

**ATTACHMENT 37 – MINNESOTA HIGHWAY DEPARTMENT BRIDGE
DESIGN MANUAL DATED APRIL 12, 1972**

(3 pages)

Distribution: B

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| MINNESOTA HIGHWAY DEPARTMENT Developed by: Bridge Division and Standards Issued by: Office of Engineering Standards | TRANSMITTAL LETTER NO. 5-392 (72-1) MANUAL: Bridge Design DATED: April 12, 1972 |
| SUBJECT: Bridge Design Manual | |

This manual will supplement the design criteria in the AASHO Standard Specifications for Highway Bridges by providing guideline information on MHD design practices and procedures. This information concerns plan checking and reviewing, standard plan notes and details, available bridge charts and computer program capabilities, and other standard procedures.

Completed sections of the manual are included in this initial issue. As succeeding sections are completed they will be forwarded to you.

K. V. Benthin
Bridge Standards Engineer

Deck area shall be computed transversely edge to edge of slab and longitudinally end to end of slab, to the nearest sq. ft.

Include all standard B details and plan sheets required. If standards are changed note "modified" under B Detail or Figure Number.

Check for lighting. Check which anchorage is required.
Check for utilities.
Check project no.

Label layout lines and working points and tie piles to the working points in footing plans of all substructure units. See Layout guide sheet in Design Aid Section.

Label centerline of fascia beams or girders on staking plan.

Place control point at intersection of survey line and centerline of cross road, track, etc.

Where the distance from edge of outside traffic lane to gutter line is 6 ft. or less continue the slope of the outside lane to the gutter line, otherwise change the slope, unless superelevated.

O. ESTHETICS

The type of rustication should conform to the rustication used on adjacent retaining walls. Check with road plans for the type of rustication being used in the area.

High abutment and retaining walls should be rusticated.

One type of rustication consists of horizontal grooves spaced at 4' and vertical grooves spaced at 6' to 8'. Do not stagger vertical grooves. Horizontal grooves should be level, and lined up with grooves on adjacent retaining walls. The copings should line up with the coping and bottom of slab on the superstructure. This type of rustication is awkward to line up with adjacent abutments at different elevations. It is suitable for isolated bridge with U type abutments.

Another type of rustication consists of vertical grooves several feet apart. Boardmark finish or straited plywood may be used for texture. Coping is not necessary. This rustication is suitable for walls with a sharply sloping top.

Size of pier columns should be proportional to depth of beams.

Avoid excessively deep or wide pier caps. Except for slight slopes, bottom of cap preferably should be parallel to top, with level pads or steps for beams. Cantilever ends should taper about 1/3 the depth of cap. Ends of caps to be rounded when round columns are used.

For bridges over wilderness streams or scenic parkways, dark green paint is more appropriate than aluminum.

Bottom of pier caps should be sloped, if necessary to make depth at both ends approximately the same. If top of cap is sloped between bearings, the level area under bearings should be set back from edge of cap.

P. CHECKING CONSULTANT PLANS

Consultant prepared plans are to be reviewed and checked for the following major items to insure adequate layout control and coordination with roadway plans.

1. Control Points - Horizontal control dimensions and vertical control elevations and dimensions are to be checked for correct alignment and grade. The horizontal and vertical clearances are to be checked for compliance with all clearance requirements of M.H.D., railroad or others. Cross check elevations and stations of each substructure unit with those on staking plan.

2. Strength - The following should be reviewed for adequacy in design and conformance with M.H.D. requirements and standards.

a. Railing - Conformance with standard and proper post spacing.

b. Slab - Conformance with M.H.D. slab tables.

c. Beams or Girders - Design check for strength, shear connector spacing, and diaphragm spacing.

d. Bearings - Check selection for proper sizes.

e. Piers and Abutments - Design check for strength. Geometric check.

f. Piling - Review for type, length, and loading.

g. Railroad underpasses will not be checked for strength.

3. Miscellaneous

a. Locate floor drains, when used; to avoid endangering traffic below.

b. Checking of individual sheet quantities in bridge plan will not be required. Check that consultant has made 2 independent computations for each quantity, and that the results agree with that shown in the plans.

c. Check the addition of each sheet's quantities with those of the summary of quantities.

d. Check notes and pay items for conformance with M.H.D. specifications and practices.