

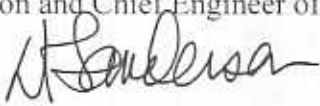


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

MEMO TO: Debbie Barbour, P.E. and Steve Varnedoe, P.E.
Director of Preconstruction and Chief Engineer of Operations

FROM: Len A. Sanderson, P.E. 
State Highway Administrator

DATE: October 25, 2004

SUBJECT: Revised Rumble Strip Guidelines

In an effort to reduce the number of run off the road crashes, the Department has revised the Rumble Strip Guidelines. The guidelines have been revised to reflect the use of rumble strips on all median divided interstates, freeways, and limited control of access expressways. Placement of rumble strips along roadways with partial control of access will also be considered on a case by case basis. The location of the rumble strip has also been moved from 3 feet to 6 inches from the edge of the travel lane. The revised rumble strip guidelines and associated detail sheets are attached.

The revised guidelines and details should be used on all applicable projects beginning with the March 2005 letting. The Highway Design Branch will be responsible for implementing the revised guidelines on TIP projects that are in the design stage. The Traffic Engineering and Safety Systems Branch will identify and cover needed retrofit projects, and Operations will include the implementation on applicable resurfacing projects. Please contact Joel Howerton with the Project Services Unit to get the full-sized sealed copies of the revised details.

If you have any questions regarding this information, please contact Art McMillan at 919-250-4001.

LAS/rdt

Attachments

cc: Steve DeWitt, P.E.
Bill Rosser, P.E.
Kevin Lacy, P.E.
Art McMillan, P.E.
Division Engineers

Jay Bennett, P.E.
Victor Barbour, P.E.
Roberto Canales, P.E.
Tony Wyatt, P.E.
Joel Howerton, P.E.

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1 SOUTH WILMINGTON STREET
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The purpose of these guidelines is to provide the Highway Design Branch, Operations Branch, and Traffic Engineering and Safety Systems Branch a procedure when using paved roadway shoulders. These guidelines should be used for identifying sections of shoulders on Interstate, Freeways, Expressways and other roadway facilities where rumble strips are desirable. This policy also discusses different types of rumble strips and selection for various types and widths of paved shoulders.

Rumble strips are sensory warning treatments that are located along the paved shoulders. They alert drivers of "drifting" off the road situations by creating an audible and vibratory warning sensation that their vehicle is leaving the designated travel lane and that a steering correction is required. Rumble strips are intended to alert the motorists before they leave the roadway and strike a roadside barrier or hazard.

It is the responsibility of the State Highway Design Engineer, the State Traffic Engineer, and the Chief Engineer of Operations to ensure that the following guidelines are followed and applied consistently within their respective area of operation.

Generally, rumble strips should be used on both the median and outside shoulder at locations where they are required. It is not necessary to use the same type of rumble strips on the median and outside shoulders. The placement of Rumble Strips on existing roadways should be investigated to verify the shoulder width and pavement structure are sufficient. On roadway facilities designated as bike routes, the placement of Rumble Strips should be coordinated with the Bicycle and Pedestrian Division. Milled rumble strips are not recommended on structures.

Rumble strips shall be used on the following types of Median Divided Roadways:

Interstate / Freeway
Expressway (Where access is limited to at-grade intersections)

Placement of Rumble Strips

For Concrete Paved Shoulders

Rumble strips will be located in accordance with Roadway Standard Drawings, Std. No. 720.01

For Asphalt Paved Shoulders

Rumble strips will be placed as shown on Roadway Standard Drawings, Std. No. 665.01

Rumble Strips should also be considered on other Roadway Facilities

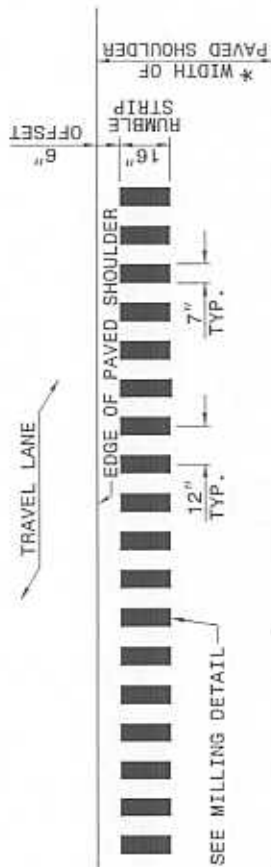
- Where documented histories of lane departure type crashes exists.
- Rural median divided facilities with partial control of access (where designated driveway and street access points are allowed) should be considered on a case by case basis.

