

## DESIGN DESIGNATION

Current ADT (1974) 100  
Design Year ADT (1994) 200  
DHV 25  
DDHV 15  
T % B & C Trucks 5%  
V Design Speed 40MPH

## CONVENTIONAL SIGNS

|                       |       |
|-----------------------|-------|
| Township Line         | ----- |
| Section Line          | ----- |
| Center Line           | ----- |
| Corporation Line      | ----- |
| Fence Line            | ----- |
| Guard Rail (existing) | ----- |
| Guard Rail (proposed) | ----- |
| Railroads             | ----- |
| Power Poles           | ----- |
| Telephone Poles       | ----- |
| Trees or Stumps       | ----- |
| Property Line         | ----- |
| Right of Way          | ----- |
| Existing Right of Way | ----- |
| Water Lines           | ----- |
| Gas Lines             | ----- |
| Construction Limits   | ----- |

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## LINE DATA

RS-1665(1)  
Begin Project Sta. 92+50 to Sta. 99+00 = 650.00 Lin. Ft.  
Sta. 102+00 to End Project Sta. 105+50 = 350.00 Lin. Ft.  
Total Length of Project RS-1665(1) = 1,000.00 Lin. Ft. or 0.189 Mile  
Begin Work Sta. 92+00 to Sta. 99+00 = 700.00 Lin. Ft.  
Sta. 102+00 to End Work Sta. 106+00 = 400.00 Lin. Ft.  
Length of Work (RS-1665(1)) = 1,100.00 Lin. Ft.  
Add for Salzman Rd.  
Sta. 10+08.22 to Sta. 16+00 = 591.78 Lin. Ft.  
Total Length of Work RS-1665(1) = 1,691.78 Lin. Ft. or 0.320 Mile  
BRS-1665(1) Project & Work  
Sta. 99+00 to Sta. 102+00 = 300.00 Lin. Ft. or 0.057 Mile  
RS-BRS-1665(1) Total Length of Project = 1,300.00 Lin. Ft. or 0.246 Mile  
RS-BRS-1665(1) Total Length of Work = 1,991.78 Lin. Ft. or 0.377 Mile

PLANS PREPARED BY: STICKLEN-BELSHAM & ASSOC. WORTHINGTON, OHIO  
PLANS PREPARED UNDER THE DIRECTIONS OF: REGISTERED ENGINEER 37188 OHIO

# STATE OF OHIO DEPARTMENT OF TRANSPORTATION HANKINS ROAD (T.R. 137)

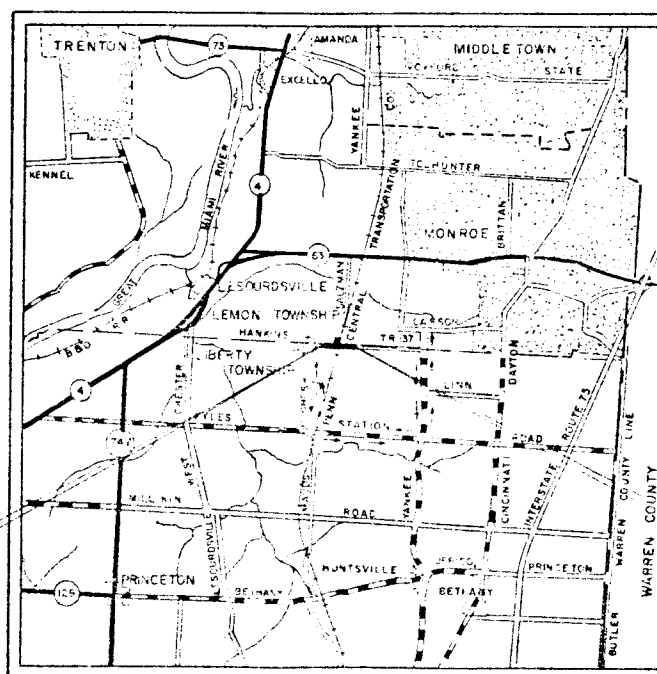
RS-BRS-1665 (1)

| FHWA REGION | STATE | PROJECT        |
|-------------|-------|----------------|
| 5           | OHIO  | RS-BRS-1665(1) |

BUTLER COUNTY  
HANKINS ROAD (T.R. 137)

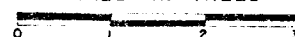
LEMON TOWNSHIP  
LIBERTY TOWNSHIP  
BUTLER COUNTY

## RECONSTRUCTION OF EXISTING SEPARATED CROSSING WITH PENN CENTRAL TRANSPORTATION COMPANY



## LOCATION MAP

SCALE IN MILES

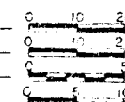


PORTION TO BE IMPROVED  
STATE & U.S. HIGHWAYS  
COUNTY ROADS  
TOWNSHIP ROADS  
DETOUR

SCALE

## PLANS

PROFILE: HORIZONTAL  
PROFILE: VERTICAL  
CROSS: SECTIONS



## 1975 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Transportation, including changes and supplemental specifications listed in the proposal shall govern this improvement.

The Right of Way for this improvement will be provided by the State of Ohio.

I hereby approve these plans and declare that the making of this improvement will require the closing of the highway to traffic and that provisions for the maintenance and safety of traffic will be as set forth on these plans and estimates.

Approved: R. F. Boriss  
Date 10-4-74 District Deputy Director of Transportation

Approved: Robert B. Pfeiffer  
Date 12-9-74 Engineer, Bureau of Bridges

Approved: E. J. Schaefer  
Date 4-15-74 Engineer, Bureau of Roadway Design

Approved: John B. Ellis  
Date 4-15-74 Assistant Deputy Director for Highway Design

Approved: William C. Lewis  
Date 7/14/74 Assistant Deputy Director for Real Estate

Approved: Howard E. Noy  
Date 4-14-76 Assistant Deputy Director for Program Development

Approved: K. E. Kottler  
Date \_\_\_\_\_ Chief Engineer, Design

Approved: \_\_\_\_\_  
Date \_\_\_\_\_ Chief Engineer, Construction

Approved: Robert D. Johnson  
Date 4-16-76 Assistant Director, Department of Transportation

Approved: \_\_\_\_\_  
Date 4-19-76 Director, Department of Transportation

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR

DATE

File No. HANKINS ROAD, BUTLER COUNTY  
Date of Letting 197  
Contract No.

| STANDARD CONSTRUCTION DRAWINGS |         |       |         |      |         | SUPPLEMENTAL SPECIFICATIONS |         |
|--------------------------------|---------|-------|---------|------|---------|-----------------------------|---------|
| BP-5                           | 8-11-75 | GR-2A | 1-1-71  | HW-4 | 1-1-70  | SD-1-69 (Sht. 3)            | 6-12-69 |
| BP-6                           | 6-1-65  | GR-2B | 11-9-71 |      |         |                             |         |
| BP-4                           | 1-1-71  | GR-3  | 11-9-71 | MC-3 | 6-1-73  | MC-1                        | 6-13-69 |
| BP-2                           | 12-1-68 | GR-4  | 11-9-71 | MC-4 | 6-13-69 |                             |         |
|                                |         | GR-6  | 1-1-71  | MC-7 | 10-1-68 |                             |         |
|                                |         |       |         | MC-5 | 6-12-75 |                             |         |
|                                |         | L-1   | 6-1-73  |      |         |                             |         |

# TYPICAL SECTIONS

TYPE 404 ON 301

SCALE: 3/8" = 1'-0"

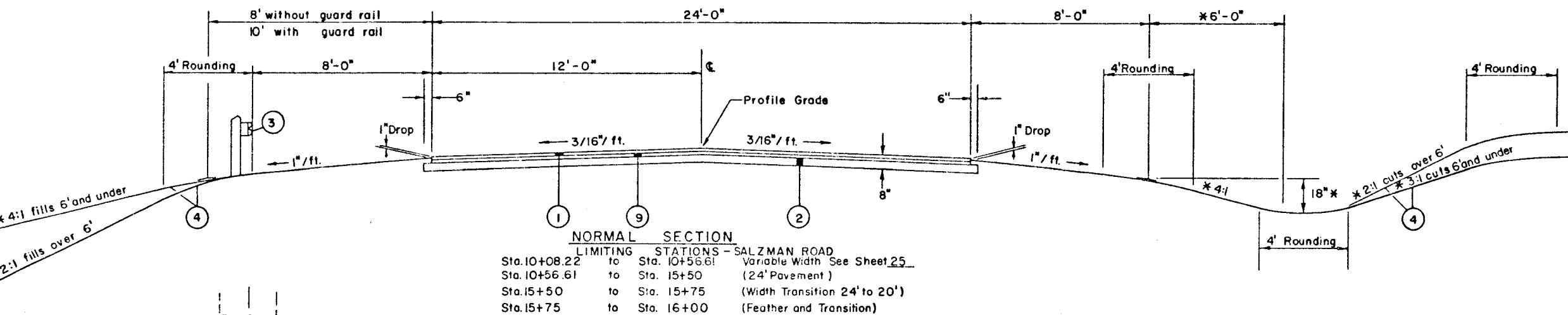
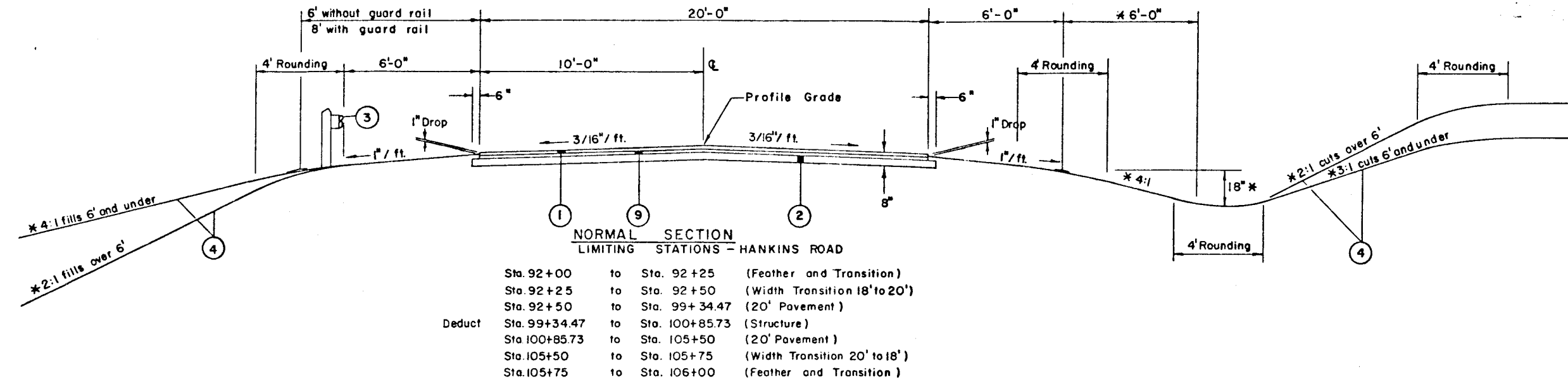
| FHWA REGION | STATE | PROJECT | FISCAL YEAR |
|-------------|-------|---------|-------------|
| 5           | OHIO  |         |             |

BUTLER COUNTY  
HANKINS ROAD

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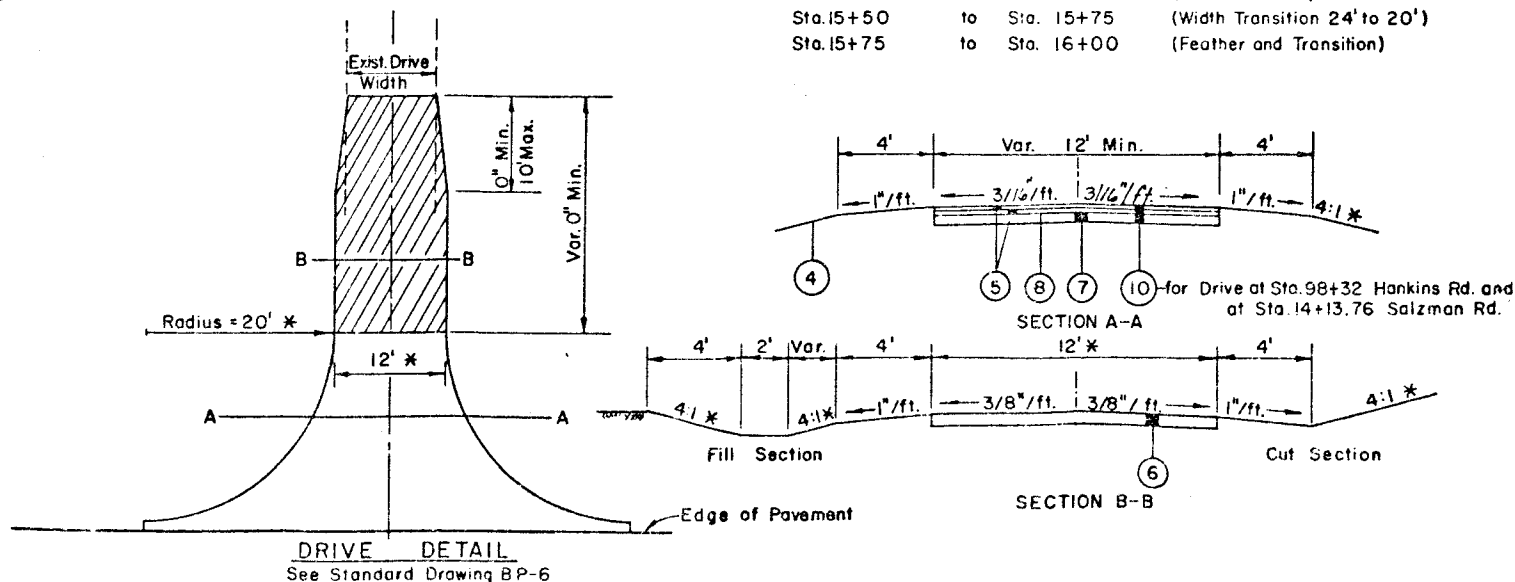
## LEGEND

- ① Item 404 1-1/4" Asphalt Concrete AC 20
- ② Item 301 5-1/2" Bituminous Aggregate Base 702.01 AC 20 or 702.09, Rt. II or Rt. 12
- ③ Item 606 Guard Rail, Type 5
- ④ Item 659 Seeding and Mulching (See General Note)
- ⑤ Item 404 1" Asphalt Concrete AC 20 2 Courses
- ⑥ Item 304 6" Aggregate Base
- ⑦ Item 304 4" Aggregate Base
- ⑧ Item 408 Bituminous Prime Coat; 702.09, RT-2 or RT-3, 702.02, MC-30 or MC-70, or 702.03, Primer 20, applied at the rate of 0.4 gallons per square yard
- ⑨ Item 402 1-1/4" Asphalt Concrete AC 20
- ⑩ Item 452 6" Plain Portland Cement Concrete Pavement



1. For details not shown, see Standard Construction Drawings.
2. Item numbers refer to the Ohio Dept. of Transportation Construction and Material Specifications.
3. Fills are measured from edge of shoulders to existing ground. Cuts are measured from bottom of ditch to existing ground.

\* Unless otherwise shown on plans



TYPICAL SECTIONS

# GENERAL NOTES

Quantities Computed By W. S. W.  
Checked By ALW. BLUM

| FHWA<br>REGION | STATE | PROJECT |  |
|----------------|-------|---------|--|
| 5              | OHIO  |         |  |

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BUTLER COUNTY  
HANKINS ROAD

## TREATED SANITARY FLOW INTO HIGHWAY DRAINAGE SYSTEMS

Treated sanitary flow may be discharged into the highway drainage system provided the owner has secured the approval of the local health authorities and has acquired from the State Department of Transportation, the official permit to have the connection made.

In each case where a permit has been issued for a sanitary connection to be made into a highway drainage conduit, it shall be provided with an inspection well, in accordance with the detail shown on standard drawing MC-8.

The following estimated quantities have been included in the general summary, for use as directed by the Engineer, in making the above described connections:

Item 603, 6" Conduit, Type C 50 L.F.

Item 604, Inspection Well 1 Each

Necessary bends or branches shall be included for payment in the pertinent conduit item.

None of the above materials shall be ordered by the Contractor until authorized by the Engineer.

## SEEDING

Quantities for seeding are calculated for the soil areas between the work limits, as shown on the cross sections.

## EROSION CONTROL

Items 601 and 660 are provided in the plans for erosion control. Rock of a stable nature will not be removed in order to place any of these items. The Engineer shall check and non-perform quantities or adjust locations and quantities for these items where indicated by field conditions during construction.

## TEMPORARY WATER POLLUTION, SOIL EROSION AND SILTATION CONTROL

The following estimated quantities are to be used as directed by the Engineer for erosion control measures:

|                                                             |      |            |
|-------------------------------------------------------------|------|------------|
| Item 207 Temporary Seeding and Mulching                     | 2300 | Sq. Yds.   |
| Item 659 Commercial Fertilizer (12-12-12)                   | 0.1  | Tons       |
| Item 207 Water                                              | 5    | M. Gal.    |
| Item 207 Temporary Slope Drains                             | 160  | Lin. Ft.   |
| Item 207 Temporary Benches, Dikes, Dams and Sediment Basins | 90   | Cu. Yds.   |
| Item 659 Repair Seeding and Mulching                        | 570  | Sq. Yds.   |
| Item 207 Mowing                                             | 26   | M. Sq. Ft. |

## (Cont.) FARM DRAINS

The following estimated quantities have been included in the General Summary for the work noted above:

|          |                    |     |          |
|----------|--------------------|-----|----------|
| Item 603 | 6" Conduit, Type B | 100 | Lin. Ft. |
| Item 603 | 6" Conduit, Type E | 100 | Lin. Ft. |
| Item 603 | 6" Conduit, Type F | 100 | Lin. Ft. |

|          |                    |     |          |
|----------|--------------------|-----|----------|
| Item 603 | 8" Conduit, Type B | 100 | Lin. Ft. |
| Item 603 | 8" Conduit, Type E | 100 | Lin. Ft. |
| Item 603 | 8" Conduit, Type F | 100 | Lin. Ft. |

Item 601, Rock Channel Protection Type B (18" thick) 5 Cu. Yds. with bedding

Necessary bends or branches shall be included for payment in the pertinent conduit item.

None of the above materials shall be ordered by the Contractor until requested by the Engineer.

## SPRING DRAINS

Reference is made to the detailed drawing on Standard Drawing MC-1 showing the method of draining any spring that may be shown on the plan or encountered during construction as determined by the Engineer. The following estimated quantities have been included in the general summary for this purpose:

Item 605 - 6" Unclassified Pipe Underdrain, 707.01 Type III or 707.12, as per plan 100 L.F.

Item 605 - Aggregate Drains for springs, as per plan 100 L.F.

The Contractor shall not order materials for "Spring Drains" until authorized by the Engineer and in the event no springs are encountered, the item shall be non performed.

## ANIMAL GUARD FOR PIPE OUTLETS

Animal guards shall be provided at the outlet end of all pipe underdrains and farm drains except when they outlet into a drainage structure. The animal guard shall comply with the detail shown on Sheet No. 25.

Payment for all material, labor and installation shall be included in the unit price bid per each for Item 603 Animal Guard for Pipe Outlet.

An estimated quantity, Item 603 2 each Animal Guard for Pipe Outlet has been provided in the general summary.

## UTILITY OWNERSHIP

Cincinnati Gas & Electric Company  
138 E. 4th St. Cincinnati, Ohio 45202

Ohio Bell Telephone Company  
1527 Central Avenue, Middletown, Ohio 45042

## MAIL BOX APPROACHES

Estimated quantities of Items 404, 408, & 304 are provided in the general summary for construction of mail box approaches at the locations directed by the Engineer.

Approximate mail box approach locations:

- A. Hankins Road (Bituminous Pavement)  
1. Sta. 95 + 40 Rt.  
2. Sta. 96 + 80 Rt.  
3. Sta. 97 + 94 Rt. (two boxes)  
4. Sta. 104 + 92 Rt. (two boxes)

- B. Salzman Road (Plain Concrete Pavement)  
1. Sta. 14 + 24 Lt.

## LOCATIONS OF GUARD RAIL

The locations of guard rail runs as shown in these plans are subject to adjustments to assure that the planned installations will afford maximum protection for traffic.

## REMOVAL OF EXISTING PIPE

The removal of all existing pipe drains which would normally be removed in various excavation items shall be included for payment in the unit prices bid for the respective excavation items, unless otherwise itemized in the plans.

## CONNECTIONS TO EXISTING PIPE

Where the plans provide for proposed conduit to be connected to, or to cross either over or under an existing sewer, it shall be the responsibility of the Contractor to locate the existing pipe both as to line and grade before he starts to lay the proposed conduit.

Payment for all operations described above shall be included in the unit price bid for the pertinent 603 conduit items.

## FARM DRAINS

All farm drains which are encountered during construction shall be provided with unobstructed outlets under the direction of the Engineer. Existing collectors which are located below the roadway ditch elevations and which cross the roadway shall be replaced within the right-of-way limits by Item 603 Conduit, Type B, one commercial size larger than the existing conduit.

Existing collectors and isolated farm drains which are encountered above the elevation of the roadway ditches shall be outletted into the roadway ditch by 603 Type F Conduit. The optimum outlet elevation shall be, if possible, one foot above the flowline elevation of the ditch.

The location, type, size and grade of required replacements shall be determined by the Engineer during construction and payment shall be made on final measurements.

(Cont.)

## ELEVATION DATUM

All elevations are based on U.S.G.S. DATUM.

## FIELD OFFICE

The Contractor shall provide a suitable field office having a minimum of 300 sq. ft. of floor space and in addition to the requirements of Item 619, he shall provide and maintain sanitary provisions as per 107.06. All the above is included in the lump sum price bid for Item 619 Field Office.

## ROUNDING OF CORNERS SHOWN ON CROSS SECTIONS

The rounded corners shown on the typical sections, apply to all cross sections even though otherwise shown on these plans.

## REMOVAL OF TREES AND STUMPS

All trees and stumps specifically marked for removal within the construction limits of this project shall be removed under the lump sum price bid for Item 201 Clearing and Grubbing, except that those trees for which protection and preservation work is indicated elsewhere in these plans shall not be removed.

The following is an approximate estimate of the number of trees and stumps to be removed.

| SIZES | NO. TREES | NO. STUMPS |
|-------|-----------|------------|
| 18"   | 3         | 2          |
| 30"   | 0         | 0          |
| 48"   | 0         | 0          |
| 60"   | 0         | 0          |

The above estimate is approximate and the State of Ohio reserves the right to order the removal of additional trees or stumps outside of the limits of construction but within the right-of-way and/or easement lines. Payment for the removal of these additional trees or stumps shall be included in the lump sum price bid for Item 201 Clearing and Grubbing.

## ESTIMATED QUANTITIES

Specific locations and usage of estimated quantities set up on this plan to be used "as directed by the Engineer" shall be made a matter of record by incorporation into the final change order governing completion of this project. Estimated quantities of materials shall not be ordered for delivery to the project unless authorized by the Engineer.

## UNDERGROUND UTILITIES

The locations of the underground utilities shown on the plans have been obtained by diligent field checks and searches of available records. It is believed that they are essentially correct, but the State of Ohio does not guarantee their accuracy or completeness.

## UTILITY ADJUSTMENT

Any or all work required for public utilities will be done by and at the expense of their respective owners, unless otherwise noted on these plans.

# GENERAL NOTES

Quantities Computed By HEC 5/1/74  
Checked By AWL 8/16/74

| FHWA<br>REGION | STATE | PROJECT |  |
|----------------|-------|---------|--|
| 5              | OHIO  |         |  |

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BUTLER COUNTY  
HANKINS ROAD

## MAINTENANCE OF TRAFFIC

The Contractor shall, in addition to the general requirements of Item 614 on this project perform the following:

Provide, erect, and maintain standard 48"x30" size "ROAD CLOSED" signs, sign supports, and lights at the following locations during the period in which the affected road is closed to traffic:

1. Hankins Rd. just east of Mauds-Hughes Rd. (TWP Rd. 138 B) intersection.
2. Hankins Rd. just west of Yankee Rd. (CR. 134 B) intersection.
3. Salzman Rd. just south of S.R. 63 intersection.

Payment for providing, erecting, maintaining, and removing lights, signs, and sign supports shall be included in the lump sum price bid for "Item 614 Maintaining Traffic".

The following quantities are provided for use in maintaining traffic and for dust control, as directed by the Engineer.

Item 410 Traffic Compacted Surface Type A or B 250 Cu.Yds.  
Item 616 Calcium Chloride 5 Tons  
Item 616 Water 5 M.Gal.

## ADDITIONAL GENERAL NOTES FOR STRUCTURE: HANKINS ROAD

### OVER

PENN CENTRAL R.R. (See Sheet No. 27  
42)

PROTECTION OF CONCRETE SURFACES: All surfaces of the piers above ground line and visible surfaces of the abutments which will be exposed to rust-laden water (corrosion resistant steel during initial weathering shall receive a clear vinyl resin coating to protect against absorptive staining. The coating shall be applied after the concrete has received a final surface finish including any grout cleaning or rubbing and before the erection of the structural steel.

Waterproof membrane curing compound and concrete curing and protective membrane, Supplemental Specification 836, shall not be used on the surfaces coated with clear protective coating. Such surfaces shall be water cured or, at the Contractor's option, two full coats of clear protective coating, each approximately 1 1/2 mils dry film thickness, may be applied to act as a combination curing compound and anti-staining agent.

The agent shall be applied by brush or roller, or by spraying, so that the surface of the concrete is completely and uniformly coated at the rate of one gallon per 200 square feet. This rate of application will provide a dry film thickness of 1 1/2 mils. If running or sagging occurs, the material shall be applied in two or more coats of approximately equal thickness. Not less than 10 minutes shall elapse between applications. When applied by spraying, the coating material may be thinned with not more than 10 percent toluene.

The composition of the clear protective coating shall be as follows:

|                             | Percent by Weight |
|-----------------------------|-------------------|
| Vinyl Resin *               | 25.0 min.         |
| Methyl Ethyl Ketone Solvent | 37.0 min.         |
| Toluene Solvent             | 37.0 min.         |

\*The resin shall be a vinyl chloride-acetate copolymer containing 86 percent vinyl chloride and 14 percent vinyl acetate. The viscosity of a 22 percent by weight solution of resin in a solvent, consisting of equal parts of Methyl Isobutyl Ketone and Toluene, shall be 250-500 centipoises at 77°F. The resin shall be Union Carbide's VYHH grade, or approved equal.

### Coating Properties:

|                                    |                     |
|------------------------------------|---------------------|
| Weight per gallon at 77°F, lb.     | 7.6 min.            |
| Consistency, Viscosity at 77°F, KU | 60-70               |
| Color                              | Clear and Colorless |
| Drying Time, hr.                   | 1/2 max.            |

The cost of this application shall be in the unit price bid for item Special, Sq. ft., Protection of Concrete Surfaces.

