



SOUTH CAROLINA
DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION
P.O. BOX 191
COLUMBIA, S.C. 29202

DM0194

DANIEL P. FANNING
EXECUTIVE DIRECTOR

January 3, 1994

MEMORANDUM TO DESIGN GROUP LEADERS AND CONSULTANTS

SUBJECT: CRITERIA FOR RAILROAD OVERPASSES
(This memorandum supersedes Design Memorandum DM0189
dated February 28, 1989)

The following criteria is to be observed when establishing bridge and span lengths and developing preliminary plans for railroad overpasses.

1. General

- A. The distance to the nearest mile post from the intersection of the centerline track and centerline of the bridge shall be shown on the plan and profile sheet.
- B. Horizontal and vertical clearances shall be clearly marked on the plan and profile sheet.
- C. A minimum of one boring shall be taken at each bent adjacent to the track. This should be specified when making a request for borings.
- D. Surveys of railroad grade separations should now include cross sections of the railroad from railroad right-of-way to railroad right-of-way, taken at 25 ft. intervals for 100 ft. on each side of the centerline of bridge. The new and fill slopes should be plotted on these cross sections. For projects developed in-house, the Road Section will plot these cross sections and provide them to Bridge Design for inclusion in the preliminary plans to be submitted to the railroad company. These cross sections should not be included in the final structure plans.

2. Clearances

- A. Horizontal Clearances: Abutments and/or piers for overhead bridge structures shall be located to clear the ditches of a typical track roadbed section and where possible be set with a minimum of 25.0 ft. from the face of column or pier to the centerline of track. Sketches from CSX

Transportation and Norfolk Southern Corp. showing track sections and clearances are attached for your reference. Edges of footing shall not be closer than 11'-0" from centerline of the track to provide adequate room for sheeting. Existing horizontal clearances should be maintained for widening projects.

- B. Vertical clearances shall be set between a minimum of 23.0 feet and a maximum of 23.4 feet from the top of rail to the bottom of the superstructure. Existing vertical clearances should be maintained for widening projects.
- C. Temporary horizontal construction clearances shall be noted on the plans as a minimum of 13.0 feet for tangent tracks and 14.0 feet for curved tracks measured from the centerline of track. Temporary vertical construction clearance shall be noted as 22.0 above the top of rail. Increased temporary clearances may be requested by the railroad company after review of the preliminary plans.

3. Bridge Length

The length of the bridge shall be established by locating the toes of the end fill slopes to accommodate the standard railroad road bed profile with open ditches as shown on the attached sheet. End fills shall be sloped at 2 horizontal to 1 vertical taken perpendicular to the tracks. Slopes flatter than 2 to 1 may be used when required by geotechnical analysis. Piping of railroad ditches shall be avoided.

Please note that the above method of establishing the bridge length conflicts with the current final rule which allows a 20 foot maximum distance from the centerline of track to the face of the fill slope. Therefore, it will be necessary for the Department to request the FHWA to grant an exception to the final rule on an individual project basis.

4. Crashwalls

Crashwalls will be required on all new and existing bents when the face of the pier or column is closer than 25.0 feet to the centerline of track, measured perpendicular to the tracks, except as noted below.

- A. Crashwalls for single column piers shall be minimum 2'-6" thick and shall extend a minimum of 10'-0" above the top of high rail. The wall shall extend a minimum of 6'-0" beyond the column on each side in the direction parallel to the track.

- B. For multiple column piers, the columns shall be connected with a wall of the same thickness as the columns or 2'-6" whichever is greater. The wall shall extend a minimum of 2'-6" beyond the end of outside columns in a direction parallel to the track and shall extend at least 4' below the lowest surrounding grade.
- C. Reinforcing steel to adequately anchor the crashwalls to the column and footing shall be provided.
- D. For piers of heavy construction, crashwalls may be omitted. Solid piers with a minimum thickness of 2'-6" and length of 20'-0", single column piers of minimum 4'-0" x 12'-6" dimensions or any other solid pier sections with equivalent cross sections and minimum 2'-6" thickness are considered as heavy construction.

5. Drainage

Deck drains shall not be used over the railroad right-of-way.

6. Protection of End Slopes

Concrete slope protection pavement shall be provided for bridges on primary or interstate routes when practical to do so. Generally, concrete slope protection will not be provided when the tracks are located in a cut section having steep slopes or for bridges on secondary or county roads. When concrete slope protection is not provided, consideration should be given to providing a low retaining wall attached to the bents adjacent to the track in order to prevent the fill from sloughing into the railroad ditches.



