DEPARTMENT OF AGRICULTURE
INYO NATIONAL FOREST

MAMMOTH LAKES SIGNAGE AND WAYFINDING PROJECT

PART I
SPECIAL PROVISIONS

CMI05-03T and CMI05-05T Non-Motor/Non-Winlderness Trails
Requisition No. 371379

March 2010

Mammoth Lakes Signage And Wayfinding Project

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Mammoth Lakes Signage And Wayfinding Project

SPECIAL PROVISIONS

0-0 STANDARD SPECIFICATIONS

0-1 GENERAL

The provisions of the 2006 edition of the "State of California Department of Transportation Standard Specifications" (CSS) prepared and promulgated by Caltrans shall constitute the Standard Specifications for this project unless otherwise noted. The following pages of modifications and additions to the Standard Specifications will be referred to as the Special Provisions. Copies available at http://www.dot.ca.gov/hq/esc/oe/standards.php

0-2 NUMBERING OF SECTIONS

The numbering of Subsections 1 through 95 in these Special Provisions is compatible with the numbering in the CSS.

0-3 MODIFICATIONS

The Subsections numbered 1 through 95, which follow, replace, modify, or add to sections of like number in the CSS. Subsections numbered 100 and above may modify Subsections in the CSS. To the extent of any conflict with the CSS, these provisions shall take precedence. Amendments to the Standard Specifications set forth in these special provisions shall be considered as part of the Standard Specifications for the purposes set forth in Section 5-1.04, "Coordination and Interpretation of Plans, Standard Specifications and Special Provisions," of the Standard Specifications.

SECTION 1. SPECIFICATIONS AND PLANS

The work embraced herein shall be done in accordance with the Standard Specifications dated May, 2006, and the Standard Plans dated May, 2006, of the California Department of Transportation and all published addenda insofar as the same may apply and in accordance with the following special provisions.

In case of conflict between the Standard Specifications and these special provisions, the special provisions shall take precedence over and be used in lieu of the conflicting portions.

ABBREVIATIONS

The following subsection is added to Section 1 of the CSS.

1-1.02 The following abbreviations are added to Subsection 1-02 of the CSS:

AGC	Associated General Contractors of America
APWA	American Public Works Association
ASA	American Standard Association
BMP	Best Management Practices
CITY	Town of Mammoth Lakes
CSP	State of California Standard Plans, May 2006 edition
CSS	State of California Standard Specifications, May 2006 edition

MCWD	Mammoth Community Water District
NEC	National Electric Code
SSPWC	Standard Specification for Public Works Construction, 1998 edition, prepared by Southern California Chapters of AGC and APWA
SWPPP	Stormwater Pollution Prevention Plan
TML	Town of Mammoth Lakes
TOWN	Town of Mammoth Lakes

1-1.03 DEFINITIONS

The following definitions replace or amend definitions in Section 1 of the CSS.

Amended Definitions

Architect, Soils Engineer, Design Engineer, Structural Engineers - Advisors employed during the design process. The Design Engineer for this project is Triad/Holmes and Associates.
Department - Forest Service Contracting Officer
Director of Transportation - Forest Service Contracting Officer
Director - Forest Service Contracting Officer
Due Notice - A written notification, given in due time, of a proposed action where such notification is required by the contract to be given a specified interval of time (usually 48 hours or two (2) working days) prior to the commencement of the contemplated action. Notification may be from Engineer to Contractor or from Contractor to Engineer.
Engineer - Forest Service Contracting Officer, acting either directly or through properly authorized agents acting within the scope of the particular duties entrusted to them.
Engineer's Estimate – Independent Government Estimate.
Laboratory - The designated laboratory authorized to test materials and the work involved in the Contract.
Owner – Forest Service Contracting Officer
State - Forest Service Contracting Officer
State of California Department of Transportation Standard Specifications (CSS) - Caltrans Standard Specifications, dated May 2006,
State of California Department of Transportation Standard Plans (CSP) - Caltrans Standard Plans dated May 2006.
Town – Forest Service Contracting Officer
Town Representative - Engineering Division, acting either directly or through properly authorized agents acting within the scope of the particular duties entrusted to them.

SECTION 2. PROPOSAL REQUIREMENTS AND CONDITIONS

Not applicable - Section 2 is superseded by Federal Acquisition Regulations

SECTION 3. AWARD AND EXECUTION OF CONTRACT

SECTION 4. SCOPE OF WORK

No changes.

SECTION 5. CONTROL OF WORK - GENERAL

5-1.02 PLANS AND WORKING DRAWINGS

The following paragraph is added to subsection 5-1.02 of the CSS:

5-1.02A TRENCH AND EXCAVATION SAFETY PLANS

No Changes

5-1.02B SHOP DRAWINGS

The Contractor shall review, mark with approval, and submit for review by the Engineer all shop drawings required by the Contract Documents. Six (6) sets of shop drawings shall be submitted to the Engineer and be accompanied by a letter of transmittal listing the drawings submitted. Drawings shall show the name of the projects, the name of the Contractor, and, if any, the names of suppliers, manufacturers, and subcontractors. Shop Drawings shall be submitted with promptness and in orderly sequence so as to cause no delay in prosecution of the work.

Shop drawings shall be complete in all respects. If the shop drawings show any deviations from the requirements of the plans and specifications because of standard shop practices or other reasons, the deviations and the reasons therefore shall be set forth in the letter of transmittal.

By submitting shop drawings, the Contractor represents that material, equipment, and other work shown thereon conforms to the plans and specifications, except for any deviations set forth in the letter of transmittal. Drawings required for conventional stock pumps, motors and all other manufactured equipment may be brochures or catalog sheets but must show all necessary dimensions required for proper installation, operation, and maintenance of the equipment.

The Engineer will, within four (4) weeks of submittal receipt, return two (2) of the copies of the drawings to the Contractor with any comments noted thereon. If so noted by the Engineer, the Contractor shall correct the drawings and resubmit them in the same manner as specified for the original resubmittal. The Contractor in the letter of transmittal accompanying resubmitted shop drawings shall direct specific attention to revisions other than the corrections requested by the Engineer on previous submittals.

The review by the Engineer is only of general conformance with the design concept of the project, and general compliance with the plans and specifications and shall not be construed as relieving the Contractor of the full responsibility for: providing materials, equipment, and work required by the contract; the proper fitting and construction of the work; the accuracy and construction processes and techniques of construction; and performing the work in a safe manner.

No portion of the work requiring a shop drawing submittal shall commence until the submittal has been reviewed by the Engineer and returned to the Contractor with a notation indicating that resubmittal is not required. Any commitment made by the Contractor to purchase unapproved items shall be the Contractor's sole responsibility.

If the Contractor believes that any shop drawing or communication relative thereto calls for changes in the work for which the contract amount or time for completion should be changed, the Contractor shall not proceed with the changes in the work so called for and shall promptly notify the Engineer in writing of the estimated changes in the contract amount and time for completion believed to be appropriate. No payment for changes in the work will be made and no change in the time for completion by reason of changes in the work will be made, unless the changes are

covered by a written change order approved by the Engineer in advance of the Contractor's proceeding with the changed work.

5-1.02C SHOP DRAWING SUBMITTALS

The following shop drawings shall be submitted:

1. Aggregate base
2. Asphalt concrete mixes (all types)
3. Bedding and backfill materials
4. Concrete Pavers
5. Concrete paver edge material
6. Certified as-built drawings****
7. Concrete mixes (all types)
8. Import fill material
9. Quality Control Program**
10. Schedule, phasing, and construction sequence plan**
11. SWPPP Erosion control plan**
12. Signs, each type
13. Sign fabrication and installation drawings
14. Coatings and color charts
15. Color samples
16. Sign material samples
17. Sign proofs
18. Site Video Tape and Photographic Record for work locations located near other improvements**
19. Traffic control plan **

5-1.02DMEASUREMENT AND PAYMENT

The Measurement and payment for shop drawing submittals shall be considered incidental and included as part of the various other item of work in the Bid Proposal and no separate payment will be made therefore, except that the initial submittal of items designated with ** shall be submitted as required for Mobilization Payment per Section 11.

Shop Drawings (as-builts) designated with **** will be paid at the lump sum bid price and shall include full compensation for furnishing all materials, labor, tools, and incidentals necessary to complete the work. Fifty percent (50%) of the bid amount will be paid at the first submittal of the as-builts or manuals and 50% when the as-builts have been accepted.

5-1.04 PRECEDENCE OF CONTRACT DOCUMENTS

The following paragraph is added to subsection 5-1.04 of the CSS:

5-1.04A PRECEDENCE OF CONTRACT DOCUMENTS

As the figured dimensions shown on the plans and in the specifications of the Contract may not in every case agree with scaled dimensions, the figured dimensions shall be followed in preference to the scaled dimensions, and plans to a large scale shall be followed in preference to the plans to a small scale. Should it appear that the work to be done, or any of the matters relative thereto, are not sufficiently detailed or explained in the Contract, the Contractor shall apply to the Engineer for such further explanations as may be necessary, and shall conform thereto as part of the Contract so far as may be consistent with the terms thereof. Any items shown on drawings and not mentioned in the specifications shall be of like effect as if shown or mentioned in both.

If there is a conflict between Contract Documents the highest precedence shall control. The precedence shall be:

1. Permits from other agencies as may be required by law.
2. Special Provisions
3. Plans
4. Standard Plans
5. Standard Specifications
6. Reference Specifications

Change Orders, Supplemental Agreements, and approved revisions to Plans and Specifications will take precedence over Items 2) through 6) above. Detailed plans shall have precedence over general plans.

5-1.05 ORDER OF WORK

The following paragraphs are added to subsection 5-1.05 of the CSS:

5-1.05A WORK PHASING ROAD CLOSURES

Paving performed after October 15 may be considered temporary if it must be completed in weather that does not meet Section 39 of the specificaitons. All paving must be completed sufficient to provide a smooth surface and trasisitons for the winter season beginning November 7.

5-1.05B WORK SEQUENCE

The Contractor shall complete work for each phase in the following sequence:

1. Shop drawings and proofs for signs. Submittal, review and revision process.
2. Installation of signs in and around the Town Urban Growth Boundary
3. Installation of Interpretive Signs without sign panels (note: the interpretive message panels will be design in the summer 2010 an will not be completed until winter 2010/2011 when the image files will be available for the contractors use in constructing the interpretive panels)
4. Installation of Signs in Lakes Basin
5. Installation of interpretive sign panels

5-1.07 LINES AND GRADE (SURVEYING)

Subsection 5-1.07, Lines and Grade, is deleted in its entirety and replaced by the following subsection:

5-1.07 SURVEY SERVICE

5-1.07A CONSTRUCTION STAKING

The Engineer will provide survey control points for each sign.

The Engineer will provide staking and layout including the flowing:

Provide stake and layout or paint on existing bike path or street with offset.
Provide bench mark location for each Type 2 and Type 7 Sign for paver elevation.
Clearing and Grubbing perimeter staking where required

The contractor shall establish horizontal and vertical control from the survey control points shown on the drawings and the reference points shown for each segment of work. The contractor must establish all layout required for the construction of work. The contractor shall furnish all lines, grades and measurements from the control points necessary for the proper prosecution and control of the work.

The contractor shall give weekly copies of the survey notes to the Engineer so that the Engineer may check them for accuracy and method of staking. All areas that are staked by the contractor must be checked by the Engineer prior to beginning any work in the area. Any error resulting in establishing grades and/or alignments that are not in accordance with the plans shall be corrected as soon as discovered and all construction not in accordance with the plans and specifications shall be replaced with no additional cost to the owner.

Path alignments may vary by up to 20 feet to avoid natural obstacles. Surveys shall be adjusted accordingly.

Construction Staking and Layout includes but is not limited to:

- Rough Grade slope stakes at 100-foot stations
- Subgrade blue tops at 25-foot stations and 25-foot offset distance (max)

5-1.07B QUANTITY SURVEYS

(a) Quantity surveys shall be conducted, and the data derived from these surveys shall be used in computing the quantities of work performed and the actual construction completed and in place.

(b) The Contractor shall conduct the original and final surveys and surveys for any periods for which progress payments are requested. All these surveys shall be conducted under the direction of a representative of the Contracting Officer, unless the Contracting Officer waives this requirement in a specific instance. The Government shall make such computations as are necessary to determine the quantities of work performed or finally in place. The Contractor shall make the computations based on the surveys for any periods for which progress payments are requested.

(c) Promptly upon completing a survey, the Contractor shall furnish the originals of all field notes and all other records relating to the survey or to the layout of the work to the Contracting Officer, who shall use them as necessary to determine the amount of progress payments. The Contractor shall retain copies of all

5-1.07C SURVEY MEASUREMENT AND PAYMENT

Measurement and payment for survey and layout work shall be included in each of the bid items requiring surveying and considered incidental to the work no separate payment shall be made therefore. The lump sum or unit price made for each item shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved survey and layout necessary to construct the new facilities. Full compensation will be considered as included in any bid item requiring survey and no additional compensation will be allowed therefore.

5-1.08 INSPECTION

Section 5-1.08, "Inspection," of the Standard Specifications, is amended by adding the following after the third paragraph:

5-1.08A GENERAL

Unless otherwise specified, inspection at the source of production for such materials and fabricated items as bituminous paving mixtures, structural concrete, fabricated metal products, cast metal products, welding, reinforced and unreinforced concrete pipe, application of protective coatings, and similar shop and plant operations is not required. A certificate of compliance, signed by an authorized officer of the producer, certifying compliance with the contract documents shall be submitted for all of the following materials: steel pipe, sizes less than 18 inches; vitrified
clay pipe; asbestos cement pipe; cast iron pipe; reinforced concrete pipe; non-reinforced concrete pipe; PVC sewer and water pipe; asphalt cement; and stripping and paint subject to sampling and testing as determined by the Engineer.

Standard items of equipment, such as electric motors, conveyors, plumbing fittings and fixtures, lumber, plywood, and so on, are subject to inspection at the job site.

All other equipment and material items shall be inspected and tested in accordance with the contract documents.

Full time inspection will not be available. The Contractor shall provide 24-hour minimum notice for each inspection required by the work unless other arrangements have been agreed upon, in writing, with the Engineer. Any inspection required outside of normal working hours and days, including holidays, shall be at the Contractor's cost at rates established by the Town and may be deducted from any compensation owed the Contractor.

Specific inspections include the following:

1. Approve subgrade
2. Grading operations
3. Post backfill
4. Reinforcing steel inspection
5. Concrete placement
6. Subgrade preparation
7. Paver operation
8. Approve forms prior to setting in place.
9. sign locations

5-1.08B INSPECTION OF MATERIALS NOT PRODUCED LOCALLY

Contractor purchased materials, fabricated items, and equipment produced at sources located more than 50 miles outside the corporate limits of Town, and which are specified to be inspected in the contract documents, will be inspected by independent inspectors or testing laboratories (approved by the Town) paid for by Contractor. If any item inspected fails to meet the specified criteria, Contractor shall pay all costs for reinspection, and such costs may be deducted from payments due to Contractor.

5-1.14 COST REDUCTION INCENTIVE

The following is added to subsection 5-1.14, Cost Reduction Incentive:

Simple reduction or elimination of work under the contract shall not be considered a cost reduction.

SECTION 5-2. MISCELLANEOUS REQUIREMENTS

5-2.01 ADJUSTMENT OF CONTRACT BID ITEMS AND SUPPLEMENTAL WORK

An item “Supplemental Work” with an estimated cost fixed by the Engineer, has been included in the contract to cover modifications to the work necessitated by field conditions. The amount of expenditure under this item may vary from zero to the total amount of the item. This amount may constitute the sum of several modifications. The Engineer will notify the Contractor in writing when a portion of the work being performed will be paid for under this item.

SECTION 5-3 MISCELLANEOUS WORK ITEMS

SECTION 5-3.01 VIDEO DOCUMENTATION

5-3.01 GENERAL

A minimum of one (1) week prior to start of construction, the Contractor shall have video taken where construction is to take place adjacent to improved facilities other than a bike path. These videos shall be narrated and shall serve as a record of existing conditions for disputes arising from restoration, and should therefore be taken along the line of construction and site access and staging areas at sufficient detail and in color as necessary to clearly depict details of existing conditions. The video shall be recorded on standard VHS cassette type tapes or digital video disk media. All videos shall be indexed and catalogued in such a manner that each photographed area is readily identifiable, and shall also indicate the date and time (hour, minutes, and seconds) on which the video was made. The Contractor shall also have video taken of any unusual

conditions encountered during construction that are not already a matter of photographic record. In any areas where existing conditions cannot be determined by means of video, the area shall be restored as approved by the Engineer at Contractor's expense. All video shall become the property of Town.

Video records/documentation shall be provided to the Engineer before any construction commences.

5-3.01.1 MEASUREMENT AND PAYMENT FOR VIDEO

Measurement and payment for video documentation shall be included in the contract lump sum price for the first year mobilization.

SECTION 5-3.02.1 STORM WATER POLLUTION PREVENTION PLAN

5-3.02.2 SCOPE

This contrat will have limited ground disurbance but provisions shall be made by the contractor to protect ersion into waterways and stormdrains near work aeas. A NOI for this contract is not crequired. Straw rolls are the prefered protection devise for ersion control and siltaion control for wirj area oerunter on steep slopes or near natural or man made draiange courses.

This item shall consist of preparation, implementation, and compliance with a storm water pollution prevention plan (SWPPP) for the project. Water pollution control work shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications and these special provisions.

This project lies within the boundaries of the Lahontan Regional Water Quality Control Board and shall conform to the requirements of the National Pollutant Discharge Elimination System (NPDES) Permit for General Construction Activities No. CAS000002, Order No, 99-08-DWQ, and utilize the Town of Mammoth Lakes MOU Resolution No. 6-91-926 issued by the State Water Resources Control Board. These permits, hereafter referred to as the "Permits," regulate storm water discharges associated with construction activities.

Water pollution control work shall conform to the requirements in the "Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual" and the "Construction Site Best Management Practices (BMPs) Manual," and addenda thereto issued up to, and including, the date of advertisement of the project, hereafter referred to respectively as the "Preparation Manual" and the "Construction Site BMP Manual" and collectively as the "Manuals." Copies of the Manuals and the Permits may be obtained from the Department of Transportation, Material Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520. Copies of the Manuals may also be obtained from the Department's Internet Web Site at: http://www.dot.ca.gov/hq/construc/stormwater.html.

The plan may also utilize the practices recommended in the *California Stormwater Best Management Practices Construction Handbook* dated March 1993, available from Blue Print Service (BPS), 1700 Jefferson Street, Oakland, CA 94612, telephone (510) 444-6771, Fax (510) 444-1262.

The Contractor shall know and fully comply with the applicable provisions of the Manuals, Permits, and Federal, State, and local regulations that govern the Contractor's operations and storm water discharges from both the project site and areas of disturbance outside the project limits during construction. The Contractor shall maintain copies of the Permits at the project site and shall make the Permits available during construction. Unless arrangements for disturbance or use of areas outside the project limits are made by the Town and made part of the contract, it is expressly agreed that the Town assumes no responsibility for the Contractor or property owner with respect to any arrangements made between the Contractor and property owner. The Contractor shall implement, inspect and maintain all necessary water pollution control practices to satisfy all applicable Federal, State, and Local laws and regulations that govern water quality for areas used outside of the

street right-of-way or areas arranged for the specific use of the Contractor for this project. Installing, inspecting, and maintaining water pollution control practices on areas outside the Street right-of-way not specifically arranged for and provided for by the Town for the execution of this contract will not be paid for.

The Contractor shall be responsible for the costs and for liabilities imposed by law as a result of the Contractor's failure to comply with the provisions set forth in this section, including but not limited to, compliance with the applicable provisions of the Manuals, Permits and Federal, State and local regulations. Costs and liabilities include, but are not limited to, fines, penalties, and damages whether assessed against the Town or the Contractor, including those levied under the Federal Clean Water Act and the State Porter Cologne Water Quality Act.

In addition to the remedies authorized by law, money due the Contractor under the contract, in an amount determined by the Town, may be retained by the State of California until disposition has been made of the costs and liabilities.
When a regulatory agency or other third party identifies a failure to comply with the permit or any other local, State, or federal requirement, the Engineer may retain money due the Contractor, subject to the following:

A. The Town will give the Contractor 30 days notice of the Town's intention to retain funds from partial payments, which may become due to the Contractor prior to acceptance of the contract. Retention of funds from payments made after acceptance of the contract may be made without prior notice to the Contractor.
B. No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications.
C. If the Town has retained funds and it is subsequently determined that the State is not subject to the costs and liabilities in connection with the matter for which the retention was made, the Town shall be liable for interest on the amount retained for the period of the retention, and the rate of interest payable shall be 6 percent per annum.

Conformance with the provisions of this section (Storm Water Pollution Prevention Plan) shall not relieve the Contractor from the Contractor's responsibilities, as provided in Section 7, "Legal Relations and Responsibilities," of the Standard Specifications.

The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor or otherwise access the project site or the Contractor's records pertaining to water pollution control work.

5-3.02.3 SWPPP PLAN PREPARATION, APPROVAL AND AMENDMENTS

As part of the water pollution control work, a Storm Water Pollution Prevention Plan, hereafter referred to as the "SWPPP," is required for this contract. The SWPPP shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Manuals, the requirements of the Permits, and these special provisions. Upon the Engineer's approval of the SWPPP, the SWPPP shall be considered to fulfill the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications for development and submittal of a Water Pollution Control Program.

No work having potential to cause water pollution, as determined by the Engineer, shall be performed until the SWPPP has been approved by the Engineer.

The Contractor shall designate a Water Pollution Control Manager. The Water Pollution Control Manager shall be responsible for the preparation of the SWPPP and any required modifications or amendments and shall be responsible for the implementation and adequate functioning of the various water pollution control practices employed. The Water Pollution Control Manager shall serve as the primary contact for all issues related to the SWPPP or its implementation. The Contractor shall submit to the Engineer a statement of qualifications, describing the training, previous work history and expertise of the individual selected by the Contractor to serve

as Water Pollution Control Manager. The Engineer will reject the Contractor's submission of a Water Pollution Control Manager if the submitted qualifications are deemed to be inadequate.

Within 15 days after the approval of the contract, the Contractor shall submit three (3) copies of the draft SWPPP to the Engineer. The Engineer will have 10 days to review the SWPPP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the SWPPP within 10 days of receipt of the Engineer's comments. The Engineer will have 7 days to review the revisions. Upon the Engineer's approval of the SWPPPfour (4) copies of the SWPPP, incorporating the required changes, shall be submitted to the Engineer. In order to allow construction activities to proceed, the Engineer may conditionally approve the SWPPP while minor revisions are being completed. .From time to time the Lahanton Regional Water Qualtiy Control Board by make a site inspection and review the field copy of the SWPPP and require revisions. The Contractor shall make such revisions and incorporte changes neccessoary to compy fully with the General Permit.

The SWPPP shall apply to all areas that are directly related to construction including, but not limited to, staging areas, storage yards, material borrow areas, and access roads within or outside of the highway right-of-way. The SWPPP shall incorporate water pollution control practices in the following six categories:

A. Soil stabilization;
B. Sediment control;
C. Wind erosion control;
D. Tracking control;
E. Non-storm water control; and
F. Waste management and material pollution control.

The Contractor shall develop a Water Pollution Control Schedule that shall describe the timing of grading or other work activities that could affect water pollution. The Water Pollution Control Schedule shall be updated by the Contractor to reflect any changes in the Contractor's operations that would affect the necessary implementation of water pollution control practices.

The Contractor shall incorporate the "Minimum Requirements" presented in the Preparation Manual into the SWPPP. In addition to the "Minimum Requirements" presented in the Preparation Manual, the Contractor shall complete the BMP Consideration Checklist presented in the Preparation Manual. The Contractor shall identify and incorporate into the SWPPP the water pollution control practices selected by the Contractor or as directed by the Engineer.

The SWPPP shall include, but not be limited to, the items described in the Manuals, Permits and related information contained in the contract documents. In addition the SWPPP shall include a copy of the following:

- ☐ Notification of Construction and agreement regarding proposed activities subject to California Fish and Game Code Section 1601, US Army Corps 404, and LRWQCB 401 permits.

The Contractor shall prepare an amendment to the SWPPP when there is a change in construction activities or operations which may affect the discharge of pollutants to surface waters, ground waters, municipal storm drain systems, or when the Contractor's activities or operations violate any condition of the Permits, or when directed by the Engineer. Amendments shall show additional water pollution control practices or revised operations, including those areas or operations not shown in the initially approved SWPPP. Amendments to the SWPPP shall be prepared, and submitted for review and approval in the same manner as specified for the SWPPP approval. Subsequent amendments shall be submitted within a time approved by the Engineer, but in no case longer than the time specified for the initial submittal and review of the SWPPP.

The Contractor shall keep one copy of the approved SWPPP and approved amendments at the project site. The SWPPP shall be made available upon request of a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency or the local storm water management agency. Requests by the public shall be directed to the Engineer.

5-3.02.4 COST BREAK-DOWN

The Contractor shall submit to the Engineer a cost break-down for the contract lump sum item of water pollution control, together with the SWPPP.

The cost break-down shall be completed and furnished in the format shown in the example of the cost break-down included in this section. Unit descriptions and quantities shall be designated by the Contractor, except for the specified special requirements shown in the example. The units and quantities given in the example, if provided, are special requirements specified for the SWPPP, and shall be included in the cost break-down furnished to the Engineer. The Contractor shall verify the estimated quantities of the special requirements and submit revised quantities in the cost break-down.

The Contractor shall determine the quantities required to complete the work of water pollution control. The quantities and their values shall be included in the cost break-down submitted to the Engineer for approval. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break-down submitted for approval. The cost break-down shall not include water pollution control practices which are shown on the plans and for which there is a separate contract item.

The sum of the amounts for the units of work listed in the cost break-down shall be equal to the contract lump sum price bid for water pollution control. Overhead and profit shall be included in each individual unit listed in the cost break-down. The cost break-down shall be submitted and approved within the same times specified for the SWPPP. Partial payment for the item of water pollution control will not be made until the cost break-down is approved, in writing, by the Engineer.

No adjustment in compensation will be made in the contract lump sum price paid for water pollution control due to differences between the quantities shown in the approved cost break-down and the quantities required to complete the work as shown on the approved SWPPP. No adjustment in compensation will be made for ordered changes to correct SWPPP work resulting from the Contractor's own operations or from the Contractor's negligence.

The plan shall also inlcude winterizaiton for winter suspensions if any are planned for the project.

The approved cost break-down will be used to determine partial payments during the progress of the work and as the basis for calculating the adjustment in compensation for the item of water pollution control due to increases or decreases of quantities ordered by the Engineer.

If requested by the Contractor and approved by the Engineer, changes to the water pollution control practices listed in the approved cost break-down, including the addition of new water pollution control practices, will be allowed. The changes shall be included in an approved amendment to the SWPPP.

WATER POLLUTION CONTROL COST BREAK-DOWN

Contract No. _____

UNIT DESCRIPTION	UNIT	APPROXIMATE QUANTITY	VALUE	AMOUNT

TOTAL _____

5-3.02.5 SWPPP IMPLEMENTATION

Upon approval of the SWPPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, removing and disposing of the water pollution control practices included in the SWPPP and any amendments. Unless otherwise directed by the Engineer, the Contractor's responsibility for SWPPP implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. Requirements for installation, construction, inspection, maintenance, removal, and disposal of water pollution control practices are specified in the Manuals and these special provisions.

If the Contractor or the Engineer identifies a deficiency in any aspect of the implementation of the approved SWPPP or amendments, the deficiency shall be corrected immediately. The deficiency may be corrected at a later date and time if requested by the Contractor and approved by the Engineer in writing, but not later than the onset of precipitation. If the Contractor fails to correct the identified deficiency by the date agreed or prior to the onset of precipitation the project shall be in noncompliance. Attention is directed to Section 5-1.01, "Authority of the Engineer," of the Standard Specifications and the payment sections of these special provisions for possible noncompliance penalties.

If the Contractor fails to conform to the provisions of the SWPPP the Engineer may order the suspension of construction operations which create water pollution.

Implementation of water pollution control practices may vary by season. The Construction Site BMP Manual and these special provisions shall be followed for control practice selection of year round, rainy season and non-rainy season water pollution control practices.

Year-Round Implementation Requirements:

- ☐ The Contractor shall have a year-round program for implementing, inspecting and maintaining water pollution control practices for wind erosion control, tracking control, non-storm water control, and waste management and materials pollution control.
- ☐ The National Weather Service weather forecast shall be monitored and used by the Contractor on a daily basis. An alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted, the necessary water pollution control practices shall be deployed prior to the onset of the precipitation.
- ☐ Disturbed soil areas shall be considered active whenever the soil disturbing activities have occurred, continue to occur or will occur during the ensuing 21 days. Non-active areas shall be protected as prescribed in the Construction Site BMP Manual within 14 days of cessation of soil disturbing activities or prior to the onset of precipitation, whichever occurs first.
- ☐ In order to provide effective erosion control the Contractor may be directed to apply permanent erosion control in small or multiple units as disturbed soil areas are deemed substantially complete by the Engineer. Permanent ersion control will be paid at the contract unit price shown on the Bid Form.

Rainy Season Requirements:

- ☐ Soil stabilization and sediment control practices conforming to the requirements in the Special Requirements and applicable Preparation Manual Minimum Requirements, shall be provided throughout the rainy season, defined as between July 1 and April 15.
- ☐ An implementation schedule of required soil stabilization and sediment control practices for disturbed soil areas shall be completed not later than 20 days prior to the beginning of each rainy season. The implementation schedule shall identify the soil stabilization and sediment control practices to be implemented and the dates on which the implementation will be 25 percent, 50 percent and 100 percent complete, respectively. Construction activities beginning during the rainy season shall implement applicable soil stabilization and sediment control practices.
- ☐ Throughout the defined rainy season, the active disturbed soil area of the project site shall be not more than 2,000 feet of project length. The Engineer may approve, on a case-by-case basis, expansions of the active disturbed soil area limit. Soil stabilization and sediment control materials shall be maintained on site sufficient to protect the unprotected disturbed soil area. A detailed

plan for the mobilization of sufficient labor and equipment shall be maintained to deploy the water pollution control practices required to protect the project site prior to the onset of precipitation events.

Non-Rainy Season Requirements:

- The non-rainy season shall be defined as all days outside the defined rainy season. The contractor's attention is directed to the Construction Site BMP Manual for soil stabilization and sediment control implementation requirements on disturbed soil areas during the non-rainy season. Disturbed soil areas within the project shall be protected in conformance with the requirements in the Construction Site BMP Manual with an effective combination of soil stabilization and sediment control.

Project Winterization:

- During periods when the project is shut down for the winter due to snow and or freezing weather the project shall be winterized to protect all disturbed areas to protect against erosion for the winter season and the spring thaw and shall be part of the SWPPP. Materials may include but not be limited to covering all disturbed areas with jute, straw, or other materials. The plan shall consider the Town's snow removal operation and have no impact on removal of snow from streets and sidewalks or blocking drainage inlets.

5-3.02.6 MAINTENANCE

The contractor shall have sufficient materials on site so that the site can be protected for erosion and storm run-off sedimentation control within 24-hours of a possible thundershower or eminent winter storm.

To ensure the proper implementation and functioning of water pollution control practices, the Contractor shall regularly inspect and maintain the construction site for the water pollution control practices identified in the SWPPP. The construction site shall be inspected by the Contractor as follows:

- Prior to a forecast storm or thunder storms of 30% chance or more;
- After a precipitation event which causes site runoff;
- At 24 hour intervals during extended precipitation events;
- Routinely, a minimum of once every two weeks outside of the defined rainy season;
- Routinely, a minimum of once every week during the defined rainy season.

The Contractor shall use the Storm Water Quality Construction Site Inspection Checklist provided in the Preparation Manual or an alternative inspection checklist provided by the Engineer. One copy of each site inspection record shall be submitted to the Engineer within 24 hours of completing the inspection.

5-3.02.7 REPORTING REQUIREMENTS

Report of Discharges, Notices or Orders

If the Contractor identifies any discharge into receiving waters in a manner causing, or potentially causing, a condition of pollution, or if the project receives a written notice or order from any regulatory agency, the Contractor shall immediately inform the Engineer. The Contractor shall submit a written report to the Engineer within 7 days of the discharge event, notice, or order. The report shall include the following information:

- The date, time, location, nature of the operation, and type of discharge, including the cause or nature of the notice or order.
- The water pollution control practices deployed before the discharge event, or prior to receiving the notice or order.
- The date of deployment and type of water pollution control practices deployed after the discharge event, or after receiving the notice, or order, including additional measures installed or planned to reduce or prevent reoccurrence.

- ☐ An implementation and maintenance schedule for any affected water pollution control practices.

Report of First-Time Non-Storm Water Discharge:

The Contractor shall notify the Engineer at least 3 days in advance of each first-time non-storm water discharge event, excluding exempted discharges. The Contractor shall notify the Engineer of each different operation causing a non-storm water discharge and shall obtain field approval for each first-time non-storm water discharge. Non-storm water discharges shall be monitored at each first-time occurrence and routinely thereafter.

Annual Certifications:

By June 15 of each year, the Contractor shall complete and submit an Annual Construction Activity Certification as contained in the Preparation Manual to the Engineer.

5-3.02.8 MEASUREMENT AND PAYMENT

The contract lump sum price paid for "Prepare Storm Water Pollution Prevention Plan" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in developing, preparing, obtaining approval of, revising, and amending the SWPPP, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.
Attention is directed to Section 9-1.06, "Partial Payments," and Section 9-1.07, "Payment After Acceptance," of the Standard Specifications. Payments for "prepare storm water pollution prevention plan" will be made as follows:

A. After the SWPPP has been approved by the Engineer, 75 percent of the contract item price for "Prepare Storm Water Pollution Prevention Plan" will be included in the monthly partial payment estimate (from the lump sum breakdouwn provided); and
B. After acceptance of the contract in conformance with the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, payment for the remaining 25 percent of the contract item price for "Prepare Storm Water Pollution Prevention Plan" (from the lump sum breakdown provided) will be made in conformance with the provisions in Section 9-1.07.

The contract lump sum price paid for "Water Pollution Control" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing, constructing, removing, and disposing of water pollution control practices, including non-storm water and waste management and materials pollution water pollution control practices except those shown on the plans and for which there is a contract item of work, and excluding developing, preparing, obtaining approval of, revising, and amending the SWPPP as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for maintenance costs of water pollution control practices as specified in these special provisions, shall be considered as included in the contract lump sum price paid for "Water Pollution Control" and no additional compensation will be allowed therefor.
Those water pollution control practices which are shown on the approved SWPPP and for which there is a contract item of work will be measured and paid for as that contract item of work.

The Engineer will retain an amount equal to 25 percent of the estimated value of the contract work performed during estimate periods in which the Contractor fails to conform to the provisions of this section (Stormwater Pollution Prevention Plan), as determined by the Engineer. Retention for failure to conform to the provisions in this section shall be in addition to the other retention provided for in the contract. The amounts retained for failure of the Contractor to conform to the provisions in this section will be released for payment on the next monthly estimate for partial payment following the date that an approved SWPPP has been implemented and maintained, and water pollution is adequately controlled, as determined by the Engineer.

5-3.03 PROJECT SIGN

Before any major physical construction work readily visible to highway users is started on this contract, the Contractor shall furnish and erect a Construction Project Information sign at the location designated by the Engineer. The approximately 4'X8' sign shall be erected on two 4x4 posts at the limits of the project. The sign shall be painted with a white background and include the Contractor name and phone number, the Town name and logo, the Forest Service logo, the project name and funding sources with logo's if appropriate. The sign shall have 6 inch minimum letter size. A detail drawing of the sign shall be submitted for review and approval prior to fabrication.

The sign shall be kept clean and in good repair by the Contractor.

Full compensation for furnishing, erecting, maintaining, and removing and disposing of the construction project information sign shall be considered as included in the contract lump sum price paid for "Project Sign(s)" and no additional compensation will be allowed therefor.

5-3.04 UTILITY COORDINATION

Attention is directed to Section 8 of the CSS and the following for protection of existing utilities and coordination with new and/or revised service.

- The Contractor shall pot hole and locate utilities prior to any excavation for facilities and prior to submittal of shop drawings for this work.
- Caltrans, the Mammoth Community Water District, and the Town are not participating members of the regional underground alert service. Specific coordination with Caltrans and the Town are required prior to any excavation near their facilities.

5-3.04A ELECTRICAL - SCE

No new service for SCE will be installed as a part of this project. SCE may have facilities within the project boundaries.

5-3.04B Verizon

No new service for Verizon will be installed as a part of this project. Verizon may have facilities within the project boundaries.

5-3.04C CATV – CABLEVISION OF MAMMOTH

No new service will be installed as a part of this project. Cablevision of Mammoth does not have facilities that are within the project boundaries.

5-3.04D WATER SERVICE – MCWD

No new service will be installed as a part of this project. A section of water line will be relocated.

5-3.04E OTHER CONTRACTS COORDINATION

The Contractor shall coordinate and cooperate with all Town, FHWA, Caltrans, Turner Propane, and/or Forest Service contractors including but not limited to:

- o A Town contractor working on the Lake Mary Road Bike Path project.
- o A Town contractor working on the parking lot adjacent to Lake Mary Road at Twin Lakes.
- o A Forest Service contractor consultant developing the message and sign layout for the Interpretive sign boards
- o A Forest Service contractor working on Lake Mary Road Bike Path Completion Project.
- o Turner Propane contractor working at borrow pit on Sherwin Creek Road
- o Town of Mammoth Lakes road crew will be resurfacing Sherwin Creek Road

Full compensation for conforming to the requirements of this section shall be included in the various items of work on the Bid Form and no additional compensation will be made therefore.

SECTION 6. CONTROL OF MATERIALS

The following paragraphs shall be added to Subsection 6-1.01 of CSS:

6-1.01A GENERAL ONE YEAR GUARANTY

The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified. The owner will give notice of observed defects with reasonable promptness.

6-1.01B MATERIAL DELIVERY

The Contractor shall furnish load tickets for concrete, asphalt, base, sand, and any other material requested by the Engineer. Tickets shall show sufficient information as to material and quantity mix design, etc. Failure to provide tickets may result in a delay of progress payments to Contractor.

6-1.01C PAYMENT

Full compensation for conforming to the requirements of this Section shall be considered incidental and included in the various other work items and no additional compensation will be made therefore.

6-3.02 TESTING BY CONTRACTOR

Subsection 6-3.02 “Testing by Contractor” is deleted in its entirety and replaced with the following subsection.

6-3.02A Contractor’s Quality Control Program

The Contractor shall establish, provide, and maintain an effective Quality Control Program that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications, and other requirements, whether manufactured by the contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified herein and elsewhere in the contract specifications, the contractor shall assume full responsibility for accomplishing the stated purpose.

The contractor shall establish a necessary level of control that will:

a) Adequately provide for the production of acceptable quality materials.

b) Ensure the proper delivery and placement of materials, including compaction.
c) Confirm that existing soil conditions discovered during grading and earthwork operations are consistant with those assumed for the design.
d) Provide sufficient information to assure both the contractor and the Engineer that the specification requirements are met.

The contractor shall be prepared to discuss and present, at the preconstruction conference, his understanding of the quality control requirements and his plan for complying with this section. The contractor shall not begin any construction or production of materials to be incorporated into the completed work until the Quality Control Program has been reviewed and approved by the Engineer.

6-3.02B Description of Program

The Quality Control Program shall ensure conformance to applicable specifications and plans with respect to materials, workmanship, construction, finish, and functional performance. This Quality Control Program shall be effective for control of all construction work performed under this contract and shall specifically include surveillance and tests required by the specifications and any other activities deemed necessary by the contractor to establish an effective level of quality control.

The contractor shall describe the Quality Control Program in a written document that shall be submitted to the Engineer for review. The Quality Control Program shall be organized to address, at a minimum, the following items:

a) Quality control organization
b) Project progress schedule
c) Submittals schedule
d) Inspection requirements
e) Quality control testing plan
f) Documentation of quality control activities, and
g) Requirements for corrective action when quality control and/or acceptance criteria are not met.

The contractor may add any additional elements to the Quality Control Program that he/she deems necessary to adequately control all production processes required to complete the contract work.

6-3.02C Town of Mammoth Lakes Quality Assurance Program

The contractor's Quality Control Program shall meet the minimum requirements of the Town of Mammoth Lakes current Quality Assurance Program (QAP), a copy of which is included in the Appendix.

The Town of Mammoth Lakes QAP references the Caltrans Quality Assurance Program (QAP). The Caltrans QAP is available on the Caltrans web site at:

http://www.dot.ca.gov/hq/LocalPrograms/public/QAP%20Manual.pdf

The Engineer or his designee will observe work completed that requires compaction and will "probe" the areas for acceptance testing. The Contractor may provide a private consultant Materials Laboratory to perform Acceptance Testing on this project, in compliance with the Town of Mammoth Lakes QAP if desired or there is dispute as to the soil probe method the Engineer will employ.

The Engineer will conduct independent quality assurance testing at his discretion. The contractor shall cooperate as necessary to facilitate independent quality assurance testing, i.e. split samples, access to testing facilities, provision of certifications of technicians and lab equipment, etc.

6-3.02D MEASUREMENT AND PAYMENT

The work required for full compliance with this section is considered incidental and no additional payment shall be made therefore and the work included the unit or lump seal price of the items on the bid form sum price paid for "Prepare Quality Control Program" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in developing, preparing, obtaining approval of, revising, and amending the Quality Control Program, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

6-3.02E NONCOMPLIANCE

In cases where quality control activities do not comply with either the Contractor Quality Control Program or the contract provisions, or where the contractor fails to properly operate and maintain an effective Quality Control Program, as determined by the Engineer, the Engineer may:

- Order the contractor to replace ineffective or unqualified quality control personnel or subcontractors.
- Order the contractor to stop work until appropriate corrective actions are taken.

SECTION 7. LEGAL RELATIONS AND RESPONSIBILITIES

7-1.04 PERMITS AND LICENSES

Subsection 7-1.04 is amended with the addition of the following paragraphs:

7-1.04A BUSINESS LICENSE AND TAX CERTIFICATE

The successful bidder shall be required to obtain or show proof of a current Business License and Business Certificate from the Town of Mammoth Lakes prior to award of the contract. Failure to obtain the Tax Certificate within ten (10) days after the award of the Contract will be grounds for termination of the Contract and Notice to Proceed will not be issued.

7-1.04B UNITED STATES FOREST SERVICE FIRE PLAN AND PERMIT

A Fire Plan is included in the appendix. The contractor shall comply with all aspects of this plan and supply information as required to the Forest Service. This plan sets forth conditions under which contract activities will be curtailed or shut down.

7-1.04C OTHER PERMITS

1. Contractor shall comply with all provisions of the Town's Noise Ordinance, Ordinance No. 87-19.

2. Contractor shall comply with all provisions of Great Basin Air Quality Control Board requirements regarding all of the Contractor's activities.
3. Contractor shall comply with the State Water Quality Control Board general construction permit although a NOI is not required.

Any fines resulting from failure to comply with these permits shall be born by the contractor.

Full compensation for conforming to the requirements in these permits, including the cost of the permit (other than those listed) shall be considered as included in the contract prices paid for in the various items of work listed on the Bid Form and no additional compensation will be allowed therefore.

7-1.08 PUBLIC CONVENIENCE

Subsection 7-1.08 of the CSS is deleted in its entirety and replaced with the following:

7-1.08A PUBLIC CONVENIENCE

The Contractor's operations shall cause no unnecessary inconvenience. The rights of the public shall be considered at all times. Unless otherwise authorized, traffic shall be permitted to pass through the work, or an approved detour shall be provided.

Safe and adequate pedestrian and vehicular access shall be provided and maintained to: fire hydrants, commercial and industrial establishments, churches, schools, parking lots, service stations, motels, hospitals, residences, and establishments of similar nature. Access to these facilities shall be continuous and unobstructed unless otherwise approved by the Engineer.

Safe and adequate pedestrian zones and public transportation stops, as well as pedestrian crossings of the work at intervals not exceeding 300 feet, shall be maintained unless otherwise approved by the Engineer.

Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods of time. If backfill has been completed to the extent that safe access may be provided, and the street is reopened to local traffic, the Contractor shall immediately clear the street, driveways, and provide and maintain access.

The Contractor shall cooperate with the various parties involved in the delivery of mail and collection and disposal of trash and garbage to maintain existing schedules for these services.

The Contractor in a manner to provide a reasonably satisfactory surface for traffic shall conduct grading operations, roadway excavation, and fill construction. When rough grading is completed, the roadbed surface shall be brought to a smooth, even condition satisfactory for traffic.

Unless otherwise authorized, work shall be performed in only one-half (1/2) the roadway at a time. One-half (1/2) shall be kept open and unobstructed until the opposite side is ready for use. If one-half (1/2) of a street only is being improved, the other half shall be conditioned and maintained as a detour.

The Contractor shall include in its Bid all costs for the above and requirements in the various items of work.

7-1.08B STORAGE OF EQUIPMENT AND MATERIALS IN PUBLIC STREETS

Construction materials shall not be stored in streets, roads, or highways for more than five (5) days after unloading. All materials or equipment not installed or used in construction within five (5) days after unloading shall be stored elsewhere by the Contractor at its expense unless authorized additional storage time.

Construction equipment shall not be stored at the work site before its actual use on the work nor for more than five (5) days after it is no longer needed. Time necessary for repair or assembly of equipment may be authorized by the Engineer.

Excavated material, except that which is to be used as backfill in the adjacent trench, shall not be stored in public streets unless otherwise permitted. After placing backfill, all excess material shall be removed immediately from the site.

7-1.08C STREET CLOSURE, DETOURS, BARRICADES

The Contractor shall comply with all applicable State, County, and Town requirements for closure of streets. The Contractor shall provide barriers, guards, lights, signs, temporary bridges, flag-persons, and watch-persons. The Contractor shall be responsible for compliance with additional public safety requirements that may arise. The Contractor shall furnish and install signs and warning devices and promptly remove them upon completion of the work.

At least 48-hours in advance of closing, partially closing, or reopening any street, alley, or other public thoroughfare, the Contractor shall notify the Police, Fire, and Engineer and comply with their requirements. The Engineer must first approve deviations in writing.

The Contractor shall secure approval, in advance, from authorities concerned for the use of any bridges proposed by it for public use. Temporary bridges shall be clearly posted as to load limit, with signs and posting conforming to current requirements set forth in Traffic Manual published by California Department of Transportation covering "signs." This manual shall also apply to the street closures, barricades, detours, lights, and other safety devices required.

NOTE: Attention is directed to LIQUIDATED DAMAGES in Section 8-1.12.3, “Failure to Keep Traffic Lanes/Access Open and Liquidated Damages”, for unauthorized lane closures and detours.

7-1.09 PUBLIC SAFETY

The Contractor shall provide for the safety of traffic and the public in conformance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications and these special provisions.

The Contractor shall install temporary railing (Type K) between a lane open to public traffic and an excavation, obstacle, or storage area when the following conditions exist:

A. Excavations**.—**the near edge of the excavation is 3.6 m or less from the edge of the lane, except:

1. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
2. Excavations less than 0.3-m deep.
3. Trenches less than 0.3-m wide for irrigation pipe or electrical conduit, or excavations less than 0.3-m in diameter.
4. Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
5. Excavations in side slopes, where the slope is steeper than 1:4 (vertical: horizontal).

6. Excavations protected by existing barrier or railing.

B. Temporarily Unprotected Permanent Obstacles**.—**The work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or the Contractor, for the Contractor's convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.

C. Storage Areas.—Material or equipment is stored within 3.6 m of the lane and the storage is not otherwise prohibited by the provisions of the Standard Specifications and these special provisions.

The approach end of temporary railing (Type K), installed in conformance with the provisions in this section "Public Safety" and in Section 7-1.09, "Public Safety," of the Standard Specifications, shall be offset a minimum of 4.6 m from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than 0.3-m transversely to 3 m longitudinally with respect to the edge of the traffic lane. If the 4.6-m minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Temporary railing (Type K) shall conform to the provisions in Section 12-3.08, "Temporary Railing (Type K)," of the Standard Specifications. Temporary railing (Type K), conforming to the details shown on 1999 Standard Plan T3, may be used. Temporary railing (Type K) fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

Temporary crash cushion modules shall conform to the provisions in "Temporary Crash Cushion Module" of these special provisions.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the following work areas, the Contractor shall close the adjacent traffic lane unless otherwise provided in the Standard Specifications and these special provisions:

Approach Speed of Public Traffic (Posted Limit)	Work Areas
Over 45 Miles Per Hour	Within 6 feet of a traffic lane but not on a traffic lane
35 to 45 Miles Per Hour or less	Within 3 feet of a traffic lane but not on a traffic lane

The lane closure provisions of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 3 m without written approval from the Engineer.

When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians.

Full compensation for conforming to the provisions in this section "Public Safety," including furnishing and installing temporary railing (Type K) and temporary crash cushion modules, shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

7-1.12 INDEMNIFICATION AND INSURANCE

Subsection 7-1.12, Responsibility for Damage, of the CSS is modified by the following subsections.

7-1.12A GENERAL

Contractor shall procure and maintain for the duration of the contract the following minimum insurance coverage and limits against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work covered by this agreement by the Contractor, his agents, representatives, employees or subcontractors:

COVERAGE PER OCCURRENCE	ISO FORM	
Commercial General Liability (Primary)	CG 00 01 11 85 or 88 Rev.	$1,000,000
Umbrella Liability (Over Primary, if required)	GL 00 01 11 85 or 88 Rev.	$1,000,000
Business Auto	CA 00 01 06 92	$1,000,000
Workers' Compensation/ Employers' Liability		Statutory $1,000,000

Contractor shall provide endorsements or other proof of coverage for contractual liability.

