## INDEX OF STANDARD "ROADWAY" DRAWINGS

Issued June, 1966

Index will NOT be revised (or issued) for every revision to drawings. It may be kept up to date by the Individual as revised drawings are released.

* - These drawings shall NOT be shown or called for on Construction Plans.

** - Not "Roadway"

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<td><strong>Type A</strong></td>
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<td><strong>SD - 14</strong></td>
<td>Apr. 18, 1966</td>
<td>CONCRETE MOUNTABLE CURBS TYPE A &amp; B, CONCRETE TRAFFIC DIVIDERS TYPE A &amp; B</td>
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<td>TYPES 1 &amp; 2 GUARD FENCE  (10 &amp; 12 GA. STEEL BEAM)</td>
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### BUILD-UP QUANTITIES—FOR SPECIFIED LENGTHS OF "RUN-OUT"

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**SUPERELEVATION AND WIDENING**

- **Degree of Curve, ft**  
- **Type of Soil**  
- **Rate of Super.**

**NOTES**

- Bituminous Surf. Course (Binder Course).  "Build-Up" quantities are based on a weight of 0.001 ton per cu. ft. using 30 barrels of binder Course per ton.  Calculated amounts based on the total length of the project, the number of curves, and the depth of the existing pavement.

**PLANS OF TYPICAL BUILD-UP**

- Crushed Aggregate Base Course.  "Build-Up" quantities are based on a weight of 0.001 ton per cu. ft. using 30 barrels of binder Course per ton.  Calculated amounts based on the total length of the project, the number of curves, and the depth of the existing pavement.

**BASE COURSE "BUILD-UP" AND WIDENING**

- Computed quantities for surf. course types.  Crushed Aggregate Base Course.  "Build-Up" quantities are based on a weight of 0.001 ton per cu. ft. using 30 barrels of binder Course per ton.  Calculated amounts based on the total length of the project, the number of curves, and the depth of the existing pavement.

**DISTANCES**

- Calculated for Surface Course Types.  Crushed Aggregate Base Course.  "Build-Up" quantities are based on a weight of 0.001 ton per cu. ft. using 30 barrels of binder Course per ton.  Calculated amounts based on the total length of the project, the number of curves, and the depth of the existing pavement.

**COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF HIGHWAYS**

- **DESIGN METHODS—RESURFACING**
  - "Build-Up" QUANTITIES TO CORRECT SUPER-ELEVATION AND TO ADD TO CURVING ON PAINTED PRIOR TO THE 1931 SPECIFICATIONS
  - **APPROVED**
  - **Chief Engineer**
**WIDENING**

1. **METHOD W-1**
   - Existing Slope and Shoulder
   - Proposed Shoulder

2. **METHOD W-2**
   - Existing Slope and Shoulder
   - Proposed Shoulder

**RESURFACING**

1. **METHOD R-1**
   - Existing Slope and Shoulder
   - Proposed Shoulder

2. **METHOD R-2**
   - Existing Slope and Shoulder
   - Proposed Shoulder

**OVERLAY & RESURFACING**

1. **METHOD OR-1**
   - Existing Slope and Shoulder
   - Proposed Shoulder

2. **METHOD OR-2**
   - Existing Slope and Shoulder
   - Proposed Shoulder

**WIDENING, OVERLAY & RESURFACING**

1. **METHOD WR-1**
   - Existing Slope and Shoulder
   - Proposed Shoulder

2. **METHOD WR-2**
   - Existing Slope and Shoulder
   - Proposed Shoulder

**NEW CONSTRUCTION**

1. **METHOD NC-1**
   - Existing Slope and Shoulder
   - Proposed Shoulder

**NOTES**

- Omit base course "lips" adjacent to PAVED SHOULDERS.
- Specified in "Special Subgrade" in Specifications Form 408 DATED 1954.
- Sub-base (if required for widened pavements) shall be in accordance with Department Standards OM-6.
- This standard also applies when Crushed Stone Base Course or any type of Crushed Aggregate Base Course is used.
METHOD 1

METHOD 2

METHOD 3

METHOD 4

METHOD 5

METHOD 6

METHOD 6A

METHOD 7

METHOD 7A

NOTES

Crushed Aggregate Base Course-Type AP will be considered on Class 1, 2, and 3 highways. It is not used on other Class Highways unless considered only under extenuating conditions and shall be approved by the Chief Engineer.

Sub-Bases (if required for widened pavement) shall be in accordance with Standard DM-6.

(*) Specified as "Special Subgrade" in SPECIFICATIONS, FORM 408 dated 1954.

OMIT BASE COURSE "LIPS" ADJACENT TO FADE SHOULDERS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
DESIGN METHODS
WIDENING, OVERLAY, & WIDENING AND NEW CONSTRUCTION WITH CRUSHED AGGREGATE BASE COURSE-TYPE AP AND BITUMINOUS SURFACE COURSE
APPROVED ________ 1953

DM-5
Proposed Shoulder

Proposed Widening
Sub-base (*l Unit Depth)

METHOD 1

WIDENING ON INSIDE OF SUPERELEVATED CURVES

Proposed Shoulder

Existing Pavement
Sub-base (*l Unit Depth)

METHOD 2

Proposed Shoulder

Existing Pavement
Sub-base (*l Unit Depth)

METHOD 3

Proposed Shoulder

Existing Pavement
Sub-base (*l Unit Depth)

METHOD 4

WIDENING ON TANGENTS

Proposed Shoulder

Existing Pavement
Sub-base (*l Unit Depth)

METHOD 5

Proposed Shoulder

Existing Pavement
Sub-base (*l Unit Depth)

METHOD 6

WIDENING ON OUTSIDE OF SUPERELEVATED CURVES

Proposed Shoulder

Existing Pavement
Sub-base (*l Unit Depth)

METHOD 7

Pipe Fdn. Drain
Suitable Outlet

(*) Specified as "Special Subgrade" in SPECIFICATIONS FORM 408 dated 1954

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
DESIGN METHODS
SUB-BASE (*)
IF REQUIRED WITH WIDENING OF PAVEMENTS
APPROVED 1955
CHIEF ENGINEER
DM-6
NOTE:

A. MINIMUM ADVISED NUMBER OF LUMINAIRES PENDING COMPLETION OF ENTIRE PROJECT.

TOTAL LUMINAIRES: 10

- POLES: 10
- LOAD: 4.8kV

TOTAL LAMPS: 48

- LUMINAIRES: TO ACCOMMODATE 400-WATT, 21,500-LUMEN MERCURY LAMP.
- POLES: METAL OR CONCRETE POLE WITH 12" BRACKET AND APPROX. 30' LUMINAIRE HEIGHT.
- LAMP BALLASTS: HOUSED IN LUMINAIRE OR MOUNTED ON POLE TOP.
- DIRECT BURIAL CABLE: APPROX. 9300'

AVERAGE HORIZONTAL F.C. AT TIME OF LOWEST AV. LEVEL OF ILLUMINATION:

- ON MAIN LANES: 0.8 FOOTCANAL, AVG.
- ON RAMPS: 0.8 FOOTCANAL, AVG.