SUB SUMMARY

| ITEM 659                           |          |          |
|------------------------------------|----------|----------|
| FERTILIZER & SEEDING               | MATERIAL |          |
| ITEM                               | TOTAL    | UNIT     |
| Seeded Area                        | 12,398   | Sq. Yds. |
| Less Sod, RCP & Riprap Areas       | 1,023    | Sq. Yds. |
| Grand Total                        | 11,375   | Sq. Yds. |
| BRS-1665(1) Total                  | 563      | Sq. Yds. |
| RS-1665(1) Total                   | 10,812   | Yds.     |
| COMMERCIAL FERTILIZER              |          |          |
| (12-12-12) at 20 lbs./1000 Sq. Ft. |          |          |
| 11,375 x 9 x 20 ÷ 1000 ÷ 2000      | 1.02     | Tons     |
| Sodding 737 x 120 ÷                |          |          |
| 857 x 9 x 20 ÷ 1000 ÷ 2000         | 0.08     | Tons     |
| Grand Total                        | 1.10     | Tons     |
| RS-1665(1) Total                   | 1.05     | Tons     |
| BRS-1665(1) Total                  | .05      | Ton      |

ITEM 203

| EXCAVATION AND EMBANKMENT           |       |          |
|-------------------------------------|-------|----------|
|                                     |       | UNIT     |
| Excavation not incl. embank. const. |       |          |
| From Sheets 11, 12, 13, 14, and 15  | 937   | Cu. Yds. |
| From Sheet 16                       | 25    | Cu. Yds. |
| From Sheets 19, 20, and 21          | 487   | Cu. Yds. |
| From Sheet 24                       | 34    | Cu. Yds. |
| Total                               | 937   | Cu. Yds. |
| Embankment                          |       |          |
| From Sheets 11, 12, 13, 14 and 15   | 937   | Cu. Yds. |
| From Sheet 16                       | 530   | Cu. Yds. |
| From Sheets 19, 20 and 21           | 5,295 | Cu. Yds. |
| From Sheet 24                       | 28    | Cu. Yds. |
| Total                               | 937   | Cu. Yds. |

PAVEMENT QUANTITIES

203

| LOCATION             | LENGTH  | 301                                                                       | 404                           | 408                                                     | 304               | 404                                             | 408                   | 402                           | 452                                        | SUBGRADE COMPACTION |
|----------------------|---------|---------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------|-------------------|-------------------------------------------------|-----------------------|-------------------------------|--------------------------------------------|---------------------|
|                      |         | 5 1/2" Bituminous Aggregate Base 702.01, AC-20, or 702.09, RT-11 or RT-12 | 1 1/4" Asphalt Concrete AC 20 | Bituminous Prime Coat 702.03 RT-2 or RT-3 at 0.1 gal/sy | 6" Aggregate Base | 1" Asphalt Concrete (Driveways) AC 20 2 Courses | Bituminous Prime Coat | 1 1/4" Asphalt Concrete AC 20 | 6" Plain Portland Cement Concrete Pavement |                     |
| HANKINS ROAD         | Feet    | Cu. Yds.                                                                  | Cu. Yds.                      | Gal.                                                    | Cu. Yds.          | Cu. Yds.                                        | Gal.                  | Cu. Yds.                      | Sq. Yds.                                   | Sq. Yds.            |
| 99+00 to 99+34.47    | 34.47   | 12                                                                        | 2.66                          | 4.03                                                    |                   |                                                 |                       | 2.66                          |                                            | 76.60               |
| 92+00 to 92+25       | 25.00   | 1.80                                                                      | 0.96                          |                                                         |                   |                                                 |                       | 0.27                          |                                            |                     |
| 92+25 to 92+50       | 25.00   | 8.49                                                                      | 1.83                          |                                                         |                   |                                                 |                       | 1.83                          |                                            | 55.56               |
| 92+50 to 99+00       | 684.47  | 232                                                                       | 50.15                         |                                                         |                   |                                                 |                       | 50.15                         |                                            | 1444.44             |
| 100+85.73 to 102+00  | 114.27  | 40.74                                                                     | 8.82                          |                                                         |                   |                                                 |                       | 8.82                          |                                            | 253.93              |
| 102+00 to 105+50     | 350.00  | 124.76                                                                    | 27.00                         |                                                         |                   |                                                 |                       | 27.00                         |                                            | 777.78              |
| 105+50 to 105+75     | 25.00   | 8.49                                                                      | 1.83                          |                                                         |                   |                                                 |                       | 1.83                          |                                            | 52.78               |
| 105+75 to 106+00     | 25.00   | 1.89                                                                      | 0.96                          | 3.92                                                    |                   |                                                 |                       | 0.28                          |                                            |                     |
| SALZMAN ROAD         |         |                                                                           |                               |                                                         |                   |                                                 |                       |                               |                                            |                     |
| 10+08.22 to 10+56.61 | 48.39   | 30.65                                                                     | 6.75                          |                                                         |                   |                                                 |                       | 6.75                          |                                            | 194.37              |
| 10+56.61 to 15+50    | 493.39  | 209.39                                                                    | 45.68                         |                                                         |                   |                                                 |                       | 45.68                         |                                            | 1315.71             |
| 15+50 to 15+75       | 25.00   | 9.76                                                                      | 2.21                          |                                                         |                   |                                                 |                       | 2.21                          |                                            | 61.11               |
| 15+75 to 16+00       | 25.00   | 2.12                                                                      | 1.06                          | 3.89                                                    |                   |                                                 |                       | 0.39                          |                                            |                     |
| MAIL BOX APPROACHES  |         |                                                                           |                               |                                                         | 10.7              | 3.6                                             | 26                    |                               | 14                                         |                     |
| BRS-1665(1) TOTALS   | 1487.4  | 52.74                                                                     | 11.48                         |                                                         |                   |                                                 |                       | 11.48                         |                                            | 330.53              |
| RS-1665(1) TOTALS    | 1691.78 | 629.35                                                                    | 138.43                        | 11.84                                                   | 10.7              | 3.6                                             | 26                    | 136.39                        | 14                                         | 3901.75             |

Quantities: Computed By NEC 3/1/74  
Checked By AWL 8/16/74

| F H W A REGION | STATE | PROJECT |
|----------------|-------|---------|
| 5              | OHIO  |         |

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BUTLER COUNTY  
HANKINS ROAD

TYPE CODE 6203, Except as shown

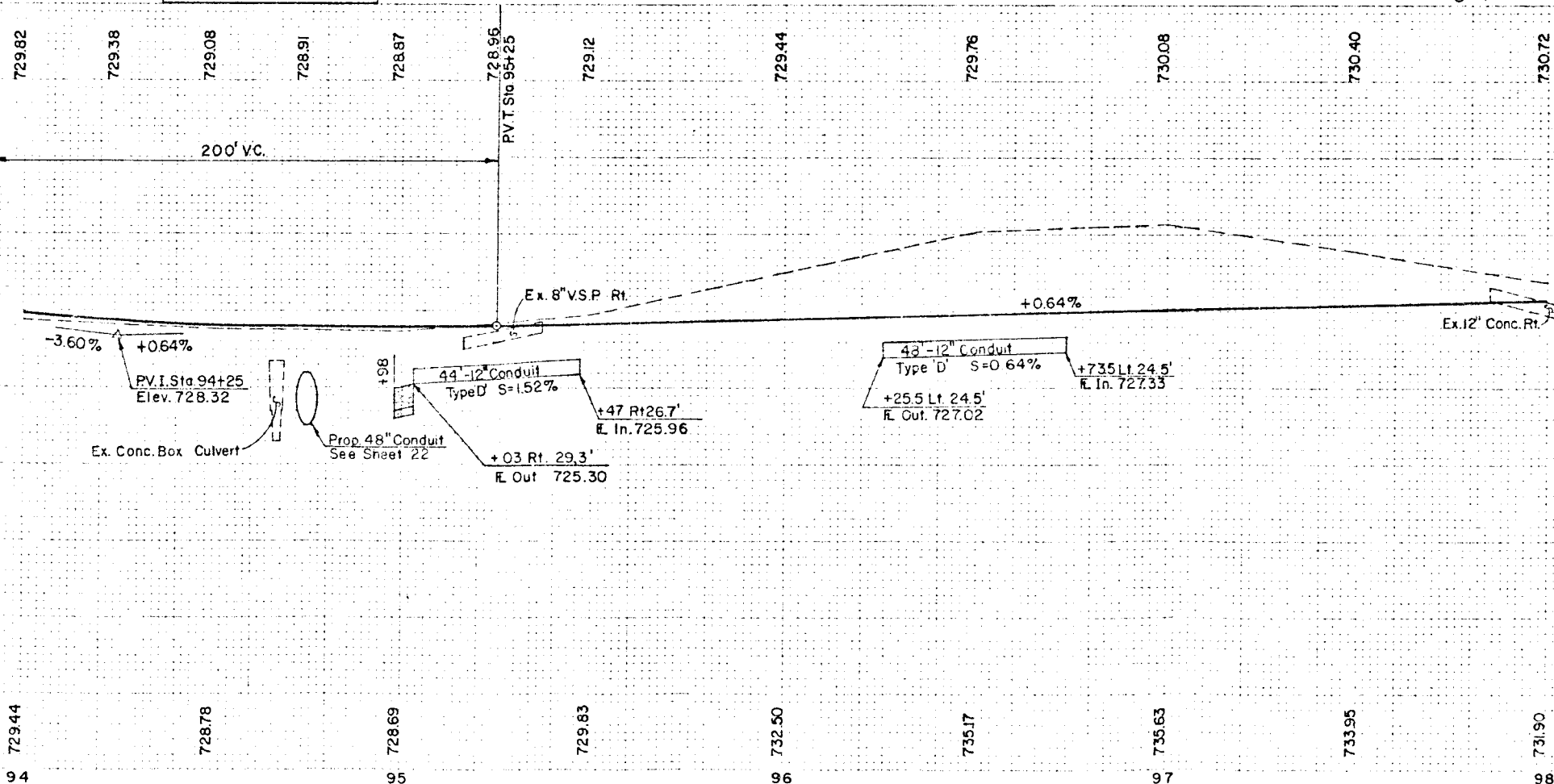
\* Farm Drain Crossings

★ BRS Funds

| GENERAL SUMMARY                                      |                                                                                           |            |                   |     |       |       |        |         |        |        |       |                  |                   |             |
|------------------------------------------------------|-------------------------------------------------------------------------------------------|------------|-------------------|-----|-------|-------|--------|---------|--------|--------|-------|------------------|-------------------|-------------|
| ITEM                                                 | DESCRIPTION                                                                               | UNIT       | FROM SHEET NUMBER |     |       |       |        |         |        |        |       | RS-1665(1) TOTAL | BRS-1665(1) TOTAL | GRAND TOTAL |
|                                                      |                                                                                           |            | 3 & 4             | 5 ★ | 5     | 6     | 7      | 8       | 9      | 17     | 18    |                  |                   |             |
| ROADWAY                                              |                                                                                           |            |                   |     |       |       |        |         |        |        |       |                  |                   |             |
| 201                                                  | Clearing and grubbing                                                                     | lump       |                   |     |       |       |        |         |        |        |       | lump             | lump              | lump        |
| 202                                                  | Pipe removed, 18" and under                                                               | lin. ft.   |                   |     |       | 63    | 41     | 20      | 62     |        |       | 186              |                   | 186         |
| 202                                                  | Structures removed                                                                        | lump       |                   |     |       |       | lump   |         |        | lump   |       | lump             |                   | lump        |
| 202                                                  | Pavement removed                                                                          | sq. yds.   |                   |     |       |       |        | 50      |        |        | 65    | 115              |                   | 115         |
| 203                                                  | Embankment                                                                                | cu. yds.   |                   | 937 | 8363  |       |        |         |        |        |       | 8363             | 937               | 9300        |
| 203                                                  | Excavation not including embankment construction                                          | cu. yds.   |                   | 9   | 5039  |       |        |         |        |        |       | 5039             | 9                 | 5048        |
| 203                                                  | Subgrade compaction                                                                       | sq. yds.   |                   | 331 | 3902  |       |        |         |        |        |       | 3902             | 331               | 4233        |
| 606                                                  | Guard rail, Type 5                                                                        | lin. ft.   |                   |     |       | 73.93 | 201.07 | 326.84★ | 371.27 | 632.25 | 79.62 | 1358.14          | 326.84            | 1684.98     |
| 606                                                  | Guard rail, Type 5, modified as per plan                                                  | lin. ft.   |                   |     |       | 37.5  | 18.75  |         |        | 18.75  |       | 75               |                   | 75          |
| 606                                                  | Anchor assembly                                                                           | each       |                   |     |       | 1     | 2      | 1★      | 2      | 1      | 1     | 7                | 1                 | 8           |
| 606                                                  | Bridge terminal assembly, Type A                                                          | each       |                   |     |       |       |        | 3★      |        | 1★     |       |                  | 4                 | 4           |
| 616                                                  | Calcium chloride                                                                          | tons       | 5                 |     |       |       |        |         |        |        |       | 5                |                   | 5           |
| 616                                                  | Water                                                                                     | M. gal.    | 5                 |     |       |       |        |         |        |        |       | 5                |                   | 5           |
| 410                                                  | Traffic compacted surface, Type A or B                                                    | cu. yds.   | 250               |     |       |       |        |         |        |        |       | 250              |                   | 250         |
| EROSION CONTROL Type code Y005                       |                                                                                           |            |                   |     |       |       |        |         |        |        |       |                  |                   |             |
| 207                                                  | Temporary seeding and mulching                                                            | sq. yds.   | 2300              |     |       |       |        |         |        |        |       | 2300             |                   | 2300        |
| 207                                                  | Water                                                                                     | M. gal.    | 5                 |     |       |       |        |         |        |        |       | 5                |                   | 5           |
| 207                                                  | Temporary slope drains                                                                    | lin. ft.   | 160               |     |       |       |        |         |        |        |       | 160              |                   | 160         |
| 207                                                  | Temporary benches, dikes, dams, and sediment basins                                       | cu. yds.   | 9                 |     |       |       |        |         |        |        |       | 9                |                   | 9           |
| 207                                                  | Mowing                                                                                    | M. sq. ft. | 26                |     |       |       |        |         |        |        |       | 26               |                   | 26          |
| 601                                                  | Riprap using 6" reinforced concrete slab                                                  | sq. yds.   |                   |     |       |       | 33     |         |        | 39     |       | 72               |                   | 72          |
| 601                                                  | Rock channel protection, Type B with bedding                                              | cu. yds.   | 5                 |     |       | 5     | 34     |         | 3      | 48     |       | 95               |                   | 95          |
| 659                                                  | Commercial fertilizer (12-12-12)                                                          | tons       | 0.1               | .05 | 1.05  |       |        |         |        |        |       | 1.15             | .05               | 1.2         |
| 659                                                  | Seeding and mulching                                                                      | sq. yds.   |                   | 563 | 10812 |       |        |         |        |        |       | 10812            | 563               | 11375       |
| 659                                                  | Repair seeding and mulching                                                               | sq. yds.   | 570               |     |       |       |        |         |        |        |       | 570              |                   | 570         |
| 660                                                  | Sodding                                                                                   | sq. yds.   |                   |     |       | 268   | 178    |         | 155    | 136    |       | 737              |                   | 737         |
| 660                                                  | Sodding for special berm and slope protection, as per plan                                | sq. yds.   |                   |     |       |       |        | 120★    |        |        |       |                  | 120               | 120         |
| DRAINAGE                                             |                                                                                           |            |                   |     |       |       |        |         |        |        |       |                  |                   |             |
| 602                                                  | Concrete masonry                                                                          | cu. yds.   |                   |     |       |       | 2.7    | 0.5     |        | 3.6    |       | 6.8              |                   | 6.8         |
| 603                                                  | 6" Conduit, Type B                                                                        | lin. ft.   | 100               |     |       |       |        |         |        |        |       | 100              |                   | 100★        |
| 603                                                  | 6" Conduit, Type C                                                                        | lin. ft.   | 50                |     |       |       |        |         |        |        |       | 50               |                   | 50          |
| 603                                                  | 6" Conduit, Type E                                                                        | lin. ft.   | 100               |     |       |       |        |         |        |        |       | 100              |                   | 100         |
| 603                                                  | 6" Conduit, Type F                                                                        | lin. ft.   | 100               |     |       |       |        |         |        |        |       | 100              |                   | 100         |
| 603                                                  | 8" Conduit, Type B                                                                        | lin. ft.   | 100               |     |       |       |        |         |        |        |       | 100              |                   | 100★        |
| 603                                                  | 8" Conduit, Type E                                                                        | lin. ft.   | 100               |     |       |       |        |         |        |        |       | 100              |                   | 100         |
| 603                                                  | 8" Conduit, Type F                                                                        | lin. ft.   | 100               |     |       |       |        | 80★     |        |        |       | 100              | 80                | 180         |
| 603                                                  | 12" Conduit, Type D                                                                       | lin. ft.   |                   |     |       |       | 92     |         | 46     |        | 50    | 188              |                   | 188         |
| 603                                                  | 15" Conduit, Type A                                                                       | lin. ft.   |                   |     |       |       |        | 88      |        |        |       | 88               |                   | 88          |
| 603                                                  | Conduit, Type D, 15" 706.01, 706.02 or 706.08; or 18" 707.01                              | lin. ft.   |                   |     |       |       |        |         | 62     |        |       | 62               |                   | 62          |
| 603                                                  | 30" Conduit, Type D                                                                       | lin. ft.   |                   |     |       | 42    |        |         |        |        |       | 42               |                   | 42          |
| 603                                                  | Conduit, Type A, 48" 706.02 or 54" 707.07                                                 | lin. ft.   |                   |     |       |       | 56     |         |        |        |       | 56               |                   | 56          |
| 603                                                  | Conduit, Type A, 54" 706.02 Class III or 60" 707.07                                       | lin. ft.   |                   |     |       |       |        |         |        | 108    |       | 108              |                   | 108         |
| 604                                                  | Inspection well                                                                           | each       | 1                 |     |       |       |        |         |        |        |       | 1                |                   | 1           |
| 605                                                  | 6" Unclassified pipe underdrain, 707.01 Type III or 707.12 as per plan                    | lin. ft.   | 100               |     |       |       |        |         |        |        |       | 100              |                   | 100         |
| 605                                                  | Aggregate drains for springs, as per plan                                                 | lin. ft.   | 100               |     |       |       |        |         |        |        |       | 100              |                   | 100         |
| 603                                                  | Animal guard for pipe outlet                                                              | each       | 2                 |     |       |       |        |         |        |        |       | 2                |                   | 2           |
| PAVEMENT                                             |                                                                                           |            |                   |     |       |       |        |         |        |        |       |                  |                   |             |
| 301                                                  | Bituminous aggregate base: 702.01, AC 20 or 702.09, RT. II or RT. 12                      | cu. yds.   |                   | 53  | 629   |       |        |         |        |        |       | 629              | 53                | 682         |
| 304                                                  | Aggregate base                                                                            | cu. yds.   |                   |     | 11    | 7     | 42     |         | 18     |        |       | 78               |                   | 78          |
| 402                                                  | Asphalt concrete, AC 20                                                                   | cu. yds.   |                   | 12  | 136   |       |        |         |        |        |       | 136              | 12                | 148         |
| 404                                                  | Asphalt concrete, AC 20                                                                   | cu. yds.   |                   | 12  | 135   |       |        |         |        |        |       | 138              | 12                | 150         |
| 408                                                  | Bituminous prime coat: 702.09, RT-2 or RT-3; 702.02, MC-30 or MC-70; or 702.03, Primer 20 | gal.       |                   |     | 36    | 22    | 69     |         | 61     |        |       | 190              |                   | 190         |
| 452                                                  | 6" Plain portland cement concrete pavement                                                | sq. yds.   |                   |     | 14    |       |        | 66      |        |        | 96    | 176              |                   | 176         |
| 404                                                  | Asphalt concrete (Driveways) AC 20                                                        | cu. yds.   |                   |     | 4     | 3     | 10     |         | 8      |        |       | 25               |                   | 25          |
| 619                                                  | Field office                                                                              | lump       | lump              |     |       |       |        |         |        |        |       | lump             | lump              | lump        |
| 614                                                  | Maintaining traffic                                                                       | lump       | lump              |     |       |       |        |         |        |        |       | lump             | lump              | lump        |
| 623                                                  | Construction layout stakes                                                                | lump       |                   |     |       |       |        |         |        |        |       | lump             | lump              | lump        |
| Quantities for Structures Over 20' Span See Sheet 28 |                                                                                           |            |                   |     |       |       |        |         |        |        |       |                  |                   |             |

SUB SUMMARY AND GENERAL SUMMARY





Quantities Computed By HEC 5/1/74  
Checked By AWW 8/16/74

|            |       |         |           |
|------------|-------|---------|-----------|
| FHA REGION | STATE | PROJECT | SHEET NO. |
| 5          | OHIO  |         | 7/42      |

BUTLER COUNTY-HANKINS ROAD

ESTIMATED QUANTITIES

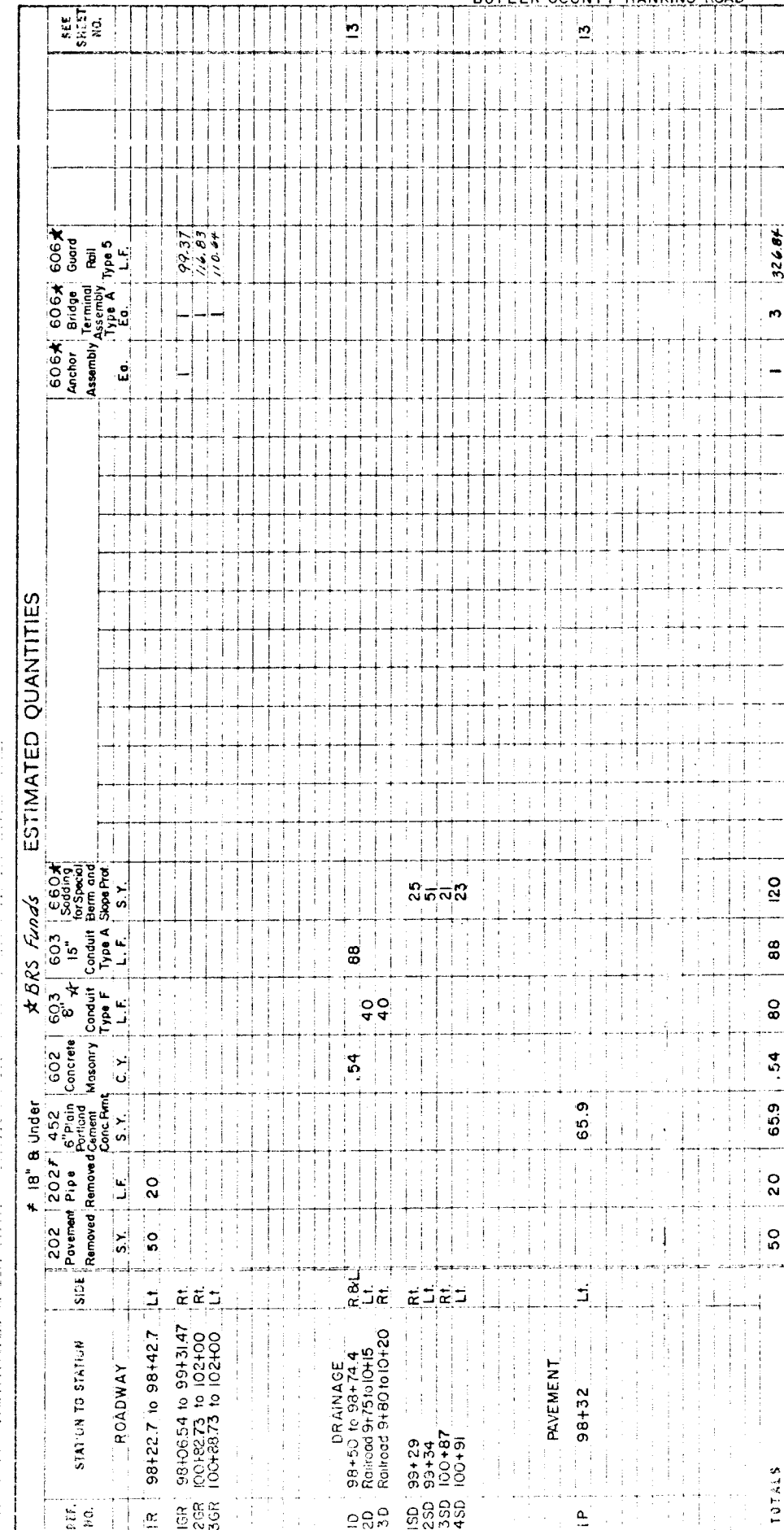
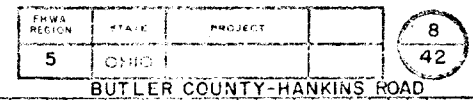
\*48"-706.02 or 54"-707.07

