

OHIO DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

MUS-208-0.00

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CALCULATED BY RLM DATE 7-22-85
CHECKED BY GRW DATE 7-25-85

PLAN NO. 50

801(86)

PART	COUNTY	ROUTE	SECTIONS	PROJECT TERMINI		NET LENGTH MILES	TOWNSHIP	CITY	VILLAGE
				BEGIN	END				
1	MUS	S.R. 208	(0.00 - 0.308)	0.00	0.44	0.74			Dresden
2	MUS	S.R. 208	(0.44 - 2.88)	0.44	10.65	10.21			
3	MUS	S.R. 208	(10.65 - 10.67)	10.65	10.81	0.16			Adamsville

The Standard 1985 Specifications of the State of Ohio, Department of Transportation, including changes and Supplemental Specifications listed in the plans and proposal shall govern these improvements.

I hereby approve these plans and declare that the making of these improvements will require the closing of the highways to traffic on Parts No. NONE and that detours will be provided by State forces. The closing to traffic of the highways will not be required on Parts No. 1, 2 and 3 and provisions for the maintenance and safety of traffic will be as indicated in the proposal.

Approved Date 8-6-85 John W. Hagan
District Deputy Director of Transportation

Approved Date 9-13-85 Walter J. Justinig
Engineer of Bridges

Approved Date _____
Engineer of Maintenance

Approved Date 12/30/85 James R. Long
Deputy Director, Operations

Approved Date _____
Assistant Deputy Director, Program Development

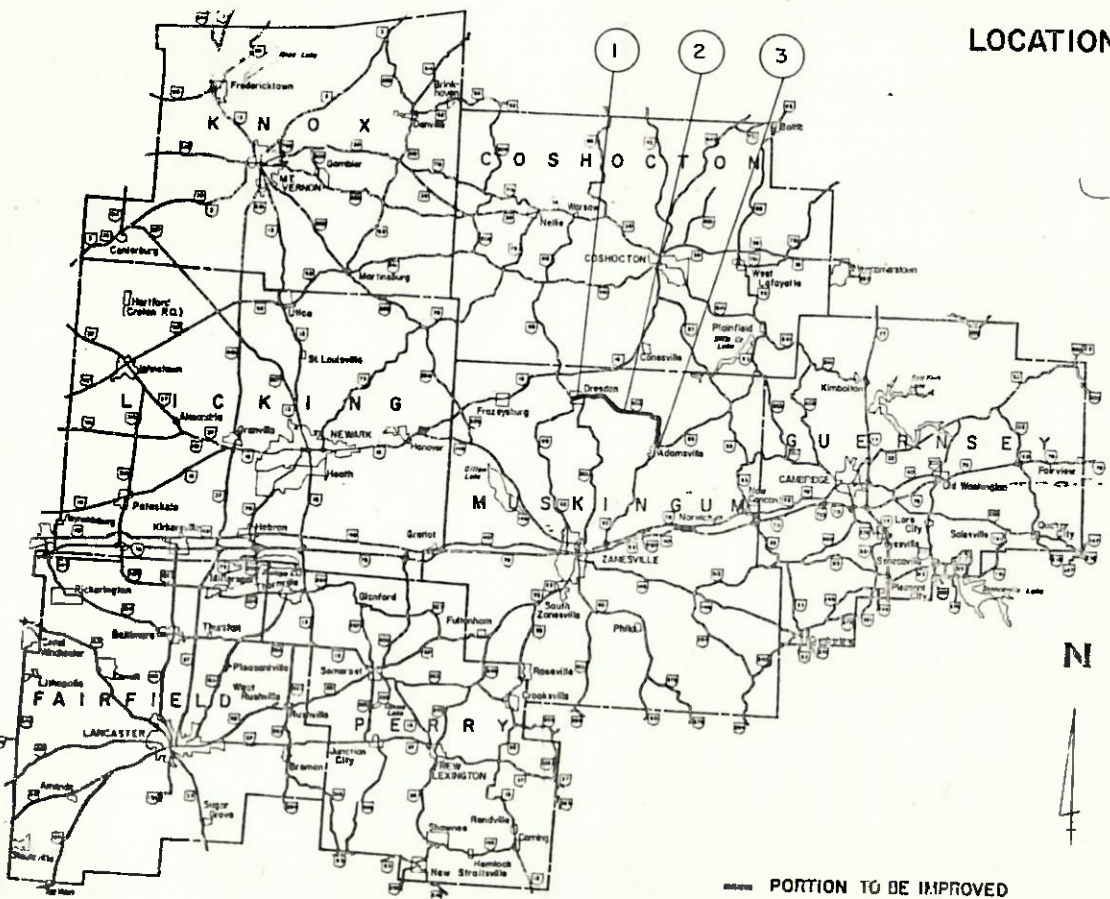
Approved Date _____
Chief Engineer, Construction

Approved Date _____
Chief Engineer, Design

Approved Date _____
Assistant Director, Department of Transportation

Approved Date 12-21-85 William J. Smith
Director, Department of Transportation

LOCATION MAP



==== PORTION TO BE IMPROVED

STANDARD DRAWINGS		SUPPLEMENTAL SPECIFICATIONS	
BP-5	1-11-85	SS-847	10-17-83
TC-71.10	4-9-79	SS-947	10-17-83
DBR-2-73	4-10-73	SS-861	9-9-83
GR-1	1-11-85	SS-961	9-9-83
GR-2B	2-5-82	SS-824	10-8-82
GR-3	1-21-85		

GENERAL NOTESCALCULATED BY RLM DATE 7-22-85CHECKED BY SKV DATE 7-25-85**Shoulder Restoration:**

In order to provide positive drainage from the roadway surface to the shoulder break, the existing roadway shoulders shall be graded and shaped using a grader having a minimum weight of 23,000 pounds. Payment for all of the above grading and shaping work, including labor and incidentals, shall be paid for at the unit price bid for ITEM SPECIAL - GRADER RENTAL, and shall be for the actual number of grader hours worked.

All excess material remaining around guardrail and other areas after the grader work is completed, and not disposed of on the site, shall be removed and disposed of by the contractor. Payment for all of the above removal work shall be paid for at the unit price bid for ITEM SPECIAL - LOADER RENTAL, and shall be for the actual number of loader hours worked. Any other equipment, labor or incidentals required to complete this Item shall be included therein for payment.

The following estimated quantities have been included in the General Summary for the above purposes.

	PART 1	PART 2	PART 3
ITEM SPECIAL - GRADER RENTAL	<u>2</u> Hours	<u>31</u> Hours	<u>1</u> Hours
ITEM SPECIAL - LOADER RENTAL	<u>1</u> Hours	<u>15</u> Hours	<u>1</u> Hours

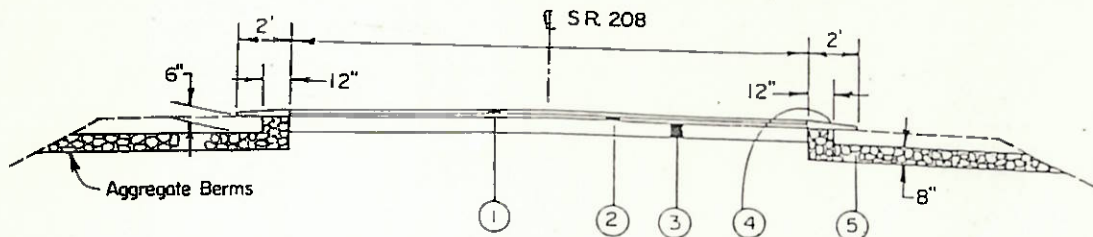
MUS-208-0.00

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CALCULATED BY RLM DATE 7-22-85

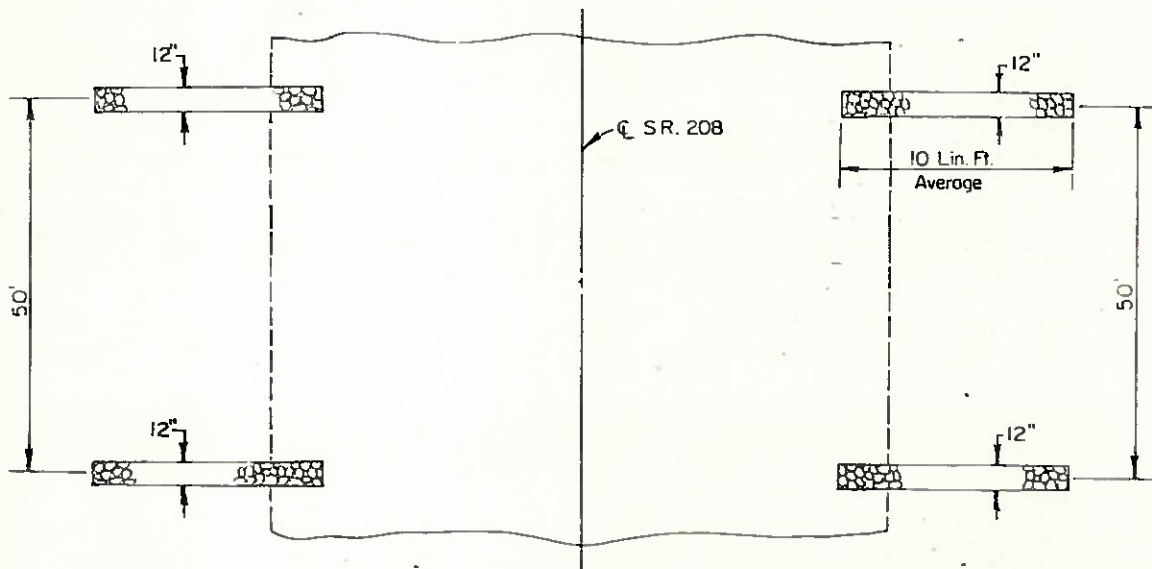
CHECKED BY SKW DATE 7-25-85

PLAN NO.
150



PAVEMENT REPAIR DETAIL

- ① 404- 1 1/4" Asphalt Concrete AC-20
- ② 403- 3/4" Asphalt Concrete AC-20
- ③ 301- 8" Bituminous Aggregate Base
- ④ 617- 2" (Average) Compacted Aggregate
- ⑤ 605- Aggregate Drains



AGGREGATE DRAIN DETAIL

ITEM SPECIAL - PAVEMENT REPAIR. (PART 2)

Quantities for Pavement Repair and Aggregate Drains have been included in the plan to be used as directed by the Engineer where the existing pavement is deteriorated. Locations shall be determined by the Engineer at the time of construction. Depth of excavation shall be approximately 8". Replacement material shall be 8" of Item 301 Bituminous Aggregate Base placed and compacted in two layers of equal thickness. The entire roadway shall then be overlaid with 1/2" of Item 403 Asphalt Concrete AC-20 and 1" of Item 404 Asphalt Concrete AC-20. When encountered, the Engineer may require the replacement of unsuitable subbase with Item 310, Subbase, for which shall include any necessary excavation. The Pavement Repair shall be performed according to a note in the proposal. Traffic shall be maintained at all times.

The following quantities have been carried to the General Summary for the above described purposes:

PART 2		
Item Special	Pavement Repair	6,550 Sq.Yd
Item 605	Aggregate Drains	1,300 Lin Ft
Item 310	Subbase, Type I, Grading A, As Per Plan	50 Cu.Yd

ESTIMATED SIZE AND NUMBER OF PAVEMENT REPAIRS

- 9' x 25' - 8
- 9' x 50' - 37
- 9' x 100' - 22
- 9' x 200' - 4
- 18' x 50' - 9
- 18' x 100' - 3

EXTRA ASPHALT FOR PRE-LEVELING (PART 2)

A quantity of 100 Cu.Yd. of 403 Asphalt Concrete has been included in the plan to be used as directed by the Engineer for pre-leveling where the pavement is low or deteriorated.

This quantity is carried to the General Summary
ITEM 403 Asphalt Concrete AC-20 100 Cu.Yd.

4
28

FORM NO.	DATE	PROJECT	
5	OHIO		4 28

MUS-208-0.00

PLAN No. 150

614 WORK ZONE PAVEMENT MARKINGS

GENERAL

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND WHEN NECESSARY, REMOVE WORK ZONE RETROREFLECTIVE PAVEMENT MARKINGS ON EXISTING, RECONSTRUCTED, RESURFACED OR TEMPORARY ROADS WITHIN THE WORK LIMITS, IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE MARKINGS SHALL BE EVALUATED BY THE ENGINEER IN ACCORDANCE WITH THE THREE PERFORMANCE PARAMETERS CONTAINED IN SUPPLEMENT 1047. THE MARKINGS SHALL BE REPAIRED OR REPLACED WHEN THE NUMERICAL RATING OF A PARAMETER IS (a) SIX OR LOWER FOR DURABILITY, (b) FOUR OR LOWER FOR VISUAL EFFECTIVENESS AND (c) FOUR OR LOWER FOR NIGHT VISIBILITY. THE CONTRACTOR SHALL REPAIR OR REPLACE UNSATISFACTORY MARKINGS IMMEDIATELY AND AT NO ADDITIONAL COST TO THE STATE.

THE CONTRACTOR SHALL, IN ADVANCE OF ANY SECTION OF ROADWAY LACKING UNUTED FULL PATTERN STANDARD DIMENSION EDGE LINE OR CENTER LINE MARKINGS, ERECT A "NO EDGE LINES" (OW-167-36) SIGN OR "UNMARKED NO PASSING ZONES" (OW-168-36) SIGN OR BOTH AS MAY BE APPROPRIATE. THESE SIGNS SHALL BE IN PLACE PRIOR TO EXPOSING THE ROADWAY TO TRAFFIC. THESE SIGNS SHALL ALSO BE ERECTED ON EACH ENTRANCE RAMP, AT INTERSECTIONS OF THROUGH ROADS TO WARN ENTERING OR TURNING TRAFFIC OF THE CONDITION AND AT LEAST ONCE EVERY TWO MILES ALONG THE ROADWAY. THESE SIGNS SHALL BE REMOVED WHEN THEY NO LONGER APPLY.

TEMPORARY PAVEMENT MARKING MATERIALS

UNLESS OTHERWISE INDICATED ON THE PLANS, TEMPORARY PAVEMENT MARKINGS MAY BE EITHER 621.02 PAINT OR 947.03 TYPE B OR C PREFORMED MATERIAL.

PAINT

PAINTED MARKINGS SHALL BE IN ACCORDANCE WITH 621 EXCEPT THAT (1) PARAGRAPH 621.14 SHALL NOT APPLY, (2) WHERE THE MARKINGS ARE NOT LIABLE TO BE TRACKED, EITHER CONVENTIONAL OR FAST DRY PAINT MAY BE USED FOR 621.02, AND (3) WHEN APPLIED TO NEW ASPHALT PAVEMENT SURFACES OR PLANE ASPHALT PAVEMENT SURFACES, THE SPECIFIED APPLICATION RATE SHALL BE AS FOLLOWS:

WIDTH OF LINE, IN.		GALLONS PER MILE OF LINE		
4		6	8	12
4	SOLID LINE	24	36	48
4	DASHED LINE	6	9	12
4	DOTTED LINE	6	12	

TYPE B AND TYPE C PREFORMED MATERIAL

PREFORMED MATERIAL SHALL COMPLY WITH 947.03 EXCEPT THAT NO PREFORMED MATERIAL CONTAINING METAL SHALL BE PLACED ON ANY SURFACE UNLESS IT WILL BE REMOVED LATER BY THE CONTRACTOR. TEMPORARY PAVEMENT MARKINGS OF 947.03 PREFORMED MATERIAL SHALL BE REMOVED PRIOR TO PLACEMENT OF 621 OR 817 SURFACE COURSE MARKINGS AT THAT LOCATION. PREFORMED MATERIAL SHALL BE APPLIED IN ACCORDANCE WITH 847 EXCEPT AS MODIFIED HEREIN.

PLACEMENT

TEMPORARY MARKINGS SHALL BE COMPLETE AND IN PLACE ON ALL PAVEMENT, INCLUDING RAMPS, PRIOR TO EXPOSING IT TO TRAFFIC. WHEN TEMPORARY MARKINGS CONFLICT WITH THE TRAFFIC PATTERN, THEY SHALL BE REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH 621.134.

LINE PLACEMENT TOLERANCE FOR FINAL SURFACES SHALL BE IN ACCORDANCE WITH 621.052, ON SURFACES OTHER THAN THE FINAL, THE TOLERANCE PERMITTED SHALL BE TWICE THAT IN 621.051.

LAYOUT AND PREMARKING SHALL BE IN ACCORDANCE WITH 621.051.

TEMPORARY MARKING CLASSES

CLASS I MARKINGS

CLASS I MARKINGS SHALL BE APPLIED TO THE FULL DIMENSIONS AS DEFINED IN 621 WITH THE FOLLOWING ADDITIONS OR EXCEPTIONS:

- 1) TRANSVERSE LINES SHALL BE 8-INCHES IN WIDTH.
- 2) STOP LINES SHALL BE 12-INCHES IN WIDTH.
- 3) CROSS WALK LINES SHALL BE 8-INCHES IN WIDTH.

CLASS II MARKINGS

CLASS II MARKINGS (ABBREVIATED) SHALL BE DEFINED AS FOLLOWS:

CENTER LINES SHALL CONSIST OF SINGLE, YELLOW 4-INCH WIDE BY A MINIMUM OF 40-INCH LONG DASHES SPACED AT A MAXIMUM OF 40-FOOT INTERVALS.

LANE LINES SHALL CONSIST OF WHITE 4-INCH WIDE BY A MINIMUM OF 40-INCH LONG DASHES SPACED AT A MAXIMUM OF 40-FOOT INTERVALS.

GORE MARKINGS SHALL BE TWO CONTINUOUS, WHITE 4-INCH LINES PLACED AT THE THEORETICAL GORE OF AN EXIT RAMP OR DIVERGING ROADWAYS.

THE PAINT APPLICATION RATE SHALL BE NOT LESS THAN 2.4 GALLONS PER MILE FOR LANE LINE AND CENTER LINE AND 24 GALLONS PER MILE FOR GORE MARKINGS.

CONFLICTING EXISTING MARKINGS

THE CONTRACTOR SHALL, PRIOR TO PLACING TEMPORARY MARKINGS, REMOVE ALL CONFLICTING EXISTING MARKINGS VISIBLE TO THE TRAVELING PUBLIC DURING DAYLIGHT OR NIGHTTIME HOURS IN ACCORDANCE WITH 621.134. THE COST FOR REMOVAL OF CONFLICTING MARKINGS SHALL BE INCLUDED IN 614 MAINTAINING TRAFFIC UNLESS SPECIFICALLY ITEMIZED.