- JUNCTION BOX

NOTE: ABOVE TOTALS APPLY TO THIS INSTALLATION ONLY.

A. ALL WIRES ARE IN 2-CONDUCTOR CABLES ON THIS DRAWING.
B. A 15' BRACKET IS ADVISED FOR POLES MARKED "A".
C. IF DIRECT BURIAL CABLE IS USED, PROTECTING CONDUIT (3" MIN.) SHOULD BE USED AT CROSS-OVER POINTS UNDER PAVEMENT, UNDER PAVED SHOULDER, AND ON BRIDGES.
D. IF A 240/480-VOLT CIRCUIT IS USED, THESE INDICATED WIRE SIZES SHOULD BE RE-CALCULATED ALSO FOR 208/240-V CIRCUIT.
E. START WITH LIGHTING POLES ON MAIN HIGHWAYS 150 FEET (±10') FROM SHOULDER NOSE OF EXIT RAMPS AND 100 FEET (±10') FROM SHOULDER NOSE OF ENTRANCE RAMPS. POLES SHALL BE LOCATED ON INSIDE OF RAMP CURVES.
F. AT EXIT RAMPS, LIGHTING POLE SHALL BE LOCATED AT LEAST 50 FEET BEYOND LOCATION OF OVERHEAD SIGNS WHICH WILL NORMALLY BE LOCATED AT THE THEORETICAL GORE.
G. GLARE SHIELDS SHALL BE PROVIDED AT THESE LOCATIONS WITHIN 75 FEET OF BRIDGE.
H. SEE SHEET 3 FOR ALTERNATE CIRCUIT RUNS.
I. LIGHTING POLES SHALL BE LOCATED AT LEAST 50 FEET FROM OVERHEAD SIGNS AND BRIDGES.

REFERENCE DRAWINGS
DM-11, SHEET 1: FOUNDATIONS
DM-11, SHEET 2: JUNCTION BOXES - LIGHT DUTY
DM-11, SHEET 3: JUNCTION BOXES - HEAVY DUTY
DM-11, SHEET 4: LIGHTING POLE DETAILS
DM-11, SHEET 5: LIGHTING & ELECTRICAL DETAILS
DM-11, SHEET 6: BRIDGE DETAILS

SCALe: 1" = 100'
NOTE:

@ MINIMUM ADVISED NUMBER OF LUMINAIRES
PENDING COMPLETION OF ENTIRE PROJECT.

TOTAL LUMINAIRES - 10
  " POLES ___ 10
  " LOAD ______ 4.8kva

TOTAL 28 WIRES

TERMINAL POLE
UTILITY POWER SUPPLY.

DIRECT-BURIAL CABLE
APPROX. 10,000'
TOTAL LAMP LOAD:
USING 480-VOLT CIRCUIT
25.0 kva.
AVERAGE horizontal.
TIME OF LOWEST
LEVEL OF ILLUMINATION
ON MAIN LANE:
0.5 FOOTCANDLE,
Avg.
ON RAMPS:
0.3 FOOTCANDLE,
Avg.

NOTE: ABOVE TOTALS APPLY TO THIS INSTALLATION ONLY.

REFERENCE DRAWINGS
SD-20, SHEET 1 - FOUNDATIONS
SD-20, SHEET 2 - JUNCTION BOXES, LIGHT DUTY
SD-20, SHEET 3 - JUNCTION BOXES, HEAVY DUTY
SD-20, SHEET 4 - LIGHTING POLE DETAILS
SD-20, SHEET 5 - LIGHTING ELECTRICAL DETAILS
ST-146, 147, 145 - BRIDGE DETAILS

LEGEND & MAJOR EQUIPMENT ITEMS

- LUMINAIRES:
  TO ACCOMMODATE A 400-WATT, 8500 LUMEN MERCURY LAMP
  TOTAL - 32
- POLES:
  METAL OR CONCRETE, WITH 12'-15' LUMINAR HEIGHT
  TOTAL - 52
- LAMP BALLASTS:
  IN LUMINAIRE, OR ON POLE-TOP
  TOTAL - 52
- DIRECT-BURIAL CABLE
  APPROX. 10,000'
- TOTAL LAMP LOAD:
  USING 480-VOLT CIRCUIT
  25.0 kva.
- AVERAGE horizontal.
  TIME OF LOWEST
  LEVEL OF ILLUMINATION
  ON MAIN LANE:
  0.5 FOOTCANDLE,
  Avg.
  ON RAMPS:
  0.3 FOOTCANDLE,
  Avg.

NOTE: ABOVE TOTALS APPLY TO THIS INSTALLATION ONLY.