\*18" & Under

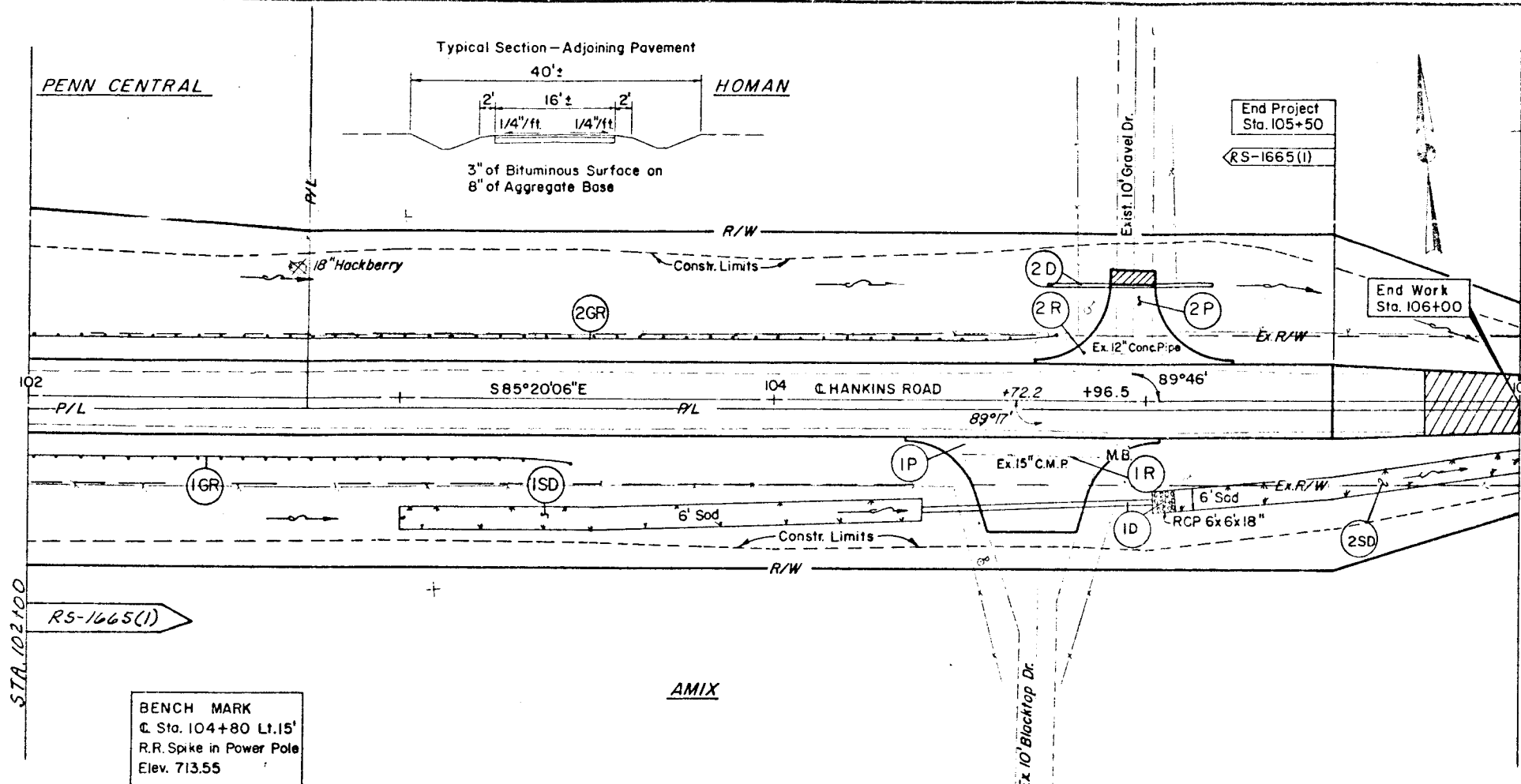
▲ With Bedding

| ITEM NO. | STATION TO STATION | 202               | 202* | 601  | 602      | 603     | 603*    | 603     | 606     | 606    | 606        | 606     | 606      | 606       | SEE SHEET NO. |
|----------|--------------------|-------------------|------|------|----------|---------|---------|---------|---------|--------|------------|---------|----------|-----------|---------------|
|          |                    | Structure Removed | Pipe | Rock | Concrete | Conduit | Conduit | Conduit | Sodding | Riprap | Guard Rail | Asphalt | Concrete | Aggregate |               |
|          |                    | Lump              | L.F. | C.Y. | C.Y.     | Type A  | Type A  | Type D  | S.Y.    | S.Y.   | Type 5 Mod | Base    | Base     | Base      |               |
|          |                    | Lump              | L.F. | C.Y. | C.Y.     | Type A  | Type A  | Type D  | S.Y.    | S.Y.   | Type 5 Mod | Base    | Base     | Base      |               |
| IR       | 94+672             | Lump              |      |      |          |         |         |         |         |        |            |         |          |           |               |
| 2R       | 95+158 to 95+371   | Rt.               | 23   |      |          |         |         |         |         |        |            |         |          |           |               |
| 3R       | 97+85 to 98+015    | Rt.               | 18   |      |          |         |         |         |         |        |            |         |          |           |               |
| IGR      | 94+00 to 95+50     | Lt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| 2GR      | 94+00 to 95+166    | Rt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| DRAINAGE |                    |                   |      |      |          |         |         |         |         |        |            |         |          |           |               |
| ID       | 94+75              | Lt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| 2D       | 95+11 to 95+43     | Lt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| 3D       | 96+25.5 to 96+73.5 | Lt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| ISD      | 94+00 to 94+58     | Lt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| 2SD      | 94+00 to 94+70     | Lt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| 3SD      | 94+79 to 95+50     | Lt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| 4SD      | 94+58 to 94+98     | Rt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| 5SD      | 94+71 to 94+87     | Rt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| PAVEMENT |                    |                   |      |      |          |         |         |         |         |        |            |         |          |           |               |
| IP       | 95+25              | Rt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| 2P       | 97+80              | Rt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| 3P       | 96+47              | Lt.               |      |      |          |         |         |         |         |        |            |         |          |           |               |
| TOTALS   |                    |                   |      |      |          |         |         |         |         |        |            |         |          |           |               |
|          |                    | Lump              | 41   | 34   | 2.66     | 56      | 92      | 178     | 33      |        | 18.75      | 19.29   | 23.23    | 9.65      | 201.07        |

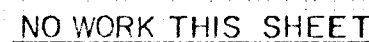
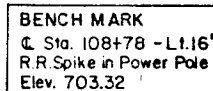
HANKINS RD. STA. 94+00 to 98+00



HANKINS RD. STA. 98+00 to 102+00



| ESTIMATED QUANTITIES #18" & Under |                      | SEE SHEET NO. |                         | 15     |        |
|-----------------------------------|----------------------|---------------|-------------------------|--------|--------|
| ITEM NO.                          | STATION TO STATION   | ITEM NO.      | STATION TO STATION      | QTY    | QTY    |
| ROADWAY                           | 104+50.5 to 104+88.5 | 408           | Asphalt Bituminous      | 39.96  | 60.63  |
|                                   | 104+88.5 to 105+06.5 | 404           | Concrete Prime Coat     | 2.87   | 8.42   |
|                                   | 105+06.5 to 105+19   | 304           | 6" Aggregate Base       | .87    | .87    |
|                                   | 105+19 to 106+00     | 304           | 4" Aggregate Base       | 5.74   | 16.84  |
| DRAINAGE                          | 104+40 to 105+08     | 601           | Rock Channel Protection |        | 3      |
|                                   | 105+08 to 105+19     | 606           | Guard Rail              | 120.04 | 371.27 |
|                                   | 105+19 to 106+00     | 606           | Anchor Assembly         | 251.23 | 2      |
|                                   | 106+00 to 106+00     | 603           | 12" Conduit Type D      |        | 46     |
| PAVEMENT                          | 104+72.2 to 104+96.5 | 603           | * Conduit Type D        | 62     | 62     |
|                                   | 104+96.5 to 105+08   | 660           | Sodding                 | 93     | 155    |
|                                   | 105+08 to 106+00     | 202           | Pipe Remove             | 38     | 62     |
|                                   | 106+00 to 106+00     | 202           | Pipe Remove             | 24     |        |
| TOTALS                            |                      |               |                         |        |        |



HANKINS RD. STA.106+00 to 110+00



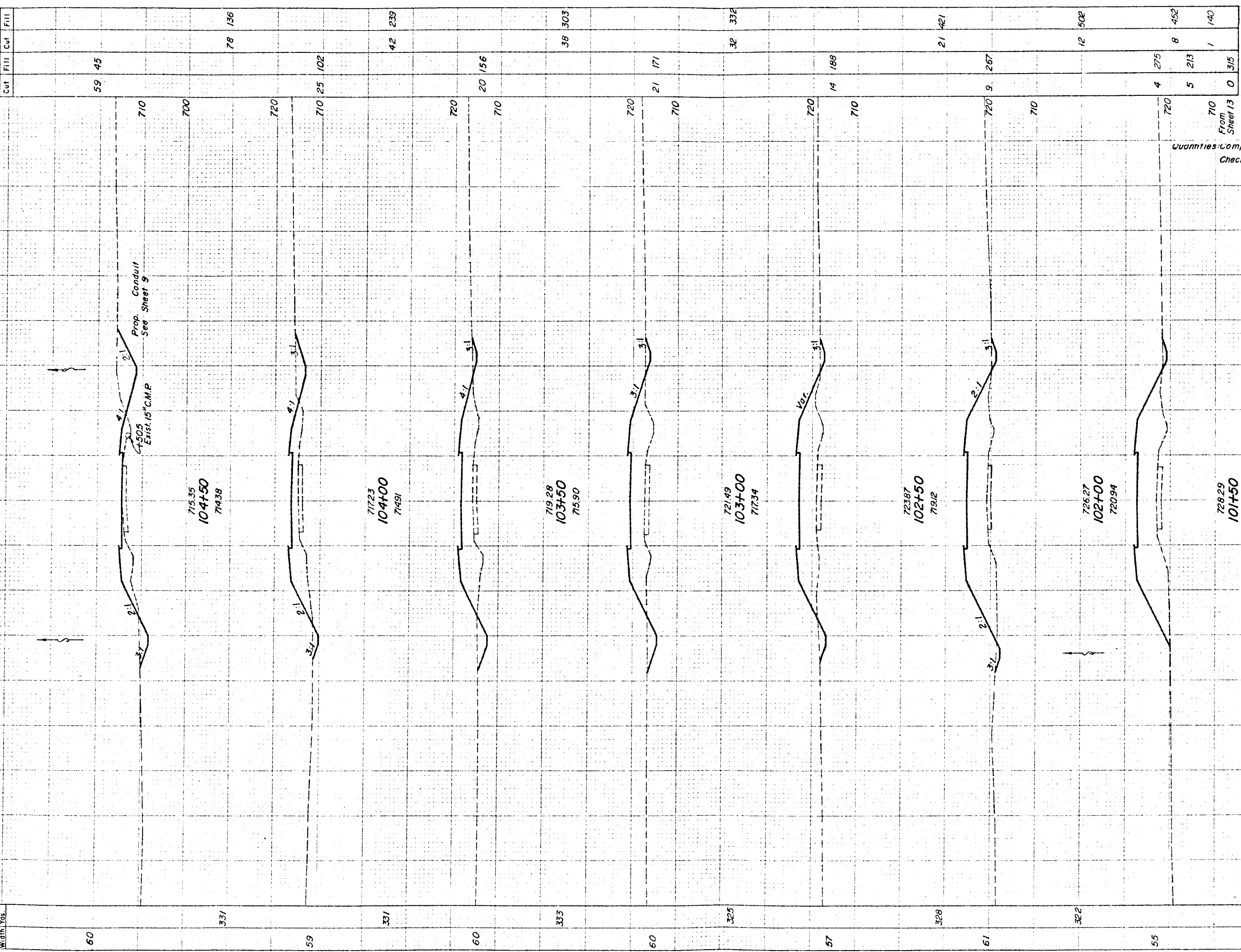


|                |       |         |  |
|----------------|-------|---------|--|
| FHWA<br>REGION | STATE | PROJECT |  |
| 5              | OHIO  |         |  |

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42

BUTLER COUNTY  
HANKINS ROAD





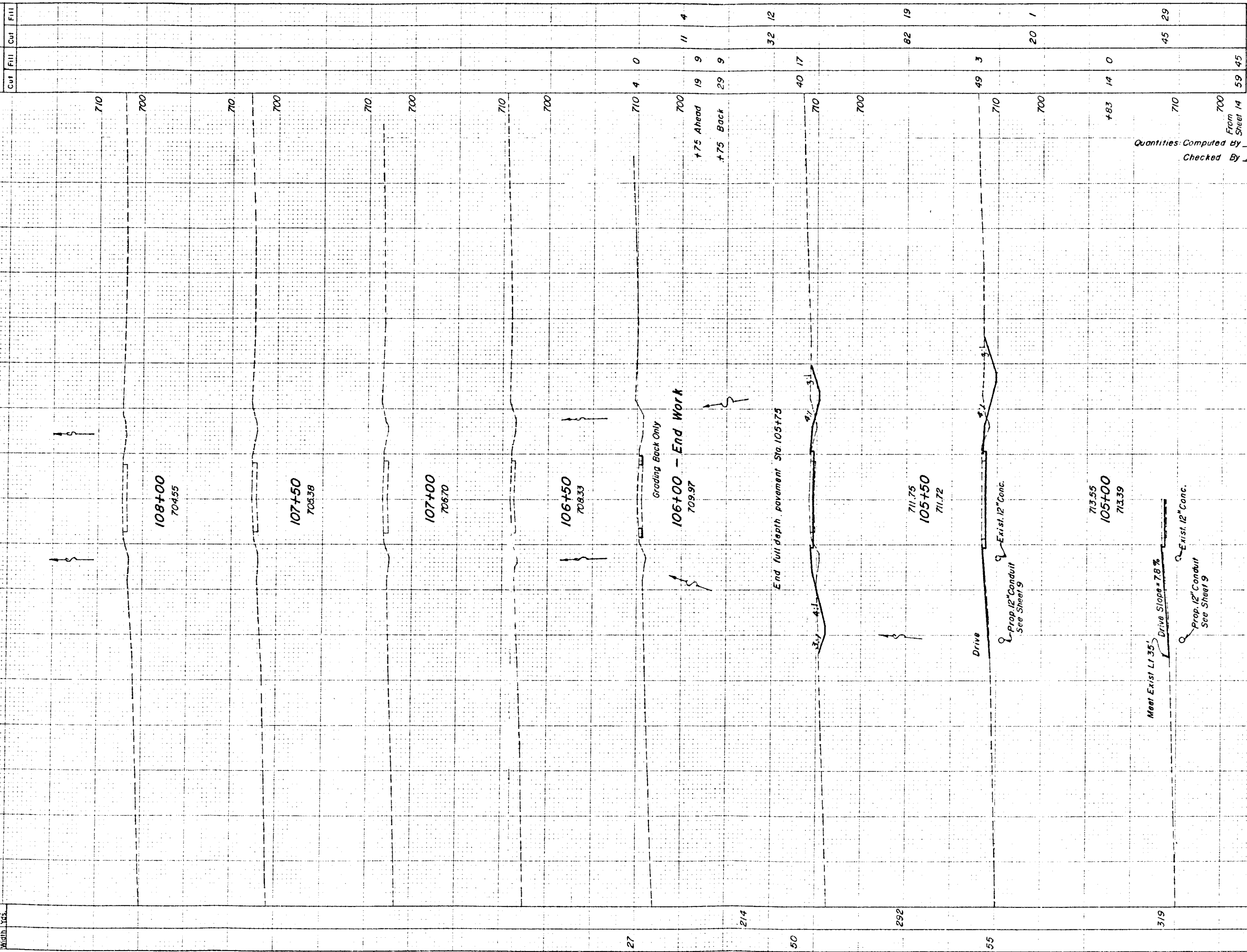
|             |       |         |  |
|-------------|-------|---------|--|
| FWHA REGION | STATE | PROJECT |  |
| 5           | OHIO  |         |  |

BUTLER COUNTY  
HANKINS ROAD

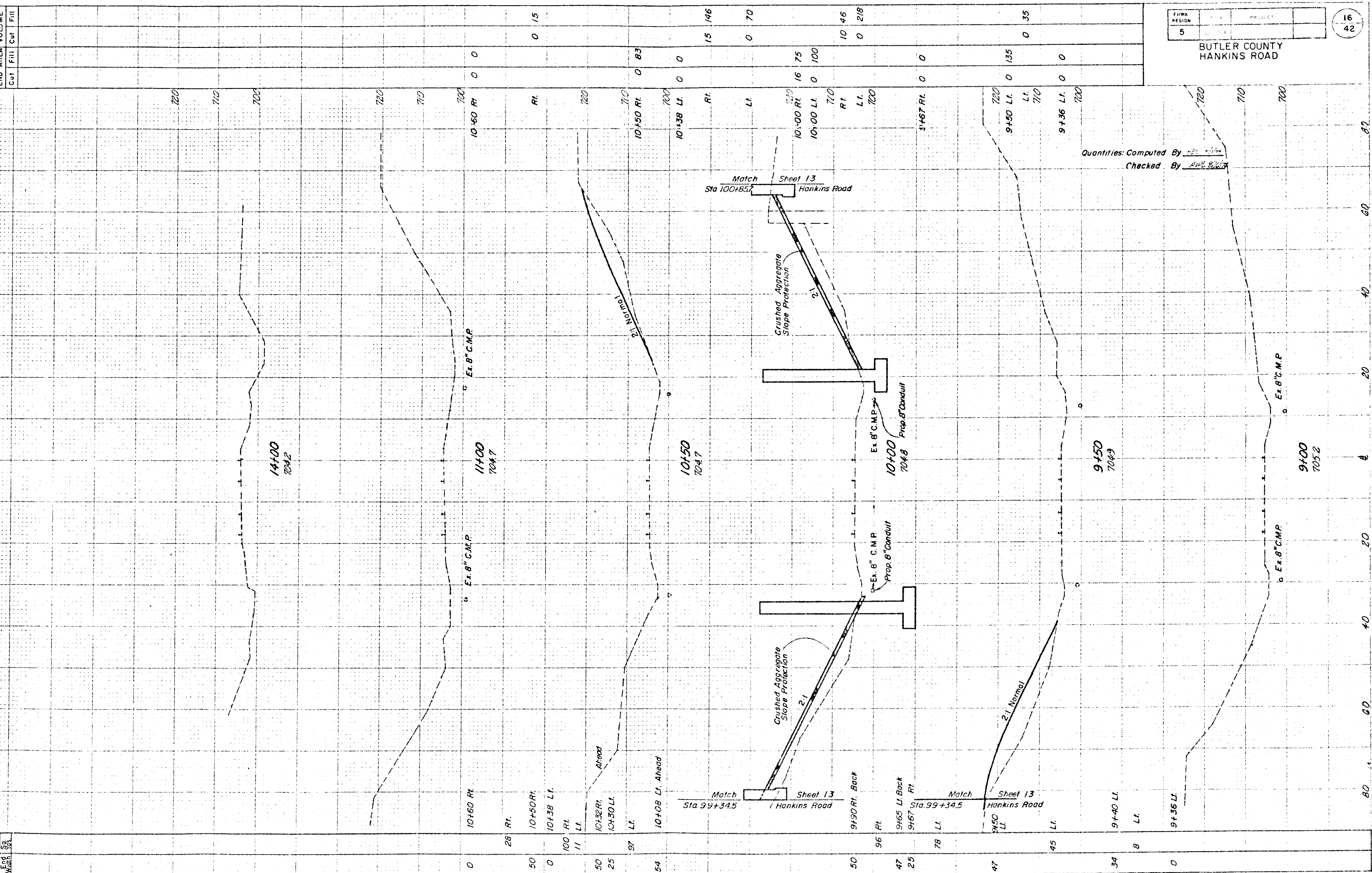
|    |
|----|
| 14 |
| 42 |

Quantities Computed By AWL 8/14/77  
Checked By AWL 8/14/77

X-SECTIONS HANKINS RD. STA. 101+00 to 104+50



Quantities Computed By REV 3/1/14  
Checked By AW 8/14/14



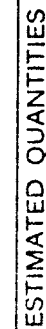
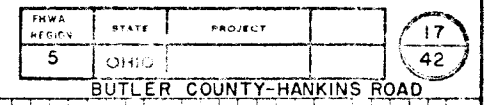
| LINE AREA | Cut | Fill | Volume |
|-----------|-----|------|--------|
| 14+00     | 0   | 0    | 0      |
| 13+50     | 0   | 0    | 0      |
| 13+00     | 0   | 0    | 0      |
| 12+50     | 0   | 0    | 0      |
| 12+00     | 0   | 0    | 0      |
| 11+50     | 0   | 0    | 0      |
| 11+00     | 0   | 0    | 0      |
| 10+50     | 0   | 0    | 0      |
| 10+00     | 0   | 0    | 0      |
| 9+50      | 0   | 0    | 0      |
| 9+00      | 0   | 0    | 0      |

|                               |    |
|-------------------------------|----|
| 16                            | 42 |
| BUTLER COUNTY<br>HANKINS ROAD |    |

Quantities Computed By W.E. Smith  
 Checked By W.E. Smith

|                     |           |           |           |         |        |           |           |                 |               |               |          |          |          |          |   |   |
|---------------------|-----------|-----------|-----------|---------|--------|-----------|-----------|-----------------|---------------|---------------|----------|----------|----------|----------|---|---|
| End of<br>Main Line | 0         | 28        | 50        | 0       | 50     | 25        | 54        | 0               | 50            | 47            | 25       | 78       | 47       | 34       | 8 | 0 |
|                     | 10+60 Rt. | 10+50 Rt. | 10+38 Lt. | 100 Rt. | 11 Lt. | 10+32 Rt. | 10+30 Lt. | 10+08 Lt. Ahead | 9+50 Rt. Back | 9+65 Lt. Back | 9+67 Rt. | 9+50 Lt. | 9+40 Lt. | 9+36 Lt. |   |   |

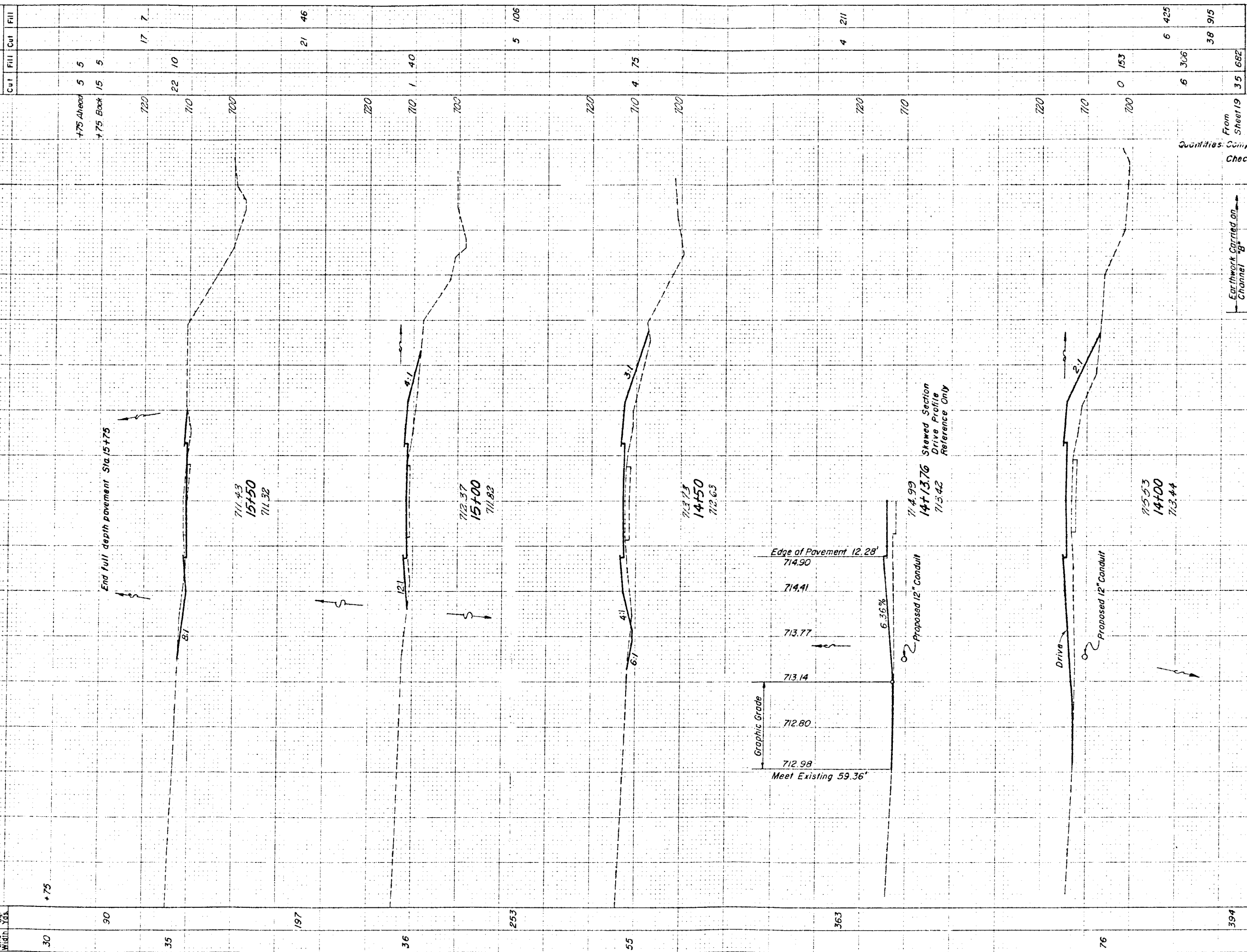
X-SECTIONS RAILROAD STA. 9+00 to 14+00



SALZMAN RD. STA. 9+97.88 to 14+00

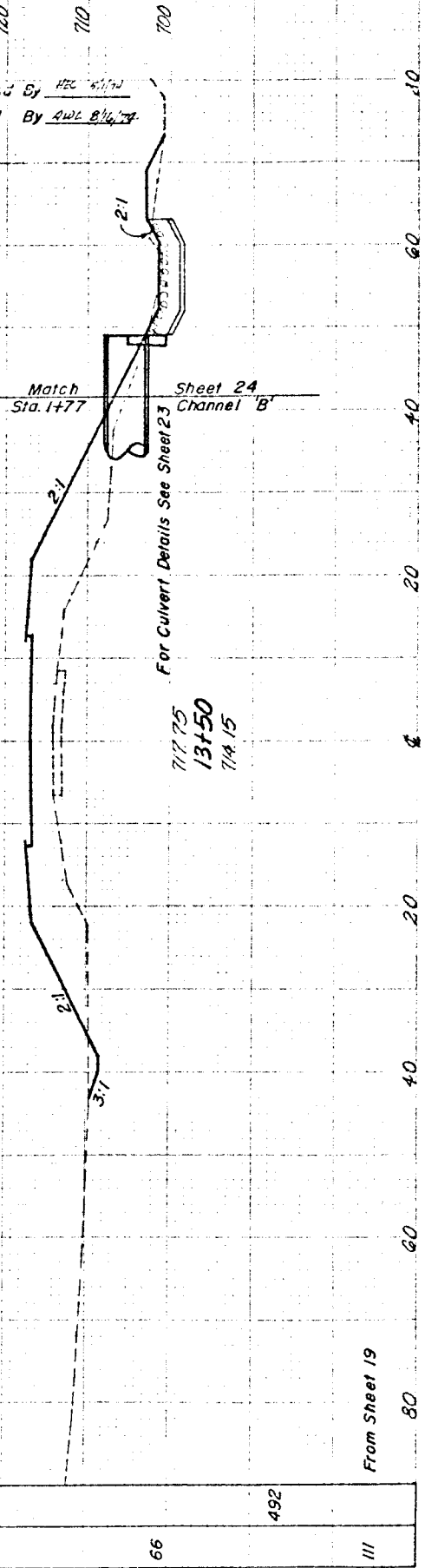






|             |       |         |          |
|-------------|-------|---------|----------|
| FWHA REGION | STATE | PROJECT | 20<br>42 |
| 5           | OHIO  |         |          |

BUTLER COUNTY  
HANKINS ROAD



Quantities Computed By REC 6/1/70  
 Checked By RWL 8/16/74

X-SECTIONS SALZMAN RD. STA. 13+50 to 15+50

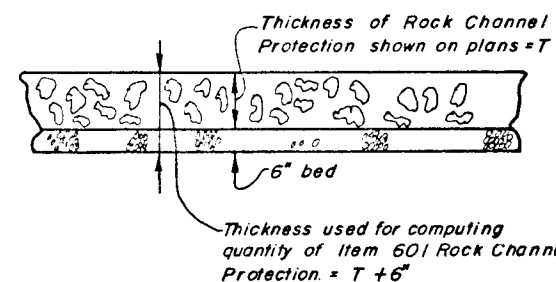


| FHWA<br>REGION | STATE | PROJECT | FISCAL<br>YEAR |
|----------------|-------|---------|----------------|
| 5              | OHIO  |         |                |