Combined single limit per occurrence shall include coverage for bodily injury, personal injury, and property damage for each accident and a **$2 million general aggregate**.

Liability coverage shall not be limited to the vicarious liability or supervising role of any additional insured. Coverage shall contain no contractors' limitation endorsements and there shall be no endorsement or modification limiting the scope of coverage for liability arising from pollution, explosion, collapse, underground property damage, or employment related practices.

Any umbrella liability coverage shall apply to bodily injury/property damage, personal injury/advertising injury, at a minimum, and shall include a "drop down" provision providing primary coverage above a maximum $25,000 self-insured retention for liability not covered by primary policies not covered by the umbrella policy. Coverage shall be following form to any other underlying coverage. Coverage shall be on a "pay on behalf" basis, with defense costs payable in addition to policy limits. There shall be no cross policy exclusion and no contractor limitation endorsement. The policy shall have starting and ending dates concurrent with the underlying coverage.

Liability policies shall contain, or be endorsed to contain the following provisions:

GENERAL LIABILITY AND AUTOMOBILE LIABILITY:

The Forest Service and the Town of Mammoth Lakes, and their consultants, and each of their directors, officers, officials, employees, and volunteers shall be covered as additional insureds using ISO form CG 20 10 11 85 as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor; or automobiles owned, leased, hired, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope or protection afforded to the Forest Service and the Town of Mammoth Lakes, and their consultants, and each of their directors, officers, officials, employees, or volunteers.

The Contractor's insurance coverage shall be primary insurance with respect to the TOWN, and their consultants, and each of their directors, officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the Town of Mammoth Lakes, and their consultants, and each of their directors, officers, officials, employees, and volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the Forest Service and the Town of Mammoth Lakes, and their consultants, and each of their directors, officers, officials, employees, and volunteers.

The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY:

Each insurance policy required by this subsection shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after fifteen (15) days written notice by certified mail, return receipt requested, has been given to:

Director of Public Works
TOWN OF MAMMOTH LAKES
POST OFFICE BOX 1609
Mammoth Lakes, CA 93546

All liability insurance shall be on an occurrence basis. Insurance on a claims made basis will be rejected. Any deductibles or self-insured retentions shall be declared to and approved by Town of Mammoth Lakes. The insurer shall provide an endorsement to TOWN eliminating such deductibles or self-insured retentions as respects the Town of Mammoth Lakes, and their consultants, and each of their directors, officials, employees, and volunteers.

Contractor shall furnish to Town of Mammoth Lakes certificates of insurance and endorsements on forms specified by the Town of Mammoth Lakes, duly authenticated, giving evidence of the insurance coverage required in this contract and other evidence of coverage or copies of policies as may be reasonably required by Town of Mammoth Lakes from time to time. Insurance shall be placed with insurers with a Best's Rating of no less than A:VII.

All subcontractors employed on the work referred to in this contract shall meet the insurance requirements set forth for Contractor. Contractor shall furnish certificates of insurance and endorsements for each subcontractor at least five (5) days prior to the subcontractor entering the job site, or Contractor shall furnish Town of Mammoth Lakes an endorsement including all subcontractors as insureds under its policies.

The Forest Service or the Town of Mammoth Lakes shall not be liable for any accident, loss, or damage to the work prior to its completion and acceptance, except as provided in Subsection 7-1.12, except as provided in Subsection 7-1.12, the Contractor shall save, keep, and hold harmless the Forest Service and the Town of Mammoth Lakes, and their consultants, and each of their directors, officers, officials, employees, agents, and volunteers from all damages, costs, or expenses in law or equity that may at any time arise or be claimed because of damages to property or personal injury received by reason of or in the course of performing work, which may be caused by any willful or negligent act or omission by the Contractor or any of the Contractor's employees or any subcontractor.

The cost of such insurance shall be included in the various items of work in the Contractor's bid and no additional compensation for purchasing insurance or additional coverage needed to meet these requirements will be allowed.

In the event that any required insurance is reduced in coverage, canceled for any reason, voided or suspended, Contractor agrees that Forest Service and/or Town of Mammoth Lakes may arrange for insurance coverage as specified, and Contractor further agrees that administrative and premium costs may be deducted from payments due to the Contractor. A reduction or cancellation will be grounds for termination of this Agreement and will cause a halt to all work on the job until the insurance is reestablished.

7-1.12B RESPONSIBILITY FOR DAMAGE

In addition to the provisions of Subsection 7-1.12A of the CSS as between the Forest Service, Town of Mammoth Lakes and Contractor, Contractor shall take and assume all responsibility for the work as stated herein and/or shown on the plans.

The Contractor shall bear all losses and damages directly or indirectly resulting to him, to the Forest Service, Town of Mammoth Lakes, and their consultants, and each of their directors, officers, employees, and agents, or to others on account of the performance or character of the work, unforeseen difficulties, accidents, or any other causes whatsoever.

The Contractor shall assume the defense of and indemnify and save harmless the Forest Service, Town of Mammoth Lakes, and their consultants, and each of their directors, officers, employees, and agents, from and against any and all claims, losses, damage, expenses, and liability of every kind, nature, and description, directly or indirectly arising from the performance of the contract or work, regardless of responsibility for negligence, and from any and all claims, losses, damage, expenses, and liability, howsoever the same may be caused, resulting directly, or indirectly from the nature of the work covered by the contract, regardless of responsibility for negligence, to the fullest extent permitted by law. In accordance with Civil Code section 2782, nothing in this Subsection 7-1.12 and the Standard Specifications shall require defense or indemnification for death, bodily injury, injury to property, or any other loss, damage, or expense arising from the sole negligence or willful misconduct of the Town, and their consultants, and each of their directors, agents, servants, or independent contractors who are directly responsible to the Town, or for defects in design furnished by such persons. Moreover, nothing in this Subsection 7-1.12 or CSS shall apply to impose on the Contractor, or to relieve the Forest Service, Town of Mammoth Lakes from, liability for active negligence of the Forest Service, Town of Mammoth Lakes or their consultants.

The Forest Service, Town of Mammoth Lakes does not, and shall not, waive any rights against the Contractor which it may have by reason of the aforesaid hold harmless agreements because of the acceptance by the Forest Service, Town of Mammoth Lakes, or deposit with Forest Service, Town of Mammoth Lakes by Contractor, of any insurance policies hereinafter described in Subsection 7-1.12 and the Standard Specifications. The aforesaid hold harmless agreement by Contractor shall apply to all damages and claims for damages of every kind suffered, or alleged to have been suffered, by reasons of any of the aforesaid operations of Contractor, or any subcontractor, regardless of whether or not such insurance policies are determined to be applicable to any of such damages or claims for damages.

No act by the Forest Service, Town of Mammoth Lakes, or its representatives in processing or accepting any plans, in releasing any bond, in inspecting or accepting any work, or of any other nature, shall in any respect relieve the Contractor or anyone else from any legal responsibility, obligation, or liability he might otherwise have.

7-1.13 DISPOSAL OF MATERIAL OUTSIDE THE HIGHWAY RIGHT-OF-WAY

Excess soil shall be delivered to the Forest Service borrow pit on Sherwin Creek Road. A specific written agreement from the local Forest Service office must be obtained by the contractor prior to any use of this soil storage area. The agreement shall detail provisions for use and clean up of the site at the conclusion of the contract. The agreement shall comply with all provisions of Section 7-1.13

7-1.19 RIGHT-OF-WAY

The following subsections are added to Subsection 7-1.19 of the CSS.

7-1.19A ADDITIONAL WORK AREAS AND FACILITIES

When the Contractor arranges for additional temporary work areas and facilities, the Contractor shall provide the Town with proof that the additional work areas and/or facilities have been left in a condition satisfactory to the owner(s) of said work areas and/or facilities prior to acceptance of the work.

7-1.19B CONTRACTOR STAGING AREAS

There are no additional staging areas exclusively identified for this project. Locations, limits of areas, and access to staging areas arranged for by the contractor shall be coordinated with the Engineer. The Contractor shall be responsible for all security, including but not limited to, theft and vandalism.

The existing borrow pit at Horseshoe Lake or the old borrow pit off Sherwin Creek Road may be available for storage of materials and equipment. Arrangements for the use of this site must be made with the Forest Service. Additionally, this site must be shared with the Town contractor working on the Lake Mary Road Bike Path project.

The Contractor may also use up to 600 - 700 sf of space at the Town Corporate Yard on Commerce Drive, Mammoth Creek Park East, 600 sf of space in the Town use permit area, 600 – 700 sf along south Lake Mary Road between Hidden Valley Road and Davison Road. Construction fencing shall be used control public access at all of these sites. These sites will be shared with other contractors and or Town crews.

7-1.19C ACCESS CORRIDOR VIOLATION LIQUIDATED DAMAGE PENALTIES

While constructing signage, the contractor's work area is restricted to the width of the path plus 4 feet on either side. If the Contractor transgress the boundaries of the work area or uses an access corridor that has not been approved, the Town will require the Contractor to restore the area to its original condition and/or pay to the Town a liquidated damage penalty fee of $500 for the first transgression, a $750 penalty for the second transgression, and a $1,000 for any additional transgression. Repeated violations of this Section may result in the termination of the contract.

SECTION 8. PROSECUTION AND PROGRESS

SECTION 8-1.03 BEGINNING OF WORK, TIME OF COMPLETION, AND LIQUIDATED DAMAGES

Attention is directed to the provisions in Section 8-1.03, "Beginning of Work," in Section 8-1.06, "Time of Completion," and in Section 8-1.07, "Liquidated Damages," of the Standard Specifications and these special provisions.

The Contractor shall begin work within fifteen (10) calendar days after the date of the Notice to Proceed, and shall diligently prosecute said work to completion before the expiration of

220-CALANDER DAYS

beginning on the date of the Notice to Proceed.

If pertinent to this contract the plant establishment period will begin at the completion of all planting and may extend beyond the 220-calander day construction contract. Maintenance prior to project acceptance and all plants being planted will be considered incidental and included in other work items.

The Contractor shall pay to the Town the sum of **$250 per day**, for each and every calendar day delay in finishing the work in excess of the number of days prescribed above.

PRE-CONSTRUCTION CONFERENCE: Prior to the issuance of the Notice to Proceed, a pre-construction conference will be held at the Town Office for the purpose of discussing with the Contractor the scope of work, contract drawings, specifications, existing conditions, materials to be ordered, equipment to be used, and all essential matters pertaining to the prosecution of and the satisfactory completion of the project as required. The Contractor's representative at this conference shall include all major superintendents for the work and include subcontractors.

ARCHAEOLOGICAL DISCOVERIES: All articles of archaeological interest, which may be uncovered by the Contractor during the progress of the work, shall be reported immediately to the Engineer. The further operations of the Contractor with respect to the find will be decided under the direction of the Engineer. The Contractor may be required to suspend operations in the location of the discovery and work on other areas of the project. No compensation for the delay will be paid if there is no impact to the project schedule and operations in the opinion of the Engineer.

8-1.12 WORK DAYS AND HOURS

The following subsections are added to the CSS:

8-1.12.1 WORK DAYS AND HOURS

Work hours for the project may be conducted between the hours of 7:00 AM to 8:00 PM Monday through Saturday with the following exception:

- Work hours for the section of bike path in the vicinity of Tamarack Lodge, STA 12+00 to STA 25+00 shall be restricted to 8:00 AM to 6:00 PM Monday through Friday.

Work in other hours or on Sundays and holidays must be approved in advance by the Engineer.

8-1.12.2 SPECIAL EVENTS

No work shall be performed on this contract during the periods listed below:

1. Friday 2:00 PM May 28, 2010 through Monday May 31, 20010; (Memorial Day weekend)
2. Thursday July 1, 2010 through Monday July 5, 2010; (4^{th} of July weekend)
3. Saturday July 24, 2010 after noon (Firemen's Canoe Races @ Horseshoe Lake)
4. Friday September 3, 2010 through Monday September 6, 2010 (Labor Day weekend)

Similar events will be conducted during the construction season of 2011. If the performance period of this contract extends into 2011, the Contractor will be provided a list of scheduled events for the 2011 year, which will prohibit street closures and activities that may disrupt the flow of traffic and visitors.

8-1.12.3 FAILURE TO KEEP TRAFFIC LANES OPEN AND LIQUIDATED DAMAGES

If traffic lanes are not kept open for public use on the days, at the times, and in the manner specified in the Special Provisions of the Specifications, damage will be sustained by the Town and its residents. Since it is and will be impracticable to determine the actual damage which the Town and its residents will sustain by reason of Contractor's failure to comply with the provisions of the Special Provisions of the Specifications, Town and Contractor agree that Contractor will

pay to Town the sum of **$200 per hour** for each and every hour that any traffic lane is not kept open for public use as required by the Special Provisions of the Specifications, not as a penalty, but as predetermined liquidated damages. The Contractor agrees to pay such liquidated damages as are provided for in this paragraph, and in case the same are not paid, Contractor agrees that Town may deduct the amount of such liquidated damages from any money that is due or that may be due the Contractor under the contract.

8-1.12.4 LEGAL HOLIDAYS

Legal Holidays include the following:

- Memorial Day
- Fourth of July
- Labor Day
- Veterans Day
- Thanksgiving
- Day after Thanksgiving
- Christmas
- New Years
- Martin Luther King, Jr. Day
- President's Day

SECTION 9. MEASUREMENT AND PAYMENT

9-1.015 FINAL PAY QUANTITIES

The following paragraph is added to subsection 9-1.015 of the CSS:

Payment for any items on the plans for which there is no specific bid item shall be included in the various items of work or in any item to which it is appurtenant.

It is mutually agreed between the parties to the Contract that progress payments made under the Contract are not evidence as to the performance of the Contract wholly or in part, by the Contractor. Progress payments shall not be construed be an acceptance of any defective work or materials.

9-2 MEASUREMENT OF QUANTITIES

Subsection 9-2, MEASUREMENT OF QUANTITIES, is added to Section 9 of the CSS:

9-2.1 MEASUREMENT OF QUANTITIES

9-2.1.1 FINAL PAY QUANTITIES

For each individual item listed in the Schedule of Items, payment shall be full compensation for all work related to the particular item in accordance with these specifications, as shown on the drawings, and as staked in the field.
Measurement and payment for contract work shall be made only for and under those pay items included in the SCHEDULE OF ITEMS. All other work and materials shall be considered incidental or as included in the payment for items shown.

9-2.1.2 DETERMINATION OF QUANTITIES

The contractor shall perform, or cause to be performed, all measurement of quantities of materials incorporated into the work processes that are to be measured under the provisions of the contract. All measurements shall be conducted under the direction of a representative of the Contracting Officer, unless the Contracting Officer waives this requirement in a specific instance.

QUANTITY MEASUREMENTS

- The Contractor shall make all measurements for computation of quantities for all work items except those specified for payment by Lump Sum (LS).
- The contractor shall compute the quantities for periodic progress payments; the Contracting Officer shall compute the quantities for the final payment based on measurements taken by the Contractor.
- All Contractor measurements are subject to verification.
- The Contractor shall submit all field notes, calculation sheets, and other data used to determine quantities.
- The Contractor shall certify in writing as to the accuracy of the measurements and computations submitted.
- Contractor shall use an acceptable format for measurement records. As a minimum, include the following in all records of measurement:
    - Project name and Contract number;
    - Contract item number from the SCHEDULE OF ITEMS;
    - Date the work was performed;
    - Location of the work;
    - Measured quantity;
    - Calculations made to arrive at the quantity;
    - Supporting sketch and details needed to clearly define the work performed and the quantity measured;
    - Names of persons measuring the work;
    - Identification as to whether the measurement is interim or final; and
    - Signed certification statement by the persons taking the measurements, performing the calculations, and submitting them for payment that the measurement and calculations are correct to the best of their knowledge and that the quantity being measured is subject to direct payment for the identified item under the contract.

The following measurements and calculations are used to determine contract quantities.

- For individual construction items, longitudinal and lateral measurements for area computations shall be made horizontally or corrected to horizontal measurement unless otherwise specified. Measurements for geotextile materials, hydroseeding, netting and erosion control blankets shall be along slope lines.
- The average end area method shall be used to compute volumes of excavation or embankment. However, if in the judgment of the Contracting Officer, the average end area method is impractical, measurement shall be made by volume in hauling vehicles or by other three dimensional methods.
- Structures shall be measured according to neat lines shown on the drawings or as altered by the Contracting Officer, in writing, to fit field conditions.
- For items that are measured by the linear foot, such as pipe culverts, measurements shall be made parallel to the base or foundation upon which the structures are placed. Pipes shall be measured along center of invert.
- For aggregates weighed for payment, the tonnage shall not be adjusted for moisture content, unless otherwise provided for.
- For standard manufactured items--such as fence, wire, plates, rolled shapes, pipe conduits--identified by gauge, weight, section dimensions, and so forth, such identifications shall be considered the nominal weights or dimensions. Unless controlled by tolerances in cited specifications, manufacturer's tolerances shall be accepted.

UNITS OF MEASUREMENT

Payment shall be by units defined and determined according to U.S. Standard measure and by the following:

- Cubic Yard (CY). A measurement computed by one of the following methods:
- Excavation, Embankment, or Borrow. The measurement computed by the average end area method from measurements made longitudinally along a centerline or reference line.
- Material in Place or Stockpile. The measurement computed using the dimensions of the in-place material.
- Material in the Delivery Vehicle. The measurement computed using measurements of material in the hauling vehicles at the point of delivery. Vehicles shall be loaded to at least their water level capacity. Leveling of the loads may be required when vehicles arrive at the delivery point.
- Each (EA). One complete unit, which may consist of one or more parts.
- Linear Foot (LF). Linear feet measured horizontally.
- Square Foot (SF). Measure on a plane parallel to the surface being measured.
- Square Yard (SY). 9 square feet. Longitudinal and transverse measurements for area computations shall be made horizontally.
- Acre (ACRE). 43560 square feet. Longitudinal and transverse measurements for area computations shall be made horizontally.
- Ton (TON). Short ton consisting of 2,000 pounds avoirdupois. Use permanently installed and certified commercial scales.
- Lump Sum (LS). One complete unit, which may consist of one or more parts.

METHODS OF MEASUREMENT

- Designed Quantities (DQ). These quantities denote the final number of units to be paid for under the terms of the Contract. They are based on the original design data available prior to advertising the project. Original design data include the preliminary survey information, design assumptions, calculations, drawings, and the presentation in the Contract. Changes in the number of units shown in the SCHEDULE OF ITEMS may be authorized under any of the following conditions:
  - As a result of changes in the Work authorized by the Contracting Officer.
  - As a result of the Contracting Officer determining that errors exist in the original design that cause a pay item quantity to change by 15 percent or more.
  - As a result of the Contractor submitting to the Contracting Officer a written request showing evidence of errors in the original design that cause a pay item quantity to change 15 percent or more. The evidence must be verifiable and consist of calculations, drawings, or other data that show how the designed quantity is believed to be in error.
- Staked Quantities (SQ). These quantities are determined from stakes quantities prior to construction.
- Actual Quantities (AQ). These quantities are determined from measurements of completed Work.
- Lump Sum (LS). These quantities denote one complete unit of work as required or described in the Contract, including necessary materials, equipment, and labor to complete the Work. They will not be measured.

  Items for which quantities are indicated as "Lump Sum," "L.S.," or "Job," shall be paid for at the price indicated in the Proposal. Such payment shall be full compensation for all costs for labor, equipment, materials, and plants necessary to furnish, construct, and install the lump sum item of work, complete, in place, and for all necessary appurtenant work, including, but not limited to, all necessary cutting, patching, repair, and modification of existing facilities and clean up of site.

Contractor shall furnish three (3) copies of a detailed schedule, which breaks down the lump sum work into its component parts and cost for each part, in a form and sufficiently detailed as to satisfy Engineer that it correctly represents a reasonable apportionment of the lump sum. This schedule is subject to approval by Engineer as to both the components into which the lump sum item is broken down, and the proportion of cost attributable to each component.

This schedule shall be the basis for progress payments for the lump sum work.

SECTION 10. MISCELLANEOUS, DUST CONTROL, AND CONSTRUCTION DETAILS

10-2 CLEANUP AND DUST CONTROL

Subsection 10-2, Cleanup and Dust Control is added to the specification.

10-2.01 GENERAL

Perform dust control operations to prevent construction operations from producing dust in amounts harmful to persons or causing a nuisance to persons living nearby or occupying buildings in the vicinity of the work sites. Use sweeping and water to control dust. Dust control shall be at the expense of the Contractor.

10-2.02 WATERING

Water for the laying of dust caused by Contractor's operations or the passage of traffic through the work shall be applied as necessary or as directed by the Engineer. Water for the above or other purposes may be obtained from any approved source. The Contractor may obtain a construction meter from MCWD and make application and payments thereto.

10-2.03 DIVERSION AND CONTROL OF WATER

This section covers the diversion and control of all water entering into the construction area or otherwise affecting construction activities.

All permanent construction shall be performed in a site free from water unless otherwise provided for in the Special Provisions. The Contractor shall construct, maintain, and operate all necessary cofferdams, pumps, channels, flumes, drains and/or other temporary diversion, and protective works required for diversion and control of all water, whatever its source, including groundwater encountered during trench excavation during construction.

Inundation of partially completed work due to lack of control during non-working periods will not be permitted and may be cause for requiring removal of work already completed with replacement at the Contractor's expense.

It shall be understood and agreed that the Contractor shall hold the Town harmless for legal action taken by any third party with respect to construction and operations of the diversion and protective work.

All work installed by the Contractor in connection with the watering, control, and diversion of water, but not specified to become a permanent part of the project, shall be removed and the site restored, insofar as practical, to its original condition prior to completion of construction or when directed by the Engineer.

Payment for this work will be considered to be included in the payments made for the other items of contract work in which water control is incidental.

10-2.04 CLEANING DURING CONSTRUCTION AND FINAL CLEANUP

At all times maintain areas covered by the Contract and adjacent properties and public access roads free from accumulations of waste, debris, and rubbish caused by construction operations.

Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

Do not burn or bury rubbish and waste materials on project site. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner in storm or sanitary drains. Do not dispose of wastes into streams or waterways.

During execution of work, clean project sites, adjacent properties, and public access roads and dispose of waste materials, debris, and rubbish to assure that buildings, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.

Provide containers for collection and disposal of waste materials, debris, and rubbish.

Cover or wet loads of excavated material leaving the site or of material being imported to prevent blowing dust. Clean the public access roads to the site of any material falling from the haul trucks.

At the completion of work and immediately prior to final inspection, clean the entire project as follows:

- Repair and/or replace any damaged improvements restoring them to their original condition.
- Clean, sweep, wash, and polish all work and equipment including finishes.
- Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces; polish surfaces so designated.
- Repair, patch, and touch up marred surfaces to specified finish to match adjacent surfaces.
- Broom clean paved surfaces; rake clean other surfaces of grounds.
- Remove from the property temporary structures and all materials, equipment, and appurtenances not required as a part of or appurtenant to, the completed work.
- In addition to trash and debris left by Contractor, the Contractor shall clean up and dispose of all existing debris along the path within ten (10) feet of all disturbed areas.

10-2.05 MEASUREMENT AND PAYMENT

Measurement and payment for work in this section shall be considered incidental and included in the payments made for the various other items of contract work and no additional payments will be made therefore.

SECTION 11. MOBILIZATION

The following paragraphs replace subsection 11-1.01 and 11-1.02 of the CSS:

11-1.01 SCOPE OF WORK

Mobilization shall consist of preparatory work and operations including, but not limited to, that necessary for the movement of personnel, equipment, supplies, and videotaping, specific shop

drawing submittals, and incidentals to the project site. Mobilization shall additionally include the establishment of any temporary facilities and the submittal of a detailed construction schedule.

In addition, mobilization shall include the initial submittals required in subsection 5-1.02 of these special provisions.

Any other costs of work in advance of construction operations and not directly attributable to any specific bid item shall be included in the item mobilization.

11-1.02 MEASUREMENT AND PAYMENT

Measurement and payment for mobilization shall be at the lump sum price bid. Mobilization shall be split into equal payments for each summer construction season that is anticipated in the contractor's schedule. All items involved in the initial season mobilization must be complete to receive any compensation.

The lump sum price bid for mobilization shall include all labor, materials, tools, and incidentals required to complete mobilization in accordance with the contract documents.

SECTION 12. TRAFFIC CONTROL

12-1 GENERAL REQUIREMENTS

All work required for maintaining and controlling traffic during the construction period shall conform to the applicable provisions of the CSS and these modifications herein. All such work shall additionally conform to national standards as contained in the Manual of Uniform Traffic Control Devices (MUTCD), to the "Traffic Manual" issued by the State of California, Department of Transportation (Caltrans), and the "Work Area Traffic Control Handbook," published by Building News, Inc.

All signs and devices remain the property and responsibility of the Contractor except as specifically noted herein.

The Contractor shall prepare and submit to the Engineer for approval a traffic control and detour plan as required by the CSS and these Special Provisions. The Engineer will coordinate reviews by Caltrans, the Police, and Fire Department. Work which interferes with the use of traveled roadways or roadway shoulders shall not be initiated or performed until a plan submitted by the contractor for satisfactory handling of traffic has been approved by the Engineer.

All construction work and traffic control shall be scheduled and constructed to provide for a minimum of inconvenience and a maximum of safety to the public vehicular and pedestrian traffic.

The Contractor shall be responsible for the protection of vehicular and pedestrian traffic until the work called for in the Plans, the Standard Specifications, and these Special Provisions has been accepted by the Engineer.

The Contractor shall notify the Engineer of intent to begin work at least five (5) working days before work is to begin. The Contractor shall cooperate with the Engineer relative to handling traffic through the area and shall make all arrangements relative to keeping the working area clear of parked vehicles.

Contractor's equipment and personal vehicles of the Contractor's employees shall not be parked on the traveled way or on any section where traffic is restricted at any time.

During any period when two-way traffic is not provided, the Contractor shall employ flaggers to control traffic through the construction zone.

Trenches shall be covered at the end of each working day.

The Contractor shall notify the Engineer of any operation that will affect two-way flow of traffic in excess of five (5) minutes for every half hour of working time, at least two (2) working days in advance of such operation.

12-2 CONSTRUCTION SIGNING

Barricades and warning devices shall be provided by the Contractor to delineate the edge of transversable road and shall conform to the State of California, Department of Transportation "Traffic Manual," Chapter 5, hereinafter referred to as the Traffic Manual. Barricades shall be installed around all open traffic areas when no work is in progress.

Advance warning signs must be provided with orange warning flags in advance of temporary stop signs. Temporary stop signs are required any time a traffic signal is dark. Temporary stop signs shall be mounted seven (7) feet high.

The Contractor shall post standard "NO STOPPING" construction zone signs 48-hours prior to construction, not more than 50-feet apart within the work area, showing the date and time of construction.

Hazards, incidental to the work, within or on the traveled way, shoulders, or turnouts shall be marked with hazard identification, illuminated beacons and other MUTCD devices to safely guide users through the area. Traffic devices shall be kept current with the work operation and removed upon its completion. Advisory speed plates may be used to control traffic through the work area.

12-3 EQUIPMENT IN THE TRAVELED WAY

All vehicles and machinery operating on or from the traveled way or road shoulder shall have flashing lights or rotary beacons operated continuously while work is in progress. All equipment shall be equipped with a standard slow-moving vehicle emblem. Truck headlights shall be on while operating. Backup horns shall be required on all self-propelled equipment in excess of 8,000 pounds vehicular weight.

Vehicles and machinery not currently used in the work operation shall be parked off the traveled way at approved locations to minimize interference with the normal use of the road.

12-4 ACCESS

Provisions for pedestrian and bicycle use of the surrounding Forest Service lands adjacent to the work site shall be maintained at all times.

Access to street intersections, public and private parking lots, commercial businesses, residences, and other public and private properties must be maintained at all times. At least 72-hours in advance of starting any work that may affect the access to private properties, the Contractor shall provide written notice to such property owners. Vehicular access to and from commercial and residential driveways and parking lots shall be maintained at all times, except when performing items of work that cannot be accomplished without access restriction.

When access must be restricted, as determined by the Engineer, it shall occur only for the time period required to accomplish the particular item of work.

12-5 RESTRICTIONS ON CLOSURE OF TRAFFIC LANES

A. All traffic lanes shall be open for public use on the days and at the time specified below:

- Saturdays, Sundays, and legal holidays, or special events: from 12:01 a.m. to 11:59 p.m.
- Fridays and any day preceding a legal holidays or special events: from 2:30 p.m. to 11:59 p.m.
- All days not covered in 1 and 2 above: 7:00 a.m. to 7:30 a.m. and 6:00 p.m. to 8:00 p.m.
- Non-construction hours: all hours when the Contractor's employees are not physically present at the construction site actively performing contract work.

B. Lane closures on Lake Mary Road over a weekend will only be approved on a case by case basis and in no event on through a holiday period or special event weekend

C. Requests for lane closure shall be submitted for approval to the Engineer a minimum of two (2) weeks prior to the closure dates. The Engineer will review the plan with other local agencies including Police and Fire. A traffic detour plan signed by the Contractor and detail signs by type.

D. On those days and hours when closure of traffic lanes is not prohibited under the provisions of Section 8-1.12.2, "Special Events", or the preceding subparagraph A and B, no more than one (1) lane may be closed at any time during construction hours. During any lane closure on public streets, type-II flashing arrow boards shall be used in accordance with the Caltrans Traffic Manual.

12-6 TEMPORARY GUIDE MARKERS

Temporary guide markers shall be either portable delineators or fluorescent traffic cones and shall conform to these Special Provisions. Only one (1) type of temporary guide marker shall be used at any one time.

Temporary guide markers shall be placed at all locations shown on the traffic control plans and at such locations as directed by the Engineer.

Temporary guide markers shall be left in place at their designated locations; maintained, repaired, and replaced as required until the Engineer approves their removal.

If the temporary guide markers are damaged, or are not in an upright position, for any reason, said markers shall immediately be replaced, or restored to their original locations in an upright position, by the Contractor, 24-hours per day, 7-days per week for as long as required by the Town.

12-7 PORTABLE DELINEATORS

Portable delineators shall conform to Section 12-3.04 of the State Standard Specifications.

The portable delineators shall be spaced as necessary for proper delineation; however, in no case shall the spacing between portable delineators exceed 25-feet on tangents or 10-feet on curves.

12-8 FLUORESCENT TRAFFIC CONES

Fluorescent traffic cones shall be new or reconditioned, and of good commercial quality flexible material suitable for the purpose intended. The outer section of the portion above the base of the cone shall be a highly pigmented fluorescent orange polyvinyl compound. The overall height of the cone shall be at least 28-inches. The base shall be of sufficient weight and size or shall be anchored in a manner such that the traffic cone will remain in an upright position.

The fluorescent traffic cones shall be spaced as necessary for proper delineation; however, in no case shall the spacing between fluorescent traffic cones exceed 25-feet on tangents or 10-feet on curves.

12-9 STRIPING

Whenever the Contractor's operations obliterate pavement delineation (lane lines, either pavement markers or painted lane lines or both), such pavement delineation shall be replaced by either permanent or temporary delineation before opening the traveled way to public traffic. Temporary delineation shall consist of reflective traffic line tape applied in pieces not less than 10 cm long nor less than 10 cm wide spaced no more than 3.7 meters apart on curves nor more than 7.5 meters apart on tangents. Reflective traffic line tape shall be applied in accordance with the manufacturer's instructions. Temporary delineation shall be the same color as the permanent delineation. of work that obliterated the existing delineation and no separate payment will be made therefor.

Temporary striping and marking for traffic control shall conform to Subsection 84 of the CSS, except that flexible, reflective Temporary Raised Pavement Markers (TRPM), as manufactured by Davidson Plastics Company, or approved equal, may be used in lieu of paint or pavement tape. Any striping and marking which has no further use shall be removed by wet sandblasting, and all sand used in sandblasting shall be removed without delay as the sandblasting operation progresses. All sandblasted asphalt pavement shall be sealed with an asphalt emulsion.

12-10 MEASUREMENT AND PAYMENT FOR TRAFFIC CONTROL

Measurement and payment for traffic control will be made at the contract lump sum price for “Traffic Control” except as noted below. All payment provisions in Section 12 of the CSS are deleted. Said price will be prorated by the Engineer throughout the duration of the project.

The above contract price shall include full compensation for designing a traffic control plan and furnishing all labor, materials, tools, equipment, transportation, and incidentals for traffic control, in accordance with the Contract Documents except as noted below.

END OF SECTION

DEPARTMENT OF AGRICULTURE
INYO NATIONAL FOREST

MAMMOTH LAKES SIGNAGE AND WAYFINDING PROJECT

PART II
SPECIAL PROVISIONS
(FEDERAL REQUIREMENTS)

CMI05-03T and CMI05-05T Non-Motor/Non-Winlderness Trails
Requisition No. 371379

March 2010

SECTION 14. FEDERAL REQUIREMENTS FOR FEDERAL-AID CONSTRUCTION PROJECTS

GENERAL.—The work herein proposed will be financed in whole or in part with Federal funds, and therefore all of the statutes, rules and regulations promulgated by the Federal Government and applicable to work financed in whole or in part with Federal funds will apply to such work. The "Required Contract Provisions, Federal-Aid Construction Contracts, "Form FHWA 1273, are included in this Section 14. Whenever in said required contract provisions references are made to "SHA contracting officer", "SHA resident engineer", or "authorized representative of the SHA", such references shall be construed to mean "Engineer" as defined in Section 1-1.18 of the Standard Specifications.

PERFORMANCE OF PREVIOUS CONTRACT.—In addition to the provisions in Section II, "Nondiscrimination," and Section VII, "Subletting or Assigning the Contract," of the required contract provisions, the Contractor shall comply with the following:

The bidder shall execute the CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS located in the proposal. No request for subletting or assigning any portion of the contract in excess of $10,000 will be considered under the provisions of Section VII of the required contract provisions unless such request is accompanied by the CERTIFICATION referred to above, executed by the proposed subcontractor.

NON-COLLUSION PROVISION.—The provisions in this section are applicable to all contracts except contracts for Federal Aid Secondary projects.

Title 23, United States Code, Section 112, requires as a condition precedent to approval by the Federal Highway Administrator of the contract for this work that each bidder file a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the submitted bid. A form to make the non-collusion affidavit statement required by Section 112 as a certification under penalty of perjury rather than as a sworn statement as permitted by 28, USC, Sec. 1746, is included in the proposal.

PARTICIPATION BY MINORITY BUSINESS ENTERPRISES IN SUBCONTRACTING.—Part 26, Title 49, Code of Federal Regulations applies to this Federal-aid project. Pertinent sections of said Code are incorporated in part or in its entirety within other sections of these special provisions.

Schedule B—Information for Determining Joint Venture Eligibility

(This form need not be filled in if all joint venture firms are minority owned.)

1. Name of joint venture _____

_____

2. Address of joint venture _____

_____

3. Phone number of joint venture _____

_____

4. Identify the firms which comprise the joint venture. (The MBE partner must complete Schedule A.) _____

_____

a. Describe the role of the MBE firm in the joint venture.

_____

_____

b. Describe very briefly the experience and business qualifications of each non-MBE joint venturer: _____

_____

5. Nature of the joint venture's business _____

_____

6. Provide a copy of the joint venture agreement.

7. What is the claimed percentage of MBE ownership? __

_____

8. Ownership of joint venture: (This need not be filled in if described in the joint venture agreement, provided by question 6.).

a. Profit and loss sharing.
b. Capital contributions, including equipment.
c. Other applicable ownership interests.

9. Control of and participation in this contract. Identify by name, race, sex, and "firm" those individuals (and their titles) who are responsible for day-to-day management and policy decision making, including, but not limited to, those with prime responsibility for:

a. Financial decisions _____

_____

b. Management decisions, such as:

1. Estimating _____

_____

2. Marketing and sales _____

_____

3. Hiring and firing of management personnel ___

_____

4. Purchasing of major items or supplies _____

_____

c. Supervision of field operations_____

_____

Note.—If, after filing this Schedule B and before the completion of the joint venture's work on the contract covered by this regulation, there is any significant change in the information submitted, the joint venture must inform the grantee, either directly or through the prime contractor if the joint venture is a subcontractor.

Affidavit

"The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operation of our joint venture and the intended participation by each joint venturer in the undertaking. Further, the undersigned covenant and agree to provide to grantee current, complete and accurate information regarding actual joint venture work and the payment therefor and any proposed changes in any of the joint venture arrangements and to permit the audit and examination of the books, records and files of the joint venture, or those of each joint venturer relevant to the joint venture, by authorized representatives of the grantee or the Federal funding agency. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statements."

.....	.....
Name of Firm	Name of Firm
.....	.....
Signature	Signature
.....	.....
Name	Name
.....	.....
Title	Title
.....	.....
Date	Date

Date _____

State of _____

County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____, to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

Date _____

State of _____

County of _____

On this ___ day of _____, 19 __, before me appeared (Name) _____ to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

(Exclusive of Appalachian Contracts)

ATTACHMENTS

A. Employment Preference for Appalachian Contracts (included in Appalachian contracts only)

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. **Selection of Labor:** During the performance of this contract, the contractor shall not:

a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or

b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.

b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively

administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 26, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

GENERAL.—The work herein proposed will be financed in whole or in part with Federal funds, and therefore all of the

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of $10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3)] issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c) the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

statutes, rules and regulations promulgated by the Federal Government and applicable to work financed in whole or

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) the additional classification is utilized in the area by the construction industry;

(3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit

as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

a. Apprentices:

(1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

(1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially repossible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;

(3) that each laborer or mechanic has been paid not less that the applicable wage rate and fringe benefits or cash equivalent for the classification of worked performed, as specified in the applicable wage determination incorporated into the contract.

e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than $1,000,000 (23 CFR 635) the contractor shall:

a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.

b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).

a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

18 U.S.C. 1020 reads as follows:

"Whoever being an officer, agent, or employee of the United States, or any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more that $10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub. L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub. L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.

3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized

for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion—Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of $25,000 or more - 49 CFR 29)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract,

grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

FEDERAL-AID FEMALE AND MINORITY GOALS

In accordance with Section II, "Nondiscrimination," of "Required Contract Provisions Federal-aid Construction Contracts" the following are the goals for female utilization:

Goal for Women (applies nationwide).....(percent)	6.9

The following are goals for minority utilization:

CALIFORNIA ECONOMIC AREA

	Goal (Percent)
174 Redding, CA:	
Non-SMSA Counties ..... CA Lassen; CA Modoc; CA Plumas; CA Shasta; CA Siskiyou; CA Tehama.	6.8
175 Eureka, CA:	
Non-SMSA Counties . ..... CA Del Norte; CA Humboldt; CA Trinity.	6.6
176 San Francisco-Oakland-San Jose, CA:	
SMSA Counties:	
7120 Salinas-Seaside-Monterey, CA.... ..... CA Monterey.	28.9
7360 San Francisco-Oakland, CA..... CA Alameda; CA Contra Costa; CA Marin; CA San Francisco; CA San Mateo.	25.6
7400 San Jose, CA ..... CA Santa Clara.	19.6
7485 Santa Cruz, CA. ..... CA Santa Cruz.	14.9
7500 Santa Rosa, CA ..... CA Sonoma.	9.1
8720 Vallejo-Fairfield- Napa, CA ..... CA Napa; CA Solano	17.1
Non-SMSA Counties ..... CA Lake; CA Mendocino; CA San Benito.	23.2
177 Sacramento, CA:	
SMSA Counties:	
6920 Sacramento, CA..... CA Placer; CA Sacramento; CA Yolo.	16.1
Non-SMSA Counties. ..... CA Butte; CA Colusa; CA El Dorado; CA Glenn; CA Nevada; CA Sierra; CA Sutter; CA Yuba.	14.3
178 Stockton-Modesto, CA:	
SMSA Counties:	
5170 Modesto, CA..... CA Stanislaus.	12.3
8120 Stockton, CA..... CA San Joaquin.	24.3
Non-SMSA Counties ..... CA Alpine; CA Amador; CA Calaveras; CA Mariposa; CA Merced; CA Tuolumne.	19.8
179 Fresno-Bakersfield, CA:	
SMSA Counties:	
0680 Bakersfield, CA ..... CA Kern.	19.1
2840 Fresno, CA ..... CA Fresno.	26.1
Non-SMSA Counties ..... CA Kings; CA Madera; CA Tulare.	23.6
180 Los Angeles, CA:	
SMSA Counties:	
0360 Anaheim-Santa Ana-Garden Grove, CA. ..... CA Orange.	11.9
4480 Los Angeles-Long Beach, CA ..... CA Los Angeles.	28.3
6000 Oxnard-Simi Valley-Ventura, CA ..... CA Ventura.	21.5

6780 Riverside-San Bernardino-
Ontario, CA. 19.0
CA Riverside;
CA San Bernardino.
7480 Santa Barbara-Santa Maria-
Lompoc, CA 19.7
CA Santa Barbara.
Non-SMSA Counties 24.6
CA Inyo; CA Mono;
CA San Luis Obispo.

181 San Diego, CA:

SMSA Counties
7320 San Diego, CA. 16.9
CA San Diego.
Non-SMSA Counties 18.2
CA Imperial.

In addition to the reporting requirements set forth elsewhere in this contract the Contractor and subcontractors holding subcontracts, not including material suppliers, of $10,000 or more, shall submit for every month of July during which work is performed, employment data as contained under Form FHWA PR-1391 (Appendix C to 23 CFR, Part 230), and in accordance with the instructions included thereo.

FEDERAL REQUIREMENT TRAINING SPECIAL PROVISION. --

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training to develop full journeymen in the types of trades or job classification involved.

The goal for the number of trainees or apprentices to be trained under the requirements of this special provision will be _____.

In the event the Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees or apprentices are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of trainees or apprentices in each occupation shall be in their first year of apprenticeship or training.

The number of trainees or apprentices shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing work, the Contractor shall submit to the Department for approval the number of trainees or apprentices to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee or apprentice employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees or apprentices as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority and women trainees or apprentices (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees or apprentices) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee or apprentice in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by both the Department and the Federal Highway Administration. The Department and the Federal Highway Administration will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee or apprentice for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with the State of California, Department of Industrial Relations, Division of Apprenticeship Standards recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some

offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training. Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein..

This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees or apprentices are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or apprentice or pays the trainee's or apprentice's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee or apprentice as a journeyman, is caused by the

Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee or apprentice will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees or apprentices be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees or apprentices specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Only trainees or apprentices registered in a program approved by the State of California's State Administrator of Apprenticeship may be employed on thhe project and said trainees or apprentices shall be paid the standard wage specified under the regulations of the craft or trade at which they are employed.

The Contractor shall furnish the trainee or apprentice a copy of the program he will follow in providing the training. The Contractor shall provide each trainee or apprentice with a certification showing the type and length of training satisfactorily completed.The Contractor will provide for the

The Contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision

DEPARTMENT OF AGRICULTURE
INYO NATIONAL FOREST

MAMMOTH LAKES SIGNAGE AND WAYFINDING PROJECT

PART III
TECHNICAL PROVISIONS

CMI05-03T abd CMI05-05T Non-Motor/Non-Wilderness Trails
Requisition No. 371379

March 2010

Part 3 Technical Provisions

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SECTION 15 - EXISTING HIGHWAY FACILITIES

1) EXISTING HIGHWAY FACILITIES – The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities", of the Standard Specifications and these Special Provisions.

2) RELOCATE EXISTING SIGNS – Signs removed during construction shall be salvaged by the Contractor and relocated or if not to be relocated they shall be salvaged and placed at the Town yard, if directed by the Engineer. Existing roadside signs shall be removed and relocated at new locations as shown on the plans. Each relocated roadside sign shall be installed at the new location on the same day said sign is removed from its original location, unless otherwise directed by Engineer. Each multipost sign or single post sign with one or more sign panels mounted on the post shall be considered a single unit.

   Full compensation for furnishing all labor, materials, tools and equipment for the storing and the relocation of existing roadside and walkway signs, complete in place, including but not limited to replacement of the post, foundation, or hardware, if required, will be considered as included in the contract unit price for “Signs - Relocate Existing Signs” and no additional compensation will be allowed therefore.

3) REMOVALS – This section includes the removal of all items necessary to construct the improvements whether shown on the plans to be removed or not. The Contractor shall coordinate with the Town of Mammoth Lakes Public Works Department for salvage of any materials specified to be salvaged. Materials shall be salvaged at the Engineer’s request. All conflicting existing improvements shall be removed from site and disposed of in a manner acceptable to the Town.

   a) REMOVE AND DISPOSE OF EXISTING FACILITIES **-** Removal and disposal of facilities include, but are not limited to, existing signs in conflict with new signs. The existing facilities to be removed shall be removed leaving a neat clean edge adjacent to the end of the remaining existing facilities, which are to remain. The Contractor shall dispose of the removed facilities and the removal area shall be left clean and free of concrete and other debris.

      Full compensation for furnishing all labor, materials, tools, equipment, incidentals and for doing all the work involved for the saw cutting and removal of facilities, including but not limited to removal, cleanup and disposal will be considered as included in the item contract price for clearing and grubbing or “Remove and Dispose or Relocate Existing Facilities Per Plan” and no additional compensation will be allowed therefore.

   b) SAW CUT EXISTING ASPHALT AND PCC - All existing asphalt concrete pavement and PCC sidewalk, curb and gutter, and other existing improvements to be removed shall be saw cut to full depth and removed leaving a straight, neat clean edge. Where a portion of existing surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw to full depth prior to removing the surfacing.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in saw cutting and removal of existing asphalt concrete, PCC, and other existing improvements to be removed will be considered as included in the contract price paid per linear foot "Sawcut" and "Remove and dispose of existing facilities" and no additional compensation will be allowed therefore.

SECTION 16 - CLEARING AND GRUBBING

1) CLEARING AND GRUBBING - Clearing and grubbing shall be per Section 16 of the Standard Specification and these Special Provisions.

   Clearing and preparations operations shall be confined to the limits of construction shown on the plans and completed in a manner acceptable to the Town. Clearing and grubbing includes, but is not limited to, removal of trees and objectionable materials within the project limits as required to construct the improvements. All unsuitable and surplus material shall become the property of the Contractor and shall be removed from the project site by the Contractor. The Contractor shall clear and grub all trees, stumps, brush, boulders, rocks, vegetation and roots and/or other objectionable material as directed by the Engineer.

   Pavement removal is included as part of this contract and shall be disposed of outside the Town Limits in an appropriate dump site. Edges of pavement to be widened shall be sawcut to form a straight edge and shall be into good pavement as determined by the Engineer.

2) TREE PROTECTION: Not Applicable.
3) TREE REMOVAL - Not applicable.
4) WETLAND AREAS - To avoid excessive disturbance of wetlands the Contractor shall coordinate with the Engineer to determine the limits of clearing and grubbing in the wetland areas shown or not shown on the plans. The wetland areas to be left undisturbed will be fenced as directed by the Engineer prior to construction.

5) TOPSOIL AND ORGANIC MATERIAL - The Contractor shall remove all topsoil and organic material within the bike path and sign improvements width. Topsoil may be used as backfill if it is suitable for that purpose or retained and placed and compacted on fill slopes or parkways for landscaping. All excess high organic material shall be disposed of off-site at an approved location.

6) MEASUREMENT AND PAYMENT - Measurement and payment for clearing and grubbing work including furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in the removal of asphalt concrete, sheeting and shoring, trees, removal of bushes, removal of shrubs, removal of boulders and rocks, removal of other objectionable materials including the disposal of all resulting materials necessary to construct the new facilities shall be incidental to the work and no additional compensation will be allowed therefore.

SECTION 17 - WATERING

1) WATERING – Watering shall be per Section 17 of the Standard Specifications and these Special Provisions.

2) SOURCE – The contractor shall not use any of the creeks or lakes as a source for this project unless approved by the USFS. Water for use in the work may be from a potable source with a permit from MCWD. The contractor shall pay all fees associated with the construction permit and meter.

3) MEASUREMENT AND PAYMENT – Measurement and payment of Watering shall be considered incidental to the various other items of work and no additional payment will be made therefore.

SECTION 19 - EARTHWORK

1) EARTHWORK - Earthwork shall be per Section 19 of the Standard Specification and these Special Provisions. The Contractor shall thoroughly inspect the site and shall satisfy himself as to the conditions to be encountered. No extra payment will be made for unusable material, nor for import of fill material.

2) GEOTECHNICAL GUIDELINES – Guidelines for Earthwork and Subgrade Preparation per Sierra Geotechnical Services, Inc, dated May 2007 are included in this section. If updated geotechnical report/guidelines are available, most recent information will take precedence over the information listed. Where plans, technical specifications and geotechnical report/guidelines conflict, geotechnical information shall take precedence first, technical specifications shall take precedence second, followed by the plans.

Earthwork and Grading

These earthwork and grading specifications are for the grading and earthwork shown on the approved grading or construction plan(s) and/or indicated in the geotechnical report(s). Earthwork and grading should be conducted in accordance with applicable grading ordinances, the current California Building Code, and the recommendations of this report. The following recommendations are provided regarding specific aspects of the proposed earthwork construction. These recommendations should be considered subject to revision based on field conditions observed by the Engineer or designee during grading.

Engineer or designee

Prior to commencement of work, the owner will employ a Engineer or designee. The Engineer or designee shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of grading or construction.