NOTE:

A. ALL WIRES ARE IN 2-CONDUCTOR CABLES ON THIS DRAWING.
B. JOHN BRACKET IS ADVISED FOR POLES MARKED "J".
C. IF DIRECT-BURIAL CABLE IS USED, PROTECTING CONDUIT (1" MIN.)
   SHOULD BE USED AT CROSS-OVER POINTS BENEATH MOVEMENT UNDER
   PAVED SHOULDERS AND ON BRIDGES.
D. IF 120/240-VOLT CIRCUIT IS USED, THESE INDICATED WIRE SIZES
   SHOULD BE RE-CALCULATED ALSO FOR 120/200-VOLT CIRCUIT.
E. START WITH LIGHTING POLES ON MAIN HIGHWAYS 30 FEET (10')
   FROM SHOULDER NOSE OF EXIT RAMPS AND A 300 FEET (100') FROM
   SHOULDER NOSE OF ENTRANCE RAMPS. POLES SHALL BE LOCATED
   ON RISE OF RAMPS OR CURVES.
F. CABLES SHOWN OVER BRIDGE ARE FOR LIGHTING EXISTING INTER-
   PRECTIONS SHOWN OVER BRIDGE ARE FOR LIGHTING EXISTING INTER-
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   PRECATIONS,
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS

DESIGN PROCEDURE

FOR DESIRABLE DESIGN LENGTH OF SPEED-CHANGE LANES, SEE

THE ALIGNMENT OF SPEED-CHANGE LANES DEVELOPED IN
CONJUNCTION WITH CURVED PORTION OF HIGHWAY WILL BE DESIGNED
IN ACCORDANCE WITH AASHO-GEOMETRIC DESIGN POLICY PAGE 278,
FIG. 22-7, PAGE 494.

THE EFFECTIVE TAPER LENGTH FOR THESE TREATMENTS IS
CONSIDERED TO BE INCLUDED IN THAT PORTION BETWEEN THE NOSE
AT ZERO TO A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H. THE LENGTH OF DECELERATION OR ACCELERATION LANE IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE EFFECTIVE TAPER LENGTH FOR THESE TREATMENTS IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE LENGTH OF DECELERATION OR ACCELERATION LANE IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE EFFECTIVE TAPER LENGTH FOR THESE TREATMENTS IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE LENGTH OF DECELERATION OR ACCELERATION LANE IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE LENGTH OF DECELERATION OR ACCELERATION LANE IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE LENGTH OF DECELERATION OR ACCELERATION LANE IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE LENGTH OF DECELERATION OR ACCELERATION LANE IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE LENGTH OF DECELERATION OR ACCELERATION LANE IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE LENGTH OF DECELERATION OR ACCELERATION LANE IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE LENGTH OF DECELERATION OR ACCELERATION LANE IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE LENGTH OF DECELERATION OR ACCELERATION LANE IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.

THE LENGTH OF DECELERATION OR ACCELERATION LANE IS
MEASURED FROM THE FIRST SPEED CHANGE CURVE, WHEN REQUIRED,
AT A POINT WHERE THE TAPER IS TWELVE (12) FEET WIDE AT
5 M.P.H.
**Commonwealth of Pennsylvania**

**Department of Highways**

**Design Methods**

**Speed Change Lanes**

**Treatment for Terminating Divisor Between Ramps**

**Merging and Diverging Lanes**

**Successive Ramp Terminals**

**Successive Entrance Terminals**

**Exit Terminal Followed by Entrance Terminal**

**Entrance Terminal Followed by Exit Terminal**

**NOTE:**
- Provide for minimum but not less than length required for maneuvering or speed change.
- Terminal arrangements shown are applicable symmetrically.
GENERAL NOTES

1. DEPARTURE AND ARRIVAL SLOPES—
   a. On Interstates: 3:1
   b. On R-1 & R-2: 6:1
   c. On R-3: 4:1

2. PIPE:
   a. All cut sections
   b. Section 3:1
   c. Section 4:1

3. STABILIZED SHOULDER
   a. Where erosion or washout is anticipated
   b. Where shoulders are less than 30 feet wide

4. SHEET I THROUGH V
   a. Sheet I: General Notes
   b. Sheet II: Design Information
   c. Sheet III: Material Specifications
   d. Sheet IV: Construction Details
   e. Sheet V: Drawings

5. GENERAL NOTES
   a. Contained on Sheet V
   b. Approved: May Khuns.
TYPICAL SECTIONS ON SUPERELEVATED CURVES - STABILIZED SHOULDERS

Details to be altered as required for flexible type pavement.

NOTE: Inside of super-elevated curves to be delineated as required for necessary sight distance.
Details to be altered as required for flexible type pavement. See Sheet N-1.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
ROADWAY SECTIONS
INTERSTATE AND CLASS I

SHEET 2 OF 5
DM-17

SEE NOTES ON SHEET N-1
NORMAL ROADWAY SECTION

SPLIT LEVEL ROADWAYS & VARIABLE WIDTH MEDIAN

ALTERNATE DESIGN WHERE CONDITIONS WARRANT

FOUR LANES DIRECTIONAL

THREE LANES DIRECTIONAL

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
ROADWAY SECTIONS
INTERSTATE AND CLASS I

DM-17
METHODS FOR REDUCING OR ELIMINATING BORROW EXCAVATION

(Provided cost of additional Right of Way is nominal)

1. Original ground
   2. Normal cut slope
   3. Normal fill slope

4. Shoulder widened
5. Normal shoulder


NOTE: Adjust Right-of-Way to conform with current practices.

METHODS FOR DISPOSAL OF EXCESS EXCAVATION

(Provided cost of additional Right of Way is nominal)

1. Original ground
   2. Normal cut slope
   3. Normal fill slope

4. Shoulder widened
5. Normal shoulder


NOTE: Adjust Right-of-Way to conform with current practices.

METHODS FOR PROTECTING VALUABLE TREES

1. Original ground
   2. Normal cut slope
   3. Normal fill slope

4. Shoulder widened
5. Normal shoulder


NOTE: Adjust Right-of-Way to conform with current practices.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS

DESIGN METHODS - REDUCING OR ELIMINATING BORROW EXCAV.
DISPOSAL OF EXCESS EXCAV. - PROTECTING VALUABLE TREES - CIRCULAR LETTER C-2055-1

APPROVED: November 23, 1943

E-2
NOTES:

Partial embankment at pipe trenches and in the immediate vicinity thereof may be constructed with a maximum slope of 10:1.

Excavation is to be Class 1 for metal plate pipe culverts and for metal plate pipe-arches as indicated by TRENCH SECTION.

MAXIMUM PAYABLE EXCAVATION
IN EMBANKMENT AREAS FOR TRENCHES OF PIPE CULVERTS, CORRUGATED METAL PIPE-ARCHES, METAL PLATE PIPE CULVERTS & METAL PLATE PIPE-ARCHES
TABLE OF STAKE POCKETS

<table>
<thead>
<tr>
<th>WIDTH OF LANE</th>
<th>NO. REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>4'</td>
<td>1</td>
</tr>
<tr>
<td>5'</td>
<td>2</td>
</tr>
<tr>
<td>6'</td>
<td>3</td>
</tr>
<tr>
<td>7'</td>
<td>4</td>
</tr>
</tbody>
</table>

THE LOAD TRANSFER UNIT SHOWN IS FOR A 10'-0" LANE OF 9" UNIFORM DEPTH. FOR NARROWER OR WIDER LANES THE NUMBER OF DOWELS IS DECREASED OR INCREASED ACCORDINGLY.