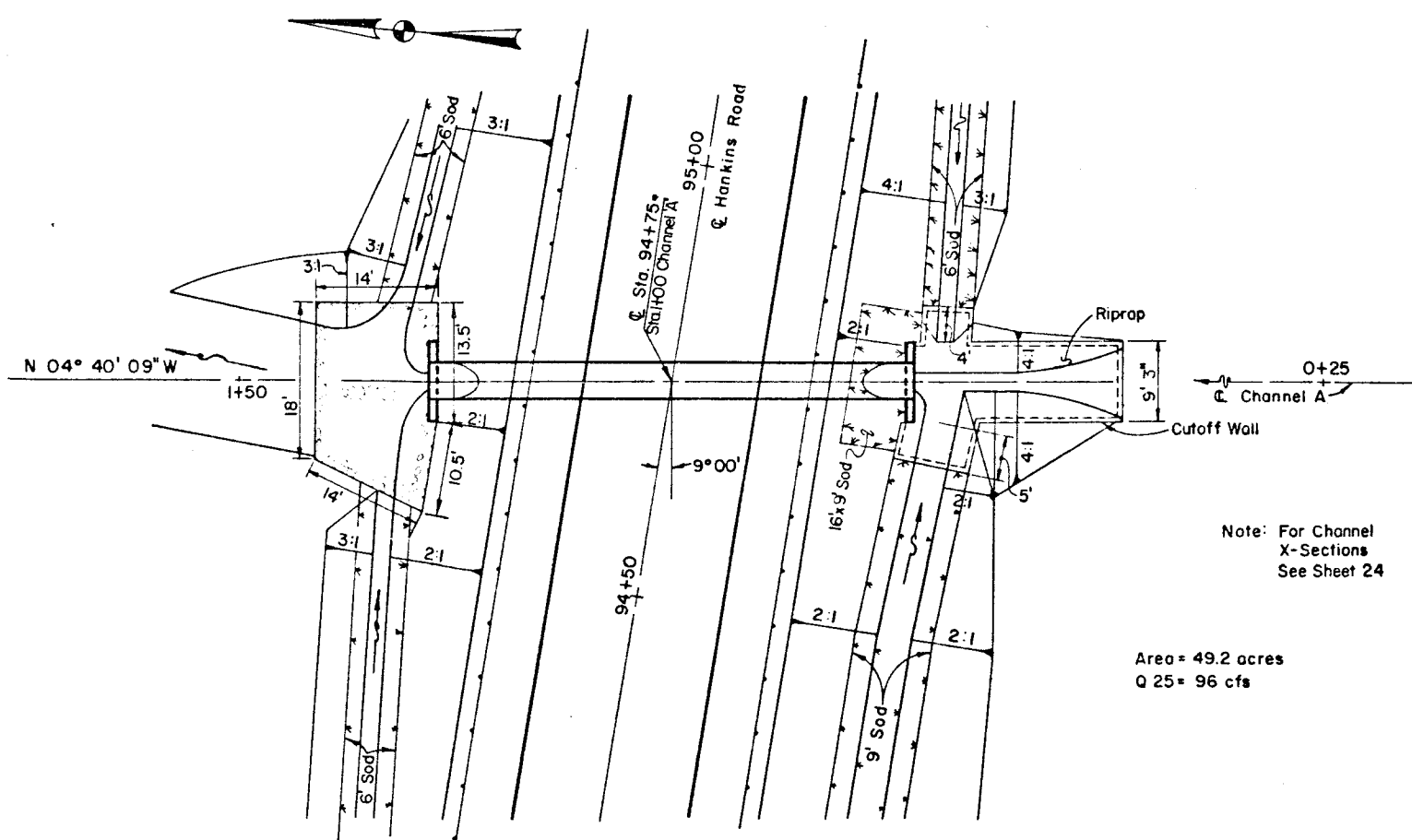
22  
42

BUTLER COUNTY  
HANKINS ROAD

Quantities Computed By HEC S.M.  
Checked By A.W. Bluff

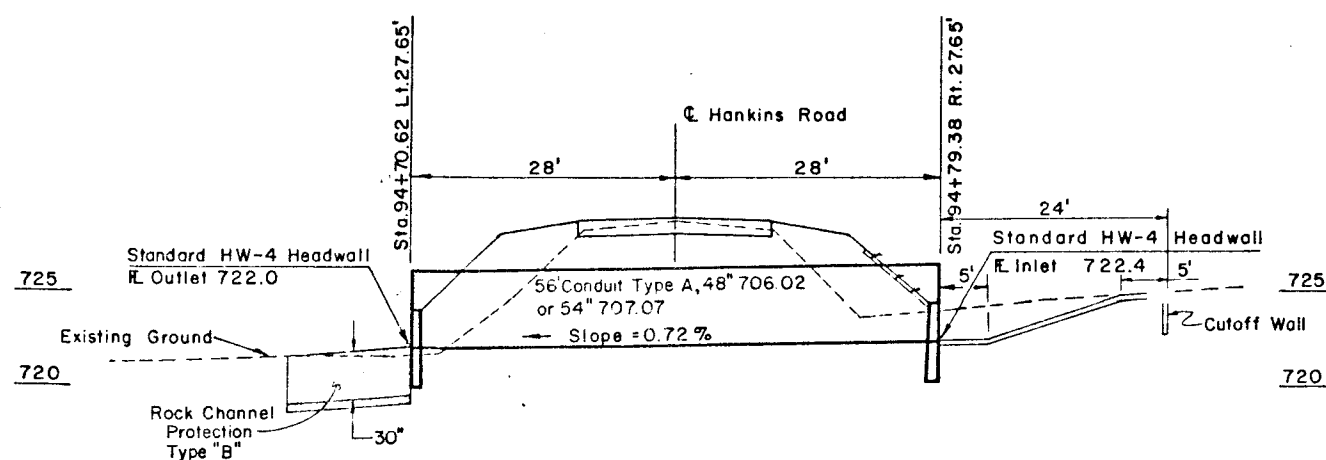


DETAIL OF ROCK CHANNEL PROTECTION



ESTIMATED QUANTITIES

|     |                                              |              |
|-----|----------------------------------------------|--------------|
| 601 | Rock Channel Protection, Type B <sub>n</sub> | 32 Cu. Yd.   |
| 602 | Concrete Masonry                             | 2.66 Cu. Yd. |
| 603 | Conduit Type A, 48" 706.02 or 54" 707.07     | 56 Lin. Ft.  |
| 601 | Riprap, using 6" reinforced Concrete Slab    | 33 S.Y.      |



| FHWA<br>REGION | STATE | PROJECT | FISCAL<br>YEAR |
|----------------|-------|---------|----------------|
| 5              |       |         |                |

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42

BUTLER COUNTY  
HANKINS ROAD

Quantities Computed By REC 5/1/72  
Checked By REC 8/1/72

Area = 74.8 acres  
Q25 = 135 cfs

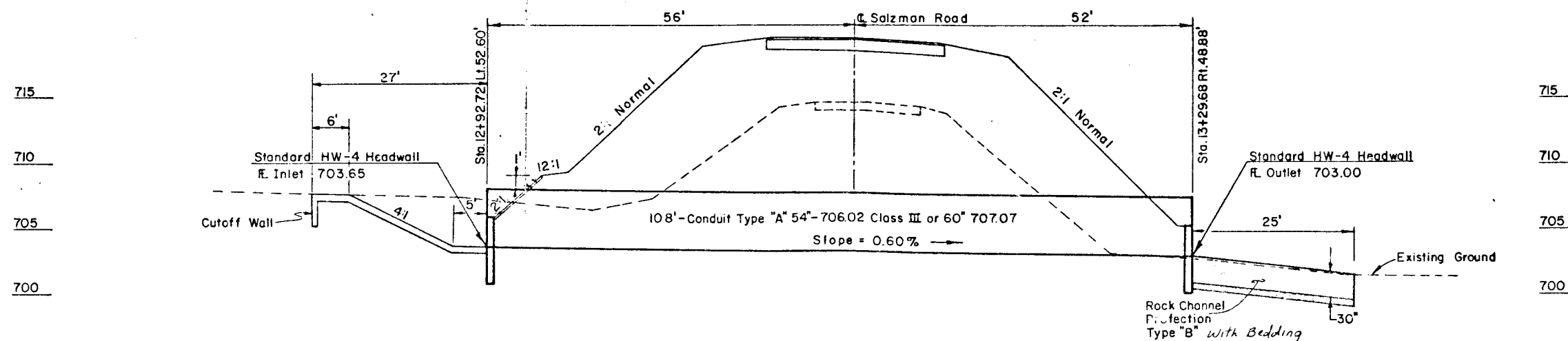
#### ESTIMATED QUANTITIES

|     |                                                        |           |
|-----|--------------------------------------------------------|-----------|
| 601 | Riprap, using 6" reinforced<br>Concrete Slab           | 39 S.Y.   |
| 601 | Rock Channel Protection Type "B"<br>with Bedding       | 48 C.Y.   |
| 602 | Concrete Masonry                                       | 3.56 C.Y. |
| 603 | Conduit Type "A" 54" 706.02<br>Class III or 60" 707.07 | 108 L.F.  |

Note: For Channel X-Sections  
see sheet 24

P.I. Channel "B" Sta. 1+63.53 Back =  
Sta. 1+60.45 Ahead

$\Delta = 71^\circ 32' 40''$   
 $R = 1600'$   
 $T = 11.53'$   
 $L = 19.98'$   
 $E = 3.72'$

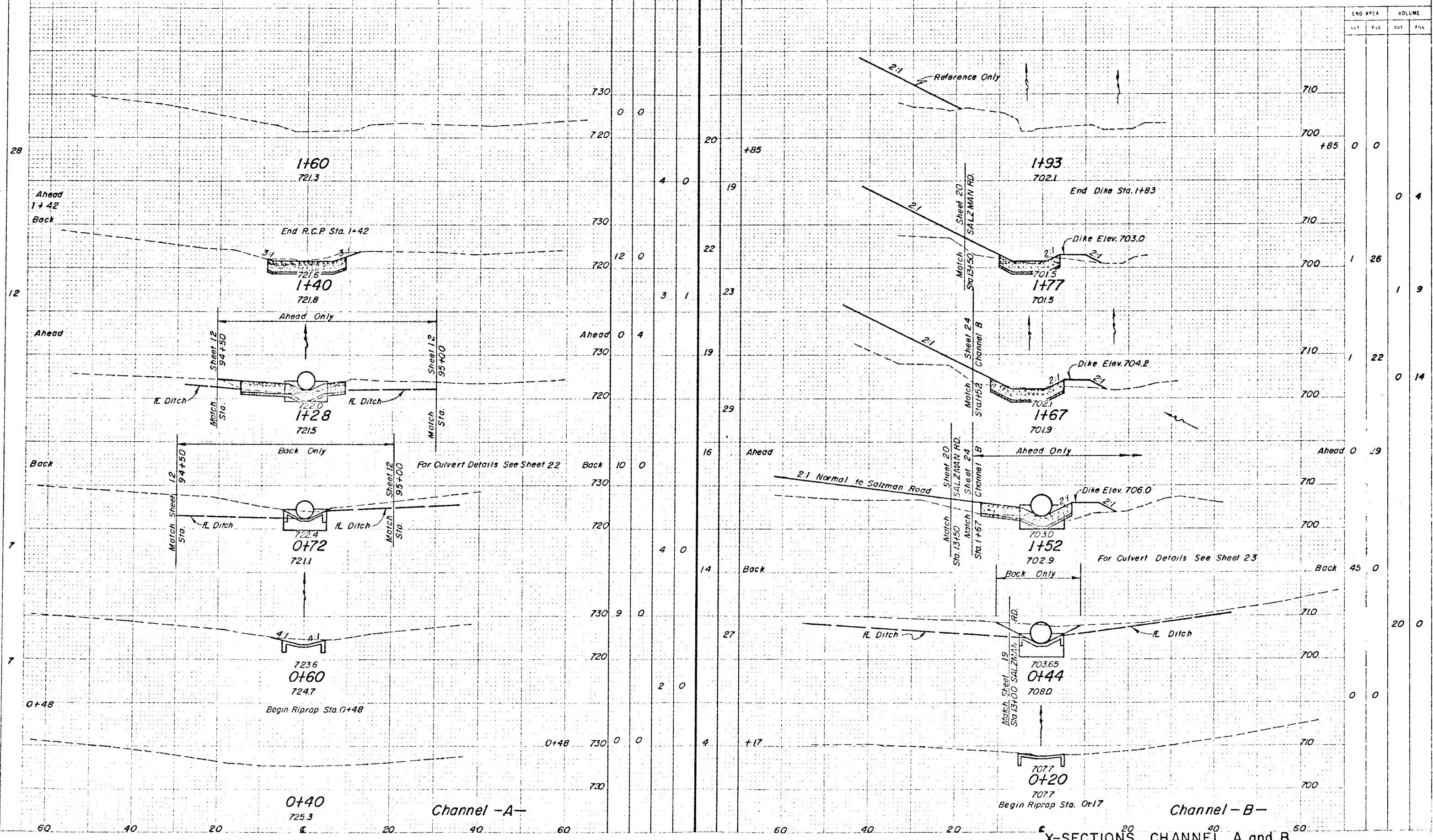


CULVERT DETAILS

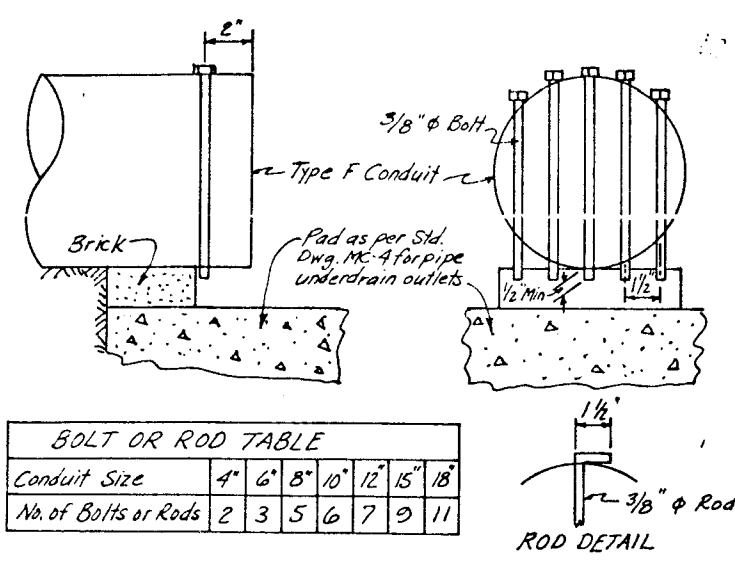
FEEDING  
IN  
YDS

BUTLER COUNTY  
HANKINS ROAD

Quantities Computed By Lee E. Smith  
Checked By AWL 8/16/74

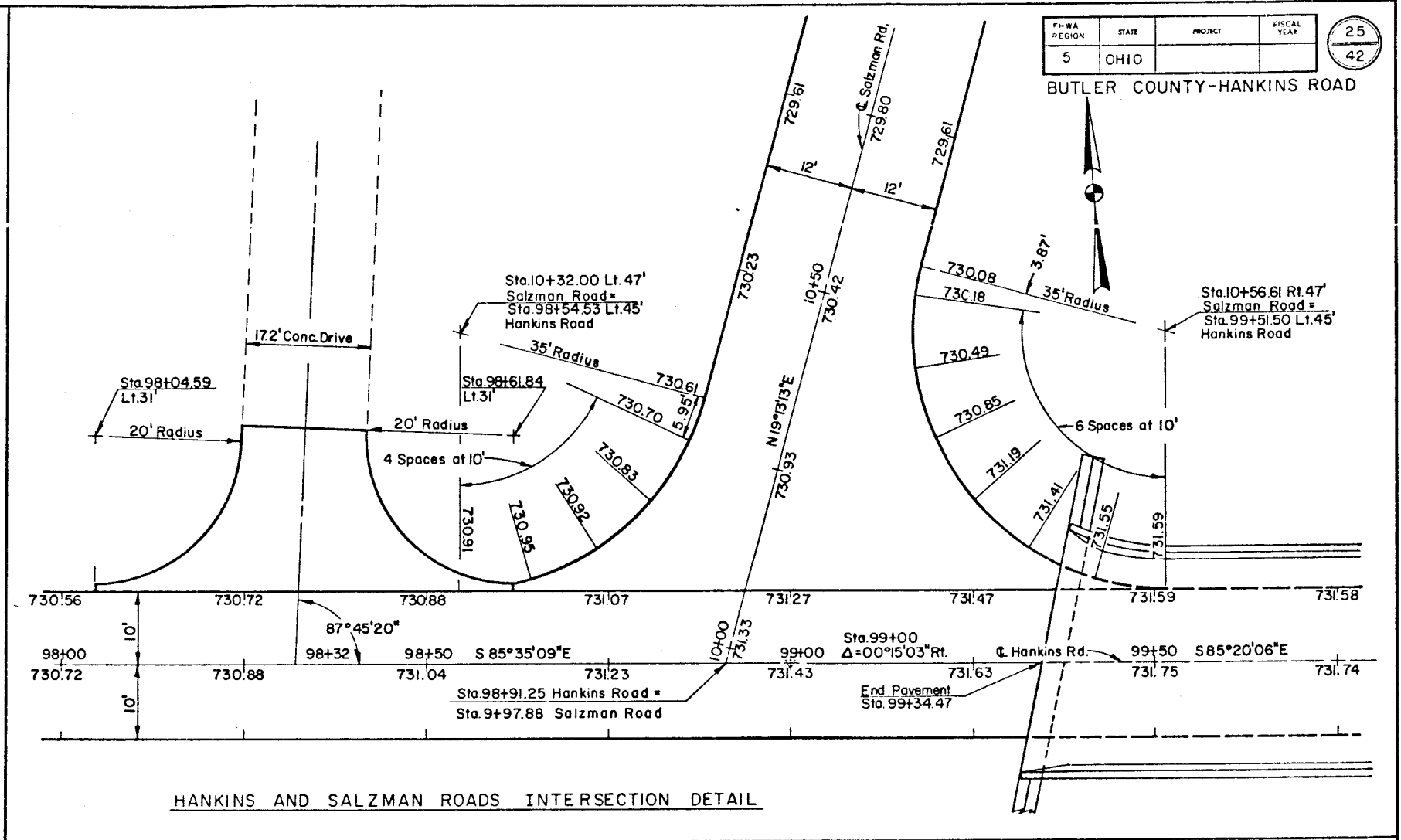


X-SECTIONS CHANNEL A and B



The steel bolts or rods shall be galvanized in accordance with ASTM A153. The holes in the pipe shall be 1/2" diameter. In lieu of drilling or punching holes into the pipe, a metal collar meeting all the above requirements may be clamped on the end of the pipe if, in the opinion of the Engineer, it will provide the same results. When a pad as shown on Std. Dwg. MC-4 is required at the outlet end of the pipe, a brick may be placed between the pad and the pipe to provide clearance for the bolts or rods.

### ANIMAL GUARD FOR PIPE OUTLET



# BUTLER COUNTY HANKINS ROAD

EARTHWORK LIMITS shown are schematic. Actual slopes shall conform to Plan - Cross Sections.

FOUNDATION DESIGN and foundation quantities are based on a study of soil sampling soundings made at the site. This information may be inspected in the office of the County Engineer, Hamilton, Ohio, but the County assumes no responsibility for the accuracy thereof.

DAILY TRAIN TRAFFIC  
2 - Passenger Trains @ 70 MPH  
24 - Freight Trains @ 50 MPH

NOTE:  
The vertical curve data does not apply to the Bridge or Graphic Curve elevations. The Bridge Elevations were obtained by adding 1 1/2" to elevations obtained from Vertical Curve Data.

## EXISTING STRUCTURE

TYPE: Concrete beam with reinf. concrete deck & substructure \*  
SPANS: 23.5' - 22.85' - 30.62' - 22.5' - 23' (Clear)  
ROADWAY: 15.9' 1/4 curbs (Pipe railing)  
SKEW: 11° - 18' - 40" Lt. Fwd.  
CLEARANCES: Vertical = 21.8'  
Horizontal = 8' from C Track to face of Pier  
\* Concrete ties exist between substructure units.  
DATE BUILT: 1906, Repairs & Additions 1935  
CONDITION: Poor  
TO BE REMOVED

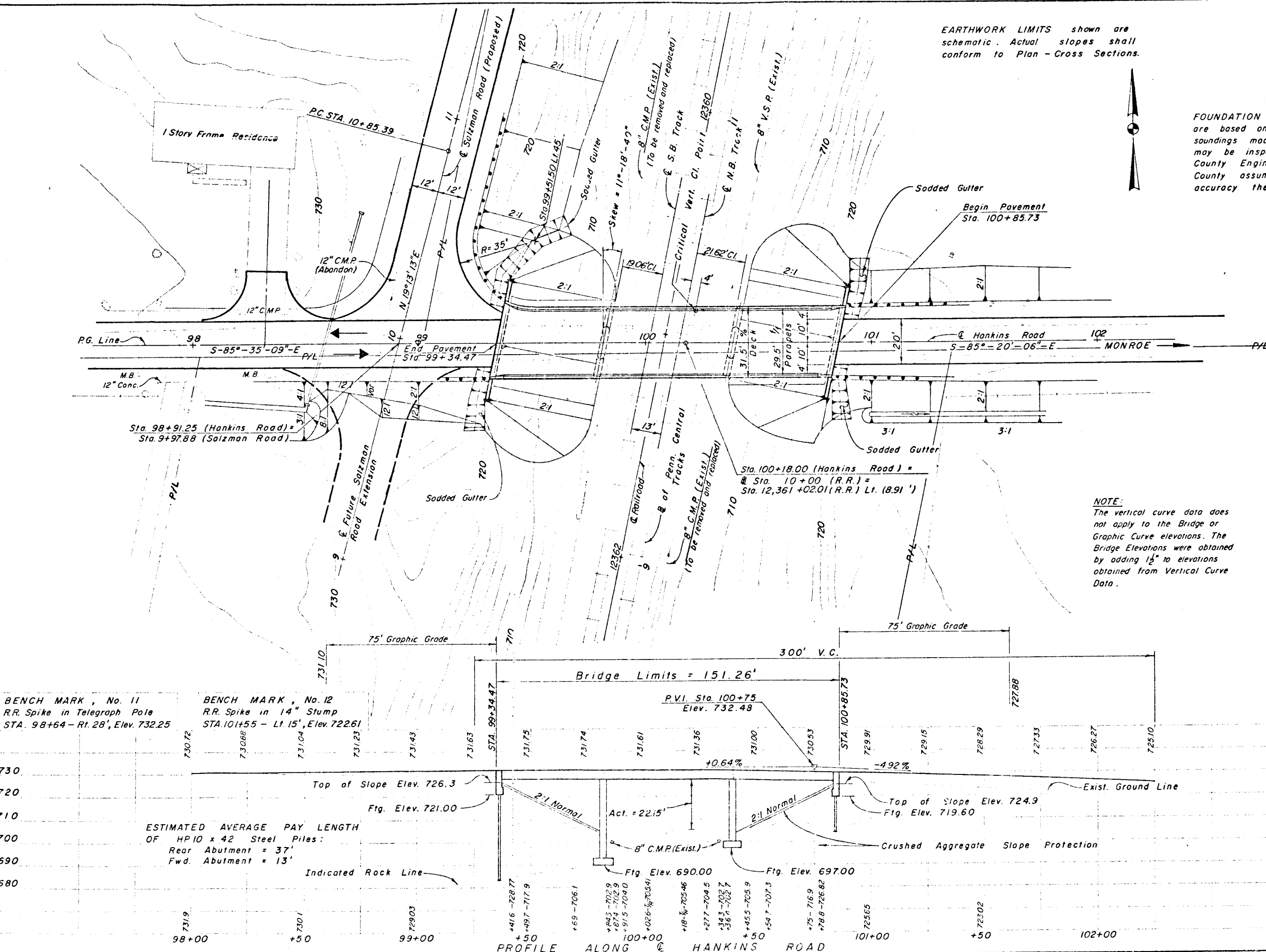
## PROPOSED STRUCTURE

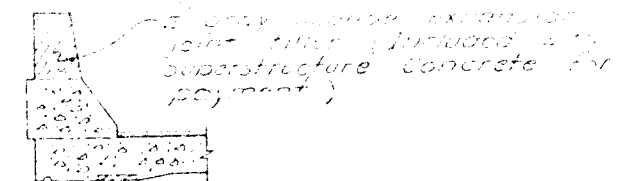
TYPE: 3 span cont. steel beam with reinf. concrete deck, integral abutments & T-type piers  
SPANS: 45.6' - 57' - 45.6' 1/2 bearings  
ROADWAY: 29' - 6" 1/4 concrete parapets  
SKEW: 11° - 18' - 40" Lt. Fwd.  
LOADING: HS 20-44  
WEARING SURFACE: 1 1/2" Asphalt concrete  
APPROACH SLABS: None  
ALIGNMENT: Tangent

STICKLEN - BELSHEIM & ASSOCIATES  
ENGINEERS

## SITE PLAN HANKINS ROAD OVER PENN CENTRAL R.R.

BUTLER CO. Sta. 99+34.47  
DESIGNED DRAWN TRACED CHECKED REVIEWED DATE REVISED  
100+85.73



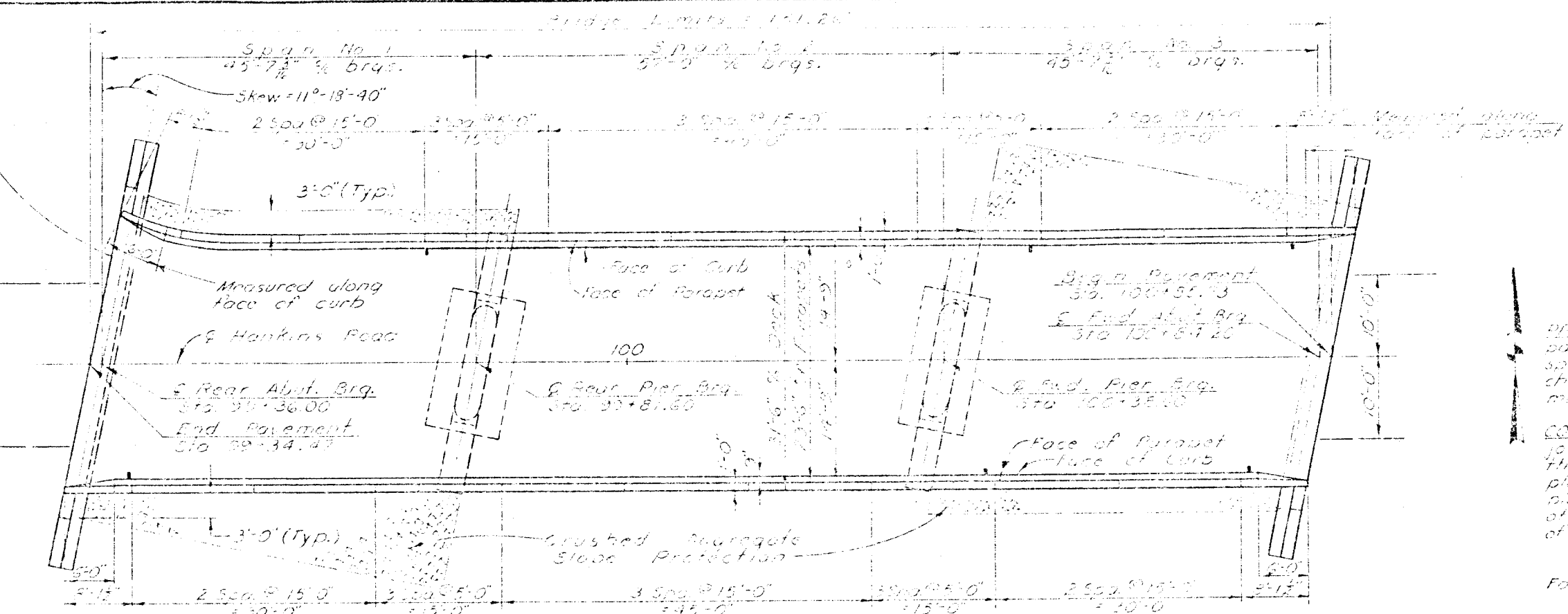
BUTLER COUNTY  
HANKINS ROAD


### SECTION THRU EXPANSION JOINT

PERFORMED EXPANSION JOINT FILLER in the railway parapet deflection joints may be either a gray sponge rubber or a gray cellular polyvinyl chloride (PVC) sponge. If rubber is used it shall meet the requirements of AASHTO M-153.