During grading and earthwork operations, the Engineer or designee shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Engineer or designee

shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the owner. Subsurface areas to be observed, mapped, elevations recorded, and/or tested include natural ground, after it has been cleared for receiving fill but before fill has been placed, bottoms of all “remedial removal areas, all key bottoms, and benches made on sloping ground to receive fill.

The Engineer or designee shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to determine the attained level of compaction. The Engineer or designee shall provide the observation results to the owner and the contractor on a routine and frequent basis.

The Contractor

The Contractor shall be solely responsible for performing the grading in accordance with the plans and specifications. The Contractor shall review and accept the plans, geotechnical report(s) and these Specifications prior to the commencement of grading. The Earthwork Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Engineer or designee unsatisfactory conditions, such as unstable soil, improper moisture condition, inadequate compaction, adverse weather, etc… are resulting in a quality of work less than required in these Specifications, the Engineer or designee shall reject the work and may recommend to the Engineer/owner that construction be stopped until the conditions are rectified.

Site Preparation

General: Site preparation includes removal of deleterious materials, unsuitable materials, and existing improvements from areas where new improvements or new fills are planned. Deleterious materials, which include vegetation, trash, and debris, should be removed from the site and legally disposed of off-site. Unsuitable materials include loose or disturbed soils, undocumented fills, contaminated soils, or other unsuitable materials. The Engineer or designee shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1-percent of organic materials (by volume). Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant etc…) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fine and/or imprisonment and shall not be allowed.

Any existing subsurface utilities that are to be abandoned should be removed and the trenches backfilled and compacted. If necessary, abandoned pipelines may be filled with grout or slurry cement as recommended by, and under the observation of, the Engineer or designee.

Excavation

The excavation is un-classified. Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Engineer or designee during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Engineer or designee based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Engineer or designee prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Engineer or designee.

In addition to removals and over-excavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured, or otherwise unsuitable ground shall be over-excavated to competent ground as evaluated by the Engineer or designee during grading.

All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Engineer or designee as suitable to receive fill. The Contractor shall obtain a written acceptance from the Engineer or designee prior to fill placement. The contractor shall maintain the grading survey control so the Engineer or designee may determine elevations of processed areas, keys, and benches.

Compaction

The onsite soils are suitable for placement as compacted fill provided the organics, oversized rock (greater than 6-inches in diameter) and deleterious materials are removed. Rocks greater than 6-inches and less than 2-feet in diameter can be placed in the bottom of deeper fills or approved areas provided they are selectively placed in such a manner that no large voids are created. All rocks shall be placed a minimum of 3-feet below finish grade elevation unless used for landscaping purposes or retaining walls. Any import soils shall be tested for suitability in advance by the Engineer.

After making the recommended removals and prior to fill placement, the exposed ground surface should be scarified to a depth of approximately 12-inches, moisture conditioned as necessary, and compacted to at least 90-percent of the maximum dry density obtained using ASTM D1557-2000 as a guideline. Surfaces on which fill is to be placed which are steeper than 5:1 (Horizontal to vertical) shall be benched so that the fill placement occurs on relatively level ground, four feet horizontal and 2 feet vertical.

For the areas to receive pavement and other improvements, a one-foot removal is recommended depending on site conditions (i.e. depth of root zone, and depth of disturbance which may have locally deeper removal depths). The removal bottom

should be observed (tested as needed) by the Engineer or designee prior to placing fill soils. The upper 12-inches of subgrade material along with the Class II Aggregate Base and the Asphaltic concrete shall be compacted to a minimum of 95-percent of the materials maximum dry density as determined by ASTM D1557-2000. The subgrade and aggregate base shall be moisture-conditioned and compacted to 95-percent of the material's maximum dry density as determined by ASTM D-1557-2000 to a depth of 12-inches.

All fill and backfill to be placed in association with the proposed construction should be accomplished slightly over optimum moisture content using equipment that is capable of producing a uniformly compacted product throughout the entire fill lift. Fill materials at less than optimum moisture should have water added and the fill mixed to result in material that is uniformly above optimum moisture content. Fill materials that are too wet can be aerated by blading or other satisfactory methods until the moisture content is as required. The wet soils may be mixed with drier materials in order to achieve an acceptable moisture content.

The fill and backfill should be placed in horizontal lifts at a thickness appropriate for equipment spreading, mixing, and compacting the material, but generally should not exceed eight inches in thickness.

No fill soils shall be placed during unfavorable weather conditions. When work is interrupted by rains, freezing temperatures, or snow, fill operations shall not be resumed until the field tests by the engineer indicate that the moisture content and density of the fill are as previously specified.

Acceptance will be based on observations by the engineer or designee generally through course of work observation and probing unless compaction is disputed due to the small quantities of earthwork on this project

Slopes

All slopes shall be compacted in a single continuous operation upon completion of grading by means of sheepsfoot or other suitable equipment, or all loose soils remaining on the slopes shall be trimmed back until a firm compacted surface is exposed. Slope compaction tests shall be made within one foot of slope surface.

Cut and fill slopes shall be a maximum of 2:1 (horizontal to vertical) unless approved by the Engineer or designee.

Planting and irrigation of cut and fill slopes and/or installation of erosion control and drainage devices should be completed immediately after completion of the cut or fill due to the erosion potential of the soil.

Temporary Excavations

Temporary excavation shall be made no steeper than 1:1 (horizontal to vertical). The recommended slope for temporary excavations does not preclude local raveling and sloughing. Where wet soils are exposed, flatter excavation of slopes

and dewatering may be necessary. In areas of insufficient space for slope cuts, or where soils with little or no binder are encountered, shoring shall be used.

All large rocks exposed above temporary cuts shall be removed prior to foundation excavation. In addition, any rocks exposed during development from raveling and sloughing should be removed immediately.

All excavations should comply with the requirements of the California Construction and General Industry Safety Orders and the Occupational Safety and Health Act and other public agencies having jurisdiction.

3) SURPLUS MATERIAL - The Contractor shall dispose of surplus material in accordance with Subsection 19-2.06, "Surplus Material," of the Standard Specifications. Surplus material, which cannot be utilized onsite within the limits of improvement, shall become the property of the Contractor and the Contractor shall remove it from the Work site. Stockpiling locations and durations must be approved in writing by the Engineer prior to the stockpiling of any material at the site. Excavated materials not used in embankments shall be disposed of in accordance with these special provisions and the provisions of Section 7-1.13, "Disposal of Material Outside the Highway Right-of-Way" of the Standard Specifications. The obtaining of any necessary permission for new borrow sources or for exceeding limitations on previously cleared sources shall be the responsibility of the Contractor. Material may also be taken to the Long Valley Mineral Material site with the prevailing fees paid by the contractor.

   The Forest Service has indicated dirt and top soil from the Bike Path project may be dumped and spread at their Horseshoe Lake borrow pit or Sherwin Creek Road Pit area. Material shall not include stumps, slash, brush, or other organic materials. Any permanent deposits of material in the borrow pit will require grading and recontouring as directed by the Forest Service. The Forest Service may require written agreement between the contractor and the Forest Service spelling out the details of what the contractor proposes to permanently deposit at the borrow pit and how the site will be left at the conclusion of the project

4) RELOCATE BOULDER - Large (minimum 3' by 4') and excess rocks shall be relocated onsite as shown on plans or as directed by Engineer. Large rocks relocated shall be placed along the areas as shown on the plans and / or as directed by the Engineer. Placement of rocks shall include the excavation of the ground to set the bottom of the rock a minimum of 12" or 1/3 the diameter of the rock, which ever is greater, below adjacent finish ground. The Engineer may direct the Contractor to set large rocks deeper than 12" below grade. Dumping of piles of rock will not be permitted. Relocation of large rocks shall be considered as incidental to the various other item of work and no additional compensation will be allowed therefore.

5) EMBANKMENT - Embankment shall conform to the provisions of Section 19 of the Standard Specifications and these Special Provisions. Backfill or embankment does not have to conform to the Sand Equivalent requirement in Section 19-3.06 and may be excavated material meeting the graduation requirements in said Section. In areas to be landscaped and left with clean native material, embankment material

shall be screened to remove rock over 1 inch in size. The top 12" of embankment shall be topsoil.

No time extension or other waiver of working days requirements will be granted in the event the Contractor is delayed by reason of there being an insufficient quantity of acceptable material available from approved sources, and no additional compensation will be made for utilization of borrow sources for embankment purposes or trench backfill.

6) ROADWAY EXCAVATION - Roadway excavation shall involve removing all material down to the grading planes upon which the bedding material, culverts, and aggregate base are to be placed. Over excavation and re-compaction of native material as needed to meet the compaction requirements shall be considered incidental to the other items of work and no additional compensation shall be made therefore.

7) BLASTING - The Contractor shall thoroughly inspect the site and shall be satisfied as to the conditions to be encountered. No extra payment will be made for drilling and blasting or for disposal of rock or unusable material, nor for import of fill material. The blasting contractor shall be licensed. No blasting is anticipated for this project and signs may be relocated to avoid blasting as directed by the engineer.

8) EARTHWORK QUANTITIES - The estimated earthwork quantities for this project were estimated from a topographic map, and the proposed typical grades as shown on the plans. The estimated quantities do not include shrinkage or swell factors or loss due to clearing operations or subsidence. No allowance is made for unsuitable trench backfill materials. It is the Contractor's responsibility to verify the quantities and estimated losses to his satisfaction. The Contractor's bid/agreement prices for earthwork items shall be considered adequate to include any anticipated shrinkage/swell/subsidence, or allowance for import/haul-away and/or replacement of unsuitable material.

   The estimate earthwork for each of the paver area is five cubic yards. All other work for signage installation is considered incidental and no additional compensation will be made therefore.

9) COMPACTION - Earth backfill shall meet compaction requirements of Section 19-5 and the following:

♦ Pipe Zone	90% relative compaction
♦ Street Zone per Section 19-5.03	95% relative compaction
♦ Crushed Aggregate Base	95% relative compaction
♦ Pipe Trench backfill outside limit of Street Zone	90% relative compaction
♦ Prepared subgrade - existing 12" depth scarified and compacted	95% earth material compaction
♦ All other fill and embankment	90% relative compaction

Percent relative compaction is defined as the minimum compaction to be achieved relating to the material's maximum dry density as determined by ASTM 1557-00.

The Town will perform compaction tests at locations determined by the inspector, at approximately 100 foot intervals to ensure compaction requirements are met. No fill, backfill, aggregate base or paving shall commence without prior Engineer approval of the subgrade.

If the required compaction is not achieved, the Contractor may (1) recompact the area between the previous and following test points, a minimum distance of 100 feet; or (2) test at own expense at points half way between the previous tests and compact the areas as far as the next passing test. This area shall then be retested at intervals offset from the previous tests by half the distance between the last two tests. This procedure is to be repeated until the compaction tests show that the required compaction has been reached. More than one (1) retest shall be at the expense of the Contractor and costs deducted from monies due the Contractor.

10) PREPARED SUBGRADE – Prepared subgrade shall be scarified to a 12" depth and re-compacted to 95%. The subgrade shall be smooth and uniform, and true to the required grade and cross section, and shall be within the tolerances specified in Section 19-1.03, or as shown on the Plans. The Contractor shall repair at his expense any damage to a prepared subgrade until the subgrade is in a condition meeting the requirements specified.

11) FINAL GRADE - The final grade (grading plane) shall be constructed smooth, uniform, even, to neat lines, and true to the required grade and cross section. It shall be within the tolerances specified in Section 19-1.03. The final grade will be visually inspected both for quality of line and quality of subgrade. The Town will perform compaction tests at locations determined by the inspector, at approximately 100-foot intervals to ensure compaction requirements are met. No fill, backfill, aggregate base, or street construction shall commence without prior Engineer approval of the subgrade. The Contractor shall repair at his expense any damage to a prepared subgrade until the subgrade is in a condition meeting the requirements specified.

12) SLURRY CEMENT BACKFILL - Slurry cement backfill shall meet the requirements of Section 19-3.062 of the Standard Specifications.

13) MEASUREMENT AND PAYMENT – Measurement and payment for earthwork shall conform to all provisions for "Measurement" and "Payment" in Section 19, "Earthwork," of the Standard Specifications and these Special Provisions.

    a) The contract unit price paid for cubic yard for "Earthwork", will be considered full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in excavation, complete in place, as shown on the plans and in conformance with the Standard Specifications and these Special Provisions and no additional compensation will be allowed therefore.

    b) Structure excavation and backfill for the signs posts and foundations will be considered as included in the price paid for the specific item in which it is used and no separate payment will be made therefore.

    c) Quantities for the earthwork items as specified herein will be paid for at the contract price per cubic yard for the greater of either the excavation, including

removals, or embankment compacted in place including replacement of removals, as measured by the end area method calculated by the Engineer of work. It is estimated that excavation including removals will be the greater of the two. Should grade changes or variances found in existing topography cause embankment to be the greater quantity, then payment will be made based upon embankment. Such price shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in construction embankments, complete in place, including spreading and compacting embankment material, and compaction and preparation of the subgrade at the grading plane in embankment areas, all as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer. No payment for import of earth fill or disposal of excess material off-site will be made, other than the contract prices specified herein. Should the existing removals or fills vary more that the five yard estimate for each of the paver locations, the variations shall be reported to the Engineer. Upon completion of each section of removals to competent ground as determined by the Engineer, the elevation of such removal limits shall be reported to the Engineer. No fill shall be placed in such area until the Engineer records said elevations. Upon completion of the project earthwork, the final payment quantity shall be calculated by the Engineer based upon end area method, using actual ground elevations, finished road subgrade per plan grades, and actual removal limits as measured in the field with no shrinkage or swell factor, the earthwork, changes to either removal limits or finished grade shall be submitted to the Engineer for re-calculation of earthwork quantities.

SECTION 26 - AGGREGATE BASE

1) AGGREGATE BASE – Aggregate Base shall conform to Section 26 of the Standard Specification and these Special Provisions.

2) Aggregate base shall be Class 2 or Class 2 permeable (as specified on the plans) ¾-inch maximum conforming to the requirements in Section 26 of the Standard Specifications and these Special Provisions. Refer to paragraph 26-1.02A Class 2 Aggregate Base. The Town encourages the use of recycled asphalt and concrete materials. When recycled materials are used, the Contractor may process the material to be either 1.5 inch or the ¾ inch aggregate mix gradation.

   A minimum of 4 inches of aggregate base shall be installed under all paved surfaces, including gutters, driveways, parking areas, sidewalks, roadways, paths, etc.. Aggregate base shoulder backing shall be placed and compacted as shown on the plans.

   Asphalt grindings may be used in lieu of Aggregate Base if they meet Section 26 requirements and are approved by the Engineer.

3) MEASUREMENT AND PAYMENT - Measurement and payment for aggregate base shall be in cubic yards and shall be based on the dimensions shown on the drawings. Aggregate base shall be measured and paid for on the basis of the

compaction requirements and dimensions shown on the plans. No allowance will be made for aggregate base placed outside said dimensions, or in excessive amounts, unless otherwise ordered by the Engineer. Full compensation for furnishing all labor, materials, tools and equipment for the removal of loosened materials, cleaning and completing all work listed above including but not limited to furnishing, installing and compacting aggregate base will be considered as included in the contract unit price per cubic yard for "Aggregate Base" and no additional compensation will be allowed therefore.

Full compensation for furnishing all labor, materials, tools and equipment necessary for pulverizing and compaction will be considered as included other items.

SECTION 39 - ASPHALT CONCRETE

1) ASPHALT CONCRETE - Asphalt concrete for patching shall be per Section 39 of the CSS and these Special Provisions.

2) The contract unit price paid for square foot for "Asphalt Concrete (Type B) Patching" for the path patching will be considered full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in asphalt concrete including but not limited to the asphalt, aggregates, asphalt concrete production, crack sealing, placement, complete in place, as shown on the plans and in conformance with the Standard Specifications and these Special Provisions and no additional compensation will be allowed therefore. For purposes of calculation, an average depth of 3 inches shall be assumed.

SECTION 56 – SIGNS

General:

The project plans indicate approximate locations of all of the signs to be manufactured and installed for the project. The plans in conjunction with information in the specifications and appendix compile all of the information necessary to price, manufacture, and install the signs. The owner will provide an image file for the interpretive sign panels when they are available, late 2010. The owner will provide updated panel information and detail plans to the contractor awarded the contract for the project at preconstruction conference for incorporation into the shop drawing submittal package to be submitted to the owner / engineer.

1) Signs shall be in conformance with Section 56 of the Standard Specifications and these Special Provisions.

1) Roadside Signs - Full compensation for furnishing all labor, materials, tools, equipment, incidentals, and for doing all the work involved for the installation of roadside signs, complete in place, will be considered as included in the contract unit price for "Sign - Install Roadside Signs" and no additional compensation will be allowed therefore.

2) Relocation of Existing Signs: See Section 15 for relocation of existing signs.

3) REMOVABLE PLASTIC BOLLARDS - Bollards shall be constructed and installed in the locations as shown on the plans.

Bollards shall be removable. Steel sleeves shall be installed in concrete flush with the bike path surface. Lock rings shall be installed below the surface to allow for the bollard to be locked in place with a key type lock. Bollards shall fit in sleeve such that they wobble no more than ½ inch at the top and are easily removable. Material for bollards shall be plastic/recycled "everlasting" by Great Lakes Manufacturing, or equal.

Keyed locks matching the Town's locks, keyed-alike to match the Town locks shall be supplied for all bollards by the Contractor. Full compensation for locks shall be considered as included in the contract price for the bollards and no additional compensation will be allowed therefore.

Payment for bollards shall be on a unit cost basis for each "Removable Plastic Bollard" installed complete in-place where shown on the plans and shall include all labor, materials including concrete footings, steel sleeves, locks, tools, equipment, incidentals, and for doing all the work involved and no additional compensation will be allowed therefore.

4) MILE POSTS – Mile posts shall be constructed and installed in the locations as shown on the plans. Mile markers shall be manufactured from high density plastic recycle material 6X6 square with routed inlaid "glow in the dark" materiel for numbers, and inlaid plastic Town of Mammoth Lakes Logo. The numbering and path designation will be provided by the engineer prior to fabrication of the posts.

Payment for mile posts shall be on a unit cost basis for each "Mile Post" installed complete in-place where shown on the plans and shall include all labor, materials including footings, tools, equipment, incidentals, and for doing all the work involved and no additional compensation will be allowed therefore.

5) Fabricated Wayfinding signs shall be manufactured as specified in the plans, the appendix panel details, and these specifications. The Plans indicate the approximate location for each of the signs to be placed on the ground. The sign message schedule provide information about the type of sign and message layout. The Lakes Basin Tail detail sheets provide additional information about the actual location. Similar sheets will be prepared for the remainder of signs to assist with actual placement of the signs in relation to path. The owner/designer may provide updated panel detail sheet and detail plans at the preconstruction conference prior to shop drawing submittals by the contractor. This updated dated will not substantially change the sign detailing and fabrication requirements in the bid documents and no additional cost will be allowed for these updated information panels and sketches. The following are specification and fabrication requirements:

a) Quality Standards. The materials, products, equipment and performance specification described herein, establish a standard of function, dimension and appearance performance and quality to be met by the fabricator.
b) Structural Design. Detail on the design drawings shown on the plans and the appendix indicate the concept but do not indicate all connection or mounting details that are required for the sign and shall be shown on the Shop Drawing

submittals and are required for structural integrity of the signs, including consideration for 300 psf snow loads and 110 mph wind loads (40 psf) and handling and erection loads. Shop Drawings shall be prepared by the fabricator and approved by the contractor that include structural design and engineering to incorporate these static and dynamic loads and provide all of the details to support, erect and maintain the signs.

c) Vandalism Design. Fabrication and installation design is to withstand severe abuse and souvenir theft vandalism, but not less than the equivalent of resisting simple hand implements and tools (screwdrivers, knives, coins, keys, and similar items), and adult physical force. All hardware and fasteners within reach shall be vandal resistant.

d) Substitution. No substitution will be considered unless the Owner has received written request for approval. Fabricator may recommend equal or better equipment or method but will be required to provided full documentation establishing such a substitution's equality or superiority as measured in the following:
   i) Compliance with the visual design
   ii) Cost
   iii) Ease of maintenance
   iv) Performance
   v) The burden of proof of the merit of the proposed substitution is upon the fabricator. The Owners decision of approval or disapproval of a proposal substitution shall be final.

e) Material Handling. The fabricator is to pack, wrap, crate, bundle box, bag, or otherwise package, handle, transport, and store all fabricated work as necessary to provide protection from damage by every cause. Fabricator shall provide clear and legible identifying information on all product packaging to ensure proper on-site identification and installation.

f) Sign Specification: Construction Methodology. The drawings call for a variety of fabrication techniques. Fabricators shall employ the methods required to meet the visual, durability, and maintainability required for each sign type.
   i) The dimension shown on the drawings are considered nominal because different extrusions have slightly different dimensions.
   ii) Sign faces are to be fabricated using aluminum plate or varying thickness, as specified on the drawings, with a minimum thickness of 0.125 inches unless noted otherwise. i.e. interpretive signs.
   iii) Sign cabinet seams shall be sealed to ensure they are watertight.
   iv) All finishes are to be satin finish, free from fading, peeling, or cracking. Paint preparation of all exterior metal surface of sign to include removal of all scratches and imperfections, sanding and chemical etching. Substrate cleaning, preparation, paint application and paint thickness to be in strict compliance with Matthews Paint or AkzoNobel published recommendation. Acceleration of the drying process is not allowed.
   v) Except where approved otherwise by the Owner, conceal all fasteners.
   vi) Any sign faces smaller that 8 feet by 20 feet are to be fabricated from a single piece of seamless material.
   vii) Non-welded joints between various portions of signs shall have a tight, hairline-type appearance, with gaps. Provide sufficient fastenings to preclude looseness, racking, or similar movement.
   viii) Provide drain holes as needed to prevent accumulation of water within signs. Holes must be inconspicuous and be located in inconspicuous locations;

holes must be located such that drainage does not occur onto signs, or other surfaces subject to staining. Provide color coordinated insect screening for drain holes.

ix) Non-illuminated inserts shall be minimally printed at 1200 DPI using pigment-based UV inks on a white, satin finish UV-coated photon paper, with a matte UV over-laminate. The thickness of the photo paper shall be heavy enough so that o wrinkles occur once installed.

x) Fiberglass panels with embedded artwork are to be fabricated using a 1/8" thick fiberglass panel with permanently embedded digital graphic (printed at a minimum of 1200 DPI using exterior inks). The panel shall be a solid, one-piece panel with all graphic elements inseparable from the fiberglass in which they are embedded (pannier 1-800-544-8428).

xi) Visible metal joints shall adhere to a fit tolerance of 0.01 inches.

xii) Panels for interpretive signs shall be manufactured using High Pressure Laminate specified elsewhere in these specifications.

xiii) **NOTE:** Steel shapes shall be Corten steel or powder coated black or bronze as selected by the owner not as shown on the plans.

xiv) **NOTE:** The lifting bracket show on type 6 shall be the rectangular shaped.

g) Fonts / Typefaces; The fonts required for this project are specific for this project and include those listed in the graphic standards.

The fabricator shall purchase and use the specified fonts and no substitution is allowed. The typefaces shall not be electronically distorted ("squeezed" or "extended") for the purpose of fitting to the specified sign or general alteration of the sign face composition unless noted in the drawing. This included but not limited to stretching, squeezing, tilting, outlining or shadowing.

i) All letter forms, symbols or graphics shall be reproduced either by photographic or computer-generated means. Hand-cut characters are not acceptable. Cutting shall be completed in such a manner that edges and corners of finished letter forms will be sharp and true. Letterforms with nicked, cut, ragged, rounded corners, and similar disfigurements will not be acceptable.

ii) All letterforms shall be made from material and gauge as indicated on design drawings. Type faces shall be replicated as indicated on the drawings. Type faces shall be replicated as indicated on the drawings.

iii) Ligatures are to be turned off.

iv) Apostrophes are to be used, not footmarks. Note that there is a difference in most fonts.

v) Silk-screen and vinyl copy is to match the sheen of the copy panel background (satin). Edges of the letters shall be straight and corners sharp. Surfaces of letters shall be uniform in color finish and free form pinholes and other imperfections.

vi) Silk-screen images shall be executed with photo screens prepared from original art. No hand-cut screens will be accepted. Original art shall be defined as artwork that is a first generation reproduction of the specified art.

vii) Silk-screening shall be highest quality, with sharp lines and no saw-tooth or uneven ink coverage. Screens shall be photographically produced. Applications of inks through screens shall consist of one flood pass and one print pass. Images shall be uniform in color and ink thickness. Images shall be free from squeegee marks and lines resulting from improper print stroke or screen off contact height. Signs shall be placed in adequate drying racks

with minimum of 2 inches between racks for ample airflow. Sign racks shall have system of forced airflow between layers to provide proper drying and curing of inks. After signs have dried completely according to the ink manufacture's time allowance., signs may be packaged.

viii) "Pushed-through" copy must fit accurately into routed portions of cabinet with tight, hairline joints and snugly into back of formed (channel) letters.

ix) The edges and corners of routed letterforms shall be sharp and true. Letterforms with nicked, cut, ragged, rounded (positive or negative) corners, and similar disfigurements will not be acceptable.

x) Letterforms shall be aligned to maintain a base line parallel to the sign format, with margins and approved shop drawings. Vertical strokes shall be plumb.

xi) Mechanically fasten center of letters to acrylic plastic as described in the design plans.

xii) Vinyl graphic and letterforms shall be computer cut.

4) Installation

a) Contractor shall protect in place all underground utilities marked from dig alert or other agencies not party to the USA dig alert system.

b) The sign locations shall be verified in the field during the Shop Drawing review process. The locations will be staked during this review by the Engineer. No signs shall be fabricated without an approved shop drawing and detail location installation detail plan. Modifications in the sign footings may be required to accommodate uneven grades.
The final Sign Message Schedule and sign location plan shall be approved by the engineer and coordinated to reconcile sign location and message / directional arrows.

Interpretive sign panel design will be completed by others by October 2010 when image files and proofs will be provided to the contractor for final fabrication. No structures for the interpretive signs shall be fabricated or installed prior to completion of the interpretive design.

c) Footings
Concrete bases for signage shall be shall be below the frost line to the depth shown on the plans. . All footings and bases shall be formed within 12 inches of the surface and provided a class 1 finish to all exposed concrete. The bases shall extend a minimum of 4 inches above the adjacent finished grade. Signs are to be mounted on J-bolt footings, centered on the concrete base or footing, as specified on plans and specifications.

d) Mounting. All signs shall be mounted level and true. All exposed hardware shall be torch-up painted on site as required. Bolts, nuts, washers or other fasteners shall be stainless steel.
Fabricator may propose substitutions for the mounting details and hardware shown on the plans. The visual and structural design shall not be compromised.

e) All signage products shall be installed such that there are no misalignments between visible components. Sign elements intended to be removable or changeable after installation shall function as intended without binding, sticking or blocking. It shall be the responsibility of the contractor to correct any installation misalignments at no charge.

Contractor and Fabricator shall have knowledge of ADA mounting guidelines,

general sign locating practices, and any particular unique installations defined by owner/engineer. The owner/engineer will locate each sign location for the contractor once. The contractor shall project the survey marks or stakes provided and retaking may be performed at the contractors expense and deducted from pay estimates. It is the desire of the Owner that the contractor and fabricator follow these guidelines as well as architectural cues in installing for the best visual placement, keeping a reasonable distance from protruding objects. Any signage that is improperly located is to be moved to the proper location by the contractor, and repairs to wall surfaces and signage are to be at the contractor's expense.

5). Punchlist
It is required that the contractor complete a walk through with the Owner immediately following installation to identify any errors, such as construction or installation issues. Such errors are to be corrected in a timely manner, and to the satisfaction of the Owner.

H. Signage Warranty
The Fabricator is to provide a written five (5) year full replacement warranty to the Owner that all signs will be free of defects due to craft work and materials including, but not limited to:

- Bubbling, chalking, rusting or other disintegration of the sign panel, graphics or of the edges.
- Corrosion appearing beneath paint surfaces of panels, brackets, posts or other support assemblies (except as an obvious result of vandalism or other external damage).
- Corrosion of fasteners.
- The assemblies not remaining true and plumb on their supports.
- Fading, chalking and discoloration of the colors and finishes within the vinyl and paint manufacturer's stated warranty period.
- Peeling, delamination or warping ("oil canning").
- Repair and reinstallation of signage due to failed mountings.

Contractor/Fabricator shall also extend in writing to the Owner all manufacturers' warranties.

I. Repair or Replacement
Without additional cost to the Owner, the contractor shall repair or replace, including installation, any defective signs or hardware that develop during the warranty period and repair any damage to other work due to such imperfections. The contractor will be required to fully replace all signs that are in error relative to the working documents (sign message schedule and sign type drawings) that were submitted to the contractor Fabricator upon award of contract.

5) Measurement and Payment - Full compensation for furnishing all labor, materials, tools, equipment, incidentals, and for doing all the work involved for the fabrication and installation of each Sign or grouping of signs identified in the bid form, complete in place, will be considered as included in the contract unit price for each Sign identified in the bid form and no additional compensation will be allowed therefore.

6) Measurement and Payment For Bid Option 1 Credit for deleting one type 6 sign raising and lowering device and providing fixed mounting on post similar in shape and strength. The owner may substitute between 25 and 75 percent of the quantity of the type 6 signs with the fixed post design. Full compensation for furnishing all labor, materials, tools, equipment, incidentals, and for doing all the work involved for the fabrication and installation of type 6 fixed Sign type, complete in place, will be considered as included in the contract unit price for Bid Option 1 identified in the bid form and no additional compensation will be allowed therefore.
7) Measurement and Payment For Bid Option 2 Credit for deleting notch in top and end of wide flange material shown on the plans and cutting at 20 to 30 degree angle as selected by the owner. All signs would cut same if this option is selected.

SECTION 88 - ENGINEERING FABRICS

1) Engineering fabrics shall be per Section 88 of the Standard Specifications and these Special Provisions.

2) Filter fabric placed at the sand permeable material interface shall be APS 3601TG or equal conforming to Section 88-1.03.

3) Filter fabric placed under concrete pavers shall be of the woven type.

4) Full compensation for engineering fabrics shall be considered included as included in the unit price for the item in which it is used, and no separate payment will be made therefore.

5) Measurement and payment shall be considered incidental to the various other items of work and no additional payment will be made therefore.

SECTION 90 - PORTLAND CEMENT CONCRETE

1) Portland cement concrete shall be per Section 90 of the 2006 Standard Specifications and the following:

2) Exposed wearing surface concrete shall be Class 1 concrete with a minimum 28-day compressive strength of 5,000 psi. Other concrete shall be Class 2 concrete with a minimum 28-day compressive strength of 3,500 psi

3) Fibermesh fiber additive or approved equal shall be added for all concrete with an exposed wearing surface.

4) Cement for all concrete in the project shall be Type II Portland cement.

5) The maximum water cement ratio shall be 0.45 for Class 1 concrete and 0.55 for Class 2 concrete.

6) All concrete shall have an air entertainment between four (4) percent and six (6) percent. (±0.1%)

7) Coarse aggregate for concrete shall be 1-inch minimum per Section 90-3.02.

8) Work included in this section is considered incidental and included in the various other items of work and no additional payment will be made therefore.

SECTION 102 – SPECIFICATION FOR EXTERIOR GRADE HIGH PRESSURE LAMINATED SIGN MATERIAL

This material shall be used for the interpretive sign panels Type 7 modified as shown on the plans and the bid form. Refer to Section 56 and the plans for all requirements.

PART I - GENERAL SPECIFICATIONS

1.1 DOCUMENTS
This section of the specification forms part of the Contract Documents and shall be interpreted and coordinated with all other parts of the document.
1.2 SCOPE
The specification applies only to the manufacture and supply of signs and graphic images in high pressure laminate for the interruptive panels. The nominal panel size will be 24 inches X 36 inches. The reprint panels shall be 0.5 inch thick minimum and support a 300 psf snow load or a 300 lb person. The panels shall have a vandal and graffiti resistant finish. Panels will be mounted in steel frames as shown on the plans. Frames shall be serviceable as specified in Section 56.

1.3 DEFINITIONS
1.3.1 HIGH PRESSURE OUTDOOR GRADE LAMINATES
High pressure laminate graphic sign material is composed of several layers of phenolic resin impregnated kraft filler paper, surfaced by a layer of melamine graphic image substrate, imaged with UV resistant, pigment based process color inks, and translucent UV overlay, and a UV resistant melamine clear overlay, plus an optical coating that will resist no less that 99% of all sunlight and U.V. rays, as well as provide a graffiti resistant coating. In lamination grades, the back must be sanded to assure even bonding during the lamination process.

1.3.2 MANUFACTURE
For purposes of this specification, layers of material described in 1.3.1 are to be assembled, and heat / pressure consolidated at approximately 1200 PSI at temperatures exceeding 275° Fahrenheit. 1.3.3

IMAGING / ARTWORK
The graphic material and images will be supplied by owner on this project and will be in the form of digital files and a proof for each of the display panels that will be manufactured by the contractor. All graphics will be assembled by computer designers familiar with and experienced in the process of digital printing.

1.3.4 APPROVALS

Approvals are required by the owner / engineer at each stage of the process and production as submitted by the supplier to the above. Work shall not proceed without their written and signed-off authorizations. Up to two sets of review comments will be made by the owner prior to release of proofs for fabrication.

PART II - GENERAL REQUIREMENTS

Supply high pressure laminate sign panels as specified and shown on the drawings and supplemental specifications, as approved by the architect or designer before fabrication.

2.1 REFERENCES

Supplier shall provide references of at least 4 clients who have used their service to satisfaction of owner / engineer.

2.2 RELATED WORK

Related work shall be carried out by a qualified contractor as approved by the owner.

2.3 INSTALLATION

Shall be performed in a workmanlike fashion consistent with general sign requirements. Manufacturing sign company shall provide instructions.

2.4 INSTALLATION MATERIALS

As specified and detailed in drawings and specifications.

2.5 QUALIFICATION

Two years previous experience with projects of this scope.

2.6 SUBMITTALS AND SAMPLES

High pressure laminate company must supply project specific samples and colors from art work and specifications as provided by owner.

2.7 QUALITY ASSURANCE

Quality of entire project must conform to specification and bid submittals as approved by owner.

2.7.1 Experience

Craftsmen shall have a minimum of two years proven experience in this type of work and be approved by the owner for this type of work.

2.7.2 Evidence

Submit evidence of having successfully completed two projects of similar scope to this bid within the preceding two years.

2.7.3 Specific Submittal

Construct project specific submittal for approval by owner once final artwork has been designed by others to indicate color matching and graphic resolution capability. All technical details contained in the submittal and color proposal to be treated as strictly confidential.

2.8 ENVIRONMENTAL

Supplier must be able to demonstrate that he is in compliance with all worker's safety and environmental regulations at his location of manufacture.

2.9 WARRANTY

Provide a written warranty issued in the name of the owner and signed by the supplier stating that the sign panels have a guaranteed life of ten years against fading, delaminating, discoloration, staining, or cracking from date of substantial performance.

2.10 ACCEPTABLE SUPPLIERS or equal

KVO Industries
1825 Empire Industrial Ct. Ste A
Santa Rosa, CA 95403
Tel: 707-573-6868

Fax: 707-573-6888
KVO Industries is an authorized reseller of iZone
2.11 SUBMITTAL AND SAMPLES
Submit and tender for owner/engineer review, a sample of the graphic elements relating specifically to this project as a condition of qualification.

PART III - FABRICATION AND PROCESS
3.1 CUTTING AND SHAPING
All fabrication tools used in shaping and cutting of high pressure laminates must be carbide-tipped. Saw blades must be no less that 10” diameter, hollow ground, 60-80 tooth, carbide tipped, running at a minimum of 3600 rpm.
3.2 POST FORMING AND LAMINATING
All work done shall be performed in accordance with approved shop techniques currently used in the cabinet manufacturing industry. Adhesives used must be approved types for the industry, and include semi-rigid (Pvac) or rigid (Lokweld) or cabinet grade liquid contact adhesive.
3.3 LAMINATION SUBSTRATES
Acceptable substrates for lamination of high pressure laminates are premium Grade A or Sound Grade 1 hardwood veneer plywood.
3.4 FINISH
Continuity of coating: Visual inspection of each unit shall reveal no visible nicks or cuts, hairline cracks or surface defects in the surface of the finished sign. The finished product will be smooth on all edges, and cut within a tolerance of 1/32” to size required for final installation.

PART IV - ART AND IMAGING
4.1 ART PREPARATION
Supplier shall produce digital art files as required from image files a design materials as supplied by the owner / engineer and the supplier shall review files and prepare as necessary for digital image processing. Art work submitted to supplier shall be in a commonly available file format, and stored on a commonly available removable media, such as Zip, or CD Rom or may be e-mailed if small enough.
4.2 ART APPROVALS
All files to be reproduced shall be submitted to the owner for approval before it is reproduced in high pressure laminate.

4.3 ART WORK
Original artwork shall not be harmed in any way (writing, cutting, etc.) and will be returned to the client upon successful completion and acceptance of the project.
4.4 IMAGING
Digital imaging shall be printed on melamine substrate for laminating and will be of even consistency throughout the image. All imaging shall be reproduced using UV pigmented inks at a resolution of no less than 2400 DPI. (Dots per Inch).
4.5 IMAGING INKS
Inks used in the printing process shall be UV resistant and opaque. The ink shall be pigment based to assure maximum durability.
4.6 TECHNICAL PROFICIENCY
Supplier shall be proficient in industry standard imaging techniques and be able to demonstrate capabilities in photographic reproduction, including halftones, duotones, four color process and line art.
4.7 COLOR MATCHING

Supplier shall be able to match nearly the entire range of colors as represented by the Pantone Matching System (PMS) and Toyo Inks, etc. Color samples are to be provided at no extra charge.

PART V - ASTM - MECHANICAL PERFORMANCE PROPERTIES
These standards represent the minimum acceptable qualities as tested for high pressure laminate materials.
Mechanical Properties ASTM Test Solid Grade
Compressive Strength D695-84 1.800 x 104 psi
Flexural Strength D790-84a
Ultimate 1.877 x 104 psi
Modulus 1.690 x 104 psi
Impact Strength D256-84 0.64 ft-lbs/inch
Tensile Strength D638-84
Ultimate 1.637 x 104 psi
Modulus 1.650 x 104 psi
Bond Strength D952-84 1.460 x 104 psi
Bearing Strength D953-84a 1.650 x 104 psi
Rockwell Hardness D785-65 70 (E Scale)
Liquid Absorption D570-81 1%
Coefficient of Linear
Expansion D696-79 1.670 x 10-5in
In./in/oF
UV Resistance ASTM G26/A No change after
2000 hrs
Boiling Water Resistance LD3 Test (3,5) No Change

PART VI - DELIVERY, TRANSPORT, AND RELATED
6.1 INSPECTION
Prior to crating, finished panels shall be inspected for blemishes, chips and flatness. Any panel not meeting the requirements of this specification shall be rejected and promptly replaced.
6.2 CLEANING
All panels shall be cleaned in advance of packaging / crating.
6.3 CRATING
Sign panels shall be packaged in a manner that completely enclose the panels from exposure to the environment or equipment. The crates shall be lined with packing material to prevent movement of panels within the crates.
6.4 DELIVERY
Delivery shall be the responsibility of the supplier and all materials will be insured for the total value of the contents. The receiver must report any damage claims to the supplier within 48 hours of receiving the crated panels.
PART VII - MAINTENANCE AND SERVICEABILITY
7.1 MAINTENANCE
Submit manufacturer’s documentation covering the care, cleaning and maintenance of materials for incorporation into maintenance manuals.

PART VIII - INSTALLATION
8.1 INSTALLATION
Installation shall be the responsibility of the owner, subcontractor or general contractor as spelled out in the contract, based on supplier recommendations.

8.2 ADHESIVES
Apply silicone or other adhesive as shown on drawings provided by supplier.
8.3 INSPECTION - SIGN PANELS
Inspect completed signage for general workmanship including clarity of images, proper alignment of images on color separations, clean backgrounds, correct colors, appropriate thickness and verify all surfaces are free from blemishes and defects.
8.4 CLEANING
Clean completed sign unit surface with a soft cloth and any good quality glass cleaner. Abrasive cleaners should be avoided for long term usage.
8.5 INSPECTION - INSTALLATION
Inspect installation site and coordinate installation schedule with owner representative.

8.6 STORAGE AND PROTECTION
Store signage units and related materials in an orderly and systemized fashion and in a manner to prevent damage or theft of products. Protect high pressure laminate signage units by storing in areas not exposed to dust, extreme changes in temperature or humidity. Top most sign should be turned face down and plywood placed on the top to protect from possible impact damage.
8.7 TRANSPORT PROTECTION
Protect all signage units during transportation of signs to installation site by wrapping all signage units individually in a soft, non-abrasive material.
8.8 WORKMANSHIP
Install completed sign units square, plumb and accurately level in accordance with the drawings and specifications for the appropriate sign unit type.
8.9 FINAL CLEANING
Clean completed, installed sign unit with any good quality glass cleaner, ensuring removal of all fingerprints , silicone, dirt, shavings, adhesive, dust particles, etc.

9.0 MEASUREMENT AND CLEANING.
Measurement and payment shall be as described in Section 56 and the bid form and not additional payment shall be made there fore.

SECTION 103 INTERLOCKING CONCRETE PAVERS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Interlocking Concrete Paver Units (manually installed).
2. Bedding and Joint Sand.
3. Edge Restraints.

B. Related Sections:

1. Section: 16 Clearing and Grubbing
2. Section: 19 Earthwork
3. Section: 26 Aggregate Base
4. Section: 88 Geotextiles.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM C 33, Standard Specification for Concrete Aggregates.

2. C 67, Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile, Section 8, Freezing and Thawing.
3. ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
4. ASTM C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
5. ASTM C 144, Standard Specification for Aggregate for Masonry Mortar.
6. ASTM C 936, Standard Specification for Solid Concrete Interlocking Paving Units.
7. ASTM C 979, Standard Specification for Pigments for Integrally Colored Concrete.
8. ASTM D 698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,000 ft-lbf/ft^3 (600 kN-m/m^3)).
9. ASTM D 1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
10. ASTM D 2940, Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports.

B. Interlocking Concrete Pavement Institute (ICPI):
1. ICPI Tech Spec Technical Bulletins

1.03 SUBMITTALS

A. In accordance with Conditions of the Contract and Submittal Procedures Section.

B. Manufacturer's drawings and details: Indicate perimeter conditions, relationship to adjoining materials and assemblies, [concrete paver patterns, color arrangement, installation and setting details.

C. Sieve analysis per ASTM C 136 for grading of bedding and joint sand.

D. Concrete pavers:
1. Four representative full-size samples of each paver type, thickness, color, finish that indicate the range of color variation and texture expected in the finished installation. Color(s) will be selected by Engineer from manufacturer's available colors.
2. Accepted samples become the standard of acceptance for the work.
3. Test results from an independent testing laboratory for compliance of concrete pavers with ASTM C 936.
4. Manufacturer's certification of concrete pavers by ICPI as having met applicable ASTM standards.
5. Manufacturer's catalog product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.

1.04 QUALITY ASSURANCE

A. Paving Subcontractor Qualifications:
1. Utilize an installer having successfully completed concrete paver installation similar in design, material, and extent indicated on this project.

B. Mock-Ups:

1. Install a initial 10 feet x 12 feet paver area at a location specified on the plans.
2. Use this area to determine surcharge of the bedding sand layer, joint sizes, lines, laying pattern(s), color(s) and texture of the job.
3. This area will be used as the standard by which the work will be judged.
4. Subject to acceptance by owner, mock-up may be retained as part of finished work.
5. If mock-up is not retained, remove and properly dispose of mock-up and reconstruct to meet specifications.

1.05 DELIVERY, STORAGE & HANDLING

A. General: Comply with special provisions Product Requirement Section.

B. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers packaging with identification labels intact.

1. Deliver concrete pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
2. Unload pavers at job site in such a manner that no damage occurs to the product.

D. Storage and Protection: Store materials protected such that they are kept free from mud, dirt, and other foreign materials.

1. Cover bedding sand and joint sand with waterproof covering if needed to prevent exposure to rainfall or removal by wind. Secure the covering in place.

1.06 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Do not install sand or pavers during heavy rain or snowfall.
2. Do not install sand and pavers over frozen base materials.
3. Do not install frozen sand or saturated sand.
4. Do not install concrete pavers on frozen or saturated sand.

1.07 MAINTENANCE

A. Extra Materials: Provide 100 sf additional material for use by owner for maintenance and repair.

B. Pavers shall be from the same production run as installed materials.

PART 2 PRODUCTS

2.01 INTERLOCKING CONCRETE PAVERS

A. Manufacturer: basalite, angelus block or equal

B. Interlocking Concrete Pavers:

1. Paver Type universal series, serpentine series.
   a. Material Standard: Comply with material standards set forth in ASTM C 936.
   b. Color to be selected by the engineer/owner.

c. Color Pigment Material Standard: Comply with ASTM C 979.

Note: Concrete pavers shall have 1/8” spacer bars on each unit.

d. Size: 80 mm thick.

e. Average Compressive Strength (C140): 8000 psi (55 MPa) with no individual unit under 7200 psi (50 MPa) per ASTM C 140.

f. Average Water Absorption (ASTM C 140): 5% with no unit greater than 7%.

g. Freeze/Thaw Resistance (ASTM C 67): Resistant to 50 freeze/thaw cycles with no greater than 1% loss of material. Freeze-thaw testing requirements shall be waived for applications not exposed to freezing conditions.

2.02 PRODUCT SUBSTITUTIONS

A. Substitutions: No substitutions permitted.

2.03 BEDDING AND JOINT SAND

A. Provide bedding and joint sand as follows:

1. Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.
2. Do not use limestone screenings, stone dust, or sand for the bedding sand material that does not conform to conform to the grading requirements of ASTM C 33.
3. Do not use mason sand or sand conforming to ASTM C 144 for the bedding sand.
4. 5. Sieve according to ASTM C 136.
6. Bedding Sand Material Requirements: Conform to the grading requirements of ASTM C 33 with modifications as shown in Table 1.

Table 1
Grading Requirements for Bedding Sand
ASTM C 33

Sieve Size	Percent Passing
3/8 in.(9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	10 to 30
No. 100 (0.150 mm)	2 to 10
No. 200 (0.075 mm)	0 to 1

7. Joint Sand Material Requirements: Conform to the grading requirements of ASTM C 144 as shown with modifications in Table 2 below:

Table 2
Grading Requirements for Joint Sand

Sieve Size	ASTM C 144 Natural Sand Percent Passing	ASTM C 144 Manufactured Sand Percent Passing
No. 4 (4.75 mm)	100	
No. 8 (2.36 mm)	95 to 100	95 to 100

No. 16 (1.18 mm) 70 to 100 70 to 100
No. 30 (0.600 mm) 40 to 75 40 to 100
No. 50 (0.300 mm) 10 to 35 20 to 40
No. 100 (0.150 mm) 2 to 15 10 to 25
No. 200 (0.075 mm) 0 to 1 0 to 10

2.04 EDGE RESTRAINTS

A. Provide edge restraints installed around the perimeter of all interlocking concrete paving unit areas as follows:
1. Manufacturer: pavetech or equal
2. Material: Plastic or concrete.
3. Material Standard: pro series or class 1 concrete.

2.05 ACCESSORIES

A. Provide accessory materials as follows:
1. Geotextile Fabric:
a. Material Type and Description: woven type.

PART 3 EXECUTION

Installation shall be sensationally in compliance with ASTM-C936, the Corps of Engineer's Report method and the following;

3.02 EXAMINATION

Note 1: Compaction of the soil subgrade is recommended to at least 98% standard Proctor density per ASTM D 698 for pedestrian areas. Stabilization of the subgrade and/or base material may be necessary with weak or saturated subgrade soils. Compaction of class 2 aggregate is recommended to not less than 98%. Mechanical tampers are recommended for compaction of soil subgrade and aggregate base in areas not accessible to large compaction equipment.

Note 2: Prior to screeding the bedding sand, the recommended base surface tolerance should be ± 3/8 in. (±10 mm) over a 10 ft. (3 m) straight edge. See ICPI Tech Spec 2, Construction of Interlocking Concrete Pavements for further guidance on construction practices.

A. Acceptance of Site Verification of Conditions:

1. General Contractor shall inspect, accept and certify in writing to the engineer that site conditions meet specifications for the following items prior to installation of interlocking concrete pavers.
a. Verify that subgrade preparation, compacted density and elevations conform to specified requirements.
b. Verify that geotextiles have been placed according to drawings and specifications.
c. Verify that class 2 Aggregate base materials, thickness, [compacted density, surface tolerances and elevations conform to specified requirements.
d. Verify location, type, and elevations of edge restraints.
2. Do not proceed with installation of bedding sand and interlocking concrete pavers until subgrade soil and base conditions are accepted.

3.03 PREPARATION

A. Verify base is dry, certified by General Contractor as meeting material, installation and grade specifications.
B. Verify that base and geotextile is ready to support sand, edge restraints, and, pavers and imposed loads.
C. Edge Restraint Preparation:
    1. Install edge restraints per the drawings and manufacturer's recommendations [at the indicated elevations.
    2. Mount directly to finished base. Do not install on bedding sand.
    3. The minimum distance from the outside edge of the base to the spikes shall be equal to the thickness of the base.