THE CONTRACTOR SHALL ALSO REMOVE THE PRISMATIC RETRO-REFLECTOR WITHIN ANY RAISED PAVEMENT MARKER (RPM) WHICH IS IN CONFLICT WITH THE TEMPORARY PAVEMENT MARKINGS. WHEN THE TEMPORARY PAVEMENT MARKINGS ARE REMOVED AND THE RPM IS NO LONGER IN CONFLICT, THE CONTRACTOR SHALL THOROUGHLY CLEAN THE RECESSED REFLECTOR ATTACHMENT AREA OF THE CASTING AND INSTALL A NEW PRISMATIC RETRO-REFLECTOR OF THE SAME KIND AND COLOR. THE COST FOR THIS WORK SHALL BE INCIDENTAL TO THE VARIOUS PAY ITEMS.

INTERIM MARKINGS

WITHIN 21 CALENDAR DAYS AFTER OPENING ANY LENGTH OF PAVEMENT TO TRAFFIC, THE 621 OR 817 PAVEMENT MARKINGS CALLED FOR IN THE PLANS SHALL BE APPLIED. EQUIVALENT 614 CLASS I, PAINT MARKINGS MAY BE USED IN LIEU OF FINAL MARKINGS. IN THIS EVENT, THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT AND MATERIAL NECESSARY TO PLACE AND MAINTAIN 614 CLASS I PAINT MARKINGS AS PART OF THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC.

FOR EACH CALENDAR DAY BEYOND 21 DAYS THAT THIS WORK SHALL REMAIN UNCOMPLETED, THE SUM OF \$200 PER CALENDAR DAY WILL BE DEDUCTED FROM ANY MONEY DUE THE CONTRACTOR, NOT AS A PENALTY BUT AS LIQUIDATED DAMAGES.

METHOD OF MEASUREMENT

TEMPORARY PAVEMENT MARKINGS WILL BE MEASURED COMPLETE IN PLACE, BY CLASS AND MATERIAL, IN THE UNITS DESIGNATED. LINE QUANTITIES WILL BE THE LENGTH OF THE COMPLETED STRIPE, INCLUDING GAPS, INTERSECTIONS, AND OTHER SECTIONS OF PAVEMENT NOT NORMALLY MARKED.

TEMPORARY PAVEMENT MARKINGS WILL INCLUDE THE LAYOUT, APPLICATION AND REMOVAL OF THE MARKINGS, WHEN REQUIRED.

BASIS OF PAYMENT

PAYMENT FOR ACCEPTED QUANTITIES COMPLETE IN PLACE WILL BE MADE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIALS, LABOR, INCIDENTALS AND EQUIPMENT FOR PLACEMENT, MAINTENANCE AND NECESSARY REMOVAL OF THE MARKINGS.

ITEM	UNIT	DESCRIPTION
614	MILES	TEMPORARY LANE LINES, CLASS _____
614	MILES	TEMPORARY CENTER LINES, CLASS <u>II</u>
614	LIN. FT.	TEMPORARY CHANNELIZING LINES, CLASS I, _____
614	MILES	TEMPORARY EDGE LINES, CLASS I, _____
614	LIN. FT.	TEMPORARY GORE MARKINGS, CLASS II, _____
614	LIN. FT.	TEMPORARY STOP LINES, CLASS I, _____
614	LIN. FT.	TEMPORARY CROSSWALK LINES, CLASS I, _____
614	EACH	TEMPORARY LANE ARROWS, CLASS I, _____
614	EACH	TEMPORARY RAILROAD SYMBOL MARKINGS, CLASS I, _____
614	EACH	TEMPORARY WORD "ONLY" ON PAVEMENT, 72-INCH, CLASS I, _____
614	LIN. FT.	TEMPORARY TRANSVERSE LINES, CLASS I, _____
614	LIN. FT.	TEMPORARY DOTTED LINES, CLASS I, _____

*TYPE MATERIAL (621 PAINT, 947.03 TYPE B OR 947.03 TYPE C OR LEFT BLANK TO PERMIT ANY OF THE THREE)

621 EDGE LINES ON NEW ASPHALT PAVEMENTS

EDGE LINES SHALL BE IN ACCORDANCE WITH 621 EXCEPT THAT (1) ON SPUR ROADWAY AND RAMP, EDGE LINES SHALL BE IN PLACE PRIOR TO EXPOSING IT TO TRAFFIC, (2) WHERE THE EDGE LINES ARE NOT LIABLE TO BE TRACKED, EITHER CONVENTIONAL OR FAST DRY PAINT MAY BE USED FOR 621.02, AND (3) WHEN APPLIED TO NEW ASPHALT PAVEMENT THE SPECIFIED APPLICATION RATE SHALL BE 24 GALLONS PER MILE.

614 WORK ZONE MARKING SIGNS

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND SUBSEQUENTLY REMOVE WORK ZONE MARKING SIGNS (OW-167 AND OW-168) WITHIN THE WORK LIMITS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE CONTRACTOR MAY USE SIGNS AND SUPPORTS IN USED BUT GOOD CONDITION PROVIDED THE SIGNS MEET CURRENT DEPARTMENT SPECIFICATIONS. SIGN FACES SHALL BE REFLECTORIZED WITH TYP G SHEETING COMPLYING WITH THE REQUIREMENTS OF 709.15. WORK ZONE MARKING SIGNS SHALL BE PROVIDED WITH SUITABLE YIELDING SUPPORTS OF SUFFICIENT STRENGTH AND STABILITY.

WORK ZONE MARKING SIGNS WILL BE MEASURED AS THE NUMBER OF SIGN INSTALLATIONS, INCLUDING THE SIGN AND NECESSARY SUPPORTS. ALL OTHER WORK ZONE SIGNS SHALL BE INCLUDED IN 614 MAINTAINING TRAFFIC UNLESS SEPARATELY ITEMIZED.

PAYMENT FOR ACCEPTED QUANTITIES, COMPLETE, IN PLACE WILL BE MADE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIALS, LABOR, INCIDENTALS AND EQUIPMENT FOR PLACEMENT, MAINTENANCE AND REMOVAL OF THE SIGNS.

ITEM	UNIT	REQUIREMENT
614	EACH	WORK ZONE MARKING SIGNS

A QUANTITY OF 44 EACH WORK ZONE MARKING SIGNS (22 EACH "NO EDGE LINES" OR 167 AND 22 EACH "UNMARKED NO PASSING ZONES" OW-168) ARE CARRIED TO THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER.

INITIAL PAVEMENT MARKINGS FOR RESURFACED SECTIONS
GENERAL NOTES

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

5
28

PLAN NO. 150

MUS-208-0.00

In addition to the requirements of 621 and 847 the following shall apply:

621 Materials

Glass beads shall be kept dry during storage and prior to use.

621 SPECIAL EQUIPMENT

The Contractor's striping machine shall be equipped with an odometer graduated to 1/100 of a mile. The Engineer will determine the degree of accuracy of the Contractor's odometer and establish an adjustment factor as may be required to accurately determine the pay item quantities. The Engineer will periodically check the odometer's operation to assure maintenance of accurate measurements.

Failure of the odometer to function properly shall be cause to stop the work until the odometer is made to function properly. On short projects the Engineer may approve alternate methods to accurately measure the length of the various types of markings applied. If measurement of the work has to be done by the Department, the cost of the Department labor and equipment plus 10 percent shall be deducted from payment due the Contractor for the work. When measuring lane, edge and center line marking the odometer shall be started at the first marked line and remain in operation, until the end of the section being marked, where it shall be shut off and the reading of the odometer recorded.

Electrical foot counters shall be provided and installed in the striping machine. The counters shall individually tabulate the amount of footage applied by each striping gun on the center line carriage and lane line carriage, whether solid or dashed. The counters shall be 6 digit type with a reset feature.

The pavement marking equipment shall be equipped with a pressure regulated air jet which shall remove all debris from the pavement in advance of the applicator gun. The air jet shall operate when marking material is being applied and shall be synchronized with marking material application or remain "on" at all times.

The Contractor shall use an accurate dashing mechanism, capable of being easily adjusted

Provision for the above special equipment by the Contractor shall be incidental to the application.

847 LAYOUT AND PREMARKING

In addition to the requirements of 847 premarking for auxiliary markings shall be located from schematic forms provided at the pre-construction conference.

621 MATERIAL QUANTITY MEASUREMENT

The quantity of marking material or glass beads per unit of measurement will be computed by the Engineer at the end of each day's work. A day's applied mileage of less than 2 miles may be included in the next day's applied markings for the purpose of computing marking material and bead application rates.

The Contractor shall provide a calibrated measuring device acceptable to the Engineer for measuring material in the striping tanks.

The quantity of marking material used shall be determined by measuring the marking material in the tanks before and after marking material is applied. The Contractor shall cooperate with the Engineer in providing measurements whenever requested. The marking material application rate shall be determined by dividing the total gallons used by the appropriate marking length as determined from the foot counter as described within the Special Equipment Section of these notes. Any determination of pay deduction resulting from shortages in marking quantities shall be based on the measurements obtained by this method. The amount of glass beads applied will be ascertained by the Engineer by observation and from information supplied by the Contractor as to quantity used.

847. AUXILIARY PAVEMENT MARKING

For this project auxiliary markings shall be defined as: stop lines, crosswalk lines, transverse lines, railroad symbol markings, lane arrows, word on pavement and dotted lines except when used to extend edge lines.

STANDARD CONSTRUCTION DRAWING TC 71.10

The dimensions shown on Standard Construction Drawing TC 71.10 are nominal. Letters, numerals and symbols conforming to the requirements of section 3B-17 of the 1978 National Manual On Uniform Traffic Control Devices may also be used. Any of the following standards for letters, numeral or symbol dimensioning may be used: A.) Standard dimensions shown on this detail or B.) Standard dimensions (either metric or their hard converted English unit equivalents) in accord with the 1977 Metric Edition Standard Alphabets For Highway Signs and Pavement Marking with Errata or C.) Standard dimensions shown in figures 3-17, 3-18, 7-2, 7-3, 8-2 or 9-6 of the 1978 National Manual On Uniform Traffic Control Devices.

CALCULATED BY RLM DATE 7-22-85

CHECKED BY SNW DATE 7-22-85

150

MUS-208-0.00

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28

TRAFFIC CONTROL FOR LONG LINE PAVEMENT MARKING OPERATIONS

GENERAL

In addition to 614, traffic shall be maintained in accordance with the following requirements.

The purpose of the following requirements for Traffic Control for Pavement Marking operations is to provide safety for highway users, workers and equipment and to protect the markings from damage during application. These requirements are the required minimums. If at any time during the application of markings it is found by the Engineer that these minimum traffic control device requirements are not achieving the necessary safety and marking protection, additional traffic control devices shall be implemented in accordance with 104.02.

The Engineer may suspend work in order to relieve traffic congestion at any time. No work shall be done during peak hours, as determined by the Engineer.

LEAD VEHICLE

A lead vehicle is to be used to warn opposing traffic of the approach of centerline and other marking equipment when this equipment extends into the adjacent opposing traffic lane. The lead vehicle shall precede the "left of center" marking equipment a distance that will provide advance safe warning to approaching traffic. The operator of this unit should drive ahead of the crest of a vertical curve or around a horizontal curve and wait until the "left of center" marking equipment nears and then proceed, maintaining an advance location of 400 feet to 600 feet.

A lead vehicle shall be equipped and operated with the following traffic control devices:

1. A 360° rotating or flashing amber beacon clearly visible a minimum of 1 mile.
2. Lighted head lights and tail lights, and
3. A KEEP RIGHT sign (OC-31R-48) and WET PAINT sign (OC-52-48) mounted a minimum of 5' above the road surface measured to the bottom of the sign and visible to opposing traffic.

POWER BROOM EQUIPMENT

Power broom equipment shall be equipped and operated during pavement preparations (Item 621.04) with the following traffic control devices:

1. A 360° rotating or flashing amber beacon clearly visible a minimum of 1 mile.
2. Lighted head lights and tail lights, and
3. A flashing arrow panel 54" x 30" (Type B) visible to the rear mounted a minimum of 7' above the road surface measured to the bottom of the panel and used only on multi-lane highways.

LINE MARKING MACHINE

All traffic line marking machines shall be equipped and operated with the following traffic control equipment:

1. Three 360° rotating or flashing amber beacons clearly visible a minimum of 1 mile mounted a minimum of 7' above the road surface; one forward, one on the right rear and one on the left rear of the vehicle.
2. (a) A flashing arrow panel 54" x 30" (Type B) displayed to the rear mounted a minimum of 7' above the road surface measured to the bottom of the panel and used only on multilane highways, or
(b) A DO NOT PASS sign (R-33A-48) visible to the rear during centerline marking on two lane, two way roadways and mounted a minimum of 7' above the road surface measured to the bottom of the sign. This sign may be

used to cover the arrow panel, which shall **Not** be used on two lane, two way roadways.

3. A WET PAINT with arrow sign (OC-50-24 or OC-51-48) shall face the rear. The sign shall be positioned with the arrow pointing to the wet line. When used, OC-50-24 shall be mounted on the in use carriage side of the vehicle. OC-50-24 and OC-51-48 signs shall be mounted a minimum of 1' above the road surface.
4. A KEEP RIGHT sign (OC-31R-48) and WET PAINT sign (OC-52-48) mounted a minimum of 5' above the road surface measured to the bottom of the sign and facing opposing traffic when this unit extends into the adjacent opposing traffic lane.
5. The guide and side mounted marking carriages shall each be equipped with a clean red flag not less than 16" square and fastened to staffs of sufficient length so as to permit the flags to move freely of any obstruction.

TRAIL VEHICLE

When required a trail vehicle shall be positioned at the track free end of the wet line. An additional trail vehicle shall be used when applying lane lines of fast dry material (i.e. \leq 2 min. dry) to protect the wet line between the line marking machine and the track free end of the wet line. All pavement marking application, protection and support equipment following the line marking machine shall be equipped with the traffic control of a trail vehicle.

Trail vehicles shall be equipped and operated with the following traffic control equipment:

1. A 360° rotating or flashing amber beacon clearly visible a minimum of 1 mile.
2. (a) A flashing arrow panel 54" x 30" (Type B) visible to the rear mounted at a minimum height of 7' above the road surface measured to the bottom of the panel and used only on multi-lane highways, or
(b) A DO NOT PASS sign ((R-33A-48) visible to the rear during centerline marking on two lane, two way roadways, and mounted a minimum of 7' above the road surface measured to the bottom of the sign. This sign may be used to cover the arrow panel, which shall **Not** be used on two lane, two way roadways.
3. A WET PAINT with arrow sign (OC-50-24 or OC-51-48) shall face the rear. The sign shall be positioned with the arrow pointing to the wet line. When used, OC-50-24 shall be mounted on the side of the vehicle nearest the wet marking material. When used, OC-50-24 shall be mounted a minimum of 4'6" above the road surface and OC-51-48 shall be mounted a minimum of 5'0" above the road surface, both measured to the bottom of the sign.

CONES AND WET PAINT-KEEP OFF SIGNS

Cones and WET PAINT-KEEP OFF signs (R-87-24) shall be placed to protect the line whenever the track free time exceeds two minutes. These devices shall not be removed until the line has dried to a track free condition. Retrieval equipment shall have traffic control of a trail vehicle. Cones shall have a minimum height of 18". They shall be spaced to protect the wet line, normally between 120' and 200'. In areas of traffic congestion, on curves and at other locations where tracking of the wet line is expected, spacings as close as 20' may be required. The WET PAINT-KEEP OFF signs (R-87-24) shall be placed facing traffic at:

- A. The beginning and end of line application,
- B. All side and cross roads, and
- C. Maximum intervals of one mile.

DATE

7-22-85

12-85

CALCULATED BY RLM DATE 7-22-85

CHECKED BY SKW DATE 7-22-85

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MUS-208-0.00

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28

MOBILE OPERATIONS

When loading material, cleaning or performing other operations in the field every effort shall be made to have all equipment completely off of the traveled roadway. When it becomes necessary to enter upon private property, permission shall be obtained in advance. When the Contractor cannot remove his equipment from the traveled roadway all traffic control devices on the vehicles shall be in operation and flaggers and vehicles shall be stationed to protect the work site and the travelling public.

Two way traffic shall be maintained. Flaggers shall be equipped in accordance with Item 614.03.

AUXILIARY MARKINGS

Pavement preparation and placing of auxiliary markings are considered to be stationary operations and traffic control shall be in accordance with plan details shown on Sheet(s) 27 and 28 and Part 7, Ohio Manual of Uniform Traffic Control Devices (OMUTCD).

LAYOUT AND PREMARKING

The vehicle used in layout and premarking (Item 621.051) shall be equipped and operated with the following equipment:

1. A 360° rotating or flashing amber beacon clearly visible a minimum of 1 mile.
2. Lighted head lights and tail lights, and
3. A KEEP RIGHT sign (OC-31R-4R) mounted a minimum of 5' above the road surface measured to the bottom of the sign and visible to opposing traffic.

NIGHTTIME OPERATION

Nighttime operation is defined to include the time from one-half hour after sunset to one-half hour before sunrise, and at any other time when there are unfavorable atmospheric conditions or when there is no sufficient natural light to render discernible persons, vehicles, and substantial objects on the highway at a distance of one thousand feet.

During nighttime conditions the following additional traffic control shall be provided:

1. Cones shall be reflectorized or equipped with lighting devices for maximum visibility (See 7F-5, OMUTCD), and
2. The guide and side mounted carriages shall be illuminated.




The presence of highway lighting does not waive these requirements.

MINIMUM PAVEMENT MARKING TRAFFIC CONTROL EQUIPMENT REQUIREMENTS

This table indicates the traffic control equipment which shall be furnished for each type of long line pavement marking operation. In addition, those types of traffic control equipment which shall be furnished when directed by the Engineer are indicated.

EQUIPMENT	PAVEMENT MARKING LINE TYPE ¹					
	CENTER LINE		EDGE LINE		LANE LINE 2 CHANNEL LANE LINE	
	> 2 MIN. DRY	≤ 2 MIN. DRY	> 2 MIN. DRY	≤ 2 MIN. DRY	> 2 MIN. DRY	≤ 2 MIN. DRY
LEAD VEHICLE	Required	Required	Not Required	Not Required	Not Required	Not Required
POWER BROOM EQUIPMENT	Required	Required	Required	Required	Required	Required
LINE MARKING MACHINE	Required	Required	Required	Required	Required	Required
TRAIL VEHICLE	Not Required	Required	Required	Required	Not Required	Required
TRAIL VEHICLE (ADDITIONAL)	Not Required	Required	Required	Required	Required	Required
TRAIL VEHICLE (SIGN & CONE RETRIEVAL)	Required	Not Required	Required	Not Required	Not Required	Not Required

1. For equipment requirements for auxiliary operations see plan sheet(s) _____ and Part 7, OMUTCD.
2. Includes both dashed and solid lane lines.