Placement of Rumble Strips on other Roadway Facilities

- The width of shoulder rumble strips may vary depending on the width of the paved shoulder provided. The Engineer should determine design and placement.
- The width and placement of centerline rumble strips may vary depending on the lane width and pavement marking type and use. The Engineer should determine the design and placement.

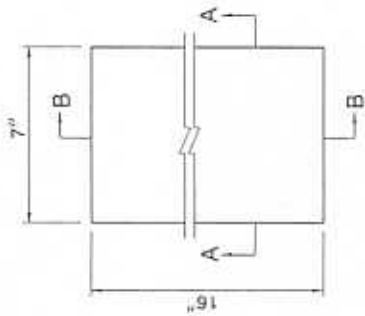
Other surface treatments may be used with the approval of the State Highway Design Engineer and the State Traffic Engineer. Project Engineers from Roadway Design and Traffic Engineering should agree upon the type and extent of shoulder surface treatments, when applicable, as well as the appropriate Division Office. These guidelines are not intended to restrict or prohibit the use of any alternative surface treatment when special engineering circumstances are required. When selecting the type of treatment, consideration should also be given to the potential use of the shoulder by traffic during future construction and maintenance operations.

These guidelines or the rumble strip standard drawings do not account for all possible applications. Therefore, it may be necessary for the designer to develop special application plans or details for the application of milled-in/stamped-in or alternative longitudinal rumble strip treatments. All such plans and details should be submitted and reviewed by the Traffic Engineering & Safety Systems Branch in coordination with the Highway Design Branch prior to usage on a project.