3.04 INSTALLATION

A. Spread bedding sand evenly over the base course and screed to a nominal 1 in. (25 mm) thickness, not exceeding 11/2 in. (40 mm) thickness. Spread bedding sand evenly over the base course and screed rails, using the rails and/or edge restraints to produce a nominal 1 in. (25 mm) thickness, allowing for specified variation in the base surface.
    1. Do not disturb screeded sand.
    2. Screeded area shall not substantially exceed that which is covered by pavers in one day.
    3. Do not use bedding sand to fill depressions in the base surface.
B. Lay pavers in pattern specified on the shop drawings. Place units hand tight without using hammers. Make horizontal adjustments to placement of laid pavers with rubber hammers and pry bars as required.
C. Provide joints between pavers between 1/16 in. and 3/16 in. wide. No more than 5% of the joints shall exceed 1/4 + 1/16" in. wide to achieve straight bond lines.
D. Joint lines shall not deviate more than ±1/2 in. over 50 ft. from string lines.
E. Fill gaps at the edges of the paved area with cut pavers or edge units.
F. Cut pavers to be placed along the edge with a masonry saw.
G. Adjust bond pattern at pavement edges such that cutting of edge pavers is minimized. All cut pavers exposed to edges shall be no smaller than one-third of a whole paver.
H. Keep skid steer and forklift equipment off newly laid pavers that have not received initial compaction and joint sand.
I. Use a low-amplitude plate compactor capable of at least minimum of 4,000 lbf at a frequency of 75 to 100 Hz to vibrate the pavers into the sand. Remove any cracked or damaged pavers and replace with new units.
J. Simultaneously spread, sweep and compact dry joint sand into joints continuously until full. This will require at least 4 to 6 passes with a plate compactor. Do not compact within 6 ft of unrestrained edges of paving units.
K. All work within 6 ft. of the laying face must shall be left fully compacted with sand-filled joints at the end of each day or compacted upon acceptance of the work. Cover the laying face or any incomplete areas with plastic sheets overnight if not closed with cut and compacted pavers with joint sand to prevent exposed bedding sand from becoming saturated from rainfall.
L. Remove excess sand from surface when installation is complete.
M. Allow excess joint sand to remain on surface to protect pavers from damage from other trades. Remove excess sand when directed by engineer.
N. Surface shall be broom clean after removal of excess joint sand.

3.05 FIELD QUALITY CONTROL

A. The final surface tolerance from grade elevations shall not deviate more than ± 3/8 in. under a 10 ft straightedge.

B. Check final surface elevations for conformance to drawings.

C. The surface elevation of pavers shall be 1/8 in. to 1/4 in. above adjacent drainage inlets, concrete collars or channels.

D. Lippage: No greater than 1/8 in. difference in height between adjacent pavers.

3.07 PROTECTION

A. After work in this section is complete, the Contractor shall be responsible for protecting work from damage due to subsequent construction activity on the site.

3.08 MEASUREMENT AND PAYMENT

Measurement. Pavers shall be measured by the square foot and will be determined from the dimensions on the plans.

8) Payment. Payment shall be made on an installed, unit price for in-place basis as shown on the Bid Schedule as measured in the field. Work shall include all labor, materials, tools, equipment, and incidentals include edge restraint, sand, geotextile fabric, pavers and for doing all work involved in the installation of the pavers.

END OF SECTION

SECTION 108
OPERATION AND MAINTENANCE MANUALS

108.01 GENERAL

Submit four (4) copies of all manufacturer operation and maintenance manuals and data pertinent to all equipment and materials supplied for the project. Prepare and organize the material in three-ring binders with divider tabs and labels. Include a table of contents.

108.02 SUBMITTALS

A. Submittals shall include:

1. List of equipment furnished for project with name, address, and telephone number of vendor.

2. List of serial numbers of equipment furnished.

3. A copy of shop drawings in final form.

4. Manufacturer's operation and maintenance instructions and parts list

6. List of seals, and other expendable equipment and devices. Specify size, type, and ordering description. List name, address, and telephone number of vendor.

B. Provide manuals for each sign type including individual components and subsystems of complete assemblies. Line out all non applicable text and illustrations. Where several models, options, or styles are described, the manual shall identify the items actually provided.

C. Each manual shall contain the following:

1) Manufacturer's identification, including order number, model, and serial number.

2) Black line prints or reviewed shop drawings and diagrams of all systems.

3) Certified equipment drawings or reviewed shop drawing data clearly marked for equipment furnished.

4) Complete operating and maintenance instructions for each and every item of equipment, setting forth in detail and step-by-step the procedure for starting, stopping, operating, and maintaining the entire system as installed. A schedule of recommended maintenance intervals should also be included.

5) Complete parts list of all replaceable parts, their part numbers, and the name and address of their nearest vendor.

6) A list of appropriate cleaning solutions that can be used to clean signs and remove graffiti.

7) Any special emergency operating instruction and a list of service organizations (including addresses and telephone numbers) capable of rendering emergency service to the various parts of the system.

8) Copy of manufacturer's equipment guarantees and warranties.

D. Brochures shall be loose leaf with durable plastic or fiberboard covers. Each sheet shall be reinforced to prevent tearing from continued use, and each brochure shall have the following information clearly printed on its cover:

1) Project name, name of owner, and address.

2) Name and address of owner's representative.

3) Name and addresses of contractors and subcontractors and department to contact.

4) Telephone number of contractors, including night land emergency numbers.

5) Major equipment vendors' names and telephone numbers.

Submit complete manuals at least four (4) weeks before the date of the instructions required by the subsections on "Manufacturer's Services" in the various specification sections.

F. Operation and maintenance manuals specified herein are in addition to any operation, maintenance, or installation instructions required by the Contractor to install, test, and start up equipment.

108.03 EQUIPMENT DATA SHEETS

Provide four (4) sets of equipment data sheets, bound in three-ring binders, summarizing the equipment manufacturer's maintenance instructions and recommendations. A sample data sheet will be provided.

DEPARTMENT OF AGRICULTURE
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MAMMOTH LAKES SIGNAGE AND WAYFINDING PROJECT

APPENDICES

CMI05-03T abd CMI05-05T Non-Motor/Non-Wilderness Trails
Requisition No. 371379

March 2010

APPENDICES

A. LAHONTAN RESOLUTION 6-91-626

B. CORPS of Engineers Method For Concrete Block Pavements

C. Sign Message Schedule for Town Wide Trails

D. Sign Message Schedule for Lakes Basin Path

E. Sign Location Detail for Lakes Basin Path

F. Sign Location Detain fro Town Wide Trails (not included)

G. Design Intent Drawings for Sign Types

H. PROJECT PLAN LAYOUT SHEETS (Reduced)

DEPARTMENT OF AGRICULTURE
INYO NATIONAL FOREST

MAMMOTH LAKES SIGNAGE AND WAYFINDING PROJECT

Appendix A

LAHONTAN RESOLUTION 9-91-626

CMI05-03T abd CMI05-05T Non-Motor/Non-Wilderness Trails
Requisition No. 371379

March 2010

EROSION AND SEDIMENT CONTROL GUIDELINES

Memorandum of Understanding
between the
California Regional Water Quality Control Board
Lahontan Region
and the
Town of Mammoth Lakes
Mono County

This Memorandum of Understanding is entered into by and between the California Regional Water Quality Control Board, Lahontan Region, hereinafter referred to as "Board", and the Town of Mammoth Lakes, hereinafter referred to as "Town". Its purpose is to expedite the overall review process for certain proposed developments and to provide a clear operating policy between the Board and the Town on the implementation of the Board's guidelines for erosion and sediment controls for land developments.

On June 9, 1983, the Regional Board adopted Resolution No. 83-5. The Resolution is an amendment to the Water Quality Control Plan for the South Lahontan Basin (Basin Plan). The Basin Plan contains general erosion control guidelines for the South Lahontan Basin. The Resolution established specific erosion and sediment control guidelines for land developments within the Mammoth Creek Watershed above elevation 7000 feet. Such standards are necessary to provide developers with a uniform approach for the design and installation of adequate systems to control erosion. The guidelines were designed to mitigate urban drainage impacts from the Town in an effort to prevent the degradation of waters of Mammoth and Hot Creeks.

Section 13260 of the California Water Code requires any person discharging waste or proposing to discharge waste within any region that could affect the quality of the waters of the State, other than into a community sewer system, to file a report of waste discharge with the regional board of that region. Implementation of Section 13260 includes regulation of any waste earthen materials being discharged wherever warranted.

Pursuant to Section 13269, the requirements of Section 13260 may be waived by a regional board as to a specific discharge or a specific type of discharge where such waiver is not against the public interest. Such waiver shall be conditional and may be terminated at any time by the board.

On January 14, 1988, the Board adopted Resolution No. 88-18. The Resolution describes that a conditional waiver of waste discharge requirements for erosion from construction would not be against the public interest when the discharge is effectively regulated by other public agencies.

In the interest of water quality and to promote a realistic and effective erosion control management program, the Board recognizes that the Town has:

1. Immediate proximity to the Mammoth Creek Watershed, to conduct on-going site inspections of construction projects; and

2. A departmental mechanism more readily available to the Town population, to expedite construction permits for projects encompassing less than five (5) acres, while effectively administering erosion control measures through plan reviews and site inspections.

Therefore, it is agreed that:

1. The Town will incorporate into its review criteria for proposed developments, Section III. GUIDELINES, of the Board's "Guidelines for Erosion Control in the Mammoth Lakes Area".

2. The Town will issue construction permits for projects encompassing less than five (5) acres without the Board's prior review provided the project complies with the "Guidelines for Erosion Control in the Mammoth Lakes Area".

3. The Town will not issue a construction permit for a project encompassing five (5) acres or more unless the Board has adopted waste discharge requirements for the project or unless the Board's Executive Officer has issued a written waiver for the project.

4. The Town at its discretion may defer consideration of those projects involving water quality issues to the Board regardless of the project's compliance with this Memorandum of Understanding.

5. The Town will maintain a record of all documents submitted and reviewed, number of permits issued, inspections performed, and compliance record and any followup actions under this Memorandum of Understanding. This record will be submitted to the Board on an annual basis, if so requested.

6. The Board after reviewing the annual record submitted by the Town, reserves the right to require the submittal of reports of waste discharge by a Town permittee for review and action (if necessary) by the Board.

7. This Memorandum of Understanding may be amended as mutually agreed in writing by the Town and the Board.

8. This Memorandum of Understanding shall be effective immediately upon execution of this agreement by both parties. It may be terminated for any reason by either party. Termination will occur upon receipt of written notice by the non-terminating party.

9. All notices and communications under this Memorandum of Understanding shall be addressed to the following person(s):

Town Representative
Town of Mammoth Lakes
Department
Address
Mammoth Lakes, CA 93546

Harold J. Singer, Executive Officer
California Regional Water Quality Control Board, Lahontan Region
15428 Civic Drive, Suite 100
Victorville, CA 92392-2494

This Memorandum of Understanding is executed on the date of the most recent signature below, by the following authorized representatives of the parties:

Town Representative
Title Town Manager
Date 8-7-91

Harold J. Singer
Executive Officer
Date 9/12/91

TOTAL P.05

GUIDELINES FOR EROSION CONTROL

IN THE MAMMOTH LAKES AREA

Erosion control guidelines have been adopted by the Regional Board to establish standards for the control of erosion and drainage from developments in the Mammoth Creek Watershed, above elevation 7,000 feet. Such standards are necessary to provide developers with a uniform approach for the design and installation of an adequate system to control erosion and storm runoff. The guidelines are designed to prevent the degradation of Mammoth and Hot Creeks by minimizing the impacts on the creeks of the drainage from the community of Mammoth Lakes.

I. GENERAL POLICY

The Regional Board will request a report of waste discharge from the developers of a proposed project and will establish waste discharge requirements to ensure that proper control measures for the protection of water quality are taken during all phases of a proposed development. The report of waste discharge and the adopted waste discharge requirements will be in conformance with the erosion control guidelines which are listed below:

II. WASTE DISCHARGE REPORTS

A. The submittal of a report of waste discharge shall be required according to the following criteria:

1. A new development involving either (a) six or more dwelling units, or (b) commercial developments that involve soil disturbance on ½ acre or more shall file a complete report of waste discharge not less than 90 days before the intended commencement of construction activities.

2. Existing developments and new developments involving five or less dwelling units shall file a report of waste discharge only at the request of the Regional Board. Such filing shall be no more than 60 days from the date of request, or sooner, if so stated in the initial request.

B. Reports of waste discharge for projects in the Mammoth Creek Watershed that involve the disturbance of soil shall contain the following elements:

1. A description of the interim erosion control measures to be applied during the period in which the project is under construction.

2. Details of the short-term and long-term erosion and drainage control measures to be employed following the completion of the construction phase of the project.

3. A time schedule delineating the sequence by which the above erosion and drainage control measures will be applied and are expected to become effective.

Details of all erosion control measures shall be shown on suitable-scale engineering drawings. The report shall also include engineering criteria and design calculations for erosion control facilities.

III. GUIDELINES

The following guidelines are necessary for the protection of water quality within the Mammoth Lakes area.

1. Drainage collection, retention, and infiltration facilities shall be constructed and maintained to prevent transport of the runoff from a 20-year, 1-hour design storm from the project site.a/

2. Surplus or waste material shall not be placed in drainage ways or within the 100-year flood plain of surface waters.

3. All loose piles of soil, silt, clay, sand, debris, or earthen materials shall be protected in a reasonable manner to prevent any discharge to waters of the State.

4. Dewatering shall be done in a manner so as to prevent the discharge of earthen material from the site.

5. All disturbed areas shall be stabilized by appropriate soil stabilization measures by October 15th of each year.

6. All work performed between October 15th and May 1st of each year shall be conducted in such a manner that the project can be winterized within 48 hours.

7. Where possible, existing drainage patterns shall not be significantly modified.

8. After completion of a construction project, all surplus or waste earthen material shall be removed from the site and deposited at a legal point of disposal.

9. Drainage swales disturbed by construction activities shall be stabilized by the addition of crushed rock or riprap as necessary or other appropriate stabilization methods.

10. All nonconstruction areas shall be protected by fencing or other means to prevent unnecessary disturbance.

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a/ The 20-year, 1-hour design storm for the Mammoth Lakes area is equal to 1.0 inch (2.5 cm).

11. During construction, temporary erosion control facilities (e.g. impermeable dikes, filter fences, hay bales, etc.) shall be used as necessary to prevent discharge of earthen materials from the site during periods of precipitation or runoff.

12. Revegetated areas shall be continually maintained in order to assure adequate growth and root development. Physical erosion control facilities shall be placed on a routine maintenance and inspection program to provide continued erosion control integrity.

13. Where construction activities involve the crossing and/or alteration of a stream channel, such activities shall be timed to occur during the period in which streamflow is expected to be lowest for the year.

IMPLEMENTATION

1. The responsibility for the timely submittal of information necessary for the Regional Board to determine compliance with these guidelines rests with persons submitting proposals for development. The Porter-Cologne Water Quality Control Act provides that no person shall initiate any new discharge of wastes prior to filing a complete report of waste discharge and prior to issuance of waste discharge requirements, the expiration of 120 days after submittal of a complete report of waste discharge, or the waiver of waste discharge requirements.

2. The Regional Board may pursue enforcement action should these erosion control guidelines not be adhered to.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

RESOLUTION NO. 6-91-926

Directing the Executive Officer to Enter into a Memorandum of Understanding with the Town of Mammoth Lakes, Regarding Implementation of Erosion Control Requirements, Mono County

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The California Regional Water Quality Control Board, Lahontan Region (Board) finds:

1. The South Lahontan Basin Water Quality Control Plan (Plan) recognizes the adverse affect discharge of silt due to land development and natural erosion has on surface water within the South Lahontan Region mountainous watershed areas;

2. The Plan prohibits the discharge of waste earthen materials to surface waters within the Mammoth Creek Watershed above the elevation 7,650 feet, including the community of Mammoth Lakes;

3. The Plan contains guidelines for erosion control (see copy attached) to be observed in land development projects;

4. The Town of Mammoth Lakes' (Town) sphere of influence lies within the area described in Finding No. 2;

5. The Town regulates the construction of projects within their sphere of influence. This regulation includes the review of erosion control plans for proposed construction projects;

6. The Town issues building and grading permits that contain provisions pertaining to erosion control measures for proposed construction projects. Provisions pertaining to erosion control used by the Town incorporate the Regional Board's "Guidelines for Erosion Control in the Mammoth Lakes Area" as adopted by the Board on May 8, 1975, and which was added as an amendment to the Water Quality Control South Lahontan Basin Plan on June 9, 1983;

7. The Town has an approved Ordinance No. 91-02 regarding encroachment and grading regulations in which the Town established drainage and erosion design standards that are in addition to the Board requirements;

8. The Town has an approved 1984 Storm Drainage Master Plan for the Town of Mammoth Lakes, which was reviewed and updated in September 1990, places a high priority on the protection of water quality in Mammoth and Hot Creeks from degradation due to sediment discharges;

9. The Town facilities and staff are located in close proximity to construction projects in the area and routinely conduct compliance inspections at various stages of construction;

10. Projects under five acres in size are not likely to significantly impact water quality when properly regulated by the Town;

11. The Board desires to minimize the levels of regulatory review and the staff time required to perform duplicate regulatory reviews;

12. The Board and the Town propose to enter into a Memorandum of Understanding (MOU) which describes procedures to be followed by both entities to implement the Board's erosion control guidelines;

13. This MOU has been circulated to interested parties and has been the subject of a Town Council Meeting where it was approved by the Town Council on May 1, 1991 and signed by the Town Manager on August 7, 1991.

THEREFORE BE IT RESOLVED; that the Board authorizes the Executive Officer to enter into the MOU between the Regional Board and the Town of Mammoth Lakes.

I, Harold J. Singer, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a resolution adopted by the California Regional Water Quality Control Board, Lahontan Region, on September 12, 1991.

HAROLD J. SINGER
EXECUTIVE OFFICER

DEPARTMENT OF AGRICULTURE
INYO NATIONAL FOREST

MAMMOTH LAKES SIGNAGE AND WAYFINDING PROJECT

Appendix B

Corps of Engineers Method For Concrete Pavers Installation and User Manual

CMI05-03T abd CMI05-05T Non-Motor/Non-Wilderness Trails
Requisition No. 371379

March 2010

CORPS OF ENGINEERS DESIGN METHOD FOR CONCRETE BLOCK PAVEMENTS

Raymond S. Rollings

U. S. Army Engineer Waterways Experiment Station
Vicksburg, Mississippi, U.S.A.

SUMMARY
The U. S. Army Corps of Engineers has adopted a design procedure for concrete block pavements that combines their current California Bearing Ratio flexible pavement design method with an equivalent thickness to account for the block surface. Limited traffic tests indicate that this will provide a conservative design. Although the existing equivalent thickness is an effective design expediency, improvements are still needed. There is some indication that the equivalent thickness for design should vary with the tire contact area, and there is still no explicit way to evaluate the effect of block thickness and shape.

1. BACKGROUND

In the fall of 1978, the Office, Chief of Engineers, U. S. Army Corps of Engineers, directed the Waterways Experiment Station to evaluate concrete block pavements for Corps of Engineers' use. Available literature was reviewed and Corps of Engineers personnel visited a number of manufacturers and examined in-service pavements. This information was used to prepare an Engineering Technical Letter that was issued by the Office, Chief of Engineers, in April 1979 (1). The Engineering Technical Letter authorized the Corps of Engineers to use concrete block pavements for low-speed pavements and provided basic design and construction information.

In August 1979, the Waterways Experiment Station built three concrete block pavement test items over a soft clay subgrade and tested them under traffic from a 25,000-lb (11,340-kg) twin wheel, tandem axle load and a 105,000-lb (47,627-kg) military tank. This test demonstrated that the Corps of Engineers design method for block pavements was conservative and that block pavements could be designed and built to carry heavy traffic loads over a soft subgrade. Additional technical literature was reviewed as it became available, and additional block pavement sites were visited over the next few years. The Waterways Experiment Station published the information gathered during this study of block pavements as a technical report in March 1983 (2).

2. SCOPE

This paper describes the basis and method for the Corps of Engineers thickness design for concrete block pavements. Shortcomings and limitations of this design method are pointed out, and areas for further work are identified.

3. DESIGN BASIS

The primary method of block pavement failure observed in experimental and in-service pavements is rutting. This is characteristic of a flexible pavement which transmits surface loads to the subgrade through layers of varying strength and stiffness. The most common flexible pavement consists of an asphaltic concrete surface over layers of decreasing quality, usually the base and subbase over the subgrade. This is in contrast to a rigid pavement such as portland cement concrete which relies on bending of the concrete slab to transmit the loads to the subgrade.

Since block pavements transmit loads and fail like flexible pavements, modifying the existing Corps of Engineers flexible pavement design procedure appeared to be the most appropriate approach for design of block pavements. The Corps of Engineers flexible pavement design method is based on three principles. First, each layer must have sufficient strength to withstand the stresses developed by the traffic loads. Next, each layer must be compacted to a degree that ensures that the layer strength assumed in design is reached and that no densification with resulting surface settlement takes place under traffic. And finally, the materials used in each layer must meet requirements such as gradation and Atterberg limits that have been found necessary for adequate long-term performance. The difference between a concrete block-surfaced and an asphaltic concrete-surfaced flexible pavement is in the way loads are transmitted through the blocks and the asphaltic concrete. Consequently, all of the requirements in existing Corps of Engineers flexible pavement design manuals (3, 4) and guide specifications that deal with the last two principles remain unchanged.

The Corps of Engineers flexible pavement design method evaluates the strength of each layer in terms of the California Bearing Ratio (CBR). Boussinesq elastic theory is used to determine stress distribution within the pavement, and linear superposition is used to handle the effect of overlapping stresses at depth from multiple wheel loads. The empirical relation between CBR, load effects, and repetitions of load is based on the results of accelerated traffic tests conducted between 1940 and 1970 and is expressed as a cubic equation (5, 6). The traffic tests on which the CBR equation is based used a failure criterion of a 1-in. (25.4-mm) upheaval due to shearing. Consequently, pave-

ment thickness selected on the basis of the CBR equation is simply the thickness found necessary from past tests to avoid a given degree of shear failure in a material of the design CBR under the design load and repetitions.

4. MODIFICATION FOR BLOCKS

Although concrete block-surfaced and asphaltic concrete-surfaced pavements are both flexible pavements, several investigators have confirmed from pressure cell measurements that concrete block pavements appear to distribute surface loads to the base better than asphaltic concrete pavements. This superior load-distributing characteristic of block pavements should reduce the required thickness of pavement compared to an asphaltic concrete-surfaced pavement since the magnitude of stress at any point in the lower layers is reduced.

Knapton (7) compared the pressure measured under concrete paving blocks to the stresses under a conventional flexible pavement using a two-layer, elastic analytical model. From this comparison, Knapton developed his recommendation that for design the concrete block surface and sand laying course could be considered as equivalent to 6.3 in. (160 mm) of conventional asphaltic concrete and base. The Corps of Engineers adopted this suggested equivalency for use with their conventional CBR flexible pavement design method but rounded it off to 6.5 in. (165 mm) (1). No direct allowance for block thickness is made in the design calculation, but the block thickness is selected from the type and weight of vehicles that will use the pavement.

Adopting Knapton's (7) recommended design equivalency allows the Corps of Engineers to include consideration of block pavements within their existing manuals and guide specifications with only minor modifications. The three Waterways Experiment Station test items indicated that this design equivalency when combined with the Corps of Engineers CBR design method would underpredict actual performance, but it would provide a conservative design (2). A review of other potential design methods generally found that the current state of the art in design of concrete block pavements is rather primitive, and no other method appears sufficiently developed and tested to warrant adoption (2).

5. APPLICATION

The Corps of Engineers designs conventional roads, streets, and storage areas in terms of a design index. The design index of a road depends on the types of vehicles and amount of traffic that the pavement will support. Design index is defined in Table 1, and some suggested minimum concrete block thicknesses are also provided. It is now a simple matter to develop the concrete block design chart in Figure 1 by using the 6.5-in. (165-mm) equivalency and the conventional flexible pavement design chart that is published in the Army manual for flexible pavement design of roads, streets, and storage areas (3).

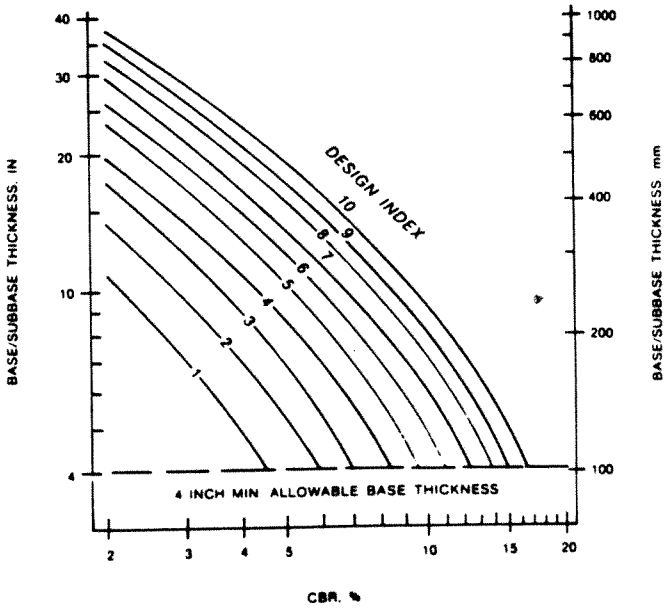


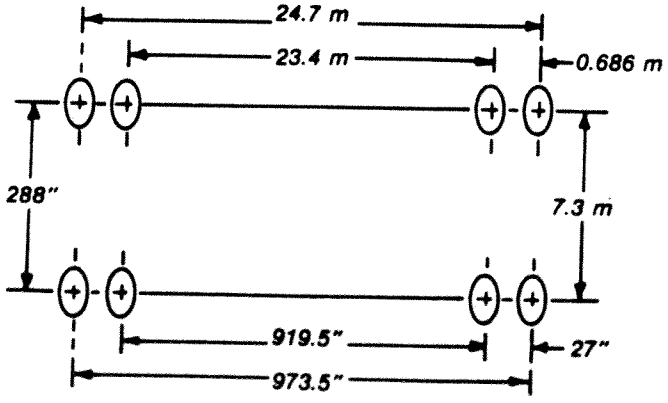
Figure 1: Concrete block pavement design curves for Army traffic design indexes

Table 1: Definition of design index

Design index	Typical traffic description*	Equivalent 18-kip single-axle loads	Suggested minimum block thickness
1	Passenger vehicles only, no trucks	3.10×10^3	60 mm
2	Up to 950 vehicles/day with up to 10% two-axle trucks	1.35×10^4	80 mm
3	Up to 2500 vehicles/day with up to 10% two-axle trucks	5.90×10^4	80 mm
4	Up to 4200 vehicles/day with up to 14% two-axle and 1% three- to five-axle trucks	2.60×10^5	80 mm
5	Up to 5800 vehicles/day with up to 14% two-axle and 1% three- to five-axle trucks	1.15×10^6	80 mm
6	Up to 5300 vehicles/day with up to 15% two-axle and 10% three- to five-axle trucks	5.00×10^6	80 mm
7	50,000-lb tracked vehicles and 30,000-lb forklifts	2.25×10^7	80 mm
8	80,000-lb tracked vehicles and 50,000-lb forklifts	1.00×10^8	80 mm
9	Up to 10 passes of 120,000-lb tracked vehicles/day	4.40×10^8	100 mm
10	Up to 100 passes of 120,000-lb tracked vehicles/day	2.00×10^9	100 mm

* Representative description only; complete description in Reference 3.

One major advantage of the Corps of Engineers CBR design method is that designs can be prepared for any type of vehicle and traffic pattern. Therefore, any type of concrete block pavement can be designed by first developing a conventional CBR design curve using the procedures published in a Waterways Experiment Station technical report (5) and then simply using the 6.5-in. (165-mm) equivalency to modify the curve for block pavements. For example, preparing a design curve for a Travelift CH1150 yard gantry with the design characteristics shown in Figure 2 would require the following steps. First an equivalent single-wheel load curve is prepared for the critical load configuration. Next the distribution of traffic and the wheel configuration are used to develop a pass-to-coverage ratio which relates the number of passes of a vehicle that are needed to apply one load repetition or coverage in the critical traffic areas of the pavement surface. For this example, the wander width of the vehicle is assumed to be 25 in. (635 mm) to represent the concentrated traffic lanes often encountered in cargo handling areas (8). The next step is to solve the CBR equation to provide a design curve relating CBR and thickness of required overlaying material for each desired level of traffic. Reference 5 describes in detail how to perform each step up to this point. Finally, 6.5 in. (165 mm) is subtracted from these curves to account for the block and sand laying course which leaves the required thickness of base and subbase needed for varying CBR values of traffic. Figure 3 shows the conventional CBR flexible pavement design curve for 50,000 passes of the Travelift CH1150 and the concrete block design curve for 200 and 50,000 passes. As can be seen, the block curves simply are displaced 6.5 in. (165 mm) from the conventional curve for any CBR value. A design example is provided as Appendix A to this paper.



GROSS WEIGHT = 223,200 LB (101,242 Kg)
SINGLE-WHEEL LOAD = 40,365 LB (179.6 KN)
TIRE INFLATION PRESSURE = 146 PSI (1007 KPa)
CONTACT AREA = 280 IN.^{2} (0.18 m^2)
PAYLOAD = 67,200 LB (30,481 Kg)

Figure 2: Design characteristics for Travelift CH1150 yard gantry

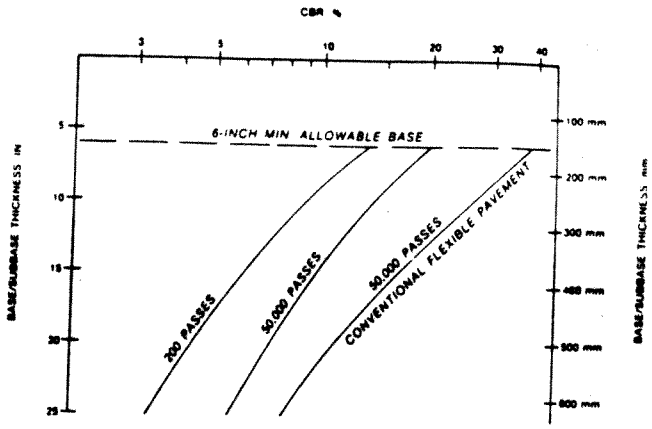


Figure 3: Conventional and concrete block design curves for CH1150 yard gantry

6. DESIGN IMPROVEMENTS

The Corps of Engineers' use of Knapton's 6.5-in. (165-mm) equivalent thickness for block pavements is an expedient design solution that provides a conservative design and that does not require major modifications to other Corps specifications such as material quality or degree of compaction. Although it is a usable interim design solution, improvements in design are still needed. Completely theoretical design approaches using elastic layer, finite difference, or finite element analytical models do not appear promising because of the difficulty of defining material properties for the block layer and because the block layer increases in stiffness under traffic. Theoretical design approaches have been proven difficult to apply to conventional pavement design and can be expected to be even more difficult to use with block pavements. The most promising immediate approaches to design improvement appear to be either continued use of equivalent thickness for the blocks or development of an empirical or semiempirical design based on carefully controlled traffic tests.

Knapton (7) based his equivalent thickness on measured pressures compared to a two-layer elastic solution to the problem. More extensive testing (9, 10) of this type generally confirmed Knapton's findings. Pressures under the block and sand layer in these tests generally are between 50 to 60 percent of the applied surface load depending on the stiffness of the underlying layers. Knapton's original assumptions concerning modular ratios and thickness of the surface layer can be avoided by using a Boussinesq solution for a circular load on an elastic half space, and this finds that the stresses at 50 to 60 percent of the surface stresses are at a depth of 1.1 to 1.3 times the radius of the loaded area. For the loading areas used by Knapton (7) and Clark (9, 10), this would correspond to a depth or effective thickness of the block surfacing between 5.3 in. (135 mm) and 7.8 in. (198 mm) roughly agreeing with Knapton's equivalency. All of the tests run with block pavements have used contact loading areas between 62 and 113 sq in. (.040 and .073 m^2) which covers the expected

range for normal highway traffic. However, many industrial vehicles used for cargo handling will have tire contact areas much larger than this. For example, the Hyster H 620B forklift has a contact area of 224 sq in. (.144 m^2) and the LeTro Crane GC-500 has a tire contact area of 1275 sq in. (.823 m^2) (8). These larger-tired vehicles may have a different equivalency than 6.5-in. (165 mm) currently used.

Clark (10) reported that only those blocks that were in contact with the loading plate were effective in transmitting load to the base. There was apparently little or no load carried over to blocks outside of this area. If this is true in general, then the stress reduction caused by the blocks depends primarily on the number of partially loaded blocks around the circumference of the load. The area of the partially loaded blocks around a circular load can be added to the load to provide an equivalent and equal circular effective loaded area. If the radius at the loaded area changes, the difference in radius between the loaded area and effective loaded area should remain constant since the pattern of partially loaded blocks on the circumference of the load should not change when the radius of the loaded area changes. The data reported by Clark (10) can be used to calculate this constant difference in radius as 2.36 in. (60 mm) for an average of 21 tests covering different block shapes and thicknesses and different base stiffnesses. This was used in Figure 4 to show that as the diameter of the loaded area increases the effective block thickness also increases. Standard plate load tests with 30-in.-diam (762-mm) plates were run on the surface of the blocks and base course for each test item during the Waterways Experiment Station tests, and the average ratio of the block surface results to the base course results was 1.30 (2). This compares well with the value of 1.34 that would be calculated from Figure 4. A number of approximations, simplifications, and the Boussinesq stress solution were used to develop Figure 4, so tests with larger diameter plates than used in past tests are needed to confirm or reject the trend shown here.

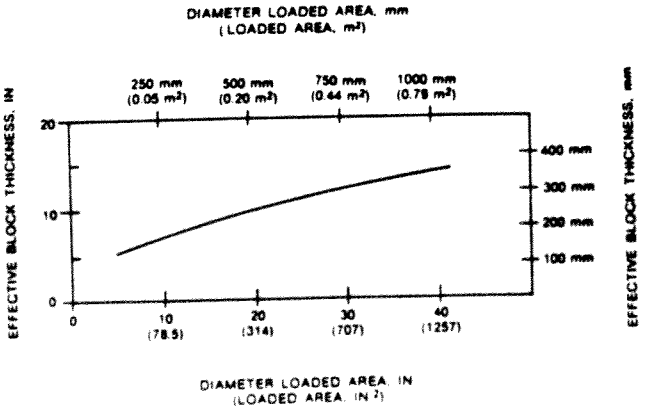


Figure 4: Influence of loaded area size on effective block thickness

Figure 5 from Reference 2 shows trafficking data reported by several investigators. There appears to be some potential for developing an empirical relation between thickness, CBR, load, and traffic levels. However, there are gaps in the data that must be filled, tests of this kind are expensive, and more work is needed to develop good usable relationships.

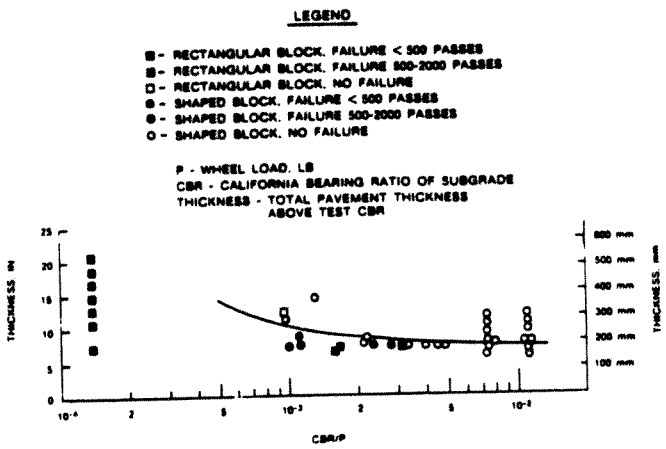


Figure 5: Performance of selected concrete block test items

Several investigators have reached different conclusions concerning the effect of block thickness and shape. At the present time information is not extensive enough to quantify these factors in a design procedure. For example, in Figure 5 most of the shaped blocks have been tested under favorable conditions such as high CBR or low load, while most of the rectangular blocks appear clustered under unfavorable conditions of low CBR or high load. This makes determining a quantitative effect of block shape impossible with the present test data.

7. CONCLUSIONS

The Corps of Engineers has adopted a simple equivalent thickness for concrete blocks that can be used with their conventional CBR flexible pavement design method. This approach provides a conservative design and requires no major changes for existing specifications and manuals. It is an effective interim approach, but more work is needed to determine if new equivalent thicknesses are needed for large contact area tires and to quantify the effect of block shape and thickness.

APPENDIX A

8. DESIGN EXAMPLE

Prepare a design for concrete block pavements for a road with a design index of 8 and for a storage area where aisles will be subjected to 50,000 passes of a CH1150 yard gantry. The subgrade has a CBR of 6 percent, and available construction materials are a sand with a design CBR of 20 percent for the subbase and a crushed stone with a design CBR of 100 percent for the base.

9. ROAD DESIGN STEPS

(1) Figure 1 requires 13 in. (330 mm) of base and subbase over 6 CBR.
(2) Reference 3 as shown in Figure 1 requires a minimum 4 in. (102 mm) base so subbase thickness will be 9 in. (228 mm) (13-4).
(3) Table 1 suggests 80 mm (3.1 in.) thick block.
(4) Final design: 80 mm (3.1 in.) block, sand laying course, 4 in. (102 mm) crushed stone base, 9 in. (228 mm) sand subbase.
(5) If cement or bituminous stabilization of the base or subbase is desired, Reference 3 provides appropriate procedures.

10. STORAGE AREA DESIGN STEPS

(1) Figure 3 requires 23.5 in. (597 mm) over a CBR of 6.
(2) Figure 3 requires 6 in. (152 mm) of base over a CBR of 20.
(3) Sand subbase thickness will be 17.5 in. (445 mm) (23.5-6.0).
(4) Because of large wheel loads, suggest 100 mm (3.9 in.) blocks and guidance of Reference 4 for minimum base thickness, base and subbase quality requirements, design for stabilizing materials with cement or bitumen, etc.
(5) Final design: 100 mm (3.9 in.) block, sand laying course, 6 in. (152 mm) of crushed stone base, 17.5 (445 mm) sand subbase.

11. REFERENCES

(1) Department of the Army. 1979. "Use of Precast Concrete Block Pavements," ETL 1110-3-310, Office, Chief of Engineers, Washington, D.C.

(2) Rollings, Raymond S. 1983. Concrete Block Pavements, Technical Report GL-83-3, USAE Waterways Experiment Station, Vicksburg, Mississippi.

(3) Department of the Army. 1980. "Engineering and Design, Flexible Pavements for Roads, Streets, Walks and Open Storage Areas," TM 5-822-5, Washington, D. C.

(4) Department of Defense. 1978. "Flexible Pavement Design for Airfields," TM 5-825-2, Washington, D. C.

(5) Pereira, A. Taboza. 1977. "Procedures for Development of CBR Design Curves," Instruction Report S-77-1, USAE Waterways Experiment Station, Vicksburg, Mississippi.

(6) Ahlvin, R. G., et al. 1971. Multiple-Wheel Heavy Gear Load Pavement Tests, Technical Report S-71-17, 5 volumes, USAE Waterways Experiment Station, Vicksburg, Mississippi.

(7) Knapton, J. 1976. The Design of Concrete Block Roads, Report No. 42.515, Cement and Concrete Association, Wexham Springs, United Kingdom.

(8) Brown, D. N., et al. 1972. "Relative Surfacing Requirements for Container-Handling Vehicles," Miscellaneous Paper S-72-34, USAE Waterways Experiment Station, Vicksburg, Mississippi.

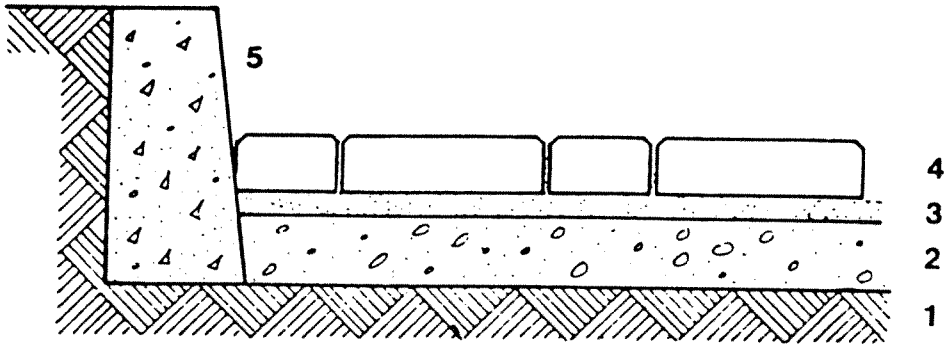
(9) Clark, A. J. 1978. "Block Paving Research and Development," Concrete, Vol. 12, No. 7, Cement and Concrete Association, United Kingdom, pp. 24-25.

(10) Clark, A. J. 1981. Further Investigations into the Load-Spreading of Concrete Block Paving, Technical Report 545, Cement and Concrete Association, Wexham Springs, United Kingdom.

FIVE KEY ELEMENTS MAKE UP PAVING

Five key elements make up paving.

1. Sub-grade - the natural earth material found on site.
2. Sub-base - a layer of gravel.
3. Sand bedding - a layer of graded sand.
4. Pavers - the surface wearing course.
5. Edge restraint - the support used around the perimeter of the paving.



PREPARATION

* Decide the area you wish to pave.
* Choose the paver type, color, and laying pattern.
* If possible vary the dimensions or layout to take advantage of using as many edge pavers as possible.
* Check the sub-grade conditions to determine if a sub-base is required.
* Complete the pavement design including drainage and edge retraints.
* Calculate the quantity of all materials required.
* Schedule delivery of the materials and equipment.

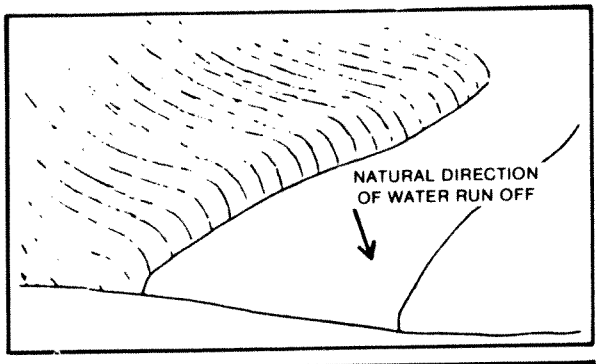
DRAINAGE

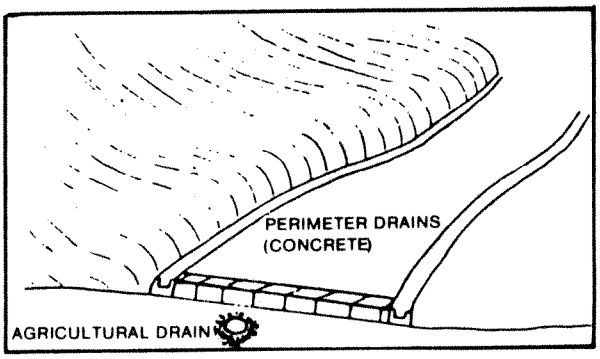
With paving, as with all types of pavement, adequate drainage is required for good performance.

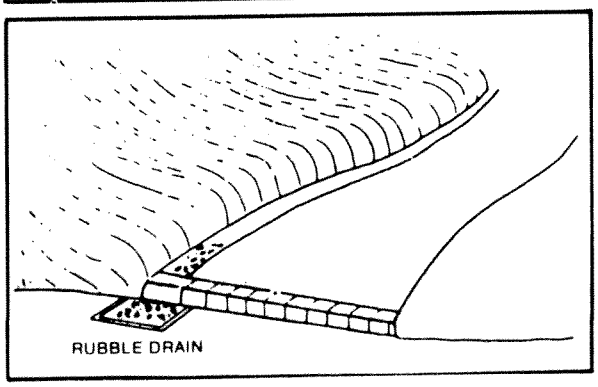
Accumulation of water or erosion of soil and base material from beneath the pavement surface can cause settlement and ultimate failure of the pavement surface. If there are poorly drained areas sub-grade drainage or perimeter drains are often required to remove this water from the pavement base.

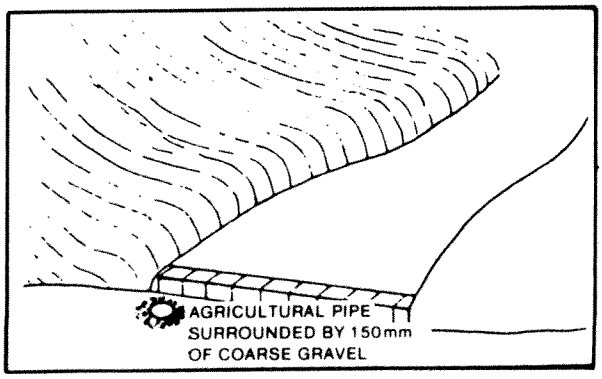
Experience has also shown that despite the granular nature of the bedding for paving there is very little penetration of water through the joints between the pavers so allowance must also be made for surface drainage. It is recommended that all paving have minimum grades of 2% (1/4" per foot)(20 mm per meter).

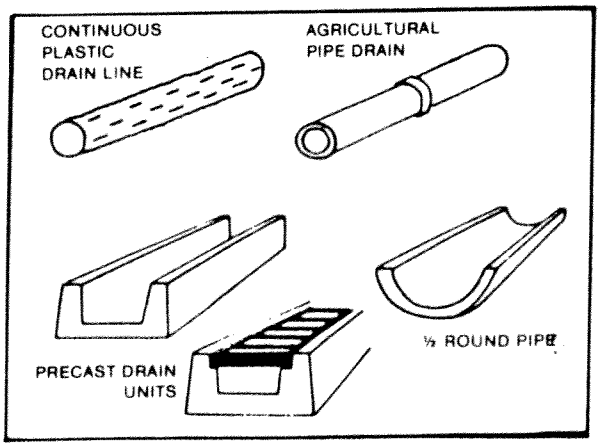
Some accepted methods of drainage are illustrated.











CONSTRUCTION
GRADES

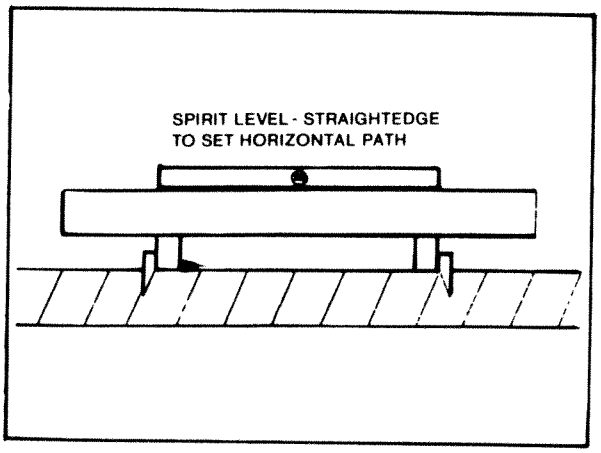
Grades and falls are set in several different ways.

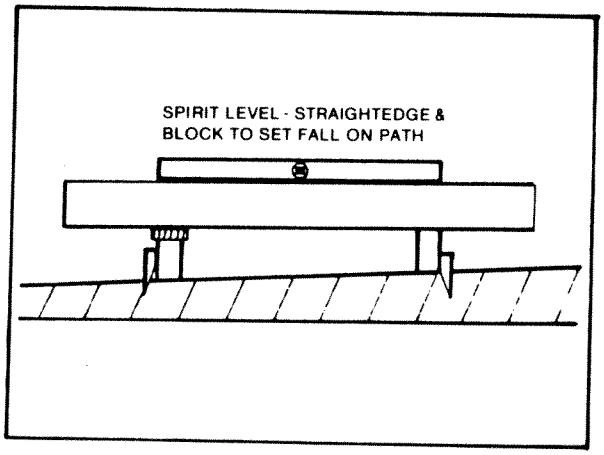
Spirit Level - the simplest and most common way to set grades. To set a fall, a block of wood equal in thickness to the fall required is placed on the lower form. When the form is adjusted to bring the straight edge and the spirit level to the right level, the correct fall is set.

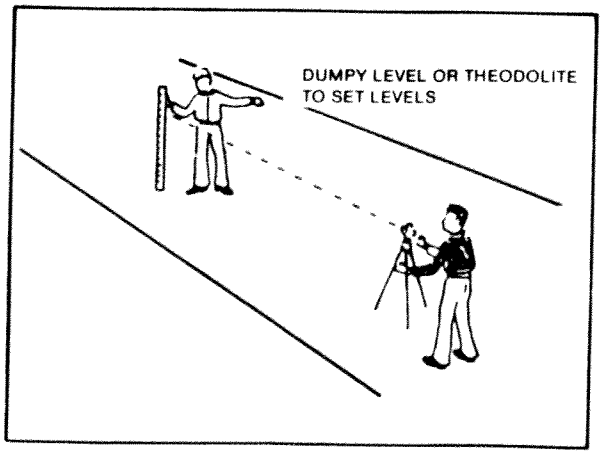
Spirit levels are inaccurate and difficult to use over longer distances so it is better to use another method of setting grades.