-  Required Equipment
-  Equipment Required When Directed by the Engineer
-  Not Required

TRAFFIC CONTROL FOR LONG LINE PAVEMENT MARKING OPERATIONS

DATE
7-22-85

PAVEMENT MARKING TYPICAL DETAILS

FED RD DIV.	STATE	PROJECT	
5	OHIO		

8
28

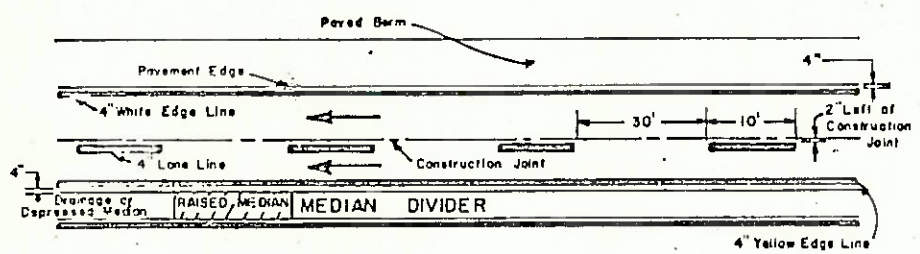
PLAN NO. 150

CALCULATED BY RLM DATE 7-22-85

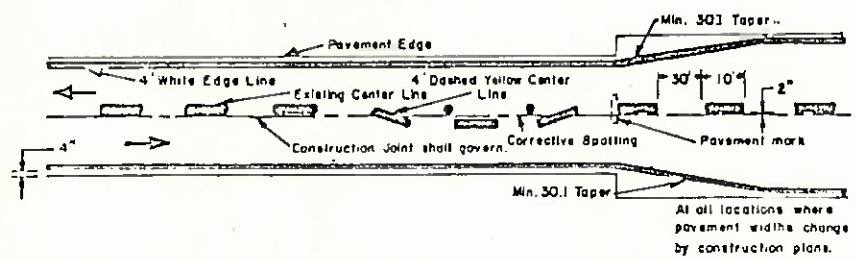
MUS-208-0.00

CHECKED BY SKW DATE 7-25-85

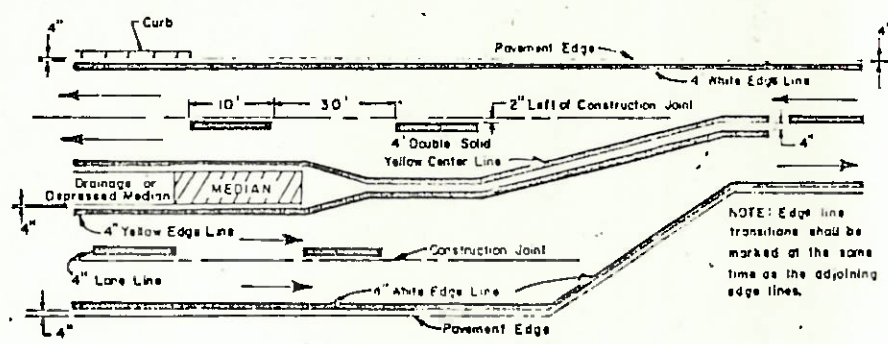
FREEWAY & EXPRESSWAY MAINLINE MARKINGS



TWO LANE MARKINGS



MULTILANE DIVIDED & UNDIVIDED HIGHWAY MARKINGS



NOTES:

1. THE DISTANCE FROM THE PAVEMENT EDGE TO THE NEAR-SIDE EDGE OF THE EDGELINE MAY BE INCREASED WITH THE APPROVAL OF THE ENGINEER IN ORDER TO MAINTAIN UNIFORM LANE WIDTH.
2. SEE TC 72.20 FOR PAVEMENT ENTRANCE AND EXIT RAMP TERMINALS.

PAVEMENT MARKING TYPICAL DETAILS	
DATE	11/18

PAVEMENT MARKING SUB-SUMMARY

(9 / 28)

CALCULATED BY Rm DATE 7-22-85

CHECKED BY DLN DATE 7-22-85

MUS-208-0.00

FED. RD. DIVISION	STATE	PROJECT		9
5	OHIO			28

PLAN # 150

O.	ROUTE	FROM		TO		621 QUANTITIES			PARTICIPATION	621 CENTER LINE
		S.L.M.		S.L.M.		CENTER LINES MILES				
						TOTAL	DASHED	SOLID		
MUS	208	0.00	S.R. 60	0.30	Suspend Work	0.30	---	0.600	PART 1	
		0.00A	Main St.	0.44	Dresden Corp.	0.44	---	0.880	PART 1	
		0.44	Dresden Corp.	10.65	Adamsville Corp.	10.21	1.780	17.914	PART 2	
		10.65	Adamsville Corp.	10.81	S.R. 93	0.16	---	0.320	PART 3	
CENTER LINE TOTAL						11.11	1.780	19.714		

CO.	ROUTE	FROM		TO		621 QUANTITIES			PARTICIPATION	621 LANE LINE
		S.L.M.		S.L.M.		4" LANE LINES MILES				
						TOTAL	DASHED	SOLID		
LANE LINE TOTAL										

CO.	ROUTE	FROM		TO		WHITE EDGE LINE QUANTITIES				YELLOW EDGE LINE QUANTITIES				621 EDGE LINE
		S.L.M.		S.L.M.		TOTAL MILES	HIGHWAY MILES	RAMP MILES	PART.	TOTAL MILES	HIGHWAY MILES	RAMP MILES	PART.	
MUS	208	0.00	S.R. 60	0.30	Suspend Work	0.60	0.60		1					
		0.04	Main St.	0.44	Dresden Corp.	0.88	0.88		1					
		0.44	Dresden Corp.	10.65	Adamsville Corp.	20.42	20.42		2					
		10.65	Adamsville Corp.	10.81	S.R. 93	0.32	0.32		3					
EDGE LINE TOTAL						22.22	22.22							

CALCULATED BY RJD DATE 7-22-85
CHECKED BY Jim DATE 8-8-85

BRIDGE REPAIR
MUS-208-0489/0511
(Part 2)



PLAN NO.
150

REFERENCE:

Detailed drawings of the existing structures may be inspected in the District 5 Office of the Ohio Department of Transportation, Newark, Ohio.

REMOVED MATERIALS:

All removed materials shall become the property of the Contractor and shall be removed by him from the job site.

EXISTING STRUCTURE VERIFICATION:

Details and dimensions shown on these plans pertaining to the existing structures have been obtained from plans of the existing structures and/or from field observations and measurements. Consequently, they are indicative of the existing structures and the proposed work but they shall be considered tentative and approximate. The Contractor is referred to C.M.S. Sections 102.05 and 105.02.

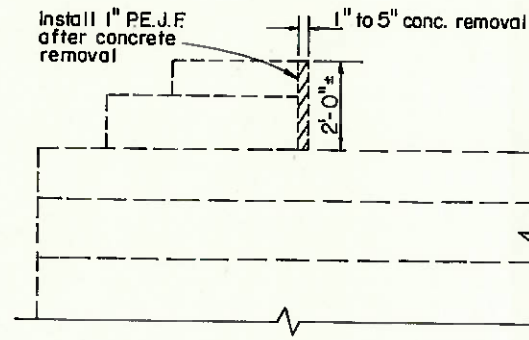
Contract bid prices shall be based upon a recognition of the uncertainties described above and upon a prebid examination of the existing structures by the Contractor. However, all project work shall be based upon actual details and dimensions which have been verified by the Contractor in the field.

ITEM 614 - MAINTAINING TRAFFIC -

Through traffic shall be maintained at all times by use of half width construction. The bridge shall be repaired half width at a time while one lane traffic is maintained on the other half. A minimum lane width of 10 feet shall be maintained for the one way traffic. The Contractor shall provide traffic signal lights for controlling the alternating flow of traffic over the one lane. These signals shall conform to the requirements of the Ohio Manual of Uniform Traffic Control Devices for Streets and Highways. See Sheet No. 26 for location of signals and signs.

WIRE MESH REINFORCING: MUS-208-0511

Wire mesh reinforcing furnished for this item shall conform to 709.12 or 709.10 of the Construction and Material Specifications. The commercial designation shall be either WWF 6 x 6 - D5 x D5, WWF 6 x 6 - W5 x W5 or WWF 6 x 6 - W5.5 x W5.5 and shall be included for payment in the contract price bid for Item 511, Class 'S' Concrete, as per plan.



The Contractor shall determine the removal and replacement thickness of the wingwall caps to accommodate the proposed deck widening and 1" Preformed Expansion Joint Filler. The removal shall be saw cut to insure a smooth surface edge prior to placement of the preformed expansion joint filler, as directed by the Engineer. The above work shall be included in Item 202 Portions of Structures Removed, Superstructure.

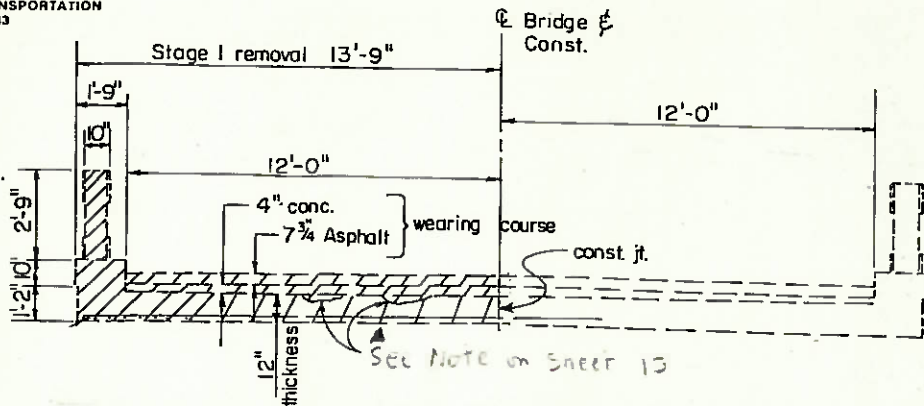
WINGWALL REMOVAL DETAIL
(Typical for Br. Nos MUS-208-0489 & 0511)

$\left\langle \frac{12}{20} \right\rangle$

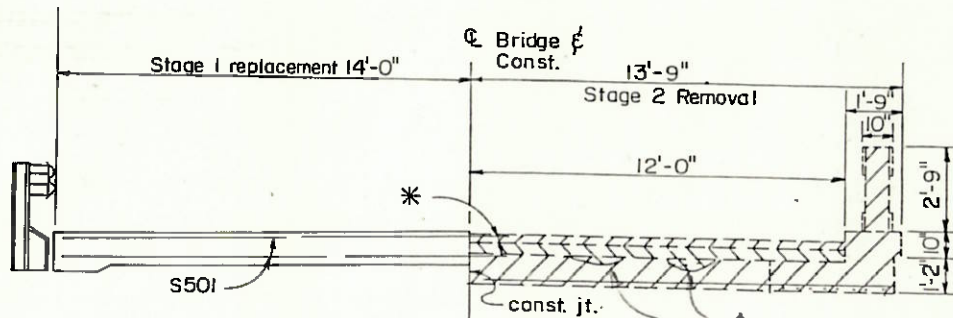
MUS-208-0.00
BRIDGE REPAIR
MUS-208-0489
(Part 2)

12
28
PLAN NO
150

CALCULATED BY RJD DATE 7-22-85
CHECKED BY Rm DATE 8-8-85



CONSTRUCTION REMOVAL DETAILS
(Stage I Removal)

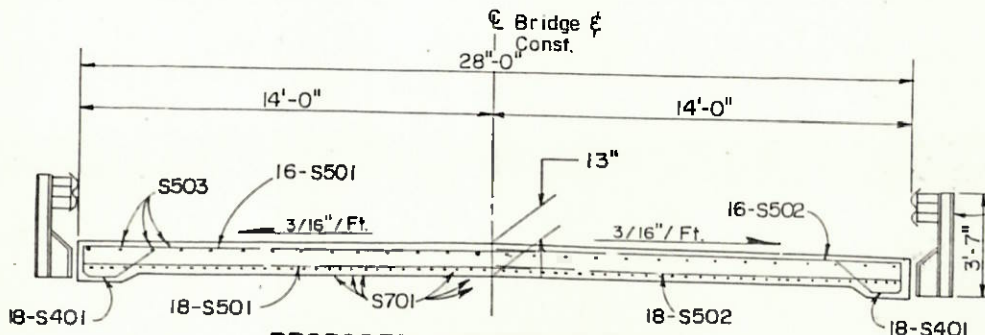


CONSTRUCTION REMOVAL DETAILS
(Stage I replacement & Stage 2 removal)

ITEM 511, CLASS 'S' CONCRETE (SUPERSTRUCTURE); MUS-208-0489

Deck quantity	18 Cu. Yds.
Est. quantity	5 Cu. Yds.
Total	23 Cu. Yds.

* Slot existing asphalt and concrete to set dowels into new concrete



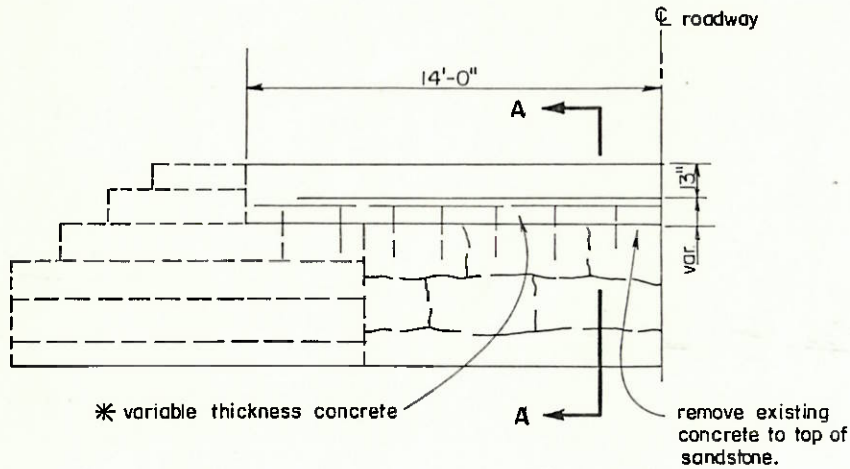
PROPOSED TYPICAL SECTION
MUS-208-0489

CALCULATED BY RDD DATE 7-22-85
 CHECKED BY Rm DATE 8-8-85

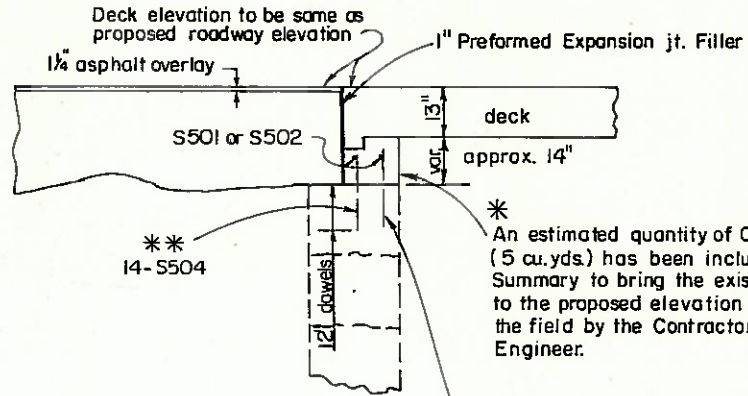
MUS-208-0.00
 BRIDGE REPAIR
 MUS-208-0489
 (Part 2)

13
 28

PLAN NO.
 150



HALF ELEVATION
 PROPOSED ABUTMENT

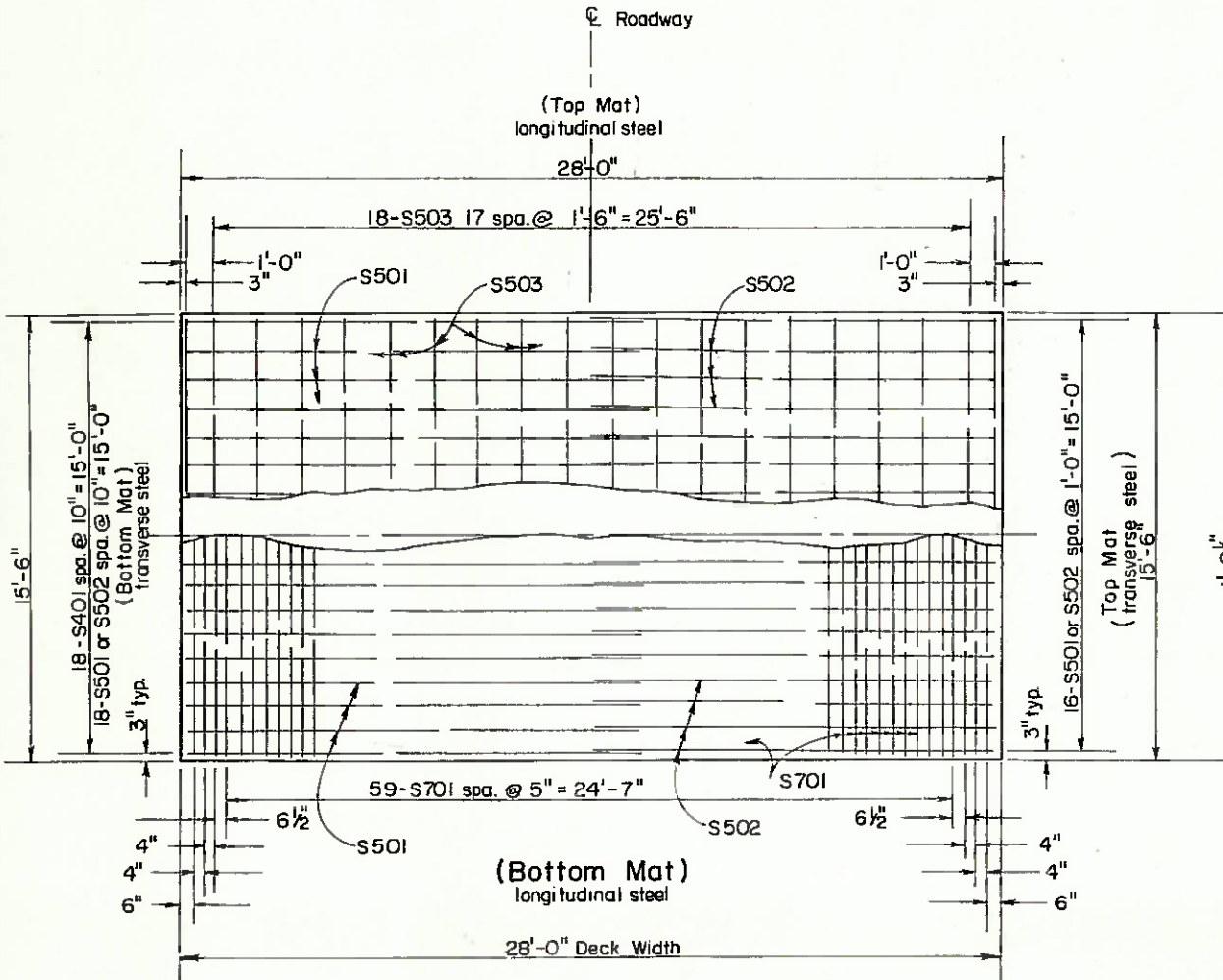


Existing dowel bars not to be disturbed. Location of existing bars in front of abutment only.

