0.9403
15	1.0181	55	1.0020	95	0.9861	135	0.9705	175	0.9551	215	0.9399
16	1.0177	56	1.0016	96	0.9857	136	0.9701	176	0.9547	216	0.9395
17	1.0173	57	1.0012	97	0.9854	137	0.9697	177	0.9543	217	0.9391
18	1.0168	58	1.0008	98	0.9850	138	0.9693	178	0.9539	218	0.9388
19	1.0164	59	1.0004	99	0.9846	139	0.9690	179	0.9536	219	0.9384
20	1.0160	60	1.0000	100	0.9842	140	0.9686	180	0.9532	220	0.9380
21	1.0156	61	0.9996	101	0.9838	141	0.9682	181	0.9528	221	0.9376
22	1.0152	62	0.9992	102	0.9834	142	0.9678	182	0.9524	222	0.9373
23	1.0148	63	0.9988	103	0.9830	143	0.9674	183	0.9520	223	0.9369
24	1.0144	64	0.9984	104	0.9826	144	0.9670	184	0.9517	224	0.9365
25	1.0140	65	0.9980	105	0.9822	145	0.9666	185	0.9513	225	0.9361
26	1.0136	66	0.9976	106	0.9818	146	0.9662	186	0.9509	226	0.9358
27	1.0132	67	0.9972	107	0.9814	147	0.9659	187	0.9505	227	0.9354
28	1.0128	68	0.9968	108	0.9810	148	0.9655	188	0.9501	228	0.9350
29	1.0124	69	0.9964	109	0.9806	149	0.9651	189	0.9498	229	0.9346
30	1.0120	70	0.9960	110	0.9803	150	0.9647	190	0.9494	230	0.9343
31	1.0116	71	0.9956	111	0.9799	151	0.9643	191	0.9490	231	0.9339
32	1.0112	72	0.9952	112	0.9795	152	0.9639	192	0.9486	232	0.9335
33	1.0108	73	0.9948	113	0.9791	153	0.9635	193	0.9482	233	0.9331
34	1.0104	74	0.9944	114	0.9787	154	0.9632	194	0.9478	234	0.9328
35	1.0100	75	0.9940	115	0.9783	155	0.9628	195	0.9475	235	0.9324
36	1.0096	76	0.9936	116	0.9779	156	0.9624	196	0.9471	236	0.9320
37	1.0092	77	0.9932	117	0.9775	157	0.9620	197	0.9467	237	0.9316
38	1.0088	78	0.9929	118	0.9771	158	0.9616	198	0.9463	238	0.9313
39	1.0084	79	0.9925	119	0.9767	159	0.9612	199	0.9460	239	0.9309

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TABLE A.2-4C: TEMPERATURE CORRECTION OF EMULSIFIED ASPHALT

For Converting Volumes of Emulsified Asphalt

t=observed temperature in °F.

M=multiplier for reducing volumes to the basis of 60°F.

t	M	t	M	t	M	t	M	t	M
60	1.0000	80	.99500	100	.99000	120	.98500	140	.98000
61	.99975	81	.99475	101	.98975	121	.98475	141	.97975
62	.99950	82	.99450	102	.98950	122	.98450	142	.97950
63	.99925	83	.99425	103	.98925	123	.98425	143	.97925
64	.99900	84	.99400	104	.98900	124	.98400	144	.97900
65	.99875	85	.99375	105	.98875	125	.98375	145	.97875
66	.99850	86	.99350	106	.98850	126	.98350	146	.97850
67	.99825	87	.99325	107	.98825	127	.98325	147	.97825
68	.99800	88	.99300	108	.98800	128	.98300	148	.97800
69	.99775	89	.99275	109	.98775	129	.98275	149	.97775
70	.99750	90	.99250	110	.98750	130	.98250	150	.97750
71	.99725	91	.99225	111	.98725	131	.98225	151	.97725
72	.99700	92	.99200	112	.98700	132	.98200	152	.97700
73	.99675	93	.99175	113	.98675	133	.98175	153	.97675
74	.99650	94	.99150	114	.98650	134	.98150	154	.97650
75	.99625	95	.99125	115	.98625	135	.98125	155	.97625
76	.99600	96	.99100	116	.98600	136	.98100	156	.97600
77	.99575	97	.99075	117	.98575	137	.98075	157	.97575
78	.99550	98	.99050	118	.98550	138	.98050	158	.97550
79	.99525	99	.99025	119	.98525	139	.98025	159	.97525

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TABLE A.2-5A: APPLICATION TEMPERATURES OF CUTBACK ASPHALTS

Grade of Cutback Asphalt	Pugmill Mixing Temperatures of Cutback Asphalt MC and SC *		Distributor Spraying Temperature	
	Minimum °F.	Maximum °F.	Minimum °F.	Maximum °F.
SC - 70	95	140	120	180
SC - 250	135	175	165	220
SC - 800	165	205	200	255
SC - 3000	200	240	235	290
MC - 70	95	140	120	180
MC -250	135	175	165	220
MC - 800	165	205	200	255
MC - 3000	200	240	235	290

* -- The maximum spraying temperature may be used if the aggregate is not heated.

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TABLE A.2-5B: APPLICATION TEMPERATURES OF EMULSIFIED ASPHALTS

Grade of Emulsion	Pugmill Mixing Temperatures of Emulsions and Aggregates*		Distributor Spraying Temperature	
	Minimum °F.	Maximum °F.	Minimum °F.	Maximum °F.
CRS-2nv	(Not used for Mixing)		125	185
CQS-1nv	(Not used for Mixing)		70	160
SS-1, CSS-1	50	160	70	160
SS-1h, CSS-1h	50	160	70	160
CMS-2s, CQS-1h	50	160	70	160
LMCRS-2h	(Not used for Mixing)		125	185
PMPS/PMPS-h	(Not used for Mixing)		110	185
PMPS-QB/PMPS-FS	(Not used for Mixing)		110	185
MSE, MSE-h	70	160	(Not used for Spraying)	

* -- The maximum spraying temperature may be used if the aggregate is not heated.

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TABLE A.2-6A: WEIGHT AND VOLUME EQUIVALENTS OF BITUMINOUS MATERIALS

Average Weight and Volumes of Cutback Asphalt			
Grade (MC or SC)	Gallons per Ton @ 60°F	Barrels per Ton @ 60°F (42 U.S. Gals)	Pounds per Gallon @ 60°F
70, 70NV	253	6.03	7.90
250	249	5.93	8.00
800	245	5.83	8.20
3000	241	5.74	8.30
Average Weight and Volumes of Asphalt Cement			
PG 58-28, PG 64-16, PG 64-28NV, PG 64-22	235	5.60	8.51
PG 64-28NVTR, PG 70-16, PG 76-22NV	234	5.58	8.55
PG 76-22NVTR	233	5.55	8.60
Average Weight and Volumes of Emulsified Asphalt			
Everything Grades	241	5.74	8.30

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TABLE A.2-6B: WEIGHT AND VOLUME EQUIVALENTS OF CONSTRUCTION MATERIALS

Portland Cement		
1 Bag (net) = 1 cubic foot	=	94 lbs.
1 Barrel = 4 Bags	=	376 lbs.
Aggregate		
Gravel, Loose, Dry	=	2,565 lbs./cu yd.
Gravel, Pit Run (Graveled Sand)	=	3,240 lbs./cu yd.
Limestone, Crushed	=	2,625 lbs./cu yd.
Granite, Crushed	=	2,778 lbs./cu yd.
Sand		
Dry, Loose	=	100 lbs./cu yd.
Dry, Loose	=	2,700 lbs./cu yd.
Wet	=	3,500 lbs./cu yd.
Sand and Gravel, Dry	=	2,916 lbs./cu yd.
Sand and Gravel, Wet	=	3,375 lbs./cu yd.
Miscellaneous		
Gasoline	=	43.7 - 46.8 lbs./cu ft.
Ice	=	55 - 58 lbs./cu ft.
Water (fresh)	=	62.4 lbs./cu ft. (approx.)
Water (salt)	=	64.0 lbs./cu ft. (approx.)
1 cu ft. of fresh snow, according to humidity of atmosphere	=	5 - 12 lbs.
1 cu ft. of snow moistened and compacted by rain	=	15 - 50 lbs.
Cinders	=	40 - 45 lbs./cu ft.

The data shown for aggregates and sand may vary depending on location; therefore, the figures should be used only for estimating purposes. To determine the weights of aggregates and sand, the specific gravity and void content should be determined by appropriate testing methods.

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TABLE A.2-7: SAND OR SCREENINGS (CHIPS) PER MILE

For Estimating Applications on Seal Coats Quantity of Sand or Screenings in Tons per Mile for Various Rates of Application

Pounds per Sq. Yd.	Width in Feet											
	9	10	12	14	15	16	18	20	22	24	26	28
10	26	29	35	41	44	47	53	59	65	70	76	82
15	40	44	53	62	66	70	79	88	97	106	114	123
18	48	53	63	74	79	84	95	106	116	127	137	148
19	50	56	67	78	84	89	100	111	123	134	145	156
20	53	59	70	82	88	94	106	117	129	141	153	164
21	55	62	74	86	92	99	111	123	136	148	160	172
22	58	65	77	90	97	103	116	129	142	155	168	181
23	61	67	81	94	101	108	121	135	148	162	175	189
24	63	70	84	99	106	113	127	141	155	169	183	197
25	66	73	88	103	110	117	132	147	161	176	191	205
26	69	76	92	107	114	122	137	153	168	183	198	214
30	79	88	106	123	132	141	158	176	194	211	229	246

Example:

To estimate the quantity of sand or screenings using an application rate of 18-lbs/yd² and a roadway width of 24-ft.

From Table:

An application rate of 18-lbs/yd², a roadway width of 24-ft requires 127 t/mi.

Example:

To estimate the quantity of sand or screenings using an application rate of 20-lbs/yd² and a roadway width of 30-ft.

From Table:

An application rate of 20-lbs/yd², a roadway width of 10-ft wide requires 59 t/MI. 59 t/MI for 10-ft width / 10 = 5.9 t/MI for 1 ft. of width. 5.9 t/MI X 30 ft. width = 177 t/MI required.

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TABLE A.2-8: CONVERSION TABLE FOR PLANTMIX, TONS TO CUBIC YARDS

Plantmix/Aggregate Tons to Cubic Yards					
Based on 3,000 pounds/cubic yard for M.M.S. Reporting ONLY					
This table is for conversion of loose material. For compacted material use 2:1 (2 tons = 1 cubic yard).					
Tons	Cubic Yards	Tons	Cubic Yards	Tons	Cubic Yards
1.5	1.0	39.0	26.0	300.0	200.0
3.0	2.0	42.0	28.0	375.0	250.0
4.5	3.0	45.0	30.0	450.0	300.0
6.0	4.0	48.0	32.0	525.0	350.0
7.5	5.0	51.0	34.0	600.0	400.0
9.0	6.0	54.0	36.0	675.0	450.0
10.5	7.0	57.0	38.0	750.0	500.0
12.0	8.0	60.0	40.0	900.0	600.0
13.5	9.0	63.0	42.0	1050.0	700.0
15.0	10.0	66.0	44.0	1200.0	800.0
16.5	11.0	69.0	46.0	1350.0	900.0
18.0	12.0	72.0	48.0	1500.0	1000.0
19.5	13.0	75.0	50.0	1800.0	1200.0
21.0	14.0	90.0	60.0	2100.0	1400.0
22.5	15.0	105.0	70.0	2400.0	1600.0
24.0	16.0	120.0	80.0	2700.0	1800.0
25.5	17.0	135.0	90.0	3000.0	2000.0
27.0	18.0	150.0	100.0	3600.0	2400.0
28.5	19.0	180.0	120.0	4200.0	2800.0
30.0	20.0	210.0	140.0	4500.0	3000.0
33.0	22.0	240.0	160.0	6000.0	4000.0
36.0	24.0	270.0	180.0	7500.0	5000.0

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TABLE A.2-9: AGGREGATE PER MILE

Aggregate for One Mile Surfacing For Estimating Shoulder, Base or Surface Material								
Depth Inches	1 Foot Wide		5 Foot Wide		10 Foot Wide		20 Foot Wide	
	Compacted		Compacted		Compacted		Compacted	
	Tons	Cu Yd.	Tons	Cu Yd.	Tons	Cu Yd.	Tons	Cu Yd.
1	32	16	160	81	321	163	643	326
2	65	33	321	163	643	326	1285	652
3	97	49	481	244	964	489	1928	978
4	128	65	643	326	1285	652	2570	1304
5	160	81	802	407	1606	815	3213	1630
6	193	98	964	489	1928	978	3855	1956
7	225	114	1123	570	2248	1141	4496	2281
8	256	130	1285	652	2570	1304	5138	2607
9	290	147	1445	733	2891	1467	5781	2933
10	321	163	1606	815	3211	1630	6423	3259
11	353	179	1766	896	3532	1792	7066	3585
12	386	196	1928	978	3853	1955	7709	3911

Quantities Based On:

Specific Gravity 2.60

10 % Voids

146 pounds / cubic foot

3942 pounds / cubic yard

1.971 tons / cubic yard

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TABLE A.2-10: AREA OF PAVEMENT SURFACES

Width in Feet	Square Feet per Mile	Square Yards per Mile	Square Yards per Lineal Foot
1	5,280	587	0.1111
2	10,560	1,173	0.2222
4	21,120	2,347	0.4444
6	31,680	3,520	0.6667
8	42,240	4,693	0.8889
10	52,800	5,867	1.1111
12	63,360	7,040	1.3333
14	73,920	8,213	1.5556
16	84,480	9,387	1.7778
18	95,040	10,560	2.0000
20	105,600	11,733	2.2222
22	116,160	12,907	2.4444
24	126,720	14,080	2.6667
26	137,280	15,253	2.8889
28	147,840	16,427	3.1111
30	158,400	17,600	3.3333
32	168,960	18,773	3.5556
34	179,520	19,947	3.7778
36	190,080	21,120	4.0000
38	200,640	22,293	4.2222

Example:

Determine the area in yd² of a roadway surface that is 24-ft wide and 9.5 mi long.

Example:

Determine the area in yd² of a roadway surface that is 25-ft wide and 9.5 mi long.

From Table:

A 24-ft roadway has 14,080-sq yd²/mi. For a length of 9.5 mi, 14,080 X 9.5 mi = 133,760 yd².

From Table:

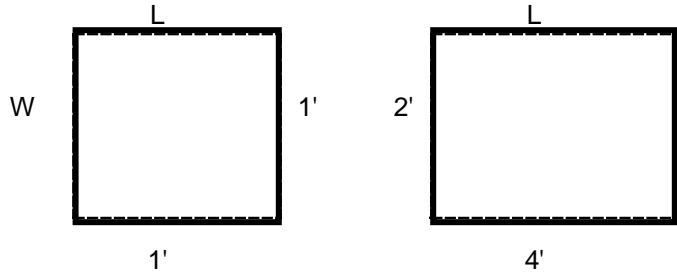
1-ft of roadway width, 1 mi long has 587 yd². For a 25-ft roadway, 25 X 587 = 14,675 yd²/mi. For a roadway 9.5 mi long, 9.5 X 14,675 = 139,412 yd².

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TABLE A.2-11: AREA CALCULATIONS

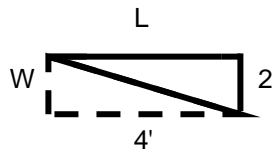
FORMULAS FOR PLANE FIGURES

Area of rectangle = length x width {l x w}



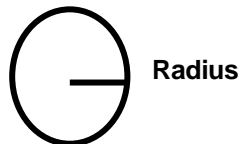
1 ft x 1 ft = 1 ft² and 2 ft x 4 ft = 8 ft²

Area of triangle=1/2 of a rectangle



Length x width / 2 {l x w / 2} 2 ft x 4 ft / 2 = 4 ft²

Area of circle = πr² or 3.14 x radius x radius {3.14 x r²}

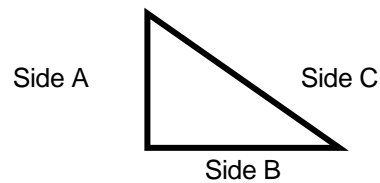


If radius = 20 ft, then: 3.14 x 20 x 20 = 1256 ft²

Diameter (d) = distance across circle going through center

Radius (r) = 1/2 the diameter

Hypotenuse of a triangle (diagonal) A² + B² = C²



If side A = 3 ft, then A² = 9
 If side B = 4 ft, then B² = 16
 then C² = 25
 so C = 5 ft

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TABLE A.2-11 (CONTINUED): AREA CALCULATIONS

Area calculations require only a length and width measurement. It is essential that the length and width be identical units. If the length is in feet, the width must be in feet; if the length is in yards, the width must be in yards.

Basic equivalents:

- 1 foot = 12 inches
- 1 yard = 3 feet
- 1 mile = 5280 feet
- 1 square yard = 9 square feet
- 1 acre = 43,560 square feet
- 1 acre = 4,840 square yards

If the measurement is made in feet, the calculation should be in feet. If a width is in feet and the length in miles, convert the miles to feet before computing the area. If the length multiplies the width, the answer will be in square units of measurement.

Examples: A section of roadway is 32 feet wide and 11.1 miles long. To calculate the square yards in this section:

1) Convert miles to feet.

$$11.1 \text{ miles} \times 5,280 \text{ feet} = 58,608 \text{ feet}$$

2) Calculate area.

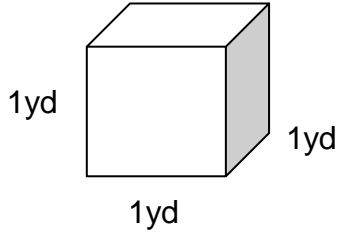
$$58,608 \text{ feet} \times 32 \text{ feet (roadway width)} = 1,875,456 \text{ square feet}$$

3) Convert square feet to square yards (1 yd² = 9 ft²).

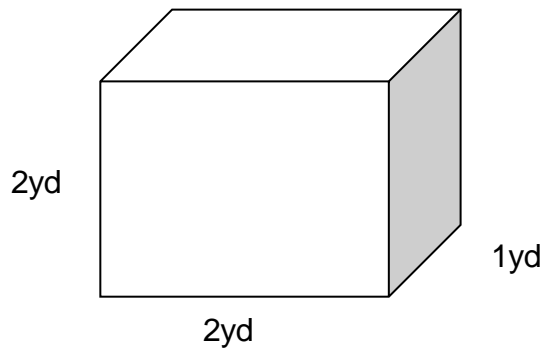
$$1,875,456 \text{ square feet} \div 9 \text{ square feet} = 208,384 \text{ square yards.}$$

TABLE A.2-12A: VOLUME CALCULATIONS (RECTANGULAR SOLID)

Rectangular solid = length \times width \times height {l \times w \times h}

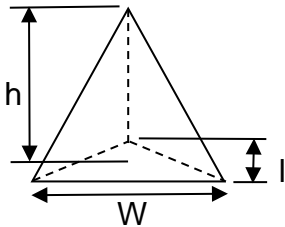


$$1 \text{ yd} \times 1 \text{ yd} \times 1 \text{ yd} = 1 \text{ cu yd } \{y^3\}$$



$$2 \text{ yd} \times 2 \text{ yd} \times 1 \text{ yd} = 4 \text{ cu yd } \{y^3\}$$

Pyramid = $\frac{1}{2}$ width \times length \times $\frac{1}{3}$ height
or $\frac{1}{2} w \times l \times \frac{1}{3} h$



If $w = 6 \text{ yd}$; $l = 4 \text{ yd}$; $h = 6 \text{ yd}$
Then volume = $\frac{1}{2} w \times l \times \frac{1}{3} h$

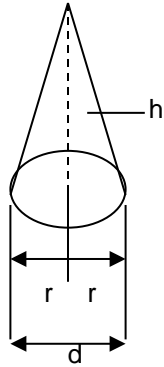
$$3 \times 4 \times 2 = 24 \text{ yd}^3$$

For volume of triangular windrow, refer to Table A.2-12C.

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TABLE A.2-12B: VOLUME CALCULATIONS (CONE AND TRAPEZOIDAL WINDROW)

Cone = Area of base x 1/3 height
 or $\pi r^2 \times 1/3 h$
 $\pi = 3.14$



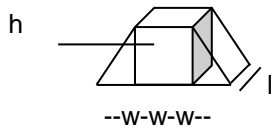
If $r = 3$ yd and $h = 6$ yd

Then Volume = $\pi r^2 \times 1/3 h$ or

$$3.14 \times 3 \times 3 \times 2 = 56.52 \text{ yd}^3$$

Trapezoidal Windrow

When calculating the volume, the trapezoid is broken down into a rectangle in the center and a triangle on each side of it.



Volume of the rectangular part = width x height x length of windrow $\{w \times h \times l\}$

Volume of the triangular parts = $1/2$ width x height x length of windrow x 2 (for 2 triangles) or $1/2 w \times h \times l \times 2$.

If $w = 1$ yd; $h = 1$ yd; $l = 10$ yd, then for the rectangular part $1 \times 1 \times 10 = 10 \text{ yd}^3$ and for the triangular parts $1/2 \times 1 \times 1 \times 10 = 5 \text{ yd}^3$

Times 2 for the two triangles $(5 \times 2) = 10 \text{ yd}^3$

Plus the 10 yd^3 for the rectangle $(10 + 10) = 20 \text{ yd}^3$

LIST OF TABLES

TABLE A.2-12C: VOLUME CALCULATIONS (TRIANGULAR WINDROW)**Triangular Windrow**

Volume calculations require a length, width and depth (height) measurement. It is essential that identical units of measure be used. The primary conversion will be to convert cubic feet to cubic yards. There are 27 cubic feet in 1 cubic yard. Basic volume calculations used in maintenance operations include:

Windrow:

The volume of a windrow can be calculated by considering the windrow as being a triangular or trapezoidal shape. When computing the triangular shaped windrow, the required measurements are width of the base, height, and length of the windrow. Volume is computed using the following formula:

- Volume = 1/2 base X height X length

Volume of triangular-shaped windrows.

Base Width (Feet)	Height (Feet)									
	1.0	1.0	2.0	2.0	3.0	3.0	4.0	4.0	5.0	5.0
	ft ³ /lin ft	yd ³ /lin ft	ft ³ /lin ft	yd ³ /lin ft	ft ³ /lin ft	yd ³ /lin ft	ft ³ /lin ft	yd ³ /lin ft	ft ³ /lin ft	yd ³ /lin ft
1	0.50	0.02	1.00	0.04	1.50	0.06	2.00	0.07	2.50	0.09
2	1.00	0.04	2.00	0.07	3.00	0.11	4.00	0.15	5.00	0.19
3	1.50	0.06	3.00	0.11	4.50	0.17	6.00	0.22	7.50	0.28
4	2.00	0.07	4.00	0.15	6.00	0.22	8.00	0.30	10.00	0.37
5	2.50	0.09	5.00	0.19	7.50	0.28	10.00	0.37	12.50	0.46
6	3.00	0.11	6.0	0.22	9.00	0.33	12.00	0.44	15.00	0.56
7	3.50	0.13	7.00	0.26	10.50	0.39	14.00	0.52	17.50	0.65
8	4.00	0.15	8.00	0.30	12.00	0.44	16.00	0.59	20.00	0.74
9	4.50	0.17	9.00	0.33	13.50	0.50	18.00	0.67	22.50	0.83
10	5.00	0.19	10.00	0.37	15.00	0.56	20.00	0.74	25.00	0.93

These figures are for a windrow that is 1 foot long. Multiply these figures by the length of the windrow.

Example:

To determine the volume of a windrow that has a 6-foot base, 4-foot height and is 210 feet long.

From Table--

6 foot base, 4 foot height = 0.44 yd³/lin. ft. For 210 ft. long, 0.44 X 210 = 92.4 yd³.

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TABLE A.2-13A: CONVERSIONS (LIQUID, LENGTH, AREA AND VOLUME)

Liquid Measure		
1 oz water	=	29.56 milliliters
2 pints	=	1 quart
4 quarts	=	1 gallon
31 1/2 U.S. gallons	=	1 bbl (ordinary)
42 U.S. gallons	=	1 bbl (petroleum)
1 U.S. gallon	=	231 cubic inches
7.48 U.S. gallons	=	1 cubic foot

Linear Measure		
1 inch	=	1/12 foot
12 inches	=	1 foot
36 inches (3 feet)	=	1 yard
5,280 feet	=	1 mile

Square Measure		
144 square inches	=	1 square foot
9 square feet	=	1 square yard
43,560 square feet	=	1 acre
640 acres	=	1 square mile

Cubic Measure		
231 cubic inches	=	1 gallon
1,728 cubic inches	=	1 cubic foot
27 cubic feet	=	1 cubic yard
1 acre foot	=	43,560 cubic feet

Water boils at 212°F at sea level Water freezes at 32°F foot of ice at 32°F = 57.5 Seawater freezes at 27°F.

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TABLE A.2-13B: CONVERSION FACTORS

Miscellaneous Items					
Unit	multiply by	To obtain	Unit	multiply by	To obtain
Acres	43560	Square Feet	Ounces	0.0625	Pounds
Cubic Feet	1728	Cubic Inches	Pounds	16	Ounces
Cubic Feet	7.4805	Gallons	Pounds	16	Ounces
Cubic Inches	0.0005787	Cubic Feet	Square Feet	144	Square Inches
Cubic Yards	27	Cubic Feet	Square Feet	0.1111	Square Yards
Gallons	8	Pints (lie.)	Square Inches	0.0069	Square Feet
Gallons	4	Quarts (lie.)	Square Yards	9	Square Feet
Gallons - Water	8.34	Pounds - Water	Miles	1760	Yards
			Yards	3	Feet
			Yards	36	Inches

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TABLE A.2-14: SIZES OF SIEVE SCREENS

U.S. STANDARD SIEVES STANDARD REQUIREMENT FOR CERTAIN SIZES		
Size of Sieve Designation	Sieve Opening	
	Millimeters	Inches
3 inch	76.2	3.00
2 1/2 inch	63.5	2.5
2 inch	50.8	2.00
1 1/2 inch	38.1	1.50
1 1/4 inch	31.7	1.25
1 inch	25.4	1.00
3/4 inch	19.1	0.750
1/2 inch	12.7	0.500
3/8 inch	9.52	0.375
1/4 inch (No. 3)	6.35	0.250
No. 4	4.76	0.187
No. 8	2.38	0.0937
No. 10	2.00	0.0787
No. 16	1.19	0.0469
No. 20	0.84	0.0331
No. 30	0.59	0.0232
No. 40	0.42	0.0165
No. 50	0.297	0.0117
No. 80	0.177	0.0070
No. 100	0.149	0.0059
No. 200	0.074	0.0029

LIST OF TABLES

TABLE A.2-15: SANDER CALIBRATION

Calibration may be done by several different methods depending on the model and type of spreader box control. For the calibration procedure, refer to the operation manual for the spreader box controller specific to the assigned vehicle. For older mechanical spread boxes use the following method to calibrate:

Calibrating is simply calculating the pounds per mile discharge at various truck speeds by first counting the number of auger or conveyor shaft revolutions per minute, measuring the salt/sand mixture discharged in one revolution, then multiplying the two and finally multiplying the discharge rate by the minutes it takes to travel one mile.

With hopper type spreaders, first calibrate for specific gate openings. Measure from floor of conveyor to edge of gate.

Each spreader should be calibrated individually; even same models can vary widely at the same setting.

Equipment Needed:

- Dairy Scale
- Canvas or bucket
- Chalk, crayon or other marker
- Watch with second hand

Calibration Steps:

1. Warm truck's hydraulic oil to normal operating temperature with spreader system running.
2. Partially load truck with salt/sand mixture.
3. Mark shaft end of auger or conveyor.
4. Dump salt/sand mixture on auger.
5. Rev truck engine to operating RPM.
6. Count number of shaft revolutions per minute at each spreader control setting; record data.
7. Collect salt/sand mixture for one revolution, weight, deducting weight of container. (For greater accuracy, collect salt/sand mixture for several revolutions and divide by the number of turns to get weight for one revolution.)
8. Multiply shaft RPM (column A) by discharge per revolution (column B) to get discharge rate in pounds per minute (column C), then multiply discharge rate by minutes to travel one mile at various truck speeds to get pounds discharged per mile.

Example: At 20 mph with 30-shaft revolutions and 7 lbs discharge,
 $30 \times 7 = 210 \times 3.0 = 630$ lbs per mile.

TABLE A.2-16: CALIBRATION CHART

CALIBRATION CHART												
Agency: _____												
Location: _____												
Truck No. _____ Spreader No. _____												
Date: _____ Calibration By: _____												
Gate Opening: (Hopper Type Spreader)				POUNDS DISCHARGED PER MILE								
	"A"	"B"	"C"	MINUTES TO TRAVEL ONE MILE								
Contr ol Settin g	Shaft RPM (Load ed)	Discharge per revolution (pounds)	Discharge Rate (Lbs/Min)	12.0 0 @ 5 MPH	6.00 @ 10 MPH	4.00 @ 15 MPH	3.00 @ 20 MPH	2.40 @ 25 MPH	2.00 @ 30 MPH	1.71 @ 35 MPH	1.50 @ 40 MPH	1.33 @ 45 MPH
1	<i>30</i>	<i>7</i>	<i>210</i>				<i>630</i>					
2		*										
3		*										
4		*										
5		*										
6		*										
7		*										
8		*										
9		*										
10		*										
11		*										

* -- This weight will remain constant for all control settings.

Numbers shown in italic reflect the example shown on the previous page.

APPENDIX A-3: DISTRICT SNOW AND ICE CONTROL PLANS

DISTRICT I SNOW AND ICE CONTROL PLAN

<http://sharepoint/district1/Manuals/Forms/AllItems.aspx>

DISTRICT II SNOW AND ICE CONTROL PLAN

<http://sharepoint/district2/Shared%20Documents/District%20II%20Snow%20Plan%20revised%209%2017%2013.pdf>

DISTRICT III SNOW AND ICE CONTROL PLAN

<http://sharepoint/District3/Snow%20Plan/MASTER%20Snow%20Plan.pdf>

DISTRICT I SNOW AND ICE CONTROL PLAN

November 2015

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DISTRICT I SNOW AND ICE CONTROL PLAN

INTRODUCTION

Due to Nevada's geographic location, elevation, and topography, snow and ice occur in varying amounts over most of the state. Snow depths and storm frequencies vary from minimal and infrequent at the lower elevations in the south to extreme and frequent at the higher elevations in the north. Nevada's tourism-based economy places added emphasis on snow and ice control because the state's life-blood depends, to great extent, on attracting visitors to Nevada via passenger vehicles.

This plan addresses variations in conditions, such as storm intensity, duration, type of traffic, and traffic volumes. It is not intended to anticipate every condition. It is a guide that outlines methods and procedures that apply District-wide for most situations. Because every storm is different and every situation cannot be anticipated, experience of the crew should be used to modify the plan when necessary. However, any modifications of the plan should be consistent with the intent of the plan.

The District I Snow and Ice Control Plan is a part of the Statewide Snow and Ice Control Plan (Program No. 161.00). It is not intended to replace the Statewide Snow and Ice Control Plan; it provides information specific to the district and individual crews.

ORGANIZATION

The District Engineer, in conjunction with Maintenance Managers, is

responsible for reviewing and modifying the Snow and Ice Control Plan annually. This yearly update is to ensure that the plan provides guidance to District staff that result in a reasonably safe level of service.

All levels of supervisory personnel are responsible for being familiar with the plan, thoroughly preparing prior to storms, and practicing good tactical procedures during storms.

All maintenance employees are responsible for ensuring that they understand procedures, are authorized to operate a particular piece of equipment before proceeding, and conduct themselves in a manner that is a credit to them as individuals as well as to NDOT.

This plan is structured as if the chain of command can always be followed. In actual practice, this is not always possible without a delay in response or a reduction in the level of service provided to the public. With snow and ice control, responsiveness is very important and should not be sacrificed for the sake of following the chain of command. Usually the chain of command can and should be followed without sacrificing the service provided to the public.

TERMINOLOGY

The following terms are used through this document:

Abrasive mixture: A mixture of sand and a deicing chemical, generally salt. The abrasive mixture is prepared before anticipated storms.

Anti-icing: Anti-icing is the snow and ice control practice of preventing the formation or development of bonded snow and ice by timely applications of a

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chemical freezing-point depressant. Moderate and periodic re-applications of the chemical during the storm can continue this effect.

Bare pavement: The condition where the travel lanes are clear of loose snow but may have patches of ice or snow pack that, when treated with chemicals or abrasive mixtures or a combination thereof, may be negotiated safely by the average driver without the need of chains.

Chain or snow tire controls: A mandatory condition where either chains or snow tires are required due to snow or ice on the roadway. Chains or snow tire requirements are placed when, in the judgment of the maintenance supervisor on duty, snow and ice conditions make it difficult for average drivers to control their vehicle when driving in a prudent manner.

Cornice: Overhanging snow forming a partial arch created by the wind.

Crossovers: Turn-through area constructed to allow official vehicles to cross from one side of a divided highway to the opposite side.

Cutting pack: Peeling ice or snow buildup from the pavement, usually done with motor graders.

De-icing: The removal of snow and ice through mechanical and/or chemical means.

End of storm: The condition when the snowstorm or blowing snow is subsiding and the weather is starting to clear.

Heeling: Pushing snow as far left or right as possible.

Pack: A buildup of ice and snow on the road surface.

Pre-op: The pre-operational check is a list of items that must be checked on each vehicle before the vehicle is used.

Run in tandem: The practice of multiple plow units plowing as a team. On non-divided highways, the lead plow starts at the centerline and plows to the right and the following plows also push snow to the right. On divided highways, the lead unit plows left from the centerline and all other trucks or graders plow from the centerline right. Divided highways with narrow median areas or barrier walls should be treated as a non-divided highway.

Sander conveyor: The chain at the bottom of the sander unit that moves the material in the sander to the spinner.

Sand spinner: The part of a sander unit that spreads the abrasive mixture. Spinner speed can be adjusted to regulate how wide material is spread.

Scheduled shift: A specific time period an employee is assigned to work, usually over a number of days. The shift may be any length of time from 8 to 12 hours but may be extended to 16 hours in emergency situations. A callout on

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overtime responding to a specific need is not a scheduled shift. An employee is normally assigned a shift prior to the end of the previous shift.

Slobbers: The snow left on the pavement, after a snow plow or rotary plow has made a pass.

Snow poles: An extension of pipe (plastic, metal, or wood) used to guide snow removal equipment and the public during and after storms. The pole can have one or more reflective stripes at the top to convey information to maintenance personnel.

Spreader calibration: The procedure of calculating the pounds of material discharged per mile at various truck speeds.

White out: A complete lack of visibility due to a snowstorm or blowing snow.

Widening: Pushing snow as far left or right as possible.

LIABILITIES AND PRECAUTIONS

Highway maintenance functions concern everyone. The State of Nevada, through the Department of Transportation, strives to maintain its highways in a reasonably safe condition for the traveling public. As it relates to winter maintenance, NDOT removes snow and ice and applies abrasive mixtures to the roadway to improve driving conditions for the motorist.

When NDOT receives actual notice of a hazardous condition on its highways, the Department will respond and check the alleged hazard. If a hazard exists, it should be corrected or adequate warning should be provided to the motorists.

PURPOSE AND POLICY***PURPOSE***

The purpose of this plan is to define operational procedures for snow and ice control. It defines the levels of service that maintenance will strive to provide. The plan is to help the maintenance crews provide the safest roadway condition reasonably possible with the resources available. Because storms vary dramatically and occur over a variety of roadway and traffic conditions, this plan is intended to be flexible to accommodate the variety of conditions encountered. It is a guide structured to fit average conditions.

POLICY

It is the policy of District I that the orderly movement of traffic during storm conditions takes precedence over all other maintenance operations except the protection of life and property. The District's maintenance organization will strive to maintain the state's highways in such condition that traffic can proceed in a reasonably safe manner during winter storms.

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SNOW PLAN DEVELOPMENT

This snow plan was developed to provide guidance to managers and crews in describing snow and ice control responsibilities. The following items in the snow plan will be reviewed and updated annually:

- Administrative data including names, addresses, and telephone numbers of regular and seasonal personnel
- Crew and shift assignments
- Equipment available for each section
- Map or listing of highway levels of service and priorities
- Emergency and road closures procedures
- Prearranged snow storage sites

FIELD OPERATIONS AND TRAINING

District Administration and Maintenance Managers shall make advance preparations so that the snow removal operations are ready prior to the first storm. District Administration should review snow removal plans with appropriate members of the NHP. Teamwork and cooperation are essential for successful snow removal operations.

The Maintenance Supervisor I should prepare shift schedules for regularly assigned crews, with any temporary or part-time employees included in the schedules. They should review their assigned personnel and make certain all

maintenance workers have or will receive any necessary training before the first storm. All maintenance workers who operate snowplows must have a Class A or B commercial drivers license and be certified in accordance with NDOT TP 1-6-19.

Temporary employees should be hired with enough lead time to ensure they receive all necessary training. They must have a Class A or B commercial drivers license and be certified on snow removal equipment in accordance with NDOT TP 1-6-19. Training should include a review of this plan.

PREPARATION AND ADVANCE PLANNING

Early plans should be made for winter work so that the roadway, equipment operators, snow plowing equipment, sanding equipment, radio equipment, sanding materials and supplies, including signs, flags, barricades, and small tools will all be ready for the first frost or snow storm.

Pre-season preparations for snow and ice control operations should normally be completed by November 1 of each winter season and should include but not be limited to the following:

- Snow plan review and modification
- Materials acquisition and stockpiling
- Equipment operator training
- Roadway preparation

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- Equipment preparation and adjustment
- Request temporary help if necessary and schedule shifts

PUBLIC RELATIONS

To a large extent, success of the snow and ice control program is dependent on how well other agencies and the public understand the program. In order to ensure that a good understanding exists, District Administration should keep other agencies and the public well informed. Both formal and informal meetings with law enforcement agencies and other maintenance organizations are effective. Cooperation and informing the news media can take several forms. Press releases and being available for interviews are effective as is allowing the media to ride in plow trucks during severe storms. Arrangements for riding in plow trucks should be made through District Administration.

All news media contacts must be reported to the district as soon as possible after the contact. Department policy requires the district to notify the director's office of news media contacts by telephone followed by a completed "Media Contact Form".

WEATHER FORECASTS

Because weather forecasts play such an important role in winter maintenance activities, the National Weather Service

Web site can be reviewed to provide updated forecasts. Other contracted weather services can provide more tailored forecasts to directly fit department needs. Timely forecasts can provide reasonably accurate predictions on:

- Timing when a storm will hit a specific area
- Type of storm predicted (snow, rain, winds, etc.)
- Intensity and amount of snow or rain
- Temperature pattern of the storm
- General progress of the storm
- Elevations that will be affected

Timely forecasts can also be helpful in scheduling employees and equipment.

In addition to weather forecasts, supervisors should pay special attention to pavement temperatures, RWIS data, and the direction that the pavement temperatures are trending, whether they are rising or dropping.

This information should be used for scheduling crews prior to a storm's arrival. Proper use of this information results in less overtime and better utilization of resources. At the beginning of each season, arrangements should be made with the National Weather Service concerning timing of calls, special information, and individuals to contact.

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**CHAIN OR SNOW TIRE
REQUIREMENTS**

"Chains or Snow Tires Required" signs are posted when, in the judgment of the supervisor on duty, snow or ice conditions exist that make it difficult for the average driver to control a vehicle.

In areas of little or infrequent snowfall, particularly in the Las Vegas urban area, posting chain or snow tire restrictions for safe travel may not be reasonable for the average-equipped driver. In those areas known as potential problem sites, plans for road closure may be noted in the crew level plan.

EMERGENCIES***OPERATIONS***

The Maintenance Supervisor I shall notify the Maintenance Supervisor II whenever it becomes apparent that he will be unable to keep his highways open without help. The Maintenance Supervisor II will arrange to send supplementary equipment and work force as available for temporary assistance. The Maintenance Manager should be contacted for possible assistance from other areas if the Maintenance Supervisor II does not have adequate resources in his area. If help is not available and it becomes necessary to close a road, the District I Traffic Operations Center shall be notified.

PROCEDURES

Any situation posing an immediate hazard for personal injury or property damage should be treated as an emergency. During the winter, situations such as traffic accidents, hazardous material spills, and abandoned vehicles become more critical due to storms and adverse road conditions. In addition, accumulating snow or ice, as well as poor visibility, during storms presents increased potential for emergencies.

***REQUESTING REMOVAL OF
VEHICLE FROM RIGHT-OF-WAY***

NDOT maintenance employees can request removal of private vehicles from the roadway. Nevada Revised Statutes (NRS) authorize the NHP to have vehicles towed from the highway right-of-way.

- NRS 487.281: States that a person shall not abandon a vehicle upon any public highway or road.
- NRS 484.397: Authorizes police officers to remove certain vehicles in certain circumstances. When a vehicle is unattended or disabled, an officer can immediately have it towed if it is an obstruction to traffic or it interferes with the normal flow of traffic. This law also provides for the towing of vehicles that have been abandoned for 24 hours on

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any freeway, US route, or primary arterial. On other routes, vehicles can be towed after 72 hours.

Any NDOT employee can call Road Operations and request the tow of a vehicle based on one of the following criteria:

1. The abandoned or disabled vehicle is encroaching into the travel lane (includes a vehicle parked on the edge line).
2. A disabled or abandoned vehicle is parked on or under a bridge structure, in close proximity to the tunnels, or otherwise looks suspicious.
3. Employees are **actively** plowing snow and a vehicle is left where it could be damaged by snow removal operations or is hampering our ability to clear the roadway of snow and ice.

Approval of a Maintenance Supervisor II or higher is required for requesting a tow for the following:

1. A winter storm is predicted and an abandoned vehicle is expected to pose a problem for snow removal operations.
2. A vehicle has been parked in the right-of-way for over 24 hours on a major route or over 72 hours on a secondary route.

MATERIALS**ACQUISITION**

Maintenance Supervisors I and II should review material needs to ensure that required materials for the snow removal operations are either delivered or will be delivered in sufficient quantities and at appropriate times to ensure that adequate material will be available for each storm.

In May of each year, a list of stockpile locations and quantities of abrasive mixtures and de-icing chemicals should be prepared by the Maintenance Manager from input received from the Maintenance Supervisor IIs. These requests are processed by the Headquarters Maintenance Office and the Equipment Division for forwarding to State Purchasing. State Purchasing proceeds with advertising and awarding contracts for the materials requested.

Upon receipt of the listing containing the successful material suppliers, orders are placed with the low bidders for the necessary materials.

STORAGE

Proper location of stockpiles is critical to an efficient snow removal operation. The location of stockpile sites should minimize nonproductive travel time and be situated to maximize use by multiple crews. Stockpile sites should be located to minimize possible environmental damage and not create a nuisance to adjoining properties. Stockpiles must be

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located in areas where there is suitable access off and on the highway for NDOT vehicles. Salt or abrasive mixtures should be stored in storage buildings wherever possible. When buildings are not available, extra attention should be given to drainage and prohibiting salt from migrating into watercourses or impacting the environment.

SECIFICATIONS**SAND**

Sand for snow and ice control shall meet Specification D for de-icing sand. Specification B may be substituted for Specification D material in some areas of the District.