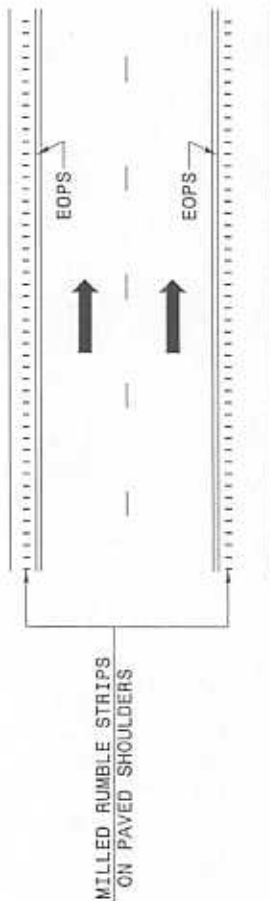


* FOR WIDTHS SEE TYPICAL SECTIONS AND PLAN SHEETS

**PLAN VIEW
PAVED SHOULDER**



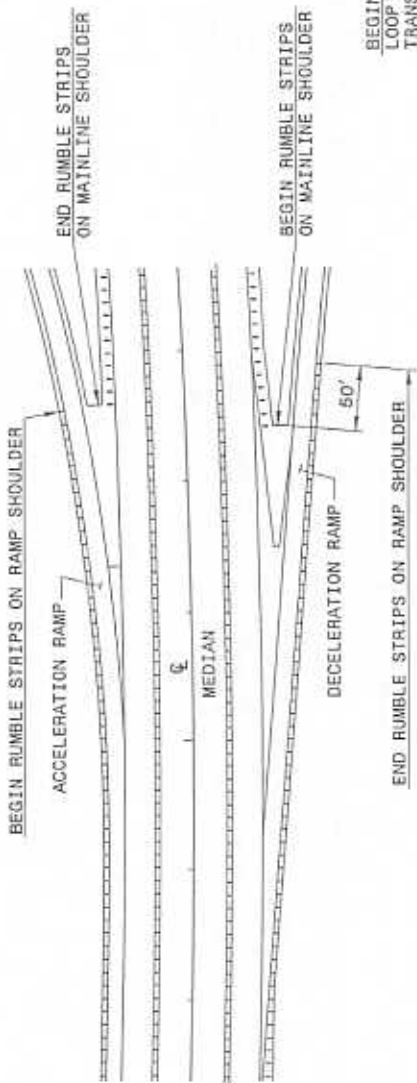
**PLAN VIEW
MILLING DETAIL**



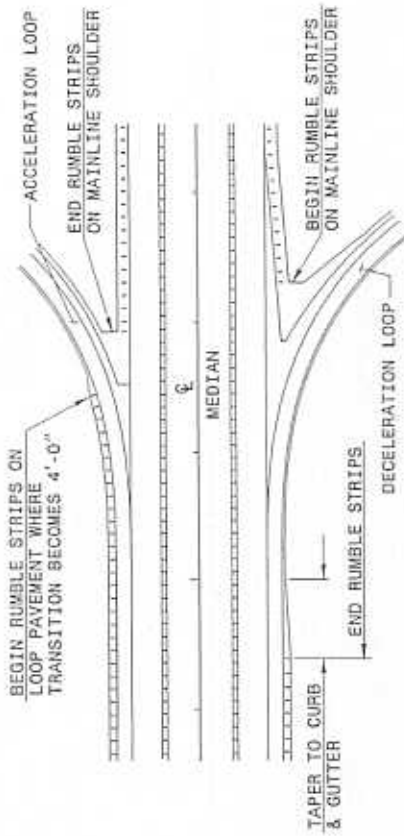
SECTION A-A



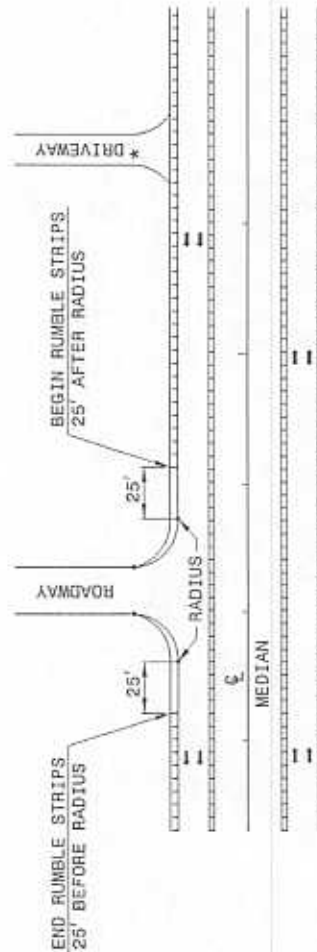
SECTION B-B



TREATMENT AT RAMP TERMINALS

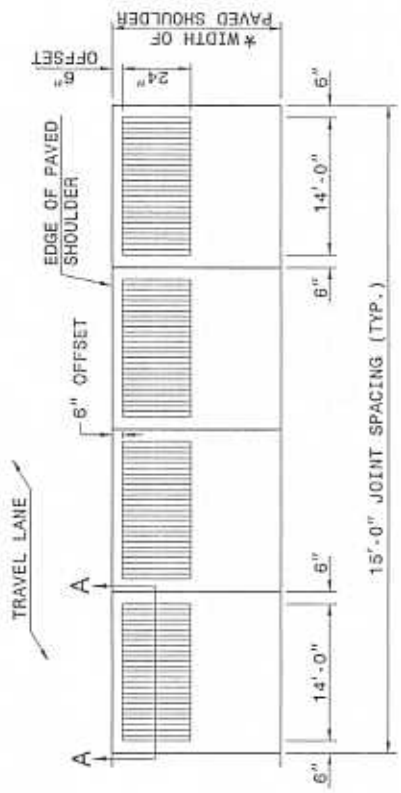


TREATMENT AT LOOP TERMINALS

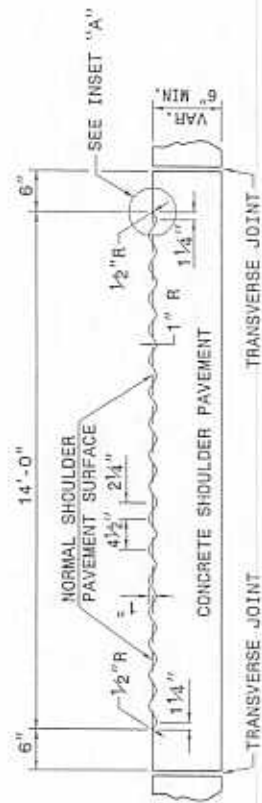
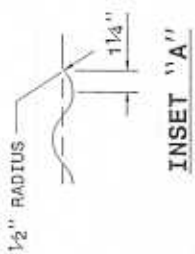