SECTION A-A

* * * An estimated amount of 14-S504 dowel bars in each abutment shall be staggered in the back of the backwall approx. between the existing dowels in front of the abutment. Spacing of the bars to be determined in the field by the Engineer so as not to damage the existing sandstone. The actual amount of dowel bars and dowel holes shall be determined in the field.

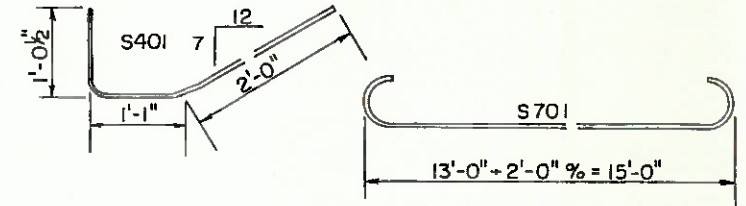
CALCULATED BY *RJD* DATE 7-22-85
 CHECKED BY *Zm* DATE 8-8-85



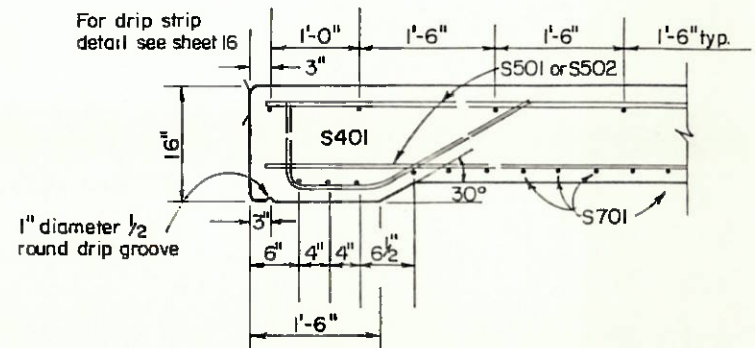
STEEL REINFORCEMENT
 PLAN

EPOXY COATED
 REINFORCING STEEL

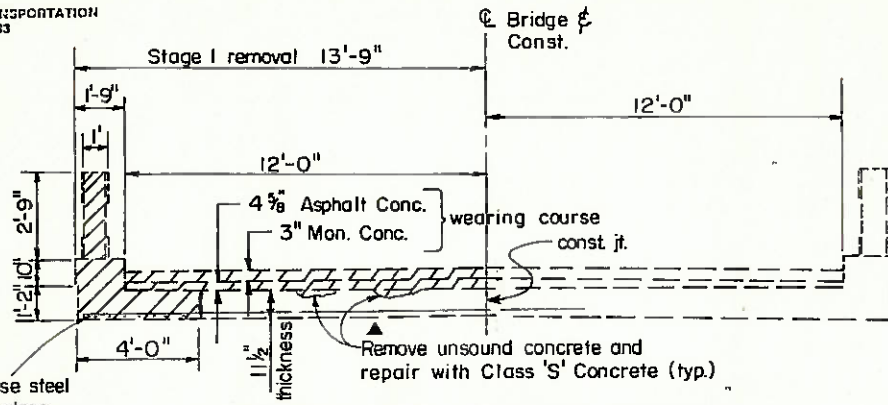
BAR SCHEDULE				
Mark	No. Req'd.	Shape	Length	Weight
S401	36	Bt.	4'-0"	96
S501	38	St.	15'-6"	614
S502	38	St.	13'-10"	548
S503	20	St.	15'-2"	316
S504	28	St.	2'-0"	58
S701	66	Bt.	16'-4"	2,271
Totals				3,903



BENDING DIAGM

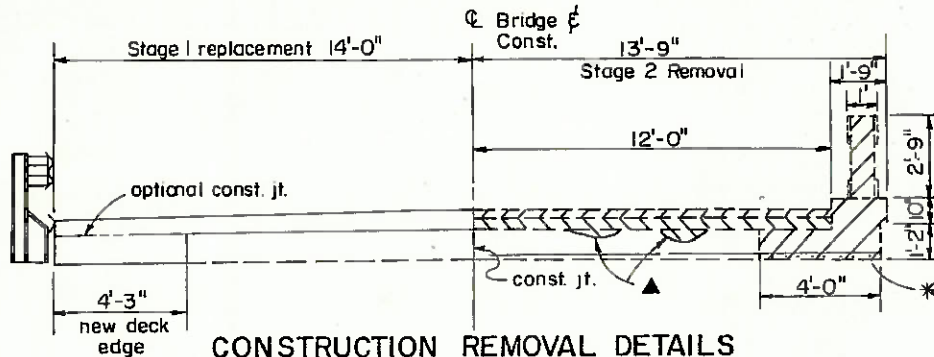


APPROVED BY RSD DATE 7-27-85
 CHECKED BY R DATE 8-8-85



CONSTRUCTION REMOVAL DETAILS
 (Stage I Removal)

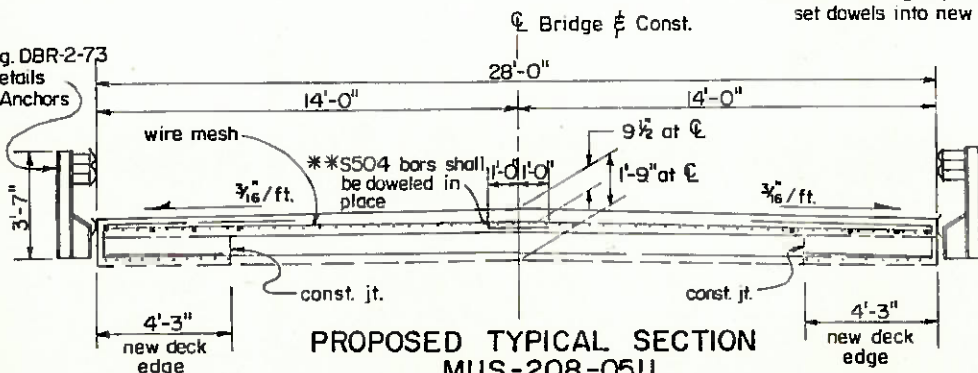
* Existing transverse steel to be salvaged in place. Longitudinal steel to be removed and replaced (typ.)



CONSTRUCTION REMOVAL DETAILS
 (Stage I replacement & Stage 2 removal)

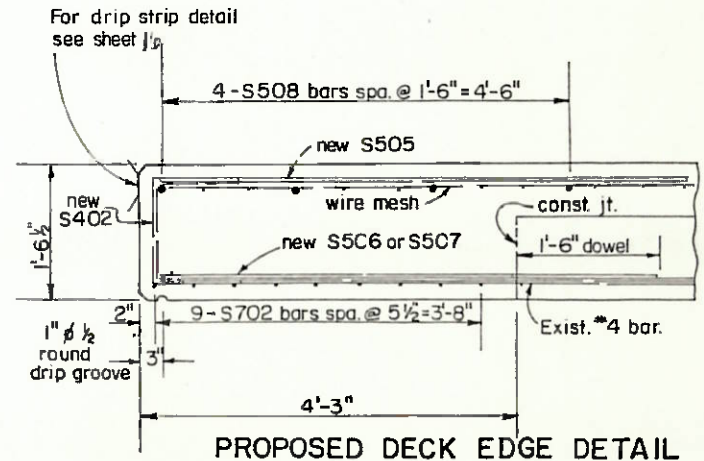
ITEM 511, CLASS 'S' CONCRETE (SUPERSTRUCTURE): MUS-208-0511
 Uniform thickness 15 Cu. Yds.
 Variable thickness 2 Cu. Yds.
 17 Cu. Yds. TOTAL

See std. drwg. DBR-2-73 for railing details (use type A Anchors)



PROPOSED TYPICAL SECTION
 MUS-208-0511

**Slot existing asphalt to set dowels into new concrete



PROPOSED DECK EDGE DETAIL

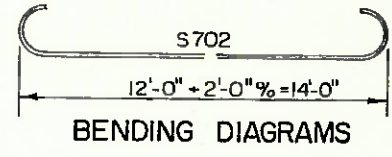
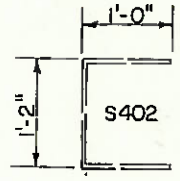
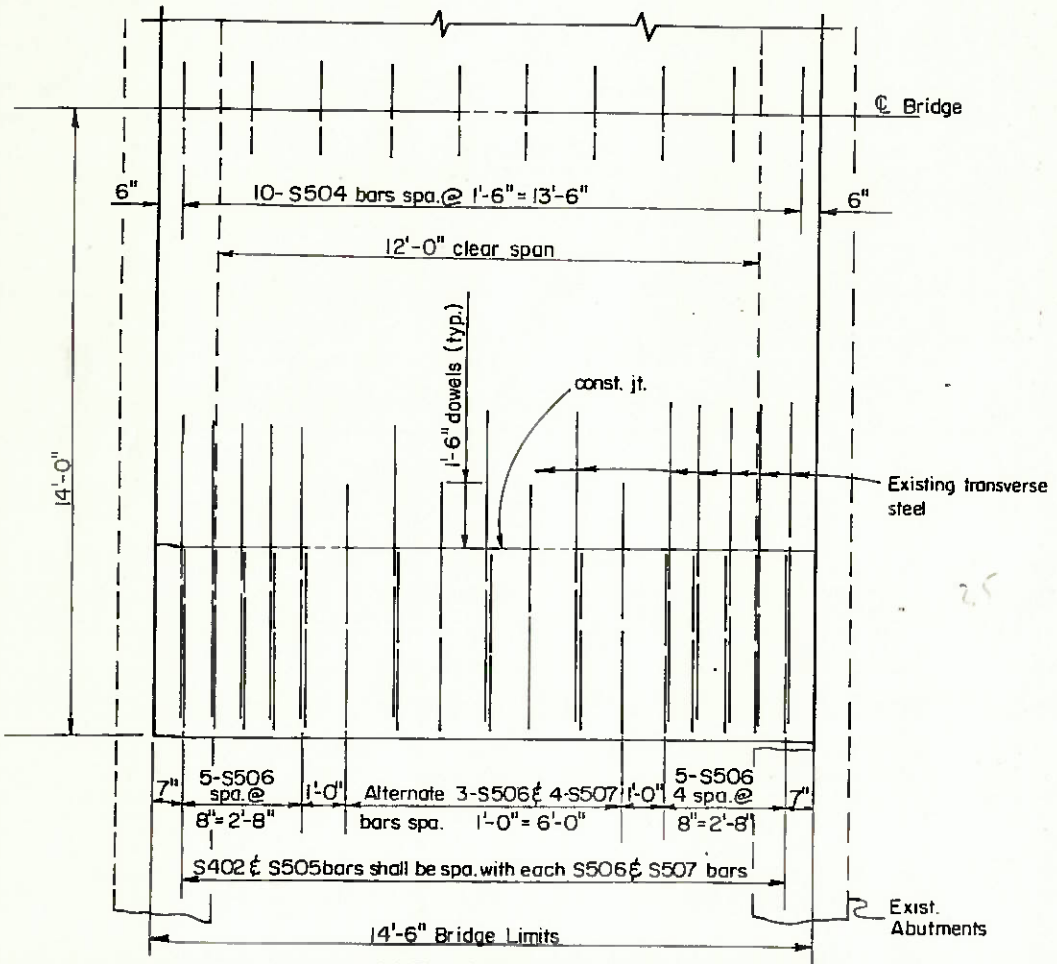
$\left[\frac{16}{29} \right]$

MUS-208-0.00
BRIDGE REPAIR
MUS-208-0511
(PART 2)

16
28

CALCULATED BY RLO DATE 7-22-85
CHECKED BY Rm DATE 8-8-85

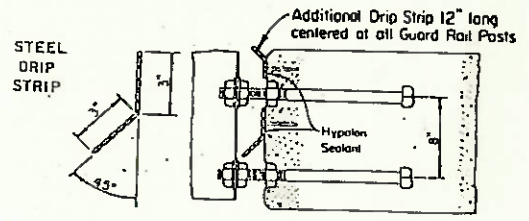
PLAN NO.
150



EPOXY COATED
REINFORCING STEEL

BAR SCHEDULE				
Mark	N ^o Req'd	Shape	Length	Weight
S402	34	Bt.	2'-10"	64
S505	34	St.	6'-0"	213
S506	26	St.	4'-3"	111
S507	8	St.	5'-7"	47
S508	8	St.	14'-2"	118
S504	10	St.	2'-0"	21
S702	18	Bt.	15'-10"	583
Total				1,157

HALF PLAN
PROPOSED BRIDGE DECK
(showing new edge reinforcing)



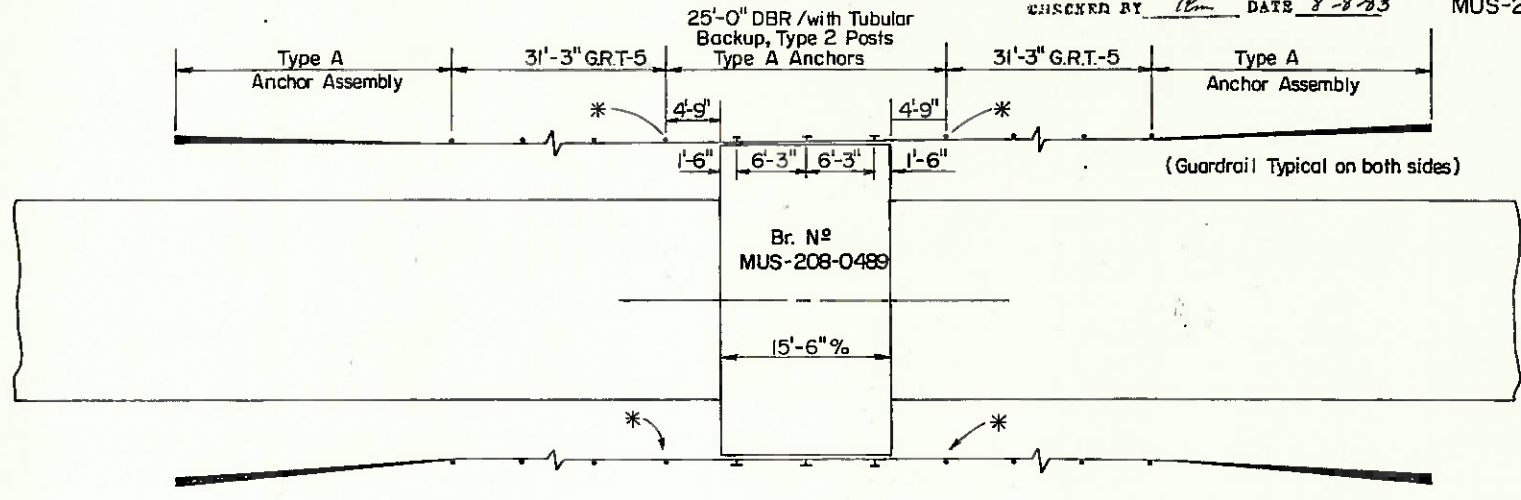
DRIP STRIP - BRIDGE NUMBERS MUS-208-0489 AND MUS-208-0511
A bent drip strip shall be installed along the edges of the deck as shown. The drip strips shall be embedded in a $\frac{3}{16}$ x 3" layer of Hypalon sealant. The strips shall be fastened at 1'-6" c/c maximum with $1\frac{1}{2}$ x $\frac{3}{32}$ x $\frac{1}{4}$ " (Length x Shank Diameter x Head Diameter) flat head drive pins and washers. Pins and washers shall be stainless steel or galvanized, or no. 30 galvanized screws and expansion anchors, subject to the approval of the Engineer. The strips shall be placed the full length of the deck, ending at the face of the abutment wing-wall. Where splices are required the individual pieces shall be butted together, not lapped. Steel for galvanized strips shall be 6" x 0.103" and shall meet the requirements of ASTM A568. Galvanizing shall be in accordance with 711D2, Stainless Steel shall be 20 gauge ASTM A67, Type 304, mill finish. Payment shall be at the contract price but for item Special 30 Fl steel drip strip, which shall include all materials, labor, tools, and incidentals necessary to complete item.
Sealant shall meet Government Specification TT-S-0023C, Type II.