As sand is delivered, it should be tested in conformance with the NDOT Standard Specifications for Road and Bridge Construction to ensure it meets specifications before accepting or using any of the material. Testing should be performed every 1,000 tons for quality assurance purposes.

SALT

De-icing salt shall meet the specifications as set forth in the annual open-term contract (OTC) or bid specifications.

LOW-MOISTURE MINERALIZED DE-ICERS

A mineralized de-icing product is now available to be purchased on OTC. This product is a chloride-based mineral material that works at lower temperatures than normal sodium chloride. It is applied to the roadway via the truck sander, just like salt-sand mixes.

Mineralized de-icers have been shown to be advantageous when temperatures fall below the working range of sodium chloride. With this product, acceptable de-icing has been achieved with pavement temperatures as low as 5°F. This de-icing product is also especially helpful in urban areas where air quality and dust caused from sand application are issues of concern.

De-icer materials shall meet the specifications as set forth in the annual OTC or bid specifications.

Sieve Size	Specification D % by Weight Passing Sieve	Specification B % by Weight Passing Sieve
No. 4	93-100	90-100
No. 8	40-80	---
No. 16	15-60	35-75
No. 50	0-20	---
No. 100	0-4	---
No. 200	0-2.5	0-3

Hardness/durability index must be greater than 75.

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ANTI-ICING PRODUCTS

Anti-icing materials are available that may provide an improved level of service or result in less environmental damage.

Anti-icing materials shall meet the specifications as set forth in the annual OTC or bid specifications.

SNOW POLES

Refer to the Maintenance Management System Manual of Instructions or the MMS System for the list of standard materials/supplies used for this task. Snow poles should be of an approved type with one to three bands of blue, white or orange reflective sheeting for delineation. In some areas it may be necessary to use longer markers. Reflective sheeting should be attached in a pattern which conforms to the District Snow and Ice Control Plan.

PROTECTING RAISED PAVEMENT MARKINGS

Raised pavement markers are used on high volume routes in areas that experience infrequent, light snowfall. Since the raised pavement markings are placed for increased visibility and are very expensive, extreme care must be exercised while plowing so they are not damaged. In order to protect the raised pavement markings from damage, emphasis should be placed on applying abrasives before snow begins to stick to the pavement. Use of abrasives to melt

the snow before it begins to accumulate is preferred over plowing. If plowing is needed, it should be next to centerlines or edge markings without allowing the plow to hit the raised pavement markings. Unfortunately this leaves an accumulation of snow along the lane lines but it protects the markings from damage and costly replacement.

ANTI-ICING AND DE-ICING***ANTI-ICING***

Anti-icing is defined as the snow and ice control practice of preventing the formation or development of bonded snow and ice by timely applications of a chemical freezing-point depressant. District I typically uses a 23% solution of sodium chloride in its anti-icing efforts. Considerations in determining application rates should include the following:

- Pavement surface texture
- Bridges, tunnels, and shaded areas
- Predicted temperature, humidity, and storm conditions

Observed residual chemical on the roadway from previous applications should also be a factor in the decision process.

Applicators should shut off spraying in advance of intersections and halfway down freeway off ramps in order to keep traffic from over tracking the material

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into the intersection and creating a possible slick condition.

Speeds when applying anti-icers should not exceed 45 MPH. Applicators should restrict spray to one lane at a time.

It is industry practice to apply anti-icing chemicals well into the storm, except when conditions of hard snow or ice pack exist. Supervisors should evaluate the effectiveness of this practice and use their best judgment when determining the usefulness of this course of action.

APPLICATION OF LIQUID ANTI-ICERS AND DE-ICERS

NDOT uses a self-contained tanker unit with a pump to apply anti-icing chemical to the roadway.

The purpose of spreading an anti-icing material for winter road maintenance is to maintain an orderly flow of traffic during adverse weather conditions and to ensure that the road is as safe as possible under the circumstances. Application rates of anti-icing chemical depend on surface conditions of pavement, anticipated winter storm conditions, and observed residual chemical left on the roadway from previous applications. Anti-icing chemicals are used to:

- Prevent the formation of a bond between the snow pack and the road surface
- Melt fresh snow as it falls

- Melt compacted snow that remains after plowing
- Retard the formation of ice

Operators should maintain speeds that do not endanger life or property but provide a reasonably prompt service. An appropriate speed for rural low-volume road with 2 inches of loose snow is considerably different than an appropriate speed for a busy urban street with an ice pack. **OPERATORS SHOULD NEVER EXCEED A SPEED THAT IS SAFE FOR CONDITIONS.**

The initial application should be made prior to the predicted winter storm event. The mixture is brine that, under most conditions, will keep snow or ice from bonding to the pavement. Subsequent applications will usually keep the snow in a mealy condition and prevent a pack from forming.

When the slush begins to stiffen, it is time to plow and reapply additional de-icing material.

Anti-icing chemical application is generally necessary on bridges long before road surfaces. Because cold air reaches the top and bottom surfaces of a bridge, they cool off much faster than the remainder of the roadway surface. Because of low temperatures and high humidity, bridge decks may ice up when there is little or no precipitation.

Equipment used for hauling or handling these chemicals should be washed as soon as possible after each storm to

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prevent corrosion. Washing should not be done where runoff could affect watercourses or impact the environment. NDOT wash racks should be used where available.

When applying anti-/de-icing chemicals, operators must pay close attention to traffic and, if necessary, shut off the nozzles to keep from spraying motorists' vehicles.

ABRASIVE MIXTURES**MIXING**

When practical, abrasive mixtures should be mixed and placed in the stockpiles prior to November 1.

Materials mixed after this date will potentially contain excessive moisture and present more handling problems than material that is mixed before winter storms. The salt to sand mix ratio can vary, depending on each sub-district's needs.

APPLICATION

Abrasive mixtures shall only be applied as necessary and when roadway conditions indicate satisfactory results will occur. Snow removal and abrasive mixture application shall be closely monitored to prevent loss of abrasive mixtures by plowing.

Spinner speed settings are critical. A spinner that revolves too fast will throw material over an excessively wide area, which has two detrimental effects: it wastes material, and material that is

cast too wide may damage vehicles behind the sand truck or in the adjacent lane. Two methods are available for reducing the distance that the spinner casts material: reducing the speed of the spinner and adjusting the deflectors on the spinner. Truck speed should not exceed 35 MPH when applying abrasive mixtures to the roadway.

A strong wind blowing across a street or highway can cause the abrasive mixture to drift as it comes out of the spreader unit, pushing it onto a shoulder or into a gutter. Operators need to be aware of these situations and "play the wind" to place the abrasive mixture where it will do the most good.

Plowing and sanding operations should be timed to allow the abrasive mixture to be effective. Plowing the abrasive mixture off the pavement before it is effective wastes material and increases the cost of snow removal. Knowing when to plow and reapply the abrasive mixture is an important factor that the operators should be aware of. Watching the snow that is being kicked out behind the vehicle tires will give the operator a good idea when to plow and reapply the abrasive mixture.

When applying abrasive mixtures in tandem, adequate distance should be maintained between trucks to allow traffic to pass the abrasive mixture application operation. Operators will pay close attention to oncoming traffic and shut off or reduce spinner speed so as not to cast the abrasive mixtures toward the motorists' vehicles, thereby

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damaging them from the abrasive mixtures being distributed.

EQUIPMENT**GENERAL**

In addition to the routine equipment operation training, employees will be trained on the use of ground speed-oriented sander controls. Operational use of the controls will be stressed so the rate of application of material will be consistent even when the speed of the sander truck varies.

PREPARATION AND ADJUSTMENT

Maintenance Supervisors I and II should review the list of available equipment to determine what plows or sanders are available and what condition they are in. Ground-speed-controlled sanders and anti-icing units should be calibrated. Equipment needing repairs should be referred to the repair shop in priority order. Communication equipment should be reviewed to ensure it is in good condition.

CARE AND OPERATION

Maintenance personnel shall check their assigned equipment at the beginning of each shift. Equipment shall be inspected, lubricated, and serviced at the end of each storm. The items listed below should be checked at the beginning or end of the shift.

PERSONAL EQUIPMENT

Because of varied and unpredictable circumstances that occur during the winter season, each employee should have the following personal equipment with them when they begin their shift

SNOW PLOWING**GENERAL**

Snowplows should not leave the paved portion of the roadway and plow unpaved shoulders in order to widen out plowed areas. If drifts need to be pushed back, it should be done only with loaders, motor graders.

Plow operators also will be cautioned about plowing snow at bridges and overpasses. They should reduce plowing speed so snow will not be thrown over the sides of the structures.

PLOWING WITH PUSH PLOWS

Because plows are throwing snow with roadway debris mixed in with the snow, truck-operating speed is very important. Operators should maintain a speed that does not endanger life or property but provides a reasonably prompt service. An appropriate speed for a low-volume rural road with 2 inches of loose snow is considerably different than an appropriate speed for a busy urban street covered with 4 inches of chunky slush.

Speeds should be further reduced to eliminate the possibility of causing

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damage to signs, vehicles, or other facilities along the highway. When plowing on bridges, speed should be decreased so that snow or ice is not pushed over the side of the structure onto traffic or pedestrians below.

OPERATIONS SHOULD NEVER EXCEED A SPEED THAT IS SAFE FOR CONDITIONS.

Trucks with plow mounted will operate with overhead warning light **on**, due to the vehicle being over width. Rear warning lights should only be used while spreading material or in times of low visibility.

Under normal circumstances, snow removal equipment should not be operated against opposing traffic unless traffic is restricted from the area under a traffic control plan.

When plowing on a **two-lane highway**, always plow starting at the center of the roadway and plow to the right.

When plowing on a **four-lane highway**, if possible, plow in tandem.

On **non-divided highways or divided highways with narrow medians or barrier rails**, the lead plow starts at centerline and plows to the right. The following plow also plows right.

On **divided highways with medians wide enough to accommodate snow storage**, the lead plow starts on the left and plows left. The following plow overlaps the first plow's cut and plows right. Any additional plows also plow right.

When plowing in the city **where there is a curb, gutter, and sidewalk**, plowing to the right should be done very carefully so that additional snow is not stacked on the sidewalk. In some cases, depending on anticipated accumulation, it may be necessary to plow all snow to the center of the roadway and come back later to remove it. Before plowing to the center of the street, it is necessary that the operator check with his/her supervisor.

Normally when plowing in tandem, adequate distance should be maintained between trucks to allow traffic to pass the plowing operation.

PLOWING WITH WING PLOWS

Wing plows offer dramatically increased productivity from a single truck and operator. However, special considerations and training need to be exercised when plowing with a wing plow.

Wing plows should never be used to plow up against guardrail sections. No one should operate a wing plow without being fully trained in the proper uses and precautions necessary to use them safely and effectively.

Rules for wing plow operation are as follows:

- The maximum speed of a snowplow equipped with a wing plow is 35 MPH while plowing and 55 MPH or lower when raised.

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- Inspection of the plow blades and plow pins must be made periodically throughout the shift.
- Safety warning lights will be operational whenever the snowplows are attached to the truck.
- Under no circumstances will the main snowplow be used to plow snow to the left and the wing plow to the right.
- When the snowplow is parked, the main plow will be lowered to the ground with the wing plow in the stowed secured position. Make sure there is enough clearance when lowering the wing plow.
- If the visibility is poor or the situation seems unsafe, do not use the wing plow.
- Be sure of your clearance.
- Do not use wing plows on narrow summits or sections of road where guardrail has been installed.
- Do not blow snow into avalanche or high-wind-drift areas.
- Be aware of roadside objects (signs, houses, parked cars, power lines, and other utilities) and take appropriate steps to prevent damage from blowing snow.
- If possible, rotary plowing should be performed when traffic is light.

SPECIAL PLOWING AND SPREADING CONSIDERATIONS***BRIDGES AND OVERPASSES***

As the cold air reaches both the top and bottom surfaces of bridges and overpasses, they will tend to freeze up long before the road surfaces. Because of this occurrence, they should receive early and continued attention throughout the storm. Bridge decks may ice up or frost over even when there is no precipitation and will need to be treated with abrasive mixtures. Operators may need to increase application rates if conditions are found to require more abrasive mixtures or chemicals.

Plow operators should reduce their speed when plowing snow on a bridge so that snow and chunks of ice will not be thrown over the sides of the bridge, which could cause considerable damage to anything below the bridge. Areas such as bridges and overpasses require special consideration. Bridge joints can cause damage to plows if they

PLOWING WITH ROTARY PLOWS

When operating rotary plows, consideration should be given to the following items:

- Do not blow snow across travel lanes unless no other acceptable alternative exists. When blowing snow across travel lanes, be alert for traffic and shut down the mill when possible for traffic.

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are struck; extra caution should be used when crossing them.

RAILROAD CROSSINGS

Before crossing the tracks, snowplows shall come to a stop and adjust the plow to clear any obstructions and then carefully cross the tracks before resuming regular plowing. No windrow of snow should be left on railroad grade crossings. When removing snow from railroad grade crossings, care should be taken to ensure that ice, snow, abrasive mixtures, or other material is not deposited and left on the railroad tracks. This procedure will help prevent serious damage to the tracks and plowing equipment.

CATTLE GUARDS

When plowing across cattle guards, precautions should be taken to ensure that ice or snow is not allowed to build up on the approach to the cattle guard, the cattle guard, or the exit from the cattle guard. Before crossing a cattle guard, snowplows should stop 5 to 10 feet prior to the cattle guard, raise plow 2 to 3 inches, and then carefully plow across the cattle guard.

WIDENING AND CLEANUP

As soon as possible after a storm, the crew will concentrate on widening shoulders and other areas where snow may be stored during subsequent storms. Driveways and mailbox turnouts that might have been plugged by earlier

snow removal activities will also be cleared.

WHITE OUT CONDITIONS

During white out conditions, the employee must make a sound judgmental decision whether the cause of the white out is due to a heavy winter storm or surface conditions (e.g. – ground blizzard).

If it is determined that a ground blizzard is the cause and is in an area known to produce this type of condition for a short distance up to ½ mile, the employee should make an attempt to continue through the known area in a safe manner. Should the known area be of a distance greater than ½ mile, the employee should proceed as if in a heavy winter storm event.

If a heavy winter storm has caused the condition of visibility to be minimized to a distance of 100 ft or less, the employee may find a safe area to pull off of the roadway (e.g. – Interstate on / off ramp) and using good judgment, allow minimal time for the conditions to improve. If it is not possible to find a safe place to get off of the roadway, the operator should apply an adequate amount of sand before coming to a stop. This should aid traffic in slowing and being able to stop. Should either of the two events occur, the employee must notify Traffic Operations Center and their immediate Supervisor. It is suggested that plowing in tandem in these conditions may aide in the ability to overcome the situation and continue

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on, as in most cases the rear plow driver usually has better visibility and may assist the lead plow driver.

CLEANING DRAINAGE STRUCTURES

Drainage structures should be pre-marked before the winter season so they can be located during and after storms. It is important that roadway drains and drop inlets be kept open to allow melting ice and snow to run off the roadway. Accumulations of water with falling temperatures may cause inlets to freeze, thus causing an additional hazard to the traffic.

Maintenance employees should be aware of drainage facilities and should make sure they are open to eliminate areas of water accumulating or water running across the roadway. Water from melted snow can create a greater hazard than the original storm, especially if it freezes.

SNOW STORAGE AND DISPOSAL

The usual method of snow storage is to push the snow off the roadway or onto a median area. Snow storage, especially in the metropolitan areas, is a serious problem during periods of heavy snow accumulation. Consideration should be given to reviewing areas for snow storage at the beginning of each winter season.

District management and field personnel should agree upon sites where snow can be disposed of if it has to be hauled from the roadway. In establishing

stockpile areas, right-of-way personnel may need to be contacted to determine limits and any special conditions that may exist. Before stockpiling snow on private property, an agreement delineating all conditions and responsibilities must be executed. Because of the chemicals used in snow and ice removal activities, locations of snow storage areas should be evaluated for possible environmental conflicts.

In areas where the snow cannot be blown or plowed off the roadway and there is sufficient roadway width, snow may be plowed to the center of the roadway for later removal. When plowing snow to the center of the roadway, consideration must be given to providing openings for left-turn and cross-traffic.

Two methods of clearing snow windrows from the center of the roadway will be permitted:

1. Material may be hauled from the center of the roadway to pre-designated storage or disposal areas. When practical, hauling should be done at night due to reduced traffic volumes.
2. If temperatures warm sufficiently to promote melting after a storm subside, the windrows may be re-spread as a thin layer on the traveled way and allowed to melt and dissipate during the daytime. Pavement temperatures should be watched closely during these operations.

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Private property owners may clear the snow from driveways within the right-of-way and deposit the snow on the right-of-way not being used by vehicles or pedestrians. No snow from other portions of private property shall be deposited on the right-of-way.

TRAFFIC CONTROL

Traffic control during the winter season has to be emphasized and given a high priority to protect the maintenance workers as well as provide safe passage for the traveling public on the facility. Because of a variety of climatic conditions (i.e., snow, rain, blowing snow, blowing dust, icy and snow packed roadways, etc.), it is more difficult for the maintenance employees to immediately have all the required signs that would normally be used for road closures, lane closures, etc.

Maintenance personnel must always be alert to the conditions and use other items that are immediately available to warn the traveling public of any incident that would cause them to deviate from their normal course of travel. Most incidents during the winter are temporary in nature, and maintenance workers can use the following devices to warn the public:

- Flares or red warning triangles
- Advance warning vehicle (a truck with warning lights in advance of the incident)

- A barrier vehicle (an unoccupied truck parked in advance of the incident, with warning lights)

The Maintenance Supervisor I should give each employee as much advance notice as possible of shift changes to avoid unnecessarily fatigued employees.

ROAD CLOSURES

Road closures due to floods, blowing snow, and dust usually occur at predictable locations. New maintenance employees should be made aware of these areas so they will be informed and be in a better position to handle an emergency should one arise. In locations where storms or other conditions may be expected to disrupt traffic, emergency signs and barricades should be on hand and possible detour routes should be investigated at the beginning of each winter season

RADIO PROCEDURES

During the winter months, maintenance personnel rely on the two-way radio communications system extensively. With the many calls for abrasive mixtures and assistance to specific areas, disabled vehicles, etc., the two-way radio is the most efficient way to communicate with other workers and the Traffic Operations Center.

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LEVEL OF SERVICE

The District's snow and ice control operations are limited by resources (budget limitations on personnel, equipment and materials) available for winter maintenance operations. Due to these limited resources, five levels of service have been established for the district's snow and ice plan.

Factors considered when establishing the level of service for a specific route include:

- Safety.
- Average daily traffic (ADT).
- Commuter routes.
- Availability of alternative routes.
- Public interest and concern.
- Potential economic impact.
- Consequence of not providing a higher level of service.
- Available resources.

Level of Service 'A'

Snow should be removed continuously and abrasives should be used as needed during a storm to keep the roads open for traffic and provide a good surface on which to operate. When visibility or avalanche danger makes

conditions too hazardous for safe plowing or abrasive application, operations will cease until conditions improve. When these conditions occur, the road should be closed to traffic. After the storm has subsided, snow will be removed and abrasives applied until a bare pavement condition exists. Patrols will be established for those areas where conditions require surveillance of the roadway for ice, rocks, avalanche or snow.

An abrasive mixture should be applied when conditions warrant.

Level of Service 'B'

This level is the same as "A" except when personnel and equipment are not sufficient to maintain an "A" level of service for both "A" and "B" routes, then "A" routes take precedence. This may require shifting personnel from "B" routes in one section to "A" routes in another section. Level of Service "B" routes may experience longer periods of snow pack and chain or snow tire requirements while the "A" routes are being maintained.

Level of Service 'C'

Snow should be removed during storms to keep roads open for traffic. Once a roadway is open and critical areas are sanded, snowpack left by truck plows will be removed only on scheduled shifts. Patrols may be used for applying abrasives to selected areas and where

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conditions require checking for ice, rocks, avalanche or snow.

Level of Service 'D'

Snow should be removed only during scheduled shifts, except some routes that may be plowed on overtime when the District Engineer determines there is sufficient reason for plowing. These routes may be allowed to close during moderate-to-heavy snowstorms.

Roads allowed to close temporarily will be reopened after the storm and during scheduled shifts as personnel and equipment become available. Once open, the road should be treated with an abrasive mixture as deemed necessary by the supervisor.

Level of Service 'E'

These routes are allowed to close during the winter and are reopened in the spring when the likelihood of a major storm has been reduced. Currently there are no routes in any of the 3 Districts assigned a level of service classification "E."

DISTRICT I CREWS

The Las Vegas maintenance area includes the following crews:

Crew 122 Alamo
 Crew 151 Las Vegas
 Crew 124 Glendale
 Crew 152 Las Vegas
 Crew 126 Mountain Springs
 Crew 153 Las Vegas

Crew 127 Searchlight
 Crew 154 Las Vegas
 Crew 129 Mount Charleston
 Crew 157 Las Vegas
 Crew 150 Las Vegas
 Crew 178 Panaca

The Tonopah maintenance area includes the following crews:

Crew 123 Beatty
 Crew 173 Blue Jay
 Crew 170 Tonopah
 Crew 175 Goldfield
 Crew 171 Tonopah
 Crew 176 Mina
 Crew 172 Big Smoky
 Crew 177
 Montgomery

LAS VEGAS MAINTENANCE AREA**Las Vegas Maintenance Area - Level of Service 'A' Routes**

<u>Route</u>	<u>Crew</u>	<u>Description</u>
I-15	124, 151, 152	From the Nevada/California state line to the Nevada/Arizona state line
I-215	153	From I-15 eastward toward Henderson.
SR-171	153	Airport connector from I-215 to tunnel.

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<u>Route</u>	<u>Crew</u>	<u>Description</u>	<u>Route</u>	<u>Crew</u>	<u>Description</u>
US-95	150, 151	(I-515/Expressway) from the junction at north end of Rancho Road to the end expressway south of Henderson.	SR- 319	178	From the US-93 junction at Panaca to the Nevada/Utah state line.
US-93	150	(Boulder Highway) from the junction of US 95 and R/R Pass to M.P. 1.61.	SR- 318	122	Sunnyside Road from SR-375 north 43.12 miles.
Las Vegas Maintenance Area - Level of Service 'B' Routes					
<u>Route</u>	<u>Crew</u>	<u>Description</u>	SR- 160	126, 152	Pahrump Valley Road from the junction of SR-604 to US-95.
US-93	124, 122, 178	From SR-604 at Garnet to the District I-III boundary at LN- WP line.	SR- 157	129	Charleston Peak Road from Charleston Peak to the junction of US- 95.
SR- 582	150	From junction of US- 95 and Wagon Wheel to junction of Fremont and 7th street.	SR- 156	129	From Ski Run to the junction of US-95.
SR- 582	150	From junction of US- 95 and Wagon Wheel to junction of Fremont and 7th street.	SR- 158	129	Deer Creek Road from the junction of SR-157 to the junction of SR-156.
US-95	127	From California/Nevada state line to the junction of US 93 at R/R Pass.	SR- 159	126, 153	Red Rock Road from SR-160 to the Red Rock Visitor Center Road.
US-95	151, 129	From the junction at the north end of Rancho Road to the junction of SR-160.	SR- 321	178	Pioche Road from US-93 southeast of Pioche to US-93 northwest of Pioche.

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<u>Route</u>	<u>Crew</u>	<u>Description</u>	<u>Route</u>	<u>Crew</u>	<u>Description</u>
SR-604	151, 152	From SR-161 to the Nellis Air Force Base.	SR-742	124	From the junction of SR-170 to Bunkerville.
SR-163	127	Laughlin Road from US-95 to the Nevada/Arizona state line.	SR-160	126	Pahrump Valley Road from 14.55 miles north Clark/Nye county line to US-95.
SR-169	124	From the boundary of Lake Mead Recreation Area to the Logandale/Overton Interchange.	SR-372	126	From the Nevada/California state line to the junction of SR-160.
SR-170	124	Bunkerville Road from the junction of I-15 to Junction SR-144.	SR-146	150	From I-15 to the west boundary of the Lake Recreation Area.
SR-144	124	From the West Mesquite Interchange to the East Mesquite Interchange.	SR-562	150	Sunset Road from SR-604 to SR-582.
Las Vegas Maintenance Area - Level of Service 'C' Routes			SR-592	150	Flamingo Road from Rainbow Boulevard to the Boulder Highway.
<u>Route</u>	<u>Crew</u>	<u>Description</u>	SR-573	151	Craig Road from US-95 (expressway) to Decatur and from Donovan to Las Vegas Blvd.
SR-168	124	From the Glendale/Moapa Interchange to the junction at US-93.	SR-595	151, 152	Rainbow Boulevard from SR-160 (Blue Diamond Road) to Silver Stream Rd.

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<u>Route</u>	<u>Crew</u>	<u>Description</u>	<u>Route</u>	<u>Crew</u>	<u>Description</u>
SR-599	151	Rancho Road from US-95 to US-95 (Tonopah Highway).	SR-578	153	Washington Ave. from 235' west of "D" Street to Las Vegas Blvd.
SR-602	151	Casino Center Drive from Stewart Avenue to Bonanza Road.	SR-579	153	Bonanza Road from Rancho Road to Las Vegas Blvd.
SR-610	151	Lamb Boulevard from the junction of SR-604 to the junction of I-15.	SR-589	153	Sahara Ave. from Rainbow Blvd. to Nellis Blvd.
SR-161	152	Goodsprings Road from Goodsprings to the junction of SR-604.	SR-596	153	Jones Blvd. from Tropicana Ave. to Rancho Road.
SR-593	152	Tropicana Avenue from Industrial Road to the Boulder Highway.	SR-601	153	Main Street from the junction of SR-604 at Foremaster Lane to the junction of SR-604 at St. Louis.
SR-147	153	Lake Mead Boulevard from the west R/W of I-15 to the boundary of the Lake Mead Recreation Area.	SR-605	153	Paradise Road from Tropicana Ave. to Sahara Ave.
SR-159	153	Charleston Blvd. from the Red Rock Visitors Center Rd. to Nellis Blvd.	SR-607	153	Eastern/Civic Center from Sahara Ave. to Cheyenne Ave.
SR-574	153	Cheyenne Blvd. from US-95 (expressway) to Nellis Blvd.	SR-612	153	Nellis Blvd. from Tropicana Ave. to Las Vegas Blvd.
			SR-317	178	Elgin Road (Rainbow Canyon) from the junction of

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<u>Route</u>	<u>Crew</u>	<u>Description</u>	<u>Route</u>	<u>Crew</u>	<u>Description</u>
		US-93 south to Elgin.	SP-54	124	Valley of Fire State Park 10.47 miles from west boundary to east boundary.
SR-320	178	Caselton Mine Road from US-93 south of Pioche to US-93 north of Pioche.	SP-54B	124	Valley of Fire Resident Road 0.43 miles NW.
SR-322	178	Ursine Road from SR-321 in Pioche to 1 mile south of Ursine.	SP-55	124	Valley of Fire White Domes Road 6.93 miles north to end pavement.
Las Vegas Maintenance Area - Level of Service 'D' Routes			SP-56	124	Valley of Fire Atlatl Rock road 1.08 miles to end of pavement.
SR-375	122	From Nye/Lincoln county line to SR-318 junction near Hiko.	SP-52	126	Spring Mountain Ranch State Park 1.11 miles west to Visitor Center.
SR-604	124, 151	5.81 miles north of Garnet Interchange to Nellis AFB.	SP-53	151	Floyd Lamb State Park 1.56 miles southeast to end of pavement.
SR-164	127	Nipton Road from Nevada/California state line to the junction of US-95.	SP-12	178	Cathedral Gorge State Park 1.72 miles north to fee box.
SR-165	127	Nelson Road from the junction of US-95 to 11 miles east.	SP-12B	178	Cathedral Gorge Campground Road 0.84
SR-604	152	From the SR-161 to SR-601.			

GENERAL INFORMATION

<u>Route</u>	<u>Crew</u>	<u>Description</u>
SP-13	178	Cathedral Gorge North Park Road 0.39 miles to parking lot.
SP-15	178	Echo Canyon State Park 1.69 miles south boundary to north boundary.

Major frontage roads and interchange ramps have been assigned a level of service "C". Minor frontage roads or interchange ramps have been assigned a level of service of "D".

Las Vegas Maintenance Area - Level of Service 'E' Routes

The Las Vegas maintenance area has no roads assigned as level of service "E".

GENERAL INFORMATION

LAS VEGAS MAINTENANCE AREA - CREW SNOW PLANS

Individual Snow and Ice Control Plans for crews in the Las Vegas maintenance area are included in this section. Each crew plan establishes specific procedures and emphasis areas for snow and ice removal for that crew. The crew plans augment the Statewide and District Snow and Ice Control Plans.

Crew 122 - Alamo Maintenance*Equipment and Materials*

Salt/sand is routinely stored at two locations in this area. One stockpile is located at the junction of SR-375 with SR-318, the other is at the Alamo yard. Portable signs used for posting snow tire or chain restrictions along with other traffic control signs and devices are kept at the Alamo Maintenance Station.

Operations

This maintenance area receives infrequent storms with minimal snowfall. For this reason few pieces of snow removal equipment are available on site. Should this area receive a substantial storm, help may be available from crew 122 or the Las Vegas crews. Since a routine method of operation has not been established, the maintenance supervisor should organize the operation based on field conditions and available equipment and personnel.

Plowing (push plows)

During storms plows may work in tandem on both US-93 and SR-318. When these routes are cleared, plows may be sent to SR-375, while others continue to monitor the two higher levels of service routes. If the roads within this crew's jurisdiction are plowed and sanded, a portion of the crew may be available to assist crew 178 to the north and crew 124 to the south. During colder weather or after initial storm accumulations, a motor grader may be needed to cut heavy snow pack.

Priorities for Sanding

- Junction area US-93/SR-318
- SR-318 MP 24-26 (White River Narrows area)
- SR-375 (Hancock and Coyote summit areas)

Special Considerations

The Alamo Maintenance area shares its road condition recording area with crew 178 to the north and crew 124 to the south. Because of this it is important for the supervisors to work closely in communicating their respective road or weather conditions and updating the recording as needed.

GENERAL INFORMATION

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
US-93	B	From the CL/LN county line to Pahrock Summit.
SR-318	B	Sunnyside Road from SR-375 north 43.12 miles.
SR-375	D	From the NY-CL county line to the SR-318 junction near Hiko.

GENERAL INFORMATION

Crew 124 - Glendale Maintenance*Routes and Levels of Service**Operations*

This maintenance area receives infrequent storms with minimal snowfall. For this reason few pieces of snow removal equipment are available on site. Should this area receive a substantial storm, help may be available from **crew 122** or the Las Vegas crews. Since a routine method of operation has not been established, the maintenance supervisor should organize the operation based on field conditions and available equipment and personnel.

Plowing (push plows)

Raised pavement markings (reflective and ceramic buttons) are used on I-15 to delineate lane lines. When plowing is required in the area of the raised pavement markings, care must be taken to avoid damaging them. Plow operators should leave a narrow area of snow along lane lines where raised pavement markings are used.

Special Considerations

The Glendale maintenance area shares its road condition recording with **crew 122** for US-93. It is important for the supervisors to work closely in communicating their respective road or weather conditions and updating the recording as needed.

<u>Route</u>	<u>Service</u>	<u>Description</u>
I-15	A	From the US-93 Interchange to the Nevada/Arizona state line.
US-93	B	From the SR-604, Garnet Interchange to the Clark/Lincoln County lines.
SR-169	B	From the boundary of the Lake Mead Recreation Area to the Logandale/Overton Interchange.
SR-170	B	Bunkerville Road from the junction of I-15 to the junction of SR-144.
SR-144	B	From the West Mesquite interchange to the East Mesquite interchange.
SR-168	C	From the Glendale/Moapa Interchange to the junction of US-93.
SR-742	C	From the junction of SR-170 to Bunkerville.

GENERAL INFORMATION

<u>Route</u>	<u>Service</u>	<u>Description</u>
SR-604	D	From the Garnet interchange to 5.81 miles north.
SP-54	AD@	Valley of Fire State Park 10.47 miles west boundary to east boundary.
SP-54B	AD@	Valley of Fire Resident Road 0.43 miles northwest.
SP-55	AD@	Valley of Fire White Domes Road 6.93 miles north to end of pavement.
SP-56	AD@	Valley of Fire Atlatl road 1.08 miles to end of pavement.

Major frontage roads and interchange ramps have been assigned a level of service "C". Minor frontages on ramps have been assigned a level of service "D".

GENERAL INFORMATION

***Crew 126 - Mountain Springs
Maintenance****Equipment and Materials*

A salt/sand stockpile and loader is stationed at the Mountain Springs yard during the winter. Permanent Mount signs (on turnaround Bases) for snow tire and chain restrictions are located at the following locations on SR-160: MP 11.20, MP 17.00, MP 22.60 and MP 46.40. Traffic control signs are stored at the Mountain Springs yard.

*Operations**Plowing (push plows)*

The greatest area of concern for plowing is generally on both sides of the Mountain Springs Summit area. During major storms and when two plows are available they may run in tandem when plowing this area. When this area is under control one plow may be sent to SR-159 or across to Pahrump Valley as necessary.

As a result of major storms on the Mountain Springs summit area, accumulations may require the use of a loader to widen and clear the roadway through cuts or drift areas at the following locations: MP 21.30, MP 19.30, MP 18.50. This operation may also require signing and flagging. In the case of extended plowing due to major localized storms (**24-hour operations**) or for flagging set-ups, Las Vegas personnel and equipment may be made available to assist.

Raised pavement markings are used in the Pahrump area on SR-160. When plowing in this area, care must be taken to avoid damaging the markings. Plow operators should leave a narrow area of snow along lane lines where raised pavement markings are used.

In instances of major storms in the Las Vegas area or where accumulations are experienced on I-15 to the South, this crew may be diverted to assist on the higher level of service routes.

Priorities for Sanding

Emphasis for sanding will be placed on the following areas:

- Mountain Springs Summit area especially the shaded areas
- Hills, curves and intersections

Special Considerations

The route over Mountain Springs Summit is the primary route for large numbers of commuters and traffic between Pahrump Valley and Las Vegas, so it is important to keep the road condition recording up to date as conditions change.

The Mountain Springs Summit is forested and must be regarded as an environmentally sensitive area. Employees should be aware of the detrimental effect excess applications of salt/sand could have on this area.

GENERAL INFORMATION

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
SR-160	B	Pahrump Valley Road from 1 mile west of SR-604 to US-95.
SR-159	B	Red Rock Road from SR-160 to Red Rock Visitors Center Road.
SR-372	C	From the Nevada/California state line to the junction of SR-160.
SP-52	AD@	Spring Mountain Ranch State Park 1.11 miles west to Visitor Center.

GENERAL INFORMATION

Crew 127 - Searchlight Maintenance*Equipment and Materials*

Sand is stockpiled in the Searchlight yard during winter storms. Portable signs for traffic control are also stored in the Searchlight yard.

*Operations**Plowing (push plows)*

This maintenance area often experiences minor accumulations of snow. Usual areas of priority for plowing are through Searchlight, over the summits on US-95, both sides of town and on SR-163 in the Christmas Tree Pass area. Although a lower level of service, Nelson Road and the Nipton Road (SR-164), with its higher elevations, is often the site of substantial snow accumulations.

Raised pavement markings (reflectors and ceramic buttons) are used on US-95 and on SR-163 to delineate center or lane lines. Plowing in these areas requires care to avoid these markers. Plow operators should leave a narrow area of snow along lane lines where raised pavement markings are used.

Priorities for Sanding

- Through Searchlight
- The summits on US-95, both sides of Searchlight

- On SR-163 at Christmas Tree Pass

Special Considerations

As US 95 is a major North/South route, it is important the road condition recording be kept current as road and weather conditions change. This may also require coordination with crew 150 to the north on US 95.

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
US-95	B	Nevada/California state line to the junction of US-93 at R/R Pass.
SR-163	B	Laughlin Road from the junction of US-95 to the Nevada/Arizona state line.
SR-164	D	Nipton Road from the Nevada/California state line to the junction of US-95.
SR-165	D	Nelson Road from the Junction of US-95 to 11 miles east.

GENERAL INFORMATION

Crew 129 - Charleston Maintenance

Equipment and Materials

Salt/sand is stockpiled and a loader is stationed at the Mt. Charleston yard during the winter. Traffic control signs are stored at the Mt. Charleston and the Indian Springs yards. Snow chains for various units are available at the Mt. Charleston yard.

Signs for snow tire or chain restrictions are mounted on permanent turn-around bases at the following locations.

- SR-156 at MP 2.50, MP 4.10, MP 7.00 and MP 10.00
- SR-157 at MP 0.90, MP 3.40, MP 4.50 and MP 8.30
- SR-158 at MP 0.30 and MP 8.60

Snow poles are used in the following locations from approximately October 1 through April 1 of each year.

- SR-156, M.P. 0-9,
- SR-157, M.P. 0-6,
- SR-158, M.P. 0-8.86.

Operations

The Mt. Charleston area receives repeated snowstorm accumulations during the winter. In some areas this may range from only inches to many feet of accumulation on drift. This area,

although on a more infrequent basis, can experience snow accumulation on US-95.

In instances of major storms in the Las Vegas area, and due to the higher assigned levels of service, crew 129 may be called upon for equipment and labor to assist crews in the Las Vegas area.

When localized storms in the Mt. Charleston area require extended plowing (**24-hour operation**) or for snow blowing or flagging operations, Las Vegas personnel and equipment may be made available to assist.

Plowing (push plows)

Routine procedure is to send a plow across SR-158 to SR-156. These routes are then plowed and sanded as needed. When possible, parking areas on SR-156 are cleared in the early morning before the ski area gets busy. Simultaneously another plow works SR-157, which is the school bus and commuter route for residents of the area. In other areas of heavy accumulation, loaders are often needed to clear approaches, turn-around or parking areas. Sometimes signing and flaggers are used for traffic control.

Should heavy snowfall occur on US-95, plowing may be necessary with emphasis on hills, curves, bridges, intersections or interchange areas such as Indian Springs or Mercury on US-95.

GENERAL INFORMATION

Plowing (rotary plows)

The following areas sometimes get accumulations that require the use of a snow blower, signing, flaggers and a snow plow/sander unit:

- SR-157 M.P. 0-1,
- SR-156 M.P. 0-1.50,
- SR-158 M.P. 3.50-5.50.

Priorities for Sanding

- Hills, curves, intersections and interchanges,
- School bus routes,
- Intersections for Indian Springs and Mercury,
- Intersection for the Angels Peak Youth Camp,
- Lee Canyon parking areas.

Special Considerations

When affected travel ways have received needed attention or as the maintenance supervisor directs, other areas may be cleared for safe public and recreational access. These include access to the U.S. Forest Service Ranger Station, and the Nevada Division of Forestry fire station at Kyle Canyon on SR-157; the Foxtail parking areas and access to the Lee Canyon ranger and fire stations on SR-156.

In the past the Department received requests to clear access on other than highway right of way, due to emergencies brought on by sudden or severe storms in this area. This is allowed only with district approval based on verification of the emergency by an appropriate agency (U.S. Forest Service, Metro PD, Nevada Power Co., NHP, etc.).

Since Mt. Charleston is forested, routes in this area must be regarded as environmentally sensitive. Employees should be aware that excess applications of salt/sand could have detrimental effects.

With US-95 being a major North/South route and due to the popularity of the Mt. Charleston Recreational Area, it is important to keep the road condition recording accurate and up to date as conditions change.

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
US-95	B	From the junction of SR-157 to the junction of SR-160 at Pahrump Valley Road.
SR-156	B	From Ski Run to the junction of US-95.
SR-157	B	Charleston Peak Road from Charleston Peak

GENERAL INFORMATION

<u>Route</u>	<u>Service</u>	<u>Description</u>
		to the junction of US-95.
SR-158	B	Deer Creek Road from the junction of SR-157 to the junction of SR-156.

Major frontage roads and interchange ramps have been assigned a level of service "C". Minor frontage or ramps have been assigned a level of service "D".

GENERAL INFORMATION

Crew 150 - Las Vegas (East Las Vegas, Henderson, Boulder City)*Equipment and Materials*

Salt/sand for the Las Vegas area is stockpiled at the Erie pit, M.P. 22 on I-15. Washed concrete sand and portable traffic control signs are available in the Las Vegas yard.

Operations

The major expressway (US-95) and commuter routes from Las Vegas to Henderson and Boulder City US-93/SR-582 (Boulder Highway) experience considerable rush hour traffic, and are a high priority.

In cases of major, extended or localized storms, Las Vegas crews may be called upon to assist other crews.

Plowing (push plows)

US-93/US-95 at Railroad Pass is an area of occasional and generally minimal snowfall. This area extending south into Boulder City sometimes requires plowing.

Raised pavement markings (reflectors and ceramic buttons) are used on the majority of the roads within this jurisdiction. Plowing in these areas requires care by operators of snow removal equipment to avoid these markers. Plow operators should leave a narrow area of snow along lane lines where raised pavement markings are used.

Priorities for Sanding

- Hills curves intersections and structures
- US-95
- US-93
- SR-582

Special Considerations

As major routes, it is important that the road condition report recording for US 95/93 be kept as current as possible.

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
SR-146	C	From I-15 to Lake Mead Recreation Area.
SR-562	C	Sunset Road from SR-604 to Annie Oakley and from Gibson to SR-582, (Boulder Highway).
SR-582	B	From 7th Street to US-95/Wagon Wheel Interchange.
SR-592	C	Flamingo Road from Rainbow Boulevard to SR-

GENERAL INFORMATION

<u>Route</u>	<u>Service</u>	<u>Description</u>
		582 (Boulder Highway).
US-93	AB	From 1.61 miles north of the Nevada/Arizona state line to RR Pass Intg.
US-95	A	(Expressway) from US-93/US-95 structure to SR-582.

Major frontage roads and interchange ramps have been assigned a level of service "C". Minor frontage or ramps have been assigned a level of service "D".

GENERAL INFORMATION

Crew 151 - Las Vegas (North Las Vegas)*Equipment and Materials*

Salt/sand for the Las Vegas area is stockpiled at the Erie pit, M.P. 22 on I-15. Washed concrete sand and traffic control signs are available in the Las Vegas yard.

Operations

The Interstate and Expressway routes are the highest priority in this section. These experience continued high traffic counts with peaks during morning and evening rush hours, weekends and holidays. Having been assigned the highest level of service rating, these routes will receive continuous monitoring, plowing or sanding.

Plowing (push plows)

Raised pavement markings (reflectors and ceramic buttons) are used on the majority of the roads within this jurisdiction to delineate center or lane lines. Plowing in these areas requires care by operators of snow removal equipment to avoid the markers. Plow operators should leave a narrow area of snow along lane lines where raised pavement markings are used.