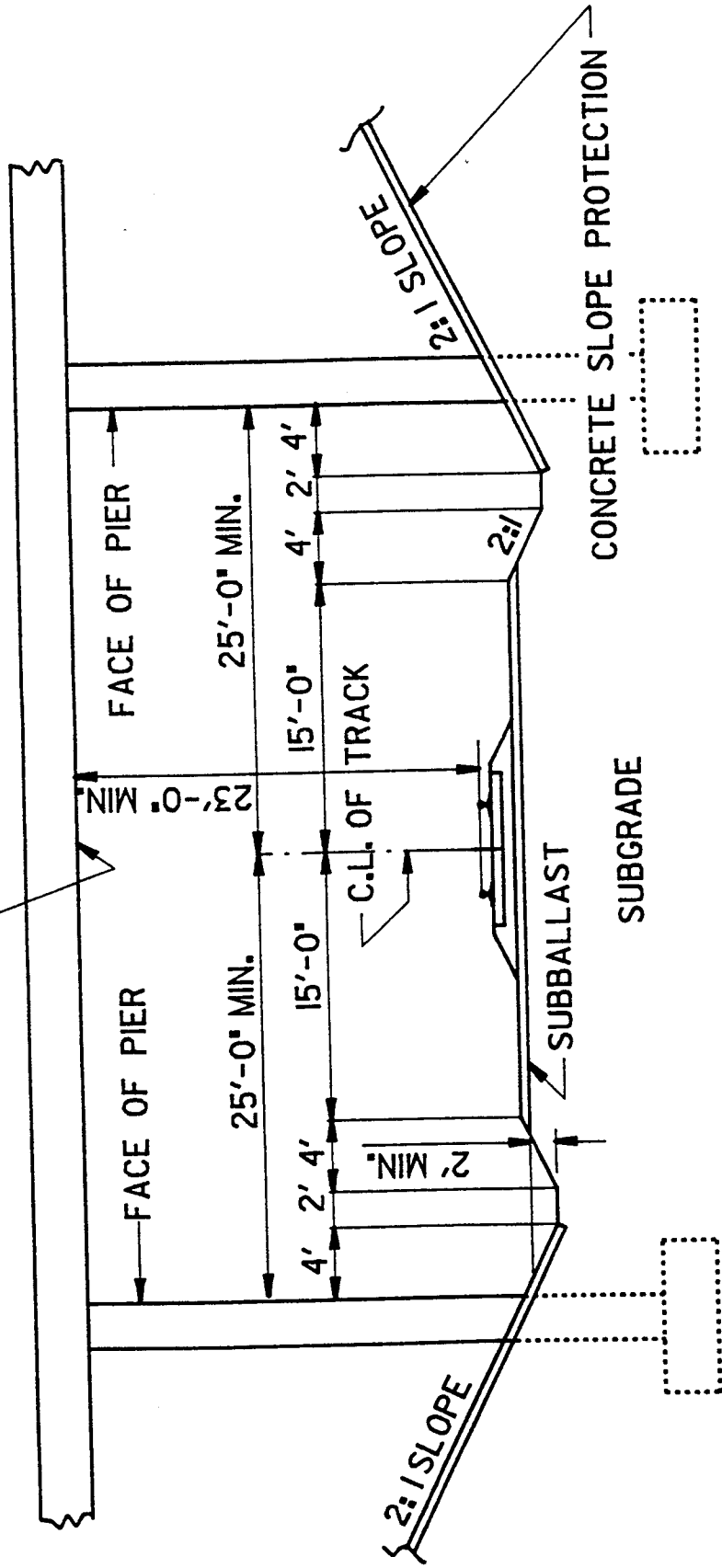
Rocque L. Kneece
Bridge Design Engineer

Attachment

RLK/JLC/slb

cc: FHWA, Mr. Schroeder
Consultants
Group Leaders
Assistant Bridge Design Engineers