TREATMENT AT INTERSECTIONS
(ROADWAY OR DRIVEWAY)

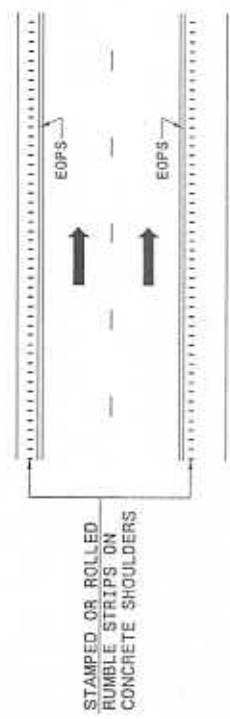
* TERMINATE AT DRIVEWAYS AS DIRECTED BY THE ENGINEER.



**PLAN VIEW
PAVED SHOULDER**

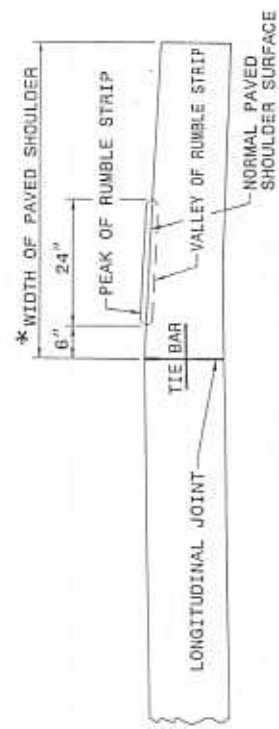


**SECTION A-A
DETAILS FOR RUMBLE STRIP**



LANE TREATMENT

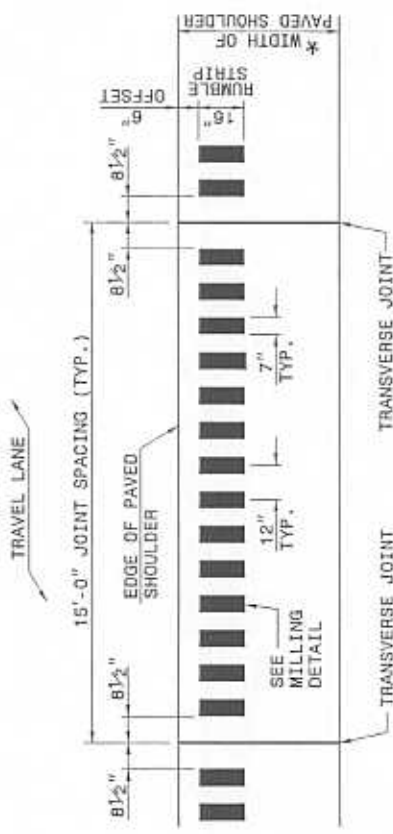
* FOR WIDTHS SEE TYPICAL SECTIONS, PLAN SHEETS, AND INTERCHANGE DETAILS.



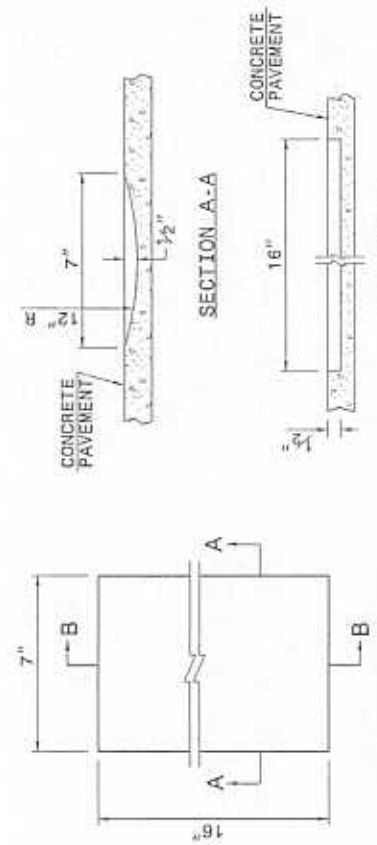
**SECTION DETAILS SHOWING
PEAK AND VALLEY OF RUMBLE STRIP**

NOTES:

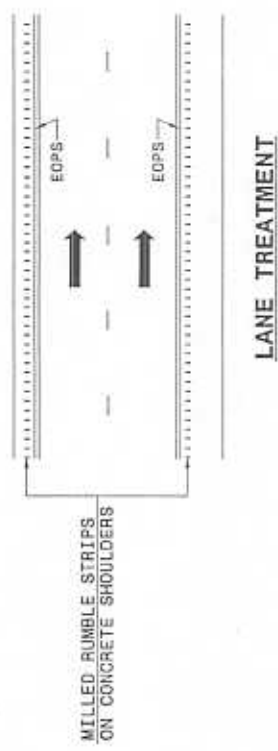
1. MATCH CONCRETE SHOULDER TRANSVERSE JOINTS TO THAT OF THE ADJACENT CONCRETE PAVEMENT.
2. SAW AND SEAL THE LONGITUDINAL JOINT AND TRANSVERSE JOINTS. SEE STD. 700.01 FOR DETAILS.
3. SEE DETAIL SHOWING "METHOD OF CONCRETE SHOULDER CONSTRUCTION" FOR PAVEMENT SLOPES.



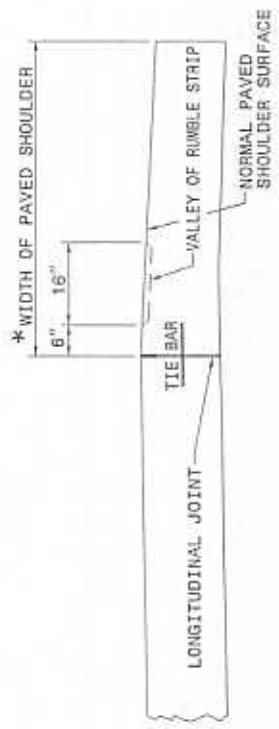
**PLAN VIEW
PAVED SHOULDER**



**PLAN VIEW
MILLING DETAIL**



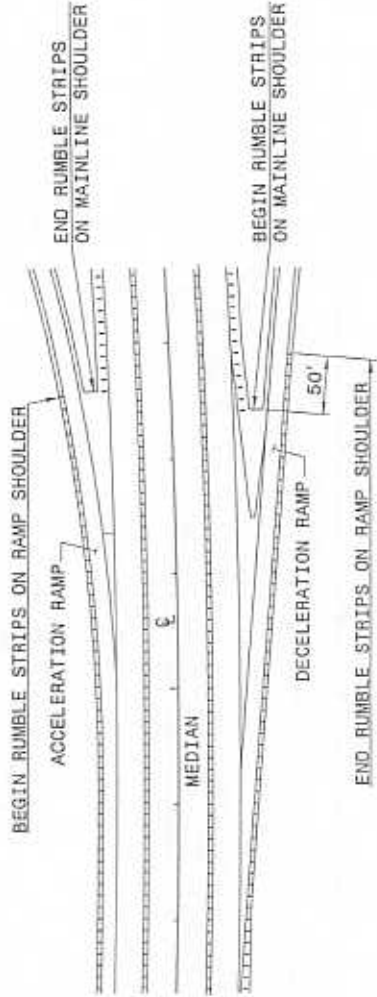
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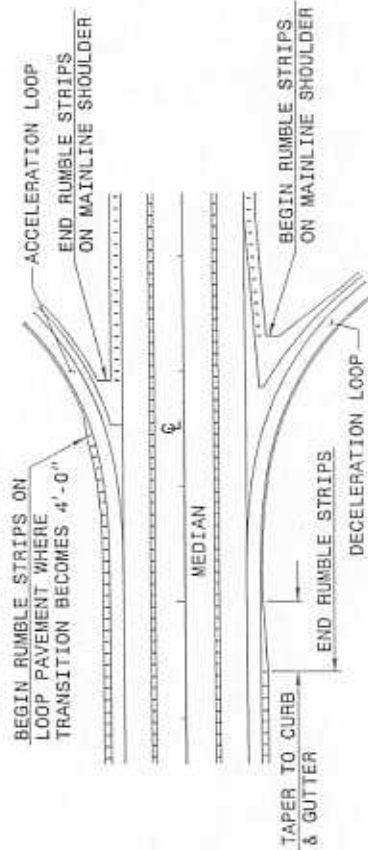
SECTION DETAILS SHOWING VALLEY OF RUMBLE STRIP