Priorities for Sanding

- Grades, curves, bridges, ramps and intersections

- US-95 viaduct section
- Apex Summit on I-15
- Interchange and ramps at I-15/US-95
- Routes with raised pavement markings

Special Considerations

The US-95/I-515 (expressway) from Eastern Avenue to I-15, including some of the I-15 interchange ramps are of special concern due to ice or snowpack resulting from a major storm or a combination of moisture and cold. If the concrete pavement or deck surfaces experience a severe ice condition and it is not possible to maintain these areas within reasonable limits of safety, the facility may require closure. The decision to close the road should be made based on the roadway condition and the impracticability of posting chain or snow tire restrictions. In these circumstances closures may need to be maintained in the following locations:

- Eastern Avenue north bound on-ramp
- Las Vegas Boulevard north and south bound on-ramps
- Casino center north bound on-ramp
- Both I-15 south bound on-ramps

GENERAL INFORMATION

Traffic control for closures and detouring should be established south bound for US-95/I-515 at I-15 and north bound at Eastern Avenue. Traffic control may include programmable message boards, advance warning signs, arrowboards, cones etc. The Nevada Highway Patrol should be contacted for assistance in areas of closure. With both I-15 and US-95 being major North/South routes, it is important to keep the road condition report recording as accurate as possible.

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>	<u>Route</u>	<u>Service</u>	<u>Description</u>
					Donovan to Las Vegas Blvd.
			SR-595	C	Rainbow Boulevard from Spring Mountain Road to Silverstream.
			SR-599	C	Rancho Road from US-95 to US-95 (Tonopah Highway).
			SR-602	C	Casino Center Drive from Stewart Avenue to Bonanza Road.
I-15 (Int)	A	From the junction of US-95 (expressway) to the US-93 interchange at Garnet.	SR-604	AB@	From St. Louis Ave to Nellis Air force Base.
US-95 (Exp)	A	From the US-95 structure to the junction at the north end of Rancho Road.	SR-604	D	From Nellis Air Force Base to Garnet Interchange.
US-95	B	From the junction at the north end of Rancho Road to SR-157.	SR-610	C	Lamb Boulevard from the junction of SR-604 to the Junction of I-15.
SR-573	C	Craig Road from US-95 (expressway) to Decatur, from	SR-53	AD@	Floyd Lamb State Park 1.56 miles southeast to end of pavement.

Major frontage roads and interchange ramps have been assigned a level of

GENERAL INFORMATION

service "C". Minor frontage roads and ramps have been assigned a level of service "D".

GENERAL INFORMATION

Crew 152 - Las Vegas (Jean, Stateline)*Equipment and Materials*

Salt/sand for the Las Vegas area is stockpiled at the Erie pit, M.P. 22 on I-15. Washed concrete sand and traffic control signs are available in the Las Vegas yard.

Operations

Interstate 15 and urban Las Vegas Boulevard routes are the highest priority in this section. These experience continued high traffic counts with peaks during morning and evening rush hours, weekends and holidays. I-15 has been assigned the highest level of service rating and should receive continuous plowing, sanding or monitoring.

In cases of major, extended or localized storms, Las Vegas crews may be called upon to assist all other divisions when available.

Plowing (push plows)

Raised pavement markings (reflectors and ceramic buttons) are used on the majority of the roads within this jurisdiction to delineate center or lane lines.

Plowing in these areas requires care by operators of snow removal equipment to avoid the markers. Plow operators should leave a narrow area of snow along lane lines where raised pavement markings are used.

Priorities for Sanding

- Tropicana Fly over
- Sahara Fly over
- Spring Mountain Road Overpass
- Grades, curves, bridges, ramps and intersections
- I-15, Erie area (M.P. 20-24)
- Interchange ramps
- Routes with raised pavement markings

Special Considerations

With I-15 being a major North/South route, it is important to keep the road condition report recording as accurate as possible.

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
I-15	A	From the Nevada/California state line to the junction of US-95 (expressway).
SR-160	B	Pahrump Valley Road from the junction of SR-604 to 1 mile west.

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<u>Route</u>	<u>Service</u>	<u>Description</u>
SR-161	C	Goodsprings Road from Goodsprings to the Junction of SR-604.
SR-593	C	Tropicana Avenue from Industrial Road to SR-582 (Boulder Highway).
SR-595	C	Rainbow Boulevard from the Blue Diamond Road to Spring Mountain Road.
SR-604	B	From SR-146 to Spring Mountain Road.
SR-604	D	From SR-161 to SR-146.

Major frontage roads and interchange ramps have been assigned a level of service "C". Minor frontage roads and ramps have been assigned a level of service "D".

GENERAL INFORMATION

Crew 153 - Las Vegas (Valley)*Equipment and Materials*

Salt/sand for the Las Vegas area is stockpiled at the Erie pit, M.P. 22 on I-15. Washed concrete sand and traffic control signs are available in the Las Vegas yard.

Operations

Although routes in this section have generally received a lower level of service assignment, they are some of the most heavily traveled urban surface streets in and around the Las Vegas Valley. These routes experience continued high traffic counts with peaks noted during morning and evening rush hours, weekends and holidays.

In cases of major, extended or localized storms, Las Vegas crews may be called upon to assist other crews when available.

Plowing (push plows)

Raised pavement markings (reflectors and ceramic buttons) are used on the majority of the roads within this jurisdiction to delineate center or lane lines. Plowing in these areas requires care by operators of snow removal equipment to avoid the markers. Plow operators should leave a narrow area of snow along lane lines where raised pavement markings are used.

Priorities for Sanding

- I-215/SR-171 Airport Connector
- Grades, curves, bridges, ramps and intersections
- Red Rock Road/Charleston Boulevard
- I-15 Interchange ramps
- Routes with raised pavement markings

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
I-215	AA@	From I-15 eastward toward Henderson.
SR-171	AA@	Airport connector from I-215 to tunnel.
SR-147	C	Lake Mead Boulevard from the west R/W of I-15 to the boundary of Lake Mead Recreation Area.
SR-159	C	Red Rock Road/Charleston Boulevard from the Red Rock Visitors

GENERAL INFORMATION

<u>Route</u>	<u>Service</u>	<u>Description</u>	<u>Route</u>	<u>Service</u>	<u>Description</u>
		Center Road to Nellis Boulevard.			Avenue to Sahara Avenue.
SR-574	C	Cheyenne Blvd. from US-95 (expressway) to Nellis Boulevard.	SR-607	C	Eastern/Civic Center from Sahara Avenue to Cheyenne Avenue.
SR-578	C	Washington Avenue from 235 feet west of "D" Street to Las Vegas Boulevard.	SR-612	C	Nellis Boulevard from Tropicana Avenue to Las Vegas Boulevard.
SR-579	C	Bonanza Road from Rancho Road to Las Vegas Boulevard.	Major frontage roads and interchange ramps have been assigned a level of service "C". Minor frontage or ramps have been assigned a level of service "D".		
SR-589	C	Sahara Avenue from Rainbow Blvd. to Nellis Blvd.			
SR-596	C	Jones Boulevard from Tropicana Avenue to Rancho Road.			
SR-601	C	Main Street from the junction of SR-604 at Foremaster Lane to the junction of SR-604 at St Louis.			
SR-605	C	Paradise Road from Tropicana			

GENERAL INFORMATION

Crew 154 - Las Vegas (Night Sweep Crew)***Crew 157 - Las Vegas (Night Roadway Maintenance Crew)***

These crews operate on scheduled routes throughout the Las Vegas Valley. In cases of major, extended or localized storms, they may be called upon to assist various divisions where needed to plow, sand or monitor roadways. They may also be needed in areas of road closure.

Operations

When individuals from these divisions are assigned snow removal or other related duties, they should refer to the crew plan for the specific section to which assigned.

GENERAL INFORMATION

Crew 178 - Panaca Maintenance

Equipment and Materials

Salt/sand, traffic control signs and snow chains for various units are available at the Panaca yard.

Permanent mount signs (fold down face plates) for snow tire or chain restrictions and "icy" signs are at the following locations:

- US-93 M.P. 77 and M.P. 93 (Caliente Summit area)
- US-93 M.P. 113, M.P. 120 and M.P. 148 (Pioche area)
- SR-319 M.P. 55 and M.P. 65 (Panaca Summit area)

Operations

Plowing (push plows)

This area experiences relatively frequent, repeated and sometimes-heavy snow fall. During wide spread major storms, individual plows are typically sent to the following areas: US-93 Caliente Summit area, SR-319 Panaca Summit area (two plows), US-93 North toward Geyser Ranch, US-93 Pioche area routes, with the remaining plow used in the Panaca or Caliente town areas or as needed to assist on the section.

During colder weather or after initial storm accumulations, a motor grader is

often used to cut heavy snowpack or icy areas. Loaders are often necessary to clear access for removal of accumulations in the following locations: Pioche town (load and haul away), Panaca and Caliente Summit (cut or drift areas), curb, gutter, sidewalk Caliente and Panaca town areas. These operations may also require appropriate traffic control such as signing and flaggers.

Priorities for Sanding

- Grades, curves, bridges, shady areas and intersections
- Caliente Summit
- Panaca Summit
- Through Pioche, Caliente and Panaca

The Elgin road through Rainbow Canyon requires monitoring as it frequently experience rockslides during storms.

Special Considerations

This section has a number of forested areas, which must be regarded as environmentally sensitive. Employees should be aware that excess applications of salt/sand could have detrimental effects.

The Panaca maintenance area shares its road condition recording area with crew 122 to the south, so it is important

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that supervisors work closely in communicating their respective road or weather conditions and updating the recording.

Routes and levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>	<u>Route</u>	<u>Service</u>	<u>Description</u>
					Lincoln/White Pine county line.
			SP-12	AD@	Cathedral Gorge State Park 1.72 miles north to fee box.
SR-317	C	Elgin Road (Rainbow Canyon) from the junction of US-93 South to Elgin.	SP-12B	AD@	Cathedral Gorge Campground Road 0.84 miles northwest to picnic area.
SR-319	B	From the US-93 junction at Panaca to the Nevada/Utah state line.	SP-13	AD@	Cathedral Gorge North Park Road 0.39 miles to parking lot.
SR-320	C	Caselton Mine Road from US-93 south of Pioche to US-93 north of Pioche.	SP-15	AD@	Echo Canyon State Park 1.69 miles from south boundary to north boundary.
SR-321	B	Pioche Road from US-93 southeast of Pioche to US-93 northwest of Pioche.			
SR-322	C	Ursine Road from SR-321 in Pioche to 1 mile south of Ursine.			
US-93	B	From Pahrock Summit to the District I - III boundary at the			

GENERAL INFORMATION

TONOPAH MAINTENANCE AREA

Salt-Sand Materials, Stockpiles

Sand used for salt/sand, as well as the ratio of the mix is approved by the district. Quantities should be calculated in advance of winter to allow time for ordering or scheduling of delivery, hauling, mixing, etc. In some cases stockpiles may be strategically located other than at the field maintenance station. A loaner loader may be made available through the district during the winter for use in loading spreader trucks.

When plowing in the city where there is curb, gutter and sidewalk, plowing to the right should be done very carefully so that additional snow is not stacked on the sidewalk. In some cases, depending on anticipated accumulation, it may be necessary to plow all snow to the center of the roadway and come back later and remove it. Before plowing to the center of streets, it is necessary that operators check with their supervisor.

Tonopah Maintenance Area - Level of Service 'A' Routes**Route Crew Description**

US-95	123, 170, 175, 176	From Pahrump Valley Road to Luning.
US-6	170, 177	From Tonopah to the Nevada/California

Route Crew Description

		state line over Montgomery Pass.
US-6	173, 171	From the District I & III boundary from 6 mi. west of Currant Creek to Tonopah.

Tonopah Maintenance Area - Level of Service 'B' Routes**Route Crew Description**

SR-264	177	Fish Lake Valley Road from the junction of US-6 to the Nevada/California state line.
SR-265	170	Silver Peak Road from the junction of US-6 to Silver Peak.
SR-266	175	Lida Road from the junction of US-95 to the Nevada/California state.

SR-360	177	From the junction of US-6 to the junction of US-95.
SR-361	176	Gabbs Road from US-95 to the District I/II Boundary

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<u>Route</u>	<u>Crew</u>	<u>Description</u>	<u>Route</u>	<u>Crew</u>	<u>Description</u>
		(Churchill county Line).	SR-377	172	From the junction of SR-376 to Manhattan.
SR-373	123	Amargosa Valley @ US-95 to the Nevada/California state line.	SR-378	172	From the junction of SR-376 to Round Mountain.
SR-375	173	From the junction of US-6 to the Lincoln county line.	SR-773	177	Fish Lake Valley cutoff from the junction of US-06 to Jct. SR 264.
SR-376	171, 172	From the junction of US-6 to the junction of US-50.	SR-844	176	Ione Road from the junction of SR-361 to milepost 12.32.
AR-503	170	From the junction of US-6 to milepost 1.			
Tonopah Maintenance Area - Level of Service 'C' Routes			Tonopah Maintenance Area - Level of Service 'D' Routes		
<u>Route</u>	<u>Crew</u>	<u>Description</u>	<u>Route</u>	<u>Crew</u>	<u>Description</u>
SR-267	175	Scotty's Castle Road from the junction of US-95 to Nevada/California state line.	AR-503	170	Radar Road from milepost 1 to milepost 4.75.
AR-504	171	Tonopah Test Range Road from the junction of US-6 to the test site.	SR-774	175	Goldpoint Road from the junction of SR-266 to Goldpoint.
SR-374	123	From Beatty to the Nevada/California state line.	FR-401	176	From the Junction with SR-361 to its Terminus at the Basic Refractory.

GENERAL INFORMATION

Tonopah Maintenance Area - Level of Service 'E' Routes

The Tonopah maintenance area has no roads assigned as level of service "E" routes.

GENERAL INFORMATION

**TONOPAH MAINTENANCE AREA -
CREW SNOW PLANS**

Individual snow and ice control plans for crews in the Tonopah maintenance area are included in this section. Each crew plan establishes specific procedures and emphasis areas for snow and ice removal for that crew. The crew plans augment information included in the Statewide and District Snow and Ice Control Plans.

Crew 123 - Beatty*Equipment and Materials*

Beatty has three plow trucks with sanders. Salt/sand and portable traffic control signs are stored at the Beatty Maintenance Station yard.

Operations

This maintenance area receives occasional snow--priority consideration is given to US-95. Abrasives are available but are rarely needed. In the event of a major storm this crew may be used to assist crew 175 on US-95 through Goldfield provided Beatty's section is clear.

Beatty shares its road recording with Goldfield (crew 175) and Tonopah (crew 170).

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
US-95	A	From the junction of SR-160 at Pahrump Valley to the junction of SR-267 (Scotty's Castle Road).
US-374	C	From the junction of US-95 in Beatty to the East boundary of the Death Valley National Monument.
SR-373	B	From the junction of US-95 at Amargosa Valley to the Nevada/California state line.

GENERAL INFORMATION

Crew 170 - Tonopah Maintenance

Equipment and Materials

A large salt/sand supply plus portable traffic control signs are kept at the Tonopah yard. A second salt/sand pile is maintained at Coaldale (Jct. US-6 & US- 95) for use by crews 170, 176 and 177.

Operations

Highest priority for this division is US-6 and US-95. These highways have the highest traffic count and should receive immediate response during snowstorms. Cooperation between NDOT and local law enforcement agencies helps the crew in detecting problem areas and disseminating routine road information.

Depending on temperatures, snowfall etc., snow on Main Street in Tonopah (US-6/US-95) is treated with salt/sand and allowed to slush and melt or it is plowed to the center of the street by use of a motor grader or reversible plow. When it is plowed to the center of the street, emphasis must be placed on clearing intersections. When plowing operations subside, snow accumulated in the center of the street will be removed using a rotary plow and dump trucks, or if temperatures permit, the snow may be spread out and allowed to melt.

Priorities for Sanding

- Hills, curves and intersections

- School bus routes

Special Considerations

The two summits on the eastern and southern city limits of Tonopah will be given special attention because of their steep grades. During major storms, as labor and equipment are available, emphasis will be placed on plowing and sanding AR 503 from the junction with US-6/US-95 to M.P. 1.00 because of the elementary school and residences adjacent to the road. Beyond milepost 1 the traffic is nominal and will be attended to after the most demanding areas are cleared.

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
US-95	A	From Tonopah to 12 miles south of Tonopah.
US-6	A	From Tonopah North to the junction of US-6 and US-95 at Coaldale.
SR-265	B	Silver Peak Road from the junction of US-6 to Silver Peak.
AR-503	B	From Junction of US-6 to M.P. 1 (Radar Road).

GENERAL INFORMATION

<u>Route</u>	<u>Service</u>	<u>Description</u>
AR-503	D	From milepost 1 to M.P. 4.75 (Radar Road).

GENERAL INFORMATION

Crew 171 - Tonopah Maintenance*Equipment and Materials*

This crew shares salt/sand stockpiles with crews: 170 in the Tonopah Yard, 172 at the junction of SR-376 and SR-377, and 173 on US-6 at M.P. 46.50. A large supply of portable signs and other traffic control devices are kept on hand in the Tonopah yard.

Operations

During snow storms trucks are dispatched to all three routes. The highest priority is US-6. There are three summits on US-6 and salt/sand is applied to these routes first and then to other sections of highways as required. During major storms crew 171 may be available to assist other crews.

Priorities for Sanding

- Hills, curves, and intersections
- School bus routes

Special Considerations

Peak traffic times on AR-504 are from 5:00 AM to 7:00 PM during weekdays. During these peak hours, special attention is given to snow removal efforts.

It is imperative that the supervisors of crews 171, 172 and 173 communicate with each other since they all share maintenance responsibilities on US-6

and SR-376. Crew 171 shares its road recording with crews 172 and 173.

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
US-06	A	From the junction of US-6 and US 95, in Tonopah, to 42.34 miles east at Warm Springs Summit.
SR-376	B	From the junction with US-6 to the junction of SR-377 (the Manhattan Road).
AR-504	C	Sandia Road from the junction with US-6 to its terminus at the Tonopah Test Range.

GENERAL INFORMATION

Crew 172 - Big Smoky Maintenance*Equipment and Materials*

Salt/sand stockpiles are maintained at the following locations:

- The Big Smoky Maintenance yard
- The junction of US-50 and SR-376
- The junction of SR-376 and SR-377

The stockpile at the junction of SR-376 and SR-377 is shared with crew 171 and the stockpile at the junction of US-50 and SR-376 is shared with the Austin Maintenance station (crew 385). Portable signs and other traffic control devices are kept on hand at the station yard.

Operations

First priority is given to SR-376 because this section has the highest volume of traffic.

The centerlines on SR-377 and SR-378 are plowed initially. Once SR-376 is plowed and sanded, the crew will direct their efforts toward removing the snow and sanding SR-377 and SR-378. Because colder temperatures are more prevalent in Big Smoky, salt/sand is initially applied to all roads to impede snow packing.

Special Considerations

The supervisor at Big Smoky Station should maintain communication with Austin (crew 385) and crew 171 supervisors to be properly informed of weather and road conditions.

SR-377 (Manhattan Road) is the highest and steepest road in crew 172 section and must be given special attention because it typically receives snowfall before other roads. Big Smoky shares its road recording with crew 171.

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
SR-376	B	From the junction with SR-377 (the Manhattan Road) to its terminus at the junction of US-50.
SR-377	C	From the junction of SR-376 to its terminus in Manhattan.
SR-378	C	From the junction of SR-376 to its terminus in Round Mountain.

GENERAL INFORMATION

Crew 173 - Blue Jay Maintenance

Equipment and Materials

Blue Jay maintains a salt/sand stockpile in the maintenance yard and shares a stockpile on US-6 at M.P. 46.50 with crew 171. Portable signs and other traffic control devices are kept on hand at the station yard.

Operations

US-6 is given first priority as it has the highest traffic volume in this section. Because of the extreme low temperatures experienced in this section salt/sand is applied at the onset of apparent large storms to impede snow packing.

Special Considerations

Blue Jay's section contains 3 summits, which receive special attention with abrasives during snowstorms. Blue Jay shares its road recording with crew 171, Tonopah.

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
US-6	A	From M.P. 44.14 to the boundary of District I/III, 6 miles west of Currant Creek.

<u>Route</u>	<u>Service</u>	<u>Description</u>
SR-375	B	From the junction with US-6 to the Nye/Lincoln county line.

GENERAL INFORMATION

Crew 175 - Goldfield Maintenance*Routes and Levels of Service**Equipment and Materials*

A salt/sand pile, portable signs and other traffic control devices are in located in the Goldfield maintenance yard.

Operations

During major storms all personnel will be actively engaged in snow removal and applying abrasives to US-95 which has the highest priority for snow removal. Afterwards SR-266 and SR-267 will be cleared as directed by the supervisor. The lowest priority is SR-774, which is a gravel road with very low traffic volume.

Special Conditions

There are three major summits in Goldfield section requiring special attention. Two are located on US-95 (Goldfield and Stonewall summits) and the third is located on SR 266 (Lida Summit). Goldfield shares its road recording with crews 123 and 170. Cooperation with the Esmeralda County Sheriff's Office is very helpful in that they notify NDOT of snow or road hazards encountered while on patrol.

Permanent chain/snow tire control signs are located on each side of Goldfield Summit.

<u>Route</u>	<u>Service</u>	<u>Description</u>
US-95	A	From the junction of SR-267 (Scotty's Castle Road) to 12.88 miles north of Goldfield.
SR-266	B	Lida Road from the junction with US-95 to the Nevada/California state line.
SR-267	C	Death Valley/Scotty's Castle Road from the junction with US 95 to the Nevada/California state line.
SR-774	D	Goldpoint Road from the junction with SR-266 to its terminus in Goldpoint.

GENERAL INFORMATION

Crew 176 - Mina Maintenance*Equipment and Materials*

Mina has a salt/sand stockpile at the maintenance yard and on SR-361 at M.P. 13.00 in Nye County. Mina also shares a stockpile, located at Coaldale, with crews 177 and 170. Chain/snow tire control signs are permanently located on SR-844 at M.P. 3.67 and 11.75. Portable signs and other traffic control devices are kept on hand at the station yard.

Operations

During major snowstorms the highest priority is US-95 because of the high volume of traffic. The next priority is SR-361, which often gets heavier snow at the higher summits than US-95. The last priority is SR 844.

Special Considerations

It is often necessary to patrol SR-361 and SR-844 during inclement weather since they frequently receive snow first. The Mina jurisdiction has four summits, which require plowing and abrasives during storms. The crew in Mina may assist crew 177 as required. Mina shares its road recording with crew 170.

Routes and Levels of Service

<u>Route</u>	<u>Service</u>	<u>Description</u>
US-95	A	From the junction of US-6/US-95 (Coaldale) to the

<u>Route</u>	<u>Service</u>	<u>Description</u>
		junction of US-95/SR-361 one mile north of Luning.
SR-361	B	Gabbs Road from the junction with US-95 to the Churchill/Nye county line.
SR-844	C	Ione Road from the junction with SR-361 to its terminus at M.P. 12.32.
FR-401	D	From the junction with SR-361 to its terminus at the Basic Refractory.

GENERAL INFORMATION

Crew 177 - Montgomery Maintenance

patrolled frequently for removal of snowdrifts.

Equipment and Materials

A salt/sand stockpile is located at the Montgomery Maintenance Station. This crew also shares a salt/sand stockpile with crews 170 and 176 at Coaldale. Chain/snow tire control signs are permanently located on US-6 at M.P. MI 0.21, MI 4.77, MI 11.95 and ES 11.10. Traffic control signs and equipment are stored at the Montgomery Maintenance Station.

*Routes and Levels of Service**Operations*

Montgomery Pass elevation is above 7,100' and in the event of major storms it is important that salt/sand is applied as early as possible. This road is a major artery linking California and Nevada and carries a high percentage of trucks. The road on both sides of the summit is narrow and steep with sharp curves. During major storms an extra snowplow is sent to crew 177 from Tonopah to assist with the "B" level of service routes.

<u>Route</u>	<u>Service</u>	<u>Description</u>
US-6	A	From the junction of US-95/US-6 (Coaldale) to the Nevada/California state line.
SR-360	B	From the junction with US-6, at Basalt, to its terminus at the junction of US-95.
SR-264	B	Fish Lake Valley Road, from the Nevada/California state line to its terminus at the junction of US-6
SR-773	C	Fish Lake Valley Cutoff, from the junction with SR-264 to its terminus at the junction of US-6.

Special Considerations

Crew 177 shares its road recording with crew 170. Adverse weather conditions are reported to Reno district office and Caltrans in Bishop via the Tonopah Maintenance Station.

There are several shaded areas on US-6 that must be given special attention with application of abrasives. During windy conditions this route must be

DISTRICT II SNOW AND ICE CONTROL PLAN



September 23, 2013

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**NEVADA DEPARTMENT OF TRANSPORTATION
DISTRICT II
SNOW AND ICE CONTROL PLAN**

INTRODUCTION

Due to Nevada's geographic location, elevation, and topography, snow and ice occur in varying amounts over most of the state. Snow depths and storm frequencies vary from minimal and infrequent at the lower elevations in the south to extreme and frequent at the higher elevations in the north. Nevada's tourism-based economy places added emphasis on snow and ice control because the state's life-blood depends, to great extent, on attracting visitors to Nevada via passenger vehicles.

Being geographically located in the western portion of the state with high mountain passes and desert valleys, District II experiences a variety of conditions. Elevations range from a high of 8,911 feet at Mt. Rose summit to a low at Imlay of 4,100 feet. Lower elevations experience less frequent storms. While snow and ice control is not required as frequently nor as intensely in these lower valleys as it is where more snow falls, it is still a very high priority.

In order to be responsive to the needs of the public, a number of factors should be considered besides snow depths. When scheduling snow and ice control, consideration should be given to routes with high traffic volumes and peak traffic periods on commuter routes. Areas that historically have been a problem for motorists to maintain traction or that have historically received extra attention in order for motorists to maintain control of their vehicle should receive a high priority. Bridge decks, tunnels, and historic drifting areas can be a problem and should be monitored. An effort should be made to accommodate school bus routes in the rural areas.

This plan addresses variations in conditions, such as storm intensity, duration, type of traffic, and traffic volumes. It is not intended to anticipate every condition. It is a guide that outlines methods and procedures that apply District-wide for most situations. Because every storm is different and every situation cannot be anticipated, experience of the crew should be used to modify the plan when necessary. However, any modifications of the plan should be consistent with the intent of the plan.

A list of terms used herein is presented for reference.

ORGANIZATION

The Nevada Department of Transportation (NDOT) is governed by its Transportation Board of Directors, which appoints a Director.

The Director establishes policy and directs the operation of NDOT within parameters established by the Transportation Board of Directors. Operational control and limited policy setting have been delegated to the District Engineers by the Director.

The District Engineer, in conjunction with Maintenance Managers, is responsible for reviewing and modifying the Snow and Ice Control Plan annually. This yearly update is to ensure that the plan provides guidance to District staff that result in a reasonably safe level of service.

All levels of supervisory personnel are responsible for being familiar with the plan, thoroughly preparing prior to storms, and practicing good tactical procedures during storms.

All maintenance employees are responsible for ensuring that they understand procedures, are authorized to operate a particular piece of equipment before proceeding, and conduct themselves in a manner that is a credit to them as individuals as well as to NDOT.

This plan is structured as if the chain of command can always be followed. In actual practice, this is not always possible without a delay in response or a reduction in the level of service provided to the public. With snow and ice control, responsiveness is very important and should not be sacrificed for the sake of following the chain of command. Usually the chain of command can and should be followed without sacrificing the service provided to the public.

TERMINOLOGY

The following terms are used through this document:

Abrasive mixture: A mixture of sand and a deicing chemical, generally salt. The abrasive mixture is prepared before anticipated storms.

Anti-icing: Anti-icing is the snow and ice control practice of preventing the formation or development of bonded snow and ice by timely applications of a chemical freezing-point depressant. Moderate and periodic re-applications of the chemical during the storm can continue this effect.

Bare pavement: The condition where the travel lanes are clear of loose snow but may have patches of ice or snow pack that, when treated with chemicals or abrasive mixtures or a combination thereof, may be negotiated safely by the average driver without the need of chains.

Chain or snow tire controls: A mandatory condition where either chains or snow tires are required due to snow or ice on the roadway. Chains or snow tire requirements are placed when, in the judgment of the maintenance supervisor on duty, snow and ice conditions make it difficult for average drivers to control their vehicle when driving in a prudent manner.

Cornice: Overhanging snow forming a partial arch created by the wind.

Crossovers: Turn-through area constructed to allow official vehicles to cross from one side of a divided highway to the opposite side.

Cutting pack: Peeling ice or snow buildup from the pavement, usually done with motor graders.

De-icing: The removal of snow and ice through mechanical and/or chemical means.

End of storm: The condition when the snowstorm or blowing snow is subsiding and the weather is starting to clear.

Heeling: Pushing snow as far left or right as possible.

Pack: A buildup of ice and snow on the road surface.

Pre-op: The pre-operational check is a list of items that must be checked on each vehicle before the vehicle is used.

Road Ops (or District II Road Operations Center): Located in Reno's District office, this is the District II dispatch center (operated 24/7 year-round) used by all NDOT employees for assistance. The on-duty dispatchers are the maintenance workers' contacts to the NHP and other law enforcement agencies. Dispatchers also disseminate information on road conditions to the public and other agencies.

Run in tandem: The practice of multiple plow units plowing as a team. On non-divided highways, the lead plow starts at the centerline and plows to the right and the following plows also push snow to the right. On divided highways, the lead unit plows left from the centerline and all other trucks or graders plow from the centerline right. Divided highways with narrow median areas or barrier walls should be treated as a non-divided highway.

Sander conveyor: The chain at the bottom of the sander unit that moves the material in the sander to the spinner.

Sand spinner: The part of a sander unit that spreads the abrasive mixture. Spinner speed can be adjusted to regulate how wide material is spread.

Scheduled shift: A specific time period an employee is assigned to work, usually over a number of days. The shift may be any length of time from 8 to 12 hours but may be extended to 16 hours in emergency situations. A callout on overtime responding to a specific need is not a scheduled shift. An employee is normally assigned a shift prior to the end of the previous shift.

Slobbers: The snow left on the pavement, on either side of a rotary plow after a cut has been made.

Snow poles: An extension of pipe (plastic, metal, or wood) used to guide snow removal equipment and the public during and after storms. The pole can have one or more reflective stripes at the top to convey information to maintenance personnel.

Spreader calibration: The procedure of calculating the pounds of material discharged per mile at various truck speeds.

White out: A complete lack of visibility due to a snowstorm or blowing snow.

Widening: Pushing snow as far left or right as possible.

LIABILITIES AND PRECAUTIONS

Highway maintenance functions concern everyone. The State of Nevada, through the Department of Transportation, strives to maintain its highways in a reasonably safe condition for the traveling public. As it relates to winter maintenance, NDOT removes snow and ice and applies abrasive mixtures to the roadway to improve driving conditions for the motorist.

When NDOT receives actual notice of a hazardous condition on its highways, the Department will respond and check the alleged hazard. If a hazard exists, it should be corrected or adequate warning should be provided to the motorists.

PURPOSE AND POLICY

PURPOSE

The purpose of this plan is to define operational procedures for snow and ice control. It defines the levels of service that maintenance will strive to provide. The plan is to help the maintenance crews provide the safest roadway condition reasonably possible with the resources available. Because storms vary dramatically and occur over a variety of roadway and traffic conditions, this plan is intended to be flexible to accommodate the variety of conditions encountered. It is a guide structured to fit average conditions.

POLICY

It is the policy of District II that the orderly movement of traffic during storm conditions takes precedence over all other maintenance operations except the protection of life and property. The District's maintenance organization will strive to maintain the state's highways in such condition that traffic can proceed in a reasonably safe manner during winter storms.

SNOW PLAN DEVELOPMENT

The snow plan developed for each District will provide guidance to managers and crews in describing snow and ice control responsibilities. The following items in the snow plan will be reviewed and updated annually:

- Administrative data including names, addresses, and telephone numbers of regular and seasonal personnel
- Crew and shift assignments
- Equipment available for each section
- Map or listing of highway levels of service and priorities
- Emergency and road closures procedures

- Prearranged snow storage sites

FIELD OPERATIONS AND TRAINING

District Administration and Maintenance Managers shall make advance preparations so that the snow removal operations are ready prior to the first storm. District Administration should review snow removal plans with appropriate members of the NHP. Teamwork and cooperation are essential for successful snow removal operations.

The Maintenance Supervisor I should prepare shift schedules for regularly assigned crews, with any temporary or part-time employees included in the schedules. They should review their assigned personnel and make certain all maintenance workers have or will receive any necessary training before the first storm. All maintenance workers who operate snowplows must have a Class A or B commercial drivers license and be certified in accordance with NDOT TP 1-6-19.

Temporary employees should be hired with enough lead time to ensure they receive all necessary training. They must have a Class A or B commercial drivers license and be certified on snow removal equipment in accordance with NDOT TP 1-6-19. Training should include a review of this plan.

PREPARATION AND ADVANCE PLANNING

Early plans should be made for winter work so that the roadway, equipment operators, snow plowing equipment, sanding equipment, radio equipment, sanding materials and supplies, including signs, flags, barricades, and small tools will all be ready for the first frost or snow storm.

Pre-season preparations for snow and ice control operations should normally be completed by November 1 of each winter season and should include but not be limited to the following:

- Snow plan review and modification
- Materials acquisition and stockpiling
- Equipment operator training
- Roadway preparation
- Equipment preparation and adjustment
- Request temporary help if necessary and schedule shifts

PUBLIC RELATIONS

To a large extent, success of the snow and ice control program is dependent on how well other agencies and the public understand the program. In order to ensure that a good understanding exists, District Administration should keep other agencies and the public well informed. Both formal and informal meetings with law enforcement agencies and other maintenance

organizations are effective. Cooperation and informing the news media can take several forms. Press releases and being available for interviews are effective as is allowing the media to ride in plow trucks during severe storms. Arrangements for riding in plow trucks should be made through District Administration.

WORKING FOR OTHER GOVERNMENTAL AGENCIES

Snow plowing may be performed for cities, counties, and other governmental agencies if resources are available. Such work shall be done at cost and only by the authority of a written agreement executed by the Director. Under these agreements, detailed costs shall be recorded and billings prepared. Service as specified above will be performed at a lower priority than work on the State Highway system.

WORKING WITH LAW ENFORCEMENT AGENCIES

Law enforcement agencies have the duty to report items they feel are hazardous and may cause accidents. As a result, the maintenance crews must respond to many calls in order to provide a high level of service and minimize liability. Maintenance employees are subject to a certain number of callouts and callbacks to provide assistance such as:

- Additional maintenance on a section of highway
- Removal of obstacles from the roadway
- Traffic control assistance at accident sites

The Maintenance Supervisor I should stress cooperation with law enforcement agencies to his/her employees and establish good lines of communications with the agencies that work within the crew's jurisdictional area.

WEATHER FORECASTS

Because weather forecasts play such an important role in winter maintenance activities, the National Weather Service Web site can be reviewed to provide updated forecasts. Other contracted weather services can provide more tailored forecasts to directly fit our needs. Timely forecasts can provide reasonably accurate predictions on:

- Timing when a storm will hit a specific area
- Type of storm predicted (snow, rain, winds, etc.)
- Intensity and amount of snow or rain
- Temperature pattern of the storm
- General progress of the storm
- Elevations that will be affected

Timely forecasts can also be helpful in scheduling employees and equipment.

In addition to weather forecasts, supervisors should pay special attention to pavement temperatures, RWIS data, and the direction that the pavement temperatures are trending, whether they are rising or dropping.

This information should be used for scheduling crews prior to a storm's arrival. Proper use of this information results in less overtime and better utilization of resources. At the beginning of each season, arrangements should be made with the National Weather Service concerning timing of calls, special information, and individuals to contact.

ASSISTING MOTORISTS

Areas located outside the metropolitan areas can be potentially hazardous for stranded motorists, especially during times of inclement weather. An offer to radio for help or to call for a tow truck promotes a good relationship with the public. Call the Road Operations Center when motorists require assistance; the dispatchers will notify the appropriate agency. Maintenance personnel should not call a tow company directly.

Maintenance employees should always try to assess the situation when approaching a stranded or disabled vehicle. If any indicators cause concern to the employee, he/she should notify District II Road Operations and arrange for law enforcement to investigate.

As a general practice, NDOT does not encourage maintenance vehicles to aid directly in towing or pushing stalled vehicles. There may be circumstances where a stranded vehicle is a hazard and may cause property damage or personal injury if not moved promptly. In these cases, maintenance personnel should exercise their best judgment and move the disabled vehicle with the driver's approval. In isolated instances, law enforcement officers may request assistance in moving stalled vehicles. Employees should inform all parties involved that they are not responsible for any damage that may occur to other vehicles.

LIMITS OF WORK

Snow and ice removal work by state forces should be confined to highway right-of-way.

PRIVATE APPROACH ROADS

Removal of normal snowfall on private approach roads, both on and off the right-of-way, is the responsibility of the property owner. NDOT maintenance forces should remove snow windrows blocking private approaches and mailbox turnouts as a part of after-storm cleanup operations.

Property owners have no authority to move snow onto the paved highway surface. If a property owner continues to move snow onto the highway after being asked not to by a supervisor, the District's Maintenance Manager should be notified. Form letters are available to issue to the offending party, asking them to stop depositing snow into the right-of-way. Law enforcement may be asked to assist in getting the practice stopped.

When possible, the illegal pushing of snow onto the right-of-way should be documented with photographs.

CONSTRUCTION PROJECTS

Snow and ice removal on construction projects should be performed only if the project is open to traffic.

ROADWAY PREPARATION

Roadway side ditches should be clean. Shoulders should be smooth and flush with the pavement. Tall weeds, grass, and brush next to the roadway that may cause drifting should be cut and removed. Slope flattening, ditch widening, and snow fence projects should be considered in high-drift areas during betterment reviews.

Maintenance Supervisors I should inspect signs pertaining to snow removal activities to ensure that the signs are in good condition. Any signs needing replacement should be replaced before the first major storms.

Snow poles are a necessary item in many snow removal operations. They provide delineation for snow removal crews and the traveling public during and after storms. The basic purpose of the snow pole is to:

- Provide roadway delineation
- Mark culverts and drains
- Mark beginning and ends of dikes and guardrail
- Delineate bridge rails
- Delineate ramp gores and median islands
- Mark miscellaneous items or obstructions that could cause damage to plows such as rock outcroppings
- Delineate objects that could be damaged by flying snow from the snow plowing activities when a rotary plow is being used such as signs, homes, trailers, power lines, other utility lines, etc.
- Mark the beginning and end of widen pavement and chain-up areas

Snow poles removed at the end of the previous season or damaged poles needing replacement should be in place prior to November 1. The minimum number of poles necessary shall be used. 400-foot spacing, or more, between the poles is desirable. Areas of poor alignment, fog, and/or severe blowing or snowing conditions may require placement of poles at a spacing less than 400 feet. In areas that have low annual snowfall, snow poles will not be placed. Existing guideposts will be sufficient in most situations.

Snow poles are permitted on the following routes.

- SR-207 Kingsbury Grade,
- US-50 West of Carson City,
- SR-28 US-50 to the Nevada/California state line,
- SR-760 Nevada Beach Road,
- SR-431 Mt.Rose Highway,
- SR-341 Virginia City Route,
- SR-342 Virginia City Route,
- SR-722 Carroll Summit Road,
- SR-338 Sweetwater Summit,
- US-50 Newpass Summit,
- SR-359 Pole Line Road,
- I-580 Washoe Valley
- US-395 South at NV/CA state line north to MP 12

Additional areas for snow pole use will be at the discretion of District II. Snow poles do not ordinarily need to be removed during the summer months.

CHAIN OR SNOW TIRE REQUIREMENTS

“Chains or Snow Tires Required” signs are posted when, in the judgment of the Maintenance Supervisor on duty, snow or ice conditions make it difficult for average drivers to control their vehicles when driving in a prudent manner. Chain or snow tire requirements should be removed when conditions improve enough to allow the average driver to control his or her vehicle.

Road Ops shall be notified of any changes in these requirements.

EMERGENCIES

OPERATIONS

The Maintenance Supervisor I shall notify the Maintenance Supervisor II whenever it becomes apparent that he will be unable to keep his highways open without help. The Maintenance Supervisor II will arrange to send supplementary equipment and work force as available for temporary assistance. The Maintenance Manager should be contacted for possible assistance from other areas if the Maintenance Supervisor II does not have adequate resources in his area. If help is not available and it becomes necessary to close a road, the District II Road Ops Center shall be notified. Road Ops will follow the protocol in place.

PROCEDURES

Emergencies are defined as unforeseen combinations of circumstances or the resulting state that calls for immediate action. Any situation posing an immediate hazard for personal injury or

property damage should be treated as an emergency. During the winter, situations such as traffic accidents, hazardous material spills, and abandoned vehicles become more critical due to storms and adverse road conditions. In addition, accumulating snow or ice, as well as poor visibility, during storms presents increased potential for emergencies.

NDOT normally becomes aware of an emergency situation by one of the following methods:

- An NDOT employee observes an emergency and reports it to the District II Road Operations Center
- A law enforcement agency reports an emergency to the District II Road Operations Center
- A private citizen reports an emergency to an NDOT employee

Once notified of an emergency, the District Office or District II Road Operations Center is responsible for notifying appropriate District supervisory personnel to ensure that the emergency is properly handled. District administration or the Road Operations Center may be required to notify the following:

- Radio and televisions stations
- Chief Maintenance Engineer
- Director's office
- Federal Highway Administration

When NDOT employees arrive on the scene of an emergency, they should:

1. Assess the situation to determine potential hazards and any assistance required.
2. Provide emergency assistance to the injured based on first-aid training and knowledge.
3. Provide traffic control to protect the public and first responders.
4. Not participate in cleanup of any hazardous materials.
5. If the emergency involves damage to state property or personal injury to NDOT employees, notify the Road Operations Center immediately so appropriate notification of District administrative personnel and investigations can be conducted.

REQUESTING REMOVAL OF VEHICLE FROM RIGHT-OF-WAY

NDOT maintenance employees can request removal of private vehicles from the roadway. Nevada Revised Statutes (NRS) authorize the NHP to have vehicles towed from the highway right-of-way.

- NRS 487.281: States that a person shall not abandon a vehicle upon any public highway or road.
- NRS 484.397: Authorizes police officers to remove certain vehicles in certain circumstances. When a vehicle is unattended or disabled, an officer can immediately

have it towed if it is an obstruction to traffic or it interferes with the normal flow of traffic. This law also provides for the towing of vehicles that have been abandoned for 24 hours on any freeway, US route, or primary arterial. On other routes, vehicles can be towed after 72 hours.

Any NDOT employee can call Road Operations and request the tow of a vehicle based on one of the following criteria:

1. The abandoned or disabled vehicle is encroaching into the travel lane (includes a vehicle parked on the edge line).
2. A disabled or abandoned vehicle is parked on or under a bridge structure, in close proximity to the tunnels, or otherwise looks suspicious.
3. Employees are **actively** plowing snow and a vehicle is left where it could be damaged by snow removal operations or is hampering our ability to clear the roadway of snow and ice.

Approval of a Maintenance Supervisor II or higher is required for requesting a tow for the following:

1. A winter storm is predicted and an abandoned vehicle is expected to pose a problem for snow removal operations.
2. A vehicle has been parked in the right-of-way for over 24 hours on a major route or over 72 hours on a secondary route.

MATERIALS

ACQUISITION

Maintenance Supervisors I and II should review material needs to ensure that required materials for the snow removal operations are either delivered or will be delivered in sufficient quantities and at appropriate times to ensure that adequate material will be available for each storm.