The center of dowels shall be located vertically below the center of the slab. For 9" slabs, minimum distance from slab edge to dowel shall be 4 1/2" for 8" paving becomes 3 1/2" and 4 1/2" respectively for 8" and 10" paving.

Under normal conditions provide 1 1/2" STAKES for stake pockets shown. Additional stakes to be furnished and placed as may be directed by the engineer where poor subsoil conditions are encountered during construction. The length of stakes may be increased or decreased depending on subgrade conditions.

Commonwealth of Pennsylvania
DEPARTMENT OF HIGHWAYS

LOAD TRANSFER UNITS
ASSEMBLY DETAILS
IN ACCORDANCE WITH DEPARTMENT STANDARD B-1
APPROVED: SATURDAY, FEB. 27, 1954

CHIEF ENGINEER

ELEVATION - (10'-0" LANE - 9" PAVEMENT)
ALL JOINTS & CONNECTIONS WELDED

SECTION AA

SCALE - 3/8" = 1'

SECTION BB

SCALE - 3/8" = 1'

SURFACE OF PAVEMENT -
DIRECTION OF CONCRETING OPERATIONS

SECTION CC

SCALE - 3/8" = 1'

SURFACE OF PAVEMENT -
DIRECTION OF CONCRETING OPERATIONS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
MANUFACTURED BY:
ELECTRIC WELDING CO.
PITTSBURGH, PA.
GENERAL NOTES

The Unit shown on this drawing is correct for a 12'-0" lane width. For lanes wider or narrower, dowels are added or omitted from the unit as shown, always on the basis of 12" center to center spacing.

End Details are standard for all units regardless of number of dowels. Usual lane widths are as follows:

Lane Width  Over-all length of Unit  No. of Dowels
12'-0"  10'-0"  10
11'-0"  10'-0"  11
10'-0"  10'-0"  12
9'-0"  11'-3"  13

These load transfer units can be used as received for either expansion or construction joints.

For expansion joints, the expansion joint material of proper thickness (3/4" or 1") must be added in the field. Steel plate, the installing cap, and the coating for slip ends of dowels are to be added to the assembly in the field. The metal tubes are not required. Installation details for the expansion joint filler in place shall be as shown on Standard Drawing B-1.

No end guides are required for construction joints. The metal tubes are not required. These load transfer units can be used as received for either expansion or construction joints.

For expansion joints, the expansion joint material of proper thickness (3/4" or 1") must be added in the field. Steel plate, the installing cap, and the coating for slip ends of dowels are to be added to the assembly in the field. The metal tubes are not required. Installation details for the expansion joint filler in place shall be as shown on Standard Drawing B-1.

No end guides are required for construction joints. The metal tubes are not required. These load transfer units can be used as received for either expansion or construction joints.

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No end guides are required for construction joints. The metal tubes are not required.

These load transfer units can be used as received for either expansion or construction joints.

For expansion joints, the expansion joint material of proper thickness (3/4" or 1") must be added in the field. Steel plate, the installing cap, and the coating for slip ends of dowels are to be added to the assembly in the field. The metal tubes are not required. Installation details for the expansion joint filler in place shall be as shown on Standard Drawing B-1.

No end guides are required for construction joints. The metal tubes are not required.

These load transfer units can be used as received for either expansion or construction joints.

For expansion joints, the expansion joint material of proper thickness (3/4" or 1") must be added in the field. Steel plate, the installing cap, and the coating for slip ends of dowels are to be added to the assembly in the field. The metal tubes are not required. Installation details for the expansion joint filler in place shall be as shown on Standard Drawing B-1.

No end guides are required for construction joints. The metal tubes are not required.
GENERAL NOTES

The unit shown on the drawing is correct for a 12'-0" lane width. For lanes wider or narrower, slabs are added to or removed from the unit as shown, shown on the basis of 12'-0" center to center spacing. The details are prepared for all units regardless of number of slabs.

LITE WIDTH OVER ALL LENGTH OF UNIT NO. OF DOWELS
11'-6" 11'-11/16" 10
1'0" 1'-11/16" 11
12'-0" 1'-1/16" 12
12'-0" 1'-11/16" 13

For expansion joints, the expansion joint material of proper thickness (1-1/2") for joints, the metal tubes for dowels with spaces for expansion, the coating for slip ends of dowels, and the installing caps for joint are to be provided in the field. For expansion joints the coating for slip ends of dowels shall be added to the assembly in the field. The metal tubes are not required.

Standard end guides for holding the expansion joint filler in place shall be provided as required on Standard Drawing B-1. At least eight guides are required for expanded construction joints.

The length of metal tubes shall be furnished for each assembly. They shall be furnished by the Engineer. The metal tubes shall be standard B-1 diameter and 12'-0" slit in between. The ends of all metal tubes shall be furnished and placed as directed by the Engineer where poor subsoil conditions are encountered during construction.

The length of metal tubes may be increased or decreased as directed by the Engineer, depending upon the subgrade conditions encountered.

The metal tubes shall be removed after the first or for the second pass of the finishing machine at the discretion of the Engineer. Upon completion of the installing caps, the resultant joint shall be filled promptly with fresh concrete poured back from the mixer.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
LOAD TRANSFER UNITS
ASSEMBLY DETAILS - SAWED JOINT
IN ACCORDANCE WITH DEPARTMENT STANDARDS B-1
APPROVED
CHIEF ENGINEER

Revised 10-8-66

J. W. H.

DESIGN DRAWING

MADE BY BETHLEHEM STEEL CORP., BETHLEHEM, PA.
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS -
LOAD TRANSFER UNITS
ASSEMBLY DETAILS - SAWED JOINT
IN ACCORDANCE WITH DEPARTMENT STANDARD B-1
APPROVED - 11/25/69

NOTE: EITHER THE ABOVE EXPANSION JOINT ASSEMBLY OR TYPE B EXPANSION JOINT ASSEMBLY AS SHOWN ON ATTACHED SHEET WILL BE USED.
The methods of placing reinforcement shall be similar to those shown for Type D on Sheet 1.