CONCRETE PARAPETS above upper construction joint shall be placed in alternate sections by the use of bulkheads. Closing sections shall be placed after removal of bulkheads and after placement of expansion joint filler. Exposed edges of the filler shall be flush with the surface of concrete and shall be fine of mortar.

For scupper spacing see Sheet No. 57.



### GENERAL PLAN

### GENERAL NOTES

DESIGNER shall be made to Standard Drawing 20-119, Sheet 3 dated 1-4-89, and to Supplemental Specifications for Bridge, dated 1-1-71, and 3-12-75.

DESIGN SPECIFICATIONS: This structure conforms to the "Specifications for Highway Bridges" issued by the American Association of State Highway Officials, 1980, including the Ohio Supplement to these specifications.

DESIGN: DESIGNER shall be made to Standard Drawing 20-119, Sheet 3 dated 1-4-89, and to Supplemental Specifications for Bridge, dated 1-1-71, and 3-12-75.

CONSTRUCTION: CONTRACTOR shall be made to Standard Drawing 20-119, Sheet 3 dated 1-4-89, and to Supplemental Specifications for Bridge, dated 1-1-71, and 3-12-75.

RAILROAD: RAILROAD shall be made to Standard Drawing 20-119, Sheet 3 dated 1-4-89, and to Supplemental Specifications for Bridge, dated 1-1-71, and 3-12-75.

PILE: The HP10-42 steel piles shall be driven to 10' on bottom or 20' on bottom for the last few inches of penetration. The design load is 30 tons per pile.

DECK REINFORCING BARS: At the Contractor's option, a section (not to exceed 10%) of the upper longitudinal bars (S401 or S402) in the deck slab may be placed beneath the upper transverse bars for support of the top mat.

SUBGRADE FOR PAVEMENT shall be as shown on Sheet No. 58, and shall extend from rear abutment to front abutment, including backfill along both north and south curbs.

ERECTING for the piers shall extend a maximum of 6 inches to bridge or to the elevation shown, whichever is over.

WORK: All work shall be done in accordance with the plans and specifications, and the Contractor shall be responsible for the work in such a manner that it is not subject to objection and be held to a minimum.

FOUNDATION BEARING PRESSURE: Pier footings are designed for a maximum bearing pressure of 4 tons per square foot.

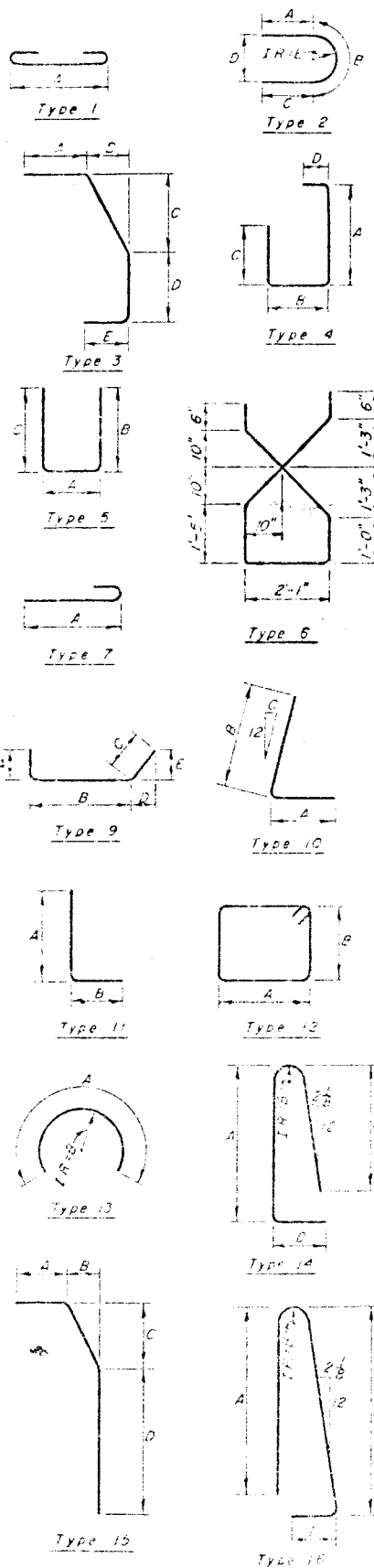
EMBANKMENT CONSTRUCTION: The embankment in the vicinity of the Pier Abutments shall be placed to an elevation of 2'-6" for a minimum distance of 30 feet from the abutment. Location of any work to be made for the Pier Abutment and Piers shown.

DESIGN: DESIGNER shall be made to Standard Drawing 20-119, Sheet 3 dated 1-4-89, and to Supplemental Specifications for Bridge, dated 1-1-71, and 3-12-75.

NOTE: For Additional General Notes See Sheet No. 58.

|                                                                               |            |        |        |
|-------------------------------------------------------------------------------|------------|--------|--------|
| STICKLEY - BELSHAM & ASSOCIATES<br>DESIGNER                                   |            | DATE   |        |
| GENERAL PLAN &<br>GENERAL NOTES<br>HANKINS ROAD<br>OVER<br>PENN. CENTRAL R.R. |            | DATE   |        |
| DESIGNED BY                                                                   | CHECKED BY | DATE   | DATE   |
| 1-1-89                                                                        | 1-1-89     | 1-1-89 | 1-1-89 |

## BENDING DIAGRAM



S IN THE COLUMN FOR "TYPE" INDICATES STRAIGHT BARS.

## REINFORCING STEEL LIST

25  
42

BUTLER COUNTY  
HANKINS ROAD

| ABUTMENTS |             |         |        |      |             |             |                     |        |        |    |   | PIERS |     |         |        |      |           |     |    |   |   |      |     | SUPERSTRUCTURE |        |              |           |       |      |     |   |   |   |   |   |  |  |
|-----------|-------------|---------|--------|------|-------------|-------------|---------------------|--------|--------|----|---|-------|-----|---------|--------|------|-----------|-----|----|---|---|------|-----|----------------|--------|--------------|-----------|-------|------|-----|---|---|---|---|---|--|--|
| MARK      | NO.         | LENGTH  | WEIGHT | TYPE | ABUTMENT    |             | DIMENSION           |        |        |    |   | MARK  | NO. | LENGTH  | WEIGHT | TYPE | DIMENSION |     |    |   |   | MARK | NO. | LENGTH         | WEIGHT | TYPE         | DIMENSION |       |      |     |   |   |   |   |   |  |  |
|           |             |         |        |      | Rear        | Fwd         | A                   | B      | C      | D  | E |       |     |         |        |      | Rear      | Fwd | A  | B | C |      |     |                |        |              | D         | E     | Rear | Fwd | A | B | C | D | E |  |  |
| AB01      | 12          | 2'-6"   | 881    | S    | 12          |             |                     |        |        |    |   | AB01  | 12  | 7'-8"   | 387    | S    |           |     |    |   |   |      |     | AB01           | 532    | 2'-3"        | 25,370    | S     |      |     |   |   |   |   |   |  |  |
| AB02      | 15          | 1'-6"   | 442    | S    | 15          |             |                     |        |        |    |   | AB02  | 12  | 10'-8"  | 1,280  | S    |           | 6   | 6  |   |   |      |     |                | AB02   | 2            | 2'-6"     | 165   | S    |     |   |   |   |   |   |  |  |
| AB03      | 7           | 3'-8"   | 648    | S    | 7           |             |                     |        |        |    |   | AB03  | 4   | 1'-3"   | 590    | S    |           | 2   | 2  |   |   |      |     |                | AB03   | Series of 15 | 4'-10"    |       | S    |     |   |   |   |   |   |  |  |
| AB04      | 12          | 2'-3"   | 825    | S    |             | 12          |                     |        |        |    |   | AB04  | 12  | 8'-6"   | 439    | S    |           | 12  |    |   |   |      |     |                | AB04   | 10           | 1'-0"     |       | S    |     |   |   |   |   |   |  |  |
| AB05      | 16          | 10'-0"  | 427    | S    |             | 16          |                     |        |        |    |   | AB05  | 12  | 1'-0"   | 1,308  | S    |           | 20  |    |   |   |      |     |                | AB05   | 10           | 1'-0"     |       | S    |     |   |   |   |   |   |  |  |
| AB06      | 7           | 3'-7"   | 600    | S    |             | 7           |                     |        |        |    |   | AB06  | 14  | 10'-0"  | 386    | S    |           | 14  |    |   |   |      |     |                | AB06   | 1            | 1'-0"     |       | S    |     |   |   |   |   |   |  |  |
| AB07      | 61          | 10'-11" | 1,000  | S    | 32          | 29          | See Bending Diagram |        |        |    |   | AB07  | 14  | 16'-5"  | 347    | S    |           | 7   | 7  |   |   |      |     | AB07           | 176    | 30'-0"       | 3,527     | S     |      |     |   |   |   |   |   |  |  |
| AB08      | 50          | 6'-10"  | 513    | 11   | 25          | 25          | 6'-2"               | 10"    |        |    |   | AB08  | 20  | 24'-4"  | 995    | S    |           |     |    |   |   |      |     |                | AB08   | 136          | 37'-0"    | 6,133 | S    |     |   |   |   |   |   |  |  |
| AB09      | 50          | 12'-6"  | 789    | 4    | 25          | 25          | 6'-2"               | 2'-6"  | 2'-2"  | 0" |   | AB09  | 14  | 10'-0"  | 386    | S    |           |     |    |   |   |      |     |                | AB09   | 49           | 17'-0"    | 1,912 | S    |     |   |   |   |   |   |  |  |
| AB10      | 4           | 1'-6"   | 83     | 11   | 2           | 2           | 9'-10"              | 10"    |        |    |   | AB10  | 14  | 10'-0"  | 386    | S    |           |     |    |   |   |      |     |                | AB10   | 1            | 1'-0"     |       | S    |     |   |   |   |   |   |  |  |
| AB11      | 4           | 1'-2"   | 85     | 4    | 2           | 2           | 9'-10"              | 2'-6"  | 2'-2"  | 0" |   | AB11  | 14  | 16'-5"  | 347    | S    |           |     |    |   |   |      |     |                | AB11   | 1            | 1'-0"     |       | S    |     |   |   |   |   |   |  |  |
| AB12      | Series of 5 | 2'-6"   | 270    | 11   | Series of 5 | Series of 5 | 6'-10"              | 10"    |        |    |   | AB12  | 10  | 7'-1"   | 517    | S    |           | 40  | 30 |   |   |      |     | AB12           | 48     | 36'-0"       | 1,061     | S     |      |     |   |   |   |   |   |  |  |
| AB13      | Series of 5 | 10'-5"  |        |      |             |             | 9'-10"              |        |        |    |   | AB13  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB13           | 94     | 13'-0"       | 1,444     | S     |      |     |   |   |   |   |   |  |  |
| AB14      | Series of 5 | 1'-2"   | 381    | 4    | Series of 5 | Series of 5 | 6'-10"              | 2'-6"  | 2'-2"  | 0" |   | AB14  | 8   | 11'-3"  | 94     | S    |           | 4   | 4  |   |   |      |     | AB14           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB15      | 128         | 0'-6"   | 227    | S    | 64          | 58          | 2'-1"               | 2'-4"  | 2'-4"  |    |   | AB15  | 8   | 12'-10" | 107    | S    |           | 4   | 4  |   |   |      |     | AB15           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB16      | 50          | 6'-3"   | 326    | S    | 25          | 25          | 2'-2"               | 2'-2"  | 2'-2"  |    |   | AB16  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB16           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB17      | 71          | 3'-7"   | 518    | S    | 37          | 37          | 2'-6"               | 2'-2"  | 2'-2"  |    |   | AB17  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB17           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB18      | 4           | 2'-7"   | 113    | S    | 4           |             |                     |        |        |    |   | AB18  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB18           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB19      | 8           | 2'-8"   | 389    | S    | 8           |             |                     |        |        |    |   | AB19  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB19           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB20      | 12          | 1'-3"   | 141    | S    | 12          |             |                     |        |        |    |   | AB20  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB20           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB21      | 6           | 2'-3"   | 82     | S    | 4           | 2           |                     |        |        |    |   | AB21  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB21           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB22      | 6           | 5'-10"  | 37     | S    | 4           | 2           |                     |        |        |    |   | AB22  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB22           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB23      | 6           | 7'-3"   | 17     | S    | 4           | 2           |                     |        |        |    |   | AB23  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB23           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB24      | 6           | 6'-9"   | 28     | S    | 4           | 4           |                     |        |        |    |   | AB24  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB24           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB25      | 4           | 2'-4"   | 105    | S    |             | 4           |                     |        |        |    |   | AB25  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB25           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB26      | 3           | 2'-5"   | 268    | S    |             | 8           |                     |        |        |    |   | AB26  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB26           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB27      | 13          | 1'-5"   | 130    | S    |             | 12          |                     |        |        |    |   | AB27  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB27           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB28      | 2           | 2'-6"   | 16     | S    |             | 2           |                     |        |        |    |   | AB28  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB28           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB29      | 2           | 2'-4"   | 5      | S    |             | 2           |                     |        |        |    |   | AB29  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB29           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |
| AB30      | 44          | 5'-5"   | 245    | S    | 33          | 33          | 9"                  | 7'-11" | 1'-11" |    |   | AB30  | 10  | 11'-0"  | 603    | S    |           | 40  | 30 |   |   |      |     | AB30           | 1      | 1'-0"        |           | S     |      |     |   |   |   |   |   |  |  |

## ESTIMATED QUANTITIES

| ITEM | TOTAL  | UNIT   | DESCRIPTION                                                             | Abut.  | Piers  | Superstr. | General |
|------|--------|--------|-------------------------------------------------------------------------|--------|--------|-----------|---------|
| 501  | 4,373  | Sq Ft  | Protection of concrete surfaces                                         | 104    | 6,168  |           |         |
| 502  | Lump   | Sum    | Structure removal                                                       |        |        |           | Lump    |
| 503  | 77     | Sq Yds | Site excavation                                                         |        | 17     |           |         |
| 503  | Lump   | Sum    | Detention, criss and sheeting                                           |        |        |           | Lump    |
| 503  | 236    | Cu Yds | Unstabilized excavation                                                 | 100    | 134    |           |         |
| 505  | Lump   | Sum    | Test pile                                                               |        |        |           | Lump    |
| 507  | 400    | Lin Ft | Steel piles, 12" x 42                                                   | 400    |        |           |         |
| 509  | 53,757 | Lbs    | Reinforcing steel                                                       | 10,121 | 43,771 |           |         |
| 511  | 70     | Cu Yds | Class "B" concrete, abutments                                           | 70     |        |           |         |
| 511  | 111    | Cu Yds | Class "C" concrete, piers above footings                                |        | 111    |           |         |
| 511  | 32     | Cu Yds | Class "C" concrete, pier footings                                       |        | 32     |           |         |
| 511  | 196    | Cu Yds | Class "C" concrete, superstructure                                      |        |        | 196       |         |
| 512  | 30     | Lin Ft | Premolded sealing strip                                                 | 30     |        |           |         |
| 513  | 87,700 | Lbs    | Structural steel (ASTM A 502)                                           |        |        | 87,700    |         |
| 514  | 13     | Cu Yds | Asphalt concrete C20                                                    |        |        | 13        |         |
| 515  | 58     | Sq Ft  | 1" preformed expansion joint filler                                     | 58     |        |           |         |
| 516  | 60     | Sq Ft  | 1" preformed expansion joint filler                                     | 60     |        |           |         |
| 516  | 0      | Each   | Bearing devices (as per plan)                                           |        |        |           |         |
| 516  | 475    | Sq Yds | Membrane waterproofing, and 6" sand fill over waterproofing             |        |        | 475       |         |
| 518  | 40     | Each   | Subgrade for wearing course, as per plan                                |        |        | 40        |         |
| 518  | 101    | Lin Ft | 6" preformed, helical corrugated metal pipe, 707.01                     | 101    |        |           |         |
| 518  | 52     | Lin Ft | 6" preformed, helical corrugated metal pipe, including specials, 707.01 | 52     |        |           |         |
| 518  | 6      | Each   | Scupper, including supports                                             |        |        | 6         |         |
| 518  | 52     | Cu Yds | Perforated backfill                                                     | 52     |        |           |         |
| 601  | 475    | Sq Yds | Graded aggregate slope protection                                       |        |        | 475       |         |
| 600  | 96     | Units  | Chemical admixtures for concrete, Type A, B or C                        |        |        | 96        |         |
| 600  | 7      | Cu Yds | Subgrade protection, as per plan                                        |        |        | 7         |         |

⊙ Vary Dim. "A" by 6" increments

⊙ Vary Dim. "B" & "C" by 6" increments

\* Vary by 2" increments

⊕ Bend in field where necessary

BAR SIZE is indicated in the bar mark. The first digit where three digits are used and the first two digits where four are used, indicate the bar size number. For example, 4700 is a number 7 size bar and A1014 is a number 10 size.

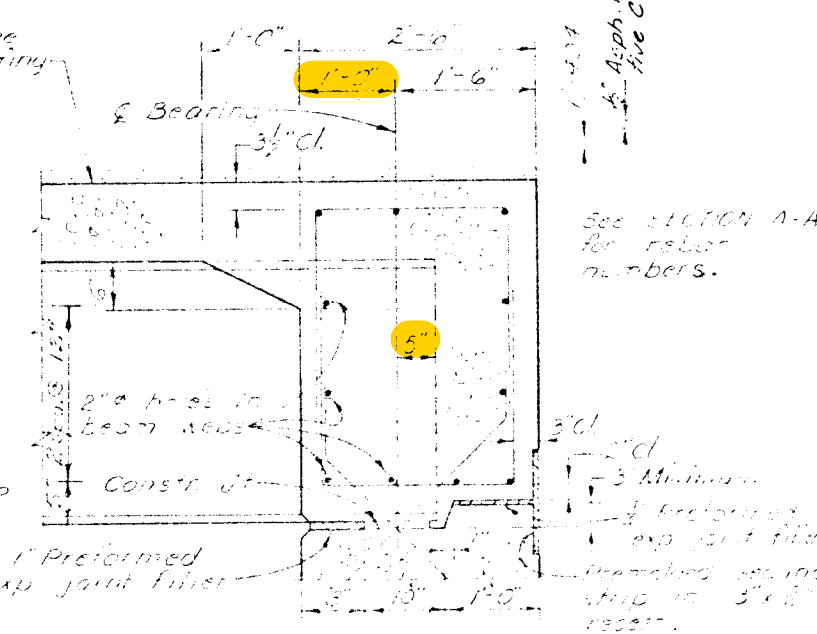
3/9

## ESTIMATED QUANTITIES &amp; REINFORCING STEEL LIST

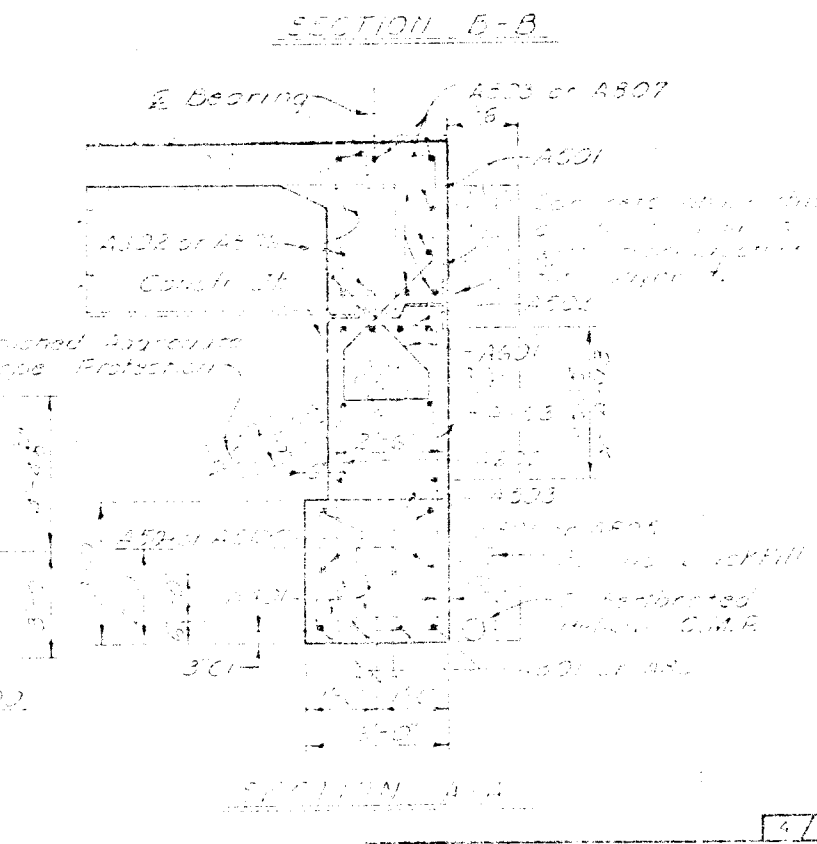
HANKINS ROAD  
OVER  
PENN CENTRAL R.R.

BUTLER CO  
HANKINS ROAD  
PROJ. NO. 1014

1. 4. 1941  
K. Alph. Protec-



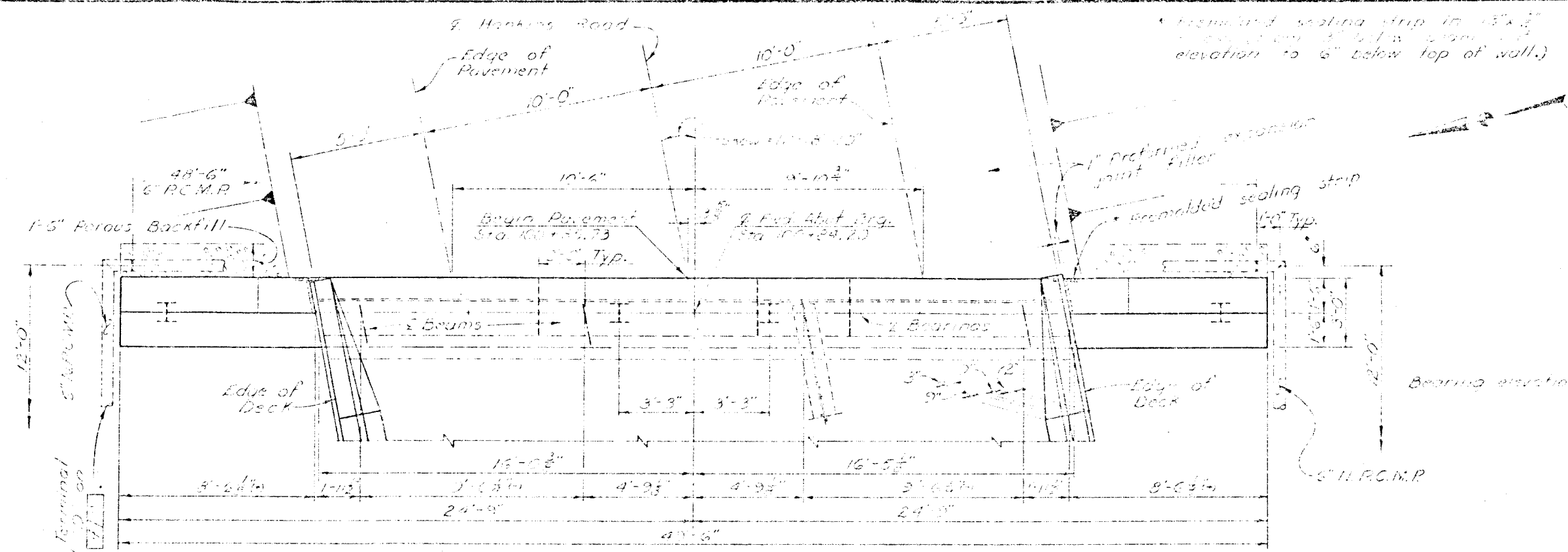
SECTION B-6



1977-1978 4-4

[illegible]