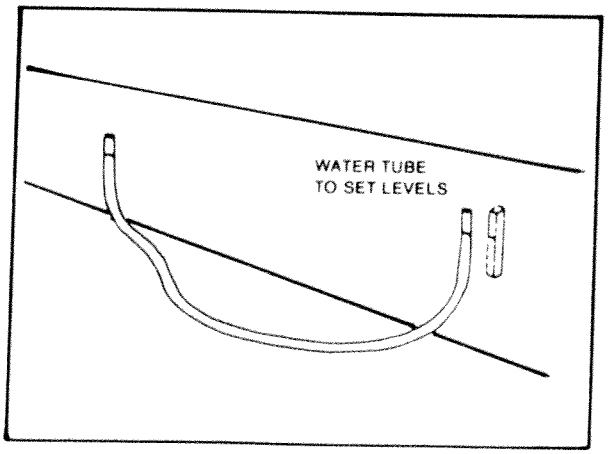
Water Tube - an inexpensive way of setting grades is to fill a clear plastic tube with water and use the water level in the tube to transfer the levels from one point to another. With this method, line of sight is not required to set the levels as the tube can be run around corners or over obstructions without affecting accuracy.

Builders Levels - are very accurate instruments and are the best to use to set grades, particularly on larger projects.



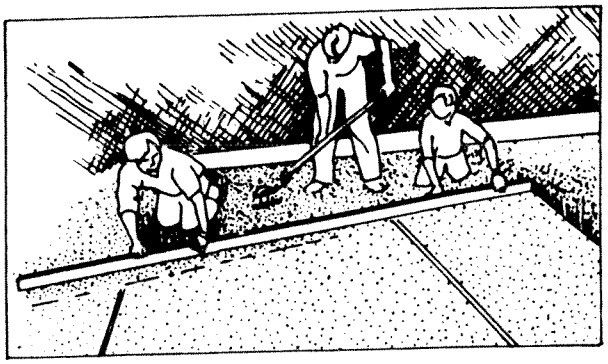


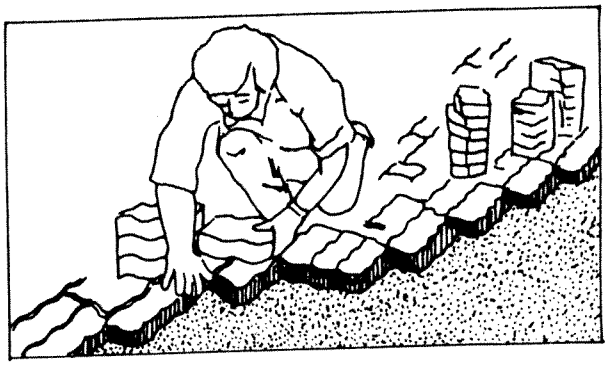




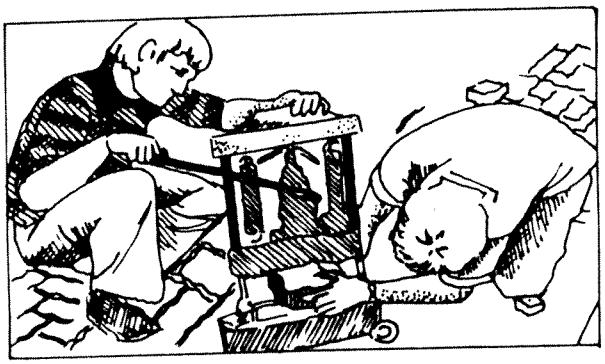
STANDARD INSTALLATION METHOD

1. Prepare the sub-base and then screed the sand bedding.

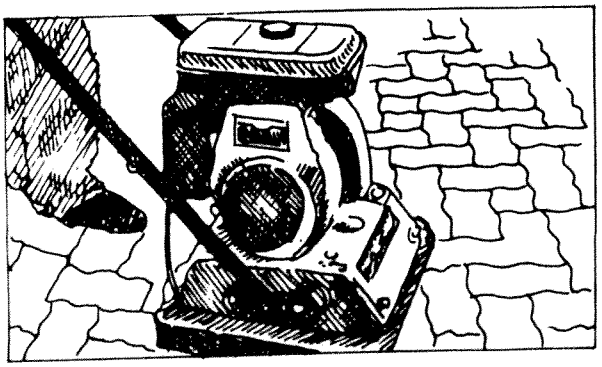




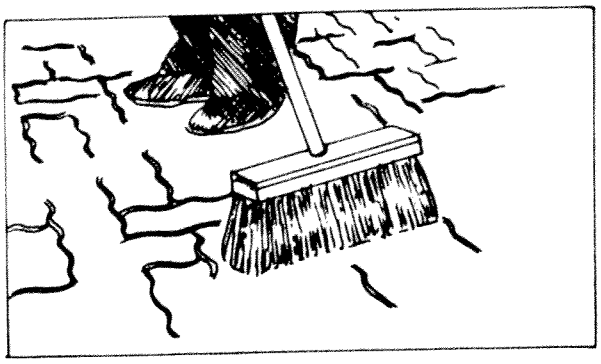
2. Lay the pavers.



3. Cut pieces to fit the edges.



4. Vibrate the pavers to their final level.

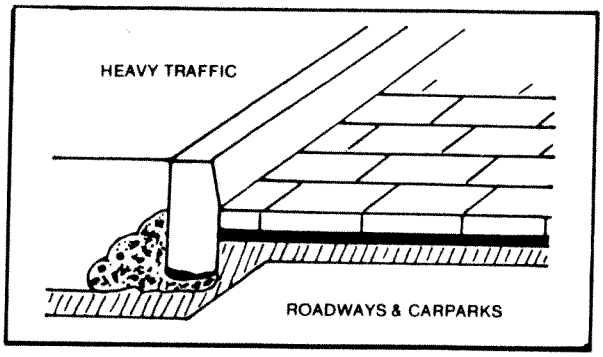


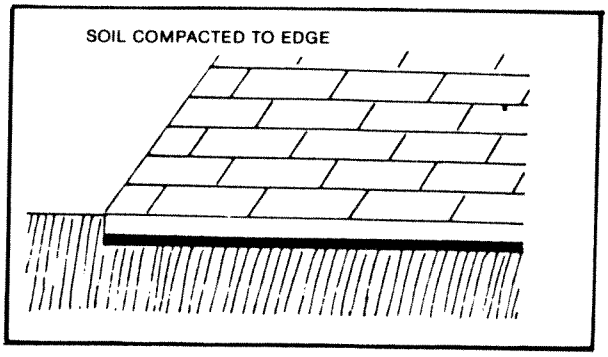
5. Sweep sand into the joints and vibrate it into place.

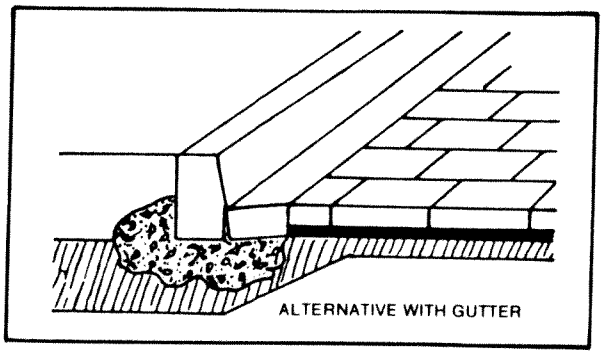
EDGE RESTRAINTS

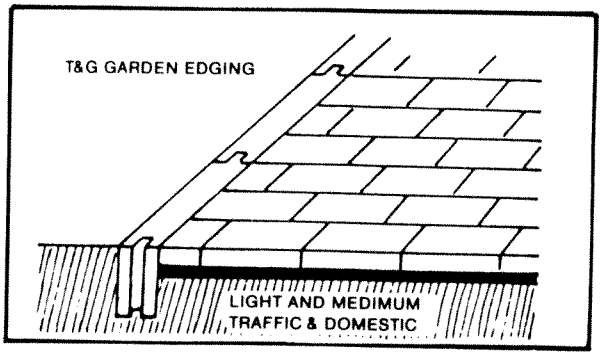
Various types of edge restraints are illustrated and the choice of which design to use is decided by the type of loading, life, aesthetic appeal, and cost.

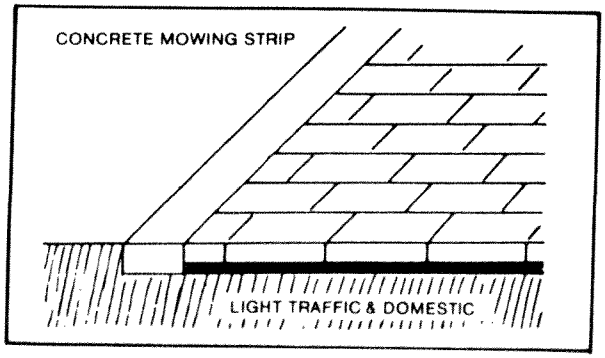
The various types shown have all been used successfully in particular applications.

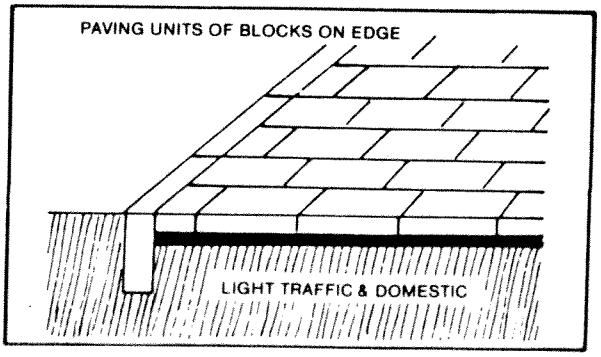


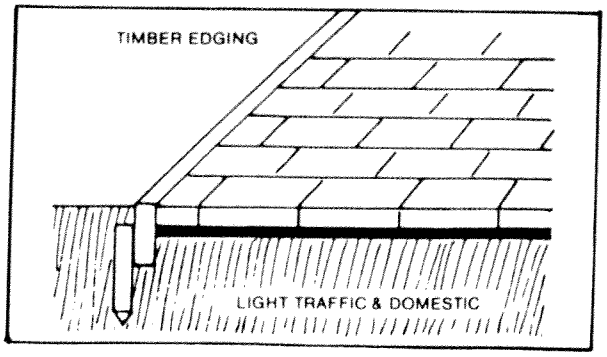


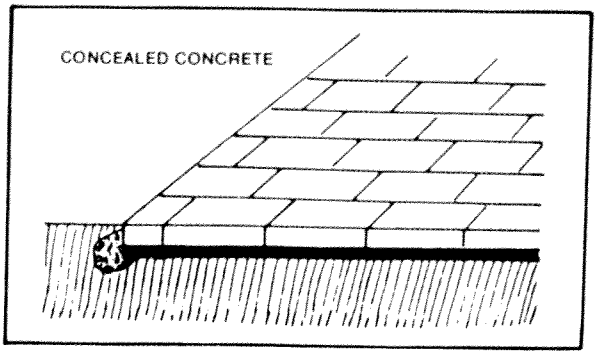








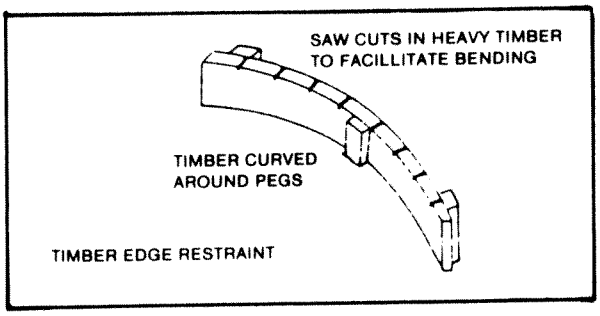


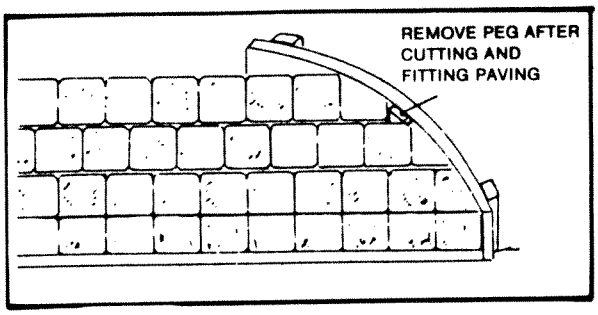


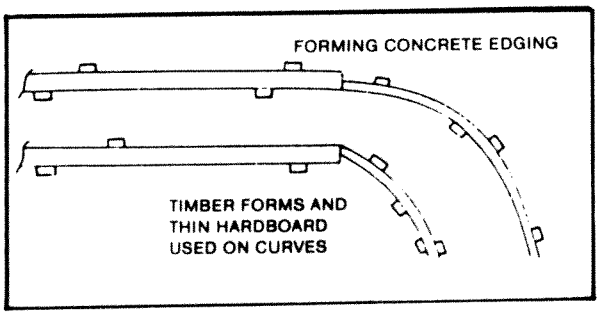
Whenever continuous edge restraints are to be used it is better to install them before paving work begins. In this way the edging can be used for reference levels, and often as a screeding surface for the sand bedding.

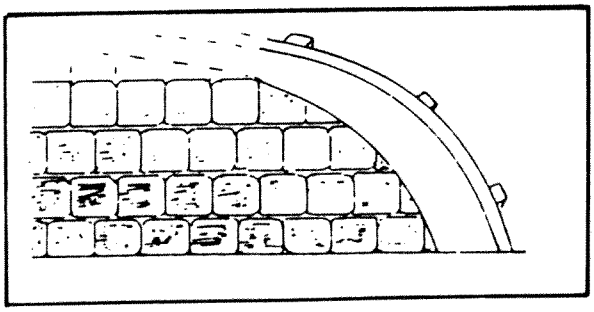
If a concrete edge restraint is to be placed after the pavers are in place, care must be taken to ensure that this concrete does not get on to the pavers and cause staining. Protect the pavers with plastic sheeting, it can be trimmed or removed after the concrete has cured.

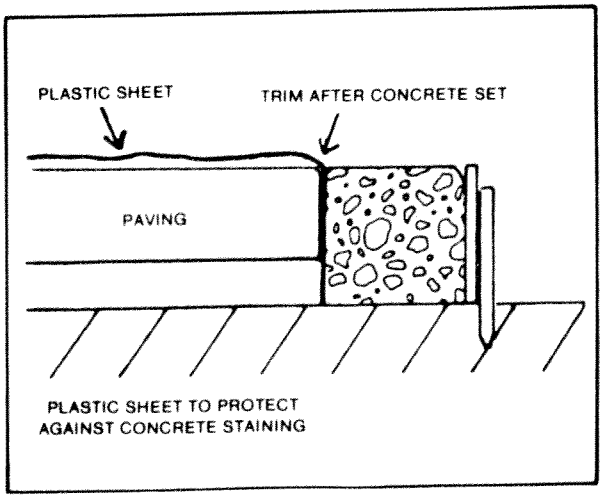
Timber edge restraints may be bent to form curved edges without cutting. Heavier timbers may need saw cuts through on the back of the curve to allow the timber to bend. Pegs positioned on the curve control bend until the paving is in place.











EXCAVATION AND BASE PREPARATION

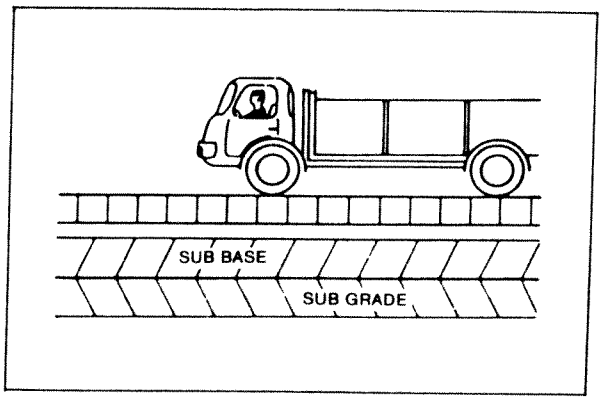
Excavate all surplus and unsuitable material to the design levels. If no sub-base is required, the depth should be 3-1/2" (90 mm) below finished grade for 2-3/8" (60 mm) pavers, and 4-1/4" (110 mm) below finished grade for 3-1/8" (80 mm) pavers.

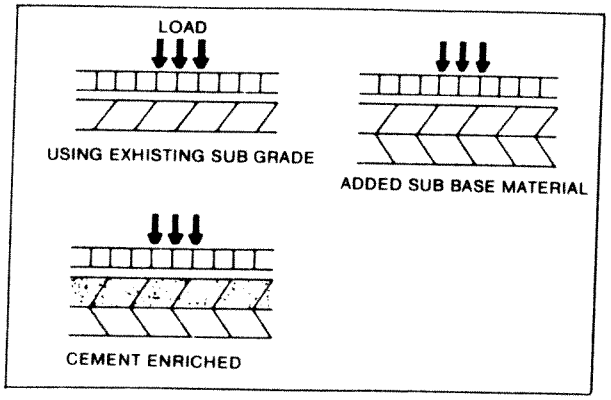
If sub-base is required this level will then be the top of the compacted sub-base.

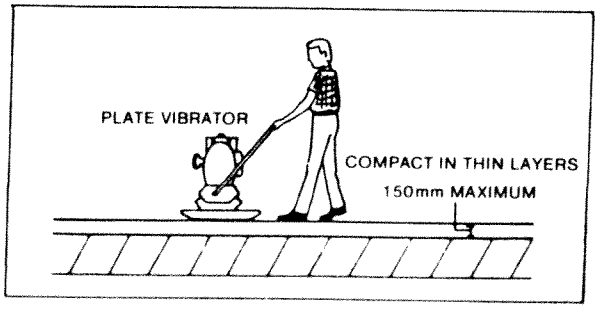
Compact the sub-grade with the necessary compaction equipment to achieve the specified density required for design loads.

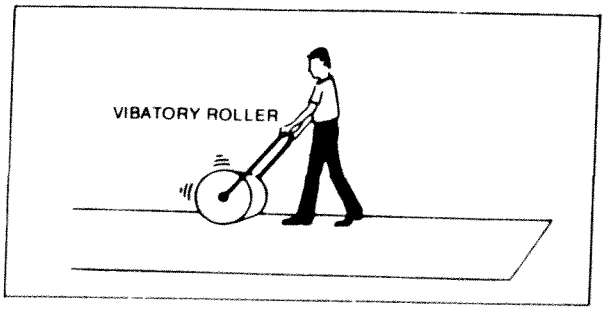
Place the sub-base in layers not exceeding 6" (150 mm) and compact to the design density.

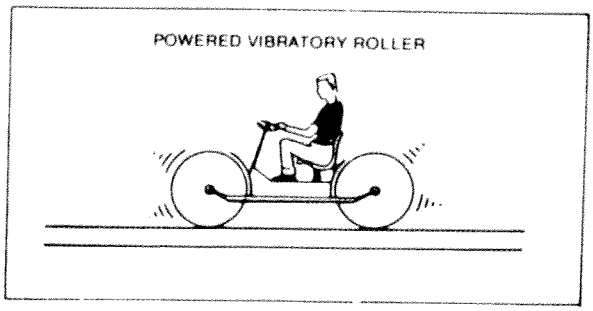
It is important to remember that the finished pavement surface will follow closely to the profile of the sub-base. Bumps and hollows in the sub-base will produce corresponding bumps and hollows in the finished job. The surface of the sub-base should be trimmed to within 3/8" (10 mm) of the design profile.

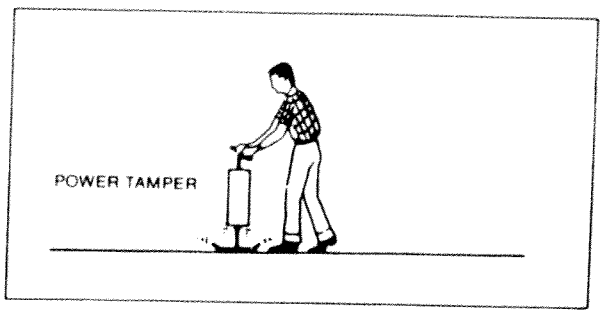












SAND BEDDING

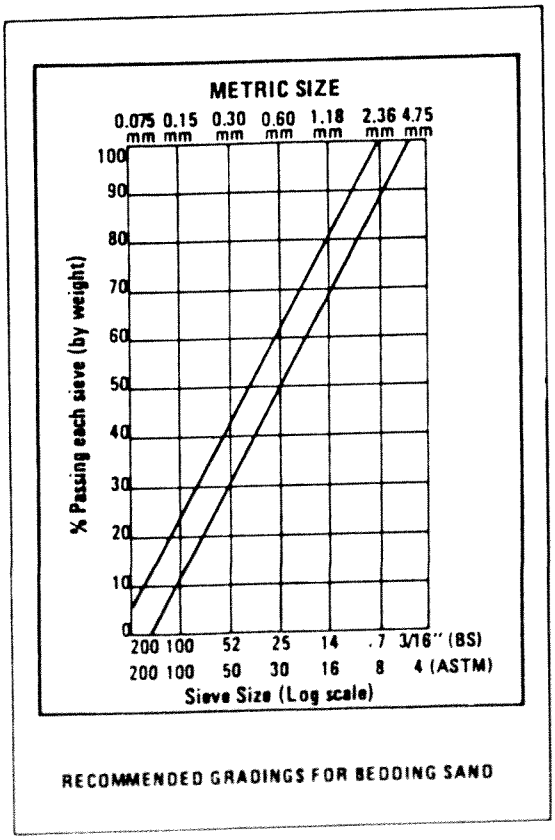
DELIVERY

The sand used for bedding should meet the recommended grading limits. Generally, any sand suited for concrete manufacture is acceptable for bedding.

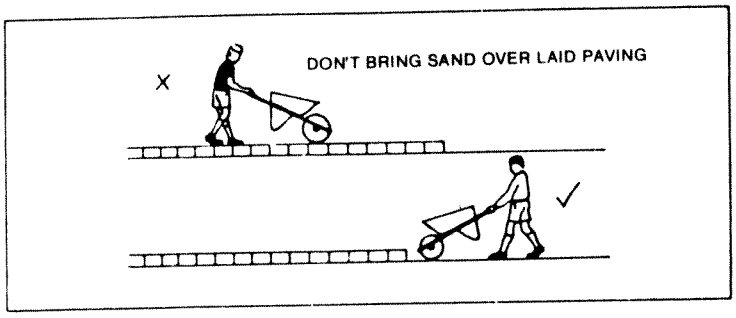
It should contain enough moisture to cling together when compressed lightly in the hand and not fall apart when the hand is re-opened. Sand which is too wet will not screed properly while sand which is to dry will not compact.

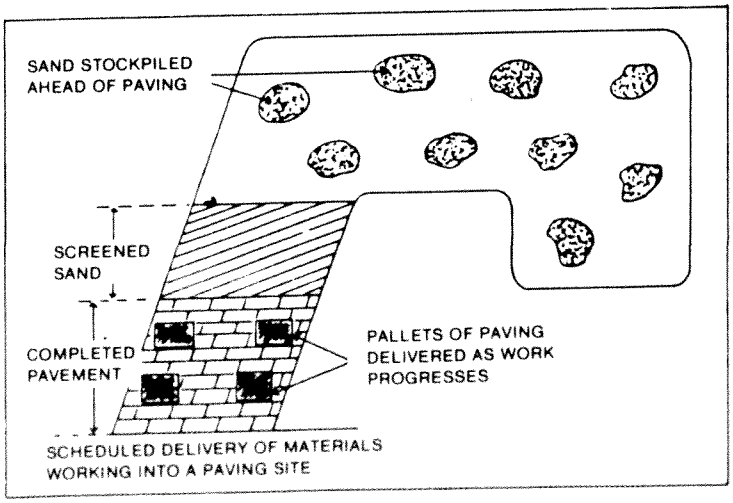
Sand is usually delivered to the job site in large bulk loads. Whenever possible sand should be unloaded in small piles spaced over the area to be paved in order to minimize further handling. Unless alternative success is available, enough sand should be stockpiled ahead of the paving to avoid delivery over the laying face.

For 1-1/2" (40 mm) of sand bedding and joint filling, allow approximately 1 cubic yard (1 cubic meter) of sand for each 150 square feet (18 sq m) of paving area.



RECOMMENDED GRADINGS FOR BEDDING SAND



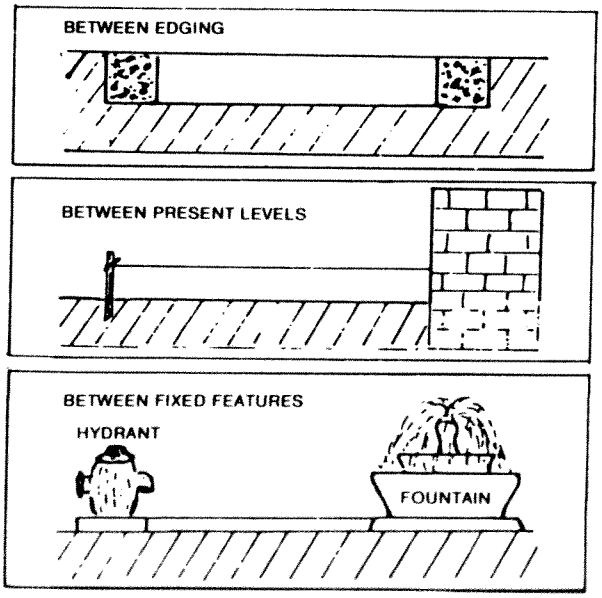


LEVELS

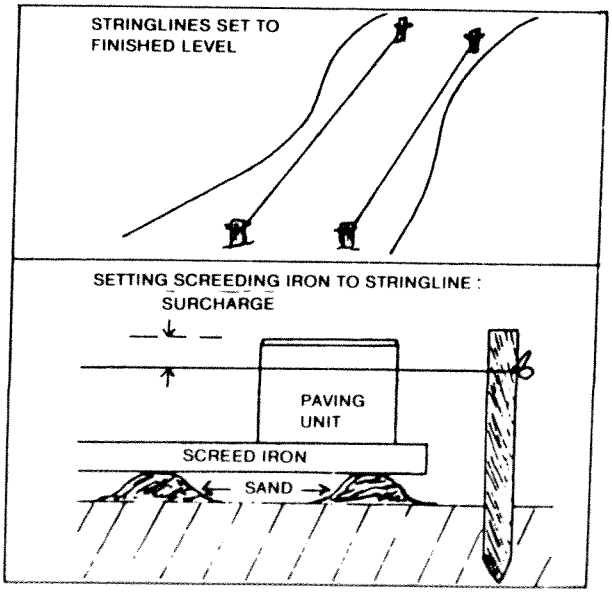
Levels for the bedding sand are set with string lines stretched between edge restraints and other existing surfaces, or those levels set for the preparation of the sub-base height.

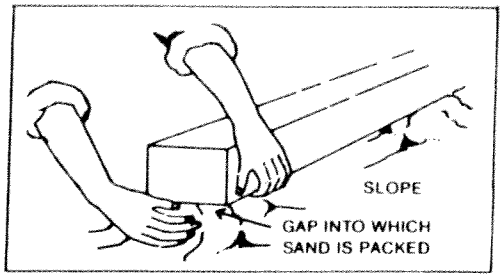
Screeding rails or timbers are laid along under the string line and supported at 3 ft (1 meter) intervals by small sand piles. Using a paver check the height from the screeding rail to string line making allowance for the surcharge just determined. Adjust the height of the screed rail by adding a little more sand to each pile or by working the rail down into the sand. When the height coincides with the paver thickness plus surcharge, plus 1 inch (30 mm), pack sand under and around the screed rail with the fingers of each hand until the rail is supported over its whole length. Good support under and along each rail prevents its movement when screeding, and thus prevents depressions and incorrect levels in the pavement.

Using the paver, again check the heights of the screed rails to ensure they have not moved while placing the sand around them. Now, distribute sand over the area to be screeded but only about 3 ft (1 meter) in front. In other words, the distance you can reach without kneeling in, and thus compacting the sand. Using a rigid, straight board (2" x 4") which spans the distance between screeding rails, level the sand by drawing the screed board directly towards you. See-sawing of the board is slower and will cause uneven compaction of the sand bed. As small pockets or holes appear behind the screed, throw more loose sand onto the area and rescreed. Loose or poorly compacted areas should be treated in the same manner.



SETTING STRINGLINES





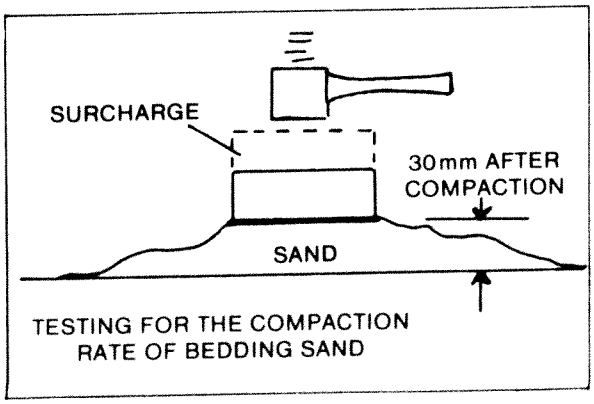
SCREEDING

This operation provides the bed of sand on which the pavers are laid and is very important to the quality of the finished pavement.

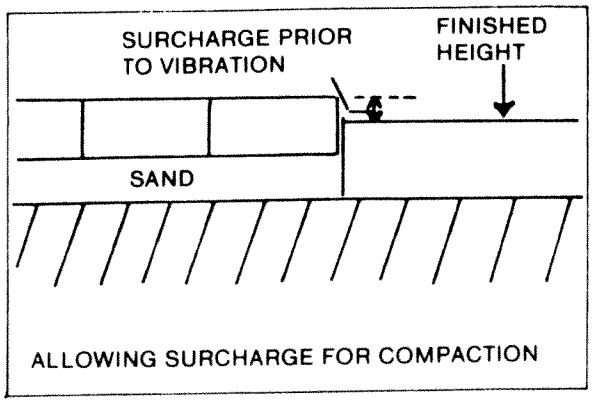
The depth of the sand must be adjusted according to the amount the sand will compact down when the paving is vibrated. To determine this depth, place a heap of the bedding sand onto the ground and spread it approximately to the 1-1/2" (45 mm) thickness required. On this sand place a paver and measure the height from the ground to the top surface of the paver. Now tap the paver down with a rubber hammer using short sharp bumps as if using a vibrator. When the paver stops settling down into the sand, the measurement from the ground to the top surface should again be checked. The difference between the two measurements is the compaction rate of the sand and is termed 'surcharge'.

The actual depth of sand required before compaction is now set by adding together the paver thickness, the sand bed thickness (usually 1" (30 mm)) and the surcharge.

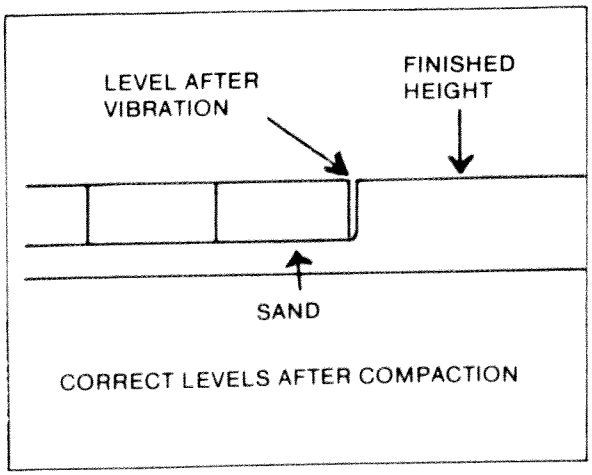
Levels should be checked regularly as laying proceeds. If levels change due to variation in the sand type or moisture content, then the surcharge will change and pavers may have to be lifted and the sand raked and rescreeded to the new levels before the pavers are relaid.



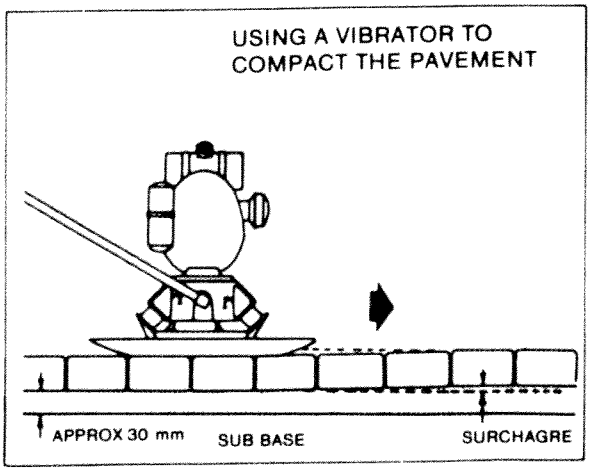
TESTING FOR THE COMPACTION RATE OF BEDDING SAND



ALLOWING SURCHARGE FOR COMPACTION



CORRECT LEVELS AFTER COMPACTION



Too much sand in front of the screed board will cause the board to bend which in turn will produce a cambered surface. It is better to take two or three passes with the screed board to ensure a true surface, flat and evenly compacted.

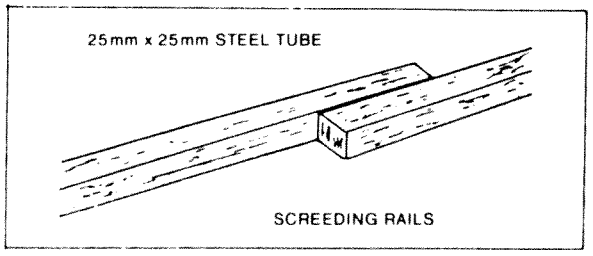
Watch for movement of the screeding rails as work progresses. If movement occurs, recheck the levels and adjust and repack the rails.

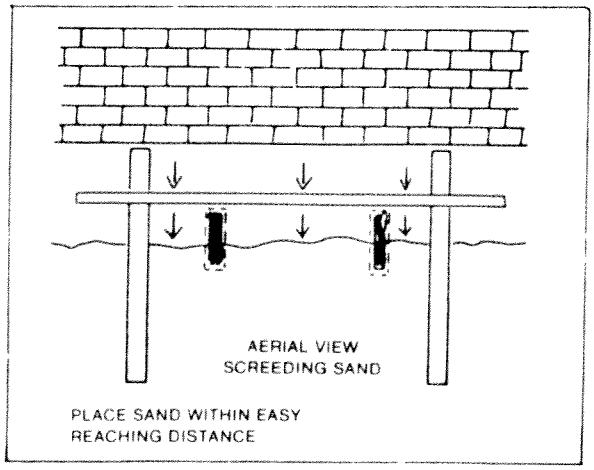
When screeding up to a fixed edge, check that the sand is properly filled and screeded in the corners. Hollow spots or bridging can occur and will result in the pavement settling lower than desired on the edges after vibrating.

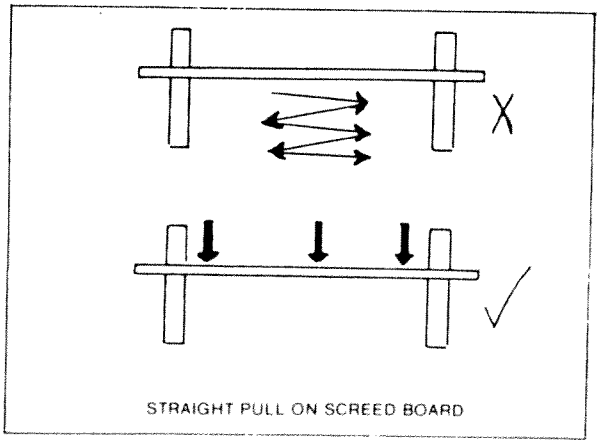
Excess sand left along edges and against walls by the screeding board is best removed with a steel float or trowel. A steel float is handy to slip under the excess, remove it and then smooth out any irregularities.

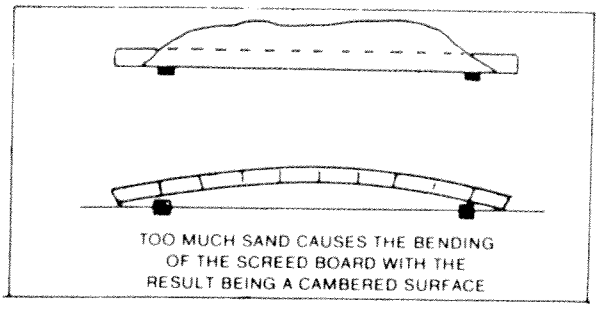
When the area to be screeded is wider than the screeded board, the board can be cantilevered over one screed rail to level the outlying areas. One man holds the screed board tight onto the screed rails and draws it along while the second man holds the opposite end level with the already screeded area. When screeding up to existing edge restraints, curbs or sidewalks surfaces should be checked for levels. It may be necessary to adjust sand levels locally to ensure the paving finishes and blends with the edging.

IMPORTANT - Standing or walking on the sand bed before and after screeding, will result in areas of differing compaction. These areas can then affect the levels of the finished pavement and therefore must be loosened up with a rake to ensure even compaction.





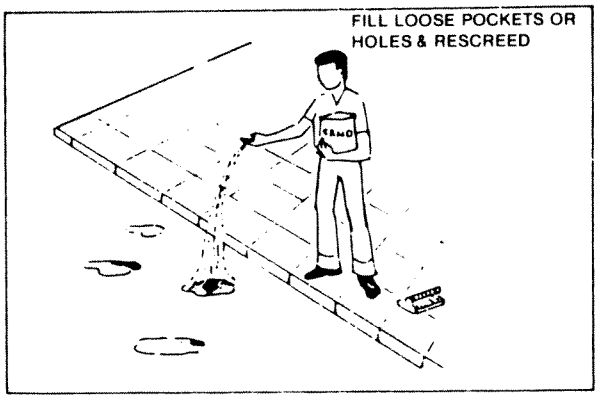


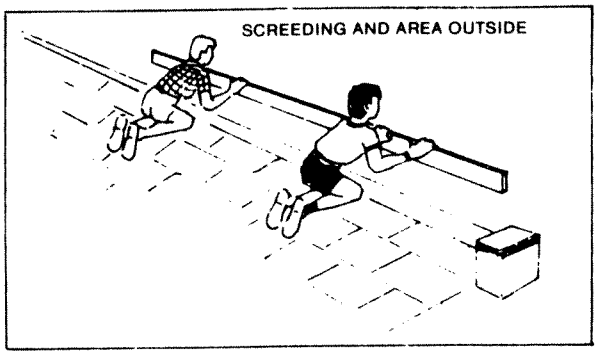


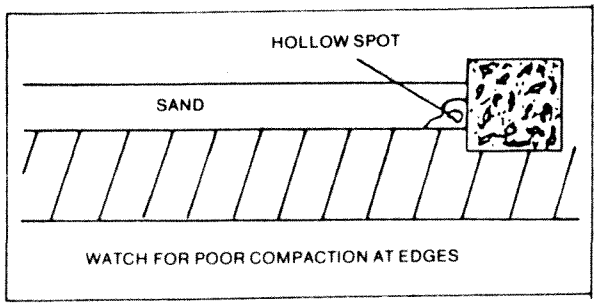
After screeding the area, the screeding rails should be carefully removed by sliding them along their longitudinal axis. If continuing on in the same direction, about 20 inches (500 mm) of the rail can be left in the groove and reset to height using the screeded surface as a guide. When an area parallel to the screeding rails is to be screeded then leave the closest screed rail in position and reset another in the new area.

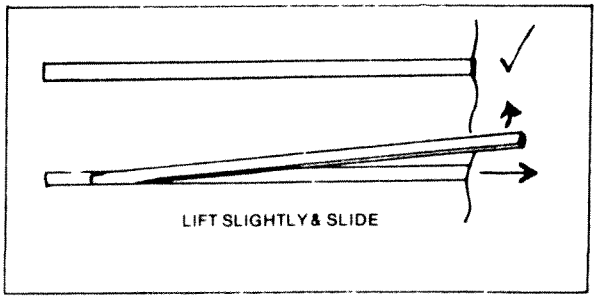
Carefully fill in and level off the grooves remaining from the removal of the screeding rails. A wooden or steel float is best for this purpose to obtain a smooth surface.

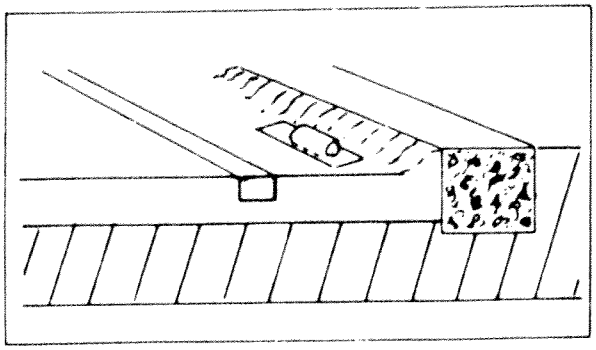
Where a pile of sand has been placed and later spread, the sand from the base will be compacted by the weight of the original pile. This base must be loosened up with a rake to ensure uniform compaction when screeding.

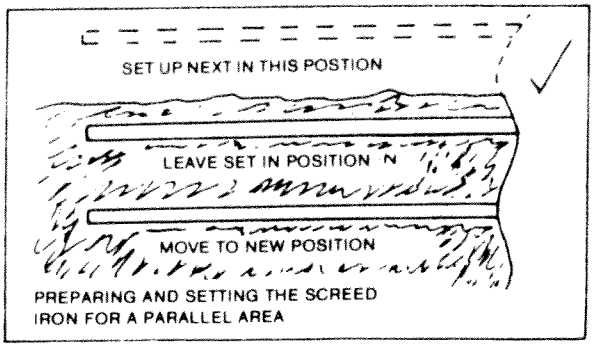












PAVERS

DELIVERY

Pavers are delivered to the site in 100 square feet (10 meter) bundles, usually without a pallet.

Wherever possible these bundles should be placed along the work site, stacked in single heights, where they will be readily accessable as the work proceeds.

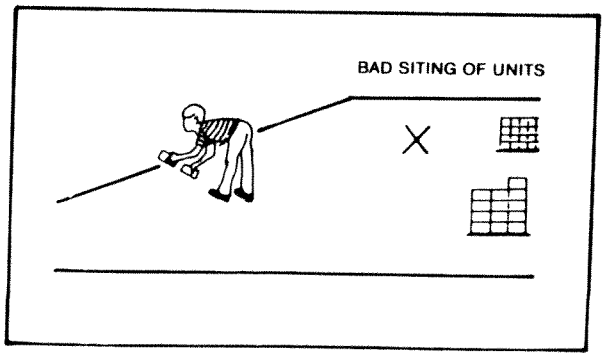
Paving done on a slope should be arranged to lay the pavers uphill to prevent the opening of the joints by gravity or movement of the laying crew.

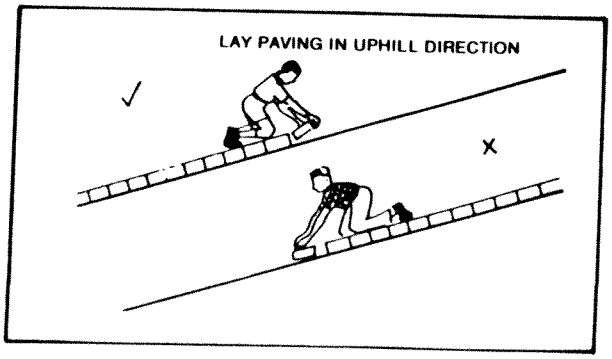
On larger jobs, delivery can be scheduled as work progresses. The pavers can then be delivered over the finished pavement and placed close to the laying face.

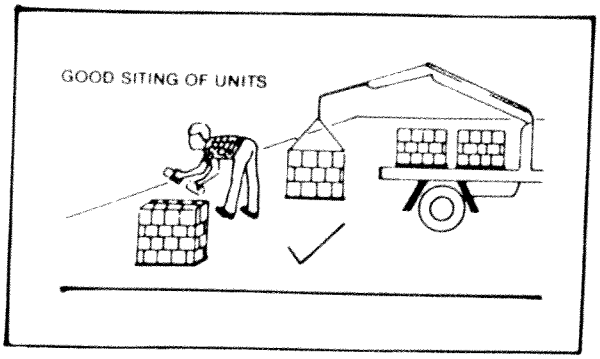
Calculate the total area of paving to be done and measure the amount of edge where standard edge pieces can be used. If the perimeter of the area can be moved to a paver module it will be possible to use edge pieces on each edge. If the area to be paved is located between fixed edges it will be necessary to cut the pavers to fit and edge pieces will only be required to start.

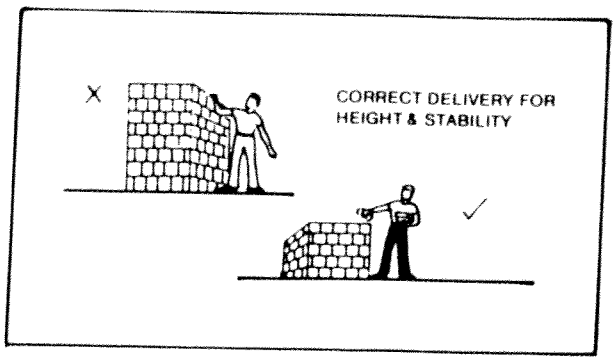
Some extra pavers should be ordered to allow for the waste that results from cutting. This usually requires approximately 20 square feet (2 sq m) for every 100 linear feet (30 m) of cut edge. Some broken pavers can be expected in every bundle. These broken pavers should be saved for cutting.

Your supplier of paving will assist in calculating the amount of regular and edge pieces required for the job.









HANDLING

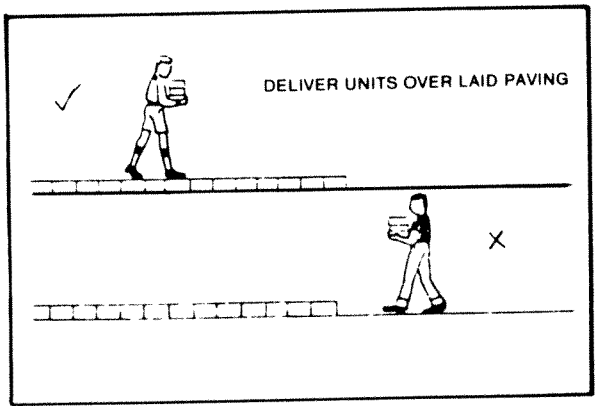
Pavers are taken from the bundles and transferred to the laying face over the previously completed pavement. This transfer is done by various methods depending on the layout and size of the job.

By hand - Pavers are carried to the laying face in stacks of six to eight pieces. The stack of pavers is placed on a single 'key' paver in an offset fashion, so that the stack can be released without jamming the fingers.

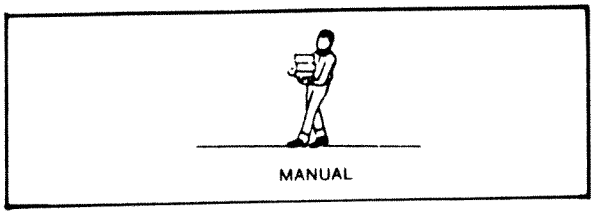
Wheelbarrow - The stacks of pavers are placed in a wheelbarrow and transported to the laying face. If two wheelbarrows are available, the pavers can be laid directly from the wheelbarrow which saves double handling.

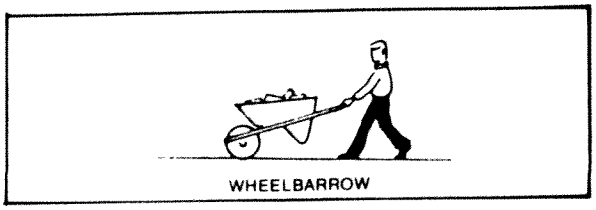
Bundle buggies or hand trucks - Heavy duty hand trucks or specially built bundle buggies can move 20 square feet (2 sq m) per trip. These methods are best suited to relatively large level sites.

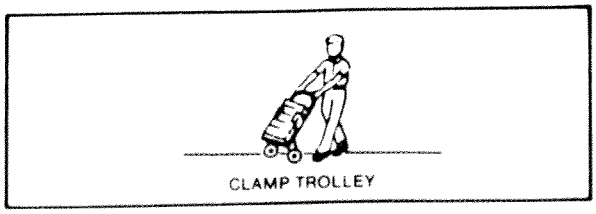
Fork lift - On large jobs or on jobs with limited access for delivery trucks, the bundles can be placed on pallets and moved with a fork lift to the laying face. The weight of a fork lift with a pallet of pavers make it mandatory for the surface where the fork lift will be travelling to be completed in order for the pavement to withstand this load without rutting.

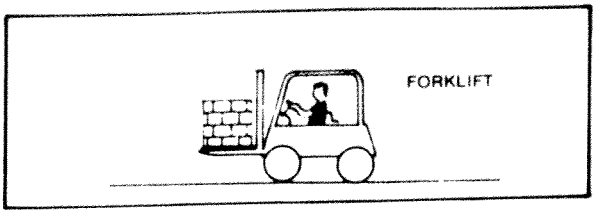


HANDLING METHODS









PLACING

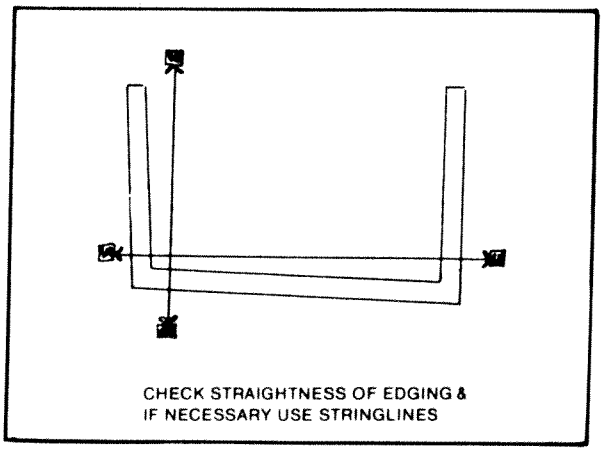
Once the bedding sand is prepared, decide on the feature to which the pattern of the pavement must be oriented. Generally the pattern will align along the direction of a road or a driveway, or parallel to a wall or edge restraint. To maintain such a line the pavement must be set out to a string line and rechecked periodically as work continues.