Type F reinforcement expanded metal mat is shown on Sheet 4.

Type F and reinforcement shown in this sheet are for use with 16-foot width pavement lane (b) on Sheet 3.

Type F reinforcement for 16-foot width pavement lane (b) on Sheet 3 is shown in Sheet 3.

Type F and reinforcement with approval drawing are shown on Sheet 5.

NOTES

The requirements for Types F and reinforcement shall be similar to those shown for Type D on Sheet 1.

Type F reinforcement expanded metal mats is shown on Sheet 4.

Type F reinforcement shown in this sheet are for use with 16-foot width pavement lane (b) on Sheet 3.

Type F reinforcement for 16-foot width pavement lane (b) on Sheet 3 is shown in Sheet 3.

Type F reinforcement with approval drawing are shown on Sheet 5.

STANDARD TYPES OF REINFORCEMENT

TYPE A REINFORCEMENT - Fabric Reinforcement shall consist of members rigidly attached at all points of intersection in accordance with the Department's Specifications, Item 101.05.

The minimum laps of members shall be shown on the drawing. The minimum lap of members shall be shown on the drawing.

Type F reinforcement shall consist of members rigidly attached at all points of intersection in accordance with the Department's Specifications, Item 101.05.

The minimum laps of members shall be shown on the drawing. The minimum lap of members shall be shown on the drawing.

Type D reinforcement shall consist of members rigidly attached at all points of intersection in accordance with the Department's Specifications, Item 101.05.
NOTES

TYPE F - EXPANDED METAL MESH

Where Type F reinforcement is indicated on the drawings or specified, either Type F expanded metal mesh or Type F fabric (wire-as shown on Sheet 2) may be used.

The diamonds or the mesh shall be 12 inches long and not less than 0.2 nor more than 0.6 inches in width. The weights shall be not less than those shown. The minimum lap shall be 12 inches or 1 diamond longitudinally as shown. Mesh shall be placed with minimum lap of 12 inches.
LANE WIDTH

WIDTH A

OVERALL WIDTH OF FABRIC

HINGED TYPE J REINFORCEMENT IS TO BE USED FOR 11'-0" WIDE LANES OR 11'-0" WIDTH PAVEMENT LANE. WHERE LONGITUDINAL JOINTS ARE NOT PERMITTED.

STEEL WIRE FABRIC SHALL CONFORM TO THE DEPARTMENT'S SPECIFICATIONS, FORM 408, AND SHALL CONSIST OF THE GAUGE, NUMBER, AND SPACING OF THE LONGITUDINAL AND TRANSVERSE WIRES FOR VARIOUS WIDTHS OF PAVING LANES SHOWN ABOVE.

MINIMUM LAP OF REINFORCEMENT SHALL BE 1'-0" FROM END TO END OF WIRES MEASURED ALONG LINE OF LAY OF THE WIRES AS SHOWN.

THE LOCATION OF THE HINGE WITH RESPECT TO THE WIDTH OF THE LANE MAY BE VARYED FROM THE LOCATION SHOWN, WITH ACCOMPANYING CHANGES IN DIMENSIONS A AND B.
RECOMMENDED METHOD OF CUTTING AND PLACING REINFORCEMENT FOR ONE PAVEMENT SLAB

In addition, place 4'3" Bar Longitudinally (Not Shown) Edge of Pavement Slab

Reinforcement shall be 10'-0" wide, outside to outside of longitudinal wires, plus 1" overhang on each side.

Reinforcement shall be 6"x12' 6/4 Gauge wires in sheets 10' wide by 16' long.

A #3 reinforcement bar shall be placed along each longitudinal edge.

The minimum lap of reinforcement shall be twelve (12) inches from end to end of the wires measured along the line of the lap, both longitudinally and transversely.

This method of cutting and placing reinforcement may also be used for slabs more than fourteen (14) feet in width where no longitudinal joint is specified.

DETAILS OF REINFORCEMENT AND METHOD OF LAPPING
Exposed edges shall be chamfered one (1) inch.

All corners on inside of endwall shall be rounded with concrete as shown.

Exposed edges shall be chamfered one (1) inch.

The design of this endwall shall be varied to suit location of outlet pipe underdrain outlet endwall.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS

STANDARD DETAILS
CLASS B CONCRETE ENDWALLS AND TYPES A & B TREE WALLS

APPROVED: [Signature] 1939

CHIEF ENGINEER

[Diagram showing various types of endwalls and tree walls with dimensions and notes on construction details.]
The base pressures in pounds per square foot are shown for each type of manhole. Where the supporting grade at the bottom of footing of any manhole is incapable of sustaining the indicated loading, the footings shall be increased in size in accordance with the dimensions shown in the tabulation below. Proper allowance shall be made for variations in height of the various types of manholes. In general it has been presumed that a sole loading of one ton per square foot will obtain. The contractor shall not proceed with the construction of any manhole until the engineer has made tests of the foundation and determined the load capacity of the underlying soil. Where necessary to increase the size of footing over and above the dimensions shown for any type of manhole at any specified depth, the contractor will be reimbursed for the increased quantity of Class A Concrete and Reinforcement Bars of the contract unit price for each of these items in accordance with the quantities shown in the tabulation. In each case the loads of reinforcement bars shall be increased to conform to the increased size of footing. The depth or thickness of footing below the bottom of the pipe shall not be less than the dimension shown in the tabulation for each type of manhole. The minimum depth of each type shall not exceed the total maximum shown i.e. 10'-0" for Type A, 15'-0" for Type B, 20'-0" for Type C, and 25'-0" for Type D. The minimum base dimensions shall conform in all cases to the minimum shown on these drawings.