In May of each year, a list of stockpile locations and quantities of abrasive mixtures and de-icing chemicals should be prepared by the Maintenance Manager from input received from the Maintenance Supervisor IIs. These requests are processed by the Headquarters Maintenance Office and the Equipment Division for forwarding to State Purchasing. State Purchasing proceeds with advertising and awarding contracts for the materials requested.

Upon receipt of the listing containing the successful material suppliers, orders are placed with the low bidders for the necessary materials.

STORAGE

Proper location of stockpiles is critical to an efficient snow removal operation. The location of stockpile sites should minimize nonproductive travel time and be situated to maximize use by multiple crews. Stockpile sites should be located to minimize possible environmental damage

and not create a nuisance to adjoining properties. Stockpiles must be located in areas where there is suitable access off and on the highway for NDOT vehicles. Salt or abrasive mixtures should be stored in storage buildings wherever possible. When buildings are not available, extra attention should be given to drainage and prohibiting salt from migrating into watercourses or impacting the environment.

SPECIFICATIONS

SAND

Sand for snow and ice control shall meet **Specification D** for de-icing sand. Specification B may be substituted for Specification D material in some areas of the District.

Sieve Size	Specification D % by Weight Passing Sieve	Specification B % by Weight Passing Sieve
No. 4	93 - 100	90 - 100
No. 8	40 - 80	---
No. 16	15-60	35 - 75
No. 50	0 - 20	---
No. 100	0 - 4	---
No. 200	0 - 2.5	0 - 3

Hardness/durability index must be greater than 75.

As sand is delivered, it should be tested in conformance with the NDOT Standard Specifications for Road and Bridge Construction to ensure it meets specifications before accepting or using any of the material. Testing should be performed every 1,000 tons for quality assurance purposes. “See page 71 for Sand Specification sheets”

SALT

De-icing salt shall meet the specifications as set forth in the annual open-term contract (OTC) or bid specifications.

LOW-MOISTURE MINERALIZED DE-ICERS

A mineralized de-icing product is now available to be purchased on OTC. This product is a chloride-based mineral material that works at lower temperatures than normal sodium chloride. Initial applications have shown the product to be very effective. It is applied to the roadway via the truck sander, just like salt-sand mixes.

Mineralized de-icers have been shown to be advantageous when temperatures fall below the working range of sodium chloride. With this product, acceptable de-icing has been achieved with pavement temperatures as low as 5°F. This de-icing product is also especially helpful in urban areas where air quality and dust caused from sand application are issues of concern. However,

due to the increased cost of this material, it should be used at the direction of a Maintenance Supervisor.

Specifications for application will be developed as we gain experience working with this material. Known trade names are "Interstate Melt 500" (Shelton's) and "Ice Slicer RS" (Envirotech).

De-icer materials shall meet the specifications as set forth in the annual OTC or bid specifications.

ANTI-ICING PRODUCTS

Anti-icing materials are available that may provide an improved level of service or result in less environmental damage. A few of the products that may be tested by NDOT are:

- Calcium magnesium acetate
- Magnesium chloride
- Calcium chloride
- Potassium acetate

Anti-icing materials shall meet the specifications as set forth in the annual OTC or bid specifications.

SNOW POLES

Snow poles should be black, six (6) foot, fiberglass Carsonite or approved QPL equivalent, and shall have reflective sheeting attached in a pattern which conforms to the patterns in the Statewide Snow and Ice Control Plan. Carsonite poles are installed behind the guidepost faceplate. Near the Mount Rose Summit it may be necessary to use longer markers. Wood poles of the appropriate size can be substituted for the Carsonite pole. Wood poles shall have the same reflective patterns as other snow poles. As existing nonconforming snow poles are replaced, they should be replaced with snow poles that conform to the current specifications.

“See pages 86 – 87 for snow pole taping specifications”

ANTI-ICING AND DE-ICING

ANTI-ICING

Anti-icing is defined as the snow and ice control practice of preventing the formation or development of bonded snow and ice by timely applications of a chemical freezing-point depressant. District II typically uses a 23% solution of sodium chloride in its anti-icing efforts. The product should be applied to the roadway in advance of a predicted winter storm at 40 to 100 gallons per lane mile. Considerations in determining application rates should include the following:

- Pavement surface texture

- Bridges, tunnels, and shaded areas
- Predicted temperature, humidity, and storm conditions

Observed residual chemical on the roadway from previous applications should also be a factor in the decision process.

Applicators should shut off spraying in advance of intersections and halfway down freeway off ramps in order to keep traffic from over tracking the material into the intersection and creating a possible slick condition.

Speeds when applying anti-icers should not exceed 45 MPH. Applicators should restrict spray to one lane at a time.

It is industry practice to apply anti-icing chemicals well into the storm, except when conditions of hard snow or ice pack exist. Supervisors should evaluate the effectiveness of this practice and use their best judgment when determining the usefulness of this course of action.

APPLICATION OF LIQUID ANTI-ICERS AND DE-ICERS

NDOT uses a self-contained tanker unit with a pump to apply anti-icing chemical to the roadway.

The purpose of spreading an anti-icing material for winter road maintenance is to maintain an orderly flow of traffic during adverse weather conditions and to ensure that the road is as safe as possible under the circumstances. The anti-icing mixture is a minimum 23% solution mixed with water. Application rates of anti-icing chemical should be between 40 and 100 gallons per lane mile, depending on surface conditions of pavement, anticipated winter storm conditions, and observed residual chemical left on the roadway from previous applications. Anti-icing chemicals are used to:

- Prevent the formation of a bond between the snow pack and the road surface
- Melt fresh snow as it falls
- Melt compacted snow that remains after plowing
- Retard the formation of ice

The eutectic composition of the sodium chloride (common road salt)-water system is 23 percent NaCl and 77 percent H₂O by weight, which freezes at about -21°C (-6°F).

Operators need to pay particular attention to the items noted below so that application of the anti-icing chemicals produces optimum results.

Some evidence suggest that anti-icing operations should not be conducted (using liquid, prewetted, or dry salt) when the pavement temperature is at or below about -9.5°C (15°F) (2). Some highway agencies also believe that it is not practical to use salt below -9°C (15°F) for general snow and ice control operations, at least not without calcium chloride. This experience has convinced them that salt's action is too slow at these lower temperatures.

Operators should maintain speeds that do not endanger life or property but provide a reasonably prompt service. An appropriate speed for rural low-volume road with 2 inches of loose snow is considerably different than an appropriate speed for a busy urban street with an ice pack.

OPERATORS SHOULD NEVER EXCEED A SPEED THAT IS SAFE FOR CONDITIONS.

The initial application should be made prior to the predicted winter storm event. The mixture is brine that, under most conditions, will keep snow or ice from bonding to the pavement. Subsequent applications will usually keep the snow in a mealy condition and prevent a pack from forming.

When the slush begins to stiffen, it is time to plow and reapply additional de-icing material.

Anti-icing chemical application is generally necessary on bridges long before road surfaces. Because cold air reaches the top and bottom surfaces of a bridge, they cool off much faster than the remainder of the roadway surface. Because of low temperatures and high humidity, bridge decks may ice up when there is little or no precipitation.

Equipment used for hauling or handling these chemicals should be washed as soon as possible after each storm to prevent corrosion. Washing should not be done where runoff could affect watercourses or impact the environment. NDOT wash racks should be used where available.

When applying anti-/de-icing chemicals, operators must pay close attention to traffic and, if necessary, shut off the nozzles to keep from spraying motorists' vehicles.

ABRASIVE MIXTURES

MIXING

When practical, abrasive mixtures should be mixed and placed in the stockpiles prior to November 1. Materials mixed after this date will potentially contain excessive moisture and present more handling problems than material that is mixed before winter storms. The salt to sand mix ratio can vary, depending on each sub-district's needs.

If an alternative de-icer is used, the manufacturer should be consulted for the recommended mixture and application rate.

APPLICATION

Abrasive mixtures shall only be applied as necessary and when roadway conditions indicate satisfactory results will occur. Snow removal and abrasive mixture application shall be closely monitored to prevent loss of abrasive mixtures by plowing.

The following is a guideline for abrasive use as stated in the 1999 AASHTO Guide for Snow and Ice Control:

“Abrasives or a mix of abrasives and chemicals are commonly used for many snow and ice control operations. The sole function of abrasives is to improve traction, which may be short-lived because traffic will rapidly disperse abrasives and additional frozen precipitation will cover the application treatment.

Abrasives are used routinely for treating snow-packed and icy lower-volume roads in rural areas. They are also used on medium and low-priority roads in many non-rural areas and on all types of roads to improve traction when pavement temperatures are so low that chemical action is slow and abrasive treatments can supplement deicing operations.

The advantages and disadvantages of abrasives must be understood. Advantages include low first costs; some immediate, although temporary, increased traction on slippery surfaces; potential usage at low temperatures when some chemicals are ineffective; and visible evidence of road crew actions. Disadvantages of abrasives include frequent reloading due to low distance of coverage per truckload; reapplication required due to traffic and precipitation; adverse effects on cars such as damage to windshields and body finishes; significant cleanup efforts of roads and drainage facilities following storms and the winter season; adverse effects on the air quality through increased airborne particulate matter (PM10 problem); and adverse effects on watercourse ecosystems.”

Spinner speed settings are critical. A spinner that revolves too fast will throw material over an excessively wide area, which has two detrimental effects: it wastes material, and material that is cast too wide may damage vehicles behind the sand truck or in the adjacent lane. Two methods are available for reducing the distance that the spinner casts material: reducing the speed of the spinner and adjusting the deflectors on the spinner. Truck speed should not exceed 35 MPH when applying abrasive mixtures to the roadway.

A strong wind blowing across a street or highway can cause the abrasive mixture to drift as it comes out of the spreader unit, pushing it onto a shoulder or into a gutter. Operators need to be aware of these situations and “play the wind” to place the abrasive mixture where it will do the most good.

Plowing and sanding operations should be timed to allow the abrasive mixture to be effective. Plowing the abrasive mixture off the pavement before it is effective wastes material and increases the cost of snow removal. Knowing when to plow and reapply the abrasive mixture is an important factor that the operators should be aware of. Watching the snow that is being kicked out behind the vehicle tires will give the operator a good idea when to plow and reapply the abrasive mixture.

Sometimes operators must go beyond their normally assigned areas when plowing and applying abrasive mixtures. Due to the location of jurisdictional breaks, there may be short gaps that do not receive adequate attention unless plow operators make an effort to cover them. A short stretch that is left for another crew to plow or sand can be hazardous to unsuspecting motorists.

Equipment used for hauling or handling salt, such as sanders, should be washed as soon as possible after each storm to prevent corrosion. Washing should not be done where runoff could affect watercourses or impact the environment.

When applying abrasive mixtures in tandem, adequate distance should be maintained between trucks to allow traffic to pass the abrasive mixture application operation. Operators will pay close attention to oncoming traffic and shut off or reduce spinner speed so as not to cast the abrasive mixtures toward the motorists' vehicles, thereby damaging them from the abrasive mixtures being distributed.

SWEEPING

The following regulation applies to after storm clean-up, (Street Sweeping) in Washoe County.

040.032 STREET SWEEPING OPERATIONS (Adopted 2/27/02)

SECTION A – GENERAL

1. **PURPOSE:** To expedite the sweeper deployment after a sanding event, and to improve the efficiency with regards to particulate emissions of the street sweeping equipment used to clean public roads. The effect of this rule shall be to reduce the amount of PM₁₀ entrained into the ambient air as a result of the roads drying out and vehicles traveling over the sand that remains on the roads.
2. **APPLICABILITY:** The provisions of this regulation shall apply to street sweeping of public roads by a governmental agency or any person, who contracts with such governmental agency, if:
 - a. The public paved road is located within Washoe County and south of Township 22N;
 - b. It is routine street sweeping and part of the agency's best management practices for keeping roads in its network swept; and
 - c. The street sweeping is necessary to clean up the material applied during a sanding event for traction control.

DEFINITIONS: For the purpose of this regulation, the following definitions shall apply.

1. **Certified Street Sweeping Equipment.** A sweeper that has been certified by the California South Coast Air Quality Management District as meeting the Rule 1186 sweeper certification procedures and requirements for PM₁₀ efficient sweepers.
2. **Materials.** Natural geologic material, including sand, but excluding sodium chloride rock salt and other de-icing chemicals, used to provide increased traction or de-icing on roadways.
3. **Routine Street Sweeping.** It is street sweeping that is regularly performed by a governmental agency or any person who contracts with such governmental agency to keep the public roads clean. It is not ancillary sweeping performed related to construction activities, or enhanced sweeping necessary because of the application of sanding material for traction control.

4. Sanding Event. The operation of equipment for the application of street sanding materials to a public road network each time an application of materials is necessary for traction control and de-icing.
5. Sweeper Deployment. The operation of street sweepers after a sanding event not inclusive of routine street sweeping.

C – STANDARDS: Any governmental agency and/or its contractor subject to the requirements of this regulation shall:

1. **CERTIFIED STREET SWEEPERS:** Purchase or lease street sweepers used to perform sweeping after a sanding event or routine street sweeping that are considered certified street sweeping equipment, if the contract date or purchase or lease date is February 1, 2002 or later.
2. **MAINTENANCE OF SWEEPERS:** Operate and maintain the certified street sweeping equipment in accordance with the manufacturer's specifications.
3. **SANDING EVENT SWEEPING:** After a sanding event, clean all streets where sanding materials have been applied for traction control as expeditiously as weather and road conditions permit after the application of the sanding material.
 - a. Beginning November 1, 2003, the District will define expeditiously as within four (4) days from the last sanding event or as soon as weather and road conditions permit.
4. **ROUTINE STREET SWEEPING:** Routinely sweep streets not related to a sanding event a minimum once per month, or more frequently as defined by the agency as their best management practices for street sweeping.

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SECTION D – ADMINISTRATIVE REQUIREMENTS

1. Upon request of the Control Officer any governmental agency and /or its contractor shall provide proof to verify that any street sweeper acquired was certified street sweeping equipment at the time of purchase.

SECTION E – COMPLIANCE AND RECORDS

1. Any governmental agency or any person who contracts with such governmental agency for street sweeping activities within the District shall complete a report and submit it to the Control Officer no later than June 30 of each year with the following information regarding sweeper deployment:
 - a. Dates - List each date necessary to complete all lane miles where sanding materials were applied, or until there is another sanding event.
 - b. Number of sweepers.
 - c. Number of lane miles swept on each date.
 - d. Type of equipment used (recorded as a percentage of lane miles swept per type of sweeper).
 - e. Major equipment malfunctions, if any.

EQUIPMENT

GENERAL

In addition to the routine equipment operation training, employees will be trained on the use of ground speed-oriented sander controls. Operational use of the controls will be stressed so the rate of application of material will be consistent even when the speed of the sander truck varies.

PREPARATION AND ADJUSTMENT

Maintenance Supervisors I and II should review the list of available equipment to determine what plows or sanders are available and what condition they are in. Ground-speed-controlled sanders and anti-icing units should be calibrated. Equipment needing repairs should be referred to the repair shop in priority order. Communication equipment should be reviewed to ensure it is in good condition.

CARE AND OPERATION

Maintenance personnel shall check their assigned equipment at the beginning of each shift. Equipment shall be inspected, lubricated, and serviced at the end of each storm. The items listed below should be checked at the beginning or end of the shift.

Plow Truck and Sander

1. Perform complete pre-trip inspection of the truck.
2. Check plow, blade, and frame for obvious damage. If any damage is detected, report it to the supervisor.
3. Check hydraulic oil levels for the sander unit.
4. Grease fittings on the sander unit and check sander controls for proper operation.
5. Check all lights on the truck and the sander.
6. Check to see that accident report forms are in the unit.
7. Check to make sure tire chains are with the vehicle along with tighteners, tools, and wire for repairs.
8. Check to see that safety equipment such as flares or red warning triangles are in the vehicle.
9. Check sander gate openings and deflector settings at the spinner.
10. After each storm, or as required, wash the truck and sander units.
11. At the end of the shift, fuel vehicle and clean cab.
12. Drain air tank daily.

Motor Grader

1. Perform a complete pre-op inspection.
2. Check to make sure tire chains are in a toolbox in the unit along with tighteners, tools, and wire for repairs.
3. Check engine-warning equipment before using equipment.
4. Make sure all lights work and are on when leaving the yard to begin work.

5. Make sure accident report forms are in the unit along with safety items such as flares or red warning triangles.
6. Check to ensure that the slow moving vehicle emblem is on the motor grader and visible to anyone coming up behind the unit.
7. Check plow blades for any obvious damage and report any damage to your supervisor.
8. Drain water from the fuel tanks weekly.
9. When working in a chain or snow tire control area, all drive wheels must be chained.
10. At the end of the shift, fuel vehicle and clean cab.
11. After each storm wash down the unit.

Rotary Plow

1. Perform a complete pre-trip inspection of the truck.
2. Check shoes, wear plates, and fan blades.
3. Check engine-warning equipment before operating unit.
4. Check to make sure that the tire chains along with tighteners, tools, and wire for repairs are on the unit.
5. Check to make sure accident report forms are in the unit.
6. Check all lights.
7. Do not leave the cutter head in gear when leaving the cab or when people are around the unit.
8. At the end of the shift, fuel up the unit, clean cab, and visually inspect the unit for any damage.
9. Drain water from the air tanks.
10. If the snow chains have been damaged, repair them or tell the supervisor before the start of the next shift.
11. Let the rotary box down on center shoes. Never work with box completely on hydraulic system.
12. Clean off all snow buildup from the head, cab, and doghouse after each shift.

Personal Equipment

Because of varied and unpredictable circumstances that occur during the winter season, each employee should have the following personal equipment with them when they begin their shift:

- Gloves
- High-visibility clothing that meets the requirements of TP 1-7-4
- Flashlight
- Hearing protection
- Winter coat or parka
- Rain gear
- Appropriate footwear

SNOW PLOWING

GENERAL

Snowplows should not leave the paved portion of the roadway and plow unpaved shoulders in order to widen out plowed areas. If drifts need to be pushed back, it should be done only with loaders, motor graders, or a wing plow.

Plow operators also will be cautioned about plowing snow at bridges and overpasses. They should reduce plowing speed so snow will not be thrown over the sides of the structures.

PLOWING WITH PUSH PLOWS

Because plows are throwing snow with roadway debris mixed in with the snow, truck-operating speed is very important. Operators should maintain a speed that does not endanger life or property but provides a reasonably prompt service. An appropriate speed for a low-volume rural road with 2 inches of loose snow is considerably different than an appropriate speed for a busy urban street covered with 4 inches of chunky slush.

The maximum speed for plowing on a low-volume rural road is 35 MPH. The plowing speed on urban streets should never exceed the posted speed limit and generally should not exceed 25 MPH. Speeds should be further reduced to eliminate the possibility of causing damage to signs, vehicles, or other facilities along the highway. When plowing on bridges, speed should be decreased so that snow or ice is not pushed over the side of the structure onto traffic or pedestrians below. **OPERATIONS SHOULD NEVER EXCEED A SPEED THAT IS SAFE FOR CONDITIONS.**

When traveling with the plow in the up position, it is District policy that speeds shall not exceed 55 MPH. Speeds may need to be further reduced when a truck is equipped with a wing plow or when traveling over very rough surfaces.

Trucks with plow mounted will operate with overhead warning light **on**, due to the vehicle being over width. Rear warning lights should only be used while spreading material or in times of low visibility.

Under normal circumstances, snow removal equipment should not be operated against opposing traffic unless traffic is restricted from the area under a traffic control plan.

When plowing on a **two-lane highway**, always plow starting at the center of the roadway and plow to the right.

When plowing on a **four-lane highway**, if possible, plow in tandem.

On **non-divided highways or divided highways with narrow medians or barrier rails**, the lead plow starts at centerline and plows to the right. The following plow also plows right.

On **divided highways with medians wide enough to accommodate snow storage**, the lead plow starts on the left and plows left. The following plow overlaps the first plow's cut and plows right. Any additional plows also plow right.

When plowing in the city **where there is a curb, gutter, and sidewalk**, plowing to the right should be done very carefully so that additional snow is not stacked on the sidewalk. In some cases, depending on anticipated accumulation, it may be necessary to plow all snow to the center of the roadway and come back later to remove it. Before plowing to the center of the street, it is necessary that the operator check with his/her supervisor.

Normally when plowing in tandem, adequate distance should be maintained between trucks to allow traffic to pass the plowing operation.

PLOWING WITH WING PLOWS

District II has been increasing its use of wing plows for the past several years. Wing plows offer dramatically increased productivity from a single truck and operator. However, special considerations and training need to be exercised when plowing with a wing plow.

Wing plows should never be used to plow up against guardrail sections. No one should operate a wing plow without being fully trained in the proper uses and precautions necessary to use them safely and effectively.

Rules for wing plow operation are as follows:

- The maximum speed of a snowplow equipped with a wing plow is 35 MPH while plowing and 55 MPH or lower when raised.
- Inspection of the plow blades and plow pins must be made periodically throughout the shift.
- Safety warning lights will be operational whenever the snowplows are attached to the truck.
- Under no circumstances will the main snowplow be used to plow snow to the left and the wing plow to the right.
- When the snowplow is parked, the main plow will be lowered to the ground with the wing plow in the stowed secured position. Make sure there is enough clearance when lowering the wing plow.
- If the visibility is poor or the situation seems unsafe, do not use the wing plow.
- Be sure of your clearance.
- Do not use wing plows on narrow summits or sections of road where guardrail has been installed.

PLOWING WITH ROTARY PLOWS

When operating rotary plows, consideration should be given to the following items:

- Do not blow snow across travel lanes unless no other acceptable alternative exists. When blowing snow across travel lanes, be alert for traffic and shut down the mill when possible for traffic.

- Do not blow snow into avalanche or high-wind-drift areas.
- Be aware of roadside objects (signs, houses, parked cars, power lines, and other utilities) and take appropriate steps to prevent damage from blowing snow.
- If possible, rotary plowing should be performed when traffic is light.

SPECIAL PLOWING AND SPREADING CONSIDERATIONS

Bridges and Overpasses

As the cold air reaches both the top and bottom surfaces of bridges and overpasses, they will tend to freeze up long before the road surfaces. Because of this occurrence, they should receive early and continued attention throughout the storm. Bridge decks may ice up or frost over even when there is no precipitation and will need to be treated with abrasive mixtures. Operators may need to increase application rates if conditions are found to require more abrasive mixtures or chemicals.

Plow operators should reduce their speed when plowing snow on a bridge so that snow and chunks of ice will not be thrown over the sides of the bridge, which could cause considerable damage to anything below the bridge. Areas such as bridges and overpasses require special consideration. Bridge joints can cause damage to plows if they are struck; extra caution should be used when crossing them.

Tunnels and Shaded Areas

Tunnels and shaded areas provide another type of problem for the motorist. These areas need special attention because of the difference in temperature between the sunny area and the shady section. Operators may need to increase application rates if conditions are found to require more abrasive mixtures or chemicals.

Railroad Crossings

Before crossing the tracks, snowplows shall come to a stop and adjust the plow to clear any obstructions and then carefully cross the tracks before resuming regular plowing. No windrow of snow should be left on railroad grade crossings. When removing snow from railroad grade crossings, care should be taken to ensure that ice, snow, abrasive mixtures, or other material is not deposited and left on the railroad tracks. This procedure will help prevent serious damage to the tracks and plowing equipment.

Cattle Guards

When plowing across cattle guards, precautions should be taken to ensure that ice or snow is not allowed to build up on the approach to the cattle guard, the cattle guard, or the exit from the

cattle guard. Before crossing a cattle guard, snowplows should stop 5 to 10 feet prior to the cattle guard, raise plow 2 to 3 inches, and then carefully plow across the cattle guard.

WIDENING AND CLEANUP

As soon as possible after a storm, the crew will concentrate on widening shoulders and other areas where snow may be stored during subsequent storms. Driveways and mailbox turnouts that might have been plugged by earlier snow removal activities will also be cleared.

WHITE OUT CONDITIONS

During white out conditions, the employee must make a sound judgmental decision whether the cause of the white out is due to a heavy winter storm or surface conditions (e.g. – ground blizzard).

If it is determined that a ground blizzard is the cause and is in an area known to produce this type of condition for a short distance up to ½ mile, the employee should make an attempt to continue through the known area in a safe manner. Should the known area be of a distance greater than ½ mile, the employee should proceed as if in a heavy winter storm event.

If a heavy winter storm has caused the condition of visibility to be minimized to a distance of 100 ft or less, the employee may find a safe area to pull off of the roadway (e.g. – Interstate on / off ramp) and using good judgment, allow minimal time for the conditions to improve. If it is not possible to find a safe place to get off of the roadway, the operator should apply an adequate amount of sand before coming to a stop. This should aid traffic in slowing and being able to stop. Should either of the two events occur, the employee must notify Road Operations and their immediate Supervisor.

It is suggested that plowing in tandem in these conditions may aide in the ability to overcome the situation and continue on, as in most cases the rear plow driver usually has better visibility and may assist the lead plow driver.

CLEANING DRAINAGE STRUCTURES

Drainage structures should be pre-marked before the winter season so they can be located during and after storms. It is important that roadway drains and drop inlets be kept open to allow melting ice and snow to run off the roadway. Accumulations of water with falling temperatures may cause inlets to freeze, thus causing an additional hazard to the traffic.

Maintenance employees should be aware of drainage facilities and should make sure they are open to eliminate areas of water accumulating or water running across the roadway. Water from melted snow can create a greater hazard than the original storm, especially if it freezes.

SNOW STORAGE AND DISPOSAL

The usual method of snow storage is to push the snow off the roadway or onto a median area. Snow storage, especially in the metropolitan areas, is a serious problem during periods of heavy snow accumulation. Consideration should be given to reviewing areas for snow storage at the beginning of each winter season.

District management and field personnel should agree upon sites where snow can be disposed of if it has to be hauled from the roadway. In establishing stockpile areas, right-of-way personnel may need to be contacted to determine limits and any special conditions that may exist. Before stockpiling snow on private property, an agreement delineating all conditions and responsibilities must be executed. Because of the chemicals used in snow and ice removal activities, locations of snow storage areas should be evaluated for possible environmental conflicts.

In areas where the snow cannot be blown or plowed off the roadway and there is sufficient roadway width, snow may be plowed to the center of the roadway for later removal. When plowing snow to the center of the roadway, consideration must be given to providing openings for left-turn and cross-traffic.

Whenever snow is stored in the roadway so that it reduces the standard lane widths, parking, or turn movements, the proper highway restriction report shall be filed with the District Office and the Permitting Office in Carson City. The restriction can then be properly posted for the public and oversize loads restricted as necessary.

Two methods of clearing snow windrows from the center of the roadway will be permitted:

1. Material may be hauled from the center of the roadway to pre-designated storage or disposal areas. When practical, hauling should be done at night due to reduced traffic volumes.
2. If temperatures warm sufficiently to promote melting after a storm subsides, the windrows may be re-spread as a thin layer on the traveled way and allowed to melt and dissipate during the daytime. Pavement temperatures should be watched closely during these operations.

Private property owners may clear the snow from driveways within the right-of-way and deposit the snow on the right-of-way not being used by vehicles or pedestrians. No snow from other portions of private property shall be deposited on the right-of-way.

TRAFFIC CONTROL

Traffic control during the winter season has to be emphasized and given a high priority to protect the maintenance workers as well as provide safe passage for the traveling public on the facility. Because of a variety of climatic conditions (i.e., snow, rain, blowing snow, blowing dust, icy and snow packed roadways, etc.), it is more difficult for the maintenance employees to immediately have all the required signs that would normally be used for road closures, lane closures, etc.

Maintenance personnel must always be alert to the conditions and use other items that are immediately available to warn the traveling public of any incident that would cause them to deviate from their normal course of travel. Most incidents during the winter are temporary in nature, and maintenance workers can use the following devices to warn the public:

- Flares or red warning triangles
- Advance warning vehicle (a truck with warning lights in advance of the incident)
- A barrier vehicle (an unoccupied truck parked in advance of the incident, with warning lights)

If the incident, in the opinion of the supervisor, is going to necessitate stationary operation, then appropriate signs should be placed in accordance with NDOT's "Handbook on Work Zone Traffic Control."

At night, special attention must be given to the problem of reduced visibility due to darkness and the varied climatic conditions. During winter, night work is a necessity that requires certain items be given increased emphasis to ensure a safe operation. Some items that should be considered and discussed with maintenance employees include the following:

- Mandatory use of TP-compliant reflective apparel for night work
- Each maintenance worker should have a flashlight
- Sufficient lighting should be provided, when possible, to allow the traveling public to identify the location of the workers

The Maintenance Supervisor I should give each employee as much advance notice as possible of shift changes to avoid unnecessarily fatigued employees.

ROAD CLOSURES

Road closures due to floods, blowing snow, and dust usually occur at predictable locations. New maintenance employees should be made aware of these areas so they will be informed and be in a better position to handle an emergency should one arise. In locations where storms or other conditions may be expected to disrupt traffic, emergency signs and barricades should be on hand and possible detour routes should be investigated at the beginning of each winter season. When it is necessary to close a road for an emergency, the following procedures should be used:

1. Road Ops shall be notified immediately with all pertinent information.
2. Adequate warning signs should be placed giving warning of the closure in accordance with MUTCD.
3. All closures shall have both ends of the closure physically blocked and manned.
4. The closed area should be driven to ensure no one is stranded.
5. The vehicles used to block the road at each end of the closure shall be equipped with radios and strobe lights.
6. The person working the closure should not leave the area until the road is reopened or another NDOT employee relieves the individual.

7. Do not argue with the traveling public. Be firm but polite when informing them of the closure. If the road closure is violated, advise the section supervisor and request assistance from the NHP.
8. Do not give information to the public on the length of the closure or when the road will be reopened unless you are certain of the information.

NDOT is responsible for determining when road closures should be established due to snow or other weather conditions. The decision to close the road should be made at the highest level practical within the District. Due to emergency situations, the highest level practical may dictate that the least experienced member of the crew make the initial determination to close a road. Immediate supervisors should be notified, and a review should be made to determine if steps can be taken to safely reopen the roadway.

Occasionally, an NHP trooper or a Deputy Sheriff will request that a roadway be closed. If circumstances allow, a supervisor from the law enforcement agency should meet with a supervisor from NDOT and review the section in question prior to closing a road. The roadway should only be closed if a reasonably prudent driver cannot negotiate it in a manner that would allow safe passage. If a law enforcement agency closes a roadway and the closure does not appear to be warranted, the Assistant District Engineer or the District Engineer should be contacted as soon as possible with the details of the closure. Road Ops shall be notified immediately of any changes to road closures.

RADIO PROCEDURES

During the winter months, maintenance personnel rely on the two-way radio communications system extensively. With the many calls for abrasive mixtures and assistance to specific areas, disabled vehicles, etc., the two-way radio is the most efficient way to communicate with other workers and the Road Operations Dispatch Center. Some items the workers should be aware of that relate to radio usage are:

- Do not use CB lingo on NDOT radios except for the following:
 - 10-4 (message received)
 - 10-7 (going out of service)
 - 10-8 (coming in service)
 - 10-20 (location)
- Be brief and to the point with your communication. Remember that others need to use the radio. Be courteous and do not interrupt other messages.
- Identify the mountain channel being accessed or if using the 800-Mhz radio, identify the 800.
- Use the appropriate channel for unit-to-unit communication without accessing the mountaintops whenever possible.

When reporting accidents or other activities that require a request to the NHP or other law enforcement agency, provide the following information:

- Location (route, milepost, and direction)

- Injuries if any
- Number of vehicles involved and type of vehicles
- Description of vehicles (make, model, color, license plate number)
- Is the person calling in the information standing by or providing assistance?
- Are any state vehicles or employees involved?

When reporting non-accident calls (i.e., disabled vehicle, etc.), provide the following information:

- Location (route, milepost, and direction)
- Type of incident
- If vehicle is involved, type of vehicle (make, model, color, license plate number)
- Travel card number and expiration date
- Any other pertinent information that you think would aid the dispatcher in passing your message to the proper authorities

Profane, foul, or abusive language on the radio will not be tolerated.

ROAD CONDITION REPORT

The District II Road Operations Center is staffed 24 hours a day year-round. Reports regarding highway conditions, road closures, and approximate time of opening, detours, etc., are compiled as messages from field personnel reach Road Operations Center located in the District Office. Information is disseminated to the public in the following ways:

- Through the telephone system by calling **5-1-1**
- Through the local media
- Via the Internet (www.nevadadot.com)
- Via the HARS (Highway Advisory Radio System)

Maintenance personnel should be aware that even during severe storms, the District II Road Operations Center is staffed by a maximum of two employees (normally only one). When radioing in to report an incident and an immediate response is not received, wait a minute or so and try again to complete the message. During a severe storm, there may be as many as 100 maintenance employees working and if many of them are trying to contact Road Operations it may take some time and patience to get through. Dispatchers also receive many calls from the NHP and other law enforcement agencies and are required to update road conditions as they change.

All District II maintenance employees shall report conditions to the District II Road Operations Center.

It is absolutely mandatory that road condition changes are relayed to the Road Operations Center as they change so current and reliable road information is always available to the public.

LEVELS OF SERVICE

Budgetary and physical resources available for winter maintenance operations often limit District snow and ice control operations. Due to these limited resources, five levels of service (A through E) have been established. Factors that should be considered when establishing the level of service for a specific route include the following:

- Safety
- Average daily traffic (ADT)
- Commuter routes
- Availability of alternative routes
- Public interest and concern
- Potential economic impact
- Consequence of not providing a higher level of service
- Available resource

LEVEL OF SERVICE A

Snow will be removed continuously, and anti-icing and de-icing techniques and abrasive mixtures will be used as needed during the storm event to keep the roads open for traffic and provide a good surface on which to operate. After the storm has subsided, snow will be removed and abrasive mixtures will be used on a continuing basis until bare pavement exists. Patrols will be established for those areas where conditions require surveillance of the roadway for ice, rocks, avalanche, or snow. An abrasive mixture should be applied to enhance traffic safety when conditions warrant.

District II Level of Service A Routes

<u>Route</u>	<u>Crew</u>	<u>Description</u>
I-80	225, 253 & 283	NV/CA state line to the Imlay Intg
US-395/I-580	227, 251, 252, 270	From the NV/CA state line near Topaz to the NV/CA state line north of Reno.
US-395A	270,252	From jct with South Eastlake Blvd. north to Patriot Blvd.
SR-28	271	From jct. with US-50 near Spooner Summit to the NV/CA state line west of Incline Village.
SR-341	234	From the junction with US 50 near Moundhouse to the jct. with US 395 @ Mt. Rose.

SR-342	234	From the junction with SR-341 in Silver City to the junction with SR-341 in Virginia City.
SR-431	250	Mount Rose Highway from the junction with SR-28 to the junction with US-395.
SR-445	251	From the junction with Nugget Avenue to Egyptian Way.
SR-529	270	From the jct. with US-395 & Spooners north to West Bonanza Drive.
US-50	270, 271, 272,280,281	From the Nevada/California state line at Lake Tahoe to the junction of SR-121, Dixie Valley Road.
US-50A	225	From the junction with US-95A to LY/CH county line near Hazen.
US-95A	225	From the junction with US-50 Silver Springs to north side I-80 Intg.
SR-338	235	Sweetwater Road, from SR-208 to the NA/CA state line.
FR-445	270	East Washoe Lake Road, from the junction with SR-429 to a point 0.77 miles north.
SR-338	235	Sweetwater Road from the California state line to the junction with SR-208 near Smith.

Major frontage roads and interchange ramps have been assigned a level of service "C." Minor frontage roads have been assigned a level of service "D." Frontage roads when used as a detour during road closures will be automatically upgraded to a level of service "A".

LEVEL OF SERVICE B

This level is the same as Level A except when personnel and equipment are not sufficient to maintain Level A service for both Level A and B routes, and then Level A routes will take precedence. This may require shifting of personnel from Level B routes in one section to Level A routes in another section. Level B routes may experience longer periods of snow pack and chain or snow tire requirements while Level A routes are being maintained.

District II Level of Service B Routes

<u>Route</u>	<u>Crew</u>	<u>Description</u>
SR-207	227	Kingsbury Grade from the jct. with US-50 at Lake Tahoe to the jct with SR-206.
SR-362	237	Hawthorne bypass from the south jct. with US-95 to the north jct. with US-95.
SR-431	250	Mount Rose Highway from the junction with SR-28 to the junction with US-395.
SR-443	251	Clear Acre Lane/Sun Valley Drive, from Wedekind to the county road at 7th.
SR-445	251	Pyramid Highway from the junction of Egyptian Way to Whiskey Springs Rd.
SR-646	252	Prater Way from the west R/W of SR-650 to the east R/W of SR-650.
SR-648	252	West 2nd Street from the jct. with SR-647 to 0.1 miles east of the SPRR underpass (B-258).
SR-648	252	East 2nd Street and Glendale Avenue, from Kietzke Lane to McCarran Blvd.
SR-659	251	West side of McCarran Blvd. from I-580 to Virginia Street.
SR-659	253	East Side of McCarran Blvd. from I-580 to Virginia Street.
SR-653	252	Plumb Lane from the jct. with Kietzke Lane to the jct. with Terminal Way.
SR-667	252	Kietzke Lane from the jct. With Neil Rd. to the jct. with Galletti Way in Sparks.
SR-668	253	Rock Blvd. from Hymer Ave. to the junction with Victorian Av..
US-50A	225, 281	From the junction with US 95A near Fernley to the junction with US-50 west of Fallon.
US-50	282	From SR-121 (Dixie Valley Road) to the CH/LA county line.

US-95	237, 280, 281	From the junction with SR-361 near Luning to the junction with I-80 north of Fallon.
US-95A	225, 236	From the junction with US-95 at Schurz to the north side of the I-80 East Fernley Intg.
SR-427	225	From the jct. with IR-80 east to the jct. of US-95A and the Main Street of Fernley.
SR-425	253	Verdi Rd. from W. Verdi Intg. to E. Verdi Intg.

Major frontage roads and interchange ramps have been assigned a level of service of "C". Minor frontage roads have been assigned a level of service of "D." Frontage roads when used as a detour during road closures will be automatically upgraded to a level of service "A".

LEVEL OF SERVICE C

Snow should be removed during the storm to keep roads open for traffic. Snow pack left by truck plows will be removed as soon as conditions (e.g., weather and workload) permit. Patrols may be used for applying abrasive mixtures to selected areas and where conditions require surveillance for ice, rocks, avalanche, or snow.

District II Level of Service C Routes

Route	Crew	Description
SR-88	227	From the Nevada/California state line to the junction with US-395.
SR-115	280	Harrigan Road from Berney Road to the junction with Stillwater Road.
SR-116	280	Stillwater Road from the junction with US-50 to Stillwater.
SR-117	281	Sheckler Road between US-50 and US-95.
SR-118	280	Wildes Road from the junction with Harrigan Road to the junction with Harmon Road.
SR-119	280	Berney Road from the junction with US-95 to the main gate of NAAS.
SR-120	280	Pasture Road from the junction with US-95 to the junction with SR-119.

SR-206	227	Fairview, Foothill Rd. & Genoa Lane, from the jct. with SR-88 to the jct. with US-395.
SR-208	235, 236	From the junction with US-395 to the junction with US-95A in Yerington.
SR-339	236	Nordyke Cutoff from the junction with SR-208 to the junction with US-95A at Goldfield Ave.
SR-340	236	Bridge Street from SR-208 to SR-339.
SR-361	282	Gabbs Road from the junction with US-50 to the Mineral/Churchill county line.
SR-396	283	From West Lovelock Interchange to Coal Canyon Road to South IR-80 R/W.
SR-397	283	Westergard Road and South Meridian Road, from the airport to Main Street in Lovelock.
SR-398	283	Main St. N. Meridian and Fairview from S. R/W of I-80 to the jct. with Cornell Ave.
SR-399	283	Pitt Road from 1.3 miles south of the mine to the junction with North Meridian Road.
SR-426	252	South Meadows Parkway from South Virginia Street to 0.37 miles east.
SR-427	225	From South IR-80 R/W at FR-422 to the West Fernley Interchange.
US-395alt	270	Bowers Mansion Rd. from the CC/WA County Line to the junction with US-395.
SR-445	251	From Whiskey Springs Rd. to Warrior Point.
SR-446	231	Sutcliffe-Nixon Road from the junction with SR-445 to the junction with SR-447.
SR-447	231	From the junction with SR-427 at Wadsworth to 0.32 miles past the RR tracks at Gerlach.
SR-518	270	Snyder Lane from the jct. with SR-529 to the Stewart State Facility.

SR-647	253	W. 4th St. from Lawton Intg. E. to View Street in Sparks.
SR-647	253	Victorian Way in Sparks from west edge of Stanford Way to McCarran Blvd.
SR-671	252	Holcomb-Huffaker Lane's from the south jct. with US-395 to the north jct. with US-395.
SR-673	251	Stead Intg. from FR-423 to north R/W line of US-395.
SR-715	281	McLean Road from Sheckler Road to US-50.
SR-718	280	Lone Tree and Curry Roads from the county road to US-95.
SR-720	280	Union Lane from US-95 to Pasture Road.
SR-723	281	Soda Lake Road, from US-50 to Cox Road.
SR-726	281	Old River Road, from US-95 to 0.02 miles east of bridge (B-547).
SR-756	227	Centerville Road from SR-88 to US-395.
SR-757	227	Muller Lane, from SR-206 to US-395.
SR-759	227	Airport Road, from US-395 to the Douglas County Airport.
SR-822	272	Dayton Valley Rd. from US-50 in Dayton to a point 0.14 miles east.
SR-823	235	Colony District Road, from SR-208 north & west to Simpson.
SR-824	235	Central Simpson Road, from SR-208 in Smith to SR-823.
SR-825	235	Gage Road from SR-824 to a point 0.41 miles west.
SR-827	236	Mason Rd., Cremetti, McKenzie and Pursel Lanes, from SR-339 in Mason to end of pavement.

SR-828	225	Fernley Farm Dist. Rd. from west junction at US-95A to east junction at US-50A.
SR-854	283	Lone Mountain Road, from North Meridian to Pitt Road.
SR-856	283	From SR-396 to the Lovelock Airpark.
SR-857	283	Coal Canyon Rd. from R/W of I-80 to SR-396.
SR-860	283	Derby Field Road, FR-401 to the cattle guard at the entrance to the airport.
SR-880	251	Wedekind Road, from Orr Ditch to SR-445.

Major frontage roads and interchange ramps have been assigned a level of service of "C." Minor frontage roads have been assigned a level of service of "D." Frontage roads when used as a detour during road closures will be automatically upgraded to a level of service "A".

LEVEL OF SERVICE D

Snow should be removed only during scheduled shifts except some routes may be plowed on overtime when the District Engineer determines there is sufficient reason for plowing. These routes may be allowed to close during moderate to heavy snowstorms. Roads allowed to close temporarily will be reopened after the end of the snowstorm during scheduled shifts as personnel and equipment become available. Once open, the road should be treated with an abrasive mixture to provide traffic safety as deemed necessary by the supervisor.