Paving must progress from one starting point only. When paving is started from different points, it never matches up when the two points finally meet.

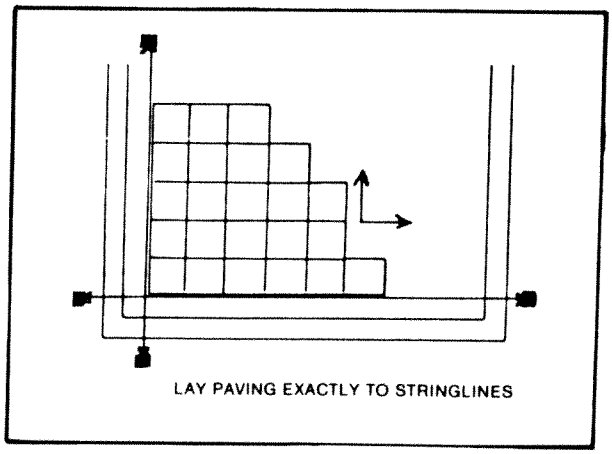
Existing edge restraints are not often straight enough to lay the pavement to, and again a point must be selected slightly away (about half a paver) from the restraint, and a string line is used to set the alignment.

To ensure that the first pavers are placed correctly and that large gaps do not open up as laying proceeds, the area should be squared using a "3, 4, 5, Triangle".

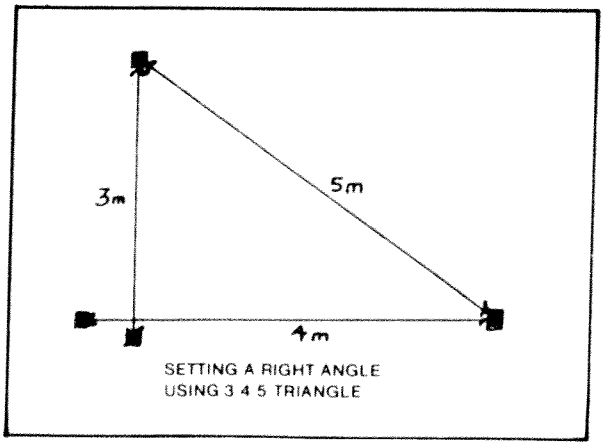
Laying should now proceed, beginning in the corner of the angle, working out both ways and keeping pavers lined up exactly with the string lines. Any gap opening up in the pattern should be closed by tapping the pavers with a rubber hammer, or stamping down and forward with a rubber soled boot.



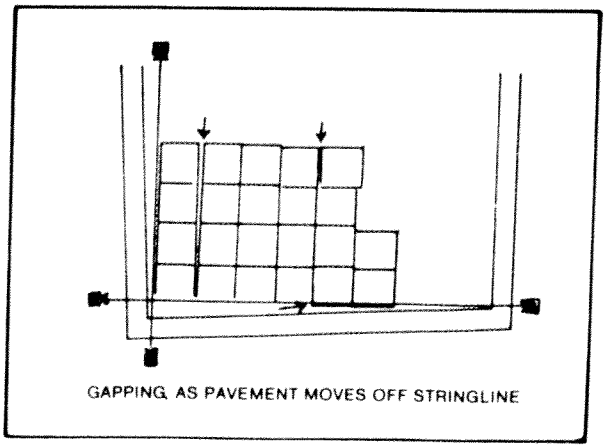
CHECK STRAIGHTNESS OF EDGING & IF NECESSARY USE STRINGLINES



LAY PAVING EXACTLY TO STRINGLINES



SETTING A RIGHT ANGLE USING 3 4 5 TRIANGLE



GAPPING AS PAVEMENT MOVES OFF STRINGLINE

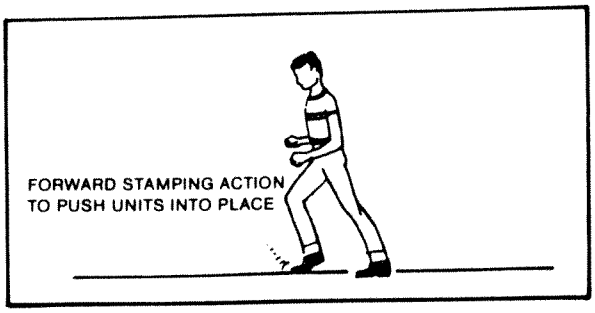
Gaps in the pavement can generally be traced to wandering away from the right angle guide lines.

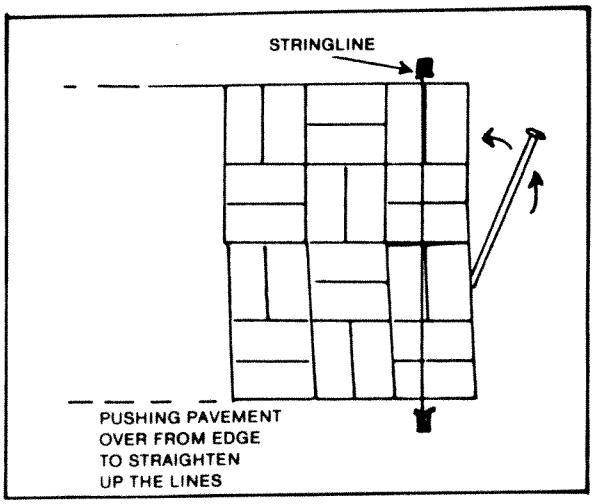
Continue laying until a straight working face is built up and laying can progress in the desired direction.

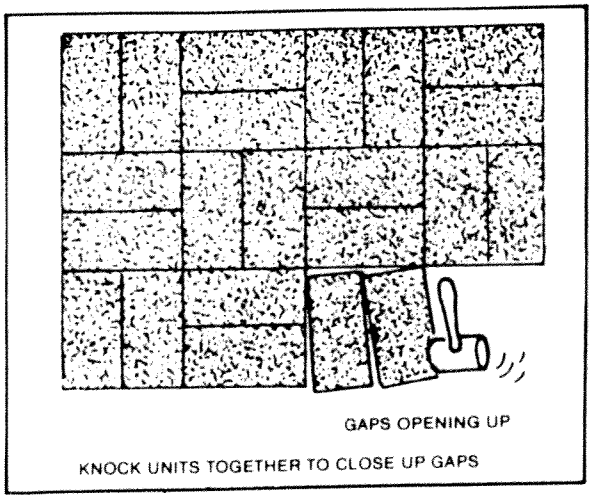
The alignment of the pattern must be checked regularly to a string line, otherwise a gradual straying of lines will result. This is important on driveways and any paved areas where crooked lines would affect the visual aspects of the pattern.

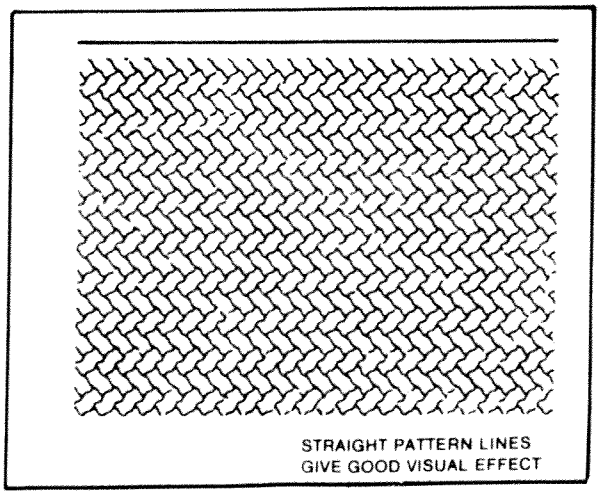
Should misalignment occur, it can very often be corrected without lifting and relaying the paving. With a screwdriver or similar tool, individual pavers may be eased over in relation to the adjoining pavers and whole sections of the pavement can be moved by using a shovel or a crow bar to apply leverage from the edges.

If patterns are used in the paving it is even more important to stay straight because the pattern will make any crooked lines highly visible.









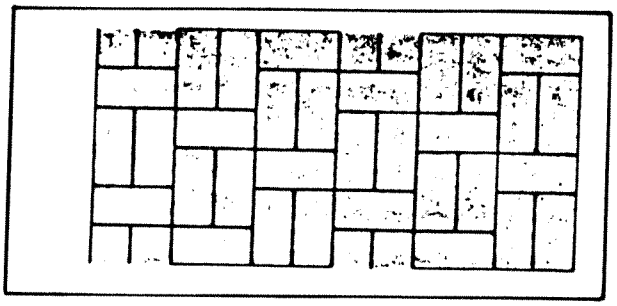
PATTERNS

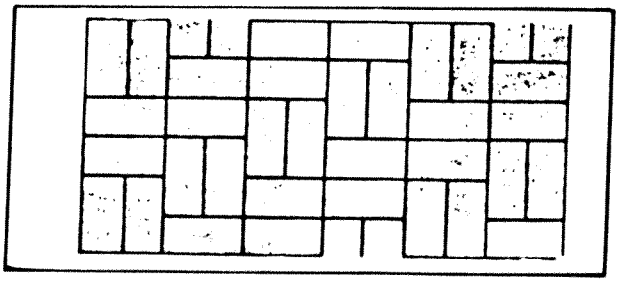
The possible laying patterns are a function of the paver shape.

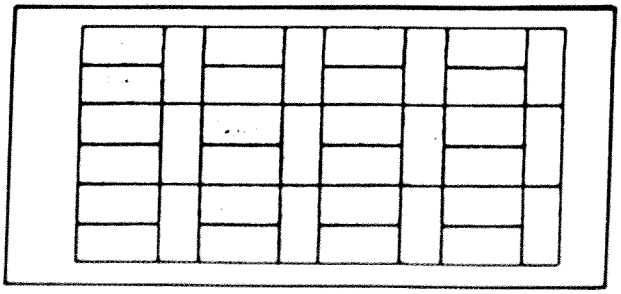
The most common patterns are:

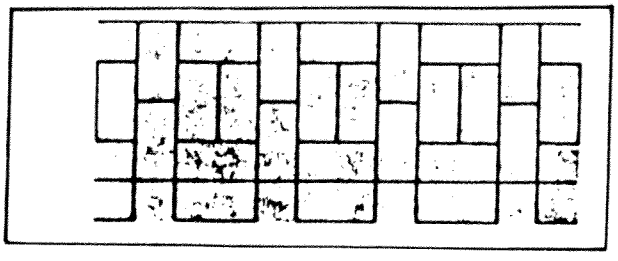
1. Parquet
2. Runner
3. Herringbone

PARQUET

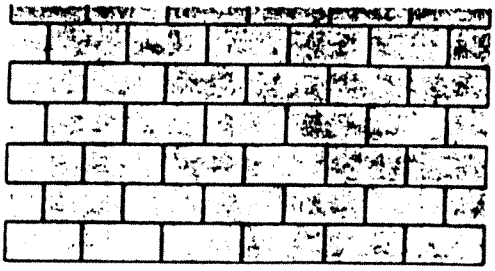


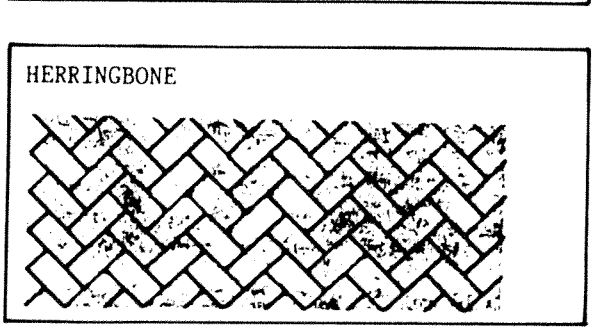




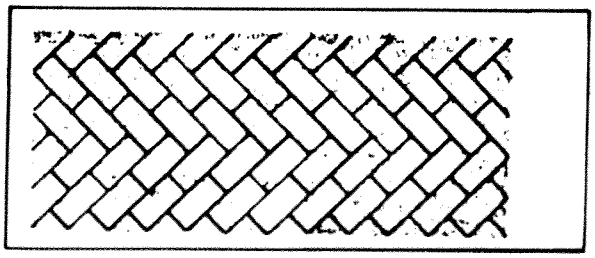


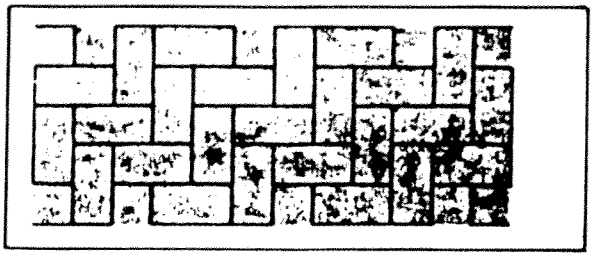
RUNNER





HERRINGBONE

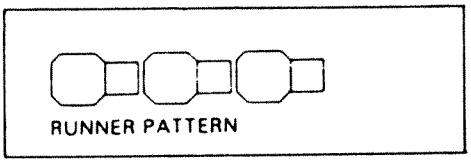


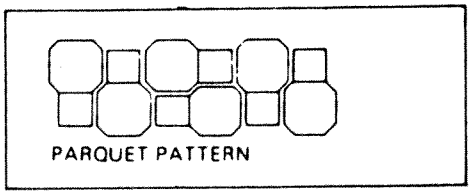


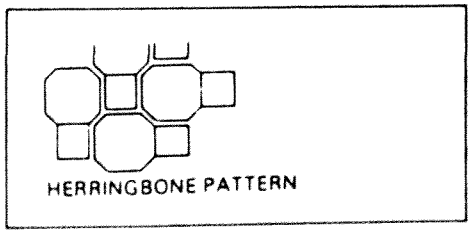
STARTING PATTERNS

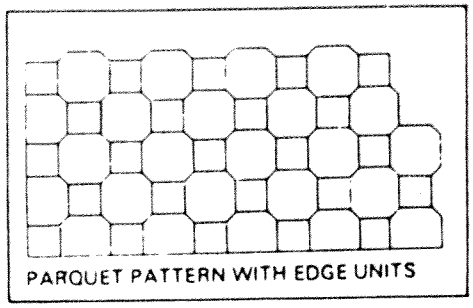
The positioning of the first few pavers demands extra care. Each paver has to be placed very carefully so not to disturb its neighbors, and it is not until three or four rows have been laid that a normal rapid laying rate can be achieved.

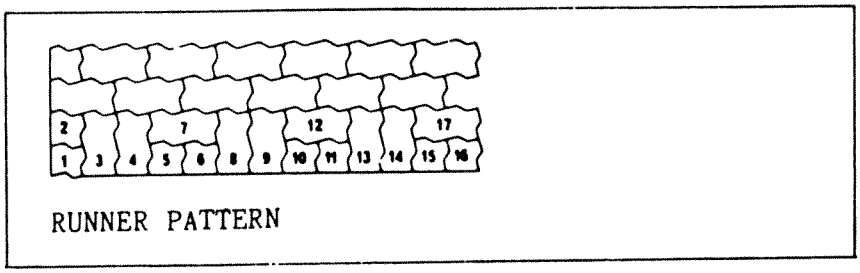
The order of laying must ensure that the pavers can be placed easily and in such a way that it is never necessary to force a paver between those already laid. With the herringbone pattern it is important that an 'open' laying procedure be followed so that more than one layer can be employed on the laying face.


RUNNER PATTERN

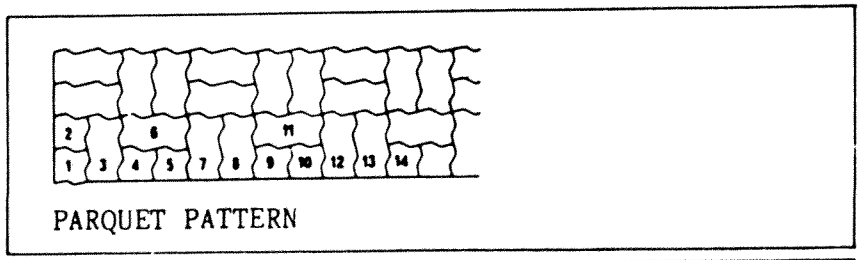

PARQUET PATTERN


HERRINGBONE PATTERN

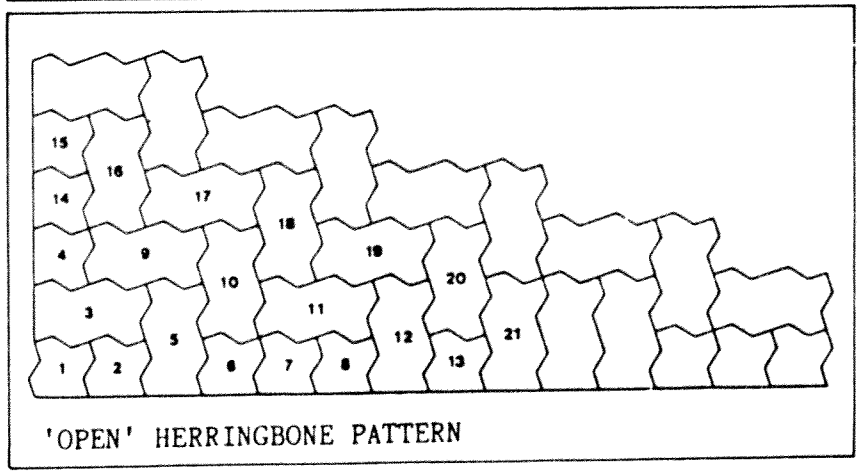

PARQUET PATTERN WITH EDGE UNITS



RUNNER PATTERN



PARQUET PATTERN



'OPEN' HERRINGBONE PATTERN

PLACING PAVERS

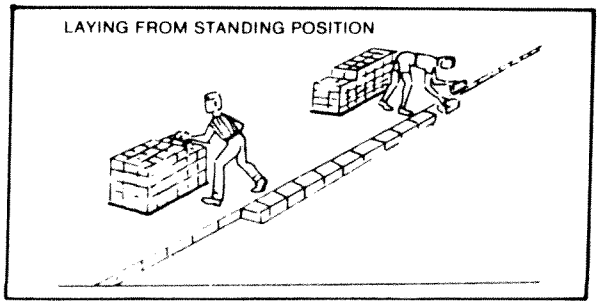
Placing the pavers quickly and accurately with minimum effort is the key to the profitable operation of a paving crew. The actual placing of each paver, although the shortest part of the operation, is often the most physically demanding. "Do we sit, stand, kneel or crouch?" is a question most frequently asked by new installers. Whichever is the most comfortable is usually the standard advice given. This is true to some extent, but the most comfortable position may not always be the most effective nor the most healthy over a period of time. Cramping, sore knees, backaches and sore toes are all symptoms of these various positions, and all too often can be linked directly to low laying rates.

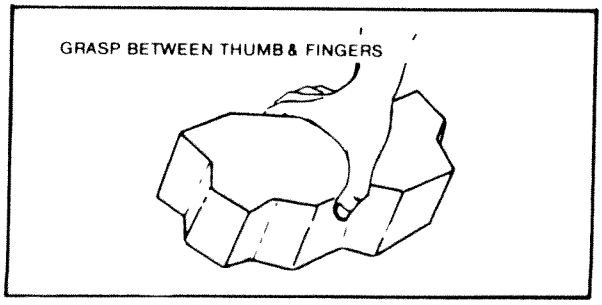
Standing allows the full capabilities of the human body to be utilized, with moving longer distances, turning, bending, reaching and hand movements made quicker and easier.

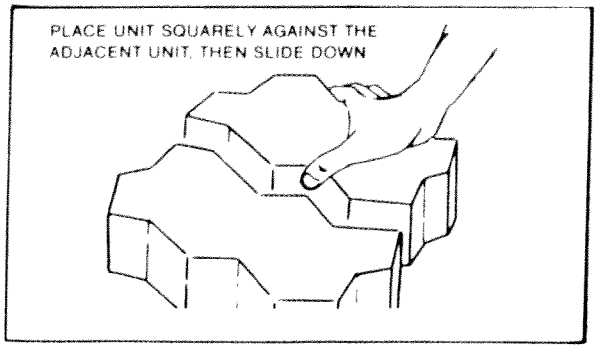
Grasping of individual pavers varies with the size of the pavers being laid. Most pavers are held between the thumb and four fingers so that the full rotation of the wrist and arm is utilized. In this manner, each paver can be rotated through 180 degrees to handle any of the laying patterns.

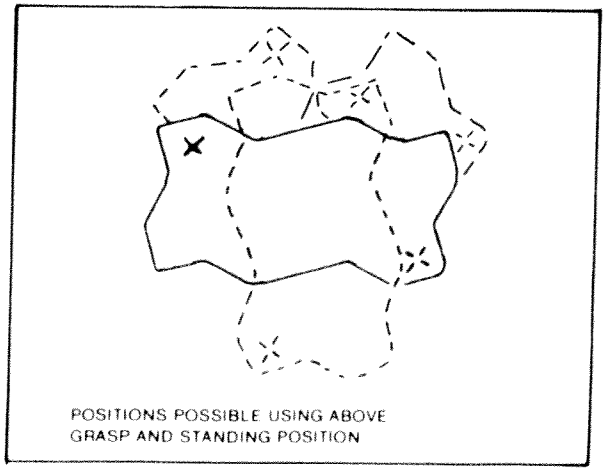
The top edge of each paver will contact the thumb between tip and first joint to enable the paver to be laid up against those already in position. In this position it is slightly above the sand bed from where it can be slid down squarely in position, releasing the thumb grip, but still maintaining finger pressure to hold it against the neighboring pavers.

This procedure ensures the pavers are placed in position without the possibility of the pavers tilting over and disturbing the sand bed.







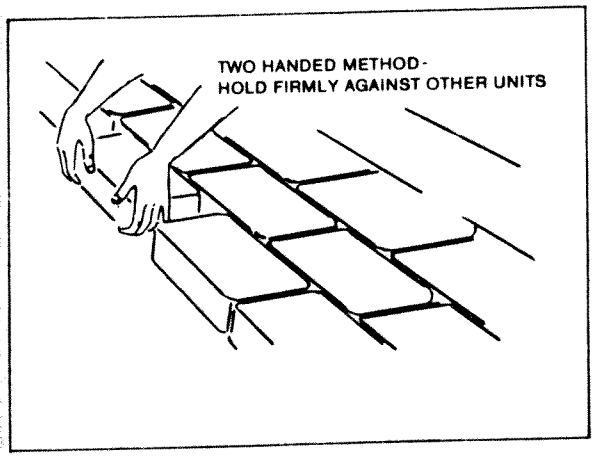


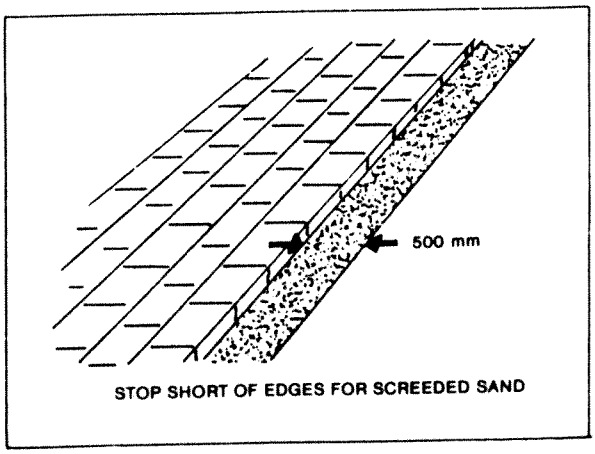
When laying larger pavers, such as roman pave or grass paver, a two handed grip is necessary. Weight and size dictate that the paver is supported underneath until it is placed up against the adjoining pavers. The hands are then repositioned and the paver slid down as for the smaller pavers.

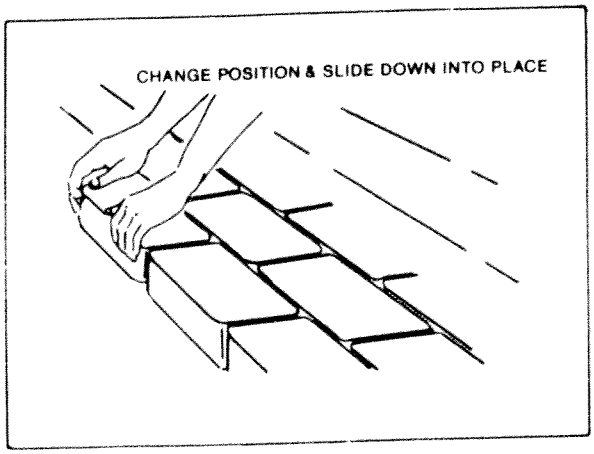
Spacing of each paver away from the adjoining pavers is desirable so that direct contact is avoided and the load transfer between pavers is achieved with the sand vibrated into the joints. A space of 1/8" (3 mm) is considered optimum but in practice is very difficult to achieve in a consistent manner. It is sufficient to place the pavers down without attempting to jam them together or space them out. The pavers will space out quite well when they are vibrated and sanded.

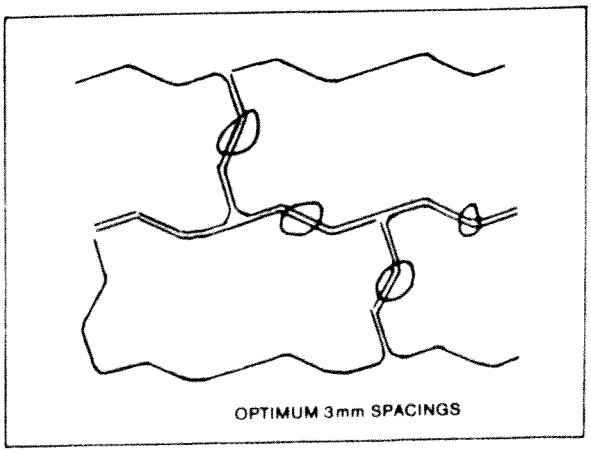
Laying should stop approximately 20" (500 mm) short of the screeded sand edge, otherwise the unsupported sand will collapse away from the paving.

When more than one installer is placing the pavers, especially on long laying faces, rotate the installers to avoid one section of pavers being laid tighter than the other causing an irregular pattern.









CUTTING

If edge pavers cannot be used at the edges of the paving, pieces will have to be cut to fit. The cut pieces should not be less than 1/4 of a full paver.

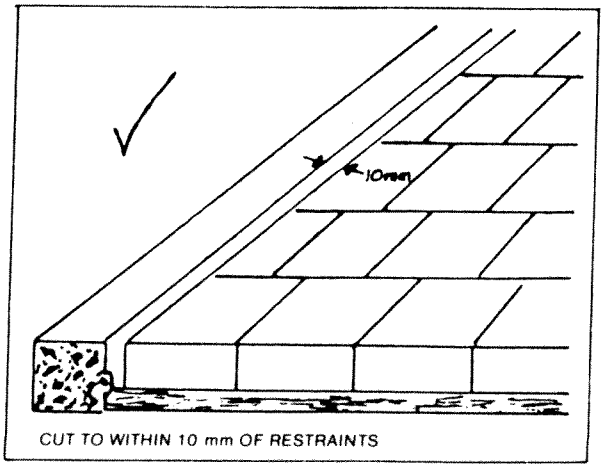
Cutting is usually done with a guillotine cutter.

Cutting rates will vary greatly depending on the type of paver, pattern being laid and the method used in marking and cutting.

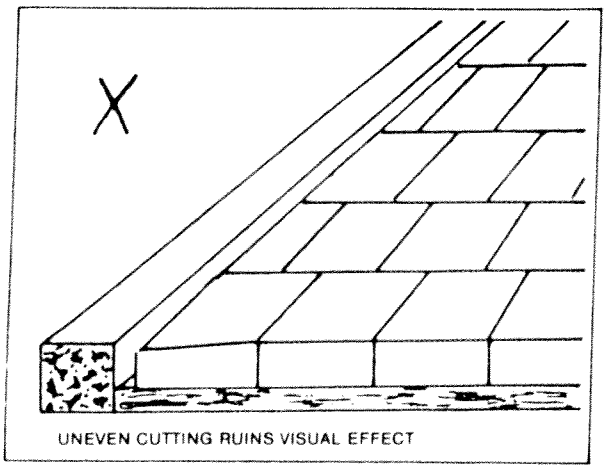
Edges which need to be cut along a wall or edge restraint should allow a 3/8" (10 mm) gap. This gap allows for the run-off of the cut and fins protruding from the wall or edge restraint.

The important feature about a cut edge is its uniformity or straightness and this is best obtained by marking out long sections for cutting.

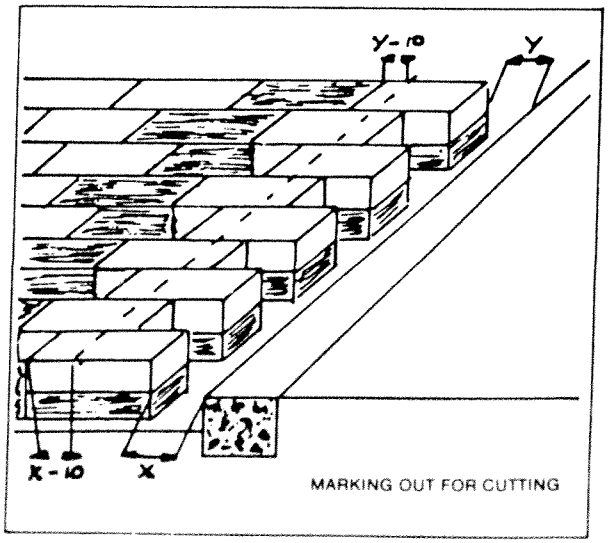
Place a layer of pavers directly on top of the last full row of pavers parallel to the edge. This puts them in the same relative position as that in which they will be laid. Measure the distance from the edge restraint to the paver at both ends and transfer each measurement less the 3/8" (10 mm) to the pavers on the second layer. Note that the measurement is marked from the other end of each paver. Join the two points, using a straightedge or chalkline and use this line to set up and cut the pavers.



CUT TO WITHIN 10 mm OF RESTRAINTS



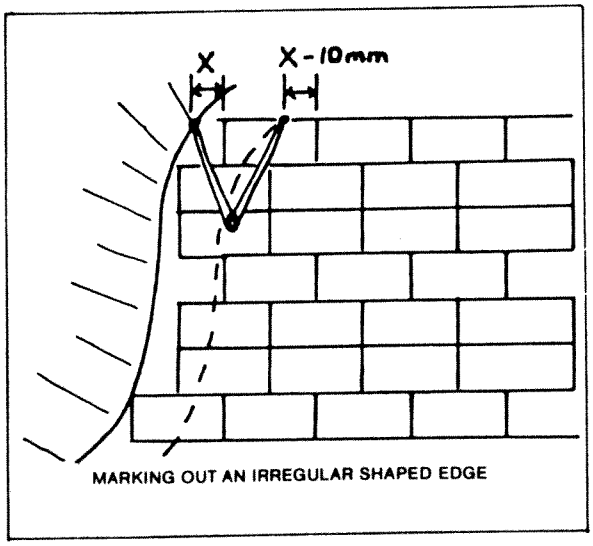
UNEVEN CUTTING RUINS VISUAL EFFECT



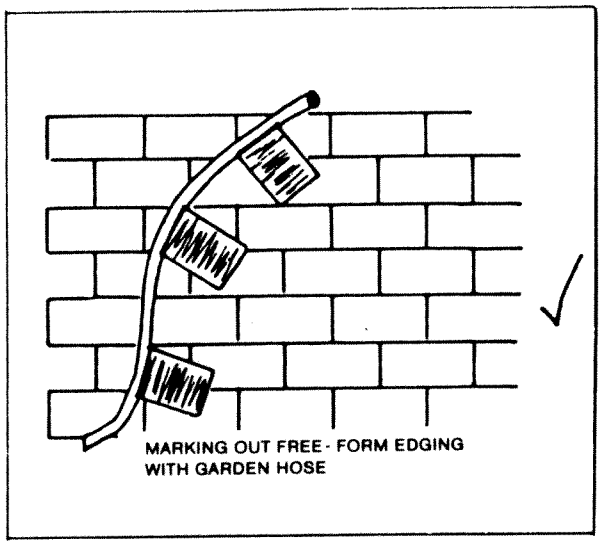
MARKING OUT FOR CUTTING

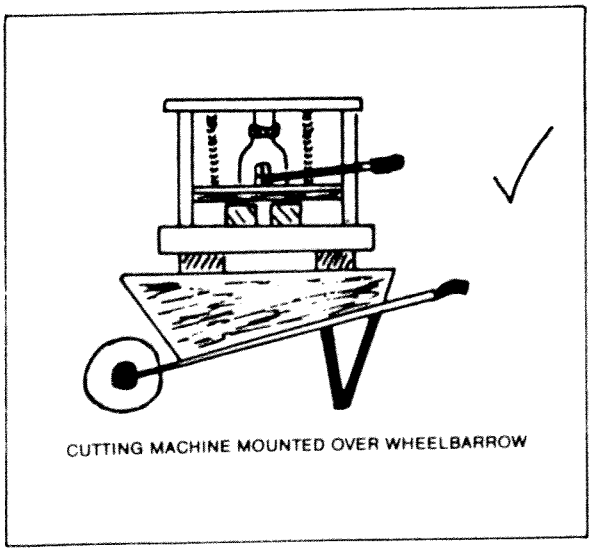
The same principle may be used for curved edges, however, the method of marking is different. Measure the distance from the edge restraint to the paver, subtract 3/8" (10 mm) and transfer the new measurement to the second layer as before. Using a scriber with a piece of chalk, set it to the distance from the restraint to the point marked on the top unit. Now scribe a line by drawing the scriber along, maintaining the point against the restraint and square with the paving pattern.

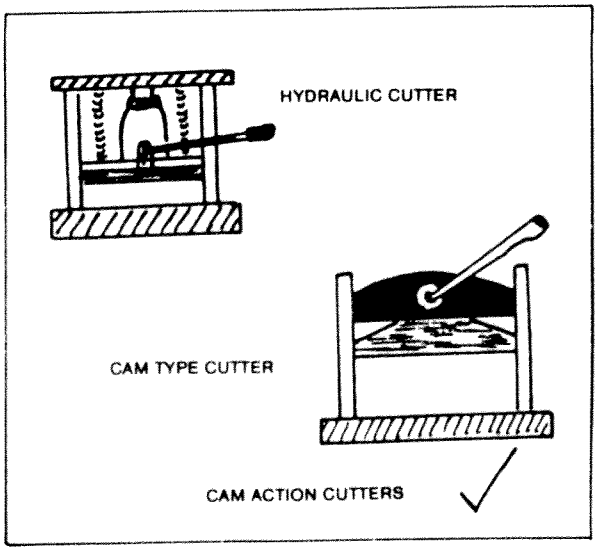
A garden hose may be used to mark the cuts for a free form edge. Lay the hose over the paving and arrange it to duplicate the desired curve. The hose can be held in position with pavers and the cuts marked with chalk.



MARKING OUT AN IRREGULAR SHAPED EDGE


MARKING OUT FREE - FORM EDGING WITH GARDEN HOSE


CUTTING MACHINE MOUNTED OVER WHEELBARROW



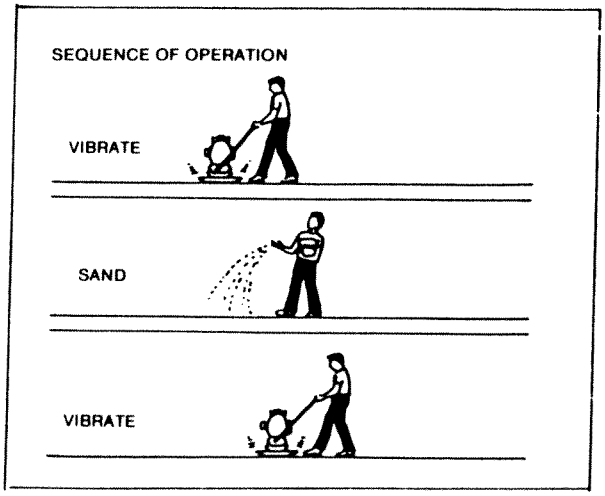
VIBRATING

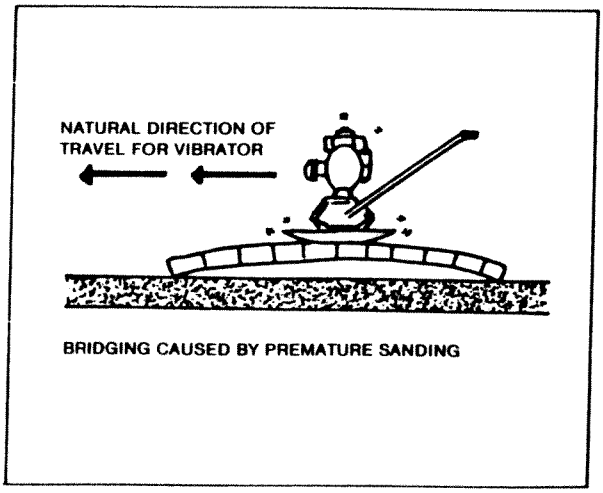
Vibrating the paving down consolidates the individual pavers into a semi-rigid interlocked surface layer capable of resisting very high loads. The addition of sand, also vibrated, into the joints further improves the interlocking qualities of the paving.

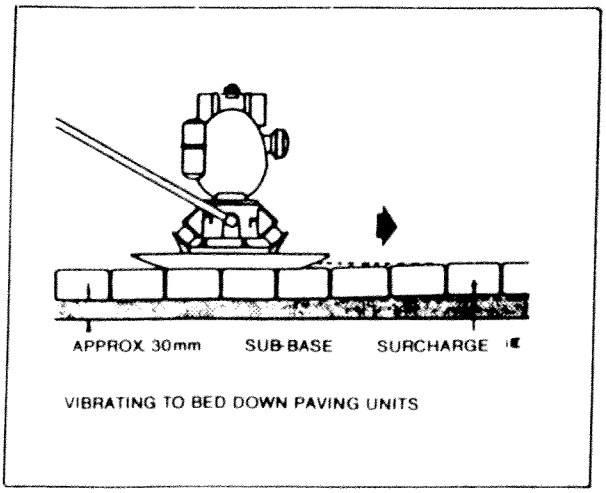
Vibrating must be performed in the correct sequence:

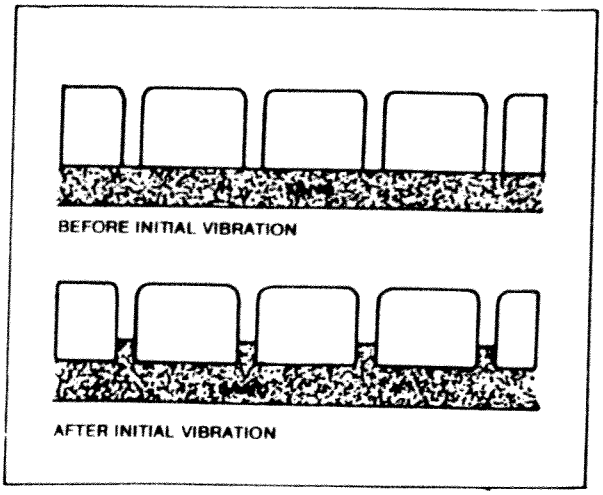
1. Vibrate the pavers down with two or three passes of the plate vibrator.
2. Apply sand and sweep it into the joints.
3. Vibrate the sand into the joints.
4. Final sweep with a broom.

When sand is applied before completing Step 1, the paving will interlock and resist the tamping action of the vibrator. This can result in "bridging", creating hollow areas under the paving and result in an uneven surface on the finished job.









In filling the joints, dry sand makes the job quicker and better as it penetrates to completely fill the gap. If the sand is wet it can be spread on the surface of the completed paving and allowed to dry before sweeping it into the joints.

One or two passes of the vibrator will be required to fully compact the sand in the joints. After each pass, the sand will have compacted down into the joints so that a further sweeping is necessary to again fill them up to the surface level. Leaving some excess sand on the pavement surface for a day or two will allow any minor settling of the joints to be rectified.

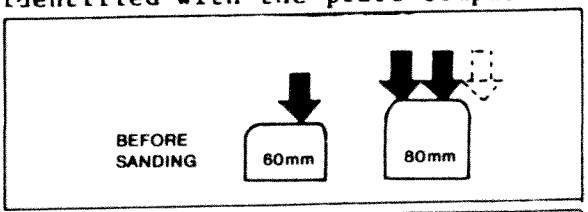
The vibrator should have a plate size of about 18" x 20" (450 mm x 500 mm) and generate a centrifugal force of about 1 ton. The centrifugal action of the vibrator allows it to move in one direction easier than another. To use this feature to advantage it is best to keep the vibrator moving continually in the same forward motion by operating it in ever decreasing squares, or turning the unit at the end of each run.

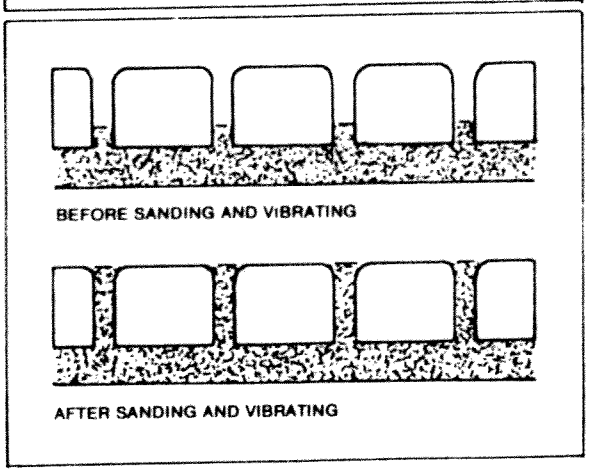
Do not vibrate within 3 ft (1 meter) of an unrestrained edge.

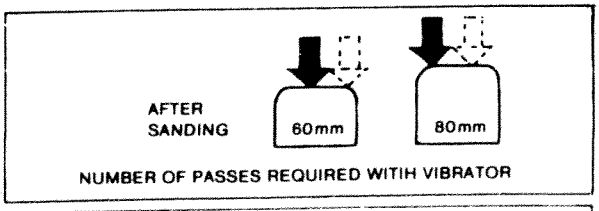
Vibrating should not be started until an area of 200 - 300 square feet (20 - 30 sq meters) has been laid. Edges can be temporarily restrained by tamping soil against them before vibrating.

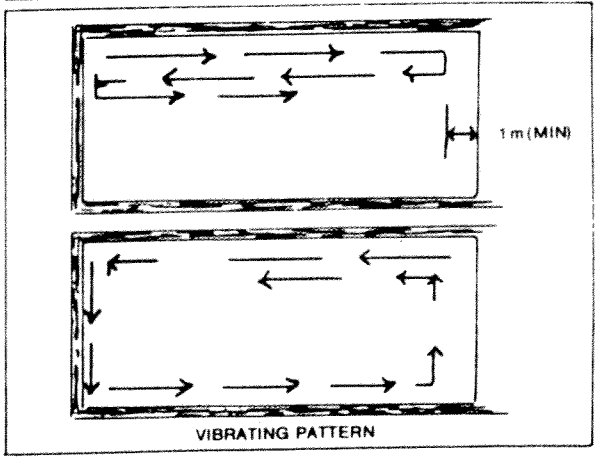
At the end of each day all pavers placed except the last 3 ft (1 meter) should be compacted.

Where the pavement is to carry heavy loads immediately after completion it is advisable to roll the pavement surface with 5 to 10 passes of a 10 ton pneumatic roller or its equivalent. This proof rolling accelerates 'lock-up' of the pavers and will also show any areas of excessive deformation which may not have been identified with the plate compactor.







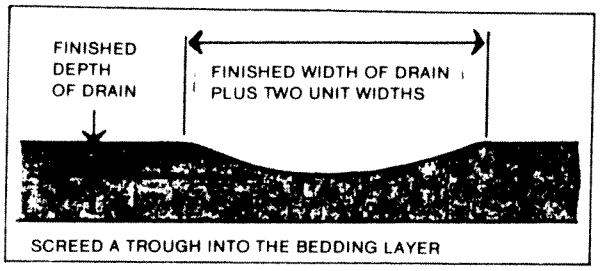


Drains - Drains are often incorporated into the pavement surface to concentrate and remove rain water. Preparation for a drain incorporated into the standard pavement only involves screeding a trough to the required depth and width. The pavers are then laid in this trough and vibrated into place following the standard procedure.

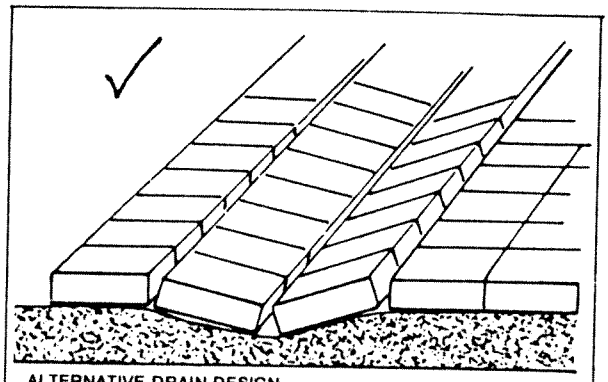
To achieve a smooth flowing surface with the drain itself it may be necessary to:

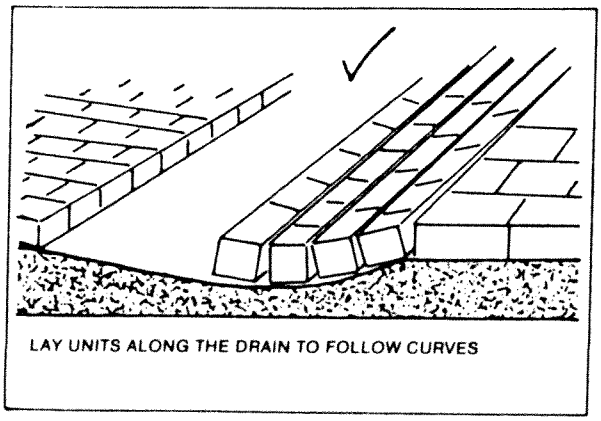
1. Change pattern
2. Change paver type
3. Cut pavers

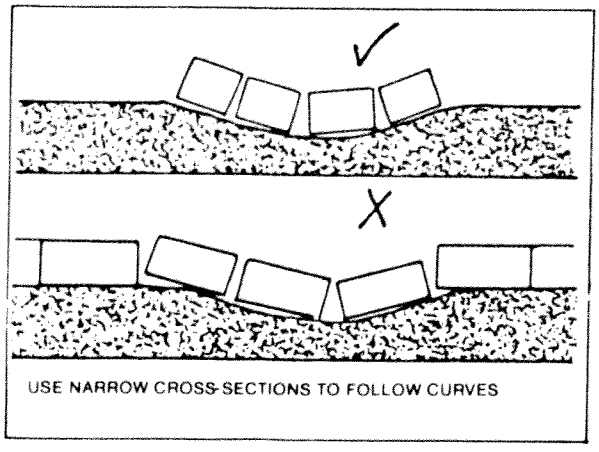
Changing pavers can have an extra advantage in indicating the position of the drain for maintenance purposes or alert pedestrians to a change in surface level. Either shape or color, or a combination of both, will be successful for this purpose.

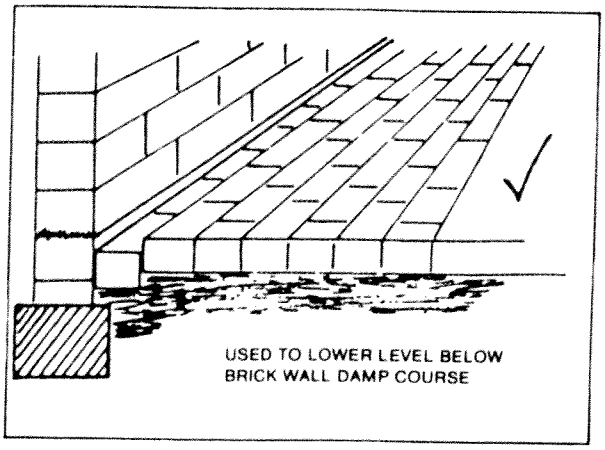


SCREED A TROUGH INTO THE BEDDING LAYER


ALTERNATIVE DRAIN DESIGN
USING FULL LENGTH OF UNITS


LAY UNITS ALONG THE DRAIN TO FOLLOW CURVES


USE NARROW CROSS-SECTIONS TO FOLLOW CURVES


USED TO LOWER LEVEL BELOW
BRICK WALL DAMP COURSE

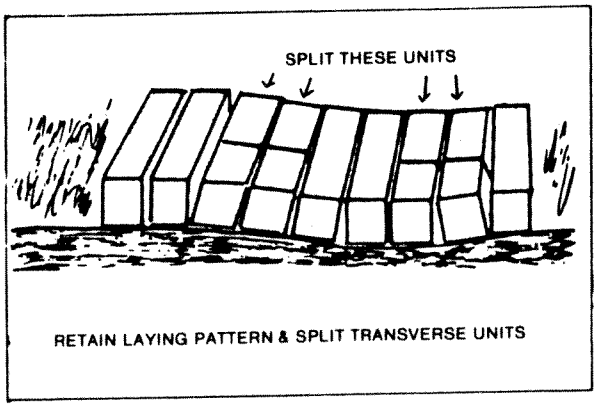
In most cases the change in pattern will be to longitudinal runner type in the drain. This places the narrow section of each paver where it can better conform to the curvature of the drain shape.