<table>
<thead>
<tr>
<th></th>
<th>42&quot; O</th>
<th>42&quot; I</th>
<th>42&quot; C</th>
<th>42&quot; D MAX.</th>
<th>42&quot; D MIN.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIAMETER</td>
<td>.83</td>
<td>.83</td>
<td>.83</td>
<td>.83</td>
<td>.83</td>
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<tr>
<td>MINIMUM TYPE DEPTH</td>
<td>1.06</td>
<td>1.06</td>
<td>1.06</td>
<td>1.06</td>
<td>1.06</td>
</tr>
<tr>
<td>MAXIMUM TYPE DEPTH</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
</tr>
<tr>
<td>LOADINGS (TONS/SQ. FT.)</td>
<td>3.25</td>
<td>3.25</td>
<td>3.25</td>
<td>3.25</td>
<td>3.25</td>
</tr>
<tr>
<td>MINIMUM BASE DIAMETER</td>
<td>.83</td>
<td>.83</td>
<td>.83</td>
<td>.83</td>
<td>.83</td>
</tr>
<tr>
<td>MAXIMUM BASE DIAMETER</td>
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<td>1.06</td>
<td>1.06</td>
<td>1.06</td>
<td>1.06</td>
</tr>
<tr>
<td>MINIMUM WEIGHT OF COVER</td>
<td>220 LBS</td>
<td>220 LBS</td>
<td>220 LBS</td>
<td>220 LBS</td>
<td>220 LBS</td>
</tr>
<tr>
<td>MAXIMUM WEIGHT OF FRAME</td>
<td>220 LBS</td>
<td>220 LBS</td>
<td>220 LBS</td>
<td>220 LBS</td>
<td>220 LBS</td>
</tr>
</tbody>
</table>

**NOTE:** FOR ALL MANHOLES, CHAINAGE, A-SIDING, ECT. ARE SHOWN ON SHEET 1 OF THIS SHEET!
Note: Spacings of toe walls and cut-off walls shall be as indicated by grid diagram on the detail drawings, as directed.

Corresponding ends of all steel bars shall be painted with graphite lubricant or approved primer and be fitted with an approved metal cap providing a 1/8 in. clearance pocket.

Class 5 Concrete

B-B Section Thru Completed Wall

Revised for lubricant and to provide metal expansion cap.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS

STANDARD DETAILS

SPECIAL MORTARED STONE SLOPE WALL

APPROVED: Nov. 1, 1941

CHIEF ENGINEER

SD-7
PLAIN CEMENT CONCRETE CURB — TYPES A, B, C & D

5', 6', 8' & 10' FOOT PLAIN CEMENT CONCRETE GUTTERS — TYPE A

These gutter widths are in accordance with the nominal size as indicated above. If the unit is to be used for Type B, the minimum width of 6 inches for Type A and 7 inches for Type B shall be maintained. The gutter shall be constructed of a minimum of 1,000 psi concrete and shall be reinforced with a minimum of 1/4 inch diameter rebar at 12-inch intervals along the length of the gutter.

VITRIFIED BRICK GUTTER

The height of the gutter shall be 3 inches, and the width shall be 6 inches. The gutter shall be constructed of vitrified brick and shall be jointed with 1/4 inch expansion joints at 12-inch intervals. The gutter shall be reinforced with a minimum of 1/4 inch diameter rebar at 12-inch intervals along the length of the gutter.

PLAIN CEMENT CONCRETE CURB — TYPES A & B

The gutter shall be 3 inches in height and 6 inches in width. The gutter shall be constructed of a minimum of 1,000 psi concrete and shall be reinforced with a minimum of 1/4 inch diameter rebar at 12-inch intervals along the length of the gutter.

STONE CURB — TYPES A & B

The gutter shall be 3 inches in height and 6 inches in width. The gutter shall be constructed of stone and shall be jointed with 1/4 inch expansion joints at 12-inch intervals. The gutter shall be reinforced with a minimum of 1/4 inch diameter rebar at 12-inch intervals along the length of the gutter.
**CLASS B CEMENT CONCRETE SLOPE WALLS (FOR SPILLWAYS)**

**PLAIN AND MORTARED STONE SLOPE WALL**

**ROCK EMBANKMENT FOR SLOPE PROTECTION**

**MORTARED STONE SLOPE WALLS (FOR SPILLWAYS)**

**COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF HIGHWAYS STANDARD DETAILS SLOPE PROTECTION**

APPROVED: March 31, 1947

SD-11
The black diagonal stripes are reserved only on face side of barricade.

TYPE A

Permanent Barricades—Types A and B

Guard Posts

Wooden (Treated) — Steel

Cement Rubble Masonry Retaining Walls

Commonwealth of Pennsylvania
Department of Highways

— Standard Details —

Miscellaneous

Approved: March 26, 1947

Chief Engineer
MODIFICATION ACROSS BRIDGES

EDGING DETAILS

These surfaces are given a final finish after the curb is colored.

TYPICAL CONSTRUCTION

TABULATION OF MOUNTABLE CURBS

<table>
<thead>
<tr>
<th>TYPE OF CURB</th>
<th>DESIGN DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Concrete Mountable Reflecting Curb, Types A &amp; B</td>
<td>As shown in sketches</td>
</tr>
<tr>
<td>Plain Concrete Mountable Reflecting Curb, Types A &amp; B</td>
<td>As shown in sketches, except replace white cement mortar with plain cement mortar and eliminate joint.</td>
</tr>
<tr>
<td>Plain Concrete Mountable Curb, Types A &amp; B</td>
<td>As shown in sketch, except replace white cement mortar with plain cement mortar and eliminate joint.</td>
</tr>
</tbody>
</table>

Revised for some of drawings, added tabulation of types and details.
Revised for colorbar size designation.
Approved May 14, 1966.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
CONCRETE MOUNTABLE CURBS
TYPES A & B
APPROVED 1948
NOTES

The scoring operation shall be done twice. The first scoring shall be done immediately after the mortar surface has been screeded and smoothed to the proper grade. The second scoring operation shall be done after the excess water has disappeared from the surface and the mortar has acquired sufficient stiffness to remain in place without slumping. All surfaces of the scored band shall be smooth, true in inclination and draft. All corners shall be sharp. The edges on each side of the scored band shall be smooth true to grade and alignment and shall be true from the excess of mortar in its junction with the scored band.

Transverse Expansion Joints of corresponding thickness shall be placed directly opposite those in the adjacent pavement. Also Transverse expansion joints shall be placed in line with construction joint in the adjacent concrete pavement and at intermediate intervals of approximately 20 feet.

Concrete Traffic Separator, Type A shall be used in areas not artificially lighted.