CALCULATED BY RLO DATE 7-22-85
 CHECKED BY Rm DATE 8-8-85

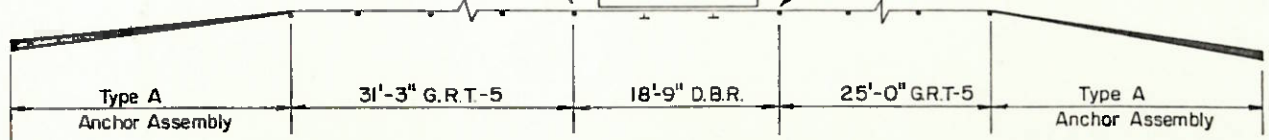
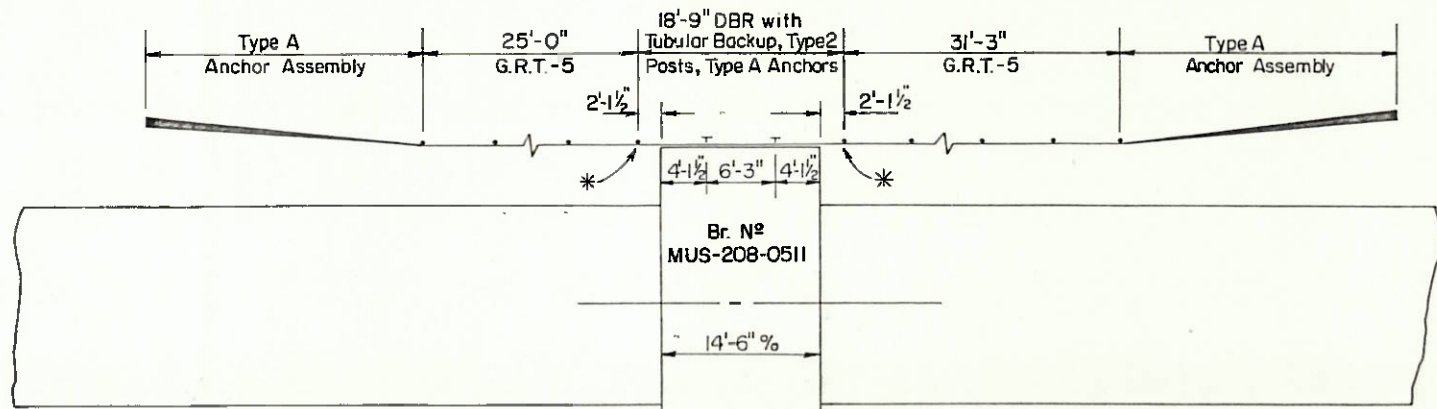
MUS-208-000
 BRIDGE REPAIR
 MUS-208-0489/0511

17
 28

PLAN NO.
 150



* Type B Bridge Terminal Assembly

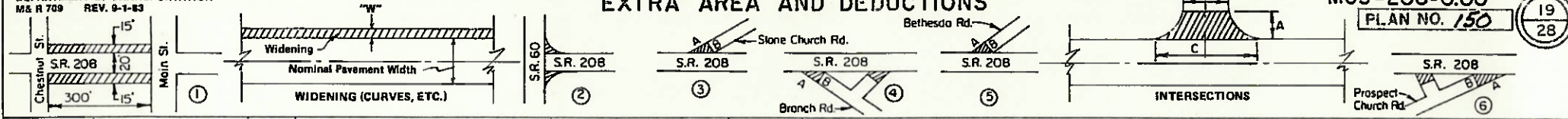


GUARDRAIL
 DETAIL

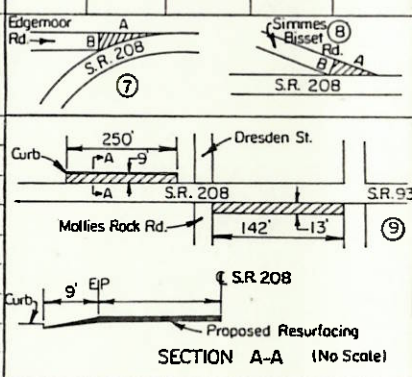
EXTRA AREA AND DEDUCTIONS

MUS-208-0.00
PLAN NO. 150

19
28



PART	ROUTE	LOG POINT TO LOG POINT	SIDE	* Feather to Catch Basins DESCRIPTION	INTERSECTIONS			AREA IN SQ. YDS.	** Average			PROPOSED ITEMS				
					A IN FEET	B IN FEET	C IN FEET		407		ASPHALT CONCRETE		408	EXISTING SURFACE	Edgemoor Rd. A B C S.R. 208	Symmes Bisset Rd. B A S.R. 208
									TACK COAT @ 0.10 gal./s.y. Gals.	COVER AGGR. lbs./s.y. Tons	THICK INCHES	CU. YDS.				
1	S.R.208			SR. 60 ②	62	26	135	375	38	1 1/2	15.63		Asph.			
			Rt.	Cass St.	28	17	55	112	11	1 1/2	4.67		Asph.			
			Lt.	Cass St.	36	17	52	138	14	1 1/2	5.75		Asph.			
			Lt.	Alley	20	14	40	60	6	1 1/2	2.50		Asph.			
			Rt.	Chestnut St.	23	33	68	129	13	1 1/2	5.38		Asph.			
			Lt.	Chestnut St.	24	36	65	135	14	1 1/2	5.63		Asph.			
			Lt.	Area between Chestnut and Main*①				500	50	1**	13.89		Asph.			
			Rt.	Area between Chestnut and Main*①				500	50	1**	13.89		Asph.			
			Lt.	High St.	30	21	70	152	15	1 1/2	6.33		Asph.			
			Rt.	River Drive	20	19	36	61	6	1 1/2	2.54		Asph.			
	TOTALS	PART 1		(TOTALS CARRIED TO SHEET 20)				2,162	217		76.21					
2	S.R.208		Lt.	Stone Church Rd. ③	105	35		204		2	11.33		82	Gravel		
			Rt.	Branch Rd. A ④	82	35		159		2	8.83		64	Gravel		
			Rt.	Branch Rd. B ④	22	18	55	89		2	4.94		36	Gravel		
			Lt.	Bethesda Church Rd. ⑤	108	51		306		2	17.00		122	Gravel		
			Rt.	Prospect Church Rd. A ⑤	25	15	42	79		2	4.39		32	Gravel		
			Rt.	Prospect Church Rd. B ⑥	95	37		195		2	10.83		78	Gravel		
			Lt.	Edgemoor Rd. ⑦	129	59		423	42	2	23.50			Asph.		
			Rt.	Summers Rd.	25	13	50	88		2	4.89		35	Gravel		
			Lt.	Symmes Bisset Rd. ⑧	82	43		196		2	10.89		78	Gravel		
	TOTALS	PART 2		(TOTALS CARRIED TO SHEET 20)				1,739	42		96.60		527			
3	S.R.208		Rt.	Miller St.	23	11	19	38	4	2	2.11			Asph.		
			Lt.	Madison St.	21	11	19	35	4	2	1.94			Asph.		
			Rt.	Mollies Rock Rd.	25	20	50	97	10	2	5.39			Asph.		
			Lt.	Dresden St.	23	17	48	83	8	2	4.61			Asph.		
			Lt.	Area before Dresden St. ⑨				250	25	1**	6.94			Asph.		
			Rt.	Area between Mollie Rock Rd. & SR.93 ⑨				205	21	1**	5.69			Asph.		
	TOTALS	PART 3		(TOTALS CARRIED TO SHEET 21)				708	72		26.68					



CALCULATED BY RLM DATE 7-22-83
CHECKED BY S.W.K. DATE 7-25-83

ASPHALT CONCRETE

CALCULATED BY R.L.M. DATE 7-11-85
CHECKED BY SKW DATE 7-25-85

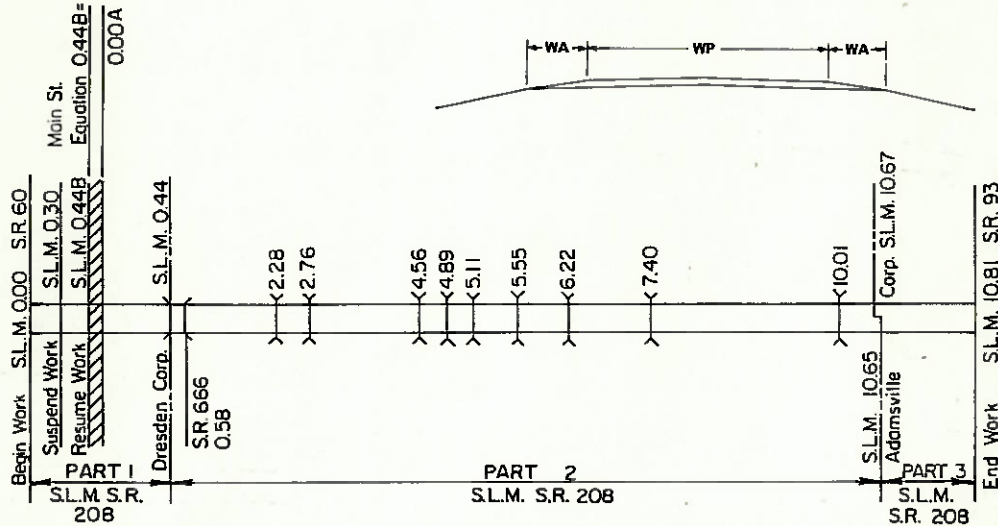
PLAN NO.
150

20
28

MUS-208-0.00

TYPICAL 1

TYPICAL 2



BRIDGE TREATMENT (PART 2)

MUS-208-0044	705.23' x 20.0'	Do Not Cover
MUS-208-0228	22.33' x 31.0'	See Sheet 23
MUS-208-0276	14.83' x 29.17'	Do Not Cover
MUS-208-0456	12.00' x 24.67'	See Sheet 23
MUS-208-0489	16.00' x 24.00'	See Sheets 11-14, 17, 18 and 23
MUS-208-0511	16.00' x 24.00'	See Sheets 11, 15-18 and 23
MUS-208-0555	14.75' x 23.50'	See Sheet 23
MUS-208-0622	39.00' x 23.00'	See Sheet 23
MUS-208-0740	25.33' x 23.00'	Do Not Cover
MUS-208-1001	49.00' x 29.00'	See Sheet 23

(1) Average (2) Field Measured (3) Bridge Length x Pavement Width

PAVEMENT DATA

PART	ROUTE	LOGPOINT TO LOGPOINT	LENGTH		WP FEET	TYPICAL	EXISTING TYPE PAVEMENT	PAVEMENT AREA SQ. YDS.	PROPOSED PAVEMENT						614 TEMPORARY CENTER LINES, CLASS II MILE	604 MANHOLES ADJUSTED TO GRADE EACH	408 BITUMINOUS PRIME COAT @ 0.40 Gal./SY. GAL.
			MILES	LIN. FT.					407		ASPHALT CONCRETE						
									TACK COAT @ 0.10 gal./s.y.	COVER AGGR. @ 1.00 lbs./s.y.	ITEM 403 THICK INCHES	CU. YDS.	ITEM 404 THICK INCHES	CU. YDS.			
1	S.R. 208	0.00-0.05	0.05	264	24 (2)	1	404	704	70	0.35	0	10	1	20			0.10
		0.05-0.075	0.025	132	22 (1)	1	404	323	32	0.16	0	4	1	9			0.05
		0.075-0.30	0.225	1,188	20	1	404	2,640	264	1.32	0	37	1	73		4	0.45
		0.44B = 0.00A - 0.04	0.04	211	30	2	404	703	70	0.35	0	10	1	20			0.08
		0.04-0.30	0.26	1,373	20	1	404	3,051	305	1.53	0	42	1	85		1	0.52
		0.30-0.44	0.14	739	19 (1)	1	404	1,560	156	0.78	0	22	1	43			0.28
Extra	Areas from Sheet 19							2,162	217					76			
Extra	Tack Coat for Longitudinal Joint								9								
TOTALS	PART 1		0.74	3,907				11,143	1,123	4.49		125		326		5	1.48
2	S.R. 208	0.44-10.65	10.21	53,909	18	1	404	107,818	10,782	53.91	0	2,246	1 1/4	3,744			20.42
Extra	Areas from Sheet 19							1,739	42					97			527
Extra	Tack Coat for Longitudinal Joint								156								
Deduct	for Bridges (3)							(1,829)	(183)	(0.91)		(38)		(64)			
TOTALS	PART 2		10.21	53,909				107,728	10,797	53.00		2,208		3,777			20.42

ASPHALT CONCRETE

CALCULATED BY RLM DATE 7-22-85

CHECKED BY SKW DATE 7-25-85

PLAN NO.
150

21
28

TYPICAL 1



TYPICAL 2



MUS-208-0.00

PAVEMENT DATA

PART	ROUTE	LOG POINT TO LOG POINT	LENGTH		WP FEET	TYPICAL	EXISTING TYPE PAVEMENT	PAVEMENT AREA SQ. YDS.	PROPOSED PAVEMENT						614 TEMPORARY CENTER LINES, CLASS II	MILES		
			MILES	LIN. FT.					407		ASPHALT CONCRETE							
									TACK COAT @ .010 gal./s.y. GALS.	COVER AGGR. @ .1 lbs./s.y. TONS	ITEM 403 THICK INCHES MIN.	CU. YDS.	ITEM 404 THICK INCHES	CU. YDS.			ITEM THICK INCHES	CU. YDS.
3	S.R. 208	10.65 - 10.67	0.02	106	9	9	1	404	212	21	0.11	0	4	1 1/4	7			0.04
		10.67 - 10.81	0.14	739	18	1	1	404	1,478	148	0.74	0	31	1 1/4	51			0.28
Extra	Areas from	Sheet 19							708	72					27			
Extra	Tack Coat for	Longitudinal Joint								2								
TOTALS	PART 3		0.16	845					2,398	243	0.85		35		85			0.32

BRIDGE DECK TREATMENT

PLAN NO. 150

23
28

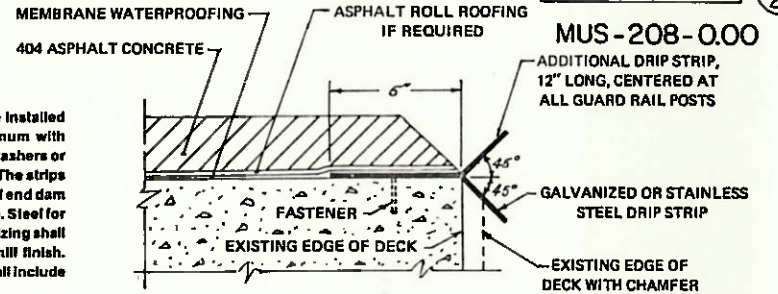
CALCULATED BY RLM DATE 7-22-85
CHECKED BY SKW DATE 7-25-85

PROTECTIVE COURSE FOR MEMBRANE WATERPROOFING

MEMBRANE WATERPROOFING, Sheet Type 1: A minimum of 1-1/2 inches of 404 Asphalt Concrete shall be placed over the membrane.

MEMBRANE WATERPROOFING: A minimum of 2-1/2 inches of 404 Asphalt Concrete shall be placed over the membrane.

DRIP STRIP: Prior to applying deck membrane waterproofing, a bent drip strip shall be installed along the edges of the deck as shown. The strips shall be fastened at 1'-6" c/c maximum with 1-1/4" x 5/32" x 1/4" (Length x Shank diameter x Head diameter) flat head drive pins and washers or No. 10 galvanized screws and expansion anchors, subject to the approval of the Engineer. The strips shall be placed the full length of the deck, ending at the face of the abutment wingwall or steel end dam angle. Where splices are required a 3" (Min.) lap shall be used with a fastener through the lap. Steel for galvanized strips shall be 8" x 0.105" and shall meet the requirements of ASTM A568. Galvanizing shall be in accordance with 711.02. Stainless steel shall be 20 gauge ASTM A167, Type 304, mill finish. Payment shall be at the contract price bid for Item Special, Sq. Ft., Steel Drip Strip, which shall include all materials, labor, tools and incidentals necessary to complete item.



TYP. SEC. DRIP STRIP

BRIDGE DECK DATA

PART	COUNTY, ROUTE, BRIDGE NO.	LENGTH (BRIDGE LIMITS) L.F.	WIDTH L.F.	BRIDGE DECK AREA S.Y.	202 WEARING COURSE REMOVED DEPTH * S.Y.	BRIDGE DECK REPAIR			PATCHING		SPECIAL		516 VERT. EXT. OF STR. EXP. JOINTS L.F.	ASPHALT CONCRETE		407 TACK COAT @ 010 Gals/SY. GAL.	202 WEARING COURSE REMOVED (See Detail Below) SQ. YD.
						" THICK OVERLAY S.Y.	VARIABLE THICKNESS OVERLAY C.Y.	FULL-DEPTH REPAIR C.Y.	STEEL DRIP STRIP S.F.	DECK WATERPROOFING		THICK INS. INS.		404 C.Y.			
										MEMBRANE WATERPROOFING SHEET TYPE 1 S.Y.	MEMBRANE WATERPROOFING S.Y.						
2	MUS-208-0228	22.33	31.0	76.91	(1) 76.91								2	4.27	8	200	
	MUS-208-0456	12.00	2467	32.89	(2) 32.89								4	3.65	4	200	
	MUS-208-0489	16.00	2400	42.67	(3) 42.67											200	
	MUS-208-0511	16.00	24.00	42.67	(4) 42.67											200	
	MUS-208-0555	14.75	23.50	38.51									2	2.14	4		
	MUS-208-0622	39.00	23.00	99.67	(5) 99.67								2	5.54	10	200	
	MUS-208-1001	49.00	29.00	157.89	(6) 157.89								2	8.77		200	
	PART 2				452.70									24.37	26	1,200	

* Wearing Course Removed Depth

- (1) 2"
- (2) 4"
- (3) 7 3/8"
- (4) 4 5/8"
- (5) 2"
- (6) 2"

WEARING COURSE REMOVED (Transition Area):

For a distance of 50 ± feet at each end of the bridge there will be a wearing course removal to assure smooth transition onto the bridge deck after the wearing course has been removed. This transition shall begin at the concrete deck of the bridge after the wearing course has been removed and feather to 0 inches 50 ft. ± in both directions. After the bridge deck has been overlaid, the transition area shall be tacked with 407 material before the 404 material is applied as directed by the Engineer. The actual thickness and distance of the transition area may vary due to irregularities in the existing surface. The final profile shall be smooth.

** Typical - Both Ends of Bridges



WEARING COURSE REMOVAL DETAIL

GENERAL SUMMARY

ITEM	STATE PART 1	STATE PART 2	STATE PART 3	GRAND TOTAL PARTS 1, 2 and 3	UNIT	DESCRIPTION
407	1,123	10,823	243	12,189	Gal.	Tack Coat
407	4	53	1	58	Ton	Cover Aggregate
403	125	2,208	35	2,468	Cu. Yd.	Asphalt Concrete AC-20
404	326	3,901	85	4,212	Cu. Yd.	Asphalt Concrete AC-20
408		527		527	Gal.	Bituminous Prime Coat
604	5			5	Each	Manhole - Adjusted to Grade
847	128	209		337	Lin. Ft.	Stop Lines, 94703, Type A ¹ Inlaid
847	442		128	570	Lin. Ft.	12" Crosswalk Lines, 94703, Type A ¹ Inlaid
847	2			2	Each	Word on Pavement, "SCHOOL", 96-inch, 94703, Type A ¹ Inlaid
847	2			2	Each	Railroad Symbol on Pavement, 94703, Type A ¹ Inlaid
621	0.74	10.21	0.16	11.11	Mile	Center Lines
621	1.48	20.42	0.32	22.22	Mile	Edge Lines
SPECIAL	2	31	1	34	Hour	Grader Rental
614	1.48	20.42	0.32	22.22	Mile	Temporary Center Lines, Class II
624	Lump	Lump	Lump	Lump	Lump	Mobilization
617					Sq. Yd.	Shoulder Preparation
617	83	1,331	21	1,435	Cu. Yd.	Compacted Aggregate
614	Lump	Lump	Lump	Lump	Lump	Maintaining Traffic

GENERAL NOTES

TRAFFIC:

Traffic shall be maintained at all times. The length of restricted traffic zones shall be kept to a minimum consistent with the specification requirements for protection of completed courses.

RAILROAD CROSSINGS:

The new surface course shall be feathered or butt jointed to meet the rail grades as specified.

ALIGNMENT AND PROFILE:

The work proposed by this project is for the resurfacing of the existing pavement. The alignment of the existing pavement will not be changed, and the profile of the proposed surface will be similar to that of the existing pavement except that it will be raised an amount equal to the thickness of the resurfacing course or courses specified in these plans.

INTERMEDIATE COURSE, SPOT LEVELING AND PATCHING:

This material shall be placed in a separate operation where and as directed by the engineer.

TACK COAT:

The tack coat operation shall be as determined at a pre-construction conference as per 407.05, and application rates shall not exceed 0.10 gal. per sq. yd.

COVER AGGREGATE:

Cover aggregate shall conform to 703.06.

TACK COAT: (Continued)

In addition to the requirements of 407.05 the tack coat shall be applied immediately ahead of the paving operation or as otherwise determined by the Project Engineer.

CONTROL OF ONE WAY TRAFFIC:

In addition to the requirements of the Ohio Manual of Uniform Traffic Control Devices and Material Specifications the following requirements shall apply.

Communications between flaggers shall be by two-way radio during the paving operations.

Payment for the above shall be included in Item 614, Maintaining Traffic.