BUTLER COUNTY  
HANKINS ROAD

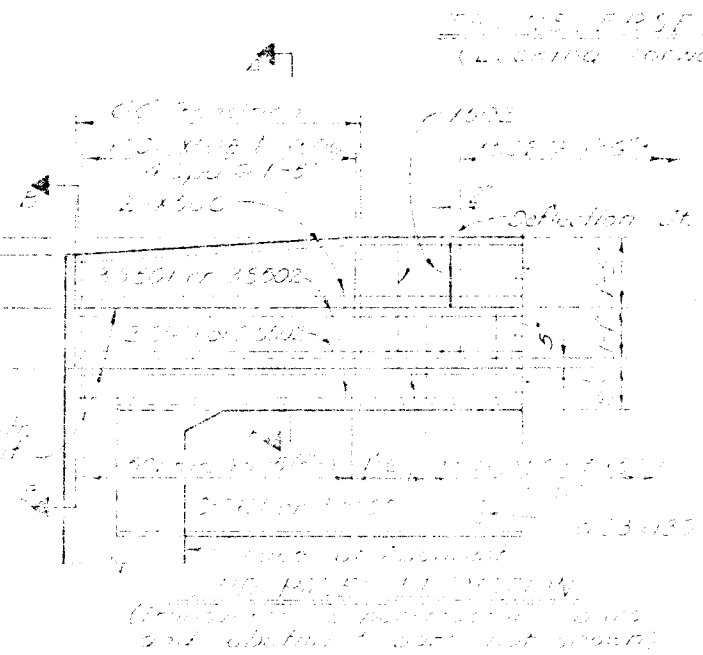
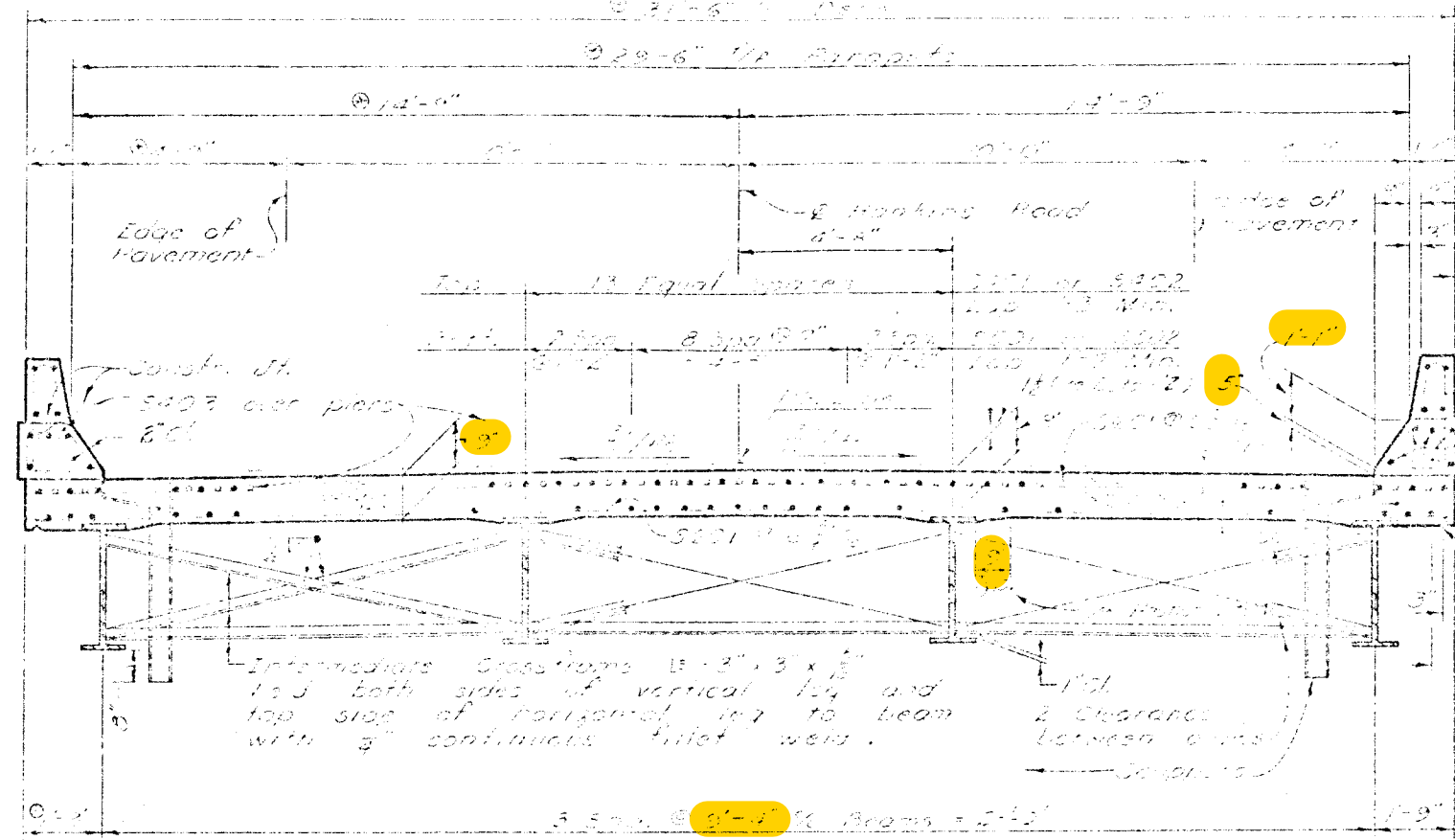
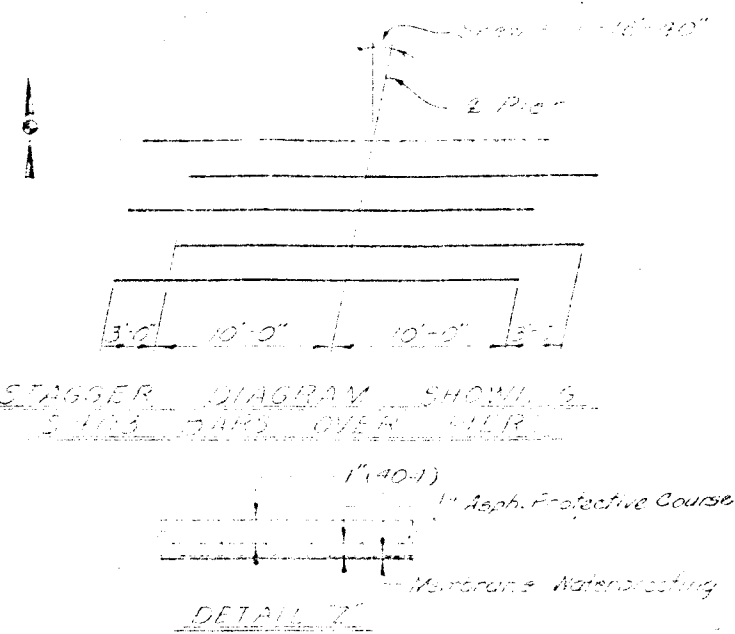




|                |       |         |  |
|----------------|-------|---------|--|
| FIELD<br>COUNT | STATE | PERCENT |  |
| 5              | OHIO  |         |  |

BUTLER COUNTY  
HANKINS ROAD

32  
42

[illegible]

the distance between any of deck flange to top of steel beam is the design dimension. The quality of cast concrete is as per code but be based on this dimension. even though deviation from it may be necessary because the top flange of the beam may not line the exact center of column. It is required to place the parallel to the finished grade.

Spall Width:  
A "spall" width of 3" shall be used for computing quantity of concrete. However, the spall width shall not be greater than 6" and 12" provided that the spall shall be not more than 1/4" to 3/4" thick and not more than 9" in length.

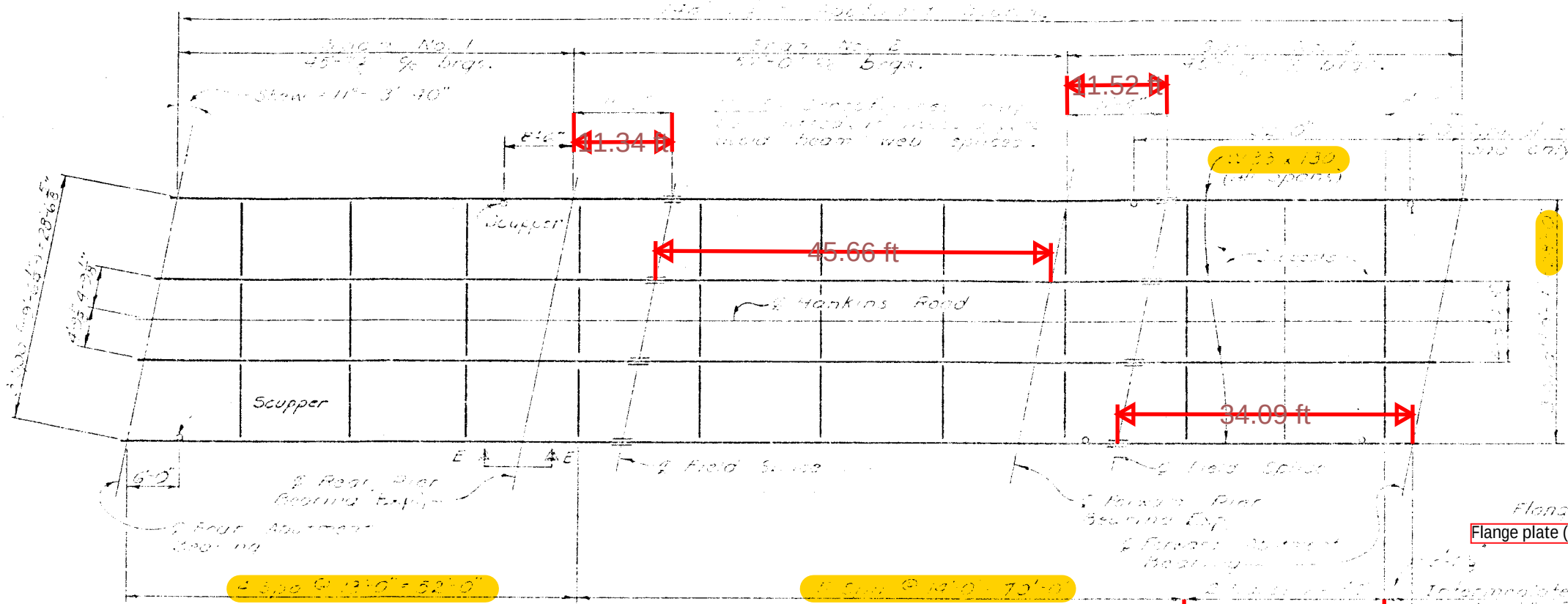
\* Space to clear definition with a:  
 1998 for 5'-0" = 100%  
 1999 for 6'-0" = 100%  
 2000 for 10'-0" = 100%

to 200 mm vary between  
stations 24+38.10± and 29+51.90.

For more of Super Dicks  
see Book 12 on Twitter  
CD-1-2 Book 7.

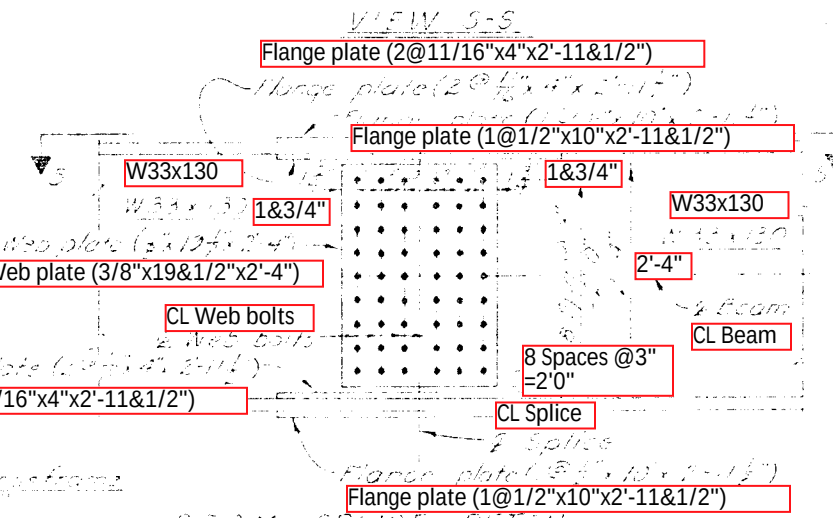
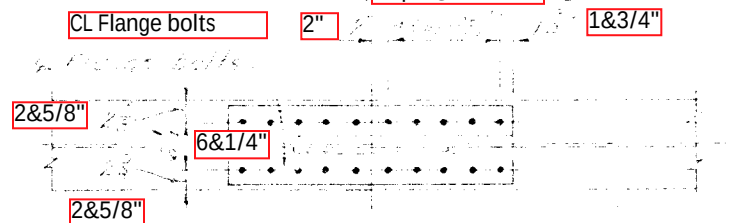
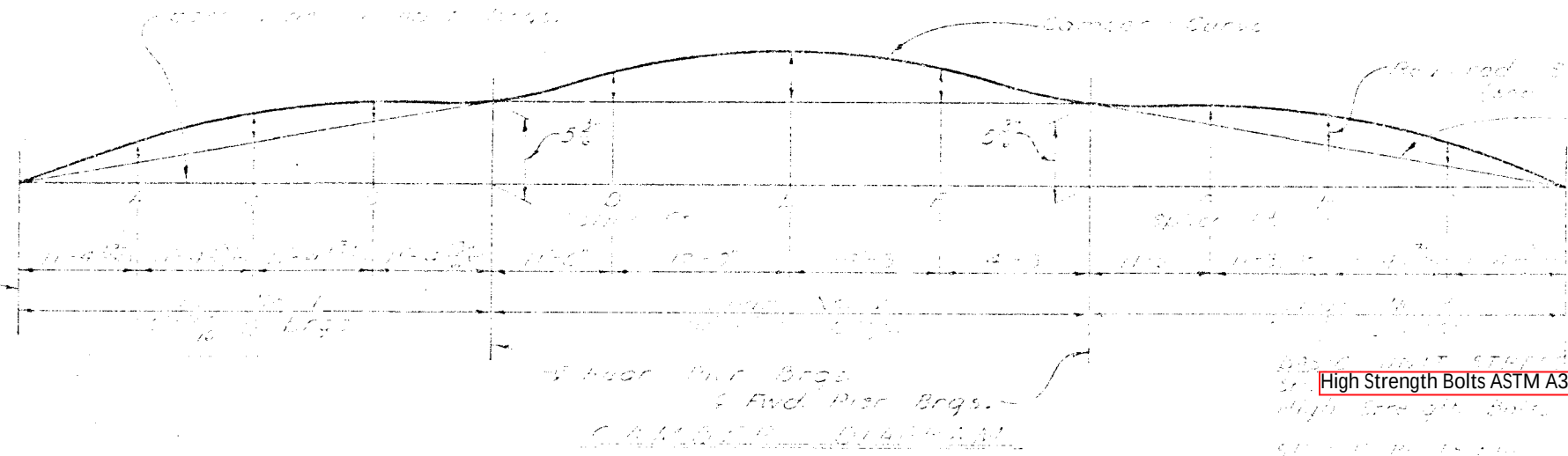
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|                                                                      |     |         |         |    |      |
|----------------------------------------------------------------------|-----|---------|---------|----|------|
| STICKERN - BENTON & ASSOCIATES<br>ENGINEERS                          |     |         |         |    | DRG  |
| SUPERSTRUCTURE<br>DETAILS<br>HANKINS ROAD<br>OVER<br>PENN CENTRAL RR |     |         |         |    |      |
| SHEET NO. 1 OF 1                                                     |     |         |         |    |      |
| DATE                                                                 | BY  | CHECKED | DATE    | BY | DATE |
| 10/1/58                                                              | APP | 10/1/58 | 10/1/58 |    |      |



**NOTE:**  
All beams and field splice material shall meet specified minimum notch toughness requirements. The fabricator shall submit to the Director a procedure designed for positive identification of material through all phases of fabrication. No material shall be fabricated until the Director has approved the procedure.

**STEEL FRAMING PLAN**



**BEAM SPLICE DETAIL**

Place bolt head on exposed side of fascia beams.

Washers may be omitted as allowed by Specifications.

Place nut of top surface of lower flange splice.

**High Strength Bolts ASTM A325, 13,500 psi shear**

**SPLICE BOLTS shall be 1" diameter ASTM A325 Type 3 high strength bolts and washer shall be...**

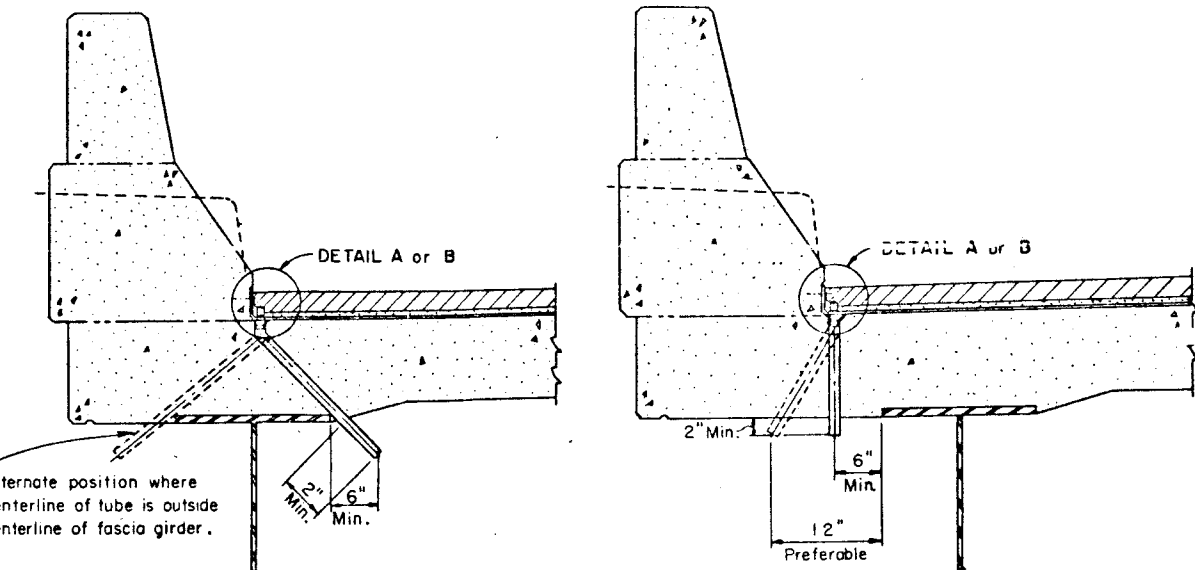
| DESCRIPTION      | QUANTITY | UNIT | PRICE |
|------------------|----------|------|-------|
| 1. STEEL FRAMING |          |      |       |
| 2. FIELD SPICES  |          |      |       |
| 3. SCUPPERS      |          |      |       |
| 4. BEAMS         |          |      |       |
| 5. WEBS          |          |      |       |
| 6. FLANGES       |          |      |       |
| 7. BOLTS         |          |      |       |
| 8. WASHERS       |          |      |       |
| 9. PLATES        |          |      |       |
| 10. OTHER        |          |      |       |

REMARKS: The steel framing shall be furnished with all necessary material and labor for erection and painting. The steel framing shall be painted with a heavy coat of paint on both sides.

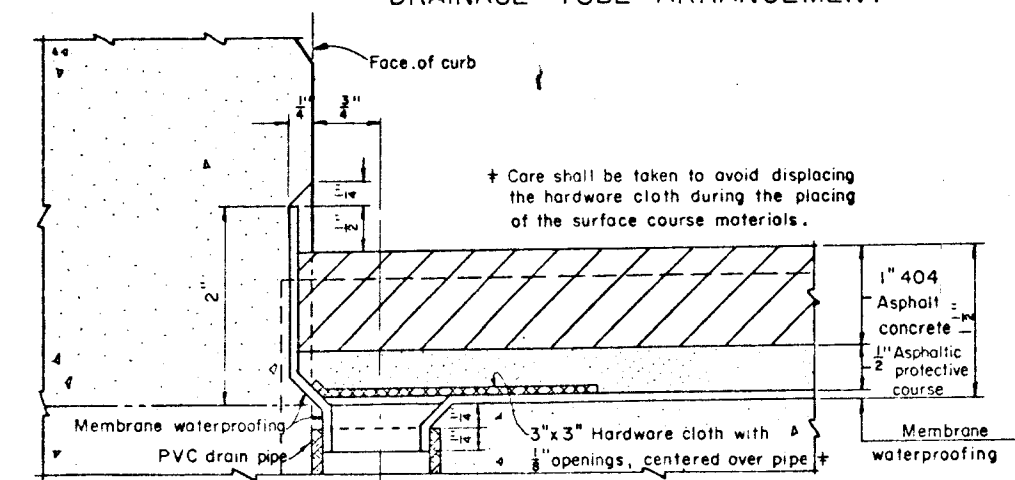
STICKLEIN - BRUSHMAN & ASSOCIATES  
ENGINEERS  
WILMINGTON, OHIO

**SUPERSTRUCTURE DETAILS**  
HANKINS ROAD  
OVER  
PENN. CENTRAL R.R.

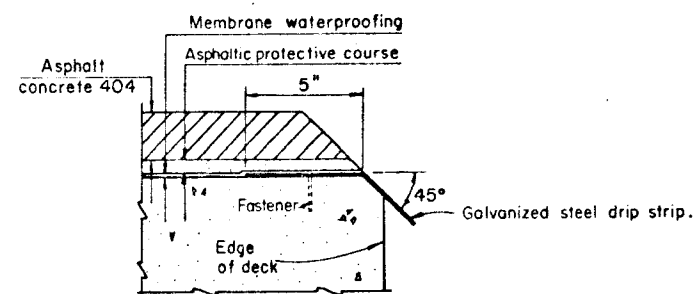
DATE: 10/1/54  
DRAWN BY: J. W. BRUSHMAN  
CHECKED BY: J. W. BRUSHMAN



STRUCTURAL STEEL BELOW CURB LINE NO STRUCTURAL STEEL BELOW CURB LINE  
DRAINAGE TUBE ARRANGEMENT

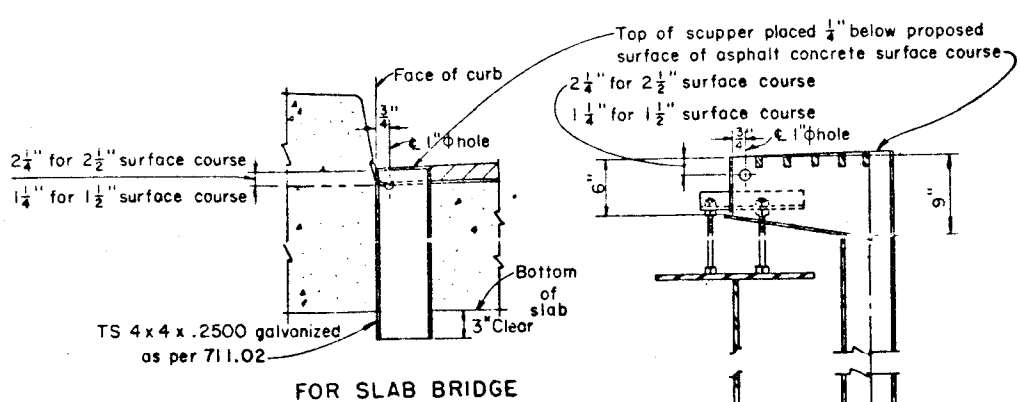


DETAIL B  
SUBDRAINAGE FOR 1 1/2" SURFACE COURSE

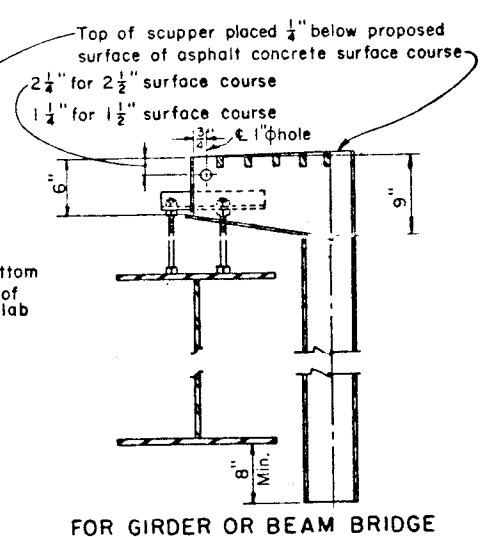


DRIP STRIP  
BRIDGES WITHOUT CURBS

Galvanized Steel Drip Strip. Prior to applying deck membrane waterproofing a bent galvanized steel drip strip, 8"x0.105" shall be installed along the edges of the deck as shown. The strips shall be fastened at 3'-0" maximum with power driven pins or #10 galvanized expansion screws, subject to the approval of the Engineer. The strips shall be placed the full length of the deck. Where splices are required a 3" (min.) lap shall be used, with a fastener through the lap. Steel shall meet the requirements of ASTM A568 and galvanizing shall be in accordance with 711.02. Payment shall be at the contract price bid for Item Special, Sq. Ft., Galvanized steel drip strip, which shall include all materials, labor, tools and incidentals necessary to complete the item.



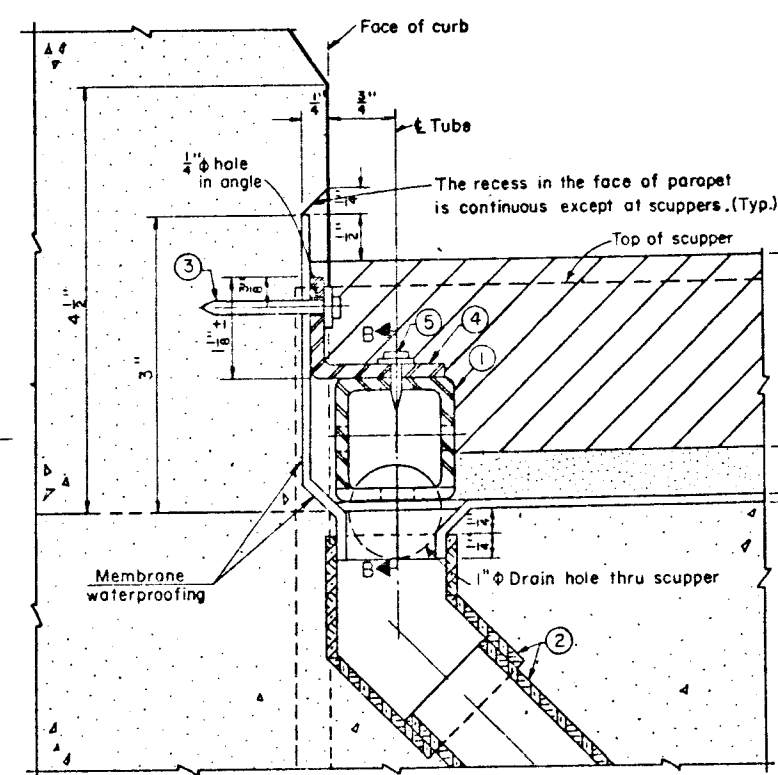
FOR SLAB BRIDGE



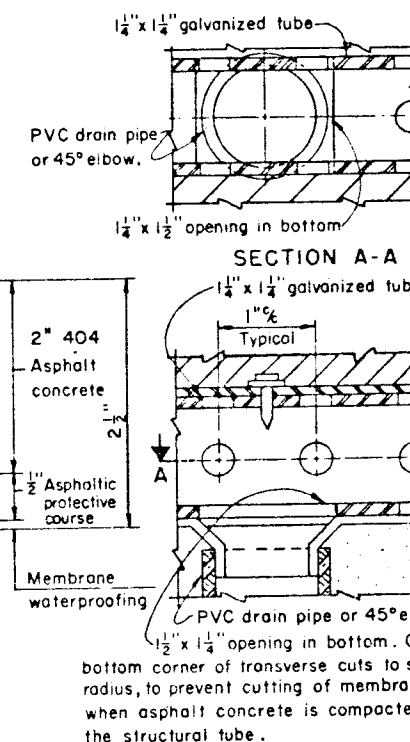
FOR GIRDER OR BEAM BRIDGE

### SCUPPER DETAILS

(Scupper details conform to SD-1-69 except as noted)



DETAIL A  
SUBDRAINAGE FOR 2 1/2" SURFACE COURSE



SECTION B-B

**SUBDRAINAGE FOR ASPHALT CONCRETE SURFACE COURSE**  
The subdrainage system shall consist of PVC pipes and fittings and structural tubes as specified on this sheet. The pipes shall be spaced at approximately six foot intervals with a pipe placed within one foot of each expansion joint, except that they shall be relocated or extended as necessary for any discharge to clear bridge seats, structural members such as beams, diaphragms and crossbracing by at least six (6) inches. Pipes shall not be placed over or within four (4) feet of a pavement or sidewalk, within ten (10) feet of the centerline of a railroad track or along curb lines where the deck configuration does not permit water to accumulate.