Concrete Traffic Separator, Type B shall be used in areas artificially lighted.
SLOPE PIPE FITTING - TYPE A

<table>
<thead>
<tr>
<th>Normal Diameter (Inches)</th>
<th>A (In)</th>
<th>B (In)</th>
<th>C (In)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot;</td>
<td>29 1/2</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>15&quot;</td>
<td>29 1/2</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

SLOPE PIPE FITTING - TYPE B

Note: Slope pipes draining only shoulder areas in embankments, other than those adjacent to structures, shall be restricted to 12" in diameter (minimum).

SUB-SURFACE DRAINS

SD-14
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS

REINFORCED CONCRETE TRAFFIC DIVIDERS - TYPES A & B

Approved: Nov. 6, 1953

CHIEF ENGINEER

LOCATION FOR TYPE A AND B TRAFFIC DIVIDERS
ALTERNATE CONDUIT LOCATION.

POLE BASE GROUNDING LUG

SCALE: 1'-0" UNLESS NOTED

NOTES:
1. ANCHOR BOLTS SHALL EXTEND 3" BELOW FORMED SECTION.
2. GALVANIZED STEEL SPACING LOCK JOINTS.
3. NEAR BOLTS SHALL BE USED.
4. CONDUIT BUSHEING AND CONNECTORS MUST BE SAME.
5. MAXIMUM MERCURY CONTENT OF GROUND WIRES SHALL BE 5 OMS.
6. FOR FOUNDATIONS SEE STANDARD FOUNDATION SHEET BASE.
7. SEE SHEET 4 FOR POLE DETAILS.
8. SEE SHEET 3 FOR GENERAL GUIDANCE.
9. FUNDATIONS NOT DESIGNED FOR 30-Foot MOUNTING.
10. SEE SHEET 4 FOR FOUNDATION DETAILS.
11. CONNECTORS FOR GROUND WIRES COULD ADOPT FOUNDATION.
12. SHOULDS ER REPR孛SE END THROUGH CENTER OF FOUNDATION.
13. COMMONWEALTH OF PENNSYLVANIA
14. DEPARTMENT OF HIGHWAYS
15. HIGHWAY LIGHTING FOUNDATIONS
16. Sheet 1 of 2

SCALE: 1'-0" UNLESS NOTED
NOTES:

JB-1 AND JB-2 SHALL BE USED IN LOCATIONS WHERE THEY WILL BE SUBJECT TO LOADS NO HEAVIER THAN PEDESTRIAN TRAFFIC.

FOR OTHER LOCATIONS USE JB-3 OR JB-12 SHOWN ON SHEET 3.

EQUIVALENT APPROVED RECEIPT JUNCTION BOXES MAY BE SUBSTITUTED FOR JB-1 AND JB-2 SHOWN.

AFTER INSTALLATION, ALL EXPOSED STEEL SHALL BE PAINTED WITH ONE COAT OF RED LEAD AND ONE COAT APPROVED BITUMINOUS PAINT.

SHEET OF 5

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
HIGHWAY LIGHTING
JUNCTION BOXES-LIGHT DUTY
APPROVED: JUNE 1969

DEPUTY ENGINEERING

SD-20
Details and specifications for highway lighting junction boxes—heavy duty, including:

- Junction Box JB-11
- Junction Box JB-12

**Details:**
- Cover frame & supporting frame
- Structural steel
- Aluminum
- Anchor bars
- Drainage
- Plan & elevation details
- Dimensions
- Scale: 1"=1'-0"

**Notes:**
- Where junction box is in sidewalk, drain pipe is on sidewalk, where it will be subject to moisture loads.
- Where sidewalk is under bridges, show bridge details.
- Dimensions shown on sheet 2.
- Structural steel shall conform to ASTM A36 designation.
- Structural aluminum shall conform to 6061-T6 designation.
- All concrete to be Class "A".

**Approved:**
- Feb. 15, 1966

**Commonwealth of Pennsylvania Department of Highways**
NOTE: SEE SHEET NO. 1 FOR DETAILS ON POLE FOUNDATIONS

POLE SIZES (EXCEPT DAVID-TYPE)

<table>
<thead>
<tr>
<th>Type of Material</th>
<th>Steel</th>
<th>Square</th>
<th>2''</th>
<th>3''</th>
<th>5''</th>
<th>6''</th>
<th>8''</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>0.61</td>
<td>0.73</td>
<td>0.73</td>
<td>0.73</td>
<td>0.81</td>
<td>0.81</td>
<td>0.81</td>
</tr>
</tbody>
</table>
| Note: Thickness may increase in C2012/Where necessary, and for SF. Tensile when B Clenared or Boxes are supported.

NOTE: SUBJECT HEIGHT OF TRANSFORMER BASE FROM POLE BASE WHEN BASE IS SPECIFIED FOR ALL TYPES OF POLES.

WHERE ALL STEEL AND ALUMINUM POLES ON TRANSFORMER BASES ARE IN CONTACT WITH CONCRETE, A CAULKING COMPOUND SHALL BE USED WHICH WILL BE AN APPROVED ALUMINUM-RESISTANT TYPE, MEETING THE TEST REQUIREMENTS OF THE FEDERAL SPECIFICATION TT-C-598-12.

FOR ALL POLES, APPROVED IDENTIFICATION PLATE SHALL BE PROVIDED. ALL DIMENSIONS ARE BASED UPON 30-FOOT MOUNTING HEIGHT OF LUMINARIES FOR HIGHER MOUNTINGS SOME DIMENSIONS WILL INCREASE.

REVISED BASE DIMENSIONS FOR 9' B. ALUMINUM DAVID POLES ARE FOR REPRESENTATIVE DATE. APPROVED, CDD/03/09/78.

GENERAL REVISIONS TO CHANGED SHEET NUMBER IN 9-72.
APPROVED JUNE 1972.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
HIGHWAY LIGHTING
LIGHTING POLE DETAILS
APPROVED JUNE 1, 1972
DEPUTY SECRETARY ENGINEERING

SD-20
6-FT SPECIAL INLET

NOTES:
Frames shall be gray, flade or rustless iron casings. Gratings shall be wrought iron, ductile cast iron or structural grade steel. Reinforced grating shall be of the materials, design and dimensions shown on this drawing.
Caulk grating shall be double butt row of the design shown, here bars #6 and #8 are used.
The number of the fabricated grating shall be joined by riveting, as shown or by apparaet riveting.
Form or pipe shall be located as required.
The exposed portion of the backgro:nd shall be constructed using metal plate or or metal bar. The design flow.
Steel mats shall be oversized to machine construction. (1st Draw 1/2 A) when the distance of the required pipe exceeds the inlet box dimensions shown.