District II Level of Service D Routes

<u>Route</u>		<u>Description</u>
SP-1	271	Cave Rock State Park road
SP-3	271	Spooner Lake State Park road
SP-12	272	Dayton State Park road
SP-13	236	Fort Churchill State Park road
SP-16to19E	236	Lahontan State Park roads, ramps west
SP-15to18	281	Lahontan State Park roads, ramps east
SP-32to34	283	Rye Patch State Park roads, ramps
SP-33	237	Walker State Park road, ramp

SP-80-81	271	Sand Harbor State Park roads, ramp
SP-94-95	270	Washoe Lake State Park roads
SP-96	252	Little Washoe Lake State Park road
SR-121	282	Dixie Valley Road, from US-50 to Dixie Valley.
SR-359	237	Pole Line Road, from US-95 to the Nevada/California state line.
SR-401	283	Rye Patch Road, from the recreational area west of the dam to the south R/W of I-80.
SR-655	253	Patrick Intg. to WA/ST county line.
SR-705	270	Clear Creek Road, from US-395 west to the diversion box.
SR-722	282	Carroll Summit, from the junction of US-50 east to the District 3 boundry.
SR-760	271	Nevada Beach Road, from the junction with US-50 to Nevada Beach entrance.
SR-829	235	Sweetwater cutoff from SR-338 to SR-208 near the Department's maintenance station.
SR-839	280	Scheelite Road, from the start of pavement to US-50.
SR-877	270	Franktown Road, from the south junction with SR-429 to the north junction with SR-429.
SR-878	250	Slide Mountain Rd. from the jct. with SR-431 to entrance of the Slide Mountain Ski Area.

Major frontage roads and interchange ramps have been assigned a level of service of "C." Minor frontage ramps & State Park Roads have been assigned a level of service of "D." Frontage roads when used as a detour during road closures will be automatically upgraded to a level of service "A".

LEVEL OF SERVICE E

These routes are allowed to close during the winter and are reopened in the spring when it is reasonable to expect that the possibility of a major storm is over.

District II Level of Service E Routes

<u>Route</u>	<u>Description</u>
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Currently there are no routes in District II assigned a level of service classification "E."

INDIVIDUAL CREW SNOW PLANS

Individual Snow and Ice Control Plans for crew numbers 225, 227, 231, 234, 235, 236, 237, 250, 251, 252, 253, 270, 271, 272, 280, 281, 282, and 283 crews are included in this section. Each crew plan establishes specific procedures and emphasis areas for snow and ice removal for that crew. The crew plans augment the Statewide and District Snow and Ice Control Plans.

FERNLEY REGION

CREW 225, FERNLEY

Field Operations

Plowing (push plows)

When removing snow and ice on I-80, a minimum of two trucks will be used in a tandem if labor and equipment is available.

Snow will be plowed to the center of US-95A and SR-427 within the Fernley city limits.

Plow operators should use caution when plowing snow at bridges and overpasses. They should reduce speed so snow will not be thrown over the sides of the structures.

Priorities for Sanding

- I-80 Interchange overpass structures and ramp intersections.
- US-95A Fernley city limits.
- SR-427 From the jct. of IR-80 at Wadsworth to jct. of US-95A.
- I-80 Tracy Clark Station to US-95 Trinity Intg.
- US-95A Silver Springs to the junction with I-80, hills, curves and intersections.
- US-50A Fernley to Hazen, hills, curves and intersections.

Routes and Level of Service

<u>Route</u>	<u>Service Level</u>	<u>Description</u>
I-80	“A”	From Tracy Clark Station to Trinity Intg.
US-50A	“A”	From the junction with US-95A to LY/CH county line near Hazen.
US-95A	“A”	From the junction with US-50 Silver Springs to north side I-80 Intg.
SR-427	“B”	From junction IR-80 West Fernley Interchange to junction US-95A and Main St.
SR-427	“C”	From South IR-80 R/W at FR-422 to West Fernley Interchange.
SR-828	“C”	Fernley Farm Dist. Rd. from US-95A to US-50A near Hazen.

Major frontage roads and interchange ramps have been assigned a level of service of "C". Minor frontage roads have been assigned a level of service of "D". Frontage roads when used as a detour during road closures will be automatically upgraded to a level of service "A".

CREW 231, NIXON

Field Operations

Plowing (push plows)

When plowing snow in Wadsworth and Nixon, intersections should not be blocked by snow windrows.

Priorities for Sanding

Emphasis for sanding will be placed on the roads through Wadsworth, Nixon, intersections, hills, and curves.

Routes and Level of Service

<u>Route</u>	<u>Service Level</u>	<u>Description</u>
SR-446	“C”	Sutcliffe/Nixon road from SR-445 to SR-447.

SR-447

“C”

From SR-427 at Wadsworth to 0.32 miles beyond WPRR in Gerlach.

CREW 235, WELLINGTON

Field Operations

Plowing (push plows)

The roads in 235's section are all secondary routes. SR-208 through Wellington and Smith, nearby residential areas, and the summit on SR-208 west of Wellington should receive attention first.

If the roads within this crew's jurisdiction are plowed and sanded, a portion of the crew may be available to assist Crew 227 on US-395 and Crew 236 on SR-208 in the Wilson Canyon area.

Priorities for Sanding

- SR-208 Through Wellington
- SR-208 The summit west of Wellington
- SR-208 Through Smith/Central
- SR-824 Simpson Road from the jct. with SR-208 past the high school to the jct. with SR-823.
- SR-208 From summit west of Wellington to the jct. with US-395.
- SR-208 From Smith/Central north/east to the section break at Wilson Canyon.
- SR-825 Gage Road from SR-824 to 0.41 miles west.
- SR-829 From SR-338 northwest to the junction with SR-208 near Wellington.
- SR-823 Colony District Road from SR-208 north & west to Simpson Road.
- SR-338 Sweetwater Road from the California state line to the junction with SR-208 near Smith

Routes and Level of Service

<u>Route</u>	<u>Service Level</u>	<u>Description</u>
SR-208	“C”	From the junction with US-395, east & north to the West Walker Bridge.
SR-338	“D”	Sweetwater Road from the California state line to the junction with SR-208 near Smith.
SR-823	“C”	Colony District Road from SR-208 north & west to Simpson Road.
SR-824	“C”	Central/Simpson Road from SR-208 in Smith to SR-823.
SR-825	“C”	Gage Road from SR-824 to 0.41 miles west.
SR-829	“D”	From SR-338 northwest to the junction with SR-208 near Wellington.

Any route used as a detour during road closures will be upgraded to a level of service “A”.

CREW 236, YERINGTON

Field Operations

Plowing (push plows)

Snow will be plowed to the center of the highway on SR-208, Main Street of Yerington.

Priorities for Sanding

- SR-208 Yerington city limits, intersections
- SR-340 Bridge Street from SR-208 to SR-339, intersections, icy bridge deck.
- US-95A Goldfield Ave. from SR-208 to SR-339, intersections, icy bridge deck.
- SR-339 From the junction with US-95A to just south of Mason, intersections.

- US-95A From Yerington north to Silver Springs, hills, curves, icy bridge deck, and intersections.
- US-95A From Yerington south to the jct. with US-95 at Schurz, hills, curves, and intersections.
- SR-827 Mason Road from SR-339 east to SR-208, intersections, icy bridge deck.
- SR-208 Wilson Canyon curves and shaded icy spots.
- SR-339 Nordyke Cutoff from Mason south to the junction with SR-208.
- SR-208 From Yerington south to the end of the section at the West Walker Bridge.
- SR-827 From SR-208 east, south, and east to the end of pavement.

Routes and level of Service

Route	Service Level	Description
SP-13	“D”	Fort Churchill State Park Road
SP-16	“D”	Lahontan S.R.A. boat launch road
SP-16B	“D”	Lahontan S.R.A. boat launch ramp road
SP-16C	“D”	Lahontan S.R.A. boat launch parking-outer loop
SP-16D	“D”	Lahontan S.R.A. middle parking loop
SP-16E	“D”	Lahontan S.R.A. water tank road
SP-19	”D”	Lahontan S.R.A. main park road, Fir Ave. to Beach 7 road.
SP-19B	“D”	Lahontan S.R.A. group 1 parking loop
SP-19C	“D”	Lahontan S.R.A. group 1 area
SP-19D	“D”	Lahontan S.R.A. beach 7 road
SP-19E	“D”	Lahontan S.R.A. boat parking road

SR-208	“C”	From the West Walker River at Wilson Canyon through Yerington to the jct. with US-95A.
SR-339	“C”	Nordyke Cutoff from Wilson Canyon to the jct. with US-95A at Goldfield Avenue.
SR-340	“C”	Bridge Street from SR-208 Main Street to SR-339.
SR-827	“C”	Cremetti, McKenzie, and Pursel Lane from SR-339 at Mason to the end of pavement.
US-95A	“B”	From the MI/LY county line to the Silver Springs junction with US-50.
US-95A	“B”	From the junction with US-95 at Schurz to the MI/LY county line.

Any route used as a detour during road closures will be upgraded to a level of service “A”.

FALLON REGION

CREW 237, HAWTHORNE

Field Operations

Plowing (push plows)

Snow on the Main Street of Hawthorne should be plowed to the center of the highway.

Priorities for Sanding

- US-95 Main Street of Hawthorne
- SR-362 Hawthorne Bypass from US-95 SE to US-95 NW of Hawthorne.
- US-95 From Hawthorne to the jct. with US-95A near Schurz, curves, hills, intersections, and shaded icy spots by Walker Lake.
- US-95 From the junction with SR-361 near Luning to Hawthorne, hills and curves.

- SR-359 From the Nevada/California state line to the junction with US-95, hills and curves.

Routes and Level of Service

Route	Service Level	Description
SP-33	“D”	Walker Lake S.R.A. main park road & boat ramp road.
SR-359	“D”	From the Nevada/California state line to the junction with US-95 in Hawthorne.
SR-362	“B”	Hawthorne bypass from US-95 SE to US-95 NW of Hawthorne.
US-95	“B”	From the junction with SR-361 near Luning to the junction with US-95A near Schurz.

Any route used as a detour during road closures will be upgraded to a level of service “A”.

CREW 280, FALLON

Field Operations

Plowing (push plows)

Plow operators should use caution when plowing many of the local roads due to the narrowness and obstacles such as mailboxes, canals, etc.

Plowing should follow a plan of priority based on traffic needs in the area.

If the roads within this crew’s jurisdiction are plowed and sanded, a portion of the crew may be available to assist Crew 281.

Priorities for Sanding

- US-95 From the start of Taylor Street south to last of intersections, intersections and shaded icy spots.
- SR-115 Harrigan Road from Berney Road to the junction with Stillwater Road.
- SR-720 Union lane from US-95 to Pasture Road.

- SR-119 Berney Road from US-95 to the main gate of NAAS.
- SR-118 Wildes Road from Harrigan Road to the junction with Harmon Road.
- SR-116 Stillwater Road from the junction with US-50 to Stillwater.
- SR-718 Lone Tree & Curry Road's from the county road to US-95.
- US-95 From Fallon south to the junction with US-95A at Schurz.
- US-50 From the jct. with US-95 east to the jct. with SR-121, Dixie Valley Road.
- SR-120 Pasture Road from US-95 to SR-119, Berney Road.
- SR-839 Nevada Shelite Mine Road from the start of oil to the junction with US-50.

Routes and Level of Service

Route	Service Level	Description
SR-115	"C"	Harrigan Road from Berney Road to the junction with Stillwater Road, intersections.
SR-116	"C"	Stillwater Road from the junction with US-50 to Stillwater, intersections.
SR-118	"C"	Wildes Road from Harrigan Road to the junction with Harmon Road, intersections.
SR-119	"C"	Berney Road from US-95 to the main gate of NAAS, intersections.
SR-120	"C"	Pasture Road from US-95 to SR-119, Berney Road, intersections.
SR-718	"C"	Lone Tree & Curry Road's from the county road to US-95, intersections.
SR-720	"C"	Union Lane from US-95 to Pasture Road, intersections.

SR-839	“D”	Nevada Shelite Mine Road from the start of the pavement to the junction with US-50.
US-50	“A”	From the junction with US-95 to the junction with SR-121, Dixie Valley Road, hills, curves, and intersections.
US-95	“B”	From the start of Taylor Street in Fallon, south to the junction with US-95A in Schurz, hills, curves, and intersections.

Any route used as a detour during road closures will be upgraded to a level of service “A”.

CREW 281, FALLON

Field Operations

Plowing (push plows)

Plow operators should use caution when plowing many of the local roads due to the narrowness and obstacles such as mailboxes, canals, etc.

Plowing should follow a plan of priority based on traffic needs in the area.

If the roads within this crew’s jurisdiction are plowed and sanded, a portion of the crew may be available to assist Crew 280.

Priorities for Sanding

- US-95 Taylor Street in Fallon from “Y” to junction with US-50, intersections.
- US-50 From the junction with US-95A to the junction with US-95, hills, curves, and intersections.
- US-50A From the LY/CH county line near Hazen to the junction with US-95, hills, curves, and intersections.
- SR-117 Sheckler Road from US-50 to US-95, intersections.
- SR-715 McLean Road from Sheckler Road to US-50, intersections.
- US-95 From the junction with US-50 at Main Street to the junction with I-80 at Trinity, hills, curves, and intersections.

- SR-726 Old River Road from US-95 to 0.02 miles east of B-547.
- SR-723 Soda Lake Road from US-50 to Cox Road.

Routes and Level of Service

Route	Service Level	Description
SP-15	“D”	Lahontan S.R.A. marina boat ramp
SP-16	“D”	Lahontan S.R.A. main park road
SP-16B	“D”	Lahontan S.R.A. beach 1 area
SP-17	“D”	Lahontan S.R.A. dam overlook road
SP-18	“D”	Lahontan S.R.A. District 3 road
SR-117	“C”	Sheckler Road from US-50 to US-95.
SR-715	“C”	McLean Road from Sheckler Road to US-50.
SR-723	“C”	Soda Lake Road from US-50 to Cox Road.
SR-726	“C”	Old River Road from US-95 to 0.02 miles east of B-547.
US-50	“A”	From LY/CH county line to the junction with US-95.
US-50	“A”	From the junction with US-95A to the LY/CH county line.
US-50A	“A”	From the LY/CH county line by Hazen to US-50 west of Fallon.
US-95	“B”	From “Y” on Taylor Street in Fallon to I-80 Trinity Jct.

Any route used as a detour during road closures will be upgraded to a level of service “A”.

CREW 282, COLD SPRINGS

Field Operations

Priorities for Sanding

- US-50 From SR-121(Dixie Valley Road) to the CH/LA county line, hills, curves, and intersections.
- SR-361 Gabbs Road from the MI/CH county line to the junction with US-50, hills, curves, and intersections.
- SR-722 Carroll Summit from the junction with US-50 to Peterson Station, hills, curves, intersections, and shaded icy spots.
- SR-121 Dixie Valley Road from US-50 north to Dixie Valley, hills, curves, and intersections.

Routes and Level of Service

Route	Service Level	Description
SR-121	“D”	Dixie Valley Road from US-50 north to Dixie Valley.
SR-361	“C”	Gabbs Road from the MI/CH county line to the junction with US-50.
SR-722	“D”	Carroll Summit from the junction with US-50 to Peterson Station.
US-50	“B”	From SR-121 (Dixie Valley Road) to the CH/LA county line.

Any route used as a detour during road closures will be upgraded to a level of service “A”.

CREW 283, LOVELOCK

Field Operations

Plowing (push plows)

When removing snow and ice on I-80, a minimum of two trucks will be used in tandem if labor and equipment are available.

Snow will be plowed to the center of the road on SR-398, Lovelock Main Street, within the city limits.

Plow operators should use caution when plowing snow at bridges and overpasses. Speed should be reduced so snow will not be thrown over the sides of the structures.

Priorities for Sanding

- SR-398 Main Street, within the Lovelock city limits
- I-80 From 0.37 miles east of Trinity, US-95 Intg. To 1.08 miles west of Imlay Intg.
- SR-399 Pitt Road from 1.30 miles south of the Eagle Picher Mine to North Meridian Road.
- SR-398 The rest of North Meridian and Fairview Road from the south junction with SR-396 to the north east junction with SR-396.
- SR-396 Upper Valley Road, old 40 from the west end of Lovelock to the east end.
- SR-854 Lone Mountain Road from North Meridian to Pitt Road.
- SR-856 From SR-396 in Lovelock to Lovelock Airpark.
- SR-397 Westergard and South Meridian from the airport to the Main Street of Lovelock.
- SR-396 Coal Canyon Road from R/W line south of I-80 to Junction FR-401.
- SR-860 Derby Field Road from SR-396 to cattle guard at the airport.
- SR-401 Rye Patch Road from the recreation area west of the dam to the south I-80 R/W.

Routes and Level of Service

Route	Service Level	Description
I-80	“A”	From 0.37 miles east of the US-95 Intg. to 1.08 Miles west of the Imlay Intg.
SP-32	“D”	Rye Patch S.R.A. lower dam road

SP-33	“D”	Rye Patch S.R.A. office road
SP-34	“D”	Rye Patch S.R.A. boat ramp road
SR-396	“C”	0.10 miles north of the Miriam Grade separation to the RR overpass down frontage road to the R/W.
SR-397	“C”	Westergard and Meridian Roads from the airport to the Main Street of Lovelock.
SR-398	“C”	Main Street, North Meridian, and Fairview Roads from the south Intg. of I-80 to Cornell.
SR-399	“C”	Pitt Road from 1.30 miles south of the mine to North Meridian Road.
SR-401	“D”	Rye Patch Road from the recreation area west of the dam to south I-80 R/W.
SR-854	“C”	Lone Mountain Road from North Meridian to Pitt Road (SR-399).
SR-856	“C”	From SR-396 in Lovelock to the Lovelock Airpark.
SR-860	“C”	Derby Field Road from SR-396 to the cattle guard at the airport.

Major frontage roads and interchange ramps have been assigned a level of service of "C". Minor frontage roads have been assigned a level of service of "D". Frontage roads when used as a detour during road closures will be automatically upgraded to a level of service "A".

RENO REGION

CREW 234, VIRGINIA CITY

Field Operations

Plowing (push plows)

Care must be taken on SR-341 through Virginia City to assure that plowing does not create a greater hazard due to the steep grades of the side streets. Plow operators should use caution not to leave windrows across the side street approaches. Snow will be plowed to the center of the street and removed as soon as possible.

Priorities for Sanding

SR-341	Virginia City, Gold Hill, and Silver City area. Intersections, hills, curves, and shaded ice.
SR-341	Geiger Grade, to the junction with US-395, intersections, hills, curves, and shaded ice.
SR-341	Silver City to the jct. of US-50, intersections, hills, curves, and shaded icy spots.
SR-342	Truck Route from jct. near Silver City to jct. with SR-341 in Virginia City, intersections, hills, curves, and shaded icy spots.

Routes and Level of Service

Route	Service Level	Description
SR-341	“A”	Virginia City road from the jct. with US-50 to the LY/ST county line.
SR-341	“A”	Virginia City road from the LY/ST county line to the ST/WA county line.
SR-341	“A”	Virginia City road from the ST/WA county to the junction with US-395.
SR-342	“A”	Truck route from SR-341 near Silver City to the LY/ST county line.
SR-342	“A”	Truck route from the LY/ST county line to SR-341 in Virginia City.

CREW 251, RENO/US-395

Field Operations

Plowing (push plows)

When removing snow and ice on US-395, a minimum of two trucks will be used in tandem if labor and equipment are available. The tandem method will also be used on Oddie Blvd., Pyramid Way from Nugget Avenue to Queen Way and Clear Acre Lane-Sun Valley Drive.

Snow on the following routes will be plowed to the center of the highway:

- SR-445 Pyramid Way, from Nugget Avenue to Queen Way.

If the roads within this crew's jurisdiction are plowed and sanded, a portion of the crew may be available to assist Crew 253 on I-80 or Crew 252 on US-395 and Interstate 580.

Personnel from Crews 240, 241, and 245 will be used to cover some routes within the cities of Reno and Sparks or other areas as directed.

Plow operators should use caution when plowing snow at bridges and overpasses. They should reduce speed so snow will not be thrown over the sides of the structures.

Priorities for Sanding

- US-395 Interchange overpass structures and ramp intersections.
- US-395 The freeway section between the junction with McCarran Boulevard and Panther Valley.
- US-395 Both sides of Anderson Hill, between mileposts WA-36.0 and 39.0.
- US-395 The south bound on ramp from Golden Valley Interchange.
- US-395 The south bound on ramp from the Stead Interchange.

Environmental Concerns

Because much of this crew's jurisdiction is in an environmentally sensitive area, additional effort will be spent on crew training and environmental awareness. Before the first winter storm the Maintenance Supervisor I should provide training on environmental issues, equipment operation and abrasive application.

Environmental Issues

Training should include topics that enhance awareness of environmental issues, especially regarding the Truckee Meadows area. The potential detrimental effects of salt and sand to roadside vegetation, water quality, air quality and the potential for increased erosion should be stressed.

Routes and Level of Service

Route	Service Level	Description
SR-443	“B”	Clear Acre Lane-Sun Valley Drive, from the junction with SR-659 to the county road.
SR-445	“A”	Pyramid Way, from the junction with Nugget Avenue to Egyptian Way.
SR-445	“B”	Pyramid Way from Egyptian Way to Whiskey Springs Rd.
SR-445	“C”	Pyramid Way, from Whiskey Springs Rd. to Warrior Point.
SR-673	“C”	Stead Intg. from FR-423 to north R/W line of US-395.
SR-880	“C”	Wedekind Road, from near the Orr Ditch to Pyramid Way.
US-395	“A”	From I-80 north to the NV/CA state line.
SR-659	“B”	From MP 10.50 to MP 22.98

Major frontage roads and interchange ramps within the jurisdiction of this crew have been assigned a level of service "C". Minor frontage roads have been assigned a level of service "D". Plowing and sanding interchange ramps will, if resources are available, be accomplished before peak daily commute times. Frontage roads when used as a detour during road closures will be automatically upgraded to a level of service “A”.

CREW 252, RENO/I-580/US-395A

FIELD OPERATIONS

Plowing (push plowing)

When removing snow and ice on US-395 and I-580, a minimum of two trucks will be used in tandem if personnel and equipment are available. The tandem method will be used on McCarran Blvd., Kietzke Lane, Plumb Lane and Glendale Avenue.

Snow on the following routes will be plowed to the center of the highway:

- SR-653 Plumb Lane, from the junction with Kietzke Ln. to the junction with Terminal Way.

- SR-667 Kietzke Lane, from South Virginia Street to the junction with Galletti Way in Sparks.

If the roads within this crew's jurisdiction are plowed and sanded, a portion of the crew may be available to assist Crew 270 in Washoe Valley by plowing and sanding from the junction with SR-429 to the Bellevue Interchange. If personnel and equipment are available, they may provide assistance in plowing and sanding operations on SR-431 between the junction with US-395 and the Galena Maintenance Station and SR-341 between the junction with US-395 and a point approximately three miles east.

Personnel from Crews 240, 241, and 245 will be used to cover some routes within the cities of Reno and Sparks or other areas as directed.

Plow operators should use caution when plowing snow at the following areas:

- On bridges and overpasses, reduce speed so snow will not be thrown over the sides of the structures.
- On the southbound lanes of I-580 between Villanova Drive and Plumb Lane, reduce speed so snow will not be thrown onto the roof of the Regional Transportation complex.
- When plowing the airport ramps use extreme caution when passing by the main terminal.

Priorities for Sanding

Emphasis for sanding will be placed on the following areas:

- I-580 The interchange overpass structures and ramp intersections.
- I-580 The Plumb Lane viaduct.
- I-580 The north bound on ramp at the south freeway entrance.
- I-580 The interchange ramps for north and south bound traffic to the Reno/Tahoe International Airport.

Environmental Concerns

Because much of this crew's jurisdiction is in an environmentally sensitive area, additional effort should be spent on crew training and environmental awareness. Before the first winter storm the Maintenance Supervisor I should provide training on environmental issues, equipment operation and abrasive application.

Environmental Issues

Training should include topics that enhance awareness of environmental issues, especially regarding the Truckee Meadows area. The potential detrimental effects of salt and sand to roadside vegetation, water quality, air quality and increased erosion should be stressed.

Routes and Level of Service

Route	Service Level	Description
I-580	“A”	From the south end at the Winters Interchange to I-80.
SP-96	“D”	Washoe Lake State Park - Little Washoe Lake
SR-426	“C”	South Meadows Pkwy. from South Virginia to 0.37 miles east.
SR-648	“B”	East 2nd St. & Glendale Ave., from Kietzke to McCarran Blvd.
SR-653	“B”	Plumb Lane, from the jct. with Kietzke Ln. to the jct. with Terminal Way.
SR-671	“C”	Holcomb-Huffaker Lanes from the south jct. with US-395 to the Delmonte Way.
US-395A	“A”	From the Winters Interchange to the junction with Patriot.

Major frontage roads and interchange ramps within the jurisdiction of this crew have been assigned a level of service "C". Minor frontage roads have been assigned a level of service "D". If resources are available, plowing and sanding interchange ramps will be accomplished before the peak daily commute times. Frontage roads when used as a detour during road closures will be automatically upgraded to a level of service “A”.

CREW 253, RENO/I-80

Field Operations

Plowing (push plows)

When removing snow and ice on I-80, a minimum of two trucks will be used in tandem if labor and equipment are available. Snow on the following route will be plowed to the center of the highway:

- SR-647 4th Street, from West McCarran Blvd. to I-80 west.
- SR-668 Rock Blvd., from Hymer Avenue to the junction with "B" Street.

If the roads within this crew's jurisdiction are plowed and sanded, a portion of the crew may be available to assist Crew 225 on I-80 or Crew 251 on US-395 and 580. During times of road closures in California, this crew may also help with the road block at the Nevada/California state line.

Personnel from Crews 240, 241, and 245 will be used to cover some routes within this crew's jurisdiction or other areas as assigned.

Caution will be used when plowing snow toward curbs so snow is not stacked on sidewalks. Plow operators must use caution when plowing snow at the following locations:

- I-80 On bridges and overpasses, reduce speed so snow will not be thrown over the sides of the structures.
- I-80 On the east and west bound lanes between 14th and 11th streets in Sparks (Sparks Viaduct), reduce speed so snow will not be thrown over the sides onto the Sparks Nugget.

Priorities for Sanding

- I-80 Interchange overpass structures and ramp intersections.
- I-80 Shady areas in the depressed section, between Mile Post WA-12.8 and 14.0.
- I-80 Bridges over the Truckee River east of Reno.
- I-80 East and west bound lanes between 14th and 11th streets in Sparks (Sparks Viaduct).
- SR-668 Rock Blvd. between Hymer Street and I-80.

Environmental Concerns

Because much of this crew's jurisdiction is in an environmentally sensitive area, additional effort will be spent on crew training and environmental awareness. Before the first winter storm the Maintenance Supervisor I will provide training on environmental issues, equipment operation and abrasive application.

Environmental Issues

Training should include topics that enhance awareness of environmental issues, especially regarding the Truckee Meadows area. The possible detrimental effects of salt and sand to roadside vegetation, water quality, air quality and increased erosion should be stressed.

Routes and Level of Service

Route	Service Level	Description
I-80	“A”	From the Nevada/California state line to MP 32.02
SR-659	“B”	McCarran Blvd. from MP 0.00 to MP 10.58
SR-425	“B”	Verdi Road, from the west Verdi Intg. to the east Verdi Intg.
SR-647	“C”	Victorian Av. in Sparks, from the west edge of Stanford Way to the jct. with McCarran Blvd. and from Galletti Way to View St.
SR-655	“D”	From ST/WA county line 0.053 miles south.
SR-655	“D”	North to south side of Patrick Intg, east & south to Storey County line.
SR-668	“B”	Rock Blvd., from Hymer Avenue to the junction with Victorian Av.

Major frontage roads and interchange ramps within the jurisdiction of this crew have been assigned a level of service "C". Minor frontage roads have been assigned a level of service "D". If resources are available, plowing and sanding interchange ramps will be accomplished before the peak daily commute times. Frontage roads when used as a detour during road closures will be automatically upgraded to a level of service "A".

CARSON/TAHOE REGION

CREW 227, GARDNERVILLE

Field Operations

Plowing (push plows)

When removing snow and ice on US-395, a minimum of two trucks will be used in tandem if labor and equipment are available.

Through the towns of Minden and Gardnerville the snow will be plowed to the center of the Highway.

When plowing on SR-756, the two block area west of US-395 will be plowed to the center of the highway.

Caution will be used if any snow has to be plowed to the curbs so that it is not stacked on the sidewalks.

If personnel and equipment from Crew 270 are not available and the highway north of the Cradlebaugh Bridge is in poor condition this crew, with the concurrence of the supervisor, will plow and sand toward Carson City as far as practical.

Plowing (rotary plows)

Rotary plow operators should review areas where rotary plowing may be necessary to check for roadside obstacles prior to the first winter storm. All obstacles should be marked and any new obstacles should receive extra caution when blowing snow near them for the first time.

Priorities for Sanding

Emphasis for sanding will be placed on intersections and shady areas of SR-207 - Kingsbury Grade.

Environmental Concerns

Because much of this crew's jurisdiction is in an environmentally sensitive area, additional effort will be spent on crew training and environmental awareness. Before the first winter storm the Maintenance Supervisor I will provide training on environmental issues, equipment operation and abrasive application.

Environmental Issues

Training should include topics that enhance awareness of environmental issues in the Lake Tahoe basin. The potential detrimental effects of salt and sand to roadside vegetation, water quality, air quality and the increased potential for erosion should be stressed.

Routes and Level of Service

Route	Service Level	Description
SR-88	“C”	From the Nevada/California state line to the junction with US-395.
SR-206	“C”	Fairview Lane, Foothill Road and Genoa Lane from the jct. of SR-88 to the jct. of US-395.

SR-207	“B”	Kingsbury Grade, from the junction with US-50 to the junction with SR-206.
SR-756	“C”	Centerville Road, from the junction with SR-88 to the junction with US-395.
SR-757	“C”	Muller Lane, from the junction with SR-206 to the junction with US-395.
SR-759	“C”	Airport Road, from the junction with US-395 to the Douglas County Airport.
US-395	“A”	From the Nevada/California state line to a point approximately ½ mile south of the Cradlebaugh Bridge.

CREW 250, MT. ROSE

Field Operations

Plowing (push plows)

Special precaution will be taken when plowing snow near the runaway truck ramp at Incline Village. Plowed snow must not be thrown on any portion of the arrestor bed. Snow that falls on the arrestor bed will be left as is. The asphalt ramp prior to the arrestor bed should be maintained at level of service "B".

Plowing (rotary plows)

Rotary plow operators should review areas where rotary plowing may be necessary to check for roadside obstacles prior to the first winter storm. All obstacles should be marked and any new obstacles should receive extra caution when blowing snow near them for the first time.

Widening and Cleanup

Widening of the areas along the Mount Rose Highway that are used for recreational purposes will be accomplished after snow removal is completed on the highway.

Priorities for Sanding

- SR-431 Frost and ice in the shady areas
- SR-878 Frost and ice in the shady areas

Environmental Concerns

Because much of this crew's jurisdiction is in an environmentally sensitive area, additional effort will be spent on crew training and environmental awareness. Before the first winter storm the Maintenance Supervisor I will provide training on environmental issues, equipment operation, anti-icing liquids and abrasive application.

Environmental Issues

Training should include topics that enhance awareness of environmental issues in the Lake Tahoe Basin. The potential detrimental effects of salt and sand to roadside vegetation, water quality, air quality and the potential for increased erosion should be stressed.

Routes and Level of Service

<u>Route</u>	<u>Service Level</u>	<u>Description</u>
SR-431	“A”	Mount Rose Highway, from the junction with SR-28 to the junction with US-395.
SR-878	“D”	Slide Mountain Road, from the junction with SR-431 to the entrance of the Slide Mountain Ski Area.

AVALANCHE CONTROL PLAN

Avalanche Rationale

Avalanches occur because of a failure of unstable snow. The failure results from a trigger that may be either natural or the result of man's activities. Natural avalanches are the result of a falling cornice, sloughing snow, stress change due to metamorphism, stress change due to weight of new snow, earth tremors, snow falling from trees, etc., and not the action of people. Artificial avalanches are triggered by people or their equipment. A passing skier, a mountaineer's weight, an explosive blast, a sonic boom, etc., commonly start artificial avalanches. There is no difference in appearance between natural and artificial avalanches.

Snowpack conditions vary considerably over time and distance. At any given time the snowpack in one avalanche-prone area may be stable while one a mile away may be unstable. Instabilities may exist at the ground-snow interface or at any level within the snowpack. Observations of weather conditions and their relationship to avalanche occurrences is an important part of snow stability and avalanche forecasting. Factors used in avalanche forecasting include weather forecasts, snowpack observations, (including snow pit analysis) on site weather observations and the U.S. Department of Agriculture, Forest Service avalanche advisories. This information is used to determine avalanche hazard. Avalanche control is initiated on the basis of the conclusions of the avalanche hazard analysis.

Avalanche Control Introduction

This plan is intended to be used as an operational plan for the NDOT, District II, Crew 250 maintenance employees in the evaluation and control of avalanches. This crew performs avalanche control on known avalanche areas adjacent to both the Mount Rose Highway (SR-431) and the Slide Mountain Highway (SR-878). Normal control procedures require use of Gaz-Ex to release unstable snow under controlled conditions.

Purpose

The purpose of this plan is to define a procedure that will identify potential avalanches and release them under controlled conditions. Controlled releases of small avalanches performed when the roadway is closed to traffic minimize risk to the public and Department employees. Due to diverse temperature, snow and wind conditions, this plan will not eliminate the possibility of uncontrolled releases. It is intended to minimize them. The plan is to assist the maintenance crews in providing as safe a roadway condition as reasonably possible with the resources available. During periods of high avalanche hazard, those sections of highway subject to avalanches will be closed to the public and to Department employees.

Limits of Work

Avalanche control performed by the Department has historically been confined to terrain adjacent to the Mount Rose Highway and the Slide Mountain Access Road.

Preparation

Plans for the avalanche control program should be started in midsummer so that the roadway, personnel, supplies and equipment will be ready prior to the avalanche season. Preparatory work such as reviewing communication equipment, verifying that control materials are available, reviewing avalanche warning signs to ensure they are in place and in good condition.

Preseason preparations for avalanche control operations should normally be completed by November 1 and should include:

- Reviewing the overall winter maintenance activities including goals and objectives, with the avalanche control team and Crew 250.
- Reviewing the schedule of formal avalanche training with district management and the Department's training division.
- Conducting training which includes safety related items with management (Assistant District Engineer through the Maintenance Supervisor II) and field personnel. New personnel should be given onsite training tours so they will be aware of areas prone to avalanches.

- Meeting with management personnel from the Mount Rose Ski Area to discuss (a) Department procedures for snow and ice control on the Mount Rose Highway and the Slide Mountain Access Road.
- Reviewing of the Avalanche Control Plan.
- Requesting that the Public Information Officer prepare information describing the Department's avalanche control work. This information should be disseminated to as many sources as possible, such as the news media and service clubs. Information provided for the public should include:
 - An explanation of the avalanche problem,
 - The Department's avalanche control program,
 - A brief summary of procedures to follow if buried by an avalanche.

Equipment Preparation and Adjustment

The Maintenance Supervisor I should review equipment used in avalanche control work to ensure that all items are available and in good working condition. Any equipment that has been damaged or is unusable must be replaced prior to the first storm. The primary items used in avalanche control work are:

- Avalanche rescue beacons,
- Metal detector,
- probe rods,
- Shovels,
- First aid kits,
- Communication equipment,
- lighting equipment,
- Gaz Ex System,
 - laptop computer, propane bottles, oxygen bottles.

Rescue equipment should be available as near avalanche areas as practical. The storage area for rescue equipment should be clearly marked. All personnel should be familiar with the location and contents. Probe rods and shovels should be carried in the trucks for immediate access. Equipment requiring batteries should be checked monthly and a record maintained of the checks.

Training

Prior to budget submittal, district management should review the formal avalanche control training needs with the Department's Training Division and include any training needs in the

budget submittal. Historically formal avalanche control training has been provided for maintenance personnel every other year.

The Maintenance Supervisor I should provide ongoing training for new crew members and refresher training for experienced employees. Emphasis should be placed on areas that have been problem avalanche areas, as well as a review and operation of safety equipment related to avalanche control. Training should include:

- Review of the avalanche control plan,
- Review of known avalanche areas,
- Review of the procedures to follow if buried by an avalanche. They are:
 1. Remain in your vehicle.
 2. Do not smoke or use matches.
 3. Shut off engine.
 4. Turn ignition to accessory position so the radio is operative.
 5. Turn off all lights except flashers or rotating beacons.
 6. Attempt to contact other units by radio and provide as much information as possible.
 7. Attempt to push the probe rod up through the snow. This may provide an estimate on the snow depth, an air passage, or a marker for rescuers.
 8. The window should be opened and the possibility of digging out considered. If it appears possible to dig out, proceed in a calm manner and do not expend energy in wild attempts.

- Review the procedures to follow when an avalanche is on the highway.
 1. Direct any vehicles to a safe location as soon as possible.
 2. Check the width and depth of the avalanche and determine if vehicles or persons could be buried.
 3. Report the location, size and other pertinent details to the Maintenance Supervisor I or other lead person.

- The Avalanche Control Team and crew members must know:
 - Location and use of rescue equipment,
 - Proper use of avalanche rescue beacons and probe rods,
 - Method of initiating a rescue operation,
 - Specific rescue techniques,
 - Support resources, (additional personnel, equipment and supplies).

Rescue procedures must be reviewed each fall with all personnel. Training should include a review of this AVALANCHE CONTROL PLAN and other reference material such as the *Avalanche Handbook* published by the U.S. Forest Service; *The State of Nevada Occupational Safety and Health Standards for the Construction Industry*, *State of Nevada Occupational Safety*

and Health Standards for General Industry, and the Uniform Fire Code.

NDOT Guidelines to aid in initial response to avalanches on SR 431, by John Talbott rev. Jan, 2009

NDOT REACTION PLAN for AVALANCHE INCIDENT / POSSIBLE BURIAL

Remain calm and “size-up” the scene for safety.

- Assess the slope for any further avalanche hazard (may require spotlight at night).
- Take action to direct people to a safe location.
- Retain any witnesses at the scene.

Determine the following:

- Location of incident
- Apparent trigger; natural release, possibly skier/rider triggered or unknown
- Size & depth of debris. Class 3 is enough snow to bury vehicle, Class 2 a person
- Number of possible victims and/or vehicles that could be involved
- Time (or time-frame) it occurred
- If road closure is needed and where the safest place would be

Call “*Reno Road*” and notify them of the incident giving them the pertinent information from above

- Ask for NHP assistance if road closure will be needed
- Ask for Sheriff if search or rescue is (or may be) needed. Sheriff will alert the search dog unit
- If it is determined an avalanche hazard (hang-fire or feeder paths) may still exist, advise “*Reno Road*” of a safe staging area for support agencies. All rescue personnel that are not properly equipped with an avalanche beacon are to hold at this location until further notice

Call Mt. Rose Ski Area 849-0704x282 for assistance if needed. 50-01 has a Mt. Rose Ski Area radio to call them. Channel 2 (patrol) during operating hours or channel 6 (grooming crew) during off hours.

If appropriate and safe to do so begin with the “most likely burial areas” and:

- Conduct a hasty search, looking for clues (equipment or clothing) and calling out. Mark any clues and spot probe around them
- Conduct a beacon search (remember to switch all beacons to search & switch back when complete)
- Manpower permitting, initiate probe grid search at 28" X 30" for body and 4' X 4' for vehicle

Remember one pass with probe-line has only a 76% (average) chance of finding a person.

Any debris large enough to bury a person should be cleared by an avalanche dog before removal.

(note: with the popularity of back-country skiing & snowboarding, consider the possibility of human trigger)

Safety measures that apply while working/driving in avalanche paths during winter:

-
1. Pay attention and observe conditions as they change.
 2. Communicate among trucks any unusual observations with regard to the storm or snowpack.
 3. Work in tandem with machines properly spaced, or if one machine is working, include a spotter in a truck.
 4. Bulldozers and loaders should have closed roll-over cab.
 5. Wear transceivers on your person (around the neck), people may be separated from machines and vehicles.
 6. Carry probe-pole(s), shovels, headlamp and flagging in machines and vehicles.
 7. Equip vehicles and persons working outside with two-way radios.
 8. Have a reaction plan if an avalanche should strike.

Survival Strategy when Caught in a Vehicle

The occupants of vehicles have a better chance of survival than unprotected persons because the vehicle affords protection from avalanche forces and provides an air space. Carbon monoxide poisoning is a principal hazard when a vehicle is buried in the snow, because the exhaust gas of a running engine may escape into the vehicle instead of the snow.

Recommended action for persons buried in a vehicle includes:

- Shut off the engine and lights
- Conserve the oxygen in the vehicle by not smoking or using matches
- Turn on emergency flashers
- Attempt any possible contact by cell phone or radio
- Attempt to push an object toward the surface as a check for depth and clue to rescuers
- Try to dig out
- When digging out is possible, leave the vehicle only when safe to do so

SURVIVAL STATISTICS

Percent Survival of People Caught in Avalanches

- 80% Survive if they remain on the surface
- 40% Survive if partially or completely buried
- 55% Survive if protected by buildings or vehicles

Causes of Death in Avalanches

- 65% Suffocation (1/2 suffocate in first 30 minutes)
- 25% Collisions with trees, rocks and other obstacles
- 10% Hypothermia and shock

“All knowledge about reality begins with experience and terminates with it.”

Albert Einstein

Snowpack Stability – *A balance between stress and strength*

When snow lies on a slope, increasing the load (stress) or reducing the strength can result in instability.

Stress is simply related to the mass of snow on the slope and the slope angle.

Strength on the other hand is controlled by an overwhelming number and variation of factors determined by the complex properties of numerous individual layers.

Existing close to the *triple point*, where solid, liquid, and vapor are in equilibrium, snow is one of the most variable substances found in nature. A high degree of compressibility and thermodynamic instability are two of its dominant characteristics. Mechanically, snow exhibits visco-elastic properties. The viscous properties allow it to deform slowly, in some cases without fracture. The elastic properties allow energy to be stored (as in a stretched rubber band) and this sets the stage for brittle type fracture (as a pane of glass would break) associated with slab avalanche release.

The more rapid the loading the less time the snowpack has time to adjust.

80% of avalanches occur during or just after a storm.

Avalanche occurrence on similar slopes remains the best indicator of instability.

Rain on Snow – *relatively ineffective as a melting agent but:*

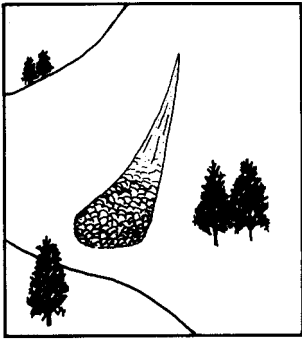
Rain

- adds weight without adding strength
- weakens layers by eroding bonds between grains
- is a source of lubrication

When rainfall occurs, the most common cause of avalanche release is usually due to the added load from the rainfall.