NOTES:

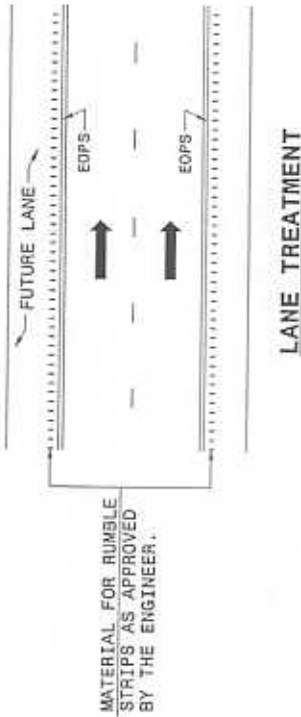
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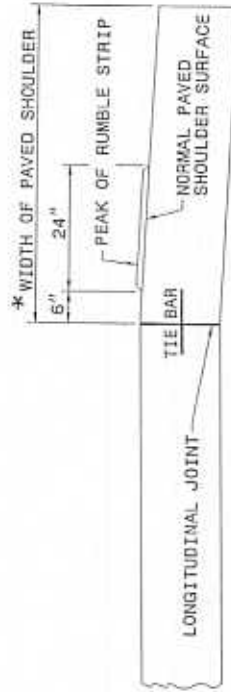
TREATMENT AT RAMP TERMINALS



TREATMENT AT LOOP TERMINALS



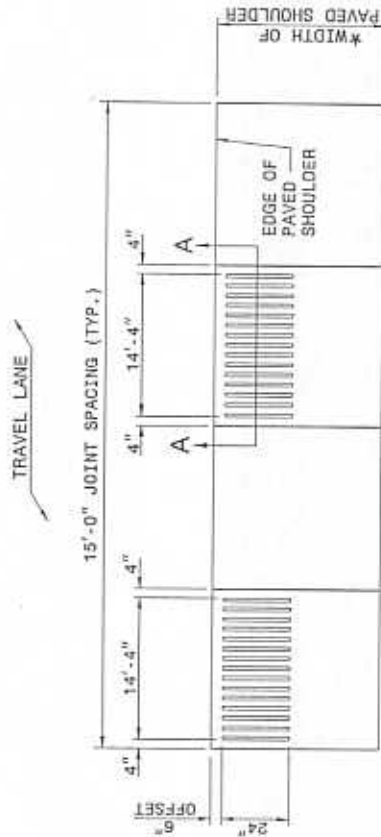
* FOR WIDTHS SEE TYPICAL SECTIONS, PLAN SHEETS, AND INTERCHANGE DETAILS.



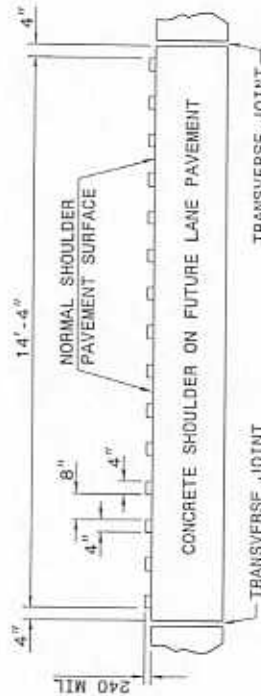
SECTION DETAILS SHOWING PEAK OF RUMBLE STRIP

NOTES:

1. DO NOT PLACE RUMBLE STRIPS ACROSS TRANSVERSE EXPANSION JOINTS.
2. MATCH CONCRETE SHOULDER TRANSVERSE JOINTS TO THAT OF THE ADJACENT CONCRETE PAVEMENT.
3. SAW AND SEAL THE LONGITUDINAL JOINT AND TRANSVERSE JOINTS. SEE STD. 700.01 FOR DETAILS.
4. SEE DETAIL SHOWING "METHOD OF CONCRETE SHOULDER CONSTRUCTION" FOR PAVEMENT SLOPES.



**PLAN VIEW
PAVED SHOULDER**



**SECTION A-A
DETAILS FOR RUMBLE STRIP**