Where the plans specify a two and one half (2 1/2) inch surface course, the subdrainage shall be as shown on Detail A. The structural tube may be placed in any convenient lengths using butt joints. The price bid per linear foot for this drainage system shall include all PVC pipe and fittings, structural tubes, and all labor necessary to complete the item. The quantity will be the actual length of structural tube required. Payment will be made at the contract price for: Item 518, Lin. Ft., Subdrainage for wearing course, as per plan.

Where the plans specify a one and one half (1 1/2) inch surface course, the subdrainage shall be as shown in Detail B. The price bid for each drain shall include the PVC pipe and fitting, the hardware cloth and all necessary labor to complete the item. Payment will be made at the contract price for: Item 518, Ea., Subdrainage for wearing course, as per plan.

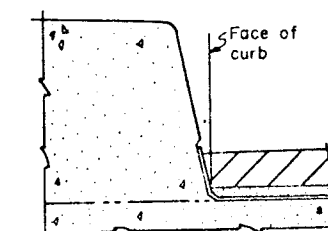
If no asphaltic protective course is specified, the 404 shall be either 2 1/2" placed in two 1 1/4" courses or 1 1/2" placed in one course.

- 1-1 1/4" x 1 1/4" galvanized, perforated, structural tube with 1/2" x 1/2" holes 1" on centers on all four sides as shown. Cut 1/2" x 1/4" opening in bottom, centered over each PVC drain pipe. The steel for the structural tube shall conform to the following:  
PREGALVANIZED, ASTM A446, Grade A Steel, Galvanizing as per ASTM A525.  
POSTGALVANIZED, ASTM A569 or A366, Galvanizing as per 711.02.

The minimum steel thickness shall be 0.105".  
Any damaged galvanizing shall be repaired as per AASHTO M36.

- 2-1 1/2" PVC DRAIN PIPE AND 45° ELBOW. Position accurately to match 1 1/2" x 1 1/4" openings in perforated tube. Place membrane to lap into the pipe, and seal the hole around the lip of the pipe. (This operation is important to the serviceability of the membrane.) The drain pipe and elbow shall comply with ASTM D2661 or ASTM D2665. The elbow shall be used only where structural steel is below curb line. Where the elbow is not adequate to provide clearance between the PVC pipe and the structural steel, the elbow shall be canted as required and cut on a line 1/4" below and parallel with the deck surface. The solvent cement for the pipe and fittings shall conform to ASTM D2235 or ASTM D2564.
- 3-1 1/4" x 5/32" x 1/4" flat head drive pin and washer.
- Fastening of the structural tube by methods other than shown shall be subject to approval by the Engineer. (Driving pins into bridge deck is prohibited.)
- 4-1 1/2" x 1 1/2" x 3/8" long, clipped and galvanized, or bent galvanized steel plate 2 1/2" x 3" x 0.105" thick. Attach to curb at approximately 10'-0" except near joints, where the angle shall be placed within 6" of the end of each tube section.
- 5-1/2" x 1/8" x 1/4" flat head drive pin and washer driven thru angle and tube.

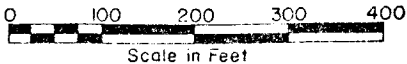
Note: Wherever "PVC" appears it shall be considered to read "PVC or ABS".



SHAPE OF SIDEWALK  
CURB

|                                                                                                                                                                         |                    |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------|
| STATE OF OHIO<br>DEPARTMENT OF TRANSPORTATION<br>DIVISION OF HIGHWAYS<br>BUREAU OF BRIDGES                                                                              |                    | 9/9              |
| DECK DRAINAGE DETAILS<br>FOR BRIDGES WITH ASPHALT CONCRETE<br>SURFACE COURSE<br>HANKINS ROAD<br>OVER PENN CENTRAL RR<br>BUTLER COUNTY<br>STA. 99 + 34.47<br>100 + 85.73 |                    |                  |
| DESIGNED<br>DLM                                                                                                                                                         | DRAWN<br>J         | TRACED<br>CPD    |
| CHECKED<br>WJJ                                                                                                                                                          | REVIEWED<br>1-2-75 | DATE<br>REVIEWED |

LOCATION PLAN

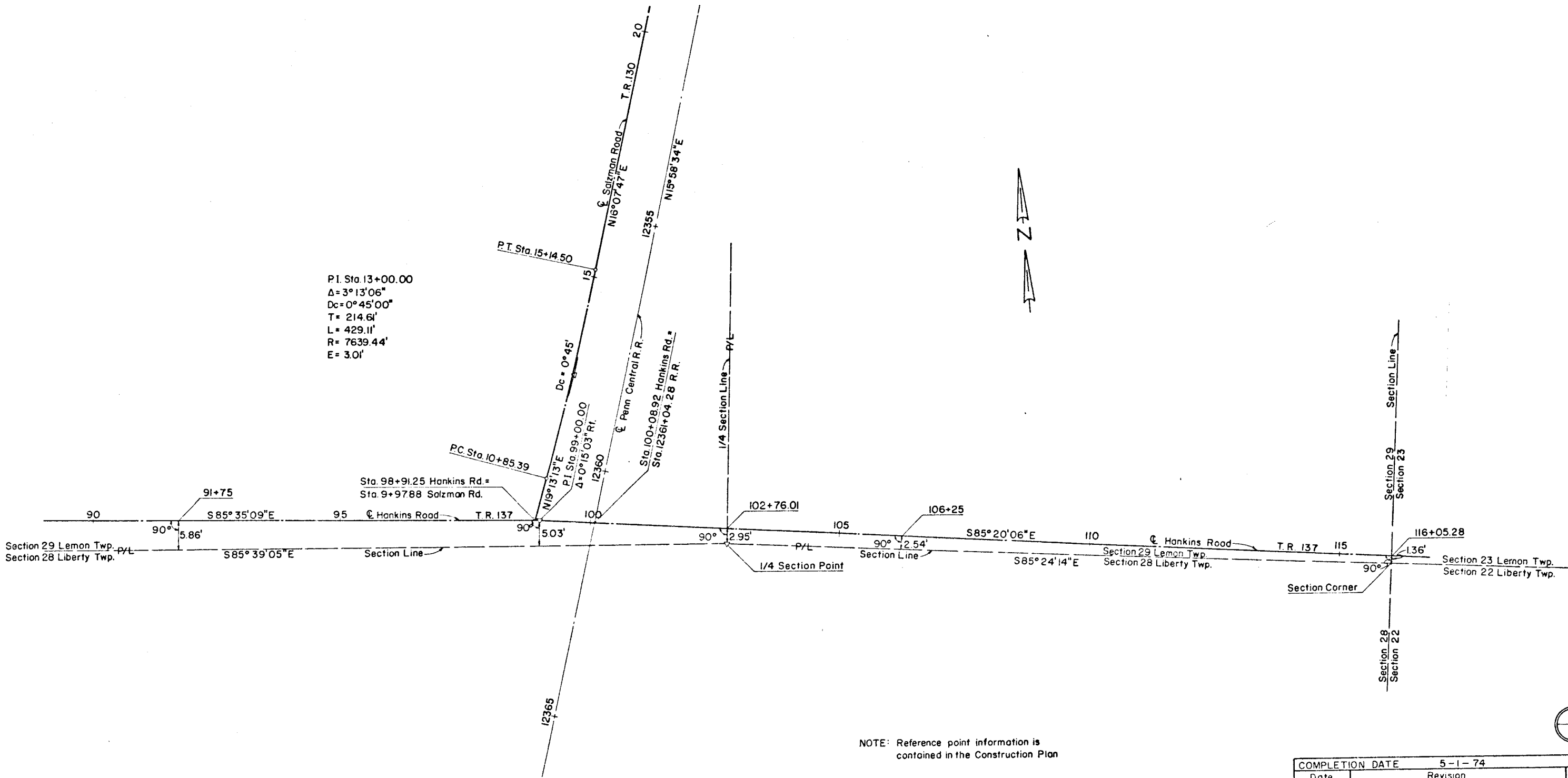


|               |                 |       |                |
|---------------|-----------------|-------|----------------|
| STATE JOB NO. | F.H.W.A. REGION | STATE | PROJECT        |
| 08284 (0)     | 5               | OHIO  | RS-BRS-1665(1) |

BUTLER COUNTY  
HANKINS ROAD  
FAS

34  
42

1  
9

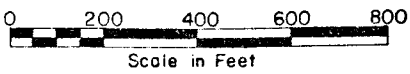


NOTE: Reference point information is contained in the Construction Plan

LEMON TOWNSHIP  
Sections 29 & 23  
LIBERTY TOWNSHIP  
Section 28

| COMPLETION DATE 5-1-74 |          |    |
|------------------------|----------|----|
| Date                   | Revision | By |
|                        |          |    |
|                        |          |    |
|                        |          |    |
|                        |          |    |
|                        |          |    |
|                        |          |    |
|                        |          |    |

PROPERTY MAP



|               |                 |       |                |
|---------------|-----------------|-------|----------------|
| STATE JOB NO. | F.H.W.A. REGION | STATE | PROJECT        |
| 08284 (0)     |                 | OHIO  | RS-BRS-1665(1) |

BUTLER COUNTY  
HANKINS ROAD  
FAS

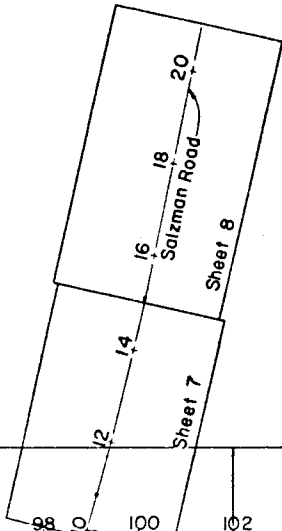
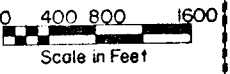
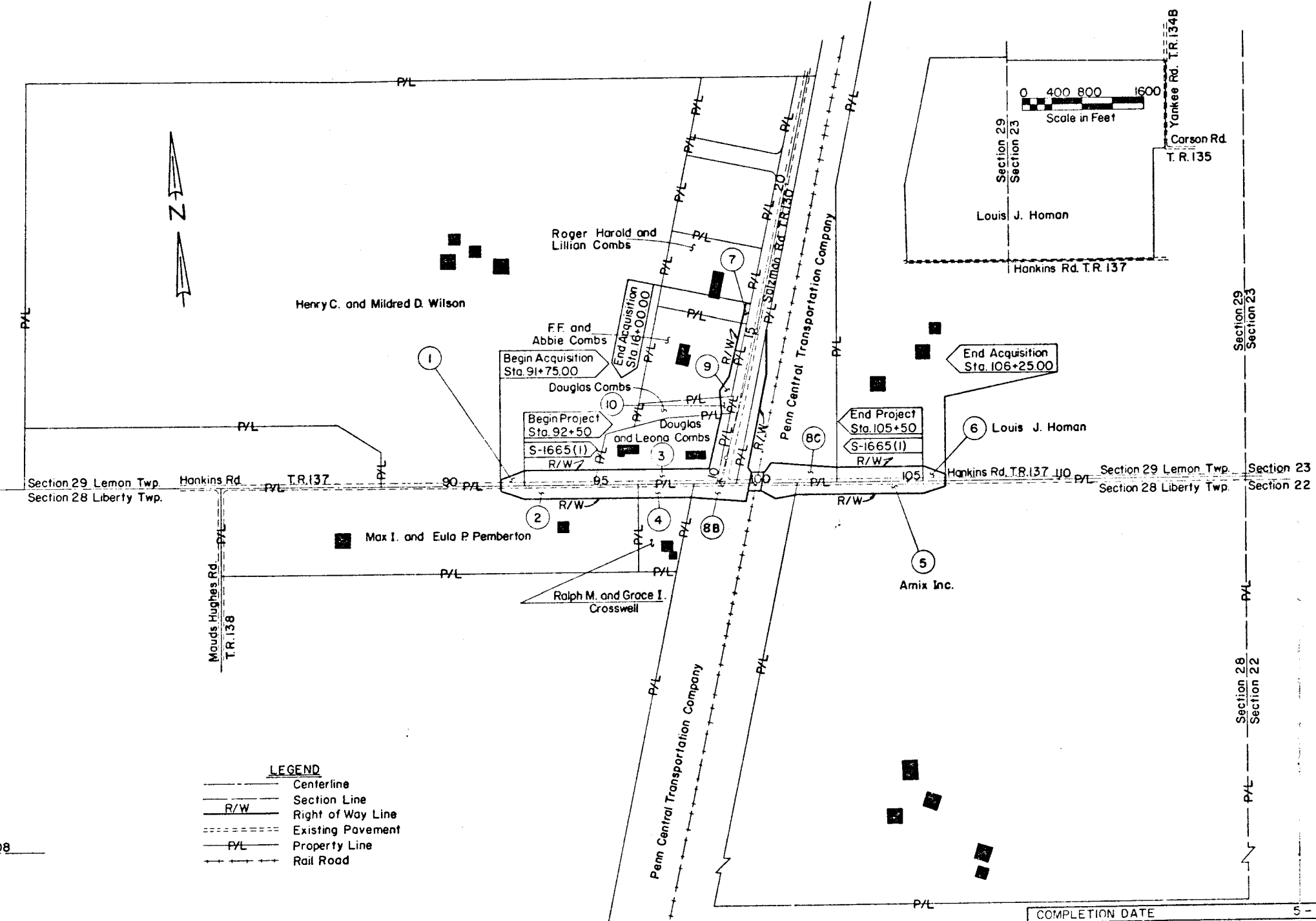
35  
42

2  
9

UTILITY OWNERSHIP

Cincinnati Gas & Electric Company  
138 E. 4th. St. Cincinnati, Ohio 45202  
Ohio Bell Telephone Company  
1527 Central Avenue, Middletown, Ohio 45042

NOTE: Reference point information is  
contained in the Construction Plan



- LEGEND
- Centerline
  - Section Line
  - R/W Right of Way Line
  - Existing Pavement
  - P/L Property Line
  - Rail Road

LEMON TOWNSHIP  
Sections 29 & 23  
LIBERTY TOWNSHIP  
Section 28

| COMPLETION DATE |         |    | 5-1-74 |
|-----------------|---------|----|--------|
| Date            | Remarks | By |        |
|                 |         |    |        |
|                 |         |    |        |
|                 |         |    |        |
|                 |         |    |        |
|                 |         |    |        |
|                 |         |    |        |
|                 |         |    |        |

SUMMARY OF ADDITIONAL RIGHT OF WAY

STATE JOB NO.  
08284 (0)

FHWA REGION  
5

STATE  
OHIO

PROJECT  
RS-BRS-1465(1)

FISCAL YEAR

36  
42

BUTLER COUNTY  
HANKINS ROAD  
FAS

3  
9

TOTAL NUMBER OF  
10 OWNERS  
0 TOTAL TAKES  
0 OWNERS WITH STRUCTURES INVOLVED  
0 OWNERS WITH PERSONALTY

| PARCEL NO. | OWNER                                   | RECORDED |      | RECORD ARFA | TOTAL P.R.O. | GROSS TAKE | P.R.O. IN TAKE | NET TAKE     |       | NET RESIDUE |        | SHEET NO. | TYPE FUNDS | REMARKS                                        |
|------------|-----------------------------------------|----------|------|-------------|--------------|------------|----------------|--------------|-------|-------------|--------|-----------|------------|------------------------------------------------|
|            |                                         | BOOK     | PAGE |             |              |            |                | I AND        | BLDG. | LEFT        | RIGHT  |           |            |                                                |
| 1          | Henry C.Wilson and Mildred D.Wilson     | 852      | 566  | 55.988      | 0.32         | 0.33       | 0.14           | 0.19         | —     | 55.48       | —      | 4         | S U        | To grade a drainage course                     |
| 1T         |                                         |          |      |             |              | 0.01       | —              | —            | —     |             |        | 4         |            |                                                |
| 2          | Max I.Pemberton and Eula P.Pemberton    | 420      | 40   | 9.00        | 0.75         | 0.44       | 0.21           | 0.23         | —     | —           | 8.02   | 4         |            | To grade a drainage course                     |
| 2T         |                                         |          |      |             |              | 0.004      | —              | —            | —     |             |        | 4         |            |                                                |
| 3          | Douglas Combs and Leona Combs           | 602      | 681  | 2.046       | 0.19         | 0.61       | 0.19           | 0.42         | —     | 1.76        | —      | 4,5,7     |            | Acreage Corrected 2.37<br>To Construct a drive |
| 3T         |                                         |          |      |             |              | 0.03       | —              | —            | —     |             |        | 5         |            |                                                |
| 4          | Ralph M.Crosswell and Grace I.Crosswell | 461      | 67   | 1.00        | 0.08         | 0.18       | 0.08           | 0.10         | —     | —           | 0.82   | 5         |            | To Construct a drive                           |
| 4T         |                                         |          |      |             |              | 0.03       | —              | —            | —     |             |        | 5         |            |                                                |
| 5          | Amix Inc.                               | 890      | 521  | 106.59      | 0.68         | 0.46       | 0.23           | 0.23         | —     | —           | 105.68 | 5,6       |            |                                                |
| 6          | Louis J.Homan                           | 918      | 110  | 194.196     | 2.02         | 0.36       | 0.16           | 0.20         | —     | 191.98      | —      | 6         |            | *75.25Ac in Sec.29 & 118.946 in Sec.23         |
| 7          | Roger Harold and Lillian Combs          | 907      | 370  | 1.70        | 0            | 0.02       | —              | 0.02         | —     | 1.68        | —      | 8         |            | Lot 11 Combs Subdivision                       |
| 8 Aerial   | Penn Central Transportation Company     |          |      |             |              | 2845 SF    | 1183 SF        | 1031 SF Temp |       |             |        | 9         |            | 1626 SF in Lemon Twp.                          |
| 8B         |                                         |          |      |             |              | 23392 SF   | 1327 Sq.Ft.    | 631 SF Net   |       |             |        | 7,8,9     |            | 189 SF in Liberty Twp.                         |
| 8C         |                                         |          |      |             |              | 17676 SF   | 4084 Sq.Ft.    | 23392 SF     |       |             |        | 9         |            | 13777 SF in Lemon Twp.                         |
| 8T-1       |                                         |          |      |             |              | 451 SF     | 5300 Sq.Ft.    | 17676 SF     |       | 2.10 Ac.    |        | 9         |            | 5615 SF in Liberty Twp.                        |
| 8T-2       |                                         |          |      |             |              | 580 SF     | 2540 Sq.Ft.    | 165 SF       |       |             |        | 9         |            | 13273 SF in Lemon Twp.                         |
| 8T-3       |                                         |          |      |             |              | 491 SF     | 367 SF         | 213 SF       |       |             |        | 7         |            | 4403 SF in Liberty Twp.                        |
| 9          | Jerry Bake (singleman)                  | 1183     | 11   | 1.91        | 0            | 0.12       | —              | 0.12         | —     | 1.79        | —      | 7,8       |            | Lot 12 Combs Subdivision                       |
| 9T         |                                         |          |      |             |              | 0.02       | —              | —            | —     |             |        | 7         |            | To Construct a drive                           |
| 10         | Douglas Combs                           | 903      | 28   | 0.448*      | 0            | 0.047      | —              | 0.047        | —     | 0.361       |        | 7         |            | *Acreage Corrected 0.413                       |
| 10X        |                                         |          |      |             |              | 0.005      | —              | 0.005        |       |             |        | 7         | S U        |                                                |

The right of way for this project will be acquired and provided by Butler County

| COMPLETION DATE |                                         |     | 5-1-74 |
|-----------------|-----------------------------------------|-----|--------|
| Date            | Remarks                                 | By  |        |
| 12-19-74        | P.R.O. Added Area 8T-1 & 8T-2 Corrected | R R |        |
| 1-10-75         | Parcel 8 Corrected                      | R R |        |
| 10-27-75        | Diagram Deleted p.9                     | E H |        |



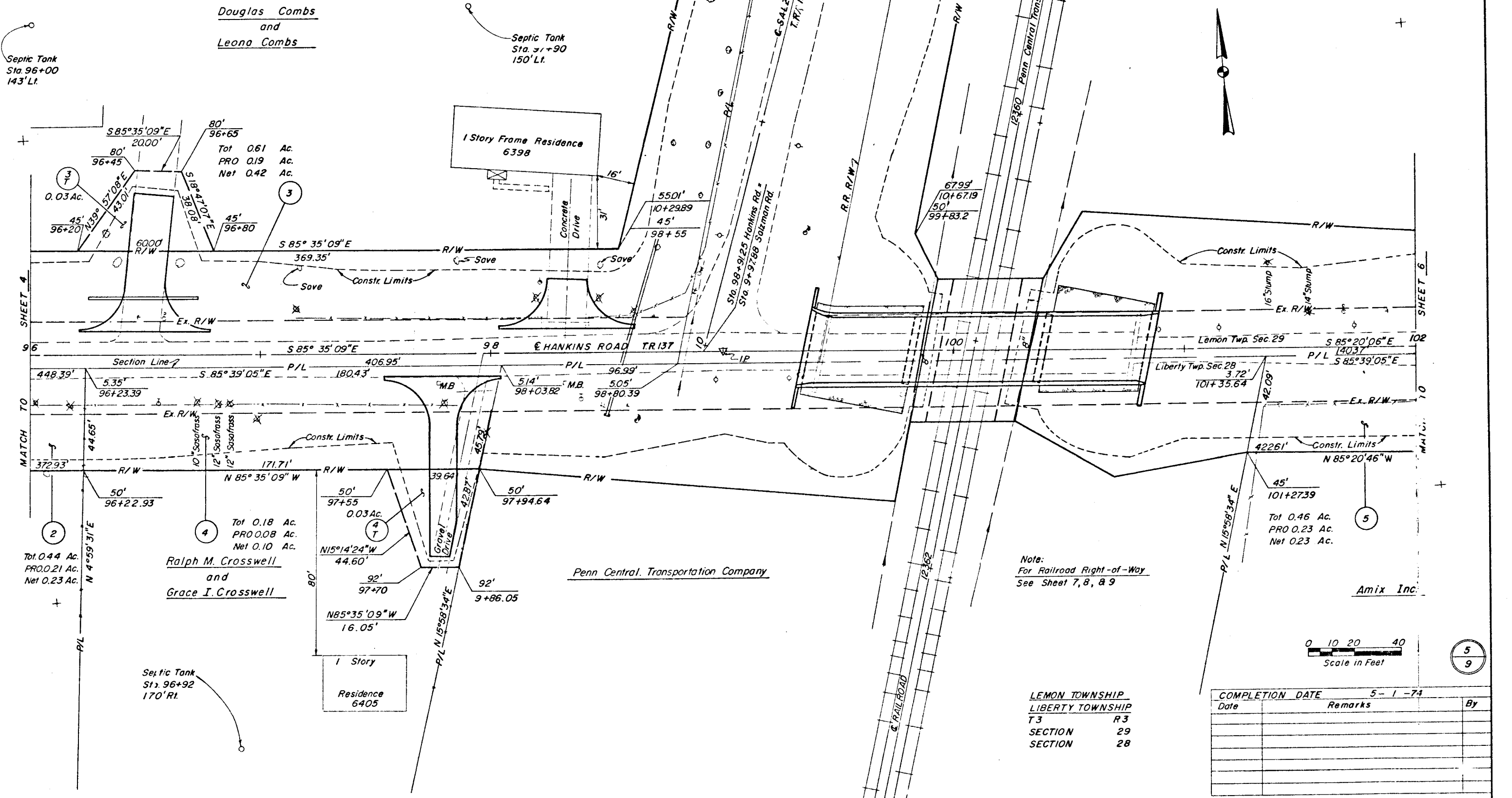
| STATE JOB NO. | FHWA REGION | STATE | PROJECT        | FISCAL YEAR |
|---------------|-------------|-------|----------------|-------------|
| 08284 (0)     | 5           | OHIO  | RS-BRS-1665(1) |             |

BUTLER COUNTY  
HANKINS ROAD  
FAS

38  
42

5  
9

Note:  
For Salzman Rd. Right-of-Way  
See Sheets 7 & 8



Note:  
For Railroad Right-of-Way  
See Sheet 7, 8, & 9

0 10 20 40  
Scale in Feet

LEMON TOWNSHIP  
LIBERTY TOWNSHIP  
T3 R3  
SECTION 29  
SECTION 28

| COMPLETION DATE 5-1-74 |         |    |
|------------------------|---------|----|
| Date                   | Remarks | By |
|                        |         |    |
|                        |         |    |
|                        |         |    |
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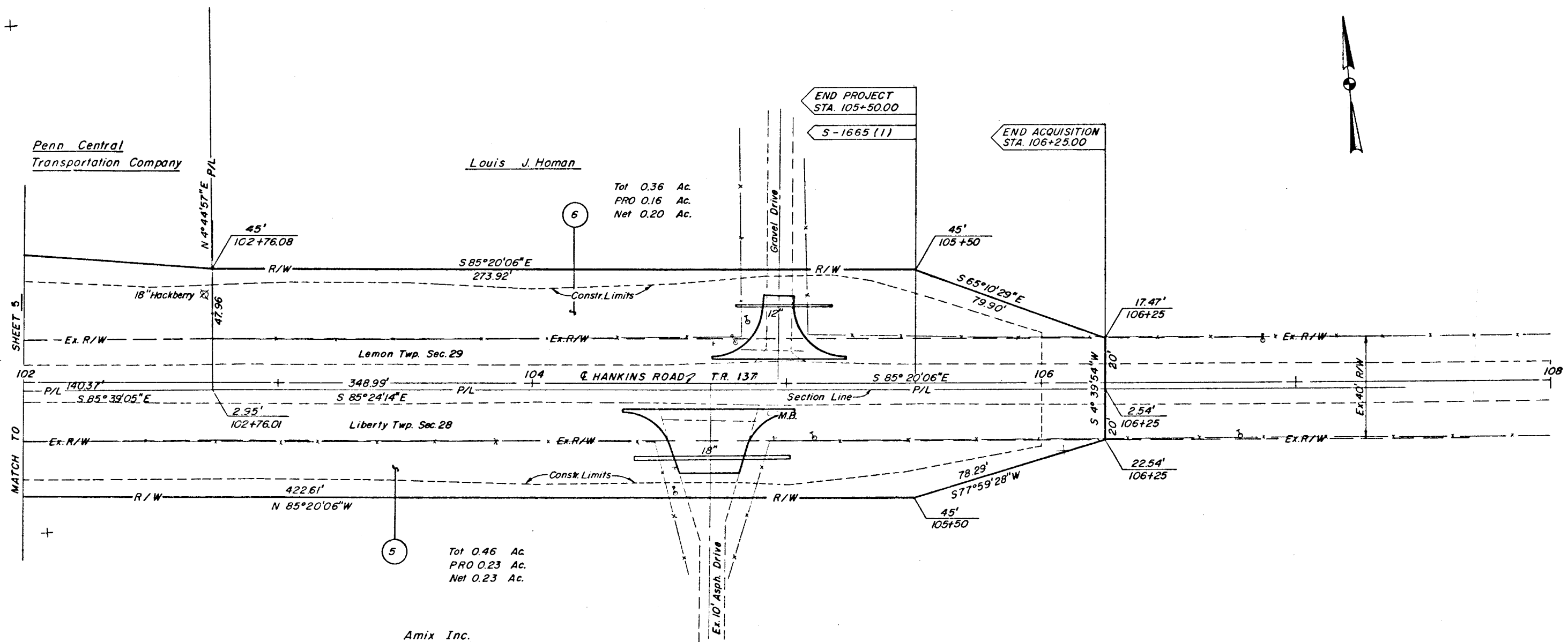
HANKINS RD. RIGHT OF WAY PLAN STA. 96+00 TO 102+00

| STATE JOB NO. | FWA REGION | STATE | PROJECT        | FISCAL YEAR |
|---------------|------------|-------|----------------|-------------|
| 08284 (0)     | 5          | OHIO  | RS-BRS-1665(1) |             |