BRIDGES:

The proposed depth of asphalt resurfacing shall be altered to match the proposed depth of the treatment on the structures. The resurfacing thickness shall be adjusted as required at the approximate rate of 25 ft. per inch of difference in thickness unless otherwise directed by the Engineer.

CALCULATED BY RLM DATE 7-21-85

DESIGNED BY SKW DATE 2-25-85

MUS-208-0.00

257
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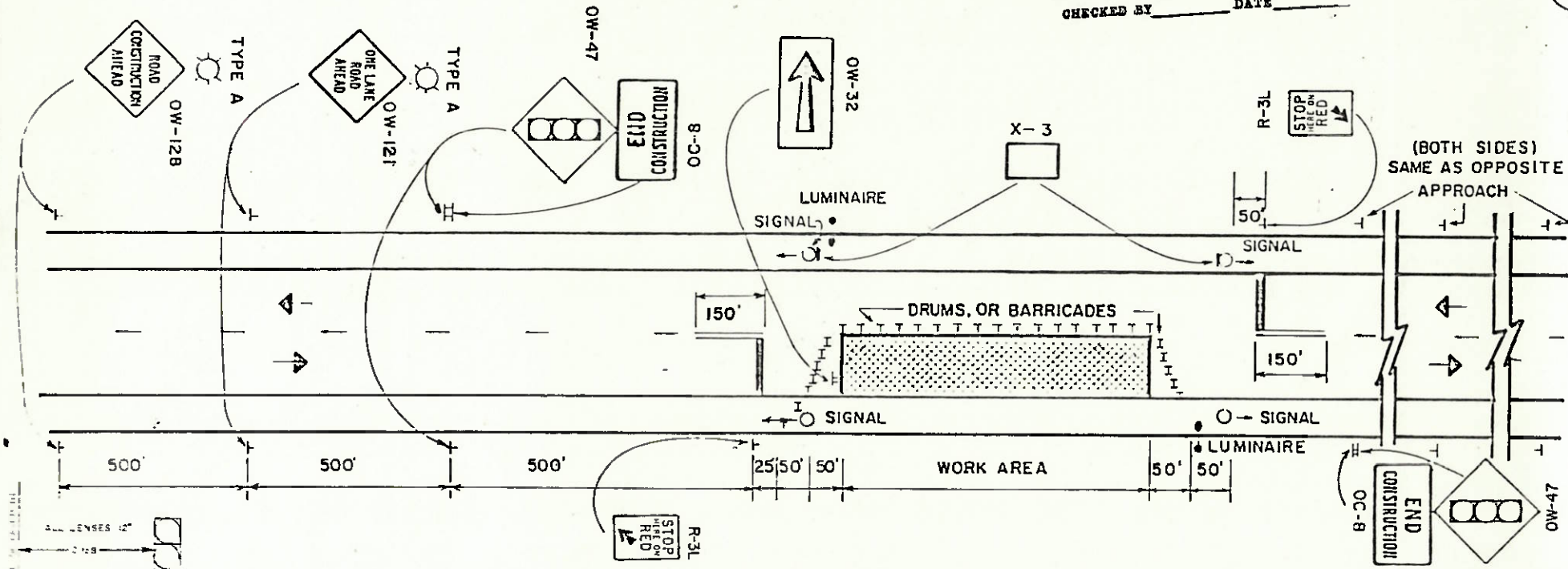
PLAN NO. 150

GENERAL SUMMARY

ITEM	STATE PART 1	STATE PART 2	STATE PART 3	GRAND TOTAL PARTS 1, 2 and 3	UNIT	DESCRIPTION
SPECIAL	1	15	1			
202		1653		17	Hour	Loader Rental
202		62		1653	Sq. Yd.	Wearing Course Removed
202		38		62	Lin. Ft.	Bridge Railing Removed
509		5,060		38	Cu. Yd.	Portions of Structures Removed, Superstructure including Wearing Course
510		36		5,060	Lb.	Reinforcing Steel, EPOXY COATED
511		40		36	Each	Dowel Holes
516		137		40	Cu. Yd.	Class 'S' Concrete, Superstructure
517		87.5		137	Sq. Ft.	1" Preformed Expansion Joint Filler
				87.5	Lin. Ft.	Railing, Deep Beam Railing with ^{STEEL} Tubular Backup, Type 2 Posts, and ^{STEEL} Type A Anchors
606		237.5				
606		8		237.5	Lin. Ft.	Guardrail, Type 5
606		8		8	Each	Bridge Terminal Assembly, Type B
SPECIAL		31		8	Each	Anchor Assembly, Type A
614				31	Sq. Ft.	Steel Drip Strip, as per plan
310		50		44	EACH	WORK ZONE MARKING SIGNS
SPECIAL		6,550		50	Cu. Yd.	Subbase, Type I, Grading A, As Per Plan
605		1,300		6,550	Sq. Yd.	Pavement Repair
				1,300	Lin. Ft.	Aggregate Drains

CALCULATED BY RJD DATE 7-22-85
CHECKED BY _____ DATE _____

26
28



GENERAL NOTES:

1. The maximum length of work area for one way traffic signal control is determined by the capacity required to handle the peak hour demand. Practical maximum length is 400 feet. Signal timing shall be approved by the Engineer.
2. Signals shall be installed and operated in accordance with the requirements of Part 6 of the Ohio Manual of Uniform Traffic Control Devices.
3. Drums or barricades shall be spaced at 50' to 60' center to center within the work area. Drums or barricades on the advance and return tapers shall be spaced at 10' center to center.
4. Adequate area illumination to clearly identify both ends of the work area at night for long term operations shall be provided by using 150-watt minimum high pressure sodium luminaires

or 250-watt minimum mercury luminaires. Luminaires shall be located adjacent to one signal for each direction of traffic as shown above. The mounting height for temporary luminaires shall be a minimum of 27 feet above the pavement and the overhead conductor clearance shall be 20 feet above the pavement.

5. Temporary no passing lines and 24" stop lines shall be installed and maintained where no passing lines are not already in place. Removable pavement markings may be used. Existing conflicting pavement markings between the work area and stop line shall be removed. After completion of the work, temporary markings shall be removed in accordance with 621.134.

6. The Type A flashing barricade warning lights shown on the "Road Construction Ahead" and the "One Lane Road Ahead" signs are required whenever a night lane closure is necessary.
7. Type C steady burning barricade warning lights shall be erected on drums or barricades for night lane closures. The maximum spacing shall be identical to the channelizing device spacing requirements described in Note 3.
8. The horizontal or vertical alignment of the roadway may require adjustments in the location of the advance warning signs (the distances shown for advance warning sign spacings are minimums). The vertical alignment of the roadway may require adjustments in the height of the signal heads within the range specified in the Typical Pole Supported Signal Detail.

9. All traffic signals and equipment used in this traffic signal installation, such as a signal cable and signal heads, shall be in conformance with Specifications 632 and 712. However, the performance test provision noted in Specification 632.27, paragraph 6 and the working drawing requirements of 632.03 are waived. The controller, flashers, load switches, conflict monitor and other controller accessories shall comply with Supplemental Specifications 861 and 961, except that the requirements of 861.03 and 861.05 are waived. Used equipment meeting current DOT Specifications is acceptable.

Conflict monitors shall be furnished at all locations unless an electromechanical pretimed controller with cam shaft is provided.

10. When the signal is changed to a flash condition either manually or automatically, red shall be flashed to both approaches.

OHIO DEPARTMENT OF TRANSPORTATION

SIGNALIZED CLOSING
1 LANE OF A 2 LANE
HIGHWAY

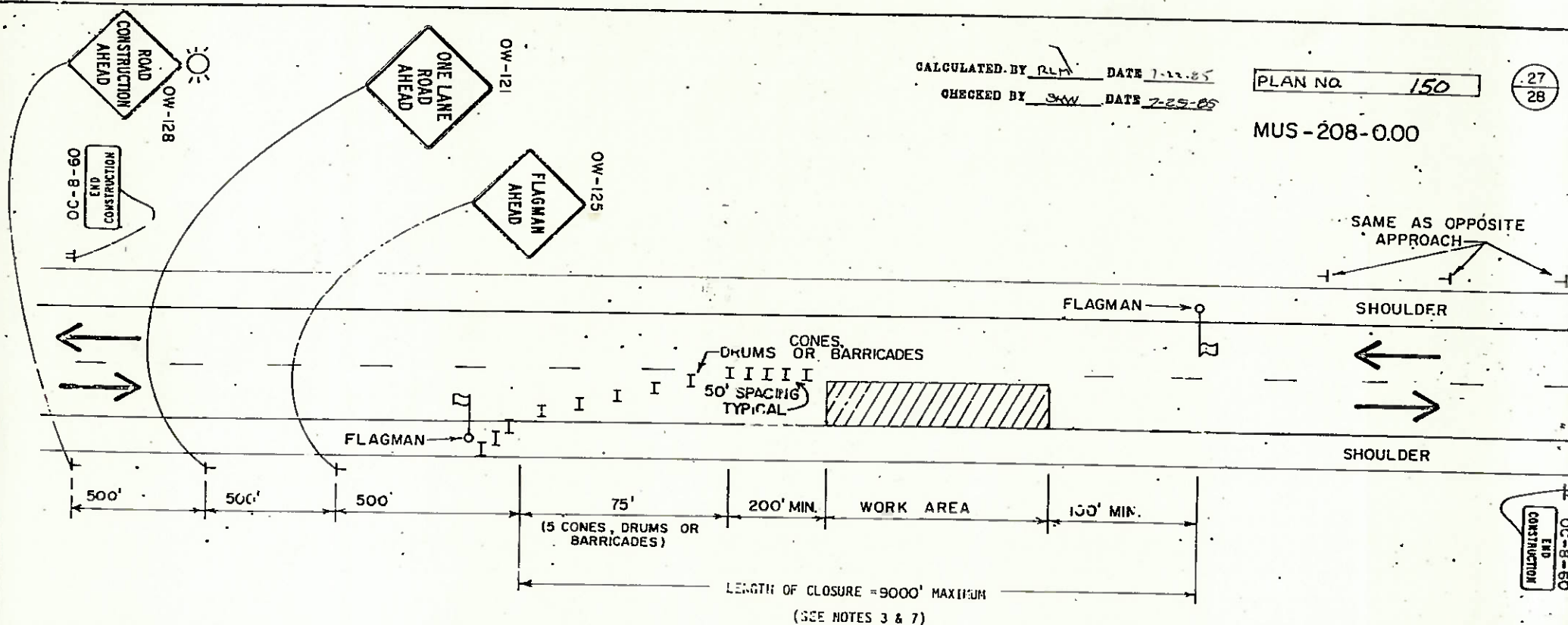
DATE
12/83

CALCULATED BY RLM DATE 7-22-85
 CHECKED BY SKW DATE 7-25-85

PLAN NO. 150

27
28

MUS-208-0.00



GENERAL NOTES

1. FLAGMEN SHALL BE USED TO CONTROL TRAFFIC CONTINUOUSLY FOR AS LONG AS ONE LANE OPERATION IS IN EFFECT. FLAGMEN SHALL BE ABLE TO COMMUNICATE WITH EACH OTHER AT ALL TIMES EITHER VERBALLY OR BY MEANS OF RADIO OR FIELD TELEPHONES. FLAGMAN STATIONS SHALL BE ADEQUATELY ILLUMINATED FOR NIGHT TIME OPERATIONS BY USE OF A 175 WATT MINIMUM LUMINAIRE.
2. CONES MAY BE SUBSTITUTED FOR BARRICADES OR DRUMS FOR THE LANE CLOSURES DURING DAYLIGHT HOURS ONLY.
3. WHEN THE AMBIENT TEMPERATURE EXCEEDS 80 DEGREES F, THE ENGINEER MAY INCREASE THE LENGTH OF CLOSURE TO ALLOW FOR SUFFICIENT COOLING OF THE NEW PAVEMENT.
 THE ENGINEER MAY SHORTEN THE MAXIMUM ALLOWABLE LENGTH OF CLOSURE TO RELIEVE EXCESSIVE TRAFFIC BACKUPS.
4. THE TYPE B HIGH INTENSITY BARRICADE WARNING LIGHT SHOWN ON THE ROAD CONSTRUCTION AHEAD SIGN IS REQUIRED WHENEVER NIGHT LANE CLOSURE IS NECESSARY.
5. TYPE C STEADY BURNING BARRICADE WARNING LIGHTS SHALL BE ERECTED ON DRUMS OR BARRICADES FOR NIGHT LANE CLOSURES.
6. THE ADVANCE WARNING SIGNS "OW-128" "OW-121" AND "OW-125" SHALL BE MOVED BACK AS REQUIRED BY THE QUEUING OF STOPPED VEHICLES.
7. WITHIN THE LENGTH OF CLOSURE, PROVISION SHALL BE MADE TO CONTROL TRAFFIC ENTERING FROM INTERSECTING STREETS AND MAJOR DRIVES AS NECESSARY TO PREVENT WRONG WAY MOVEMENTS AND TO KEEP VEHICLES OFF OF NEW PAVEMENT NOT READY FOR TRAFFIC.

ALL TRAFFIC CONTROL SIGNS, CHANNELIZING DEVICES, AND FLAGMEN SHALL BE MOVED FORWARD BEFORE THE CLOSURE REACHES THE MAXIMUM ALLOWABLE LENGTH. ONLY ONE SIDE OF THE ROAD SHALL BE CLOSED AT ANY TIME IN A WORK AREA.

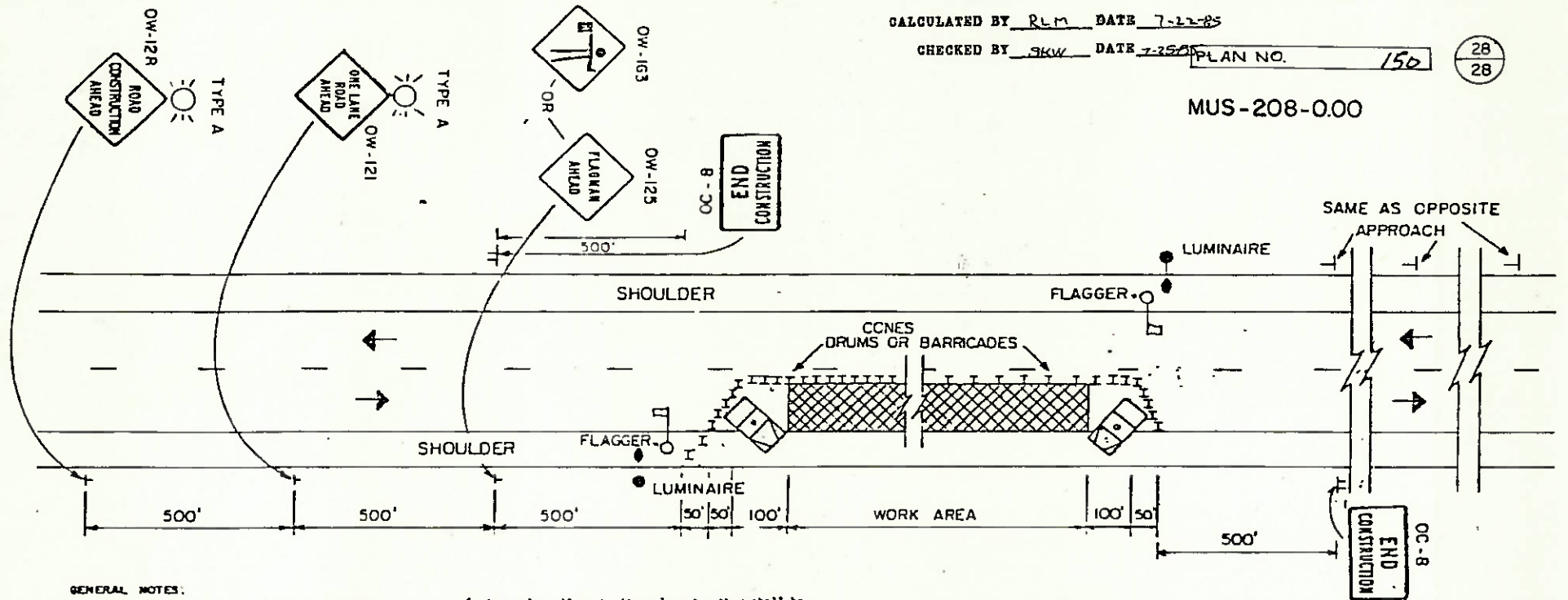
OHIO DEPARTMENT OF TRANSPORTATION	
FLAGMEN CLOSING 1 LANE OF A 2 LANE HIGHWAY	DATE 12/0
PAVING OPERATIONS	

CALCULATED BY RLM DATE 7-22-85

CHECKED BY JKW DATE 7-25-85 PLAN NO. 150

28
28

MUS-208-000



GENERAL NOTES:

1. The location of the advance warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment. The distances shown are minimums.
2. Flaggers shall be used to control traffic continuously for as long as a one lane operation is in effect. The flaggers shall communicate with each other at all times as described in the Ohio Manual of Uniform Traffic Control Devices (MUTCD) in Section 7A: Control of Traffic Through Work Areas.
3. Cones drums or barricades shall be spaced at approximately 50' to 60' center to center for the first 1000 feet of the work area and at a maximum of 100' to 120' center to center for the balance of the work area. Cones, drums or barricades on the advance and return tapers shall be spaced at 10' center to center. Cones may be substituted for barricades or drums for the lane closures during daylight hours only.

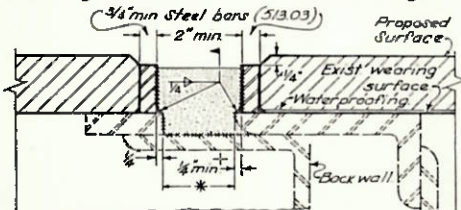
4. Several small work sites close together shall be combined into one work area to make a closure not more than 2000 feet long including tapers. Closures of more than 2000 feet may be approved by the Engineer. The minimum length between closures shall be 2000 feet. Only one side of the road shall be closed in any one work area.
5. The work vehicles shown at the beginning and end of the work area shall be in place and unoccupied whenever workers are in the work area. These work vehicles shall be removed from the pavement whenever workers are not in the work area. Other protective devices may be used in lieu of the work vehicles shown when approved by the Engineer. The vehicles shall be equipped with a 360° rotating or flashing amber beacon clearly visible in all directions a minimum of 1/2 mile.
6. The Type A flashing barricade warning lights shown on the "Road Construction Ahead" and the "One Lane Road Ahead" signs are required whenever a night lane closure is necessary.

7. Type C steady burning barricade warning lights shall be erected on drums or barricades for night lane closures. The maximum spacing shall be identical to the channelizing device spacing requirements described in Note 3.
8. Adequate area illumination to clearly identify the flagger station at night for long term operations shall be provided by using 150 watt minimum high pressure sodium luminaires or 250 watt minimum mercury luminaires. Luminaires shall be located adjacent to one flagger station for each direction of traffic as shown above. The mounting height for temporary luminaires shall be a minimum of 27 feet above the pavement and the overhead conductor clearance shall be 20 feet above the pavement.