When necessary to retain the same laying pattern, the pavers whose long axis falls across the drain are split in half to allow them to conform better to the curve of the drain.

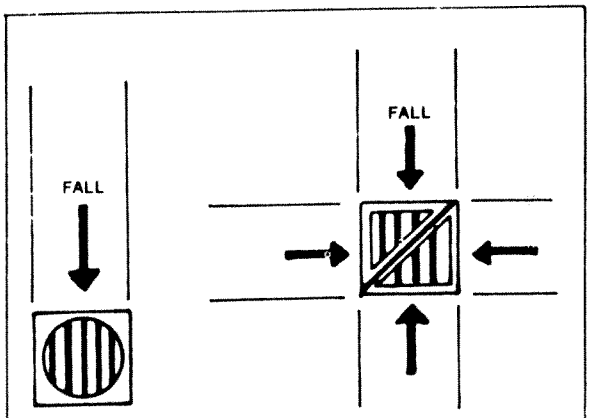
Catch Basins - Large areas of paving must be profiled to direct surface water towards the catch basins.

Whenever possible the catch basins should be set to finished grade before paving begins. The catch basin can then be used to set accurate screeding levels.

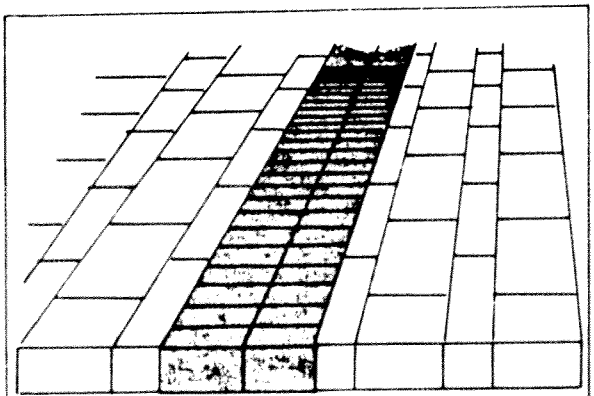
The pavers should always be set at least the chamfer thickness higher than the catch basin to ensure positive drainage from the paving.

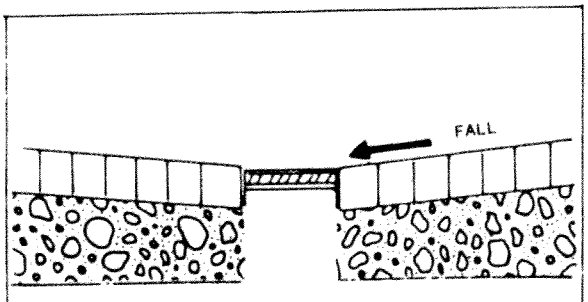


RETAIN LAYING PATTERN & SPLIT TRANSVERSE UNITS



CONNECTING SPOON DRAINS & DRAINAGE GRATES


INDICATE DRAIN BY COLOUR & CHANGE OF UNIT

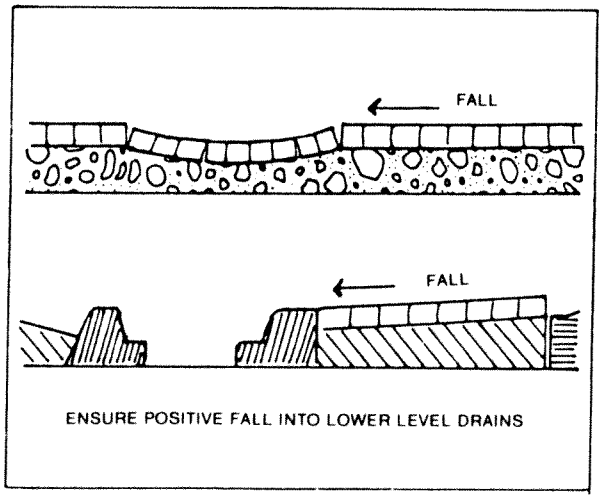


SLOPE PAVING TO GIVE FALLS INTO GRATINGS

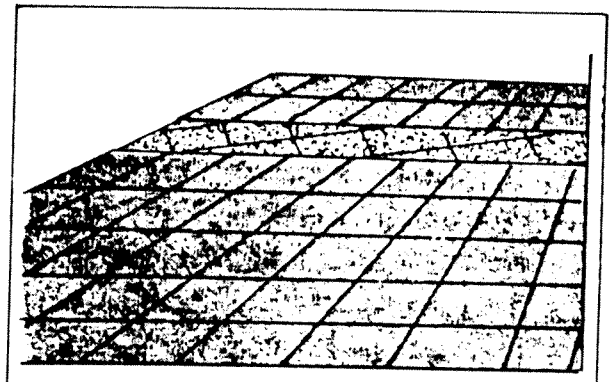
LOCATION OF SERVICES

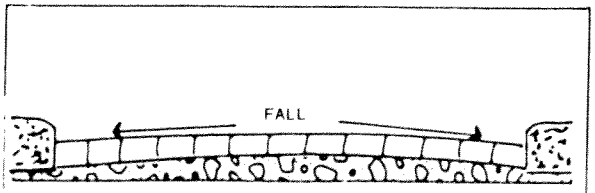
Local government, commercial, and industrial sites often require special openings and marking to assist service personnel to locate or gain entry to underground services. Colors, different paver shapes, and laying patterns can be used to meet this requirement.

Color can identify both locations and type of service that is under the paving.

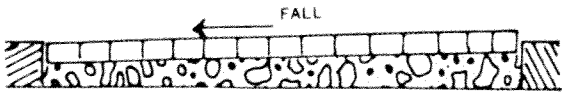


ENSURE POSITIVE FALL INTO LOWER LEVEL DRAINS

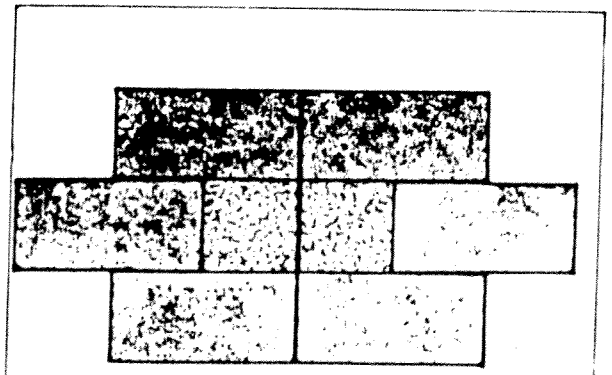

USE DIFFERENT UNIT PATTERN OR COLOUR
TO IDENTIFY UNDERGROUND SERVICE



ROAD CAMBERED TO SIDE GUTTERS



FOOTPATH WITH CROSSFALL TO SHED WATER

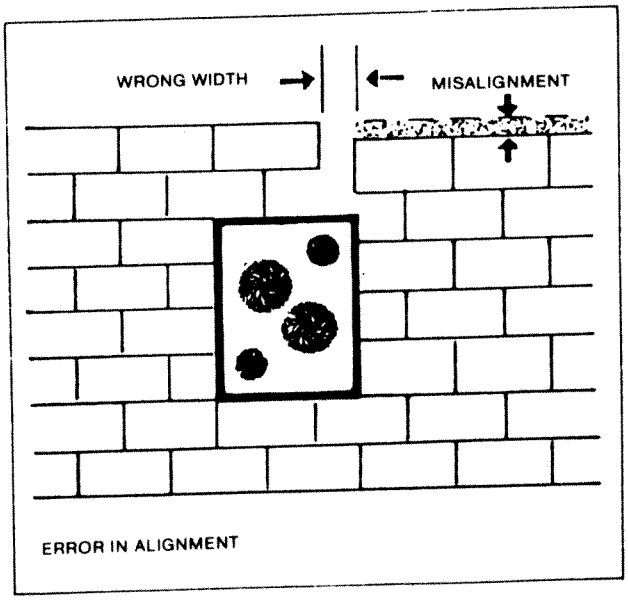

UNIT COLOURED OR SPLIT TO IDENTIFY SERVICE

OBSTRUCTIONS

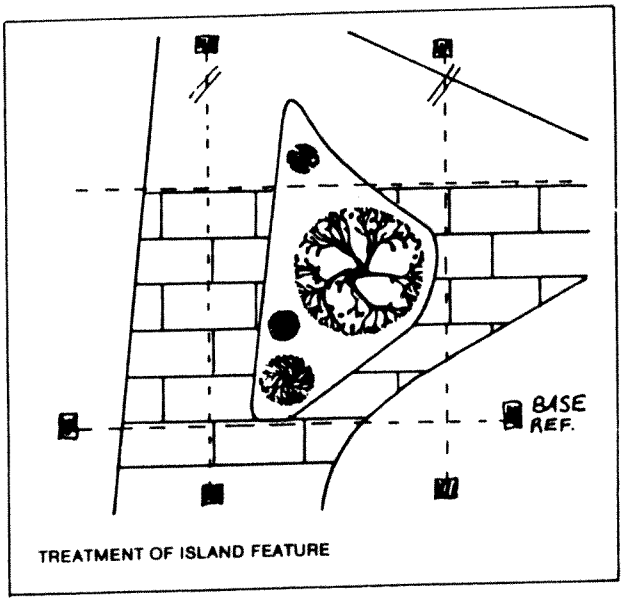
Paving around obstructions such as planters or small buildings can present special problems in keeping the pattern straight and to ensure the paving matches up on the extreme side of the obstruction.

String lines are used to maintain laying accuracy.

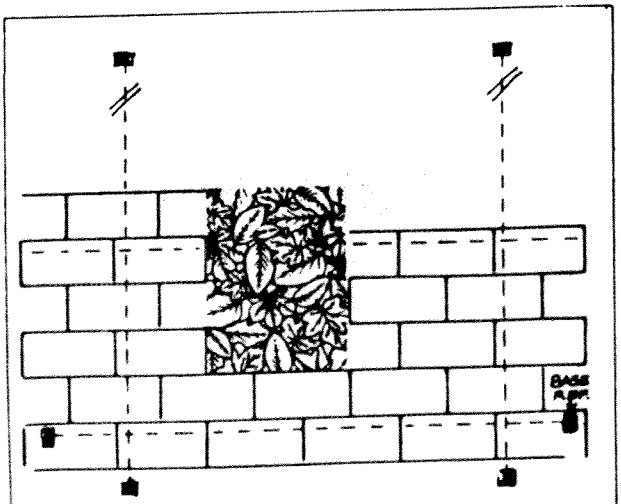
Parallel lines are set right through the area around the obstruction and parallel with the pavement pattern. The paving then proceeds simultaneously from each side, keeping strictly to the line indicated. A string line must also be set at right angles to the pattern line to prevent the paving on one side of the obstruction from creeping ahead of that on the other side. This string line can be advanced, to check progress every two or three rows, by resetting it from the original base line.



ERROR IN ALIGNMENT



TREATMENT OF ISLAND FEATURE

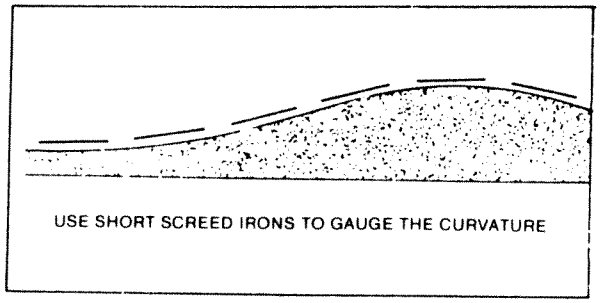

USE STRINGLINE GRID TO CHECK ALIGNMENT

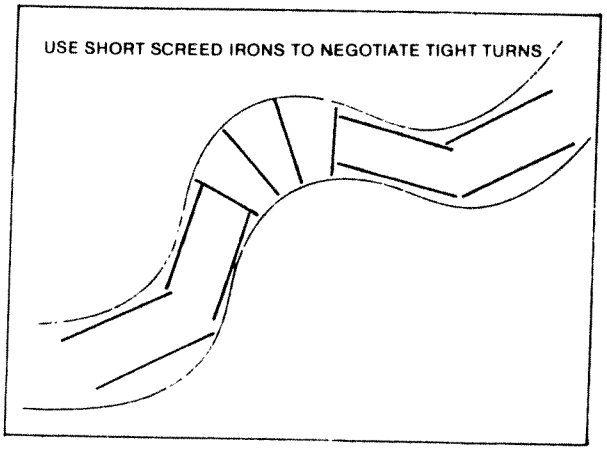
ROLLING AND FREEFORM SURFACES

Paving is sometimes set to follow the natural lay of the land to achieve both visual effect and economy of installation. This means that hills and hollows as well as natural or manmade obstructions must be negotiated with special techniques.

To duplicate the rolling surfaces of the landscape with the screeded bedding sand, it is necessary to utilize short length screeds to produce a series of short, straight sections approximating a vertical curve.

The same screeds must be used to negotiate tight bends and varying widths of pavement where longer screeds could not be used.





MAINTENANCE

SEALING

If the surface of paving is sealed with a concrete sealer it will slow the rate of oxidation on the surface and the color of the pavers will remain brighter for a longer period of time. Although there is no set time as to how long the sealer will last, the usual practice is to clean and reseal the pavers every two to three years.

SUITABLE SEALERS

Webseal 100 - Websen Pacific, Kent, WA.

Concrete Sealer 4054 - Cloverdale Paint, Cloverdale, BC.

REMOVING STAINS AND CLEANING

OIL STAINS

If oil is removed immediately from the surface of pavers there will be little danger of permanent staining. Soak up the surface oil immediately with an absorbent material, such as paper towels or cat litter. Wiping should be avoided as it spreads the stain and drives the oil into the pavers.

If the stain persists or the oil has been allowed to remain on the pavers for some time, saturate the area with paint thinner, then cover with cat litter or dry cement. Let it stand overnight, and then sweep away the cover. Repeat if necessary.

CLEANING

Normal cleaning can be done with a hose and broom. Wash the surface of the pavers the same as you would any other concrete surface.

For particularly difficult areas it may require a high pressure washer. Do not blast dirrectly into the joints as it may remove an excessive amount of sand. The correct distance from the surface and the nozzle angle are determined by the type of soil to be removed.

WEEDS

If weed or grass seeds get into the sand joints they will germinate. The small joint between the pavers makes it a relatively easy task to kill this growth with a growth inhibiting spray.

EFFLORESCENCE

If the surface of concrete appears to turn white this is a natural state, called efflorescence. It is less noticeable on plain concrete than it is on colored pavers.

Any normal concrete contains some calcium hydroxide as a product of the reaction between cement and water. When this calcium hydroxide is brought to the surface of the pavers by water, it combines with the carbon dioxide in the air to form calcium carbonate, which then appears as a whitish deposit.

Efflorescence is usually more common during cooler weather when the evaporation rates are slower, thus allowing more time for the migration of the salts to the surface of the pavers.

Although unattractive, in general efflorescence is harmless and will become lighter and less extensive as the pavers age.

Most efflorescence can be removed by dry brushing or high pressure washing followed with flushing with clean water.

Efflorescence can also be removed with a dilute solution of muriatic acid (1 part acid to 12 parts water). Before any acid treatment is used it should first be tested on a small inconspicuous area of the paving to see if the acid will cause any objectionable surface etching or discoloration.

Dampen the surface of the pavers with clean water before applying the acid solution. After about five minues scrub the area with a stiff bristle brush to remove the salt deposits. The surface of the paving should then be immediately and thoroughly flushed with clean water to remove all traces of the acid.

CAUTION

Be sure to protect eyes, skin, and clothing when using muriatic acid.

ASTM C936-82

STANDARD SPECIFICATION FOR SOLID CONCRETE INTERLOCKING PAVING UNITS (1)

1.0 SCOPE

1.1 This specification covers the requirements for interlocking concrete pavers manufactured for the construction of paved surfaces. Units shall not be greater than 160 mm (6½ in.) in width, 240 mm (9½ in.) in length, or 140 mm (5½ in.) in thickness.

1.2 Concrete units covered by this specification may be made from lightweight or normal weight aggregates or mixed lightweight and normal weight aggregates.

1.3 When particular features are desired, such as weight classification, higher compressive strength, surface textures, finish, color, or other special features, such properties should be specified separately by the purchaser. However, local sellers should be consulted as to the availability of units having the desired features.

1.4 The values stated in inch-pound units are to be regarded as the standard.

2.0 APPLICABLE DOCUMENTS

2.1 ASTM Standards

C33 Specification for concrete aggregates (2).

C67 Sampling and testing brick and structural clay tile (3).

C140 Sampling and testing concrete masonry units (3).

C150 Specification for Portland Cement (4).

C207 Specification for hydrated lime for masonry purposes (5).

C331 Specification for lightweight aggregates for concrete masonry units (6).

C418 Test for abrasion resistance of concrete by sandblasting (7).

C595 Specification for blended hydraulic cements (4).

C618 Specification for fly ash and raw or calcined natural pozzolan for use as a mineral admixture in Portland Cement concrete (7).

NOTES:

(1) This specification is under the jurisdiction of ASTM Committee C-27 on precast concrete products and is the direct responsibility of sub-committee C27.20 on architectural and structural products.

Current Edition approved February 23, 1982 and published March 1982.

(2) Annual Book of ASTM Standards, Parts 14 & 15.

(3) Annual Book of ASTM Standards, Part 16.

(4) Annual Book of ASTM Standards, Parts 13 & 14.

(5) Annual Book of ASTM Standards, Part 13.

(6) Annual Book of ASTM Standards, Parts 14 & 16.

(7) Annual Book of ASTM Standards, Part 14.

3.0 MATERIALS

3.1 Cementitious Materials - Materials shall conform to the following applicable ASTM specifications:

3.1.1. Portland Cements - Specification C150.

3.1.2. Blended Cements - Specification C595, Types IS or IP.

3.1.3. Hydrated Lime, Type S - Specification C207.

3.1.4. Pozzolans - Specification C618.

3.2 Aggregates shall conform to the following ASTM Specifications, except that grading requirements shall not necessarily apply:

3.2.1. Normal Weight - Specification C33.

3.2.2. Lightweight - Specification C331.

3.3 Other Constituents - Air-Entraining admixtures, coloring pigments, integral water repellents, and finely ground silica, shall be previously established as suitable for use in concrete and either shall conform to ASTM Standards where applicable, or shall be shown by test or experience not to be detrimental to the concrete.

4.0 PHYSICAL REQUIREMENTS

4.1 Compressive Strength - At the time of delivery to the work site, the average compressive strength of the test samples shall not be less than 8000 PSI (55 MPa) with no individual unit less than 7200 PSI (50 MPa) as required in 7.2.

NOTE - It is the consensus of the task group that compressive strength does not truly express a significant property of a paving unit. Rather, a flexural property evaluated by means of a tensile splitting test will be more meaningful. Accordingly, test date are to be developed by NCMA and C27 will do an evaluation of existing data to arrive at a specification value, using the test method of ISO DIS 4180. Upon completion of these tests, compressive strength values will be replaced by a tensile splitting requirement.

4.2 Absorption - The average absorption of the test samples shall not be greater than 5% with no individual unit greater than 7% as required in 7.2.

4.3 Resistance to Freezing and Thawing - The manufacturer shall satisfy the purchaser either by proven field performance or a laboratory freezing-and-thawing test that the paving units have adequate resistance to freezing and thawing. If a laboratory test is used, when tested in accordance with Section 8 of Method C67, specimens shall have no breakage and not greater than 1.0% loss in dry weight, of any individual unit when subjected to 50 cycles of freezing and thawing. This test shall be conducted not more than 12 months prior to delivery of units.

4.4 Abrasion Resistance - When tested in accordance with Method C418, specimens shall not have a greater volume loss than 15 cu. cm. per 50 sq. cm. (0.915 cu. in. per 7.75 sq. in.) the average thickness loss shall not exceed 3 mm (0.118 sq. in.).

5.0 PERMISSIBLE VARIATIONS IN DIMENSIONS

5.1 Length or widths of units shall not differ by more than ±1.6 mm (±1/16 in.) from approved samples. Heights of units shall not differ by more than ±3.2 mm (±1/8 in.) from the specified standard dimension. All tests shall be performed as required in 7.2.

6.0 VISUAL INSPECTION

6.1 All units shall be sound and free of defects that would interfere with the proper placing of the unit or impair the strength or permanence of the construction. Minor cracks incidental to the usual methods of manufacture or minor chipping resulting from customary methods of handling in shipment and delivery, shall not be deemed grounds for rejection.

7.0 SAMPLING AND TESTING

7.1 The purchaser or his authorized representative shall be accorded proper facilities to inspect and sample the units at the place of manufacture from lots ready for delivery.

7.2 Sample and Test Units in accordance with Method C140, except as required in 4.3

8.0 REJECTION

8.1 In case the shipment fails to conform to the specified requirements, the manufacturer may sort it, and new specimens shall be selected by the purchaser from the retained lot and tested at the expense of the manufacturer. In case the second set of specimens fail to conform to the test requirements, the entire lot shall be rejected.

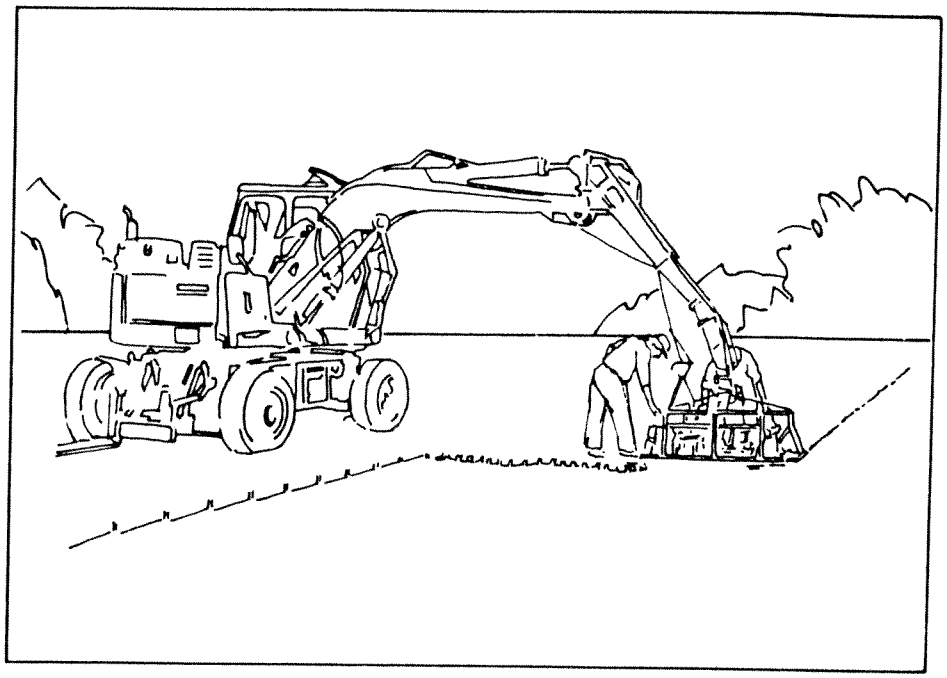
Structural Design of Pavements Surfaced With Concrete Paving Block ("Pavers")

Introduction

This design sheet provides guidance in selecting the thicknesses of pavement layers in a concrete block pavement (see Fig. 1) subjected to vehicle loadings. It covers a wide range of loadings from light traffic pavements carrying a few trucks on up to very heavily loaded industrial pavements.

Concrete pavers (also called concrete paving blocks, paving stones, or road stones, as well as various trade names) made in different shapes and colors have been used as attractive surfaces for sidewalks, drives, malls, and other paved areas in architectural settings. These paving blocks, about the size of a brick, are manufactured to close tolerances of dense, high-quality concrete. In addition to their aesthetic qualities, these paving blocks have developed a record of good performance under low-speed vehicular loading conditions ranging from driveways and parking lots up to industrial pavements carrying very heavy loads. In applications for vehicular loadings, the engineering characteristics of concrete block pavements become as important as, or more important than, their esthetic qualities. Some of the engineering properties are:

- in addition to handling heavy wheel loads, the ability to handle concentrated loads of semitrailer dollies and posts of shipping containers
- the ability to tolerate some subgrade movement and still maintain reasonable pavement continuity
- the ease of repairing the pavement in case of serious subgrade soil settlement with almost complete reuse



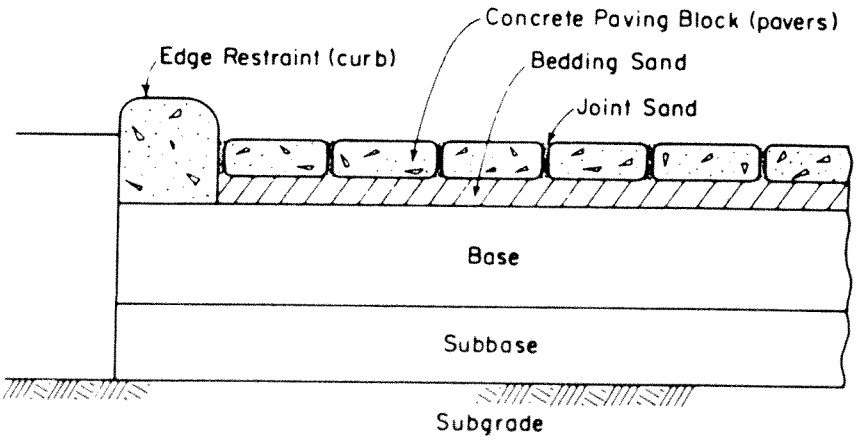


Fig. 1. Cross section of concrete block pavement.

of the pavers

the ease of access to underground services and subsequent repair without visible patching

the high strength of the pavers that provides durability and abrasion resistance needed in many industrial applications

resistance to damage caused by oil and fuel leakage

low maintenance requirements; this is especially advantageous for industrial pavements

, typical cross section of a concrete lock pavement is shown in Fig. 1. After reparation and compaction of the atural subgrade soil, designed thicknesses of subbase and base course omprised of specified materials are laced and properly compacted. The ase should be of a higher quality aterial than the subbase. The pavers re placed with a spacing of about ⅛ in. 3 mm) between them on a uniform ickness of bedding sand between 1 25 mm) and 1.5 in. (38 mm) thick. A pecial sand is swept into the joints etween the pavers, and the blocks are en seated by vibratory compaction. dge restraint provided by curbing round the paved area is considered ecessary so that the blocks do not eparate and lose their interlocking ffect.

For vehicular loadings, experience as indicated that the gradations of the edding sand and joint sand are important. The following gradations limits are enerally recommended for the bedding sand:

ieve Size	⅜ in	No 4	No 8	No 16
Passing	100	95-100	80-100	50-85

ieve Size	No 30	No 50	No 100	No 200
Passing	25-60	10-30	5-15	0-10

Joint sands that have been found to ork best have 100% passing a No. 16 eve with about 10% passing a No 200 eve Where it is of concern, the sands hould be free of contaminants likely to ause efflorescence and reduced skid esistance

Additional information on the conruction procedures and requirements or the concrete block, bedding sand, nd joint sand are given in References through 6

Basis for Design

Reference 7 summarizes the extensive research on concrete block pavements in Australia, South Africa, the United Kingdom, the United States, New Zealand and Denmark, as well as observations of in-service pavements Most investigators agree that block pavements behave in a manner similar to flexible (asphalt surfaced) pavements The research also discusses effects of block shape and thickness, laying pattern, sand-layer thickness, and other factors. Both interlocking and rectangular blocks (herringbone pattern) effectively distribute imposed loads exhibiting increasing stiffness, or "lockup," under traffic. Block damage has not been a serious problem.

Based on experience with concrete block pavements, several thickness design approaches are available (References 8-18). The procedure presented in this publication follows the U.S. Army Corps of Engineers method (see Reference 19). Based on test-track research (see Reference 17), their design procedure for flexible pavements was modified to conservatively recognize the interlocking effect of concrete block pavements. The design method is based on placing adequate thicknesses of successively stronger layers above the soil subgrade so that rutting of the pavment due to shear deformation or densification is avoided. Shear deformation is controlled by designing adequate layer thicknesses, and densification is controlled by specifying adequate compaction of the layers.

The design factors used in the procedure are the type, magnitude, and frequency of vehicle loads and the strengths of the subgrade, subbase, and base layers.

Traffic

Estimation of the traffic that will use the pavement over its design life is an important factor in the structural design of pavements of any type

For streets, drives, and parking lots, the number and weights of truck axleloads control the design thickness The designer estimates the ADT (average daily traffic, all vehicles) and the percent of trucks, some information on this may be available from city's traffic department who may also give guidance on the axleload magnitudes.

For commercial establishments, a prediction is made of the weights and axleload configurations of trucks carrying incoming materials and outgoing products Industrial pavements may be serving lift trucks, straddle carriers, and cranes as well as conventional trucks, and it is necessary to make a reasonable prediction of the loads and wheel configurations of all the heavier vehicles. In some cases, there may be parts of the paved area that will differ in the magnitudes, frequencies, and types of imposed loads.

A convenient way to characterize the traffic in flexible design procedures is to convert all the loads to a common denominator—the equivalent 18,000-lb (80-kN) single axleload, or ESAL (equivalent standard axleload). Values of ESAL for different axleload magnitudes are shown for conventional trucks and other vehicles in Table 1.

To illustrate the concept, one pass of a 34-kip (151-kN) tandem axle is equivalent to, and must be designed for, 3.3 passes (Table 1) of the standard 18-kip (80-kN) single axle. In a design problem, the number of repetitions of each load expected during the design life is multiplied by the respective ESAL factor, and the sum of all of these is used to determine design thickness in Table 4. More detailed explanation is given later in the design examples.

Where detailed information is not available, Table 2 provides some general guidance for estimating ESAL design values for different categories of traffic.

For heavy industrial and port loadings, very heavy lift trucks, cranes, and straddle carriers are evaluated in a similar manner but with the use of a heavier equivalency base—that of equivalent passes of the Caterpillar 998B forklift (see Table 3). This is illustrated in Design Example 3

Subgrade

In this design procedure the strength of the subgrade, as well as the subbase and base layers, is evaluated by the California Bearing Ratio (CBR) test, ASTM D-1883. Whenever economically

Table 1. Equivalent Standard Axleload (ESAL) Factors for Conventional Trucks and Other Vehicles (from U.S. Army Corps of Engineers)

Axle-load, kips	ESAL Factor	
	Single Axles	Tandem Axles
4	0.002	
6	0.008	
8	0.02	0.01
10	0.06	0.02
12	0.13	0.05
14	0.27	0.08
16	0.53	0.14
18	1.00	0.21
20	1.8	0.33
22	3.2	0.49
24	5.3	0.71
26	8.8	1.0
28	14.0	1.4
30	22.0	1.9
34		3.3
38		5.6
42		9.0
46		14.0
50		21.0

Gross Weight, kips	ESAL Factor	
	Tracked Vehicles	Forklift Trucks
5	0.007	0.001
10	0.032	0.030
15	0.120	0.26
20	0.04	1.4
25	0.9	5.3
30	2.1	16.0
35	4.5	44.0
40	9.0	105.0
45	17.0	
50	31.0	
55	54.0	
60	91.0	
65	150.0	
70	240.0	
80	560.0	
90	1200.0	
100	2600.0	
110	5100.0	
120	9500.0	

Table 2. Typical Design Traffic Categories and ESAL's

Traffic Category	Design Traffic	ESAL Repetitions in Design Life
A	Driveways, automobile parking lots	100,000
B	Minor residential streets (up to 25 ADTT*)	400,000
C	Residential and collector streets (25 to 500 ADTT), storage areas, and light industrial areas	600,000
D	Medium to heavy-duty industrial areas (500 to 1000 ADTT)	1,500,000
E	Heavy-duty industrial areas (1000 to 1500 ADTT)	2,000,000

* Average daily truck traffic excluding panels and pickup trucks

Table 3. Equivalent Caterpillar 988B Factors[1]

Vehicle	Gross Vehicle Weight (lb)	Number of Wheels[2]	Single[3] Wheel Load (lb)	Equivalent Factor
Caterpillar 988B forklift	165,000	4	66,000	1.00
Hyster 700 forklift	177,800	6	42,250	0.80
Kalmar forklift	204,250	6	48,080	2.13
Clark C500 forklift	198,000	6	45,250	1.65
Taylor 66 forklift	212,000	6	49,500	1.76
Clark 512 straddle carrier	154,200	6	27,900	0.28
Ferranti straddle carrier	225,000	4	56,250	0.60
Grove 80-ton crane (lifting)	275,000	4 outrigger paws	69,750	3.64
Grove 80-ton crane (moving)	119,000	12	10,136	0.05

Because of the wide variety of loads and wheel configurations of heavy industrial vehicles it is not possible to include them all here. Procedures for developing this design information for any vehicle are given in Reference 20.

The spacing between wheels affects the equivalencies so vehicles of similar weight with the same number of wheels may require very different pavement thicknesses due to the arrangement of wheels.

[3] Distribution of load between wheels is not constant and these represent the approximate maximum expected on any one wheel.

feasible, laboratory CBR tests should be run on samples of subgrade soil. These should be run on material compacted to the moisture and density conditions anticipated under service conditions since these factors will markedly influence the strength results obtained.

Since the CBR test is performed on saturated specimens, some adjustment may be taken if complete subgrade saturation is not anticipated. For groundwater table depths of more than 2 ft (0.3 m) below subgrade surface, the adjustments are: for CBR values of 2 or less, increase the CBR by 1; for values between 3 and 10, increase the CBR by 2, and for CBR's greater than 10, no change is made.

In the absence of laboratory test values, the approximate CBR soil classification correlation shown in Fig. 2 may be used as a guide. The subgrade should be prepared to be in as uniform condition of material type, density, and moisture as possible. Localized weak areas should be removed and replaced or otherwise corrected to provide reasonable uniformity of subgrade strength. Subgrade compaction requirements should conform to those appropriate for the soil type and for those successfully used for pavements of similar traffic conditions. Subgrade compaction requirements for heavily loaded industrial pavements should follow those for heavy-duty airports.

Subbase and Base Layers

Materials suitable for the subbase and base courses should meet the following requirements:

Material Property	Test Method	Subbase	Base
CBR	ASTM D1883	20 Min.*	80 Min.
Pass #200 Sieve	ASTM D1140	25% Max.	10% Max.
Liquid Limit	ASTM D423	25 Max.	25 Max.
Plasticity Index	ASTM D424	10 Max.	6 Max.
Compaction	AASHTO T-180	95% Min.	97% Min.

* Minimum subbase CBR is 30 for pavements carrying more than 500,000 ESAL during the design life and for pavements carrying industrial vehicles heavier than 100 kips (445 kN) gross weight.

These requirements are suggested as a guide to unbound base and subbase materials that have generally performed satisfactorily as layers in flexible pavements. Of course, they may be modified based on successful experience with specific local materials and conditions.

Depending on the materials available, their costs, and required design thicknesses, it may sometimes be desirable to omit the subbase layer and use base-course material for full depth.

For heavy-duty pavements, use of a stabilized granular material may become an economical alternative. Because these stabilized materials are stronger than unbound base materials, a thickness reduction can be taken in the design. The thickness for stabilized bases is determined by dividing the design thickness requirement for unbound granular base by the appropriate equivalence factor for the type of stabilized material. For example, the equivalence factor of high-quality cement-treated base* (CTB) is usually taken as 1.65 (1 in. [25 mm] of CTB is equivalent to 1.65 in. [40 mm] of high-quality granular base). Thus, if 11.5 in. (290 mm) of untreated base course is determined from Table 4, the required thickness of CTB is 11.5/1.65 = 7 inches (175 mm). Suggested minimum thicknesses for base courses, unbound or stabilized, are 4 in. (100 mm) for most conditions and 6 in. (150 mm) for heavy loading situations.

*Recommended requirements for CTB are given in Reference 15.

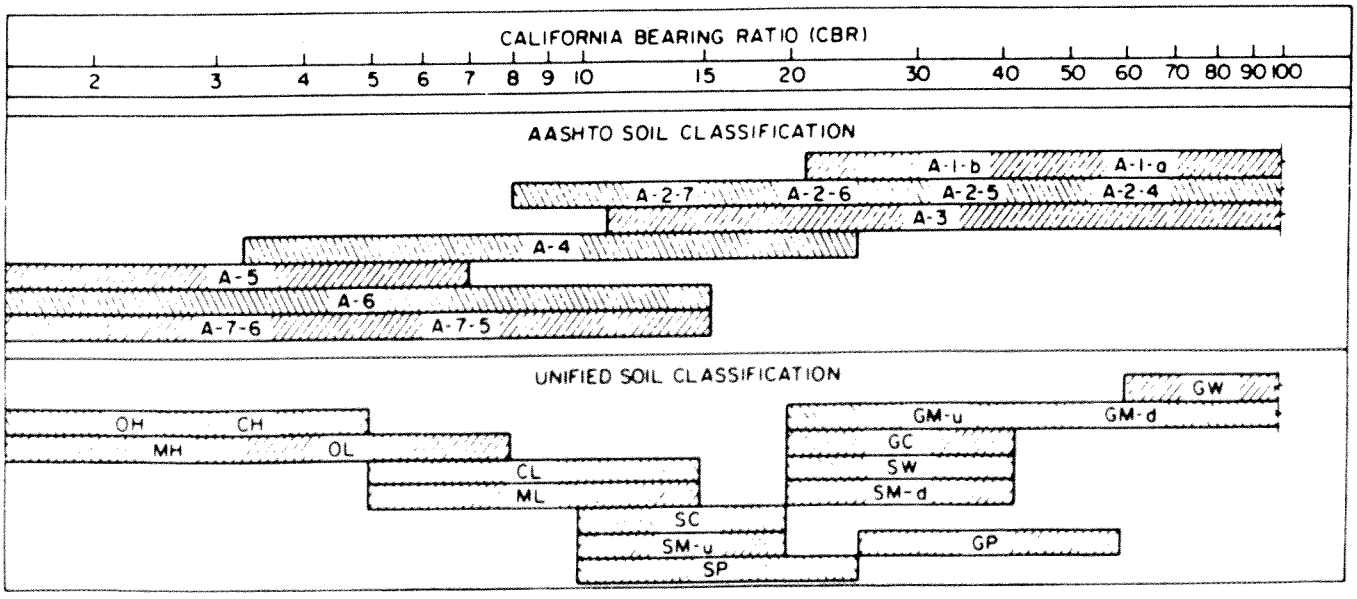


Fig. 2. Relationship between CBR and soil classifications.

Table 4. Required Thickness of Granular Base and Subbase (excludes thickness of paving block and bedding sand)

Equivalent Standard Axleloads (ESAL)	Thickness of Base and Subbase, in.										
	Subgrade CBR Value										
	2	2.5	3	3.5	4	5	6	8	10	15	20
1000	10.1	8.2	6.7	5.6	4.6						
2000	11.5	9.4	7.8	6.6	5.6	4.0					
4000	12.8	10.6	8.9	7.6	6.5	4.8					
8000	14.2	11.8	10.0	8.6	7.4	5.6	4.2				
10,000	14.7	12.2	10.3	8.9	7.7	5.8	4.4				
20,000	16.0	13.4	11.4	9.9	8.6	6.6	5.1			Min. 4.0	
40,000	17.4	14.6	12.5	10.9	9.5	7.4	5.9				
80,000	18.8	15.8	13.6	11.9	10.5	8.3	6.6	4.1			
100,000	19.2	16.2	14.0	12.2	10.8	8.5	6.8	4.3			
200,000	20.6	17.5	15.1	13.2	11.7	9.3	7.5	4.8			
400,000	22.0	18.7	16.2	14.2	12.6	10.1	8.2	5.4			
800,000	23.4	19.9	17.3	15.2	13.5	10.9	8.9	6.0			
1 Million	23.8	20.3	17.6	15.5	13.8	11.2	9.2	6.2	4.0		
2 Million	25.2	21.5	18.7	16.5	14.8	12.0	9.9	6.8	4.5		
4 Million	26.6	22.7	19.8	17.6	15.7	12.8	10.6	7.3	5.0		
8 Million	28.0	23.9	20.9	18.6	16.6	13.6	11.3	7.9	5.4		
10 Million	28.4	24.3	21.3	18.9	16.9	13.9	11.5	8.1	5.6		

Equivalent Caterpillar 988B	Thickness of Base and Subbase, in.										
	Subgrade CBR Value										
	2	2.5	3	3.5	4	5	6	8	10	15	20
100	27.8	23.4	20.3	17.9	16.0	13.2	11.1	8.3	6.4		
200	32.2	27.3	23.7	21.0	18.8	15.6	13.3	10.1	8.0	Min. 6.0	
400	36.0	30.5	26.6	23.5	21.2	17.6	15.1	11.6	9.3		
800	39.9	33.8	29.5	26.2	23.6	19.7	16.9	13.1	10.6	6.7	
1000	41.4	35.2	30.7	27.2	24.5	20.5	17.7	13.7	11.1	7.1	
2000	45.3	38.6	33.7	29.9	27.0	22.6	19.5	15.3	12.5	8.2	
4000	47.8	40.6	35.5	31.6	28.5	23.9	20.6	16.2	13.3	8.8	6.1
8000	51.8	44.1	38.5	34.3	31.0	26.0	22.5	17.8	14.6	9.8	6.9
10,000	53.4	45.5	39.8	35.4	32.0	26.9	23.3	18.4	15.1	10.2	7.3
20,000	56.7	48.3	42.3	37.7	34.0	28.7	24.8	19.7	16.2	11.0	7.9
40,000	59.2	50.5	44.2	39.4	35.6	30.0	26.0	20.6	17.0	11.7	8.5
80,000	63.5	54.1	47.3	42.2	38.2	32.2	27.9	22.2	18.4	12.7	9.3
100,000	64.3	54.8	48.0	42.8	38.7	32.7	28.3	22.3	18.7	12.9	9.5
200,000	68.7	58.5	51.2	45.7	41.3	34.9	30.3	24.1	20.1	14.0	10.3

Frost Action

For frost areas, flexible pavement design procedures (see Reference 21) consider one of two approaches: (1) limited subgrade frost penetration, or (2) reduced subgrade strength design. The first method, requiring a thicker pavement, is used for high-speed traffic situations such as runways and highways where roughness due to frost heave cannot be tolerated. The second method, which permits some roughness for slow-moving vehicles, recognizes that subgrades soften on spring thaw. The reduced-strength method is suggested for concrete block pavements. Other frost-design methods that have proved satisfactory may be used.

For frost action to occur, all of three conditions must be present: (1) frost-susceptible soil, (2) freezing temperatures penetrating the subgrade, and (3) a supply of water. With the absence of any one of these factors, frost action will not occur. For practical design situations, frost-susceptible soils are

defined as soil deposits having greater than 2% finer than the 0.02-mm size. Frost-susceptible soils are grouped by relative severity to frost action as shown in Table 5.

When all three of the above conditions for frost action exist, the following CBR values shall be used for design purposes:

F1	CBR = 8
F2	CBR = 6
F3	CBR = 3
F4	CBR = 3*

By using the CBR values shown for the various F-ratings soil groups, "reduced strength" thicknesses are compared to the structural design thickness found from Table 4. If the anticipated depth of frost penetration is less than the total thickness of pavement, that is, frost does not penetrate the subgrade, then design against frost action is not warranted other than utilizing non-frost-susceptible materials within the frost zone. However, when frost is expected to penetrate the subgrade soil, the final design thickness shall be the greater of the two thicknesses generated from the "structural design" and the "frost design."

Table 5. Frost Susceptible Soil Categories

Rating	Frost Severity	Description
NFS	No Problem	Non-frost-susceptible (less than 2% pass 0.02 mm)
F1	Slight	Gravelly Soils (3 to 20% finer than 0.02 mm)
F2		Sands (3 to 15% finer than 0.02 mm)
F3		Gravelly Soils (greater than 20% finer than 0.02 mm)
		Sandy Soils except Silty Sands (greater than 15% finer than 0.02 mm)
		Plastic Clays (PI > 12)
		Varved Clays (with uniform condition)
F4	Highest	Silts, including Sandy Silts, fine Silty Sands (greater than 15% finer than 0.02 mm)
		Lean Clays (PI < 12)
		Varved Clays (with nonuniform condition)

Table 6. Conversion of Equivalent Standard Axleloads (ESAL) to Equivalent Caterpillar 988B Loads

Equivalent Standard Axleloads (ESAL)	Subgrade CBR Value								
	2	3	4	5	6	8	10	15	20
10,000	16	16	16	16	15	13	11	6	2
40,000	25	24	24	24	23	20	16	9	3
100,000	33	32	32	31	30	26	21	10	3
400,000	49	48	48	47	44	38	31	14	4
1 Million	64	63	63	61	58	49	39	17	4
4 Million	97	95	94	91	87	73	57	23	5
10 Million	130	125	122	119	113	94	73	29	5
40 Million	195	187	181	177	167	139	106	39	6
100 Million	250	240	234	230	217	179	135	47	7

Thickness Design

The thickness design process involves determination of the thickness of the base and subbase layers. Concerning the thickness of the concrete pavers, of the thicknesses that have been available, the practice has been to use 60-mm pavers for light traffic, 80-mm pavers for pavements carrying trucks and other heavy vehicles, and 100-mm or 120-mm pavers for very heavy load situations (ESAL greater than 1.5 million).

The thickness** of base and subbase material needed above a given subgrade CBR is shown in Table 4. It is to be noted that the thicknesses shown do not include the sand bedding course or the concrete pavers.

The lower portion of Table 4 shows the required thicknesses for heavy industrial loadings for which the traffic has been evaluated in terms of equivalent Caterpillar 988B loadings. If there is a mix of these heavy loadings (Table 2) with other traffic evaluated by ESAL's (Table 1), the latter can be converted to equivalent Caterpillar 988B loadings by the use of Table 6. Design Example 3 illustrates this.

The use of the design table is illustrated by the following example problems.

Design Example 1

A service driveway for several multiple dwellings is to be designed. It will carry mostly passenger cars with a few service and delivery trucks and a weekly garbage truck. The subgrade soil is simply described as a silty clay by visual examination. The location is a non-frost area. No laboratory tests or traffic data are available.

In the absence of detailed data, the designer must resort to the correlations

* A CBR value of 3 may be used for F4 soils if the subgrade material is not extremely variable in the horizontal direction. Some frost heave may occur with this design but its effect may not be critical for slow-moving vehicles. See Reference 21 if there are: very severe frost conditions with extremely variable F4 soils, very weak soils (CBR less than 3), and if pavement smoothness is critical.

** Traffic distribution on different areas of the pavement affects thickness requirements. Table 4 gives thicknesses for areas where traffic is concentrated or highly channelized in the same wheel paths. Where traffic is more distributed, a reduction in thickness can be taken as follows:
- 90% of thickness for areas where vehicle passes are only moderately channelized, wander width (lateral distribution of 75% of placements of vehicle centerline) of 6 ft up to 15 ft.
- 80% of thickness where traffic distribution is more or less random without definite channelization.

shown in Fig. 2 for the CBR value and Table 2 for the traffic category. Regarding the subgrade, a silty clay will usually fall into the better range of AASHTO A-6 class and in the Unified soil class of CL; so from Fig. 2, a subgrade CBR of 6 is selected. From Table 2, a condition between traffic curves A and B (say 100,000 ESAL) is selected because there are occasional heavy trucks.

With a CBR of 6 and ESAL of 100,000, Table 4 shows a total subbase and base thickness of 6.8 in. (170 mm). Since, in this case, it probably would not be practical or economical to specify 2 layers of construction (base and subbase), material meeting granular base-course requirements will be used full depth. Thus, the design solution is:

2.4-in. (60-mm) concrete paving block
1- to 1½-in. (25- to 40-mm) bedding sand
7-in. (170-mm) unbound granular base course

Design Example 2

A paved area at an industrial plant is to be designed to carry, on a regular basis, the following vehicles on the most heavily trafficked section:

Loads	Per Day	Repetitions In 20 Years		ESAL Factor		ESAL
34 kip tandem axle	12	60,000	×	3.3	=	198,000
22 kip single axle	5	25,000	×	3.2	=	80,000
20 kip forklift	18	90,000	×	1.4	=	126,000
30 kip forklift	4	20,000	×	16.0	=	320,000
						724,000

Empty trucks, other loaded trucks which come infrequently, and light trucks are assumed to not affect the design.

Laboratory tests on the silty-clay subgrade soil, proposed subbase, and base materials show CBR's of 5, 35, and 92, respectively. Frost penetration at the site averages about 24 in. (610 mm), and the subgrade soil's frost susceptibility category (Table 5) is F3.

For subgrade CBR of 5 and ESAL of 724,000, Table 4 indicates a total thickness of base and subbase of 10.75 in. (275 mm) above the subgrade.

Thus, the design, without frost considerations, is:

3.1-in. (80-mm) concrete pavers
1- to 1½-in. (25- to 40-mm) bedding sand
4-in. (100-mm) granular base material
6.75-in. (175-mm) granular subbase material

In a nonfrost area, this would represent the design thickness. However, a frost penetration of 24 in. (610 mm) will penetrate the frost-susceptible subgrade.* As a result, it is necessary to check the above design for frost action. Since the subgrade soil is classified as an F3, its CBR under spring thaw conditions must be downgraded to a value of 3. With this CBR, Table 4 indicates that 17 in. (430 mm) is required for frost action. So the final design, controlled by frost considerations, is:

3.1-in. (80-mm) concrete pavers
1- to 1½-in. (25- to 40-mm) bedding sand
4-in. (10-mm) granular base material
13-in. (330-mm) granular subbase material

*Note that if the frost penetration were less than the total thickness above subgrade, about 14 in. (360 mm), frost action would not be a problem.