S.I. 4 & 6
TYPE J INLET

- NOTES -

Frames shall be of cast iron, ductile iron castings, or malleable iron castings. Fabricated frames shall be made of the materials, design and dimensions shown on the drawing. Steel girders shall be ductile iron or the design shown, having the same cross sections and strength as shown. The members of the fabricated frame shall be joined by Riveting as shown or by approved welding. Pipe or Pipes shall be located as required. The exposed top of the frame shall be constructed vertically or horizontally as required. All other details shall conform to Type J Inlets.

TOTAL RISER:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS

STANDARD DETAILS

MISC. INLETS

NOTE - ALL INLETS

PART WALLS shall be molded similar to masonry construction. Size and shape of the rectangular part walls in the required part except the design dimensions shown.
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
TYPES 2-A & 2-B GUARD FENCE
(10 & 12 GAUGE - STEEL BEAM)
APPROVED

INTERMEDIATE POST

TERMINAL TO BE PLACED ON BACK OF RAIL ELEMENT

TERMINAL TO BE PLACED ON FACE OF RAIL ELEMENT

ALTERNATE TERMINAL SECTIONS

MIN. 12 GA. (U.S. Std.)

NOTE:
- Restraints shall be bolted on posts before or after posts are driven into ground as provided in the Specifications.
- Bolts for restraints shall be 3/4" x 3 1/2" long with hex nuts.
- All bolts and nuts shall be galvanized in accordance with Department Specifications.
- Splice bolts shall develop the design strength of the rail element.
- Post bolts shall withstand a 1500 pound side pull in either direction.

Where guard fence is required on curves having a radius of less than 150 feet, the rail element shall be shop formed.
SET POSTS IN EXCAVATED HOLES FOR TYPES 1-A, 1-B, & 1-C

OFFSET BRACKET FOR TYPE 1-C

HINT BOLT FOR TYPE 1-C

DRIVEN OR SET INTERMEDIATE POSTS FOR TYPE 1-C

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS

STEEL POSTS FOR TYPES 1-A, 1-B & 1-C GUARD FENCE

APPROVED: November 1946

CHIEF ENGINEER
Unless otherwise noted, all metal is 3/8" min. thickness.

**FOR STEEL POSTS**

- Alternate malleable iron offset brackets for Type 1-C guard fence.

- Pressed steel offset bracket (for steel posts of Type 1-C guard fence).

**FOR WOOD AND CONCRETE POSTS**

- Hole in face.
- Slot in face.

**FOR WOOD AND CONCRETE POSTS**

- Hole in base.

**FOR STEEL POSTS**

- Hole in base.

**LOCATION OF HOLES**

- Bolt for restraints shall be 3/4" diam. x 4" long, equipped with 3/8" washers.

- Rail shall be welded to the base of the post with a fillet weld.

- Bolt holes shall be drilled or bored to provide good bearing for offset spring brackets.

- For other details of construction, see standard corresponding to type of guard fence used.

**COMMONWEALTH OF PENNSYLVANIA**

**DEPARTMENT OF HIGHWAYS**

**STEEL POSTS**

For Types I-A, I-B & I-C guard fence also offset brackets for Type 1-C.
GENERAL NOTES:

1. All materials and workmanship shall be in accordance with PDH Form 408, Sec. 6.29.
2. Metal base plates will be required.

DEPARTMENT OF HIGHWAYS
BRIDGE DIVISION

STANDARD METAL CRIBBING-UNCOATED

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
BRIDGE DIVISION

ST-142
**GENERAL NOTES:**

- All materials and workmanship shall be in accordance with P.D. Form 408, Sec. 6.29.
- All exposed interior and exterior metal sheets used to form the members of the closed face metal cribbing shall be coated by (A) or (B), when specified for Metal Cribbing Coated:
  - (A) Coated on both sides with a layer of asbestos fibers applied to a sheet form by pressing it into a mastic metallic bonding medium. Immediately after the metallic bond has solidified, the asbestos fibers shall be thoroughly impregnated with a bituminous saturant. The finished sheets shall be of first class commercial quality free from blister and unsaturated spots.
  - (B) Galvanized on both sides by the hot-dip process as specified in Section 6.29.2 (2) of Form 408, and field coated with bituminous materials. Immediately prior to application of coating, galvanized surfaces are to be either sand blasted to lightly etch surfaces and to remove any grease-like material by blasting or thoroughly saturated with vinegar (acetic acid) and when dry wipe off any bloom which has formed.
- Apply two (2) coats of coal tar based paint (Federal Specification MIL-18480) to be applied at the rate of 55-70 square feet per gallon. One coat of coal tar emulsion to conform to Federal Specification MIL-C-9523 of the rate of 60 square feet per gallon. Twenty-four hour drying time to be allowed between coats.
- Metal base plates will be required.

Approved: FEB. 25, 1965

COMMONWEALTH of PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
BRIDGE DIVISION

STANDARD
METAL CRIBBING-COATED

ST-143
GENERAL NOTES:
- All Materials and Workmanship shall be in accordance with FO-H Class FB, Section 12.08.
- Concrete Crib members shall be Class 4 Concrete.
- Headers shall be Class 4 Concrete.
- Where total height of cribbing is not more than 5'-0" use spacers 4'-0" long, one above the other to maintain a height of cribbing in between 4'-0" and 5'-0" with headers 6'-0" long. For heights between 5'-0" and 6'-0" use headers 6'-0" long. Higher cribbing walls to be of 'equal' design.
- All contractors to have letter "T" indelibly impressed in the face to indicate the exposed surface in the finished wall.
- Bottom of wall 2" per foot.
- All dimensions necessary to provide proper foundation.
- Reinforcement bars shall be of intermediate to lead grade or high strength designed for 4000 psi and detailed in accordance with ACI Code.

DEPARTMENT OF HIGHWAYS
INLAND DIVISION

COMMONWEALTH OF PENNSYLVANIA

STANDARD
CONCRETE CRIBBING
TYPE I