OHIO DEPARTMENT OF TRANSPORTATION	
FLAGGERS CLOSING 1 LANE OF A 2 LANE HIGHWAY	
DATE	
DR	CR

RESURFACING

- * Increase as necessary to maintain 2" min opening.
- * Vertical extension of joints found to be closed to $\frac{1}{2}$ " or less may be non-performed as directed by the Engineer



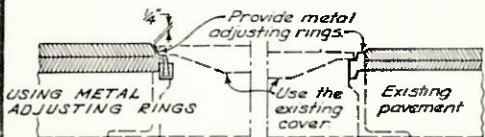
As a part of item 516, seal joint with a hot-applied bridge deck waterproofing material which also meets the requirements of 70504. Sandblast vertical surfaces (1) and wipe clean. Seal joint before rust forms. If rust forms, re-sandblast. Use bond breaker on the horizontal surface (2).

MAINTENANCE OF TRAFFIC: Generally the bars shall be welded while the lane is closed for water-proofing or resurfacing. However, if traffic is routed over the bars before resurfacing, temporary ramps shall be constructed to the tops of the bars using 402 or 404 feathering at a max. slope of 6% in. The ramps shall be removed prior to resurfacing. Payment for placing and removing the ramps shall be included in the lump sum bid for item 614.

VERTICAL EXTENSION OF STRUCTURAL EXPANSION JOINTS

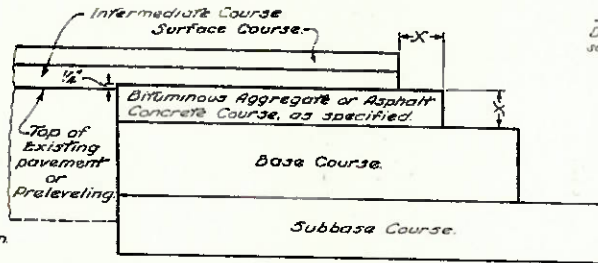


Grade rings, bricks, Class C concrete or mortar. Max mortar thickness 1 1/2". USING CONCRETE OR MORTAR



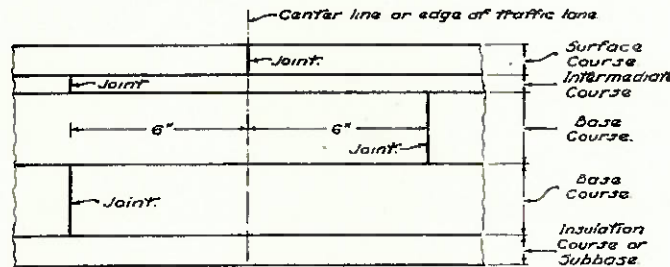
Metal adjusting rings shall: (a) attach securely to the existing frame by welding or mechanical devices; (b) consist either of cast metal having an integral rim and seat, or be fabricated metal with a sturdy connection between the seat and rim; and (c) provide an even seat for the manhole cover. In addition, the adjusting ring type shall be a design acceptable to the local governmental agency responsible for street and sewer maintenance. Any installation unacceptable to the Engineer shall be replaced by the contractor at his expense.

MANHOLES ADJUSTED TO GRADE

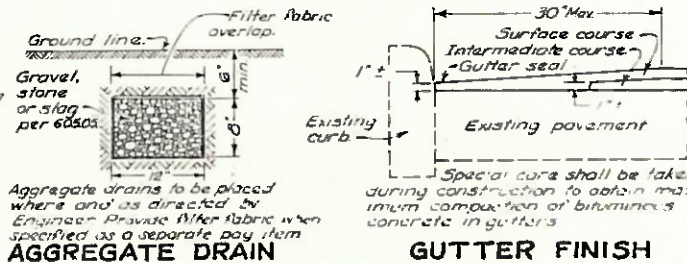


The Bituminous Aggregate in the upper part of the base widening shall finish approximately 1/4" above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified, it shall be placed prior to excavation of the widening trench and the upper course of the base widening shall finish approximately 1/4" above the preleveling.

COURSE DETAIL FOR WIDENING

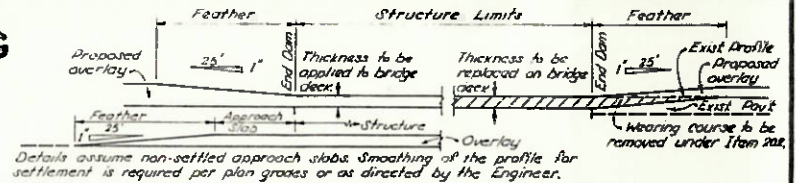


LAPPING LONGITUDINAL JOINTS

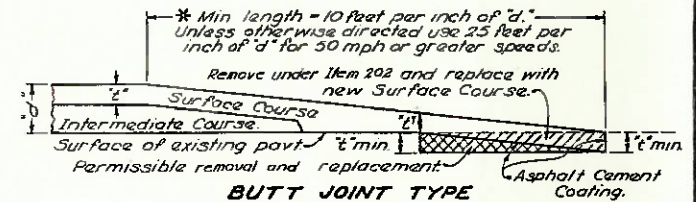


AGGREGATE DRAIN

GUTTER FINISH



FEATHERING AT STRUCTURES



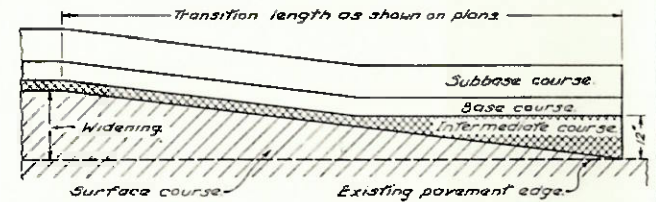
BUTT JOINT TYPE



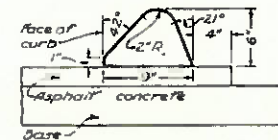
TAPER EDGE TYPE

NOTE: Either butt or taper type may be used unless type is specified by the plan.

PLACING FEATHERED AREAS

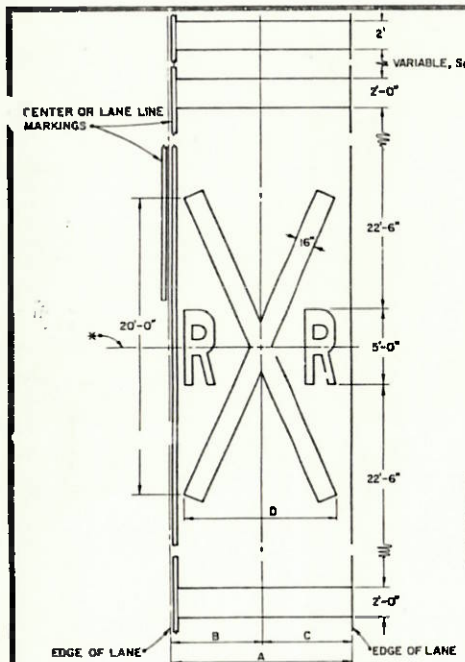


MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT

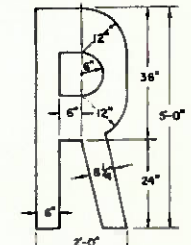


TYPE I ASPHALT CONCRETE CURB

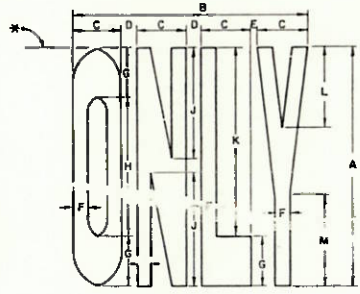
BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
RESURFACING	
STANDARD CONSTRUCTION DRAWING	BP-5
APPROVED: <i>[Signature]</i>	ENGR. L. B. D.



A PVT WIDTH	DIMENSIONS (INCHES)		
	B	C	D
8'-0"	52	44	84
9'-0"	58	50	96
10'-0"	60	60	96
11'-0"	66	66	96
12'-0"	72	72	120

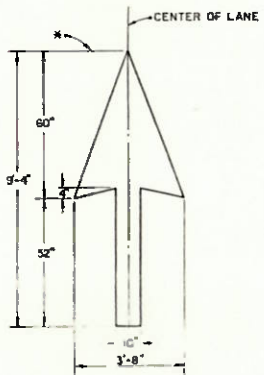


RAILROAD "R"

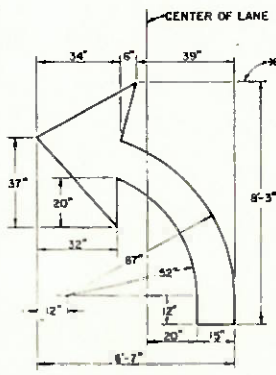


TYPE	DIMENSIONS (INCHES)												
	A	B	C	D	E	F	G	H	J	K	L	M	
RURAL	96	94	20	6	2	6	20	56	45	76	32	36	
URBAN	72	90	18	8	2	4.50	15	42	33.75	57	27	31	

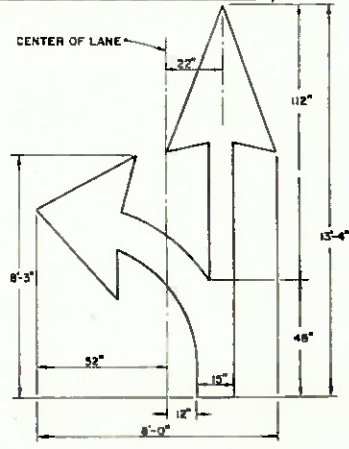
* INDICATES STATION REFERENCE POINT.



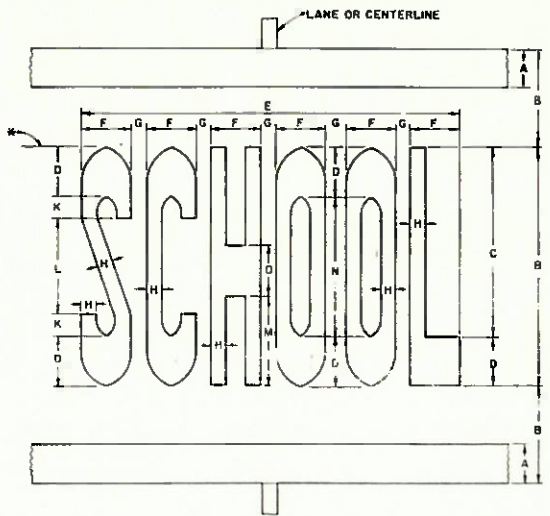
THROUGH ARROW



TURN ARROW



COMBINED ARROW



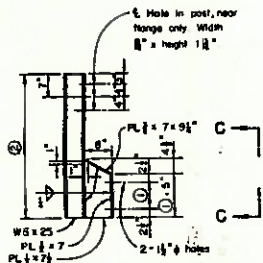
TYPE	DIMENSIONS (INCHES)													
	A	B	C	D	E	F	G	H	J	K	L	M	N	
RURAL	16	96	76	20	150	20	5	6	8	9	38	45	56	
URBAN	16	72	57	15	148	18	8	4.50	9	6.75	28.50	33.75	42	

NOTES:

- PAVEMENT MARKING FOR WORDS, SYMBOLS, ARROWS, AND TRANSVERSE LINES FOR THE WORD SCHOOL OR THE RAILROAD SYMBOL SHALL BE WHITE REFLECTIVE MATERIAL.
- TWO TRANSVERSE LINES SHALL BE INCLUDED IN THE PAYMENT FOR EACH WORD SCHOOL. THREE TRANSVERSE LINES SHALL BE INCLUDED IN THE PAYMENT FOR EACH RAILROAD SYMBOL.
- ON MULTI-LANE APPROACHES, THE TRANSVERSE LINES USED WITH THE RAILROAD SYMBOLS SHALL EXTEND ACROSS ALL APPROACH LANES AND INDIVIDUAL SYMBOLS SHALL BE PLACED IN EACH APPROACH LANE.
- FOR THE RAILROAD SYMBOL, NO PORTION OF ONE TRANSVERSE LINE SHALL BE CLOSER THAN 30 FEET FROM THE NEAREST RAILROAD TRACK RAIL AND THE LINE MAY BE EITHER PARALLEL TO THE TRACK OR PERPENDICULAR TO THE CENTERLINE OF THE ROADWAY. THE OTHER TWO TRANSVERSE LINES AND THE RAILROAD SYMBOL SHALL BE LOCATED FROM THE STATION REFERENCE POINT SHOWN IN THE PLANS.
- ON MULTI-LANE APPROACHES, THE TRANSVERSE LINES USED WITH THE WORD SCHOOL SHALL EXTEND ACROSS ALL APPROACH LANES WITH A SINGLE WORD SCHOOL CENTERED ACROSS THE APPROACH LANES ON TWO LANE ROADWAYS, THE TRANSVERSE LINES SHALL EXTEND ACROSS THE ROADWAY WITH THE WORD SCHOOL CENTERED ACROSS THE ROADWAY. CENTER OR LANE LINES SHALL NOT PASS THROUGH THE SCHOOL MARKING.
- THE PAVEMENT ARROW STATION REFERENCE POINT SHALL BE 30 FEET IN ADVANCE OF THE STOP LINE. THE WORD ONLY SHALL BE LOCATED FROM 35 TO 65 FEET (IN URBAN AREAS) OR 40 TO 85 FEET (IN RURAL AREAS) IN ADVANCE OF THE PAVEMENT ARROW STATION REFERENCE POINT IN AREAS WHERE THESE DIMENSIONS ARE NOT PRACTICAL, THEY MAY BE REDUCED AS DETERMINED BY THE ENGINEER.
- DIMENSIONS SHOWN ARE NOMINAL. SYMBOLS FROM NATIONAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES MAY BE USED.

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	
WORDS, SYMBOLS AND ARROWS	DATE 12/11/73 4/9/79
STANDARD CONSTRUCTION DRAWING TC-71.10	
APPROVED _____ Engineer of Design Services	

Bolts in slotted holes shall not be drawn up so tight as to prevent sliding between the tube and channel

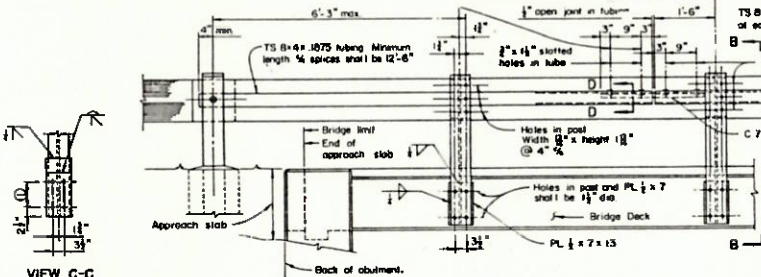


Dimension ① is 6" or 8" depending on box beam depth. See project plans and POST ANCHORAGE DETAILS, PRESTRESSED CONCRETE BOX BEAMS.

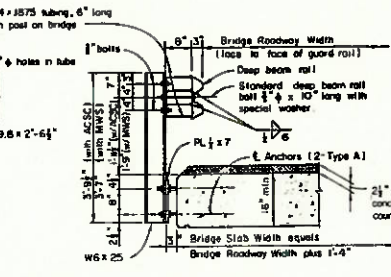
For Dimension ② see project plans.

SECTION B-B
TYPE 2 POST

(For use with prestressed concrete box beams)

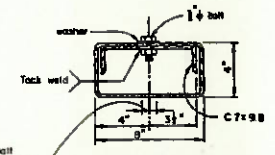


RAILING ELEVATION
(Type I posts shown)



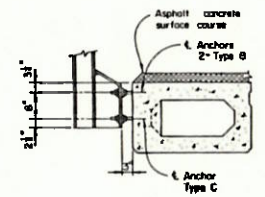
SECTION B-B
TYPE I POST

ACSC indicates Asphalt Concrete Surface Course. MWS indicates Moosle's Wearing Surface.

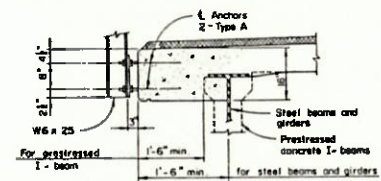
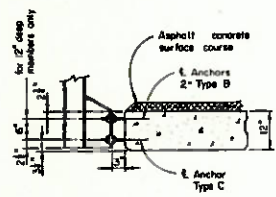


SECTION D-D

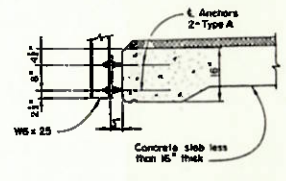
1" x 1" x 1/4" asphalt concrete surface course. Location to be shown on project plans.



POST ANCHORAGE DETAILS
PRESTRESSED CONCRETE BOX BEAMS

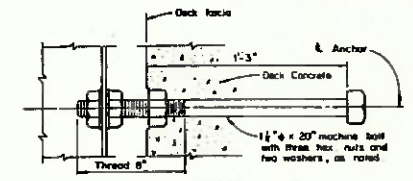


LONGITUDINAL BEAM BRIDGES



CONCRETE SLABS

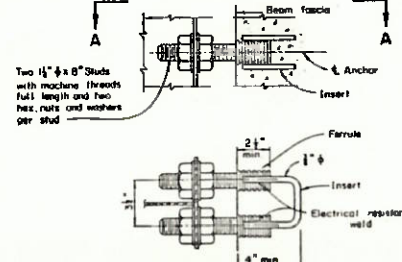
POST ANCHORAGE DETAILS
(Not for use with prestressed concrete box beams)



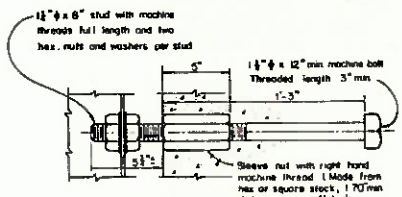
TYPE A ANCHOR DETAIL



TYPE A ANCHORS SUPPORTED BY FORMS



SECTION A-A
TYPE C ANCHOR DETAIL



TYPE B ANCHOR DETAIL



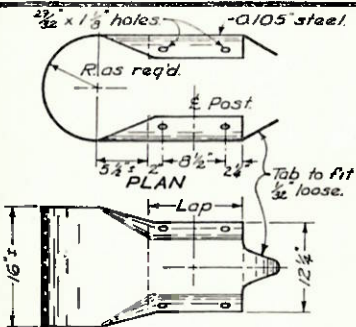
SPECIAL WASHER

MATERIAL: All anchor bolts, nuts and studs shall conform to the physical properties of ASTM-A325 except that the minimum elongation shall be 10%. The chemical properties are waived.