Design Example 3

A port container pavement area is to be designed to carry very heavy lift trucks and straddle carriers. It is in a nonfrost area. Alternate design will include both granular and cement-treated layers. The following vehicles and number of load repetitions are estimated:

Loads	Repetitions	ESAL Factor	ESAL
40 kip forklift	60,000	105.0	6,300,000
34 kip tandem axleloads	40,000	3.3	132,000
			6,432,000

		Caterpillar 988B factor	Equivalent Cat 988B loads
Clark 512 straddle carrier	1,000	0.28	280

CBR values of the subgrade, subbase, and base-course materials are 4, 40, and 85, respectively.

The above loadings evaluated by the use of ESAL's are converted to equivalent Caterpillar 988B loadings. This is done with Table 6, which, for a subgrade CBR of 4, shows that 6,432,000 ESAL's is equivalent to about 105 Cat 988B's. Adding the effect of Clark 512 straddle carrier loads, the total equivalent Caterpillar load is: 105 + 280 = 385.

For these conditions, the lower portion of Table 4 indicates a total thickness of base and subbase of 21 in. (530 mm). The design for untreated granular layers would then be:

6-in. (150-mm) base (minimum) on 15-in. (380-mm) subbase

If a cement-treated base (CTB) were used, several alternate designs can be worked out on the basis of the equivalence of 1.65:

6-in. (150-mm) CTB on 11-in. (280-mm) subbase
8-in. (200-mm) CTB on 8-in. (200-mm) subbase
13-in. (330-mm) CTB on 0-in. subbase

For this heavy loading situation, use of 100- or 120-mm thick paving blocks is recommended. (Note that if traffic is not highly channelized, the thickness requirements can be reduced. See footnote, page 6.)

References

1. "Concrete Block Pavements Design and Construction," National Concrete Masonry Association, Herndon, Va., 1979.
2. "Concrete Block Pavements Structural Design," National Concrete Masonry Association, TEK 115 Herndon, Va., 1980.
3. "Standard Specification for Solid Concrete Interlocking Paving Units," American Society for Testing and Materials, ASTM C936.
4. "Canadian Standards Association, Preliminary Standard A231.2M, Precast Unit Pavers," 1983, Rexdale, Ontario.
5. Hodgkinson, J. R., "Specification for Construction of Trafficked Interlocking Concrete Pavements," TN 41, Cement and Concrete Association of Australia, March 1982.
6. "Specification for Precast Concrete Paving Blocks," Cement and Concrete Association, Wexham Springs, United Kingdom.
7. Rollings, R. S., "Concrete Block Pavements," Technical Report GL-83-3, Geotechnical Laboratory, U.S. Army Waterways Experiment Station, Vicksburg, Miss., March 1983.
8. Shackel, B., "An Experimental Investigation of the Response of Interlocking Concrete Block Pavements to Simulated Traffic Loading," Seminar on Interlocking Concrete Block Pavements, Australian Road Research Board, Australia, 1978.
9. Shackel, B., and Arora, M. G., "The Evaluation of Interlocking Block Pavements," An Interim Report, *Proceedings, Annual Conference*, Concrete Masonry Association, Australia, 1978.
10. Shackel, B., "The Design of Interlocking Concrete Block Pavements for Road Traffic," First International Conference on Concrete Block Paving, University of Newcastle-Upon-Tyne, England, 1980.
11. Seddon, P. A., "The Behavior of Concrete Block Paving Under Repetitive Loading," First International Conference on Concrete Block Paving, University of Newcastle-Upon-Tyne, England, 1980.
12. Lilley, A. A., and Clark A. J., "Concrete Block Paving for Lightly Trafficked Roads and Paved Streets," Report No. 46.024, Cement and Concrete Association, Wexham Springs, England, 1978.
13. Lilley, A. A., and Walker, B. J., "Concrete Block Paving for Heavily Trafficked Roads and Paved Areas," Technical Report 46.023, Cement and Concrete Association, Wexham Springs, United Kingdom, 1978.
14. Knapton, J., "The Design of Concrete Block Roads," Report No. 42.515, Cement and Concrete Association, Wexham Springs, United Kingdom, 1976.
15. Hodgkinson, J. R. and Morrish, C. F., "Interim Guide to the Design of Interlocking Concrete Pavements for Vehicular Traffic," TN 34, Cement and Concrete Association, Australia, 1980.
16. "Concrete Block Pavements—Structural Design," TEK 115, National Concrete Masonry Association, Herndon, Va., 1980.
17. Tait, J. B., "Industrial Use of Block Paving," *New Zealand Concrete Construction*, March 1983.
18. "Design of Concrete Block Pavements for Heavy Industrial and Port Loads," TEK 131, National Concrete Masonry Association, Herndon, Va., 1983.
19. Department of the Army, "Use of Precast Concrete Block Pavements," ETL 1110-3-310, Office, Chief of Engineers, Washington, D.C., 1979.
20. Pereira, A. T., "Procedures for Development of CBR Design Curves," Instruction Report S-77-1, U.S. Army Engineers Waterways Experiment Station," Vicksburg, Miss., June 1977.
21. "Pavement Design for Frost Conditions," Department of the Army and the Air Force (U.S.A.). TM 5-818-2 (AFM 88-6, Chapter 4), 1965.

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DEPARTMENT OF AGRICULTURE
INYO NATIONAL FOREST

MAMMOTH LAKES SIGNAGE AND WAYFINDING PROJECT

Appendix C

Sign Message Schedule For Town Wide Trails

CMI05-03T and CMI05-05T Non-Motor/Non-Wilderness Trails
Requisition No. 371379

March 2010

Mammoth Lakes Recreational Signage & Wayfinding System

Sign Message Schedule for Town Wide Trails

February 25, 2010

The Town of Mammoth Lakes

California

Prepared by

corbindesign

109 East Front 304
Traverse City, MI 49684
231 **947.1236**

corbindesign

Town wide trails, Mammoth Lakes 2010

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML7.00	Type 2 Trail Information Kiosk		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
[header:]
Town Loop
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
TML
7.00
Rescue Number
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[South SIDE B]
[posting board]

Phase

Notes

Rescue Location Number TML 7.00

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location
Mammoth Creek Road
Cross Street
Old Mammoth Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
MCP0.02	Type 2 Trail Information Kiosk		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
[header:]
Town Loop
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
MCP
0.02
Rescue Number
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[West SIDE B]
[posting board]

Phase

Notes

Rescue Location Number MCP 0.02

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location
Old Mammoth Road
Cross Street
Mammoth Creek Park

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML7.08	Type 4/6 Information/Trail Guide		South	TOML

Sign Message

[side panel:]
Rescue Number
Town Loop
[message body:]
↑ {message to be determined}
[rule line]
[map]
Rescue Number
TML
7.08
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number TML 7.08

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Old Mammoth Road
Cross Street
Mammoth Creek Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML0.14	Type 4/6 Information/Trail Guide		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
[side panel:]
Town Loop
[message body:]
↑ To Town Loop .25 mi
[map]
Rescue Number
TML
0.14
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[S/W SIDE B]
↑ Mammoth Creek Park .15 mi

Phase

Notes

Rescue Location Number TML 0.14

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Old Mammoth Road
Cross Street
Mammoth Creek Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML0.33	Type 4 Access/Egress Information		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
[side panel:]
Town Loop
[Hike] [Bike] [Dog]
[map]
Rescue Number
TML
0.33
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[S/W SIDE B]
➔ To Town Loop .25 mi [Rest] [Play] [Pic]

Phase

Notes

Rescue Location Number TML 0.33

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Minaret Road
Cross Street
Old Mammoth Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
MIN0.0W	Type 6a Trail Guide (secondary)		Northeast	TOML

Sign Message

➔ Town Loop
Rescue Number
MIN
0.0W
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number MIN 0.0W

Location Photo

Photo Notes

Single-Sided
YES
Double-Sided

Street Location
Minaret Road
Cross Street
Old Mammoth Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML 1.07	Type 4/6 Information/Trail Guide		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
[side panel:]
Town Loop
[message body:]
➔ Town Loop
Eagle Lodge
[rule line]
[map]
Rescue Number
TML
1.07
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[West SIDE B]
↑ Town Loop 1.0 mi [Rest] [Play] [Pic]

Phase

Notes

Rescue Location Number TML 1.07

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Waterford Avenue
Cross Street
Old Mammoth Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML1.27	Type 4 Access/Egress Information		South (Side A) and North (B)	TOML

Sign Message

[South SIDE A]
[side panel:]
Town Loop
[Hike] [Bike] [Dog]
[map]
Rescue Number
TML
1.27
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[North SIDE B]
↑ Town Loop

Phase

Notes

Rescue Location Number TML 1.27

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Waterford Avenue
Cross Street
Majestic Pines Drive

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML1.37	Type 4 Access/Egress Information		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
[side panel:]
Town Loop
[Hike] [Bike] [Dog]
[map]
Rescue Number
TML
1.37
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[South SIDE B]
← Eagle Lodge .4 mi [Ski]

Phase

Notes

Rescue Location Number TML 1.37

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location
Waterford Avenue
Cross Street
Majestic Pines Drive

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML2.15	Type 4 Access/Egress Information		Northeast	TOML

Sign Message

[side panel:]
Town Loop
[Hike] [Bike] [Dog]
[map]
Rescue Number
TML
2.15
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number TML 2.15

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Juniper Springs Drive
Cross Street
Majestic Pines Drive

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML2.18	Type 6a Trail Guide (secondary)		N/W (side A) and S/E (B)	TOML

Sign Message

[N/W SIDE A]
Town Loop
Rescue Number
TML
2.18
In case of emergency call 911
[TOML logo]
[S/E SIDE B]
Town Loop
Rescue Number
TML
2.18
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 2.18

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Juniper Springs Drive
Cross Street
Majestic Pines Drive

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML2.24	Type 6a Trail Guide (secondary)		West (Side A) and East (B)	TOML

Sign Message

[West SIDE A]
Town Loop
Rescue Number
TML
2.24
In case of emergency call 911
[TOML logo]
[East SIDE B]
Town Loop
Rescue Number
TML
2.24
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 2.24

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Juniper Springs Drive
Cross Street
N. Majestic Pines Drive

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
ELA002	Type 6a Trail Guide (secondary)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Town Loop
Rescue Number
ELA
002
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
↑ Town Loop
Rescue Number
ELA
002
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number ELA 002

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Juniper Springs Drive
Cross Street
N. Majestic Pines Drive

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
ELA001	Type 6a Trail Guide (secondary)		West (Side A) and East (B)	TOML

Sign Message

[West SIDE A]
↑ Town Loop
Rescue Number
ELA
001
In case of emergency call 911
[TOML logo]
[East SIDE B]
↑ Town Loop
Rescue Number
ELA
001
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number ELA 001

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Juniper Springs Drive
Cross Street
N. Majestic Pines Drive

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML2.35	Type 6a Trail Guide (secondary)		South (Side A) and North (B)	TOML

Sign Message

[South SIDE A]
Town Loop
Rescue Number
TML
2.35
In case of emergency call 911
[TOML logo]
[North SIDE B]
Town Loop
Rescue Number
TML
2.35
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 2.35

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Juniper Springs Drive
Cross Street
N. Majestic Pines Drive

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML2.38	Type 6a Trail Guide (secondary)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
Town Loop
Rescue Number
TML
2.38
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
Town Loop
Rescue Number
TML
2.38
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 2.38

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Juniper Springs Drive
Cross Street
N. Majestic Pines Drive

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML2.39	Type 4 Access/Egress Information		Southwest	TOML

Sign Message

[side panel:]
Town Loop
[Hike] [Bike] [Dog]
[map]
Rescue Number
TML
2.39
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number TML 2.39

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Juniper Springs Drive
Cross Street
N. Majestic Pines Drive

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LSC0.00	Type 6a Trail Guide (secondary)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
➔ Lodestar Trail
Rescue Number
LSC
0.00
In case of emergency call 911
[TOML logo]
[West SIDE B]
➔ Lodestar Trail
Rescue Number
LSC
0.00
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LSC 0.00

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lodestar Drive
Cross Street
Meridian Blvd.

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML3.04	Type 4/6 Information/Trail Guide		Northeast	TOML

Sign Message

[side panel:]
Town Loop
[message body:]
↑ Town Loop
Eagle Lodge .75 mi [Ski]
[rule line]
➔ Lakes Basin Path
North Village .7 mi
[map]
Rescue Number
TML
3.04
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number TML 3.04

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location Meridian Blvd.
Cross Street Minaret Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML3.06	Type 6a Trail Guide (secondary)		West	TOML

Sign Message

↑ Town Loop
Rescue Number
TML
3.06
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 3.06

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location Meridian Blvd.
Cross Street Minaret Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML3.15	Type 6a Trail Guide (secondary)		West (Side A) and East (B)	TOML

Sign Message

[West SIDE A]
↑ Town Loop
Rescue Number
TML
3.15
In case of emergency call 911
[TOML logo]
[East SIDE B]
↑ Town Loop
Rescue Number
TML
3.15
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 3.15

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Meridian Blvd.
Cross Street
Obsidian Place

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML3.71	Type 6a Trail Guide (secondary)		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
↑ Town Loop
Rescue Number
TML
3.71
In case of emergency call 911
[TOML logo]
[South SIDE B]
↑ Town Loop
Rescue Number
TML
3.71
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 3.71

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Callahan Way
Cross Street
South Frontage Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML3.80	Type 6a Trail Guide (secondary)		East	TOML

Sign Message

← Town Loop
Rescue Number
TML
3.81
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 3.80

Single-Sided YES

Double-Sided

Street Location
Callahan Way
Cross Street
South Frontage Road

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML3.81	Type 6a Trail Guide (secondary)		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
↑ Town Loop
Rescue Number
TML
3.81
In case of emergency call 911
[TOML logo]
[South SIDE B]
→ Town Loop
Rescue Number
TML
3.81
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 3.81

Single-Sided

Double-Sided YES

Street Location
Callahan Way
Cross Street
South Frontage Road

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML3.87	Type 6a Trail Guide (secondary)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
↑ Town Loop
Rescue Number
TML
3.87
In case of emergency call 911
[TOML logo]
[West SIDE B]
↑ Town Loop
Rescue Number
TML
3.87
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 3.87

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
South Frontage Road
Cross Street
Callahan Way

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML4.0	Type 6a Trail Guide (secondary)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
↑ Town Loop
Rescue Number
TML
4.0
In case of emergency call 911
[TOML logo]
[West SIDE B]
↑ Town Loop
Rescue Number
TML
4.0
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 4.0

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
South Frontage Road
Cross Street
Manzanita Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML4.37	Type 6a Trail Guide (secondary)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
Town Loop
Rescue Number
TML
4.37
In case of emergency call 911
[TOML logo]
[West SIDE B]
Town Loop
Rescue Number
TML
4.37
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 4.37

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Laurel Mountain Road
Cross Street
South Frontage Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML4.47	Type 2 Trail Information Kiosk		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
[header:]
Town Loop
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
TML
4.47
Rescue Number
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[West SIDE B]
[posting board]

Phase

Notes

Rescue Location Number TML 4.47

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Old Mammoth Road
Cross Street
Main Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
NMC0.10	Type 6a Trail Guide (secondary)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
← Town Loop
Rescue Number
NMC
0.10
In case of emergency call 911
[TOML logo]
[West SIDE B]
↑ Visitor Center
Rescue Number
NMC
0.10
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number NMC 0.10

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Murphy Drive
Cross Street
Ruby Lane

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML4.51	Type 6a Trail Guide (secondary)		N/W (side A) and S/E (B)	TOML

Sign Message

[N/W SIDE A]
↑ Town Loop
Rescue Number
TML
4.51
In case of emergency call 911
[TOML logo]
[S/E SIDE B]
↑ Town Loop
Rescue Number
TML
4.51
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TML 4.51

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Highway 203
Cross Street
Old Mammoth Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SRP0.23N	Type 6a Trail Guide (secondary)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
➔ Shady Rest Path
Rescue Number
SRP
0.23N
In case of emergency call 911
[TOML logo]
[West SIDE B]
➔ Shady Rest Path
Rescue Number
SRP
0.23N
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number SRP 0.23N

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Sawmill Cutoff Road
Cross Street
Highway 203

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SRP0.23S	Type 4/6 Information/Trail Guide		North	TOML

Sign Message

[side panel:]
Town Loop
[message body:]
➔ Welcome Center .2 mi [Info] [Rest]
Ranger Station
➔ Town Loop
[rule line]
[map]
Rescue Number
SRP
0.23S
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number SRP 0.23S

Location Photo

Photo Notes

Single-Sided
YES
Double-Sided

Street Location
Sawmill Cutoff Road
Cross Street
Highway 203

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SRP0.29	Type 6a Trail Guide (secondary)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Welcome Center
Rescue Number
SRP
0.29
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
↑ Shady Rest Park
Rescue Number
SRP
0.29
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number SRP 0.29

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Banner Road
Cross Street
Sawmill Cutoff Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SRP0.30	Type 2 Trail Information Kiosk		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
[header:]
Shady Rest Path
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
SRP
0.30
Rescue Number
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[S/W SIDE B]
[posting board]

Phase

Notes

Rescue Location Number SRP 0.30

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Banner Road
Cross Street
Sawmill Cutoff Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
2030.08	Type 6a Trail Guide (secondary)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
← Town Loop
Rescue Number
203
0.08
In case of emergency call 911
[TOML logo]
[West SIDE B]
→ Town Loop
Rescue Number
203
0.08
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number 203 0.08

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location
Highway 203
Cross Street
Sierra Park Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
036	Type 4/6 Information/Trail Guide		South	TOML

Sign Message

[side panel:]
Town Loop
[message body:]
→ Welcome Center [Info] [Rest]
Ranger Station
← Shady Rest Path
Shady Rest Park
[rule line]
[map]
Rescue Number
SRP
0.15
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number SRP 0.15

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Highway 203
Cross Street
Sierra Park Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SPC0.75	Type 6a Trail Guide (secondary)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
↑ Town Loop
Rescue Number
SPC
0.75
In case of emergency call 911
[TOML logo]
[West SIDE B]
↑ Town Loop
Rescue Number
SPC
0.75
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number SPC 0.75

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location
Sierra Park Road
Cross Street
Highway 203

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML4.68	Type 4 Access/Egress Information		Southeast	TOML

Sign Message

[side panel:]
Town Loop
[Hike] [Bike] [Dog]
[map]
Rescue Number
TML
4.68
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number TML 4.68

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Highway 203
Cross Street
Sierra Park Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
2030.00	Type 6 Trail Guide (primary)		Southwest	TOML

Sign Message

[side panel:]
Town Loop
[message body:]
↑ Welcome Center [Info] [Rest]
Ranger Station
Shady Rest Park
[rule line]
← Town Loop
Rescue Number
203
0.00
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number 203 0.00

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Highway 203
Cross Street
Sierra Park Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SRP.06S	Type 6a Trail Guide (secondary)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Shady Rest Path
Rescue Number
SRP
0.06S
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
➔ Welcome Center [Info] [Rest]
Rescue Number
SRP
0.06S
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number SRP .06S

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Highway 203
Cross Street
Mammoth Lakes Welcome Ctr

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SRP.06N	Type 2 Trail Information Kiosk		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
[header:]
{message to be determined}
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
SRP
0.06N
Rescue Number
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[S/W SIDE B]
[posting board]

Phase

Notes
Name of this are to be determined

Rescue Location Number SRP .06N

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location
Highway 203
Cross Street
Mammoth Lakes Welcome Ctr

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
MWC001	Type 5 Vehicular Guide (horizontal)		Southeast	TOML

Sign Message

[header:]
Mammoth Lakes
← Public Parking
← Ranger Station
← Welcome Center

Phase

Notes

Rescue Location Number MWC 001

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Mammoth Lakes Welcome Ctr
Cross Street
Highway 203

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
MWC002	Type 1 Portal Identification Marker		Southeast	TOML

Sign Message

[header:]
Mammoth Lakes
Welcome Center
[message body:]
[Hike] [Bike] [Dog] [Ski] [SS]
{message to be determined}
[TOML logo]

Phase

Notes

Rescue Location Number MWC 002

Single-Sided
YES

Double-Sided

Street Location
Mammoth Lakes Welcome Ctr
Cross Street
Highway 203

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML5.64	Type 4/6 Information/Trail Guide		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
➔ Trails End Park .2 mi [Rest] [Skate]
[S/W SIDE B]
[side panel:]
Town Loop
[message body:]
↑ Welcome Center .9 mi [Rest] [Ran] [info]
↑ Shady Rest Park 2 mi [Rest] [Ball] [Play]
[Skate] [Pic]
[map]
Rescue Number
TML
5.64
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number TML 5.64

Single-Sided
Double-Sided
YES

Street Location
Commerce Drive
Cross Street
Meridian Blvd.

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TEP001	Type 2 Trail Information Kiosk		South (Side A) and North (B)	TOML

Sign Message

[South SIDE A]
[header:]
Town Loop
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
TEP
001
Rescue Number
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[North SIDE B]
[posting board]

Phase

Notes

Rescue Location Number TEP 001

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Meridian Blvd.
Cross Street
Wagon Wheel Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TNC0.06	Type 6a Trail Guide (secondary)		N/W (side A) and S/E (B)	TOML

Sign Message

[N/E SIDE A]
← Trails End Park
Rescue Number
SRP
0.06S
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
→ School
Rescue Number
SRP
0.06S
In case of emergency call 911
[TOML logo]

Phase

Notes
Name of this access route to be determined

Rescue Location Number TNC 0.06

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Meridian Blvd.
Cross Street
Wagon Wheel Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
MCO001	Type 7 Interpretive Kiosk		Southwest	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number MCO 001

Single-Sided YES

Double-Sided

Street Location
Meridian Blvd.
Cross Street
Wagon Wheel Road

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
MCO002	Type 7 Interpretive Kiosk		Northwest	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number MCO 002

Single-Sided YES

Double-Sided

Street Location
Meridian Blvd.
Cross Street
Wagon Wheel Road

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
MCO003	Type 7 Interpretive Kiosk		Northeast	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number MCO 003

Single-Sided YES

Double-Sided

Street Location Meridian Blvd.
Cross Street Wagon Wheel Road

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SPC0.11	Type 4/6 Information/Trail Guide		East	TOML

Sign Message

[side panel:]
Sierra Park Connector
[message body:]
↑ Sierra Park Connector
← Town Loop
Mammoth Creek Park
→ Meridian Connector
[rule line]
[map]
Rescue Number
SPC
0.11
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes
Side panel message to be determined. Is this the Sierra Connector?

Rescue Location Number SPC 0.11

Single-Sided YES

Double-Sided

Street Location Mammoth Creek Road
Cross Street Old Mammoth Road

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
CTC0.04	Type 2 Trail Information Kiosk		West (Side A) and East (B)	TOML

Sign Message

[West SIDE A]
[header:]
Sierra Park Connector
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
CTC
0.04
Rescue Number
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[East SIDE B]
[posting board]

Phase

Notes
Header panel message to be determined. Is this the Sierra Connector?

Rescue Location Number CTC 0.04

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Mammoth Creek Road
Cross Street
Old Mammoth Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SPC0.26	Type 2 Trail Information Kiosk		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
[header:]
Sierra Park Connector
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
SPC
0.26
Rescue Number
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[S/W SIDE B]
[posting board]

Phase

Notes
Header message to be determined. Is this the Sierra Connector?

Rescue Location Number SPC 0.26

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Meridian Blvd.
Cross Street
Sierra Park Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SPC0.30	Type 6a Trail Guide (secondary)		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
↑ Town Loop
Rescue Number
SPC
0.30
In case of emergency call 911
[TOML logo]
[South SIDE B]
↑ Meridian Connector
Rescue Number
SPC
0.30
In case of emergency call 911
[TOML logo]

Phase

Notes
Message to be determined. Is this the Sierra Connector?

Rescue Location Number SPC 0.30

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location
Meridian Blvd.
Cross Street
Sierra Park Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
MBC0.97	Type 4 Access/Egress Information		Southwest	TOML

Sign Message

[side panel:]
Meridian Connector
[Hike] [Bike] [Dog]
[map]
Rescue Number
MBC
0.97
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number MBC 0.97

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Meridian Blvd.
Cross Street
Sierra Park Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML6.81	Type 4 Access/Egress Information		North	TOML

Sign Message

[side panel:]
Town Loop
[Hike] [Bike] [Dog]
[map]
Rescue Number
TML
6.81
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number TML 6.81

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Mammoth Creek Road
Cross Street
Old Mammoth Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SPC0.01	Type 6a Trail Guide (secondary)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
➔ Sierra Park Connector
Rescue Number
SPC
0.01
In case of emergency call 911
[TOML logo]
[West SIDE B]
➔ Sierra Park Connector
Rescue Number
SCP
0.01
In case of emergency call 911
[TOML logo]

Phase

Notes
Name of this connector to be determined.
Is this the Sierra Connector?

Rescue Location Number SPC 0.01

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location
Mammoth Creek Road
Cross Street
Old Mammoth Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML6.89	Type 6 Trail Guide (primary)		North	TOML

Sign Message

[side panel:]
Town Loop
[message body:]
← Trails End Park [Rest] [Skate]
[rule line]
→ Mammoth Creek Park [Rest] [Play] [Pic]
Rescue Number
TML
6.89
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number TML 6.89

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location Mammoth Creek Road
Cross Street Old Mammoth Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
STP001	Type 1 Portal Identification Marker		Southwest	TOML

Sign Message

[header:]
Shady Rest Park
[message body:]
[Hike] [Bike] [Dog] [Ski] [SS] [SM]
{message to be determined}
[TOML logo]

Phase

Notes

Rescue Location Number STP 001

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location Sawmill Road
Cross Street Sawmill Cutoff Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SRP1.04	Type 6a Trail Guide (secondary)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
↑ Welcome Center
Rescue Number
SRP
1.04
In case of emergency call 911
[TOML logo]
[West SIDE B]
↑ Shady Rest Park
Rescue Number
SRP
0.06S
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number SRP 1.04

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Sawmill Road
Cross Street
Sawmill Cutoff Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
SRP1.05	Type 2 Trail Information Kiosk		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
[header:]
Shady Rest Path
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
SRP
1.05
Rescue Number
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[S/W SIDE B]
[posting board]

Phase

Notes

Rescue Location Number SRP 1.05

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Sawmill Road
Cross Street
Sawmill Cutoff Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
STP002	Type 3 Park Identification Marker		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
[header:]
Shady Rest Park
[message body:]
[Rest] [Ball] [Play] [Skate] [Pic]
[TOML logo]
[West SIDE B]
[header:]
Shady Rest Park
[message body:]
[Rest] [Ball] [Play] [Skate] [Pic]
[TOML logo]

Phase

Notes

Rescue Location Number STP 002

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Sawmill Road
Cross Street
Sawmill Cutoff Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
MIN0.0E	Type 6a Trail Guide (secondary)			TOML

Sign Message

↑ Town Loop
Rescue Number
MIN
0.0E
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number MIN 0.0E

Location Photo

Photo Notes

Single-Sided
YES
Double-Sided

Street Location
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LSC0.45	Type 4 Access/Egress Information		South (Side A) and North (B)	TOML

Sign Message

[South SIDE A]
[side panel:]
Lodestar Connector
[Hike] [Bike] [Dog]
[map]
Rescue Number
LSC
0.45
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[North SIDE B]
↑ To Town Loop .45 mi

Phase

Notes

Rescue Location Number LSC 0.45

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TML5.63C	Type 6 Trail Guide (primary)		West	TOML

Sign Message

[side panel:]
Town Loop
[message body:]
← Welcome Center [Rest] [info]
← Shady Rest Park [Rest] [Play] [Pic]
← Main Street
[rule line]
→ Trails End Park [Rest] [Skate]
→ Mammoth Creek Park [Rest] [Play] [Pic]
Rescue Number
TML
5.63C
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number TML 5.63C

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
PAN0.00	Type 4 Access/Egress Information		East	TOML

Sign Message

[side panel:]
Panorama Vista Trail
[Hike] [Bike] [Dog]
[map]
Rescue Number
PAN
0.00
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number PAN 0.00

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
PAN0.78	Type 4 Access/Egress Information		West	TOML

Sign Message

[side panel:]
Panorama Vista Trail
[Hike] [Bike] [Dog]
[map]
Rescue Number
PAN
0.78
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number PAN 0.78

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
MRT0.00	Type 4 Access/Egress Information		East	TOML

Sign Message

[side panel:]
Mammoth Rock Trail
[Hike] [Bike] [Dog]
[map]
Rescue Number
MRT
0.00
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number MRT 0.00

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
MRT2.58	Type 4 Access/Egress Information		West	TOML

Sign Message

[side panel:]
Mammoth Rock Trail
[Hike] [Bike] [Dog]
[map]
Rescue Number
MRT
2.58
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number MRT 2.58

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

DEPARTMENT OF AGRICULTURE
INYO NATIONAL FOREST

MAMMOTH LAKES SIGNAGE AND WAYFINDING PROJECT

Appendix D

Sign Message Schedule For Lakes Basin Path

CMI05-03T abd CMI05-05T Non-Motor/Non-Wilderness Trails
Requisition No. 371379

March 2010

Mammoth Lakes Recreational Signage & Wayfinding System

Sign Message Schedule for Lakes Basin Path

February 25, 2010

The Town of Mammoth Lakes

California

Prepared by

corbindesign

109 East Front 304
Traverse City, MI 49684
231 **947.1236**

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.00	Type 5b Pedestrian Guide		East (Side A) and West (B)	TOML

Sign Message

[header:]
Mammoth Lakes Trail System
[East SIDE A]
↑ Lakes Basin
↑ Horseshoe Lake
→ North Village
→ Community Center Park
[West SIDE B]
↑ To Town Loop
Main Street
Shady Rest Park
→ To Town Loop
Golf Courses
Eagle Lodge
← North Village

Phase

Notes

Rescue Location Number LBP 0.00

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Minaret Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.05	Type 2 Trail Information Kiosk		N/W (side A) and S/E (B)	TOML

Sign Message

[N/W SIDE A]
[header:]
Lakes Basin Path
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
0.05
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[S/E SIDE B]
[posting board]

Phase

Notes

Rescue Location Number LBP 0.05

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Canyon Blvd

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.11	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
0.11
In case of emergency call 911
[TOML logo]
[stop sign]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
0.11
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 0.11

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Hidden Valley Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.12	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
0.12
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
0.12
In case of emergency call 911
[TOML logo]
[stop sign]

Phase

Notes

Rescue Location Number LBP 0.12

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Hidden Valley Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.16	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
0.16
In case of emergency call 911
[TOML logo]
[stop sign]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
0.16
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 0.16

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Hidden Valley Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.17	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
0.17
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
0.17
In case of emergency call 911
[TOML logo]
[stop sign]

Phase

Notes

Rescue Location Number LBP 0.17

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Hidden Valley Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.46	Type 4 Access/Egress Information		Northwest	TOML

Sign Message

[side panel:]
Lakes Basin Path
[Hike] [Bike] [Dog]
[map]
[TOML logo]
Rescue Number
LBP
0.46
CALL 911 and use this number to inform emergency personnel of your location

Phase

Notes

Rescue Location Number LBP 0.46

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Lake Mary Road
Cross Street
Lakeview Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.56	Type 2 Trail Information Kiosk		N/W (side A) and S/E (B)	TOML

Sign Message

[N/W SIDE A]
[header:]
Lakes Basin Path
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
0.56
[TOML logo]
CALL 911 and use this number to inform emergency personnel of your location
[S/E SIDE B]
[posting board]

Phase

Notes

Rescue Location Number LBP 0.56

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Kelley Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.55	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
0.55
In case of emergency call 911
[TOML logo]
[stop sign]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
0.55
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 0.55

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Kelley Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.57	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
0.57
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
0.57
In case of emergency call 911
[TOML logo]
[stop sign]

Phase

Notes

Rescue Location Number LBP 0.57

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Kelley Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.66	Type 6a Trail Guide (secondary)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
0.66
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
0.66
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 0.66

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Dirt Road to Tyrolean Village

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP0.76	Type 6a Trail Guide (secondary)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
0.76
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
0.76
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 0.76

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Lee Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP1.02	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin 1.2 mi
Rescue Number
LBP
1.02
In case of emergency call 911
[TOML logo]
[stop sign]
[S/E SIDE B]
↑ North Village 1 mi
Rescue Number
LBP
1.02
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 1.02

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Camp High Sierra Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP1.03	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
1.03
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
↑ North Village
Rescue Number
LMP
1.03
In case of emergency call 911
[TOML logo]
[stop sign]

Phase

Notes

Rescue Location Number LBP 1.03

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Camp High Sierra Road

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP1.04	Type 6 Trail Guide (primary)		Northeast	TOML

Sign Message

[side panel:]
Lakes Basin Path
[message body:]
← Juniper trail
[Bike]
[rule line]
↑ Lakes Basin
Rescue Number
LBP
1.04
CALL 911 and use this number to inform
emergency personnel of your location
[TOML logo]

Phase

Notes
Check for additional destinations in Juniper trail direction

Rescue Location Number LBP 1.04

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Lake Mary Road
Cross Street
Mountain bike path

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP1.05	Type 6 Trail Guide (primary)		Southwest	TOML

Sign Message

[side panel:]
Lakes Basin Path
[message body:]
→ Juniper trail
[Bike]
[rule line]
↑ North Village
Rescue Number
LBP
1.05
CALL 911 and use this number to inform
In case of emergency call 911
[TOML logo]

Phase

Notes
Check for additional destinations in Juniper trail direction

Rescue Location Number LBP 1.05

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Lake Mary Road
Cross Street
Mountain bike path

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP1.08	Type 6a- Stop Trail Guide (secondary/regulatory sign)		South	TOML

Sign Message

➔ Juniper trail
Rescue Number
LBP
1.08
In case of emergency call 911
[TOML logo]
[yield]

Phase

Notes

Rescue Location Number LBP 1.08

Single-Sided
YES

Double-Sided

Street Location
Lake Mary Road
Cross Street
Mountain bike path

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP1.19	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
1.19
In case of emergency call 911
[TOML logo]
[stop sign]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
1.19
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 1.19

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Juniper Road

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP1.20	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
1.20
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
1.20
In case of emergency call 911
[TOML logo]
[stop sign]

Phase

Notes

Rescue Location Number LBP 1.20

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street
Juniper Road

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP1.70	Type 7 Interpretive Kiosk		Northwest	TOML

Sign Message

[interpretive panel]

Phase

Notes
Future rest area

Rescue Location Number LBP 1.70

Location Photo

Photo Notes

Single-Sided
YES
Double-Sided

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.13	Type 7 Interpretive Kiosk		West	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number LBP 2.13

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.17	Type 6a Trail Guide (secondary)		South	TOML

Sign Message

↑ North Village
Rescue Number
LBP
2.17
In case of emergency call 911

Phase

Notes

Rescue Location Number LBP 2.17

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.19	Type 4/6 Information/Trail Guide		Southeast	TOML

Sign Message

[side panel:]
Lakes Basin Path
← North Village 2.2 mi
→ Lakes Basin
→ Horseshoe Lake 3.2 mi
[map]
Rescue Number
LBP
2.19
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 2.19

Location Photo

Photo Notes

Single-Sided YES
Double-Sided

Street Location Lake Mary Road
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TLP004	Type 7 Interpretive Kiosk		Northeast	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number TLP 004

Location Photo

Photo Notes

Single-Sided YES
Double-Sided

Street Location Lake Mary Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TLP001	Type 7 Interpretive Kiosk		Northeast	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number TLP 001

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TLP003	Type 7 Interpretive Kiosk		Northeast	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number TLP 003

Location Photo

Photo Notes

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.20	Type 6a Trail Guide (secondary)		Northwest	TOML

Sign Message

↑ Lakes Basin
Rescue Number
LBP
2.20
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 2.20

Single-Sided
YES

Double-Sided

Street Location
Lake Mary Road
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TLP002	Type 2 Trail Information Kiosk		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
[header:]
Twin Lakes Vista
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
[TOML logo]
[West SIDE B]
[posting board]

Phase

Notes

Rescue Location Number TLP 002

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.31	Type 4/6 Information/Trail Guide		Southwest	TOML

Sign Message

[side panel:]
Lakes Basin Path
[message body:]
↑ Panorama Dome Trail
➔ Lakes Basin
[map]
Rescue Number
LBP
2.31
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number LBP 2.31

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.34	Type 2 Trail Information Kiosk		N/W (side A) and S/E (B)	TOML

Sign Message

[S/E SIDE B]
[header:]
Lakes Basin Path
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
2.34
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[N/E SIDE A]
[cabinet for postings]

Phase

Notes

Rescue Location Number LBP 2.34

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.35	Type 6a Trail Guide (secondary)		Northeast	TOML

Sign Message

↑ Lakes Basin
Rescue Number
LBP
2.35
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 2.35

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.66	Type 6a Trail Guide (secondary)		Southeast	TOML

Sign Message

↑ North Village
Rescue Number
LBP
2.66
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 2.66

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TLC0.14	Type 6 Trail Guide (primary)		Southeast	TOML

Sign Message

[side panel:]
Lakes Basin Path
[message body:]
← Lakes Basin
→ North Village
Rescue Number
TLC
0.14
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number TLC 0.14

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.68	Type 2 Trail Information Kiosk		N/W (side A) and S/E (B)	TOML

Sign Message

[S/E SIDE B]
[header:]
Lakes Basin Path
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
2.68
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[N/W SIDE A]
[posting board]

Phase

Notes

Rescue Location Number LBP 2.68

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LFP0.00	Type 4 Access/Egress Information		Southwest	TOML

Sign Message

[side panel:]
Tamarck Lodge
{trail users to be determined}
[map]
Rescue Number
LFP
0.00
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number LFP 0.00

Single-Sided YES

Double-Sided

Street Location
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
TLC0.07	Type 6a Trail Guide (secondary)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin Path
Rescue Number
TLC
0.07
In case of emergency call 911
[TOML logo]
[S/W SIDE B]
↑ Lakes Basin Path
Rescue Number
TLC
0.07
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number TLC 0.07

Single-Sided

Double-Sided YES

Street Location
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.74	Type 6a Trail Guide (secondary)		Northeast	TOML

Sign Message

↑ Lakes Basin
Rescue Number
LBP
2.74
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 2.74

Single-Sided YES

Double-Sided

Street Location
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.80	Type 4 Access/Egress Information		West	TOML

Sign Message

[side panel:]
Lakes Basin Path
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
2.80
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number LBP 2.80

Single-Sided YES

Double-Sided

Street Location
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP2.81	Type 4 Access/Egress Information		Northeast	TOML

Sign Message

[side panel:]
Lakes Basin Path
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
2.81
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number LBP 2.81

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location

Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LFC0.03	Type 2 Trail Information Kiosk		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
[header:]
{name to be determined}
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
{trail users to be determined}
[map]
Rescue Number
LFC
0.03
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[S/W SIDE B]
[posting board]

Phase

Notes

Rescue Location Number LFC 0.03

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location
Twin Lakes Road

Cross Street
Upper Twin Lakes Rd

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LFC0.04	Type 6a- Stop Trail Guide (secondary/regulatory sign)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
↑ {name to be determined}
Rescue Number
LFC
0.04
In case of emergency call 911
[TOML logo]
[stop sign]
[West SIDE B]
↑ Lakes Basin Path
Rescue Number
LFC
0.04
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LFC 0.04

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Twin Lakes Road
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LFC0.05	Type 6a- Stop Trail Guide (secondary/regulatory sign)		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
↑ {message to be determined}
Rescue Number
LFC
0.05
In case of emergency call 911
[TOML logo]
[West SIDE B]
↑ Lakes Basin Path
Rescue Number
LFC
0.05
In case of emergency call 911
[TOML logo]
[stop sign]

Phase

Notes

Rescue Location Number LFC 0.05

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Twin Lakes Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LCF0.09	Type 6 Trail Guide (primary)		Northeast	TOML

Sign Message

[side panel:]
{name to be determined}
[message body:]
← {message to be determined}
→ {message to be determined}
↑ {message to be determined}
Rescue Number
LFC
0.09
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number LFC 0.09

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LFC0.25	Type 2 Trail Information Kiosk			TOML

Sign Message

[SIDE A]
[header:]
{name to be determined}
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
{trail users to be determined}
[map]
Rescue Number
LFC
0.25
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[SIDE B]
[posting board]

Phase

Notes

Rescue Location Number LFC 0.25

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Twin Lakes Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.12	Type 6a- Stop Trail Guide (secondary/regulatory sign)		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
↑ Lakes Basin
Rescue Number
LBP
3.12
In case of emergency call 911
[TOML logo]
[stop sign]
[South SIDE B]
↑ North Village
Rescue Number
LBP
3.12
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 3.12

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Twin Lakes Road
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.13	Type 6a- Stop Trail Guide (secondary/regulatory sign)		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
↑ Lakes Basin
Rescue Number
LBP
3.13
In case of emergency call 911
[TOML logo]
[South SIDE B]
↑ North Village
Rescue Number
LBP
3.13
In case of emergency call 911
[TOML logo]
[stop sign]

Phase

Notes

Rescue Location Number LBP 3.13

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Twin Lakes Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.28	Type 6a Trail Guide (secondary)		Southeast	TOML

Sign Message

↑ North Village
Rescue Number
LBP
3.28
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 3.28

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.29	Type 4/6 Information/Trail Guide		Southwest	TOML

Sign Message

[side panel:]
Lakes Basin Path
[message body:]
← Horseshoe Lake 2 mi
→ North Village 3.2 mi
[map]
Rescue Number
LBP
3.29
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number LBP 3.29

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.30	Type 6a Trail Guide (secondary)		North	TOML

Sign Message

↑ Lakes Basin
Rescue Number
LBP
3.30
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 3.30

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.36	Type 6a Trail Guide (secondary)		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
→ Scenic Vista
Rescue Number
LBP
3.36
In case of emergency call 911
[TOML logo]
[South SIDE B]
← Scenic Vista
Rescue Number
LBP
3.36
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 3.36

Single-Sided

Double-Sided YES

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
BDV.02N	Type 7 Interpretive Kiosk		East	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number BDV .02N

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
BDV.02S	Type 7 Interpretive Kiosk		East	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number BDV .02S

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.56	Type 2 Trail Information Kiosk		East (Side A) and West (B)	TOML

Sign Message

[East SIDE A]
[header:]
Lakes Basin Path
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
3.65
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[West SIDE B]
[posting board]

Phase

Notes

Rescue Location Number LBP 3.56

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.57	Type 6a-Stop Trail Guide (secondary/regulatory sign)		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
↑ Lakes Basin
Rescue Number
LBP
3.57
In case of emergency call 911
[TOML logo]
[stop sign]
[South SIDE B]
↑ North Village
Rescue Number
LBP
3.57
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 3.57

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.58	Type 6a- Stop Trail Guide (secondary/regulatory sign)		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
↑ North Village
Rescue Number
LBP
3.58
In case of emergency call 911
[TOML logo]
[stop sign]
[South SIDE B]
↑ Lakes Basin
Rescue Number
LBP
3.58
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 3.58

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.61	Type 6a- Stop Trail Guide (secondary/regulatory sign)		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
↑ Lakes Basin
Rescue Number
LBP
3.61
In case of emergency call 911
[TOML logo]
[stop sign]
[South SIDE B]
↑ North Village
Rescue Number
LBP
3.61
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 3.61

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.63	Type 6a- Stop Trail Guide (secondary/regulatory sign)		North (Side A) and South (B)	TOML

Sign Message

[North SIDE A]
↑ North Village
Rescue Number
LBP
3.63
In case of emergency call 911
[TOML logo]
[South SIDE B]
↑ Lakes Basin
Rescue Number
LBP
3.63
In case of emergency call 911
[TOML logo]
[stop sign]

Phase

Notes

Rescue Location Number LBP 3.63

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.89	Type 6a Trail Guide (secondary)		Southwest	TOML

Sign Message

↑ North Village
Rescue Number
LBP
3.89
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 3.89

Location Photo

Photo Notes

Single-Sided
YES
Double-Sided

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.90	Type 2 Trail Information Kiosk		N/W (side A) and S/E (B)	TOML

Sign Message

[N/W SIDE A]
[posting board]
[S/E SIDE B]
[header:]
Lakes Basin Path
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
3.90
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number LBP 3.90

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location

Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP3.91	Type 6a Trail Guide (secondary)		Northeast	TOML

Sign Message

↑ Lakes Basin
Rescue Number
LBP
3.91
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 3.91

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Lake Mary Road

Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LLC0.00	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/W (side A) and S/E (B)	TOML

Sign Message

[N/W SIDE A]
↑ Lake Mary Loop Road
[TOML logo]
[stop sign]
[S/E SIDE B]
↑ Lakes Basin Path
[TOML logo]

Phase

Notes

Rescue Location Number LLC 0.00

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP4.23	Type 6a Trail Guide (secondary)		Northwest	TOML

Sign Message

↑ North Village 4.2 mi
Rescue Number
LBP
4.23
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 4.23

Single-Sided
YES
Double-Sided

Street Location
Lake Mary Road
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP4.25	Type 2 Trail Information Kiosk		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
[posting board]
[S/W SIDE B]
[header:]
Lakes Basin Path
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
4.25
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number LBP 4.25

Location Photo

Photo Notes

Single-Sided

Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP4.26	Type 6a Trail Guide (secondary)		Southeast	TOML

Sign Message

↑ Horseshoe Lake 1 mi
Rescue Number
LBP
4.26
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 4.26

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
ULC0.00	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lake Mary Loop Road
[TOML logo]
[stop sign]
[S/W SIDE B]
↑ Lakes Basin Path
[TOML logo]

Phase

Notes

Rescue Location Number ULC 0.00

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
POK001	Type 6a- Stop Trail Guide (secondary/regulatory sign)		Northwest	TOML

Sign Message

← Lakes Basin Path
[TOML logo]
[stop sign]

Phase

Notes

Rescue Location Number POK 001

Single-Sided
YES
Double-Sided

Street Location
Lake Mary Road
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

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Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
POK002	Type 6a- Stop Trail Guide (secondary/regulatory sign)		Southeast	TOML

Sign Message

➔ Lakes Basin Path
[TOML logo]
[stop sign]

Phase

Notes

Rescue Location Number POK 002

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP4.60	Type 6a Trail Guide (secondary)		Northwest	TOML

Sign Message

↑ North Village
Rescue Number
LBP
4.60
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 4.60

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

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Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP4.62	Type 7 Interpretive Kiosk		Southwest	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number LBP 4.62

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP4.63	Type 7 Interpretive Kiosk		Southwest	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number LBP 4.63

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP4.64	Type 4 Access/Egress Information		Southeast	TOML

Sign Message

[side panel:]
Lakes Basin Path
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
4.64
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number LBP 4.64

Single-Sided YES

Double-Sided

Street Location
Lake Mary Road
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP4.66	Type 6a Trail Guide (secondary)		Southeast	TOML

Sign Message

↑ Horseshoe Lake
Rescue Number
LBP
4.66
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 4.66

Single-Sided YES

Double-Sided

Street Location
Lake Mary Road
Cross Street

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP4.76	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Horseshoe Lake
Rescue Number
LBP
4.76
In case of emergency call 911
[TOML logo]
[stop sign]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
4.76
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 4.76

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP4.77	Type 6a- Stop Trail Guide (secondary/regulatory sign)		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
↑ Lakes Basin
Rescue Number
LBP
4.77
In case of emergency call 911
[TOML logo]
[stop sign]
[S/W SIDE B]
↑ North Village
Rescue Number
LBP
4.77
In case of emergency call 911
[TOML logo]

Phase

Notes

Rescue Location Number LBP 4.77

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP4.79	Type 4 Access/Egress Information		Northeast	TOML

Sign Message

[side panel:]
Lakes Basin Path
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
4.79
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number LBP 4.79

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP5.21	Type 7 Interpretive Kiosk		South	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number LBP 5.21

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

[ ] - Notes within brackets are not to be printed. They represent symbols, graphical elements or special notes. [P]: Parking Symbol

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP5.22	Type 4 Access/Egress Information		North	TOML

Sign Message

[side panel:]
Lakes Basin Path
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
5.22
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number LBP 5.22

Location Photo

Photo Notes

Single-Sided
YES

Double-Sided

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
LBP5.31	Type 2 Trail Information Kiosk		N/E (side A) and S/W (B)	TOML

Sign Message

[N/E SIDE A]
[header:]
Lakes Basin Path
MAMMOTH LAKES TRAIL SYSTEM
[message body:]
[Hike] [Bike] [Dog]
[map]
Rescue Number
LBP
5.31
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]
[S/W SIDE B]
[posting board]

Phase

Notes

Rescue Location Number LBP 5.31

Location Photo

Photo Notes

Single-Sided
Double-Sided
YES

Street Location
Lake Mary Road
Cross Street

Sign Type Diagram

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Sign Message Schedule - Exterior

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
HLP001	Type 7 Interpretive Kiosk		North	TOML

Sign Message

[interpretive panel]

Phase

Notes

Rescue Location Number HLP 001

Single-Sided YES

Double-Sided

Street Location Lake Mary Road

Cross Street

Location Photo

Photo Notes

Sign Type Diagram

Sign Number	Sign Type Code	Sign Type Symbol	Direction Sign Faces	Jurisdiction
OMC0.06	Type 4/6 Information/Trail Guide		Northeast	TOML

Sign Message

[side panel:]
Lakes Basin Path
{message to be determined}
[map]
Rescue Number
OMC
0.06
CALL 911 and use this number to inform emergency personnel of your location
[TOML logo]

Phase

Notes

Rescue Location Number OMC 0.06

Single-Sided

Double-Sided

Street Location Lake Mary Road

Cross Street Old Mammoth Road

Location Photo

Photo Notes

Sign Type Diagram

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