LOWEST ELEVATION OF OVERHEAD STRUCTURE



CLEARANCES REQUIRED FOR OVERHEAD STRUCTURES
TYPICAL ROADBED SECTION WITH STANDARD DITCHES

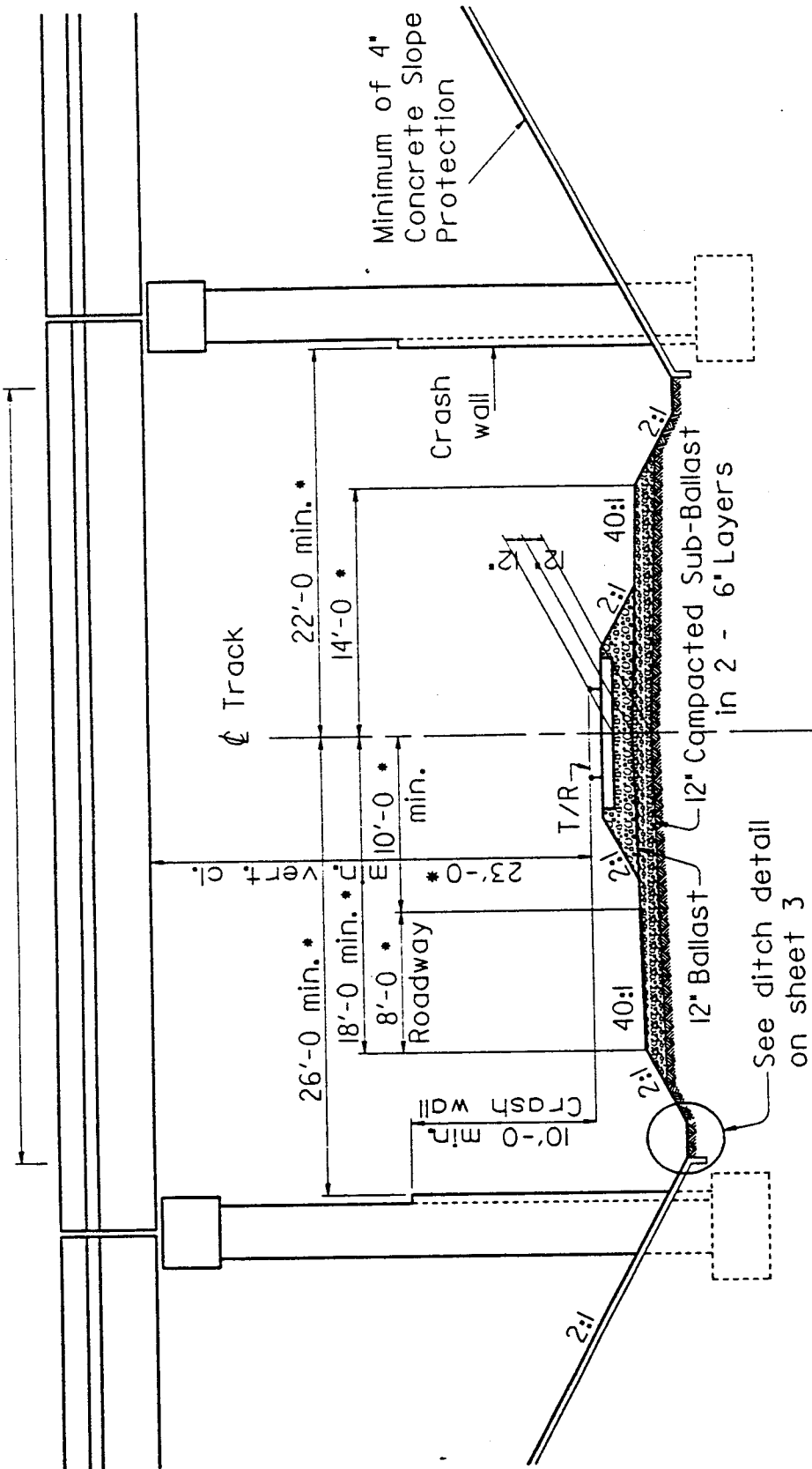
NOTE: FOR MULTIPLE TRACKS, STANDARD TRACK CENTERS IS 15'-0".