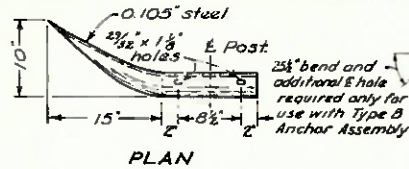
GALVANIZING: All guard rail posts, tubes, hardware and accessories shall be galvanized in accordance with ASTM A123 or ASTM A153, except as otherwise noted.

TYPE C ANCHOR INSERTS of a different type may be provided if approved by the Director.

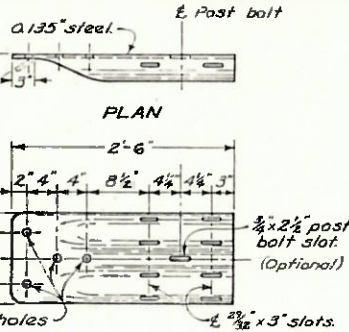
REVISION	DATE	BY	CHKD
DEEP BEAM BRIDGE GUARD RAIL WITH TUBULAR BACKUP			
DESIGNED BY	CHECKED BY	APPROVED BY	DATE
WWS	TGC	CPO	BFB 7-99
			DR-2-73



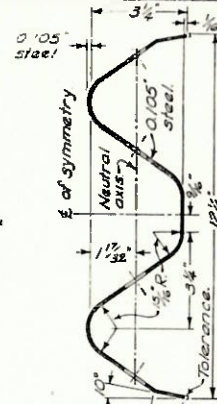
**ELEVATION
BUFFER END SECTION**



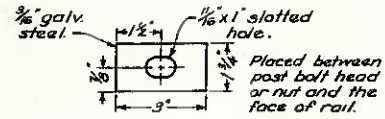
**ELEVATION
FLARED END SECTION**



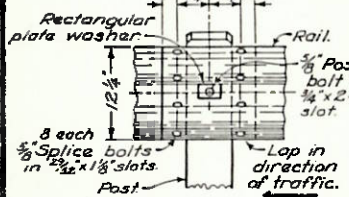
**ELEVATION
TERMINAL CONNECTOR**



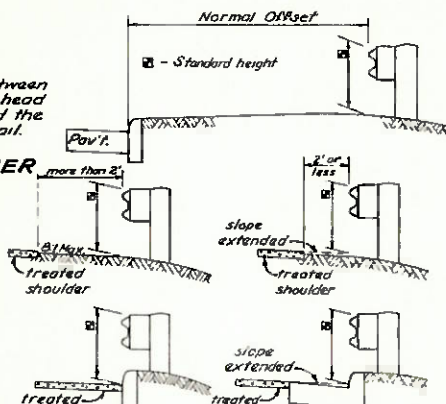
**SECTION
BEAM RAIL**



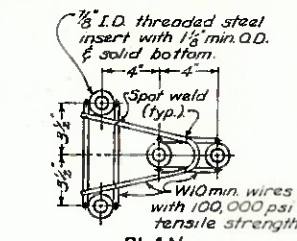
RECTANGULAR PLATE WASHER



BEAM RAIL SPLICE



MEASURING GUARDRAIL HEIGHT

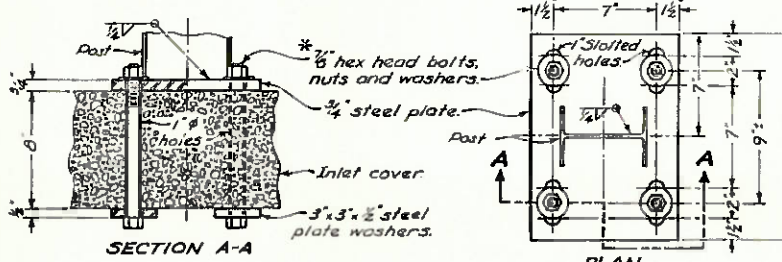


**ELEVATION
CONCRETE INSERT ANCHOR ASSEMBLY**

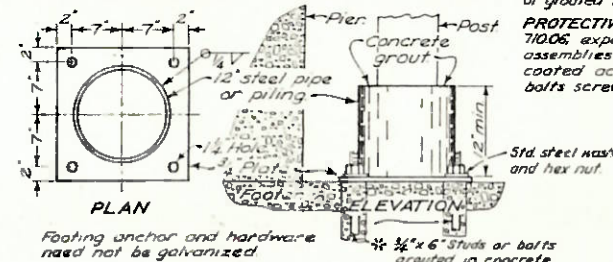
L (in)	Top Slab (in)	Bottom Slab (in)	Bolt Use
18	2 3/4	3 1/2	Type 5 WP/WB
10	2 1/2	2 1/2	Type 4 WP Type 5 SP/WB
2	1 1/2	1 1/2	Type 4 SP Type 5 SP/SB
1 1/2	Full	Full	Splice bolt

WP=wood post WB=wood block
SP=steel post SB=steel block
Longer bolt may be needed for round WP larger than 8" dia.

**SECTION
BUTTON HEAD BOLT
(For post and splice bolts)**



**SECTION A-A
INLET MOUNTED POST**



**PLAN
FOOTING ANCHOR**

Footings anchor and hardware need not be galvanized.
3/4 x 6 studs or bolts grouted in concrete

NOTES
BEAM RAIL ELEMENTS shall be 12'-6" effective length, unless otherwise specified, with 3/4" x 2 1/2" post bolt slots on 6'-3" centers regardless of post spacing. Field punching or drilling of bolt holes or slots for irregularly spaced posts shall be according to 60% O.S.

BEAM RAIL SPLICE between two rail elements, or rail and terminal connector shall be lapped in the direction of traffic. The buffer or flared end sections shall lap on the traffic face. A 12" length of beam rail (Back-Up Plate), with a 3/4" dia bolt hole or a 3/4" x 2 1/2" slot, shall be provided at posts not having a rail splice.

SPECIAL POST MOUNTINGS: Inlet mounted posts are required for guardrail posts located on a drainage inlet. Footing anchors are required for guardrail posts located on footers with less than 3'-5" cover, except that for footer cover of 2'-6" to 3'-5" the posts may be installed by using a 4" minimum concrete encasement. The inlet mounted post may be used for footing anchors in runs with steel posts.

When standard post depth is not available due to a culvert, the guardrail posts directly over the culvert shall not be driven, but set in holes with a 4" minimum concrete encasement for the maximum post depth available.

Cost of the inlet mounted posts, footing anchors, and concrete encasement shall be included in the unit price bid for guardrail of the type required by the plan. **STEEL POST SIZES:** The W6 x 8.5 and W6 x 15.5 posts may be used in lieu of the W6 x 3 and W6 x 15 respectively which are shown on the various Standard Construction Drawings for guardrail.

ANCHORS conforming to 712.01, or anchors per FF-5-325 Group II, Type 4, Class 1 or 2 or Group VIII, Type 1 or 2 with proof load certification per 712.01, may be substituted with the same bolt diameter specified. If there is any question of deteriorated concrete, expansion anchors will not be allowed, as determined by the Engineer. Where self-drilling anchors are permitted and used for guardrail construction, the holes shall be drilled with the expansion shield (not by drill bit) and the shield shall be installed flush with the concrete surface.

The Engineer shall visually inspect, after installation, all expansion anchors used in guardrail construction. The Engineer may require the Contractor to test load any expansion anchor to 1/2 the certified proof load in direct pull. The equipment and method used shall meet the approval of the Engineer. Each expansion anchor that fails to meet the test requirements shall be reset or removed and replaced with bolts extending through the concrete or grouted in place, as directed by the Engineer.

PROTECTIVE COATING: In lieu of the requirements of 710.06 expansion shields, anchors and insert anchor assemblies installed (embedded) in concrete may be coated according to good commercial practices. Any bolts screwed into these embedded devices shall meet 710.06.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

**GUARDRAIL
DETAILS**

STANDARD
CONSTRUCTION
DRAWING GR-1

APPROVED _____ ENGR. L. B. O.

DATE:
12-6-76
2-5-82
1-11-85

NOTES

POSTS may be round (single rail only) or 6"x8" square-sawn pressure-treated wood or W6x9 galvanized steel. The same type post shall be used throughout the length of project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 8" plus or minus 1" in diameter at the top and not more than 3" larger at the butt with a uniform taper. Posts may be set in drilled holes or may be driven to grade.

Wood posts shall be fabricated with square ends. Posts and spacer blocks shall be pressure-treated as per 710.14. Bolt holes shall be bored and tops of posts trimmed, if required, after posts are set.

FOR DETAILS not shown see GR-1.

SPACER BLOCKS: When wood spacer blocks are used with the steel post, a roofing nail shall be driven through the hole in the adjacent flange to prevent blocks from turning.

WASHERS: Place a rectangular plate washer between the face of rail and post bolt head or nut. All other washers indicated are standard galvanized steel of the appropriate size.

WELDED BEAM guardrail posts and spacer blocks may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A769, Class 1 using A36 steel with the following exceptions:

7.2 Test reports of tensile properties for each lot shall accompany each shipment.

11. Ultrasonic inspection need not be performed on welded beams used for Item 606.

12. Beams which have imperfections repaired by welding shall not be accepted for use in Item 606.

13. Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

STEEL BEAM POSTS & BLOCKS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W 6x8.5	5.83"	3.94"	.194"	.170
Rolled W 6x9	5.90"	3.94"	.215"	.170
Rolled W 8x10	7.09"	3.94"	.205"	.170
Welded 6x8.5	6.0"	3.94"	.194"	.170
Welded 6x9	6.0"	3.94"	.215"	.170
Welded 8x10	8.0"	3.94"	.205"	.170

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

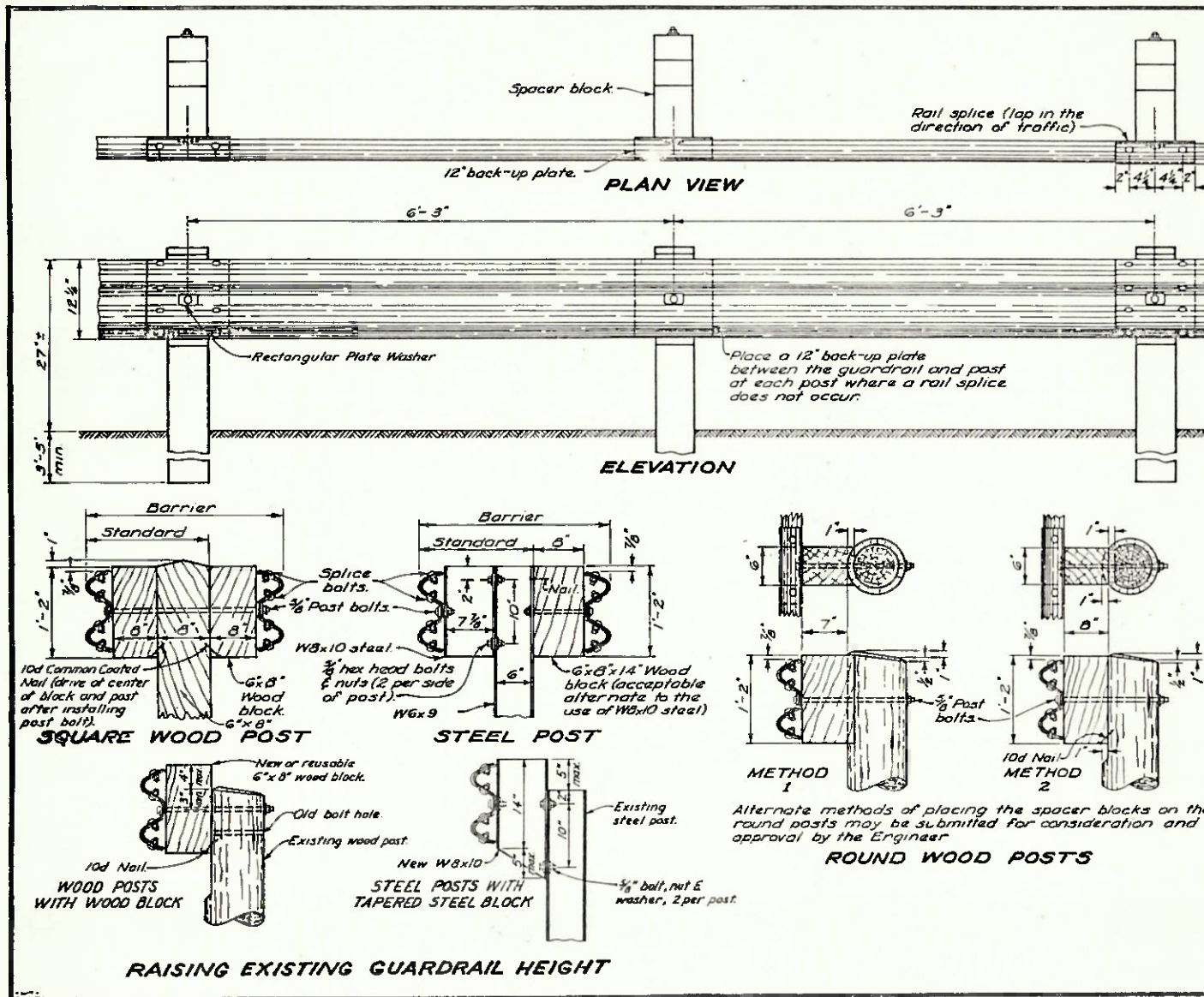
GUARDRAIL TYPE 5

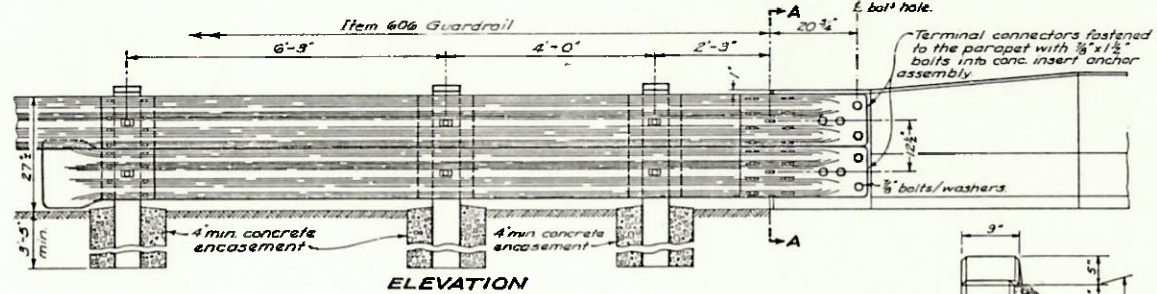
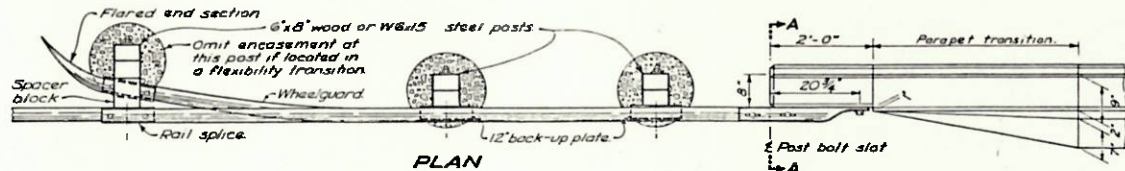
STANDARD
CONSTRUCTION
DRAWING

GR-2B

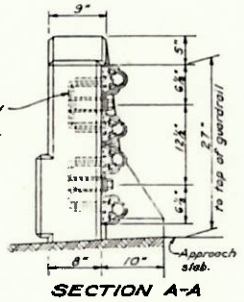
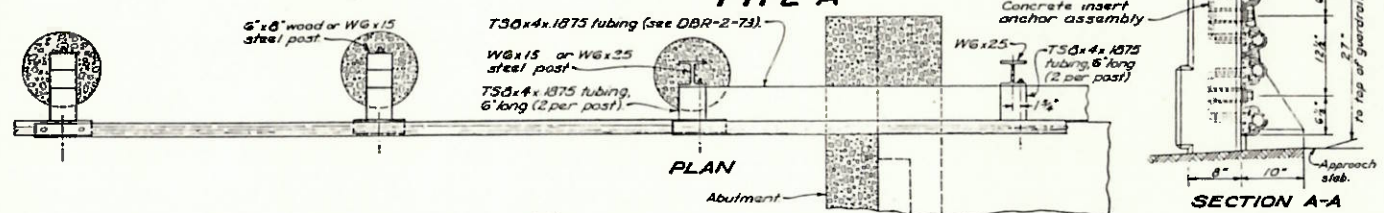
APPROVED _____ ENGR. L. B. D.

DATE
2-15-60
11-7-71
12-6-76
2-5-82

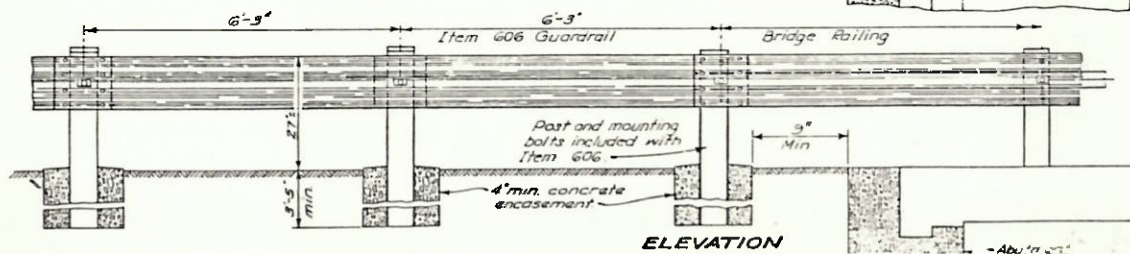




ELEVATION
TYPE A



SECTION A-A



ELEVATION
TYPE B

NOTES

PAYMENT for Item 606, each, Bridge terminal assembly, Type A, shall include the additional cost in excess of normal guardrail cost, such as: additional or heavier posts, concrete encasement, wheelguard, terminal connectors, and other hardware, payment for bridge railing and parapets shall include the cost of the concrete insert anchor assembly, and the T30x4 spacers and tubular back-up rail at and in between the first posts of the bridge.

TYPE A: The wheelguard shall be required on all uncurbed approach connections and on all uncurbed trailing connections on undivided highways. The wheelguard shall be omitted: on all curbed connections, on uncurbed trailing connections on divided or directional roadways, and all three posts shall have spacer blocks and concrete encasement.

TERMINAL CONNECTORS of Type A shall be fastened to existing (safety shape) parapets, not having concrete insert anchor assemblies, with four 1/2" dia. hexhead bolts through the parapet with 3"x3"x1/2" plate washers and hex nuts on back of parapet.

POST TYPE shall be the same material type as used on approach guardrail except the first post of the bridge for Type B shall be as shown.

FOR DETAILS not shown, see GR-1 and other Standard Construction Drawings pertaining to design of specific guardrail type.

BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION		DATE
BRIDGE TERMINAL ASSEMBLIES		1-1-71 11-9-71 12-6-78 2-3-82 1-28-88
STANDARD CONSTRUCTION DRAWING		GR-3
APPROVED	<i>[Signature]</i>	ENGR. L. B. B.