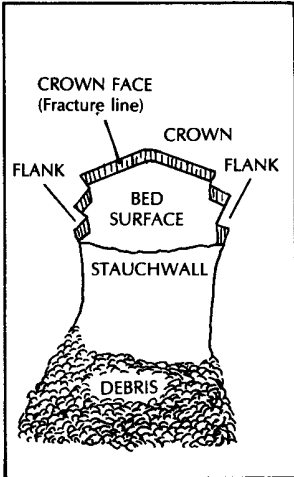
Warning signals:

- Rain on 10" or more of new snow
- Snow turning to rain ("inverted" storm)



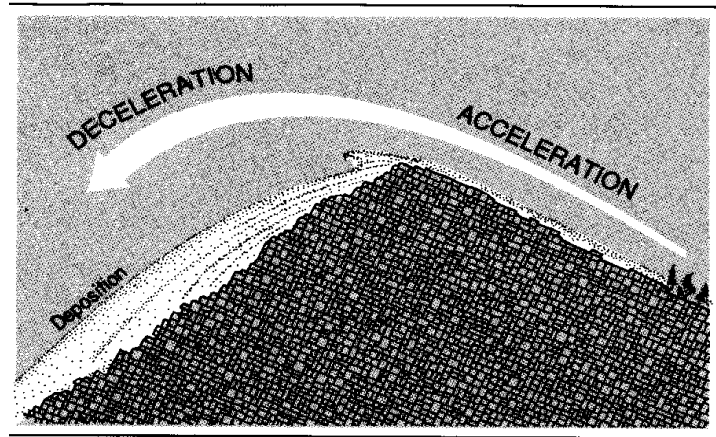
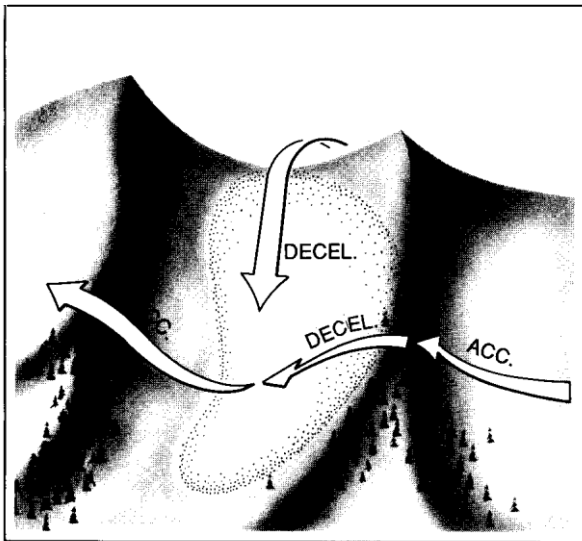
Loose Snow Slides

Loose snow slides start with a small amount of cohesion less snow and often pick up more snow as they run. From a distance, they appear to start at a point and fan out into a triangle. They usually involve only upper layers of snow.



Slab Avalanches - usually more dangerous

Slab avalanches occur when a layer of cohesive snow breaks away as a unit at the fracture line. The sides of the slab are called the flanks and the bottom boundary the stauchwall. Slabs vary in size from just a few inches to many tens of feet thick and similarly, range in width from a few yards to over a mile. Slab material is also highly variable. Slabs may be hard or soft, wet or dry. As the slabs travel down slope, they break up into smaller blocks or clods.



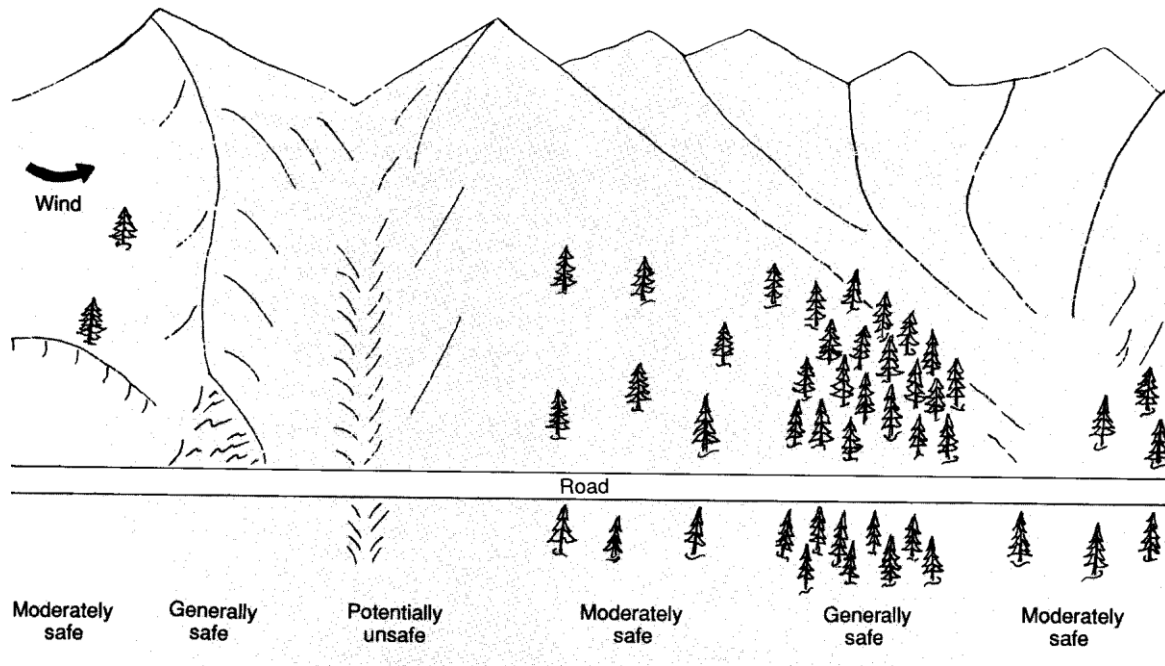
WIND LOADING *"The sculptor of avalanches"*

Wind and loose snow can result in loading without precipitation.

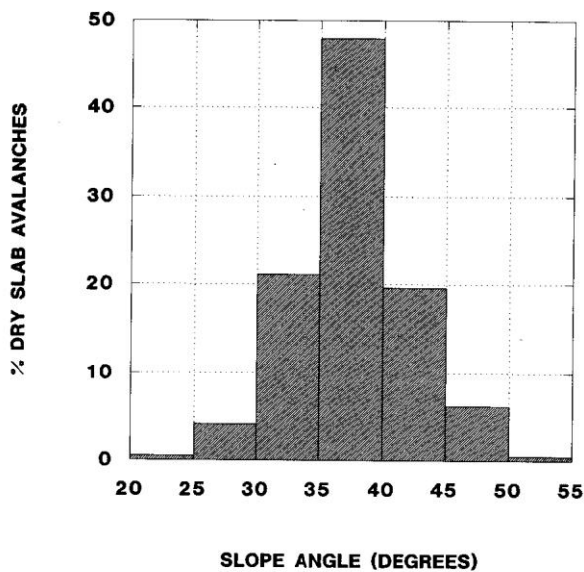
Wind transports snow from areas of acceleration (windward, upslope) and deposit it in areas of deceleration (down slope, leeward).

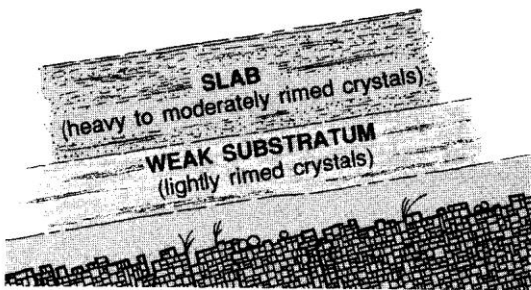
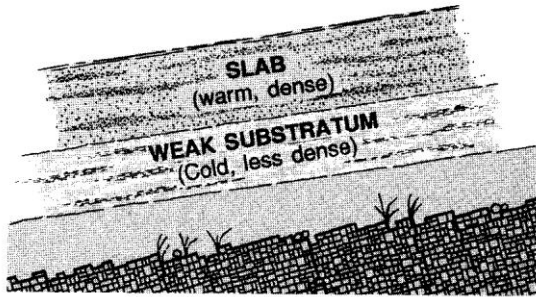
Wind deposited snow is dense so tends to form slabs.

Terrain Safety



Slope Angles for Slab Avalanches (remember it as Mother Nature's hand gesture!)





Some typical examples of stronger (slab) over weaker layer.

For “TRACKER DTS” Avalanche Beacon

Quick Reference

This quick reference page is an introduction to proper use of the Tracker DTS. For more detailed information, read the entire manual and consult our website: www.bcaccess.com.

ENGLISH

Basic functions

On/off – Push and turn the on/off switch on the back of the Tracker to the "on" position. It performs a self-diagnostic check, displays battery power in percent, and enters transmit mode. Change batteries before they reach zero percent.

Search mode -- Push the red search/transmit button, hold until "SE" is displayed, then quickly release.

Return to transmit -- Press the search/transmit button until "tr" is displayed.

Searching with the Tracker DTS

The objective for beginners is to find the strongest signal (lowest distance reading) and immediately begin probing the area.

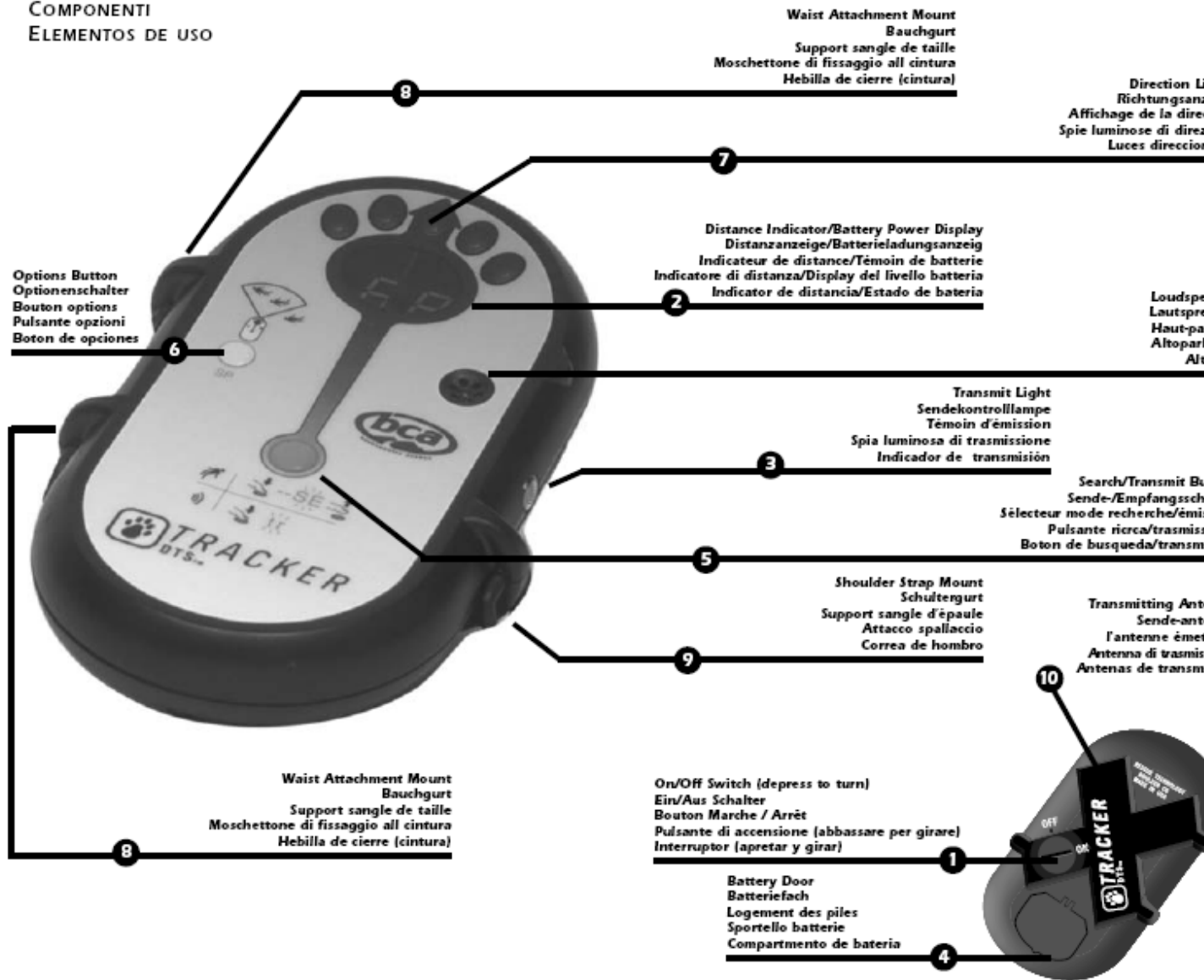
In the event of a burial, switch your Tracker (and all other beacons) to search mode. "SE" will flash in the distance window until a signal is captured.

Primary/signal search: If there is a "last seen point," start your signal search there, and search downhill. Otherwise, start your signal search at the top of the slide path. Allow a maximum of 20 meters between searchers or between switchbacks if only one searcher. Slowly rotate your Tracker back and forth and vertically until you engage the signal.

Secondary search: Once a signal is engaged, align the Tracker so that any of the center three lights are flashing and move quickly in the direction the Tracker is pointing. Make sure the number in the distance display is decreasing. If it is increasing, turn 180 degrees. Inside 10 meters, move slowly and try to keep the center search light engaged. Your direction of travel might be straight or slightly curved.

Pinpoint search: Within three meters, use your beacon close to the snow surface and look for the smallest distance reading. Ignore sudden fluctuations in distance and direction; the strongest signal is often just past these fluctuation points. Begin probing at the smallest reading (strongest signal).

OPERATING ELEMENTS
 BEDIENUNGSELEMENTE
 FONCTIONNEMENT ET AFFICHAGE
 COMPONENTI
 ELEMENTOS DE USO



Waist Attachment Mount
 Bauchgurt
 Support sangle de taille
 Moschettone di fissaggio all cintura
 Hebilla de cierre (cintura)

Direction L
 Richtungsanz
 Affichage de la dire
 Spie luminose di direz
 Luces direccion

Options Button
 Optionenschalter
 Bouton options
 Pulsante opzioni
 Boton de opciones

Distance Indicator/Battery Power Display
 Distanzanzeige/Batterieladungsanz
 Indicateur de distance/Témoin de batterie
 Indicatore di distanza/Display del livello batteria
 Indicator de distancia/Estado de bateria

Loudspe
 Lautspre
 Haut-pa
 Altoparl
 Alt

Transmit Light
 Sendekontrolllampe
 Témoin d'émission
 Spia luminosa di trasmissione
 Indicador de transmisión

Search/Transmit Bu
 Sende-/Empfangssch
 Sélecteur mode recherche/émi
 Pulsante ricerca/transmiss
 Boton de busqueda/transm

Shoulder Strap Mount
 Schultergurt
 Support sangle d'épaule
 Attacco spallaccio
 Correa de hombro

Transmitting Ant
 Sende-ant
 l'antenne émet
 Antenna de trasmis
 Antenas de transm

Waist Attachment Mount
 Bauchgurt
 Support sangle de taille
 Moschettone di fissaggio all cintura
 Hebilla de cierre (cintura)

On/OFF Switch (depress to turn)
 Ein/Aus Schalter
 Bouton Marche / Arrêt
 Pulsante di accensione (abbassare per girare)
 Interruptor (apretar y girar)

Battery Door
 Batteriefach
 Logement des piles
 Sportello batterie
 Compartimento de bateria

FIELD OPERATIONS

Snow Removal

Snow removal in avalanche zones should be performed as rapidly as possible to reduce exposure time in the area. All maintenance personnel working on the Mount Rose Highway shall carry a rescue beacon and have it on transmits. Stopping in the slide path should be avoided. In the event of a natural avalanche, the first person on the scene shall report the incident to his/her supervisor, determine if anyone is trapped in the slide and, if necessary, and initiate rescue procedures.

After an avalanche has occurred, the chance of a second avalanche occurring should be considered. The area should be evaluated for further avalanches by a "Qualified Person" before allowing workers and equipment in the slide area.

When it has been determined that the original snow debris can be removed safely, work may begin. All personnel not required for traffic control, snow removal, worker safety and supervision should be removed from the area.

Procedures

Use of individual hand charges or several charges tied together is the normal method used by the Department to generate artificial avalanches. The explosives delivery methods are chosen on the basis of the general terrain, snowpack, and operational conditions.

- A hand charge is an assembly consisting of an explosive and a safety fuse. Hand charges are delivered by Mt. Rose Ski personnel on foot, on skis, or by other approved methods. When practical, hand charges should be tied off to prevent movement prior to detonation.
- Advantages of hand charges include accuracy of placement. Results of detonation can be easily accessed and, if necessary, further action can be taken immediately. Minimal equipment, support facilities, and maintenance systems are required for hand charges.
- Duds (misfires) are to be disposed of as soon as safely possible. A waiting period of at least one hour should be observed before a dud location is approached. If the location is safe enough to allow access to the dud, it must be destroyed after the waiting period expires. A dud is destroyed in place by detonating a hand charge adjacent to, but not touching it. Care shall be taken to ensure that the dud is not disturbed. If the detonating cord is intact, another safety fuse assembly is attached to it and the charge detonated. Non-sparking shovels shall be used when digging for duds within a snowpack.

- The Maintenance Supervisor I will periodically review procedures being used by the avalanche control team to ensure safety procedures are being followed. Any discrepancies will be reported to the Supervisor II.
- During control work, the avalanche control team must be in radio, voice, or line of sight contact with maintenance personnel at all times.

Avalanche Control Closures

Prior to closing a road for avalanche control, the informational signs located on SR-431 near the intersection of Country Club Drive at Incline and west of Junction with IR-580 near Galena High School. These signs notify motorists that they may experience a delay due to avalanche control work. Reno Road must be notified a minimum of one hour prior to the closure. The road condition message will be updated to reflect possible delays on SR-431 due to avalanche control work.

All closures shall have both ends of the closure physically manned or blocked and all traffic controlled. The Maintenance Supervisor I or his designee will determine traffic control locations and when the closure will begin. Any time that a highway is closed for avalanche control work, a sweep of the closed area must be made before the avalanche control team begins any activity. A sweep is best performed as follows.

1. A radio-equipped truck stops at one end of the area to be closed and parks crosswise on the highway while another radio-equipped truck proceeds to the other end of the closure.
2. As the operator drives through the area, he/she notifies the driver of the stopped truck of any vehicles going in the opposite direction.
3. When the second driver reaches the end of the area to be closed, the truck is parked crosswise on the highway in such a manner as to make it impossible for any vehicle to get past.
4. The operator then calls the truck on the other end of the closure to make sure all of the vehicles that were in the area are now past the first truck.
5. When the area is clear and closed, the avalanche control team is notified. If there is reason to believe someone has gotten into the closed area, the supervisor and avalanche control team or the person responsible for detonation (Gaz Ex) must be notified and the operation suspended until the area can be confirmed as clear.
6. Individuals physically blocking the highway should not leave their positions unless directed to do so by the supervisor.
7. It is best that one end of the closure be in a position that affords a view of the slide area.

8. When possible a third truck should be used for the sweep after the closures are in place at each end.

Records

Standard avalanche observation records are to be completed for avalanche areas and a copy retained by the Maintenance Supervisor I. Records document the time, date, location, type and size of explosive device, detonation status, road closure times, avalanche characteristics, and any damage noted. Each time control is performed, the Maintenance Supervisor I or lead person should review the avalanche control procedure used with a member of the control team to make certain all information recorded is accurate. The information is then entered on the U.S. Forest Service form and sent to U.S. Forest Service, Fort Collins, Colorado.

Since explosives are being donated by the Mount Rose Ski Lodge, no explosives inventory records need be maintained by the Department. There should be, however, periodic checks with the person responsible for the explosives inventory at the ski lodge to document what records are being maintained for the explosives used on the highway avalanche control program.

Safety

Many safety procedures just involve common sense, but are often overlooked or neglected when in a hurry. It is imperative that constant attention be exercised by all Department personnel in order to prevent accidents.

Personal Equipment

Because of unpredictable circumstances that occur during the winter, employees should have the following equipment with them when they begin their shifts:

- Avalanche rescue beacon,
 - Gloves,
 - Orange hat,
 - Safety vest or orange shirt (**a vest or other approved clothing with reflective markings is mandatory for night work**),
 - Flashlight,
 - hearing protection,
 - Warm jacket with hood,*
 - Rain gear,*
 - Boots.*
- * Suggested clothing furnished by employees.

Rescue Beacons

Avalanche rescue beacons shall be carried by all personnel while working in avalanche prone areas. Any management personnel or visitors shall be provided a rescue beacon while in these areas. Beacons should be carried in an inside pocket that can be fastened. They may also be carried by placing the attached cord around the neck with the beacon positioned under a coat.

The Maintenance Supervisor I should periodically review the proper method for carrying beacons with the crew.

A check should be made each day to ensure beacons are operating on the "Transmit Mode." Any beacon not operating properly should be returned to the supervisor for replacement.

Radio Equipment

All Department vehicles and equipment operating in avalanche areas shall be equipped with two-way radios.

Terminology

Avalanche	A mass of loosened snow, earth, etc., that suddenly and swiftly slides down a mountain.
Avalanche Path	The terrain boundaries of known avalanches. The avalanche path is divided into three sections: starting zone, track and runout. The track refers to the part of the path between the starting zone and the runout zone.
Hand Charge	An explosive device that is thrown into an avalanche area designed to create stress in excess of the strength of the snowpack to resist movement, and thus start an artificial avalanche.
Probe Rod	A collapsible rod made of rigid steel or aluminum tubing. The rod should be nine to twelve feet long when fully extended.
Qualified Person	An individual, normally a supervisor or lead person, who has completed formal training for avalanche control within the last three years.
Rescue Beacon	An electronic transceiver that transmits and receives a signal from other rescue beacons. These units are very helpful in locating victims carrying a beacon, who have been buried in avalanches.

CREW 270, CARSON CITY/WASHOE VALLEY

Field Operations

Plowing (push plows)

When removing snow and ice on US-395, a minimum of two trucks will be used in tandem if labor and equipment are available.

If the roads within this crew's jurisdiction are plowed and sanded, a portion of the crew may be available to assist Crew 271 on the lower portion of Spooner Summit (US-50) or assist Crew 252 on US-395 north of Winters Ranch.

The section of SR-529 between the junction with Fairview Drive and the Spooner Summit junction is maintained by Crew 270. Crew 271 also travels over this section to their jurisdiction, which begins at the Spooner Summit junction. At different times personnel from Crew 271 may observe a problem area and will take appropriate action (additional plowing and sanding) to correct the problem. Both crews will communicate with each other so that there is not duplication or a lack of effort.

Environmental Concerns

Because much of this crew's jurisdiction is in an environmentally sensitive area, additional effort will be spent on crew training and environmental awareness. Before the first winter storm the Maintenance Supervisor I will provide training on environmental issues, equipment operation and abrasive application.

Environmental Issues

Training should include topics that enhance awareness of environmental issues, especially regarding the Carson and Washoe Valley areas. The potential detrimental effects of salt and sand to roadside vegetation, water quality, air quality and increased erosion should be stressed.

Routes and Level of Service

Route	Service Level	Description
SP-94	“D”	Washoe Lake State Park - Main Road
SP-94B	“D”	Washoe Lake State Park - Entry Road
SP-94C	“D”	Washoe Lake State Park - Trail head Road
SP-94D	“D”	Washoe Lake State Park - Loop A Road
SP-94E	“D”	Washoe Lake State Park - Loop B Road
SP-95	“D”	Washoe Lake State Park - Residence Road
FR-445	“A”	East Washoe Lake Road, from the junction with US-395A to a point 0.10 mile east.
US-395A	“A”	Bowers Mansion Road, from the CC/WA County Line to the junction with US-395.
SR-518	“C”	Snyder Lane, from the junction with SR-529 to the Stewart State Facility.
SR-529	“A”	From the south jct. with US-50/US-395, north

SR-705	“D”	to the jct. of Fairview Drive. Clear Creek Road, from the junction with CC/DO County Line to the diversion box.
SR-877	“D”	Franktown Road, from the south junction with SR-429 to the north junction with SR-429.
US-395	“A”	From a point .5 miles south of Cradlebaugh Bridge to jct. with US-50.
I-580	“A”	From the jct. with Fairview Drive to the Winter’s Interchange.

Major frontage roads and interchange ramps within the jurisdiction of this crew have been assigned a level of service "C". Minor frontage roads have been assigned a level of service "D". Plowing and sanding interchange ramps will, if resources are available, be accomplished before the peak daily commute traffic times. Frontage roads when used as a detour during road closures will be automatically upgraded to a level of service "A".

CREW 271, SPOONER SUMMIT/INCLINE VILLAGE

Field Operations

Plowing (push plows)

When removing snow and ice on US-50, a minimum of two trucks will be used in tandem if labor and equipment are available.

When plowing snow in the South Lake Tahoe Area and in particular the casino corridor, snow will be plowed to the curbs. Caution will be taken so that snow is not plowed up on the sidewalks. Historically the snow has been removed by the casinos and hauled to a temporary disposal site, which is normally an out of the way area in one of their parking lots.

Special precaution will be required when plowing in the following areas:

- At the runaway truck ramps, plowed snow must not be thrown on any portion of the arrestor beds. Snow that naturally falls on the arrestor beds will be left as is. The asphalt ramp prior to the arrestor should be maintained at a level of service "B".
- In the bin wall areas, plowing speed will be reduced so snow will not be thrown over the bin wall sections, where it could cause personal injury or damage to private property. This is particularly important in the areas south of the Cave Rock tunnels. An area that has been a problem area is at the Lincoln Park Road.
- Areas where there is considerable residential development very near the highway. Areas such as the Skyland subdivision the R/W is limited and the subdivision

fence is very close to the highway. Other areas where the road for the residences is at the toe of the slope or close to the bin walls are Cedarbrook and Zephyr Cove.

If the roads within this crew's jurisdiction are plowed and sanded, a portion of the crew may be available to assist Crew 250 on the lower portion of the Mount Rose Highway, Incline side.

The section of US-50 between the junction with Fairview Drive and the Spooner junction is maintained by Crew 270. Crew 271 also travels over this section en route to their jurisdiction, which begins at the Spooner junction. When personnel from crew 271 observe a problem in this area, they should take appropriate action (additional plowing and sanding) to correct the problem. Both crews will communicate with each other so there is not a duplication or lack of effort.

Priorities for Sanding

- US-50 Frost and ice in the shady areas, and in particular Glenbrook Canyon.
- US-50 The approaches and exits of the tunnels at Cave Rock.
- SR-28 Frost and ice in the shady areas and on Crystal Bay Hill.

Environmental Concerns

Because much of this crew's jurisdiction is in an environmentally sensitive area, additional effort will be spent on crew training and environmental awareness. Before the first winter storm the Maintenance Supervisor I will provide training on environmental issues, equipment operation and abrasive application.

Environmental Issues

Training should include topics that enhance awareness of environmental issues in the Lake Tahoe Basin. The potential detrimental effects of salt and sand to roadside vegetation, water quality, air quality and increased erosion should be stressed.

Routes and Level of Service

Route	Service Level	Description
SP-01	“D”	Cave Rock M. A. Cave Rock Road
SP-03	“D”	Spoooner Lake Rd., Mntc. Rd., Loop A Rd. and Loop B Rd.
SP-80	“D”	Sand Harbor M. A. Road’s 1, 2, 3, 4, 5, 6, 7

SP-81	“D”	Sand Harbor M. A. Road’s 8, 9, 10, 11, 12, 13
SR-28	“A”	From the junction with US-50 to the NV/CA state line west of Incline Village.
SR-760	“D”	Nevada Beach Road, from the junction with US-50 to the entrance of Nevada Beach Park.
US-50	“A”	From the Nevada/California state line at South Shore to the junction with US-395.

CREW 272, CARSON CITY/DAYTON/SILVER SPRINGS

Field Operations

Plowing (push plows)

When removing snow and ice on US-50 between the junction with I-580 and the junction of Flowery Avenue east of Dayton, a minimum of two trucks will be used in tandem if labor and equipment are available.

If the roads within this crew's jurisdiction are plowed and sanded, a portion of the crew may be available to assist Crew 270 or 271 on either US-50 or US-395/I-580.

Priorities for Sanding

- US-50 Dayton and Dump Hills.
- SR-822 Bridge over the Carson River in Dayton.

Environmental Concerns

Because much of this crew's jurisdiction is in an environmentally sensitive area, additional effort will be spent on crew training and environmental awareness. Before the first winter storm the Maintenance Supervisor I will provide training on environmental issues, equipment operation, and abrasive application.

Environmental Issues

Training should include topics that enhance awareness of environmental issues, especially in the Carson City and Dayton areas. The potential detrimental effects of salt and sand to roadside vegetation, water quality, air quality and increased erosion should be stressed.

Routes and Level of Service

Route	Service Level	Description
SR-822	“C”	Dayton Valley Rd., from the junction with US-50 to a point 0.14 miles east.
US-50	“A”	From Lompa Lane to Silver Springs.

Major frontage roads within the jurisdiction of this crew have been assigned a level of service "C". Minor frontage roads have been assigned a level of service "D". Frontage roads when used as a detour during road closures will be automatically upgraded to a level of service "A".

SAND SPECIFICATIONS

(2) SPECIFICATION "B": SAND, BLOTTER & DE-ICING SAND

The material for Specification B, shall meet the requirements of "SAND BLOTTER", Sub-Section 705.03.05, of the Nevada Department of Transportation Standard Specifications, 2001 Edition. The sieve sizes of Subsection 705.03.05 are modified to read as follows: Moisture content in excess of 5% will be deducted from the weight of the material delivered, prior to making payment, (**Reference item #21, Additional Requirements**).

SIEVE SIZE PERCENTAGE BY WEIGHT PASSING SIEVE

3/8 inch 100%

No. 4 90-100%

No. 16 35-75%

No. 200 0-3%

TEST METHOD REQUIREMENTS

Sieve Analysis Nev. T-206F Above

Sand Equivalent Nev. T-227F 55 Min.

Durability Index Nev. T-210 55 Min.

(4) DE-ICING SAND SPECIFICATIONS (SPEC. "D"):

Moisture content in excess of 5% will be deducted from the weight of the material delivered, prior to making payment, (**Reference item #21, Additional Requirements**).

After March 31, 2002, No person or public agency shall supply for use or place any materials upon any public paved road, driveway, or parking lot located within Washoe County, south of Township 22N, which does not meet the following requirements:

Durability Index or hardness must be greater than 75.

The loss by abrasion must be less than 33%.

The content of material smaller than 100 mesh sieve must not exceed 4.0 percent fines by weight.

The content of material smaller than 200 mesh sieve must not exceed 2.5 percent fines by weight.

Phosphorus: The maximum phosphorus content shall be 10 parts per million or less.

SIEVE SIZE PERCENTAGE PASSING

#4 93%-100%

#8 40%-80%

#16 15%-60%

#50 0%--20%

#100 0%--4%

#200 0%--2.5%

“Percent Fines” means the percent material passing a specified sieve size as determined by the American Society for Testing Materials (AASHTO) “Standard Method for Sieve Analysis of Fine and Coarse Aggregates”, designation 136-84a or AASHTO Designation T27.

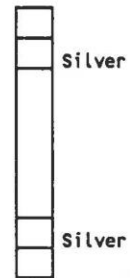
“Durability Index” means the hardness of the material or its resistance to breaking down as defined by American Association of State Highway and Transportation Officials (AASHTO) T-210 or Caltrans Test 229.

All snow poles shall be color coded with one or more bands of 3 inch wide high intensity type "Encapsulated Lens" reflective sheeting (tape) wrapped around the pole with a minimum 1 inch overlap.

References for placement of tape on poles are to top of tape. Color coding on the snow poles is as follows:

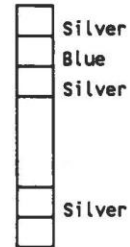
1. Standard snow pole

Silver tape shall be placed 3 inches from the top of the pole and 4 feet 6 inches from the ground.



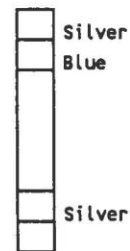
2. Drop inlets and culverts

Silver tape shall be placed at the top of the pole, blue tape 3 inches from the top, silver tape 6 inches from the top and silver tape 4 feet 6 inches from the ground.



3. Roadside obstructions, (bridges, guardrail, curbs, dikes, etc)

Silver tape shall be placed at the top of the pole, blue tape 3 inches from the top of the pole and silver tape 4 feet 6 inches from the ground, on poles at the beginning of obstruction and continuing through the obstruction.

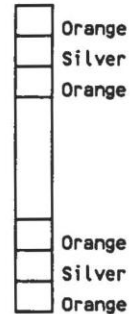


The pole at the end of the obstruction will have silver tape at the top of the pole and silver tape 4 feet 6 inches from the ground, (the same as No. 1).

4. Rotary plow obstructions, (cabins, homes, advertising signs, high voltage lines, transformers, frontage roads, ski trails, etc.)

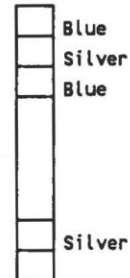
Orange tape shall be placed at the top of the pole, silver tape 3 inches from the top of the pole, orange tape 6 inches from the top of the pole. The same orange-silver-orange markings shall be placed 4 feet 6 inches from the ground.

The pole at the end of the obstruction shall have silver tape 3 inches from the top of the pole and silver tape 4 feet 6 inches from the ground, (the same as number 1).

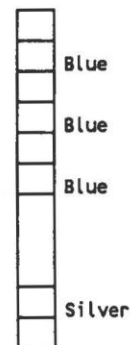


5. Cattle guards and railroad crossings

Blue tape shall be placed at the top of the pole, white tape 3 inches from the top, blue tape 6 inches from the top of the pole and silver tape 4 feet 6 inches from the ground on the pole 300 feet in advance of the obstruction.



The pole at the obstruction shall have blue tape 3 inches, 9 inches and 15 inches from the top of the pole and silver tape 4 feet 6 inches from the ground.



If the snow pole is mounted on a regular guide post, the sight plate will substitute for the silver tape that is 4 feet 6 inches from the ground.

Snow poles utilized to mark cattle guards and railroad crossings are not restricted to those routes listed in section 1.407 of this plan.

DISTRICT III SNOW AND ICE CONTROL PLAN



October 2016

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NEVADA DEPARTMENT OF TRANSPORTATION DISTRICT III SNOW AND ICE CONTROL PLAN

INTRODUCTION

Due to Nevada's geographic location, elevation, and topography, snow and ice occur in varying amounts over most of the state. Snow depths and storm frequencies vary from minimal and infrequent at the lower elevations in the south to extreme and frequent at the higher elevations in the north. Nevada's tourism-based economy places added emphasis on snow and ice control because the state's life-blood depends, to great extent, on attracting visitors to Nevada via passenger vehicles.

Being geographically located in the northeastern portion of the state with high mountain passes and desert valleys, District III experiences a variety of conditions. Elevations range from a high of 8,378 feet at the upper Angel Lake campground to a low at Imlay of 4,100 feet. Lower elevations experience less frequent storms. While snow and ice control is not required as frequently nor as intensely in these lower valleys as it is where more snow falls, it is still a very high priority.

In order to be responsive to the needs of the public, a number of factors should be considered besides snow depths. When scheduling snow and ice control, consideration should be given to routes with high traffic volumes and peak traffic periods on commuter routes. Areas that historically have been a problem for motorists to maintain traction or that have historically received extra attention in order for motorists to maintain control of their vehicle should receive a high priority. Bridge decks, tunnels, and historic drifting areas can be a problem and should be monitored. An effort should be made to accommodate school bus routes in the rural areas.

This plan addresses variations in conditions, such as storm intensity, duration, type of traffic, and traffic volumes. It is not intended to anticipate every condition. It is a guide that outlines methods and procedures that apply District-wide for most situations. Because every storm is different and every situation cannot be anticipated, experience of the crew should be used to modify the plan when necessary. However, any modifications of the plan should be consistent with the intent of the plan.

A list of terms used herein is presented for reference.

ORGANIZATION

The Nevada Department of Transportation (NDOT) is governed by its Transportation Board of Directors, which appoints a Director.

The Director establishes policy and directs the operation of NDOT within parameters established by the Transportation Board of Directors. Operational control and limited policy setting have been delegated to the District Engineers by the Director.

The District Engineer, in conjunction with Maintenance Managers, is responsible for reviewing and modifying the Snow and Ice Control Plan annually. This yearly update is to ensure that the plan provides guidance to District staff that results in a reasonably safe level of service.

All levels of supervisory personnel are responsible for being familiar with the plan, thoroughly preparing prior to storms, and practicing good tactical procedures during storms.

All maintenance employees are responsible for ensuring that they understand procedures, are authorized to operate a particular piece of equipment before proceeding, and conduct themselves in a manner that is a credit to them as individuals as well as to NDOT.

This plan is structured as if the chain of command can always be followed. In actual practice, this is not always possible without a delay in response or a reduction in the level of service provided to the public. With snow and ice control, responsiveness is very important and should not be sacrificed for the sake of following the chain of command. Usually the chain of command can and should be followed without sacrificing the service provided to the public.

TERMINOLOGY

The following terms are used through this document:

Abrasive mixture: A mixture of sand and a deicing chemical, generally salt. The abrasive mixture is prepared before anticipated storms.

Anti-icing: Anti-icing is the snow and ice control practice of preventing the formation or development of bonded snow and ice by timely applications of a chemical freezing-point depressant. Moderate and periodic reapplications of the chemical during the storm can continue this effect.

Bare pavement: The condition where the travel lanes are clear of loose snow but may have patches of ice or snow pack that, when treated with chemicals or abrasive mixtures or a combination thereof, may be negotiated safely by the average driver without the need of chains.

Chain or snow tire controls: A mandatory condition where either chains or snow tires are required due to snow or ice on the roadway. Chains or snow tire requirements are placed when, in the judgment of the maintenance supervisor on duty, snow and ice conditions make it difficult for average drivers to control their vehicle when driving in a prudent manner.

Cornice: Overhanging snow forming a partial arch created by the wind.

Crossovers: Turn-through area constructed to allow official vehicles to cross from one side of a divided highway to the opposite side.

Cutting pack: Peeling ice or snow buildup from the pavement. Usually done with motor graders.

De-icing: Removal of snow and ice through mechanical and/or chemical means.

End of storm: The condition when the snowstorm or blowing snow is subsiding and the weather is starting to clear.

Facility Pollution Prevention Plan (FPPP): Plan to prevent, or reduce to the maximum extent practicable (MEP), stormwater pollutant discharges into receiving waterways that are associated with activities conducted by Maintenance and District personnel at NDOT Maintenance facilities.

Heeling: Pushing snow as far left or right as possible.

Pack: A buildup of ice and snow on the road surface.

Pre-op: The pre-operational check is a list of items that must be checked on each vehicle before the vehicle is used.

District III Road Operations Center (ROC): Located in Elko's District office, this is the District III dispatch center (operated 24/7 year-round) used by all NDOT employees for assistance. The on-duty Traffic Center Technicians are the maintenance workers' contacts to the NHP and other law enforcement agencies. Traffic Center Technicians also disseminate information on road conditions to the public and other agencies. Road Operations Centers are located in Elko, Reno, and Las Vegas and can also be referred to as Traffic Management Centers (TMC), Road Operations Center or Road Ops.

Run in tandem: The practice of multiple plow units plowing as a team. On non-divided highways, the lead plow starts at the centerline and plows to the right and the following plows also push snow to the right. On divided highways, the lead unit plows left from the centerline and all other trucks or graders plow from the centerline right. Divided highways with narrow median areas or barrier walls should be treated as a non-divided highway.

Sander conveyor: The chain at the bottom of the sander unit that moves the material in the sander to the spinner.

Sand spinner: The part of a sander unit that spreads the abrasive mixture. Spinner speed can be adjusted to regulate how wide material is spread.

Scheduled shift: A specific time period an employee is assigned to work, usually over a number of days. The shift may be any length of time from 8 to 12 hours but may be extended to 16 hours in emergency situations. A callout on overtime responding to a specific need is not a scheduled shift. An employee is normally assigned a shift prior to the end of the previous shift.

Slobbers: The snow left on the pavement, on either side of a rotary plow after a cut has been made.

Snow poles: An extension of pipe (plastic, metal, or wood) used to guide snow removal equipment and the public during and after storms. The pole can have one or more reflective stripes at the top to convey information to maintenance personnel.

Spreader calibration: The procedure of calculating the pounds of material discharged per mile at various truck speeds.

White out: A complete lack of visibility due to a snowstorm or blowing snow.

Widening: Pushing snow as far left or right as possible.

LIABILITIES AND PRECAUTIONS

Highway maintenance functions concern everyone. The State of Nevada, through the Department of Transportation, strives to maintain its highways in a reasonably safe condition for the traveling public. As it relates to winter maintenance, NDOT removes snow and ice and applies abrasive mixtures to the roadway to improve driving conditions for the motorist.

When NDOT receives actual notice of a hazardous condition on its highways, the Department will respond and check the alleged hazard. If a hazard exists, it should be corrected or adequate warning should be provided to the motorists.

PURPOSE AND POLICY

PURPOSE

The purpose of this plan is to define operational procedures for snow and ice control. It defines the levels of service that maintenance will strive to provide. The plan is to help the maintenance crews provide the safest roadway condition reasonably possible with the resources available. Because storms vary dramatically and occur over a variety of roadway and traffic conditions, this plan is intended to be flexible to accommodate the variety of conditions encountered. It is a guide structured to fit average conditions.

POLICY

It is the policy of District III that the orderly movement of traffic during storm conditions takes precedence over all other maintenance operations except the protection of life and property. The District's maintenance organization will strive to maintain the state's highways in such condition that traffic can proceed in a reasonably safe manner during winter storms.

OVERTIME

District III maintains a an Overtime Approval Process. Due to budgetary limitations, every effort shall be made to curtail the use of overtime. The policy is meant to make the District more flexible and responsive to customers' needs and allow us to more readily react to our core mission. Due diligence shall be use when determining the appropriateness of requests for overtime. When possible, innovative (flex) shifts shall be used. Proper preapprovals of overtime shall be obtained by crews.

SNOW PLAN DEVELOPMENT

The snow plan developed for each District will provide guidance to managers and crews in describing snow and ice control responsibilities. The following items in the snow plan will be reviewed and updated annually:

- Administrative data including names, addresses, and telephone numbers of regular and seasonal personnel
- Crew and shift assignments
- Equipment available for each section
- Map or listing of highway levels of service and priorities
- Emergency and road closures procedures
- Prearranged snow storage sites

FIELD OPERATIONS AND TRAINING

District Administration and Maintenance Managers shall make advance preparations so that the snow removal operations are ready prior to the first storm. District Administration should review snow removal plans with appropriate members of the NHP. Teamwork and cooperation are essential for successful snow removal operations.

The Maintenance Supervisor I should prepare shift schedules for regularly assigned crews, with any temporary or part-time employees included in the schedules. They should review their assigned personnel and make certain all maintenance workers have or will receive any necessary training before the first storm. All maintenance workers who operate snowplows must have a Class A or B commercial drivers license and be certified in accordance with NDOT TP 1-6-19.

Temporary employees should be hired with enough lead time to ensure they receive all necessary training. They must have a Class A or B commercial drivers license and be certified on snow removal equipment in accordance with NDOT TP 1-6-19. Training should include a review of this plan.

PREPARATION AND ADVANCE PLANNING

Early plans should be made for winter work so that the roadway, equipment operators, snow plowing equipment, sanding equipment, radio equipment, sanding materials and supplies, including signs, flags, barricades, and small tools will all be ready for the first frost or snow storm.