STANDARD CLEARANCES FOR OVERHEAD STRUCTURES

NOVEMBER 1, 1993

Deck Drains and Scuppers prohibited between track ditches



WITH MAINTENANCE ROADWAY | WITHOUT ROADWAY

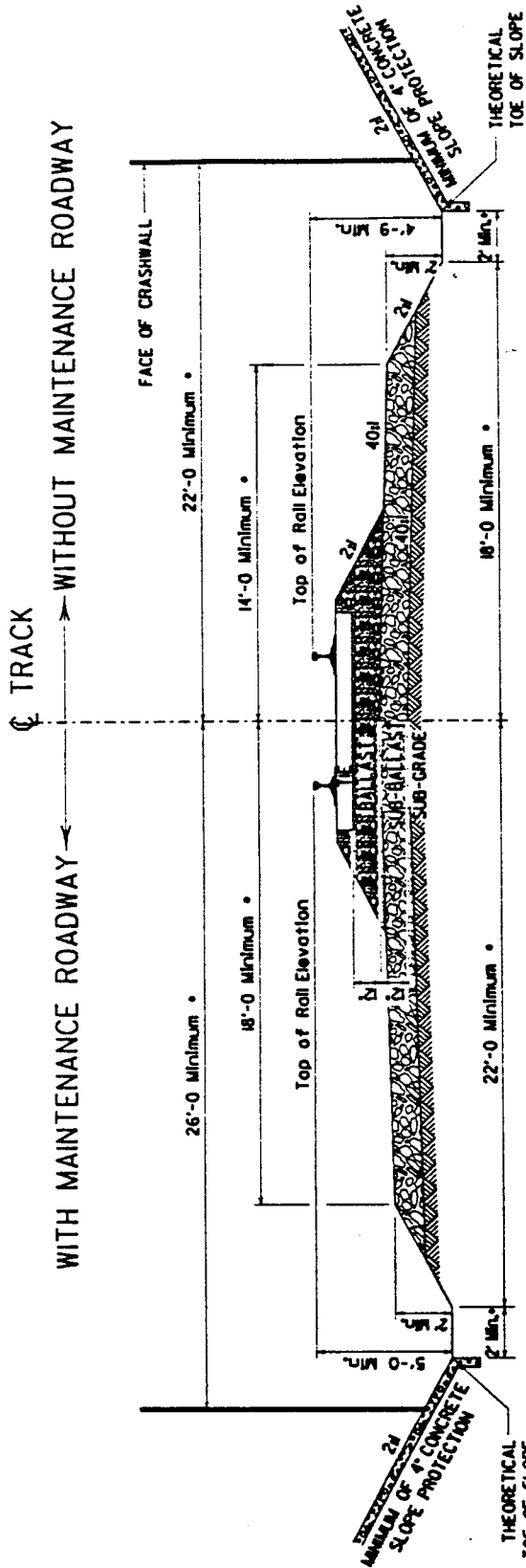
PROFILE

NORFOLK SOUTHERN CORP
STANDARD OVERHEAD
BRIDGE DETAILS

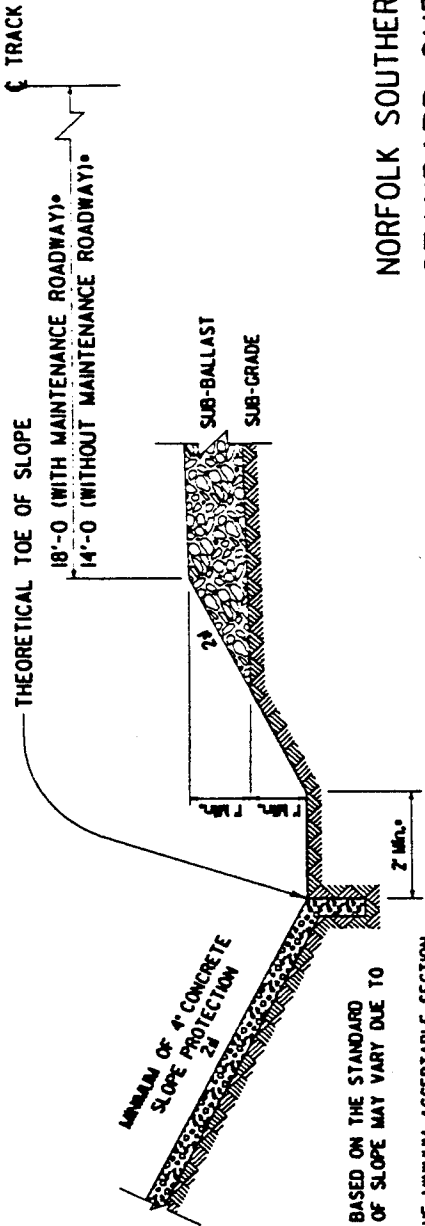
PERMANENT CLEARANCES
 DETAILS

OFFICE OF CHIEF ENGINEER BRIDGES & STRUCTURES
 JANUARY, 1992

- Horizontal dimensions shown are perpendicular to ℄ of track. Horizontal dimensions shown are the minimum which will allow the construction of Norfolk Southern's standard roadbed section. Actual required horizontal clearances may need to be increased due to existing roadbed section, location of parallel ditches, and hydrological conditions.



ROADBED PROFILE WITH OPEN DITCHES



DITCH DETAIL

NOTE: THEORETICAL TOE OF SLOPE IS BASED ON THE STANDARD ROADBED SECTION. ACTUAL TOE OF SLOPE MAY VARY DUE TO EXISTING GROUND LINE.
 THE DITCH SECTION SHOWN IS THE MINIMUM ACCEPTABLE SECTION.
 THE DITCH SECTION IS TO BE INCREASED AS REQUIRED BY LOCAL CONDITIONS, BASED ON HYDROLOGICAL AND HYDRAULIC STUDIES.

- Horizontal dimensions shown are perpendicular to \O of track. Horizontal dimensions shown are the minimum which will allow the construction of Norfolk Southern's standard roadbed section. Actual required horizontal clearances may need to be increased due to existing roadbed section, location of parallel ditches, and hydrological conditions.

NORFOLK SOUTHERN CORP
 STANDARD OVERHEAD
 BRIDGE DETAILS

DITCH AND DRAINAGE
 DETAILS
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