Pre-season preparations for snow and ice control operations should normally be completed by November 1 of each winter season and should include but not be limited to the following:

- Snow plan review and modification
- Materials acquisition and stockpiling
- Equipment operator training
- Roadway preparation
- Equipment preparation and adjustment
- Request temporary help if necessary and schedule shifts

PUBLIC RELATIONS

To a large extent, success of the snow and ice control program is dependent on how well other agencies and the public understand the program. In order to ensure that a good understanding exists, District Administration should keep other agencies and the public well informed. Both formal and informal meetings with law enforcement agencies and other maintenance organizations are effective. Cooperation and informing the news media can take several forms. Press releases and being available for interviews are effective as is allowing the media to ride in plow trucks during severe storms. Arrangements for riding in plow trucks should be made through District Administration.

WORKING FOR OTHER GOVERNMENTAL AGENCIES

Snow plowing may be performed for cities, counties, and other governmental agencies if resources are available. Such work shall be done only by the authority of a written agreement executed by the Director. Under these agreements, detailed costs shall be recorded and billings prepared. Service as specified above will be performed at a lower priority than work on the State Highway system.

WORKING WITH LAW ENFORCEMENT AGENCIES

Law enforcement agencies have the duty to report items they feel are hazardous and may cause accidents. As a result, the maintenance crews must respond to many calls in order to provide a high level of service and minimize liability. Maintenance employees are subject to a certain number of callouts and callbacks to provide assistance such as:

- Additional maintenance on a section of highway
- Removal of obstacles from the roadway
- Traffic control assistance at accident sites

The Maintenance Supervisor I should stress cooperation with law enforcement agencies to his/her employees and establish good lines of communications with the agencies that work within the crew's jurisdictional area.

WEATHER FORECASTS

Because weather forecasts play such an important role in winter maintenance activities, the National Weather Service Web site can be reviewed to provide updated forecasts. Other contracted weather services can provide more tailored forecasts to directly fit our needs. Timely forecasts can provide reasonably accurate predictions on:

- Timing when a storm will hit a specific area
- Type of storm predicted (snow, rain, winds, etc.)
- Intensity and amount of snow or rain
- Temperature pattern of the storm
- General progress of the storm
- Elevations that will be affected

Timely forecasts can also be helpful in scheduling employees and equipment.

In addition to weather forecasts, supervisors should pay special attention to pavement temperatures, RWIS data, and the direction that the pavement temperatures are trending, whether they are rising or dropping.

This information should be used for scheduling crews prior to a storm's arrival. Proper use of this information results in less overtime and better utilization of resources. At the beginning of each season, arrangements should be made with the National Weather Service concerning timing of calls, special information, and individuals to contact.

ASSISTING MOTORISTS

Areas located outside the metropolitan areas can be potentially hazardous for stranded motorists, especially during times of inclement weather. An offer to radio for help or to call for a tow truck promotes a good relationship with the public. Call the District III Road Operations Center when motorists require assistance; the Traffic Center Technicians will notify the appropriate agency. Maintenance personnel should not call a tow company directly.

Maintenance employees should always try to assess the situation when approaching a stranded or disabled vehicle. If any indicators cause concern to the employee, he/she should notify District III Road Operations Center and arrange for law enforcement to investigate.

As a general practice, NDOT does not encourage maintenance vehicles to aid directly in towing or pushing stalled vehicles. There may be circumstances where a stranded vehicle is a hazard and may cause property damage or personal injury if not moved promptly. In these cases, maintenance personnel should exercise their best judgment and move the disabled vehicle with the driver's approval. In isolated instances, law enforcement officers may request assistance in moving stalled vehicles. Employees should inform all parties involved that they are not responsible for any damage that may occur to other vehicles.

LIMITS OF WORK

Snow and ice removal work by state forces should be confined to highway right-of-way.

PRIVATE APPROACH ROADS

Removal of normal snowfall on private approach roads, both on and off the right-of-way, is the responsibility of the property owner. NDOT maintenance forces should remove snow windrows blocking private approaches and mailbox turnouts as a part of after-storm cleanup operations.

Property owners have no authority to move snow onto the paved highway surface. If a property owner continues to move snow onto the highway after being asked not to by a supervisor, the District's Maintenance Manager should be notified. Form letters are available to issue to the offending party, asking them to stop depositing snow into the right-of-way. Law enforcement may be asked to assist in getting the practice stopped.

When possible, the illegal pushing of snow onto the right-of-way should be documented with photographs.

CONSTRUCTION PROJECTS

Snow and ice removal on construction projects should be performed only if the project is open to traffic.

ROADWAY PREPARATION

Roadway side ditches should be clean. Shoulders should be smooth and flush with the pavement. Tall weeds, grass, and brush next to the roadway that may cause drifting should be cut and removed. Slope flattening, ditch widening, and snow fence projects should be considered in high-drift areas during betterment reviews.

Maintenance Supervisors I should inspect signs pertaining to snow removal activities to ensure that the signs are in good condition. Any signs needing replacement should be replaced before the first major storms.

Snow poles are a necessary item in many snow removal operations. They provide delineation for snow removal crews and the traveling public during and after storms. The basic purpose of the snow pole is to:

- Provide roadway delineation
- Mark culverts and drains
- Mark beginning and ends of dikes and guardrail
- Delineate bridge rails
- Delineate ramp gores and median islands
- Mark miscellaneous items or obstructions that could cause damage to plows such as rock outcroppings
- Delineate objects that could be damaged by flying snow from the snow plowing activities when a rotary plow is being used such as signs, homes, trailers, power lines, other utility lines, etc.
- Mark the beginning and end of widen pavement and chain-up areas

Snow poles removed at the end of the previous season or damaged poles needing replacement should be in place prior to November 1. The minimum number of poles necessary shall be used. A 400-foot spacing, or more, between the poles is desirable. Areas of poor alignment, fog, and/or severe blowing or snowing conditions may require placement of poles at a spacing less than 400 feet. In areas that have low annual snowfall, snow poles will not be placed. Existing guideposts will be sufficient in most situations.

Snow poles are permitted on the following routes:

IR-80	Selected areas
US-93	Selected areas
US-93A	Selected areas
SR-225	Mountain City Hwy.
SR-226	Deep Creek Rd.
SR-227	Lamoille Rd.
SR-228	Jiggs Rd.
SR-229	Ruby Valley Rd.
SR-230	Starr Valley Rd.
SR-231	Angel Lake
SR-232	Clover Valley
SR-233	Montello Rd.
SR-278	Pine Valley Rd.
SR-766	Newmont/Barrick Mine Rd.
SR-767	So. Ruby Valley Rd.
SR-140	Denio Highway High Country
US-50	Austin and Bob Scott Summits
US-50	Pinto Summit
US-50	Pancake Summit
US-50	Little Antelope Summit

US-50	Robinson Pass
US-6	Currant Creek Summit
US-6	Murray Summit
US-6	Sacramento Pass
US-6	Connors Pass
US-95	Paradise Hill

Snow poles should be removed during the summer months unless there are extenuating circumstances.

CHAIN OR SNOW TIRE REQUIREMENTS

“Chains or Snow Tires Required” signs are posted when, in the judgment of the Maintenance Supervisor on duty, snow or ice conditions make it difficult for average drivers to control their vehicles when driving in a prudent manner. Chain or snow tire requirements should be removed when conditions improve enough to allow the average driver to control his or her vehicle.

The District III Road Operations Center shall be notified of any changes in these requirements.

EMERGENCIES

OPERATIONS

The Maintenance Supervisor I shall notify the Maintenance Supervisor II whenever it becomes apparent that he will be unable to keep his highways open without help. The Maintenance Supervisor II will arrange to send supplementary equipment and work force as available for temporary assistance. The Maintenance Manager should be contacted for possible assistance from other areas if the Maintenance Supervisor II does not have adequate resources in his area. If help is not available and it becomes necessary to close a road, the District III Road Operations Center shall be notified. The District III Road Operations Center will follow the protocol in place.

PROCEDURES

Emergencies are defined as unforeseen combinations of circumstances or the resulting state that calls for immediate action. Any situation posing an immediate hazard for personal injury or property damage should be treated as an emergency. During the winter, situations such as traffic accidents, hazardous material spills, and abandoned vehicles become more critical due to storms and adverse road conditions. In addition, accumulating snow or ice, as well as poor visibility, during storms presents increased potential for emergencies.

NDOT normally becomes aware of an emergency situation by one of the following methods:

- An NDOT employee observes an emergency and reports it to the District III Road Operations Center

- A law enforcement agency reports an emergency to the District III Road Operations Center
- A private citizen reports an emergency to an NDOT employee

Once notified of an emergency, the District Office or District III Road Operations Center is responsible for notifying appropriate District supervisory personnel to ensure that the emergency is properly handled. District administration or the Road Operations Center may be required to notify the following:

- Radio and televisions stations
- Chief Maintenance Engineer
- Director's office
- Federal Highway Administration

When NDOT employees arrive on the scene of an emergency, they should:

1. Assess the situation to determine potential hazards and any assistance required.
2. Provide emergency assistance to the injured based on first-aid training and knowledge.
3. Provide traffic control to protect the public.
4. Not participate in cleanup of any hazardous materials.
5. If the emergency involves damage to state property or personal injury to NDOT employees, notify the Road Operations Center immediately so appropriate notification of District administrative personnel and investigations can be conducted.

REQUESTING REMOVAL OF VEHICLE FROM RIGHT-OF-WAY

NDOT maintenance employees can request removal of private vehicles from the roadway. Nevada Revised Statutes (NRS) authorize the NHP to have vehicles towed from the highway right-of-way.

- NRS 487.281: States that a person shall not abandon a vehicle upon any public highway or road.
- NRS 484.397: Authorizes police officers to remove certain vehicles in certain circumstances. When a vehicle is unattended or disabled, an officer can immediately have it towed if it is an obstruction to traffic or it interferes with the normal flow of traffic. This law also provides for the towing of vehicles that have been abandoned for 24 hours on any freeway, US route, or primary arterial. On other routes, vehicles can be towed after 72 hours.

Any NDOT employee can call the District III Road Operations Center and request the tow of a vehicle based on one of the following criteria:

1. The abandoned or disabled vehicle is encroaching into the travel lane (includes a vehicle parked on the edge line).

2. A disabled or abandoned vehicle is parked on or under a bridge structure, in close proximity to the tunnels, or otherwise looks suspicious.
3. Employees are **actively** plowing snow and a vehicle is left where it could be damaged by snow removal operations or is hampering our ability to clear the roadway of snow and ice.

Approval of a Maintenance Supervisor II or higher is required for requesting a tow for the following:

1. A winter storm is predicted and an abandoned vehicle is expected to pose a problem for snow removal operations.
2. A vehicle has been parked in the right-of-way for over 24 hours on a major route or over 72 hours on a secondary route.

FACILITY POLLUTION PREVENTION PLAN (FPPP)

FPPPs have been developed for the District's major facilities: Elko, Ely, Winnemucca and Wells maintenance facilities. Major facilities are those that accommodate multiple maintenance crews and serve as a location for equipment repairs beyond routine maintenance. More remote facilities are grouped together and covered under one umbrella FPPP with site specific considerations. The FPPP contains various aspects of pollution prevention methods, such as equipment and vehicle storage, stockpile storage and washing. Crews should take FPPPs into consideration for their specific site locations prior to performing tasks.

MATERIALS

ACQUISITION

Maintenance Supervisors I and II should review material needs to ensure that required materials for the snow removal operations are either delivered or will be delivered in sufficient quantities and at appropriate times to ensure that adequate material will be available for each storm.

Each year, a list of stockpile locations and quantities of abrasive mixtures and de-icing chemicals should be prepared by the Maintenance Manager from input received from the Maintenance Supervisor IIs. These requests are processed by the Headquarters Maintenance and Asset Management Division for forwarding to State Purchasing. State Purchasing proceeds with advertising and awarding contracts for the materials requested.

Upon receipt of the listing containing the successful material suppliers, orders are placed with the low bidders for the necessary materials.

STORAGE

Proper location of stockpiles is critical to an efficient snow removal operation. The location of stockpile sites should minimize nonproductive travel time and be situated to maximize use by

multiple crews. Stockpile sites should be located to minimize possible environmental damage and not create a nuisance to adjoining properties. Stockpiles must be located in areas where there is suitable access off and on the highway for NDOT vehicles. Salt or abrasive mixtures should be stored in storage buildings wherever possible. When buildings are not available, extra attention should be given to drainage and prohibiting salt from migrating into watercourses or impacting the environment. Review the appropriate Facility Pollution Prevention Plan for guidance.

SPECIFICATIONS

SAND

Sand for snow and ice control shall meet **Specification D** for de-icing sand. Specification B may be substituted for Specification D material.

Sieve Size	Specification D % by Weight Passing Sieve	Specification B % by Weight Passing Sieve
No. 4	93 - 100	90 - 100
No. 8	40 - 80	---
No. 16	15-60	35 - 75
No. 50	0 - 20	---
No. 100	0 - 4	---
No. 200	0 - 2.5	0 - 3

Hardness/durability index must be greater than 75.

As sand is delivered, it should be tested in conformance with the NDOT Standard Specifications for Road and Bridge Construction to ensure it meets specifications before accepting or using any of the material. Testing should be performed every 1,000 tons for quality assurance purposes.

SALT

De-icing salt shall meet the specifications as set forth in the annual open-term contract (OTC) or bid specifications.

LOW-MOISTURE MINERALIZED DE-ICERS

A mineralized de-icing product is now available to be purchased on OTC. This product is a chloride-based mineral material that works at lower temperatures than normal sodium chloride. Initial applications have shown the product to be very effective. It is applied to the roadway via the truck sander, just like salt-sand mixes.

Mineralized de-icers have been shown to be advantageous when temperatures fall below the working range of sodium chloride. With this product, acceptable de-icing has been achieved with pavement temperatures as low as 5°F. This de-icing product is also especially helpful in urban

areas where air quality and dust caused from sand application are issues of concern. However, due to the increased cost of this material, it should be used at the direction of a Maintenance Supervisor.

Specifications for application will be developed as we gain experience working with this material. Known trade names are "Interstate Melt 500" (Shelton's), "Ice Slicer RS" (Envirotech), and "Rapid Thaw" (McArthur Farm Supply).

De-icer materials shall meet the specifications as set forth in the annual OTC or bid specifications.

ANTI-ICING PRODUCTS

Anti-icing materials are available that may provide an improved level of service or result in less environmental damage. A few of the products that may be tested by NDOT are:

- Calcium magnesium acetate
- Magnesium chloride
- Calcium chloride
- Potassium acetate

Anti-icing materials shall meet the specifications as set forth in the annual OTC or bid specifications.

SNOW POLES

Snow poles shall be orange, polyolefin, 3 to 8 feet in length, and have reflective sheeting or reflector attached 3 inches below the top of pole for delineation. As existing nonconforming snow poles are damaged or need to be replaced, they should be replaced with snow poles that conform to the current specification.

ANTI-ICING AND DE-ICING

ANTI-ICING

Anti-icing is defined as the snow and ice control practice of preventing the formation or development of bonded snow and ice by timely applications of a chemical freezing-point depressant. District III typically uses a 30% solution of magnesium chloride in its anti-icing efforts. The product should be applied to the roadway in advance of a predicted winter storm at 20 to 40 gallons per lane mile. Considerations in determining application rates should include the following:

- Pavement surface texture
- Bridges, tunnels, and shaded areas
- Predicted temperature, humidity, and storm conditions

Observed residual chemical on the roadway from previous applications should also be a factor in the decision process.

Applicators should shut off spraying in advance of intersections and halfway down freeway off ramps in order to keep traffic from overtracking the material into the intersection and creating a possible slick condition.

Speeds when applying anti-icers should not exceed 55 MPH. Applicators should restrict spray to one lane at a time.

It is industry practice to apply anti-icing chemicals well into the storm, except when conditions of hard snow or ice pack exist. Supervisors should evaluate the effectiveness of this practice and use their best judgment when determining the usefulness of this course of action.

APPLICATION OF LIQUID ANTI-ICERS AND DE-ICERS

NDOT uses a self-contained tanker unit with a pump to apply anti-icing chemical to the roadway.

The purpose of spreading an anti-icing material for winter road maintenance is to maintain an orderly flow of traffic during adverse weather conditions and to ensure that the road is as safe as possible under the circumstances. The anti-icing mixture is a minimum 22% to 30% solution mixed with water. Application rates of anti-icing chemical should be between 20 and 40 gallons per lane mile, depending on surface conditions of pavement, anticipated winter storm conditions, and observed residual chemical left on the roadway from previous applications. Anti-icing chemicals are used to:

- Prevent the formation of a bond between the snow pack and the road surface
- Melt fresh snow as it falls
- Melt compacted snow that remains after plowing
- Retard the formation of ice

The anti-icing chemical magnesium chloride is very effective from 25°F to -28°F and not effective below -30°F.

Operators need to pay particular attention to the items noted below so that application of the anti-icing chemicals produces optimum results.

The initial application should be made prior to the predicted winter storm event. The mixture is brine that, under most conditions, will keep snow or ice from bonding to the pavement. Subsequent applications will usually keep the snow in a mealy condition and prevent a pack from forming.

When the slush begins to stiffen, it is time to plow and reapply additional de-icing material.

Anti-icing chemical application is generally necessary on bridges long before road surfaces. Because cold air reaches the top and bottom surfaces of a bridge, they cool off much faster than the remainder of the roadway surface. Because of low temperatures and high humidity, bridge decks may ice up when there is little or no precipitation.

Equipment used for hauling or handling these chemicals should be washed as soon as possible after each storm to prevent corrosion. Washing should not be done where runoff could affect watercourses or impact the environment. NDOT wash racks should be used where available. Review the appropriate Facility Pollution Prevention Plan for guidance.

When applying anti-/de-icing chemicals, operators must pay close attention to traffic and, if necessary, shut off the nozzles to keep from spraying motorists' vehicles.

Operators should maintain speeds that do not endanger life or property but provide a reasonably prompt service. An appropriate speed for rural low-volume road with 2 inches of loose snow is considerably different than an appropriate speed for a busy urban street with an ice pack.

OPERATORS SHOULD NEVER EXCEED A SPEED THAT IS SAFE FOR CONDITIONS.

ABRASIVE MIXTURES

MIXING

When practical, abrasive mixtures should be mixed and placed in the stockpiles prior to November 1. Materials mixed after this date will potentially contain excessive moisture and present more handling problems than material that is mixed before winter storms. The salt to sand mix ratio can vary, depending on each sub district's needs.

If an alternative de-icer is used, the manufacturer should be consulted for the recommended mixture and application rate.

APPLICATION

Abrasive mixtures shall only be applied as necessary and when temperatures indicate satisfactory results will occur. Snow removal and abrasive mixture application shall be closely monitored to prevent loss of abrasive mixtures by plowing.

The purpose of spreading an abrasive mixture for winter road maintenance is to maintain an orderly flow of traffic during adverse weather conditions and ensure that the road is as safe as possible under the circumstances. The abrasive mixture is a mixture of salt and sand. The ratio of salt to sand can vary by location and is dependent on prevalent temperatures, traffic volumes, and management determinations. Salt is used in the mixture to:

- Prevent the formation of a bond between the snow pack and the road surface
- Melt fresh snow as it falls

- Melt compacted snow that remains after plowing
- Prevent the formation of ice

Salt (sodium chloride) is very effective above 25°F, fairly effective between 25° and 15°F, marginal between 10° and 15°F, and not effective below 10°F.

Operators need to pay particular attention to the items noted below so that application of the abrasive mixture produces optimum results.

Sand to Salt Ratio (volume)	Optimum Application Rate (pounds per lane mile)	Optimum Mileage Per Load	
		5 tons	8 tons
4 parts sand to 1 part salt	1,500	6.7 miles	10.7 miles
3 parts sand to 1 part salt	1,200	8.3 miles	13.3 miles
2 parts sand to 1 part salt	900	11.1 miles	17.8 miles
1 part sand to 1 part salt	600	16.7 miles	26.7 miles
Salt only	300	33.3 miles	53.3 miles

Timing is crucial in applying abrasive mixtures. Make the initial application just prior to when the snow begins to accumulate on the pavement. The mixture will quickly produce a brine that, under most conditions, will keep snow or ice from bonding to the pavement. Subsequent applications will usually keep the snow in a mealy condition and prevent a pack from forming.

Spinner speed settings are critical. A spinner that revolves too fast will throw material over an excessively wide area, which has two detrimental effects: it wastes material, and material that is cast too wide may damage vehicles behind the sand truck or in the adjacent lane. Two methods are available for reducing the distance that the spinner casts material: reducing the speed of the spinner and adjusting the deflectors on the spinner. Truck speed should not exceed 35 MPH when applying abrasive mixtures to the roadway.

Spinner speeds along with truck speeds will be monitored to ensure abrasive mixtures are not thrown over an excessively wide area. Material cast too wide has several detrimental effects: it wastes material, has the potential to damage vehicles behind the truck and in the adjacent lane, and can be deposited in area that may be harmful to the environment and adjacent property.

A strong wind blowing across a street or highway can cause the abrasive mixture to drift as it comes out of the spreader unit, pushing it onto a shoulder or into a gutter. Operators need to be aware of these situations and “play the wind” to place the abrasive mixture where it will do the most good.

Salt in the abrasive mixture needs time to work. Plowing and sanding operations should be timed to allow the abrasive mixture to be effective. Plowing the abrasive mixture off the pavement before it is effective wastes material and increases the cost of snow removal. Knowing when to plow and reapply the abrasive mixture is an important factor that the operators should be aware

of. Watching the snow that is being kicked out behind the vehicle tires will give the operator a good idea when to plow and reapply the abrasive mixture.

When the slush begins to stiffen, it is time to plow and reapply additional abrasive mixture.

Abrasive mixture application is generally necessary on bridges long before road surfaces. Because cold air reaches the top and bottom surfaces of a bridge, they cool off much faster than the remainder of the roadway surface. Because of low temperatures and high humidity, bridge decks may ice up when there is little or no precipitation.

Brine created from combining an abrasive mixture with moisture will flow to the low side of the roadway especially on super-elevated curves. Place the abrasive mixture on the high side of curves and let gravity spread the brine across the roadway.

Sometimes operators must go beyond their normally assigned areas when plowing and applying abrasive mixtures. Due to the location of jurisdictional breaks, there may be short gaps that do not receive adequate attention unless plow operators make an effort to cover them. A short stretch that is left for another crew to plow or sand can be hazardous to unsuspecting motorists.

Equipment used for hauling or handling salt, such as sanders, should be washed as soon as possible after each storm to prevent corrosion. Washing should not be done where runoff could affect watercourses or impact the environment. Review the appropriate Facility Pollution Prevention Plan.

When applying abrasive mixtures in tandem, adequate distance should be maintained between trucks to allow traffic to pass the abrasive mixture application operation. Operators will pay close attention to oncoming traffic and shut off or reduce spinner speed so as not to cast the abrasive mixtures toward the motorists' vehicles, thereby damaging them from the abrasive mixtures being distributed.

EQUIPMENT

GENERAL

In addition to the routine equipment operation training, employees will be trained on the use of ground speed-oriented sander controls. Operational use of the controls will be stressed so the rate of application of material will be consistent even when the speed of the sander truck varies.

PREPARATION AND ADJUSTMENT

Maintenance Supervisors I and II should review the list of available equipment to determine what plows or sanders are available and what condition they are in. Ground-speed-controlled sanders and anti-icing units should be calibrated. Equipment needing repairs should be referred to the repair shop in priority order. Communication equipment should be reviewed to ensure it is in good condition.

CARE AND OPERATION

Maintenance personnel shall check their assigned equipment at the beginning of each shift. Equipment shall be inspected, lubricated, and serviced at the end of each storm. The items listed below should be checked at the beginning or end of the shift.

Plow Truck and Sander

1. Perform complete pre-trip inspection of the truck.
2. Check plow, blade, and frame for obvious damage. If any damage is detected, report it to the supervisor.
3. Check hydraulic oil levels for the sander unit.
4. Grease fittings on the sander unit and check sander controls for proper operation.
5. Check all lights on the truck and the sander.
6. Check to see that accident report forms are in the unit.
7. Check to make sure tire chains are with the vehicle along with tighteners, tools, and wire for repairs.
8. Check to see that safety equipment such as flares or red warning triangles are in the vehicle.
9. Check sander gate openings and deflector settings at the spinner.
10. After each storm, or as required, wash the truck and sander units.
11. At the end of the shift, fuel vehicle and clean cab.
12. Drain air tank daily.

Tow Plow

1. Perform complete pre-trip inspection of the tow plow, and trailer.
2. Check hydraulic oil levels.
3. Check wheel chocks.
4. Check safety pins for plow.
5. Check all lights on unit.
6. Empty sander daily.
7. Keep glad hands and electric lines protected.

Motor Grader

1. Perform a complete pre-op inspection.
2. Check to make sure tire chains are in a toolbox in the unit along with tighteners, tools, and wire for repairs.
3. Check engine-warning equipment before using equipment.
4. Make sure all lights work and are on when leaving the yard to begin work.
5. Make sure accident report forms are in the unit along with safety items such as flares or red warning triangles.
6. Check to ensure that the slow moving vehicle emblem is on the motor grader and visible to anyone coming up behind the unit.

7. Check plow blades for any obvious damage and report any damage to your supervisor.
8. Drain water from the fuel tanks weekly.
9. When working in a chain or snow tire control area, all drive wheels must be chained.
10. At the end of the shift, fuel vehicle and clean cab.
11. After each storm wash down the unit.

Rotary Plow

1. Perform a complete pre-trip inspection of the truck.
2. Check shoes, wear plates, and fan blades.
3. Check engine-warning equipment before operating unit.
4. Check to make sure that the tire chains along with tighteners, tools, and wire for repairs are on the unit.
5. Check to make sure accident report forms are in the unit.
6. Check all lights.
7. Do not leave the cutter head in gear when leaving the cab or when people are around the unit.
8. At the end of the shift, fuel up the unit, clean cab, and visually inspect the unit for any damage.
9. Drain water from the air tanks.
10. If the snow chains have been damaged, repair them or tell the supervisor before the start of the next shift.
11. Let the rotary box down on center shoes. Never work with box completely on hydraulic system.
12. Clean off all snow buildup from the head, cab, and doghouse after each shift.

Personal Equipment

Because of varied and unpredictable circumstances that occur during the winter season, each employee should have the following personal equipment with them when they begin their shift:

- Gloves
- High-visibility clothing that meets the requirements of TP 1-7-4
- Flashlight
- Hearing protection
- Winter coat or parka
- Rain gear
- Appropriate footwear

SNOW PLOWING

GENERAL

Snowplows should not leave the paved portion of the roadway and plow unpaved shoulders in order to widen out plowed areas. If drifts need to be pushed back, it should be done only with loaders, motor graders, or a wing plow.

Plow operators also will be cautioned about plowing snow at bridges and overpasses. They should reduce plowing speed so snow will not be thrown over the sides of the structures.

PLOWING WITH PUSH PLOWS

Because plows are throwing snow with roadway debris mixed in with the snow, truck-operating speed is very important. Operators should maintain a speed that does not endanger life or property but provides a reasonably prompt service. An appropriate speed for a low-volume rural road with 2 inches of loose snow is considerably different than an appropriate speed for a busy urban street covered with 4 inches of chunky slush.

The maximum speed for plowing on a low-volume rural road is 35 MPH. The plowing speed on urban streets should never exceed the posted speed limit and generally should not exceed 25 MPH. Speeds should be further reduced to eliminate the possibility of causing damage to signs, vehicles, or other facilities along the highway. When plowing on bridges, speed should be decreased so that snow or ice is not pushed over the side of the structure onto traffic or pedestrians below. **OPERATIONS SHOULD NEVER EXCEED A SPEED THAT IS SAFE FOR CONDITIONS.**

When traveling with the plow in the up position, it is District policy that speeds shall not exceed 55 MPH. Speeds may need to be further reduced when a truck is equipped with a wing plow or when traveling over very rough surfaces.

Under normal circumstances, snow removal equipment should not be operated against opposing traffic unless traffic is restricted from the area under a traffic control plan.

When plowing on a **two-lane highway**, always plow starting at the center of the roadway and plow to the right.

When plowing on a **four-lane highway**, if possible, plow in tandem.

On **non-divided highways or divided highways with narrow medians or barrier rails**, the lead plow starts at centerline and plows to the right. The following plow also plows right.

On **divided highways with medians wide enough to accommodate snow storage**, the lead plow starts on the left and plows left. The following plow overlaps the first plow's cut and plows right. Any additional plows also plow right.

When plowing in the city **where there is a curb, gutter, and sidewalk**, plowing to the right should be done very carefully so that additional snow is not stacked on the sidewalk. In some cases, depending on anticipated accumulation, it may be necessary to plow all snow to the center of the roadway and come back later to remove it. Before plowing to the center of the street, it is necessary that the operator check with his/her supervisor.

Normally when plowing in tandem, adequate distance should be maintained between trucks to allow traffic to pass the plowing operation.

PLOWING WITH WING PLOWS

District III has been increasing its use of wing plows for the past several years. Wing plows offer dramatically increased productivity from a single truck and operator. However, special considerations and training need to be exercised when plowing with a wing plow.

Wing plows should never be used to plow up against guardrail sections. No one should operate a wing plow without being fully trained in the proper uses and precautions necessary to use them safely and effectively.

Rules for wing plow operation are as follows:

- The maximum speed of a snowplow equipped with a wing plow is 35 MPH while plowing and 55 MPH or lower when raised.
- Inspection of the plow blades and plow pins must be made periodically throughout the shift.
- Safety warning lights will be operational whenever the snowplows are attached to the truck.
- Under no circumstances will the main snowplow be used to plow snow to the left and the wing plow to the right.
- When the snowplow is parked, both plows will be lowered to the ground. Even at the gas pumps, Make sure there is enough clearance to lower the wing plow.
- If the visibility is poor or the situation seems unsafe, do not use the wing plow.
- Be sure of your clearance.
- Use extra care with wing plows on narrow summits or sections of road where guardrail has been installed.
- Train operator to have toe up slightly and lift toe in areas of known bridge problems.

PLOWING WITH TOW PLOWS

District III has begun the use of a tow plow. Tow plows offer increased productivity from a single truck and operator and wing plows. However, special considerations and training need to be exercised when plowing with a tow plow.

Tow plows should never be used to plow against guard rail or concrete barrier rail sections, and the operator must always be aware of trailing area of the unit when it is deployed. No one should

operate a tow plow without being fully trained in the proper uses and precautions necessary to use them safely and effectively.

Rules for tow plow operation are as follows:

- The maximum speed of a tow plow is 45 MPH. (Special for the tow plow only)
- Inspection of the plow blades and keeper pins must be made periodically throughout the shift and replaced if needed.
- Safety warning lights will be operational whenever the tow plow is attached to the main unit and deployed.
- Operator must make sure all safety hazards and travelling public is in a clear zone when plow is being deployed as there are many blind spots.
- If visibility is poor or situation seems unsafe, do not deploy and use the tow plow.
- Be sure of your clearance and swing of tow plow, identifying hazards and unsafe areas.
- Avoid contacting the tow plow against guardrail or concrete Barrier Rail or similar items like curb and gutter.
- Inspection of pintle hitch, safety chains, and glad hands must be checked periodically throughout the shift for stress cracks and wear.
- During hydraulic failure for steering use wheel locks and immediately go to shop.
- Follow weight recommendations for trailer load. (Trailer is designed to carry straight salt. Salt / Sand mixtures commonly used at most stockpiles are heavier, therefore less can be carried).
- Do not operate unit in the opposing traffic lanes. It may be utilized in both right / left turn lanes and paved center median areas.
- When tow plow is parked and disconnected make sure trailer is chocked and all safety pins are in place with proper keepers for the storage of the plow. If plow is still connected to tow unit and parked, all safety precautions must still be followed as per operators manual and recommendations.
- Make sure all trailer connections are properly inserted, kept cleaned, and properly stored when unhooked.

PLOWING WITH ROTARY PLOWS

When operating rotary plows, consideration should be given to the following items:

- Do not blow snow across travel lanes unless no other acceptable alternative exists. When blowing snow across travel lanes, be alert for traffic and shut down the mill for traffic.
- Do not blow snow into avalanche or high-wind-drift areas.
- Be aware of roadside objects (signs, houses, parked cars, power lines, and other utilities) and take appropriate steps to prevent damage from blowing snow.
- If possible, rotary plowing should be performed when traffic is light.

SPECIAL PLOWING AND SPREADING CONSIDERATIONS

Stormwater Considerations

During winter operations special care should be taken around waterways, drainage culverts, staff should reference the most current stormwater operating reference material.

Bridges and Overpasses

As the cold air reaches both the top and bottom surfaces of bridges and overpasses, they will tend to freeze up long before the road surfaces. Because of this occurrence, they should receive early and continued attention throughout the storm. Bridge decks may ice up or frost over even when there is no precipitation and will need to be treated with abrasive mixtures. Operators may need to increase application rates if conditions are found to require more abrasive mixtures or chemicals.

Plow operators should reduce their speed when plowing snow on a bridge so that snow and chunks of ice will not be thrown over the sides of the bridge, which could cause considerable damage to anything below the bridge. Areas such as bridges and overpasses require special consideration. Bridge joints can cause damage to plows if they are struck; extra caution should be used when crossing them.

Tunnels and Shaded Areas

Tunnels and shaded areas provide another type of problem for the motorist. These areas need special attention because of the difference in temperature between the sunny area and the shady section. Operators may need to increase application rates if conditions are found to require more abrasive mixtures or chemicals.

Railroad Crossings

Before crossing the tracks, snowplows shall come to a stop and adjust the plow to clear any obstructions and then carefully cross the tracks before resuming regular plowing. No windrow of snow should be left on railroad grade crossings. When removing snow from railroad grade crossings, care should be taken to ensure that ice, snow, abrasive mixtures, or other material is not deposited and left on the railroad tracks. This procedure will help prevent serious damage to the tracks and plowing equipment.

Cattle Guards

When plowing across cattle guards, precautions should be taken to ensure that ice or snow is not allowed to build up on the approach to the cattle guard, the cattle guard, or the exit from the cattle guard. Before crossing a cattle guard, snowplows should stop 5 to 10 feet prior to the cattle guard, raise plow 2 to 3 inches, and then carefully plow across the cattle guard.

WIDENING AND CLEANUP

As soon as possible after a storm, the crew will concentrate on widening shoulders and other areas where snow may be stored during subsequent storms. Driveways and mailbox turnouts that might have been plugged by earlier snow removal activities will also be cleared.

WHITE OUT CONDITIONS

During white out conditions, the employee must make a sound judgmental decision whether the cause of the white out is due to a heavy winter storm or surface conditions (e.g. – ground blizzard). If it is determined that a ground blizzard is the cause and is in an area known to produce this type of condition for a short distance up to ½ mile, the employee should make an attempt to continue through the known area in a safe manner. Should the known area be of a distance greater than ½ mile, the employee should proceed as if in a heavy winter storm event. If a heavy winter storm has caused the condition of visibility to be minimized to a distance of 100 ft or less, the employee may find a safe area to pull off of the roadway (e.g. – Interstate on / off ramp) and using good judgment, allow minimal time for the conditions to improve. If it is not possible to find a safe place to get off of the roadway, the operator should apply an adequate amount of sand before coming to a stop. This should aid traffic in slowing and being able to stop. Should either of the two events occur, the employee must notify the District III Road Operations Center and their immediate supervisor.

It is suggested that plowing in tandem in these conditions may aide in the ability to overcome the situation and continue on, as in most cases the rear plow driver usually has better visibility and may assist the lead plow driver.

CLEANING DRAINAGE STRUCTURES

Drainage structures should be pre-marked before the winter season so they can be located during and after storms. It is important that roadway drains and drop inlets be kept open to allow melting ice and snow to run off the roadway. Accumulations of water with falling temperatures may cause inlets to freeze, thus causing an additional hazard to the traffic.

Maintenance employees should be aware of drainage facilities and should make sure they are open to eliminate areas of water accumulating or water running across the roadway. Water from melted snow can create a greater hazard than the original storm, especially if it freezes.

SNOW STORAGE AND DISPOSAL

The usual method of snow storage is to push the snow off the roadway or onto a median area. Snow storage, especially in the metropolitan areas, is a serious problem during periods of heavy

snow accumulation. Consideration should be given to reviewing areas for snow storage at the beginning of each winter season.

District management and field personnel should agree upon sites where snow can be disposed of if it has to be hauled from the roadway. In establishing stockpile areas, right-of-way personnel may need to be contacted to determine limits and any special conditions that may exist. Before stockpiling snow on private property, an agreement delineating all conditions and responsibilities must be executed. Because of the chemicals used in snow and ice removal activities, locations of snow storage areas should be evaluated for possible environmental conflicts.

In areas where the snow cannot be blown or plowed off the roadway and there is sufficient roadway width, snow may be plowed to the center of the roadway for later removal. When plowing snow to the center of the roadway, consideration must be given to providing openings for left-turn and cross-traffic.

Whenever snow is stored in the roadway so that it reduces the standard lane widths, parking, or turn movements, the proper highway restriction report shall be filed with the District Office, The District III Road Operations Center, and the Permitting Office in Carson City. The restriction can then be properly posted for the public and oversize loads restricted as necessary.

Two methods of clearing snow windrows from the center of the roadway will be permitted:

1. Material may be hauled from the center of the roadway to pre-designated storage or disposal areas. When practical, hauling should be done at night due to reduced traffic volumes.
2. If temperatures warm sufficiently to promote melting after a storm subsides, the windrows may be re-spread as a thin layer on the traveled way and allowed to melt and dissipate during the daytime. Pavement temperatures should be watched closely during these operations.

Private property owners may clear the snow from driveways within the right-of-way and deposit the snow on the right-of-way not being used by vehicles or pedestrians. No snow from other portions of private property shall be deposited on the right-of-way.

TRAFFIC CONTROL

Traffic control during the winter season has to be emphasized and given a high priority to protect the maintenance workers as well as provide safe passage for the traveling public on the facility. Because of a variety of climatic conditions (i.e., snow, rain, blowing snow, blowing dust, icy and snow packed roadways, etc.), it is more difficult for the maintenance employees to immediately have all the required signs that would normally be used for road closures, lane closures, etc.

Maintenance personnel must always be alert to the conditions and use other items that are immediately available to warn the traveling public of any incident that would cause them to deviate from their normal course of travel. Most incidents during the winter are temporary in nature, and maintenance workers can use the following devices to warn the public:

- Flares or red warning triangles
- Advance warning vehicle (a truck with warning lights in advance of the incident)
- A barrier vehicle (an unoccupied truck parked in advance of the incident, with warning lights)

If the incident, in the opinion of the supervisor, is going to necessitate stationary operation, then appropriate signs should be placed in accordance with NDOT's "Handbook on Work Zone Traffic Control."

At night, special attention must be given to the problem of reduced visibility due to darkness and the varied climatic conditions. During winter, night work is a necessity that requires certain items be given increased emphasis to ensure a safe operation. Some items that should be considered and discussed with maintenance employees include the following:

- Mandatory use of TP-compliant reflective apparel for night work
- Each maintenance worker should have a flashlight
- Sufficient lighting should be provided, when possible, to allow the traveling public to identify the location of the workers

The Maintenance Supervisor I should give each employee as much advance notice as possible of shift changes to avoid unnecessarily fatigued employees.

ROAD CLOSURES

Road closures due to floods, blowing snow, and dust usually occur at predictable locations. New maintenance employees should be made aware of these areas so they will be informed and be in a better position to handle an emergency should one arise. In locations where storms or other conditions may be expected to disrupt traffic, emergency signs and barricades should be on hand and possible detour routes should be investigated at the beginning of each winter season. When it is necessary to close a road for an emergency, the following procedures should be used:

1. The District III Road Operations Center shall be notified immediately with all pertinent information.
2. Adequate warning signs should be placed giving warning of the closure in accordance with MUTCD.
3. All closures shall have both ends of the closure physically blocked and manned, unless otherwise authorized by a supervisor II or higher.
4. The closed area should be driven to ensure no one is stranded.
5. The vehicles used to block the road at each end of the closure shall be equipped with radios and strobe lights.
6. The person working the closure should not leave the area until the road is reopened or another NDOT employee relieves the individual.

7. Do not argue with the traveling public. Be firm but polite when informing them of the closure. If the road closure is violated, advise the section supervisor and request assistance from the NHP.
8. Do not give information to the public on the length of the closure or when the road will be reopened unless you are certain of the information.

NDOT is responsible for determining when road closures should be established due to snow or other weather conditions. The decision to close the road should be made at the highest level practical within the District. Due to emergency situations, the highest level practical may dictate that the least experienced member of the crew make the initial determination to close a road. Immediate supervisors should be notified, and a review should be made to determine if steps can be taken to safely reopen the roadway.

Occasionally, an NHP trooper or a Deputy Sheriff will request that a roadway be closed. If circumstances allow, a supervisor from the law enforcement agency should meet with a supervisor from NDOT and review the section in question prior to closing a road. The roadway should only be closed if a reasonably prudent driver cannot negotiate it in a manner that would allow safe passage. If a law enforcement agency closes a roadway and the closure does not appear to be warranted, the Assistant District Engineer or the District Engineer should be contacted as soon as possible with the details of the closure. The District III Road Operations Center shall be notified immediately of any changes to road closures.

RADIO PROCEDURES

During the winter months, maintenance personnel rely on the two-way radio communications system extensively. With the many calls for abrasive mixtures and assistance to specific areas, disabled vehicles, etc., the two-way radio is the most efficient way to communicate with other workers and the District III Road Operations Center. Some items the workers should be aware of that relate to radio usage are:

- The preferred method of communication is standard terminology and / or text such as “In Service” and “Out of Service”.
- Do not use CB lingo on NDOT radios except for the following:
 - 10-4 (message received or copy)
- Be brief and to the point with your communication. Remember that others need to use the radio. Be courteous and do not interrupt other messages.
- Use the Elko Road Operations group for communication with the District III Road Operations Center. Switch back to your crew talk group when finished.
 - Exception to this is when there are only single rovers on, they should remain on the Road Operation talk group until full operations are commenced.

All maintenance personal should report to the District III Road Operations Center when they come in service and go out of service.

When reporting accidents or other activities that require a request to the NHP or other law enforcement agency, provide the following information:

- Location (route, milepost, and direction)
- Injuries if any
- Number of vehicles involved and type of vehicles
- Description of vehicles (make, model, color, license plate number)
- Is the person calling in the information standing by or providing assistance?
- Are any state vehicles or employees involved?

When reporting non-accident calls (i.e., disabled vehicle, etc.), provide the following information:

- Location (route, milepost, and direction)
- Type of incident
- If vehicle is involved, type of vehicle (make, model, color, license plate number)
- Travel card number and expiration date
- Any other pertinent information that you think would aid the Traffic Center Technician in passing your message to the proper authorities

*Profane, foul, or abusive language on the radio will not be tolerated.
All calls to the District III Road Operations Center are recorded.*

ROAD CONDITION REPORT

The District III Road Operations Center is staffed 24 hours a day year-round. Reports regarding highway conditions, road closures, and approximate time of opening, detours, etc., are compiled as messages from field personnel reach the District III Road Operations Center located in the District Office. Information is disseminated to the public in the following ways:

- Through the telephone system by calling 511 (1-877-687-6237)
- Through the local media
- Via the Internet (www.nevadadot.com)
- Via the HARS (Highway Advisory Radio System)

Maintenance personnel should be aware that even during severe storms, the District III Road Operations Center is staffed by a maximum of two employees (normally only one). When radioing in to report an incident and an immediate response is not received, wait a minute or so and try again to complete the message. During a severe storm, there may be as many as 100 maintenance employees working and if many of them are trying to contact The District III Road Operations Center it may take some time and patience to get through. Traffic Center Technicians also receive many calls from the NHP and other law enforcement agencies and are required to update road conditions as they change.

All District III maintenance employees shall report conditions and controls to the District III Road Operations Center. During shift changes maintenance personnel should relay to the oncoming shift, their sections current conditions and current active controls.

It is absolutely mandatory that road condition changes are relayed to the District III Road Operations Center as they change so current and reliable road information is always available to the public.

LEVELS OF SERVICE

Budgetary and physical resources available for winter maintenance operations often limit District snow and ice control operations. Due to these limited resources, five levels of service (A through E) have been established. Factors that should be considered when establishing the level of service for a specific route include the following:

- Safety
- Average daily traffic (ADT)
- Commuter routes
- Availability of alternative routes
- Public interest and concern
- Potential economic impact
- Consequence of not providing a higher level of service
- Available resource

LEVEL OF SERVICE A

Snow will be removed continuously, and anti-icing and de-icing techniques and abrasive mixtures will be used as needed during the storm event to keep the roads open for traffic and provide a good surface on which to operate. After the storm has subsided, snow will be removed and abrasive mixtures will be used on a continuing basis until bare pavement exists. Patrols will be established for those areas where conditions require surveillance of the roadway for ice, rocks, avalanche, or snow. An abrasive mixture should be applied to enhance traffic safety when conditions warrant. Overtime needs to be preapproved, but must be held to a minimum.

District III Level of Service A Routes

<u>Route</u>	<u>Description</u>
IR-80	PE, HU, LA, EU, EL (all section in District III) MP to MP
US-6	From the junction of SR-318 to Ely (MP WP 13.92 to MP WP 37.95)
US-50	LA, EU, (MP WP 0.00 to MP WP 28.00)
US-50	MP WP 61.00 to MP WP 67.67

US-93	From Junction at US-50/US-93 in Ely to Idaho state line (MP WP 53.45 to MP EL 141.88)
US-95	HU Winnemucca to Oregon State Line
SR-225	From junction of SR-535 in Elko to Chain-up area (MP EL 27.23 to MP EL 29.00)
SR-227	From junction of SR-535 in Elko to Palace Parkway Intersection (MP EL 0.00 to MP EL 13.58)
SR-318	From District line in Lincoln County to junction with US-6
SR-535	From junction of SR 225 in Elko to junction of SR 227 in Elko
SR-787	HU

LEVEL OF SERVICE B

This level is the same as Level A except when personnel and equipment are not sufficient to maintain Level A service for both Level A and B routes, then Level A routes will take precedence. This may require shifting of personnel from Level B routes in one section to Level A routes in another section. Level B routes may experience longer periods of snow pack and chain or snow tire requirements while Level A routes are being maintained. Overtime needs to be preapproved, but must be held to a minimum.

District III Level of Service B Routes

<u>Route</u>	<u>Description</u>
US-6	From District boundary to US-6 at SR-318 (MP NY 111.99 to MP WP 13.92)
US-50	MP WP 28.00 to MP WP 61.00
US-6 & US-50	From junction of US-6/50/93 in Ely to Nevada-Utah state line at US-6 (MP WP 65.00 to MP WP 101.88)
US-93	From LN/WP County line at Geyser Ranch to Majors Junction (MP WP 0.00 to MP WP 26.71)
US-93A	From junction of US-93 at Lages to end in West Wendover (MP WP 0.00 to MP WP 53.20)
SR-223	From Angel Lake Road (SR-231) to 0.3 miles past US-93 (MP EL 73.99 to MP EL 75.98)

SR-225	From chain-up area north of Elko to Nevada-Idaho state line (MP EL 29.00 to MP EL 127.54)
SR-227	From Palace Parkway Intersection to end of pavement at Lamoille (MP EL 13.58 to MP EL 20.10)
SR-278	From junction of US-50 (MP EU 0.00 to MP EU 11.00)
SR-278	From Midway to West Carlin Interchange I-80 Exit 279 (MP EU 61.18 to MP EL 5.02)
SR-289	US-95 (Melarkey) to SR-795 (Reinhart)
SR-294	Grass Valley Road from PE/HU County line to SR 787 Hanson Street.
SR-304	Front Street in Battle Mountain from W. Battle Mountain Interchange to E. Battle Mountain Interchange
SR-305	From Battle Mountain City limits to SR-304
SR-306	From end of state maintenance near Gold Acres to Beowawe Interchange I-80 (MP LA 2.32 to MP EU 20.43)
SR-490	From US-93 northwest 8.93 miles to Ely State Prison
SR-766	Newmont/Barrick mine road, from junction of SR-221 in Carlin to end of pavement (MP EL 0.00 to MP EU 6.31)
SR-794	HU
SR-795	HU

LEVEL OF SERVICE C

Snow should be removed only during scheduled or innovative shifts except that some routes may be plowed on overtime when the Supervisor II determines there is sufficient reason for plowing. Snow pack left by truck plows will be removed as soon as conditions (e.g., weather and workload) permit. Use of abrasive mixtures may be limited to intersections, curves and grades depending on budgetary limitations. Patrols may be used for applying abrasive mixtures to selected areas and where conditions require surveillance for ice, rocks, avalanche, or snow.

District III Level of Service C Routes

<u>Route</u>	<u>Description</u>
SR-140	From junction of US-95 to (MP HU 65.58) at Denio

SR-221 From SR-278 thru Carlin to FR-EL02

SR-226 Deep Creek Road, from junction SR-225 39.02 miles northwest
(MP EL 0.00 to MP EL 39.02)

SR-228 Jiggs Road, from junction of SR-227 near Spring Creek to Jiggs

SR-229 Ruby Valley Road, from I-80 Halleck Interchange to junction of US-93
(MP EL 0.00 to MP EL 50.00)

SR-230 Starr Valley Road, from I-80 at Deeth to I-80 at Welcome

SR-232 Clover Valley Road (MP EL 2.61) to US-93 junction

SR-233 Montello Road, from I-80 to Nevada-Utah state line
(MP EL 0.00 to MP EL 34.17)

SR-278 MP EU 11.00 north to Midway MP EU 61.18

SR-290 From junction of US-95 north to end of pavement

SR-292 From junction of SR-140 north to Nevada-Oregon state line in Denio
(MP HU 65.58 to MP HU 68.52)

SR-293 Kings River Road from junction of US-95, west to Kings River Valley County
Rd. (MP HU 23.99)

SR-305 From junction of SR-305 and US-50 at Austin to Battle Mountain City limits

SR-379 From junction at US-6 to end of pavement near Duckwater
(MP WP 0.00 to MP WP 19.53)

SR-400 From I-80 Mill City Interchange, south to Unionville Road at end of pavement
(MP PE 16.61 to MP PE 0.00)

SR-487 From Nevada-Utah state line to junction of US-6/50

SR-488 From junction of SR-487 in Baker to Great Basin National Park boundary

SR-535 From north side of exit 298 to end of state maintenance near
Gateway RV (MP EL 21.68 to MP EL 24.13)

SR-789 From I-80 at Golconda Interchange, east to Midas County Road, at end of
pavement (MP HU 16.25)

SR-796 HU

- SR-892 From junction of US-50 north up Newark Valley to end of asphalt paving (MP WP 35.92)
- SR 893 From junction of US-6/50 to end of pavement (MP WP 0.00 to MP WP 39.75)
LEVEL is C-
- SR-895 From the junction of SR-318 to (MP WP 1.48) at Preston
- FR See crew plans for frontage roads

LEVEL OF SERVICE D

Snow should be removed only during scheduled shifts except some routes may be plowed on overtime when the District Engineer determines there is sufficient reason for plowing. These routes may be allowed to close during moderate to heavy snowstorms. Roads allowed to close temporarily will be reopened after the end of the snowstorm during scheduled shifts as personnel and equipment become available. Once open, the road should be treated with an abrasive mixture to provide traffic safety as deemed necessary by the supervisor.

District III Level of Service D Routes

<u>Route</u>	<u>Description</u>
SR-140	From MP HU 65.58 at Denio Nevada-Oregon state line
SR-231	From Angel Creek Campground to Wells MP EL 11.00
SR-722	From Dist Boundary to US-50 (MP LA 12.00 to MP LA 41.52)
SR-767	So. Ruby Valley Road, from end of pavement to junction of SR-229 (MP EL 37.18 to MP EL 39.10)
SR-806	North Battle Mountain Road from junction of SR-304, north to Lander County Road (MP LA 5.81)
SR-894	From end of pavement to junction of US-93 (MP WP 0.00 to MP WP 16.62)
SR-895	From junction of SR-318 to Preston (MP WP 0.00 to MP WP 1.48)
RP-802	Beowawe Rest Area on I-80 (MP EU 6.56)
RP-804	Cosgrave Rest Area on I-80 at (MP PE 69.66)
RP-807	Schellbourne Rest Area on US 93 (MP WP 92.55)

RP-808	Button Point Rest Area on I-80 at (MP HU 23.65)
RP-809	Valmy Rest Area on I-80 at (MP HU 53.07)
RP-810	Sunnyside Rest Area on SR 318 at (MP NY 22.90)
RP-812	Salmon Falls Creek Rest Area, south of Jackpot on US-93 at (MP EL 138.00)
SP-01	Main park road to Cave Lake State Park from west park boundary to junction of SP-01B, 2.47 miles
SP-01B	Cave Lake State Park campground road from junction of SP-01 to .67 mile to south end of Cave Lake where pavement ends
FR	See crew plans for frontage roads.

LEVEL OF SERVICE E

These routes are allowed to close during the winter and are reopened in the spring when it is reasonable to expect that the possibility of a major storm is over.

District III Level of Service E Routes

<u>Route</u>	<u>Description</u>
SR-231	Angel Lake Road, from Angel Lake to Angel Creek Campground (MP EL 0.00 to MP EL 4.00)
SR-781	Palisade Bridge over Humboldt River 800 feet south to 400 feet north

MAINTENANCE CREW PLANS

CREW 322 - CONTACT

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
US-93	From Salt Sand Pad (MP EL 96.4) north to Nevada-Idaho state line (MP EL 96.4 to MP EL 141.88)	A

CREW 324 - EMIGRANT

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
IR-80	From LA-EU County line to Central Carlin Interchange (MP EL 2.85)	A

SR-306	From end of pavement near Gold Acres to Beowawe Interchange (MP LA 2.32 to MP EU 20.69)	B
RP-802	Beowawe Rest Area on IR-80 IR-80 (MP EU 6.56)	D

Major frontage roads within the jurisdiction of this crew will be assigned a Level of Service C. Minor paved frontage roads will be assigned a Level of Service D. Minor gravel frontage roads will be assigned a Level of Service E.

CREW 327 - INDEPENDENCE/NORTH FORK

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
SR-225	From SR-226 to Idaho-Nevada state line (MP EL 54.37 to MP EL 127.54)	B
SR-226	Deep Creek Road, from junction of SR-225 to end of pavement (MP EL 39.02)	C

CREW 331 - RUBY VALLEY/CURRIE

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
US-93	From junction of US-93A at Lages to Warm Springs Salt Sand Pile (WP MP 112.76 to MP EL 49.40)	A
SR-229	From junction of county road to Lamoille to junction of US-93 south of Wells (MP EL 11.05 to MP EL 50.36)	C
SR-767	From end of pavement to junction of SR-229 (MP EL 37.18 to MP EL 39.10)	D

CREW 332 - WELLS CREW #1

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
IR-80	From East Wells Interchange to Oasis Interchange (MP EL 74.03 to MP EL 100.92)	A

US-93	From Warm Springs Salt Sand Pile to East Wells Interchange (MP EL 49.40 to MP EL 74.35)	A
SR-223	From Angel Lake Road to 0.3 mile past US-93 (MP EL 73.99 to MP EL 75.98)	B
SR-232	Clover Valley Road (MP EL 2.61 to US-93 junction)	C

Major frontage roads within the jurisdiction of this crew will be assigned a Level of Service C.
 Minor paved frontage roads will be assigned a Level of Service D.
 Minor gravel frontage roads will be assigned a Level of Service E.

CREW 335 - WELLS CREW #2

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
IR-80	From Halleck - Ruby Valley Interchange to East Wells Interchange (MP EL 43.70 to MP EL 74.03)	A
US-93	From 4 Way Intersection in Wells to Salt Sand Pile (MP EL 75.35 to MP EL 96.4)	A
SR-230	Starr Valley Rd., from IR-80 at Deeth to IR-80 at Welcome (MP EL 65.89)	C
SR-231	Angel Creek Campground to Wells (MP EL 11.00)	D
SR-231	Angel Lake Road, from Angel Lake to Angel Creek Campground (MP EL 0.00 to MP EL 4.00)	E

Major frontage roads within the jurisdiction of this crew will be assigned a Level of Service C.
 Minor paved frontage roads will be assigned a Level of Service D.
 Minor gravel frontage roads will be assigned a Level of Service E.

CREW 336 - WENDOVER

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
IR-80	From Oasis Interchange to	A

Nevada-Utah state line
(MP EL 100.92 to MP EL 132.72)

US-93A	From junction of US-93 at Lages to junction of SR-224 in Wendover (MP WP 0.00 to MP EL 53.20)	B
SR-233	Montello Rd., from IR-80 at Oasis to Nevada/Utah state line (MP EL 34.17)	C

Major frontage roads within the jurisdiction of this crew will be assigned a Level of Service C.
Minor paved frontage roads will be assigned a Level of Service D.
Minor gravel frontage roads will be assigned a Level of Service E.

CREW 340 - ELKO – SPECIALTY CREW

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
SR-225	1 mile north of IR 80 to junction of SR-226 (from MP EL 29.00 to MP EL 54.37)	B

CREW 350 – ELKO CREW #1

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
IR-80	From Central Carlin Interchange to Mountain City Hwy Interchange SR-225 (MP EL 2.85 to MP EL 23.27)	A
SR-278	From Midway to West Carlin Interchange I-80 Exit 279 (MP EU 61.18 to MP EL 5.02)	B
SR-766	Newmont/Barrick Mine Road from junction of SR-221 in Carlin to end of pavement (MP EL 0.00 to MP EU 6.31)	B
SR-221	From end of IR-80 through Carlin to FR-EL02	C
SR-278	From Alpha to Midway (MP EU 35.33 to MP EU 61.18)	C

SR-781 From south end B-1489 (Humboldt River) to north end E

Major frontage roads within the jurisdiction of this crew will be assigned a Level of Service C.
 Minor paved frontage roads will be assigned a Level of Service D.
 Minor gravel frontage roads will be assigned a Level of Service E.

CREW 351 – ELKO CREW #2

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
IR-80	From Mountain City Interchange to Halleck/Ruby Valley Interchange (MP EL 23.27 to MP EL 43.70)	A
SR-227	Lamoille Hwy, from junction of 12 th Street in Elko to Palace Parkway intersection (MP EL 1.45 to MP EL 13.58)	A
SR-227	Lamoille Hwy, from Palace Parkway intersection to end of pavement at Lamoille (MP EL 13.58 to MP EL 20.10)	B
SR-228	Jiggs Road, from junction of SR-227 near Spring Creek	C
SR-229	Ruby Valley Road, from I-80 Halleck Interchange to junction of county road to Lamoille (MP EL 0.00 to MP EL 11.05)	C

South Fork State Park routes

Elko County and NDOT have an agreement for Elko County to service snow removal on the main State Park routes.

Major frontage roads within the jurisdiction of this crew will be assigned a Level of Service C.
 Minor paved frontage roads will be assigned a Level of Service D.
 Minor gravel frontage roads will be assigned a Level of Service E.
 Crew 379 Stormwater provides additional coverage during winter season.

CREW 355 - DISTRICT III BRIDGE CREW

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
SR-227	Lamoille Hwy, (5 th Street in Elko)	A

from junction of SR-535 to
junction of 12th Street in Elko
(MP EL 0.00 to MP EL 1.45)

SR-225	From junction of SR-535 to Chain-up area (MP EL 27.23 to MP EL 29.00)	A
SR-535	Idaho Street, from junction of SR-225 to 5 th Street, SR 227 (MP EL 24.65 to MP EL 25.49)	A
FR-EL 17	East Jennings Way south side IR-80 Exit 303 from Idaho Street to 0.056 of Idaho Street 0.256 miles north Ramps 3 & 4	B
SR-535	From north side of exit 298 to end of state maintenance near Gateway RV (MP EL 21.68 to MP EL 24.13)	C
FR-EL 54	East Idaho Street from NYTC to end of state maintenance at Osino Interchange (6.938 miles east of NYTC)	C

Major frontage roads within the jurisdiction of this crew will be assigned a Level of Service C.
Minor paved frontage roads will be assigned a Level of Service D.
Minor gravel frontage roads will be assigned a Level of Service E.

CREW 379 – STORMWATER CREW

SR-228 Jiggs Road, from junction of SR-227 near C
 Spring Creek

Additional crew coverage for SR-228 during winter season.

CREW 341 – WINNEMUCCA - SPECIALTY CREW

In the event that snowfall accumulates in excess of 6 inches on the routes listed below, the snow will be plowed to the center of the highway and dispersed of immediately following the storm when manpower and equipment are available.

1. US 95 and SR-289, Winnemucca Blvd. from Winnemucca Blvd. West Interchange to Winnemucca Blvd. East Interchange
2. SR-794, Old US-40 from junction of SR-289 east to end of three lane section

3. SR-787, Hanson Street

If the snow is plowed to the center of the highway, the cross street intersections will be plowed open before the end of the work shift.

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
US-95	From junction of I-80 at Exit 176 to Reinhart Lane	A
SR-787	Hanson Street from SR-289 Winnemucca Blvd. to junction of SR-294 - Grass Valley Road	A
SR-289	US-95 (Melarkey) to SR-795 (Reinhart)	B
SR-294	Grass Valley Road from PE/HU County line to SR-787 Hanson Street	B
SR-794	Old US-40 from junction of SR-289 east to north side of IR-80 at East Winnemucca Interchange (MP HU 17.05)	B
SR-795	Reinhart Lane from SR-289 to US-95 junction	B
SR-796	Airport Road from cattle guard at airport 1.33 miles north to FR-HU 15	C
FR-HU 15	3.06 miles east of PE County line to FR-HU 20	C
FR-HU 17	FR-HU 15 to cattle guard North of I-80	C
FR-HU 20	Pilot truck stop to US 95 at I-80	C

Frontage roads and rest areas will be assigned a Level of Service D.

CREW 370 - WINNEMUCCA CREW #1

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
IR-80	Western district boundary	A

1.08 miles west of Imlay
Interchange east to Winnemucca
Blvd. East Interchange

SR-400	Unionville Road from junction of Unionville Canyon Road to Mill City Interchange on IR-80	C
FR-PE 15	Imlay to 151 Interchange (Dun Glen)	C
RP-804	Cosgrave Rest Area on south side of IR-80 at (MP PE 69.66)	D

Other frontage roads and rest areas will be assigned a Level of Service D.

CREW 371 - BATTLE MOUNTAIN

In the event that snowfall accumulates in excess of 6 inches on the routes listed below, the snow will be plowed to the center of the highway and dispersed of immediately following the storm when manpower and equipment are available.

<u>Route</u>	<u>Description</u>
SR-304	Front Street from Forest Street west to Tule Street
SR-305	Austin Highway from junction of SR-304 south to Carson Street
SR-806	North Battle Mountain Road from junction of SR-304 north to North 3rd Street

If the snow is plowed to the center of the highway, the cross street intersections will be plowed open before the end of the work shift.

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
IR-80	From 0.87 mile west of Valmy Interchange east to LA/EU County line (MP EU 26.97)	A
SR-304	Front Street in Battle Mountain from West Battle Mountain Interchange to East Battle Mountain Interchange	B
SR-305	From junction of SR-304 To the Battle Mountain City limits	B
SR-305	From the Battle Mountain City limits to MP LA 72.70	C

FR-LA 01	From SR-304 to Skyline Blvd.	C
FR-LA 02	From SR 304 to Muleshoe Road	C
SR-806	North Battle Mountain Hwy from junction of SR-304 north to Lander County Road at railroad tracks	D

Other frontage roads and rest areas will be assigned a Level of Service D.

CREW 372 - OROVADA

In the event that snowfall accumulates in excess of 6 inches on the following routes, the snow will be plowed to the center of the highway and dispersed of immediately following the storm when manpower and equipment are available.

1. US-95, from south city limits of McDermitt, north to the Oregon-Nevada state line (MP 73.76)

If the snow is plowed to the center of the highway, the cross street intersections will be plowed open before the end of the work shift.

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
US-95	From junction of SR-290 at bottom of Paradise Hill north to Nevada-Oregon state line at McDermitt (MP HU 73.76)	A
SR-290	Paradise Road from junction of US-95 north to Cotton Wood Creek structure (MP HU 18.00)	C
SR-293	Kings River Valley Hwy from junction of US-95 at Orovada west to Kings River Valley (MP HU 23.99)	C

The rest area is assigned a level of service D.

CREW 373 - QUINN RIVER

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
SR-140	From junction of US-95 to MP	C

65.58 at Denio to Oregon State Line
(MP HU 110.11)

SR-292	Denio Road from junction of SR-140 at MP 65.58 north to Nevada-Oregon state line in Denio (MP HU 68.52)	C
SR-140	From MP HU 65.58 at Denio to Oregon State Line	D

Rest areas are assigned a level of service D.

CREW 374 - WINNEMUCCA CREW #2

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
IR-80	From Winnemucca Blvd. East Interchange to 0.67 mile east of Pumpnickel Interchange (MP HU 14.96 to MP HU 42.20)	A
US-95	From junction of Reinhart Lane north to junction of SR-290 (Paradise Road) (MP HU 22.09)	A
SR-789	Getchell Road from Golconda Interchange on IR-80 east to Midas County Road (MP HU 16.25)	C

Frontage roads and rest areas will be assigned a Level of Service D.

CREW 342 - ELY - SPECIALTY CREW

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
US-93	From Ely to the North End of McGill (MP WP 53.45 to MP WP 66.00) This section is assigned to Crew 342 during winter months (Nov. - April)	A
US-50	(MP WP 61.00 to MP WP 67.67) This section is assigned to Crew 342 during the winter months (Nov. - April)	A
SR-490	Ely State Prison Road (MP WP 0.0 to MP WP 8.93)	B

This section is assigned to Crew 342 during winter months (Nov. - April)

380 - ELY CREW #1

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
US-6	MP WP 28.00 to MP WP 37.95	A
US-50 & 93	From junction of US-50 and US-93 in Ely to junction with US-6 at US-50 (MP WP 67.67 MP WP 68.43)	A
US-93	From the North end of McGill to Lages Junction (MP WP 66.00 to MP WP 112.76)	A
US-50	MP WP 28 to MP WP 61.00	B
RP-807	Schellbourne Rest Area on US-93 (MP WP 92.55)	D

CREW 381 – ELY CREW #2

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
US-6, 50 & 93	From junction of US-6/50/93 in Ely to Nevada-Utah state line (MP WP 39.20 to MP WP 101.88)	B
US-93	From LN/WP County line at Geyser Ranch to intersection of US-93 at Majors Junction (MP WP 0.00 to MP WP 26.71)	B
SR-487	From Nevada-Utah state line to junction of US-6/50 (MP WP 0.00 to MP WP 11.00)	C
SR-488	From junction of SR-487 Baker to Great Basin National boundary in Baker (MP WP 0.00 MP WP 5.49)	C
SR-893	From junction of US-6/50 to end of	C-

	pavement (MP WP 0.00 MP WP 39.75)	
SR-894	From end of pavement junction of US-93 (MP WP 0.00 to MP WP 16.62)	D
SP-01	Main road to Cave Lake State Park from west Cave Lake State Park boundary to junction of SP-01 and 01B, a distance of 2.47 miles	D
SP-01B	Cave Lake State Park campground road from junction of SP-01B and 01 to south end of Cave Lake where pavement ends, a distance of 0.67 mile	D

CREW 382 - LUND

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
SR-318	From District boundary to junction of US- 6 (MP LN 43.67 to MP WP 22.56)	A
US-6	MP WP 13.92 to MP WP 28.00	A
US-6	From the District boundary to intersection with SR-318 (MP WP 13.92 at Blackjack)	B
SR-379	From junction of US-6 at Currant Creek to end of pavement near Duckwater (MP WP 0.00 to MP WP 19.53)	C
SR-895	From junction of SR-318 to Preston (MP WP 0.00 to MP WP 1.48)	D
RP-810	Sunnyside Rest Area on SR-318 (MP NY 20.90)	D

CREW 384 - EUREKA

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
US-50	From LA/EU County line at US-50 near Illipah Junction (MP EU 0.00 to MP WP 28.00)	A

SR-278	From junction of US-50 (MP EU 0.00 to EU MP 11.00)	B
SR-278	MP EU 11.00 to Ely/ Elko Sub district Boundary (MP EU 35.33)	C
SR-892	From junction of US-50 to End of pavement (MP WP 0.00 WP MP 35.92)	C

CREW 385 - AUSTIN

<u>Route</u>	<u>Description</u>	<u>Service Level</u>
US-50	From CH/LA County line to LA/EU County line (MP LA 0.00 MP LA 56.53)	A
SR-305	From junction of US-50 to Ely/Winnemucca Sub district boundary (MP LA 30.80 to MP LA 72.80)	B
SR-722	From District II/III boundary (MP LA 12.00 to MP LA 41.52)	D

APPENDIX A-4: FORMS

ACCOUNTING

Form Title	Form Number	Link/Directory/Contact
Payment Voucher and Purchase Order	060-067	http://sharepoint/060/Shared%20Documents/General%20Forms
Report of Damage to Department of Transportation Property	060-076	Restricted; available upon request from the Accounting Division
Supply Issue Charge Ticket	060-034	Not available online
Billing Request	060-002	http://sharepoint/060/Shared%20Documents/General%20Forms

ACQUISITION

Form Title	Form Number	Link/Directory/Contact
Asphalt/Aggregate/Paint Purchase Requisition (APR)	(O) 3725	Not available online
Combination Request for Supplies, Equipment and Shipping Record (Form 51)	072-002	http://sharepoint/737/Form%2051%20Revised%20042014

EQUIPMENT

Form Title	Form Number	Link/Directory/Contact
Vehicle Accident, Incident & Damage Report	A078-001	http://sharepoint/078/DRIVING/Vehicle%20Accident%20Rpt%20FORM%202010.pdf
Property Disposition Form (Property Transfer Form)	N/A	http://sharepoint/737/PROPERTY%20DISPOSITION%20REPORT/pdr_ff.pdf
Request for Services	737-031	http://sharepoint/737/Lists/FORMS/AllItems.aspx

FORMS

MATERIALS

Form Title	Form Number	Link/Directory/Contact
Field Material Sieve Sheet	040-013	http://sharepoint/040/Construction%20Management/040-013%20Field%20Material%20Sieve%20Sheet.pdf
Transmittals for Asphalt Samples	020-016	http://sharepoint/040/Construction%20Management/020-016,%20Transmittal%20for%20Asphalt%20Samples.pdf
Transmittals for Test Samples and Certifications	020-018	http://sharepoint/040/Construction%20Management/020-018,%20Transmittal%20for%20Test%20Samples%20and%20Certifications.pdf
Oil Viscosity Test	020-016	http://sharepoint/040/Construction%20Management/020-016,%20Transmittal%20for%20Asphalt%20Samples.pdf

PERSONNEL

Form Title	Form Number	Link/Directory/Contact
Driving Record Card	078-009	http://sharepoint/078/DRIVING
Employee Appraisal Development Report	NPD-015	http://sharepoint/076/PERFORMANCE%20EVALUATIONS
Notice of Injury or Occupational Disease (Incident Report)	C-1	http://sharepoint/078/WORKERS%20COMP/WORKERS%20COMP%20FORMS
Employer's Report of Industrial Injury or Occupational Disease	C-3	http://sharepoint/078/WORKERS%20COMP/WORKERS%20COMP%20FORMS
Supervisor's Report of Injury & Accident Investigation	078-011	http://sharepoint/078/WORKERS%20COMP/WORKERS%20COMP%20FORMS
Early Return to Work Program Temporary Modified Duty Assignment for Recovering and Injured Workers	N/A	Not available online. Contact Safety and Loss Control.
Early Return to Work Program Physical Assessment	N/A	http://sharepoint/078/WORKERS%20COMP/WORKERS%20COMP%20FORMS
Request for Equipment Operator Training	N/A	\\datsrv1\050maintOPS\SharepointData\Maintenance Coordinator II\Forms\ Request for Equipment Operation
Training Request Form	A077	http://sharepoint/077/Training%20Forms

MISCELLANEOUS

Form Title	Form Number	Link/Directory/Contact
Entry Permit	523	http://sharepoint/030/Shared%20Documents/Form's/500-Negotiations/523%20Entry%20Permit.doc
Customer Services Work Order	003-001	Not available online
Revocable Application and Permit for Occupancy of Nevada Department of Transportation Right-of-Way	725	http://www.nevadadot.com/Doing_Business/Forms_Download.aspx
Truck Escape Ramp Incident Log Form	N/A	http://sharepoint/050/Truck%20Escape%20Ramp%20Documentation/NDOT%20Arrestor%20Bed%20Incident%20Log.pdf
Truck Escape Ramp Maintenance Checklist	N/A	http://sharepoint/050/Truck%20Escape%20Ramp%20Documentation/NDOT%20Arrestor%20Bed%20Maintenance%20Checklist.pdf
Stormwater Reporting Manuals and Forms	N/A	http://sharepoint/018/SitePages/Maintenance.aspx

GLOSSARY

A

Abrasive Mixture

A mixture of sand and a deicing chemical, generally salt. The abrasive mixture is prepared before anticipated storms at the District's prescribed mix ratio.

Accomplishment Unit

The unit of measure used to describe the quantity of work performed for a task.

Aggregate

Materials such as gravel, crushed stone, slag, sand or combination thereof, used for various purposes in highway maintenance and construction.

Anionic

Emulsions with a negative charge on the asphalt droplets, which adhere best to aggregates with mostly positive surface charges (e.g., limestone and dolomite).

Asphalt

A black cementing material that varies widely in consistency from solid to semi-solid (soft solid) at normal air temperatures. When heated sufficiently, asphalt softens and becomes a liquid. Asphalt is made up largely of a hydrocarbon called bitumen; consequently, asphalt is often called a bituminous material.

Asphalt Cement

Asphalt that is refined to meet specifications for paving purposes.

Average Daily Traffic (ADT)

The total volume of traffic divided by the number of days in the count period, usually a year.

B

Backfill

Material used to replace or the act of replacing material removed during construction. Also, is used to denote material placed or the act of placing material adjacent to a structure such as a culvert.

Bare Pavement	The condition where the travel lanes are clear of loose snow, but may have patches of ice or snow pack that, when treated with chemicals or abrasive may be negotiated safely by the average motorist without the need of chains or snow tires.
Base Course	The layer or layers of specified or selected material of designed thickness on a sub-base or a subgrade to support a surface course.
Bedding	The foundation under a drainage structure.
Betterment	Improvements to a highway that increase roadway capacity, safety or structural section over its originally constructed condition.
Best Management Practices (BMPs)	A set of preferred procedures or methods that represent the most effective course of action for stormwater pollution prevention and management (see Facility Pollution Prevention Plan) and MS4 Permit compliance (see MS4).
Binder	Material used to stabilize or cement loose soil or aggregates together. As used in this manual, it refers to emulsions or other asphalt products used on seal projects.
Bitumen	A mixture of hydrocarbons frequently accompanied by nonmetallic derivatives, which may be gaseous, liquid, semi-solid or solid, and are completely soluble in carbon disulfide.
Bituminous Material	Includes asphalt cements, cutback asphalts and emulsified asphalts.
Bituminous Pavement	A flexible pavement structure composed of crushed rock or other aggregate cemented together with a bitumen. (Also, referred to as bituminous mixture.) Most pavements are termed plantmix bituminous surface (plantmix or hot mix) or premixed bituminous paving material (premix or cold mix).
Blading	Planing or smoothing the surface or various parts of a roadway by means of a motor-driven, adjustable steel blade (motor grader).

Bleeding Excess bituminous material on the roadway surface (See Flushing), caused by heat or the use of excessive quantities of bituminous material in patching or surfacing.

C

Cationic Emulsions with a positive charge on the asphalt droplets, which adhere best to aggregates with mostly negative surface charges, like granite and high silicon aggregates.

Chain Installers Individuals issued a permit to install chains for a fee for motorists. The permit is issued to the "chain installer" for a specific highway.

Chains or Snow Tire Controls A mandatory condition where either chains or snow tires are required due to snow or ice on the roadway. Chain or snow tire requirements are placed when, in the judgment of the maintenance supervisor on duty, snow and ice conditions make it difficult for average drivers to control their vehicles.

Chip Seal The application of a bituminous material onto the roadway surface immediately followed by the application of an aggregate that is rolled to embed it into the bituminous material.

Cleanout An access opening to a roadway drainage system usually consists of a manhole shaft, a special chamber or an opening into a culvert, drain or sand oil separator.

Control of Access The condition where the right of owners or occupants of abutting land or other persons to access a highway is fully or partially controlled by a public authority, such as NDOT.

Cornice Overhanging snow forming a partial arch created by the wind.

Corrective Maintenance Includes tasks designed to repair failures and to restore the facility to its original condition and efficiency.

Course	A layer of supporting road material separately placed and compacted during construction or maintenance of a highway.
Crossovers	Turn through areas constructed to allow official vehicles to cross from one side of a divided highway to the opposite side.
Culvert	A closed conduit, other than a bridge, which conveys water, by a channel or waterway, transversely under the roadway.
Cutback Asphalt	An asphalt cement, which has been liquefied by blending with petroleum solvents (also called diluents).
D	
Delineator	A light-reflecting device mounted slightly outside the paved edge of a highway, which reflects light from headlights back to the driver to indicate alignment of the roadway.
Detour	A temporary route that deviates from the normal route.
Dike	Usually an earthen bank alongside a watercourse or an asphalt cement bituminous bank along the edge of the shoulder.
Divided Highway	A highway with separated roadways for vehicles traveling in opposite directions.
Double Chip Seal	The application of a bituminous material and an aggregate that is rolled to embed it into the bituminous material, followed by an additional application of a bituminous material and an aggregate (of approximately half the average dimension of the base coat aggregate) that is rolled once more to embed it into the bituminous material.
Down drain	A prefabricated drainage facility assembled and installed in the field for transporting water down steep slopes.

Drainage The natural or artificial removal of surface and sub-surface water from an area.

Dust Palliative Any compound used to stabilize dust.

E

Emulsified Asphalt A mixture in which minute globules of asphalt cement are dispersed in water that contains an emulsifying agent (detergent).

Encroachment Use of the highway right-of-way or easements for other than highway purposes. An occupancy permit may authorize encroachments.

Erosion The wearing away of a surface by some external force. For drainage, this term generally refers to the wearing away of the earth's surface by flowing water.

Excavation A general term denoting all digging required in highway construction or maintenance.

Expansion Joint A joint located to provide for expansion of a rigid slab to prevent damage to itself, adjacent slabs or structures.

F

Facility Pollution Prevention Plan (FPPP) The guideline for stormwater pollution prevention practices implemented at Department maintenance facilities, stations, yards and offsite material storage/stockpile areas statewide.

Faulting Differential vertical displacement of rigid slabs at a joint or crack.

Filler A finely divided mineral product (crusher dust, limestone dust, cement, lime or natural fines, etc.), which has at least 65 percent passing the #200 mesh sieve, used in bituminous mixes.

Flash Point	That temperature at which a material gives off flammable vapor in sufficient quantity to burn instantaneously at the approach of a flame or spark.
Flexible Pavement	An asphalt pavement structure which maintains contact with and distributes loads to the subgrade and depends on aggregate interlock, particle friction and cohesion for stability.
Flush Seal	An application of a bituminous material onto the roadway surface.
Flushing	Excess bituminous material on the roadway surface, caused by heat or the use of excessive quantities of bituminous material in patching or surfacing.
Fog Seal	See Flush Seal.
Frontage Road	A public street or auxiliary road to and normally adjacent to a highway for purposes of maintaining local road continuity and for control of access. A frontage road is connected to public roads or streets at one or both ends.
Frost Heave	Displacement of pavement due to an accumulation of ice crystals, which build up in the subgrade to the extent that the pavement is heaved up and distorted.
G	
Gore	The area immediately beyond the divergence of two roadways, bounded by the edges of those two roadways.
H	
Hand Patch	Any act of patching the roadway surface, which does not include the use of any type of asphalt laydown machine.
Headwall	A wall placed at the end of a culvert.

Highway	A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.
Historic Site	A building, monument, park, cemetery or other site having public interest and national, regional or state significance.
I	
Interchange	A system of interconnecting roadways, in conjunction with one or more grade separations, that provide for the movement of traffic between two or more roadways on different levels.
Island	A defined area between traffic lanes for control of vehicle movements or for pedestrian refuge. Within an intersection, a median or an outer separation is considered an island.
J	
K	
L	
Level of Service	A qualitative rating of the effectiveness or priority of a maintenance program, task or project
Leveling Course	The layer of bituminous material placed on an existing paved surface to eliminate irregularities prior to placing an overlaying course.
Liquid Asphalt	See Cutback Asphalt.
M	
Maintenance Management System (MMS)	The collection of programs and tasks that support a uniform approach to maintaining the State Highway System.

MMS System	An automated Web application/database composed of interrelated management tools designed to provide a basis for recording program/task resources, work accomplished, budgeting, scheduling work, quality control, levels of service, performance standards and evaluation.
MUTCD	The <i>Manual on Uniform Traffic Control Devices</i> . A manual containing uniform standards on traffic control devices.
Median	The portion of a divided highway separating the traveled ways for traffic in opposing directions.
Milepost Marker	A sign panel that identifies a specific mile location on a highway.
Mulch	Any organic matter such as leaves, straw, bark, chips, etc., used to protect plant material and surface soil from heat, cold, erosion or to reduce water loss.
Municipal Separate Storm Sewer Systems (MS4) Permit	A statewide permit issued by the Nevada Department of Environmental Protection that authorizes the Department to discharge municipal stormwater runoff to receiving waterways from within the NDOT right-of-way and jurisdictional boundary, including maintenance facilities, stations, yards and offsite material storage/stockpile areas.
N	
O	
P	
Pavement	See Bituminous Pavement.
PCC	Portland cement concrete.

Performance Standards	Formally established criteria for specific tasks that: (1) outline the work involved; (2) describe labor, equipment and material requirements; (3) list expected accomplishment or productivity rates; and (4) define the threshold at which the maintenance task should be carried out.
Plantmix	A mixture produced in an asphalt mixing plant that consists of mineral aggregate uniformly coated with asphalt cement or cutback asphalt.
Pothole	Bowl shaped depressions of various sizes in the pavement surface.
Pre-trip/Post-trip Inspection	A list of items that must be checked on each piece of equipment before and after it is used.
Premix	A combination of mineral aggregate and liquid asphalt mixed for future use at a central plant or on a mixing pad by motor graders and pulvimixers.
Preventive Maintenance	Includes tasks designed to delay, prevent or stop deterioration and as such are performed prior to an actual failure.
Program	A classification of the Maintenance Management System that contains a set of related tasks.
Q	
Qualified Products List (QPL)	A list of manufactured products available on the market that have been evaluated and determined suitable for a specific use.
R	
Ramp	A one-way connecting roadway between two intersecting highways at an interchange.
Raveling	The progressive loosening of material by abrasion or because of a dry mix in the surface course of a road that results in depressions in the roadway surface.

Rest Area	A roadside area with parking facilities, separated from the roadway, provided for motorists to stop and rest for short periods. They include toilets and may include drinking water, tables and benches, litter barrels, telephones and information on other facilities.
Rest Stop	A roadside area with parking facilities, provided for motorists to stop and rest for short periods. They may include tables and benches and litter barrels.
Rigid Pavement	A pavement structure that distributes loads to the subgrade having as one course a Portland cement concrete slab of high bending resistance.
Right-of-Way	A general term denoting land, property or interest therein, usually in a strip, acquired for or devoted to transportation purposes.
Roadbed	The graded portion of a highway within the top and side slopes, prepared as a foundation for the pavement structure and shoulders.
S	
Salt Brine	A solution of salt and water that is mixed to a prescribed ratio.
Sand Seal	An application of a bituminous material onto the roadway surface, followed by an application of sand or fine aggregate.
Scour	The erosive action of running water, primarily in streams, excavating and carrying away material from the bed and banks.
Screenings (Chips)	Angular fragments of stone containing very little fines or dust conforming to a gradation specification and used as cover material for chip seals.

Scrub Seal	An application of a bituminous material that is scrubbed into the surface with a broom or squeegee, followed by an application of sand to provide traction and prevent tracking prior to the material setting up.
Seal Coat	An application of bituminous material, usually with cover aggregate, applied to a surface course. The term includes chip seals, flush/fog seals, sand seals and scrub seals.
Shoulder	The portion of the roadway contiguous with the traveled way for vehicles stopped for emergencies and for lateral support of the base and surface courses.
Single Chip Seal	See Chip Seal.
Snow Poles	Plastic pipes, flat fiberglass panels or wood poles attached to a guidepost to guide snow removal equipment and the public during the winter months.
Spalling	The breaking or chipping of concrete at joints, cracks, edges or flaking of the surface.
Spreader Calibration	The procedure of calculating the pounds of material discharged per mile at various equipment speeds.
Stockpile	To place and store materials, such as gravel, at locations for future use.
Stormwater Management Program (SWMP)	A detailed description of the Department's Stormwater Management Program (SWMP) and practices, addressing stormwater pollution related to highway planning, design, construction, and maintenance activities throughout the state.
Stormwater Pollution Prevention Plan (SWPP)	See Facility Pollution Prevention Plan (FPPP).

Structures	Bridges, culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, end walls, buildings, sewers, service pipes, underdrains, foundation drains and other features that may be encountered in the work and not otherwise specifically defined.
Subgrade	The top surface of a roadbed upon which the pavement structure and shoulders, including curbs, are constructed.
Surface Course	The topmost layer of a pavement structure (also referred to as a wearing course) that resists skidding, traffic abrasion and the disintegrating effects of climate.
T	
Tack Coat	An application of bituminous material to an existing paved surface to provide a bond with new overlay material.
Task	A unique maintenance operation, which may include a small group of associated activities.
Traffic Island	Any restricted area permanently located in a roadway, which provides for the physical separation of traffic.
Traffic Control Device	A sign, signal, marking or other device placed on or adjacent to a street or highway to regulate, warn or guide traffic.
U	
V	
Viscosity	The resistance of a fluid to flow.
Voids	The empty spaces between particles in a substance or mixture.

W

Wearing Course

See Surface Course.

Welcome Center

A facility with the same amenities as a rest area that also provides information including accommodations, food, fuel and attractions through an attendant or some other means of communication.

Windrow

Material deposited along the surface in a continuous row.

X

Y

Z

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