BUTLER COUNTY  
HANKINS ROAD  
FAS

39  
42

6  
9



0 10 20 40  
Scale in Feet

LEMON TOWNSHIP  
LIBERTY TOWNSHIP  
T3 R3  
SECTION 29  
SECTION 28

| COMPLETION DATE 5-1-74 |         |    |
|------------------------|---------|----|
| Date                   | Remarks | By |
|                        |         |    |
|                        |         |    |
|                        |         |    |
|                        |         |    |
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|                        |         |    |
|                        |         |    |

| STATE JOB NO. | FHWA REGION | STATE | PROJECT         | FISCAL YEAR |
|---------------|-------------|-------|-----------------|-------------|
| 08284 (10)    | 5           | OHIO  | RS-BRS-1665(10) |             |

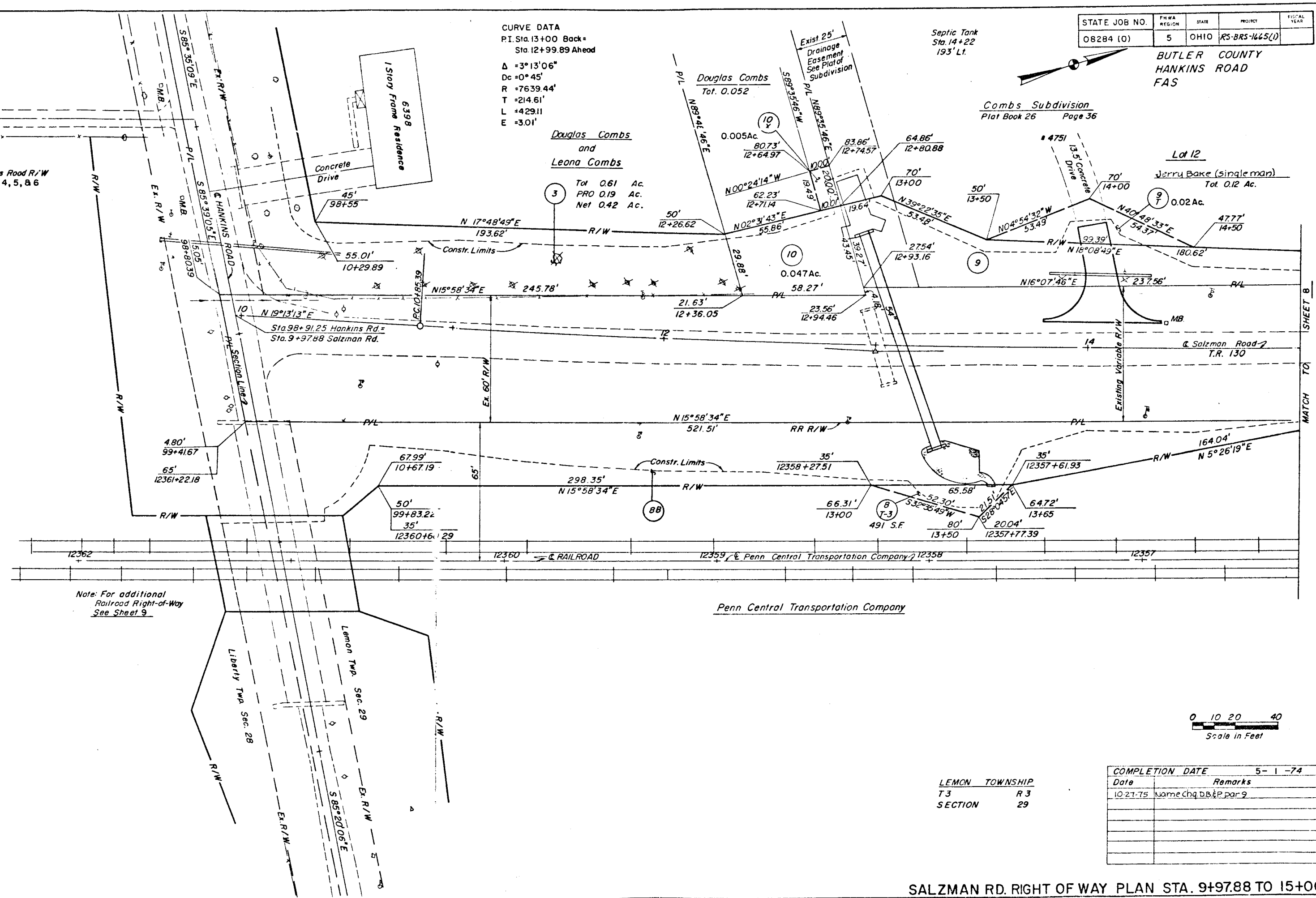
BUTLER COUNTY  
HANKINS ROAD  
FAS

40  
42  
7  
9

CURVE DATA  
P.I. Sta. 13+00 Back =  
Sta. 12+99.89 Ahead  
 $\Delta = 3^\circ 13' 06''$   
Dc = 0° 45'  
R = 7639.44'  
T = 214.61'  
L = 429.11  
E = -3.01'

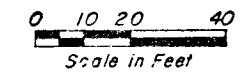
Combs Subdivision  
Plat Book 26 Page 36

Note:  
For Hankins Road R/W  
See Sheet 4, 5, & 6



Note: For additional  
Railroad Right-of-Way  
See Sheet 9

Penn Central Transportation Company



7  
9

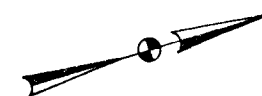
LEMON TOWNSHIP  
T3 R3  
SECTION 29

| COMPLETION DATE 5-1-74 |                     |      |
|------------------------|---------------------|------|
| Date                   | Remarks             | By   |
| 10-27-75               | Name Chg DB&P par 9 | E.H. |
|                        |                     |      |
|                        |                     |      |
|                        |                     |      |
|                        |                     |      |
|                        |                     |      |
|                        |                     |      |

SALZMAN RD. RIGHT OF WAY PLAN STA. 9+97.88 TO 15+00

| STATE JOB NO. | FHWA REGION | STATE | PROJECT        | FISCAL YEAR |
|---------------|-------------|-------|----------------|-------------|
| 08284 (0)     | 5           | OHIO  | RS-BRS-1645(1) |             |

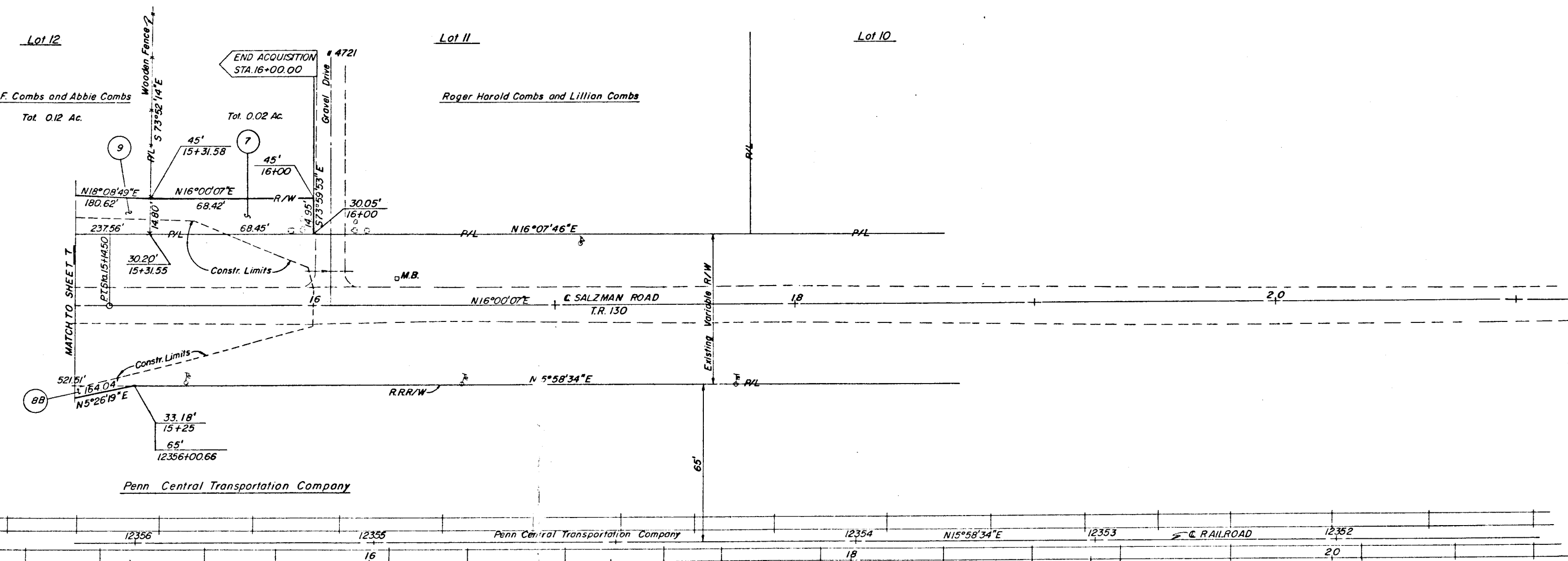
41  
42



BUTLER COUNTY  
HANKINS ROAD  
FAS

8  
9

Combs Subdivision  
Plat Book 26 Page 36



0 10 20 40  
Scale in Feet

8  
9

LEMON TOWNSHIP  
T 3 R 3  
SECTION 29

| COMPLETION DATE 5-1-74 |         |    |
|------------------------|---------|----|
| Date                   | Remarks | By |
|                        |         |    |
|                        |         |    |
|                        |         |    |
|                        |         |    |
|                        |         |    |
|                        |         |    |
|                        |         |    |

SALZMAN RD. RIGHT OF WAY PLAN STA. 15+00 TO 21+00

| STATE JOB NO. | TERRA REGION | STATE | PROJECT        | FISCAL YEAR |
|---------------|--------------|-------|----------------|-------------|
| 08284 (0)     | 5            | OHIO  | RS-BRS-1665(1) |             |

42  
42

BUTLER COUNTY  
HANKINS ROAD  
FAS

9  
9

Note:  
For Additional Railroad Right-of-Way See Sheets 7 and 8

RESIDUE 2.10 Ac.

Section 29  
LEMON TOWNSHIP

Section 28  
LIBERTY TOWNSHIP

| PENN CENTRAL TRANSPORTATION COMPANY |                   |             |                 |           |            |
|-------------------------------------|-------------------|-------------|-----------------|-----------|------------|
| Parcel No.                          | Easement Required | Total Area  | Area of Overlap |           | P.R.       |
|                                     |                   |             | Aerial          | Temporary |            |
| 8 Aerial                            | Aerial            | 2845 Sq Ft  | 103             | —         | 1183 Sq Ft |
| 8 B                                 | Highway           | 23392 Sq Ft | —               | —         | 541 Sq Ft  |
| 8 C                                 | Highway           | 17676 Sq Ft | —               | —         | 7840 Sq Ft |
| 8T-1                                | Temporary         | 451 Sq Ft   | 451             | —         | 285 Sq Ft  |
| 8T-2                                | Temporary         | 580 Sq Ft   | 580             | —         | 367 Sq Ft  |
| 8T-3                                | Temporary         | 491 Sq Ft   | —               | —         | —          |

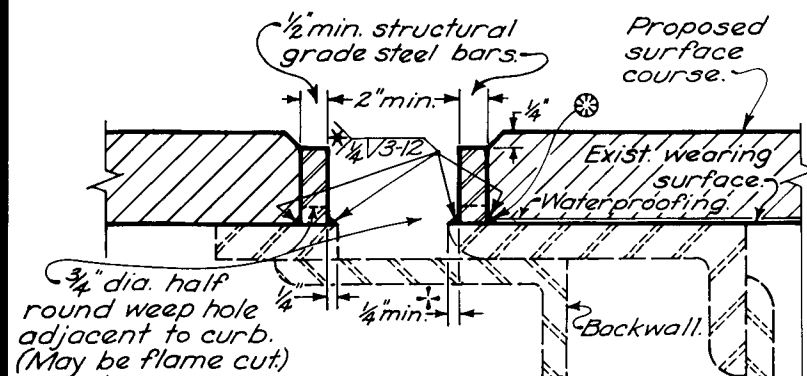
0 10 20 40  
Scale in Feet

Railroad information for this plat  
taken from Railroad valuation plat  
Sheet No. 17 of V-26

| COMPLETION DATE |                                         | 5-1-74 |
|-----------------|-----------------------------------------|--------|
| Date            | Remarks                                 | By     |
| 12-19-74        | P.R.O. Added, Area 8T1 & 8T-2 Corrected | R.R.   |
| 1-10-75         | P.R.O. Added                            | R.R.   |
|                 |                                         |        |
|                 |                                         |        |
|                 |                                         |        |
|                 |                                         |        |

PROPERTY PLAT PENN CENTRAL TRANSPORTATION COMPANY

✦ Increase as necessary to maintain 2" min. opening.

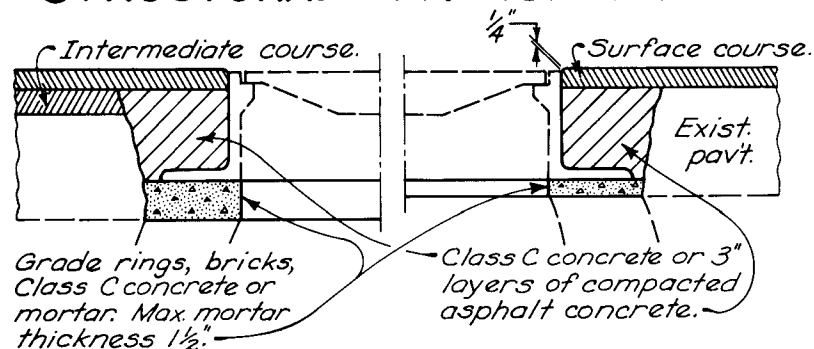


\* At the option of the Contractor, this non-stress carrying weld may be continuous.

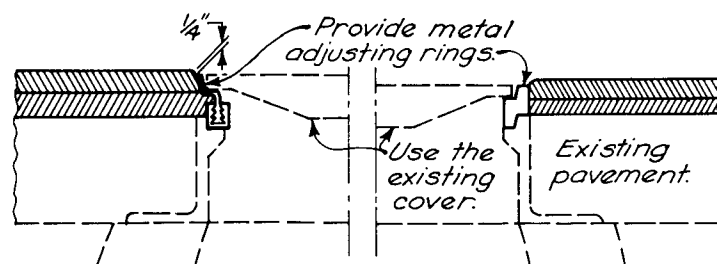
⊗ If the waterproofing membrane is a prefabricated sheet, seal at this point with mastic or heat.

**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 1 ft/in. The ramps shall be removed prior to resurfacing. Cost of placing and removing the ramps shall be included with Item 614 for payment.

## VERTICAL EXTENSION OF STRUCTURAL EXPANSION JOINTS



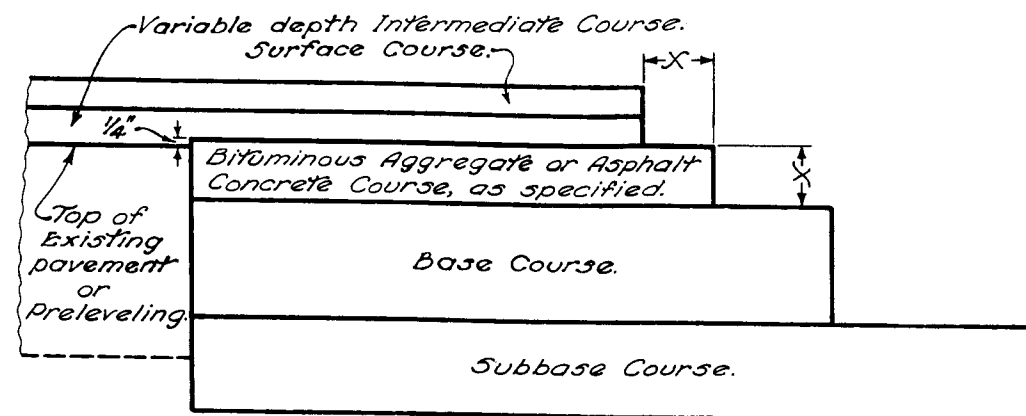
### USING CONCRETE OR MORTAR



The metal adjusting rings shall be equal to the Series R-1979 by the Neenah Foundry Co. or the models LS, LB, SB, NB or MB by the National Utility Products Co. or an approved equal. Adjustment range 1" to 4 1/8".

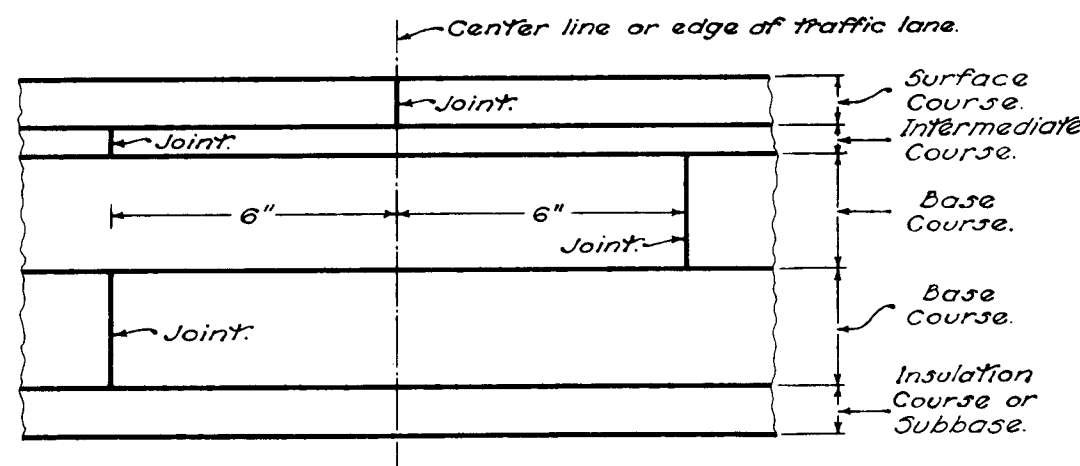
### USING METAL ADJUSTING RINGS MANHOLES ADJUSTED TO GRADE

# RESURFACING

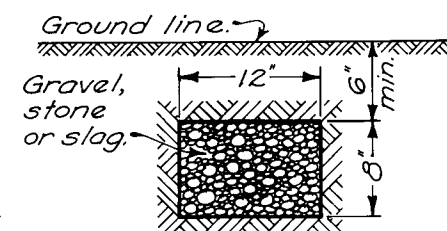


The Bituminous Aggregate in the upper part of the base widening shall finish approximately 1/4" above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified, it shall be placed prior to excavation of the widening trench and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

## COURSE DETAIL FOR WIDENING

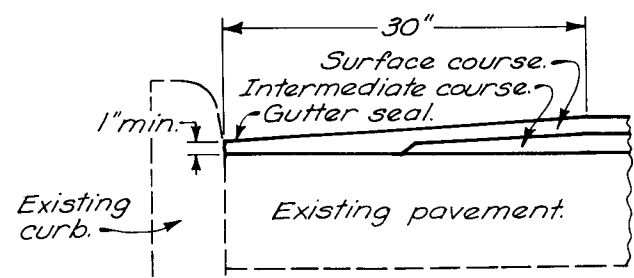


## LAPPING LONGITUDINAL JOINTS



Aggregate drains to be placed where and as directed by Engineer.

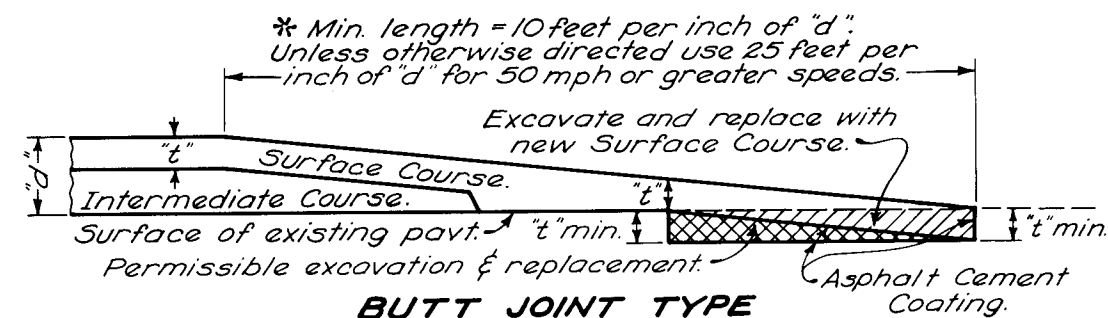
### AGGREGATE DRAIN



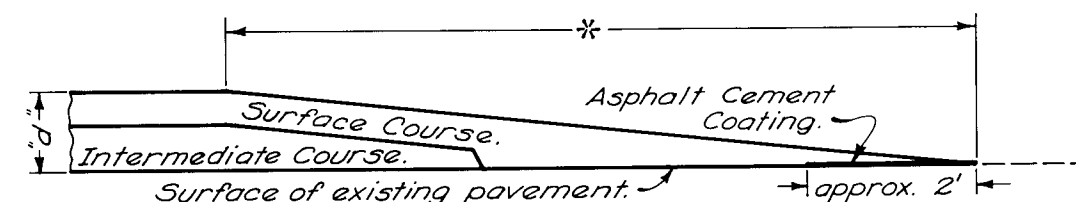
Special core shall be taken during construction to obtain maximum compaction of bituminous concrete in gutters.

### GUTTER FINISH

NOTE: Either type feathered area may be used unless type is specified by the plan.

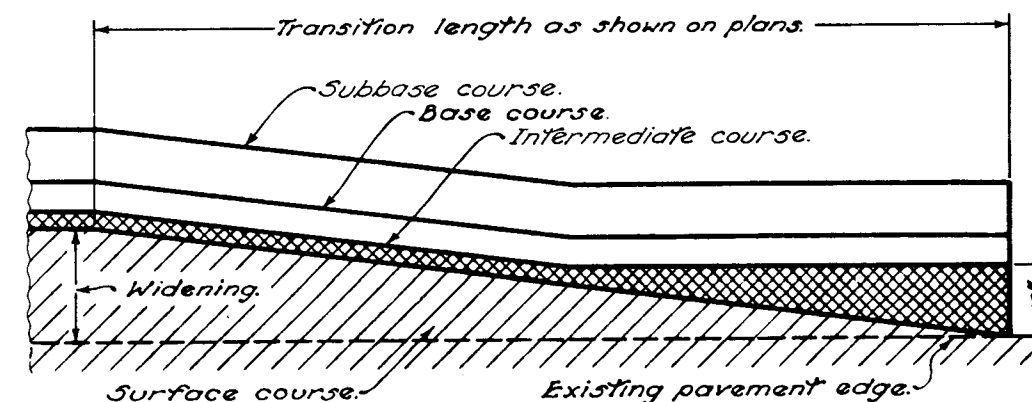


### BUTT JOINT TYPE

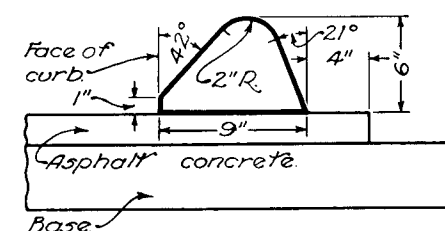


### FEATHER EDGE TYPE

## PLACING FEATHERED AREAS



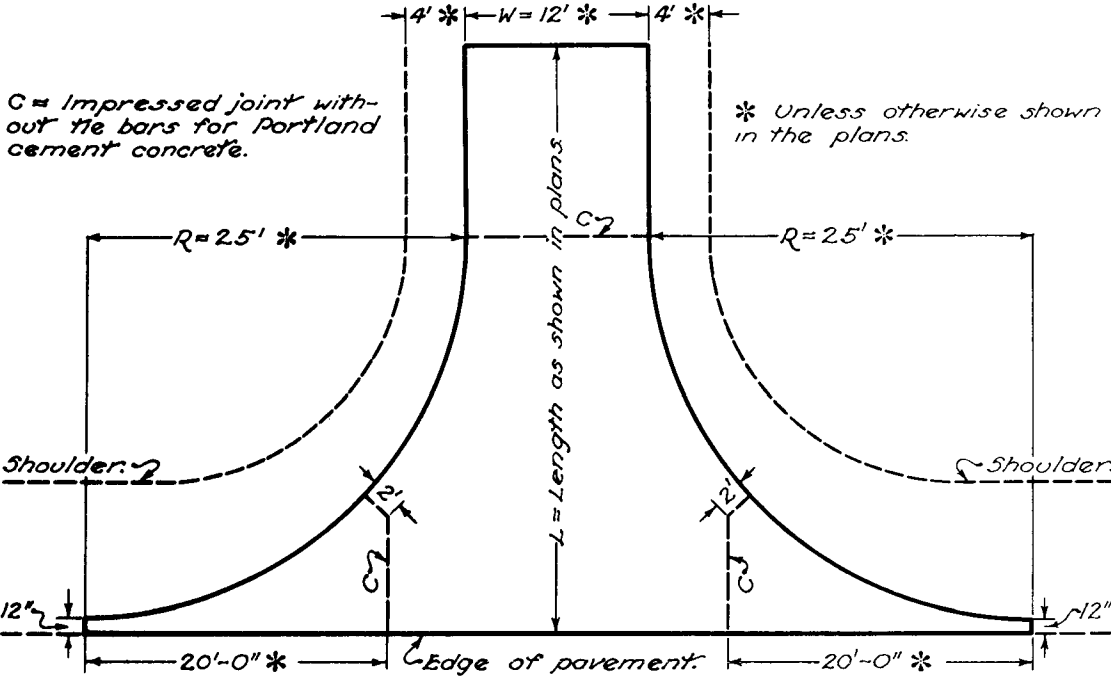
## MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT



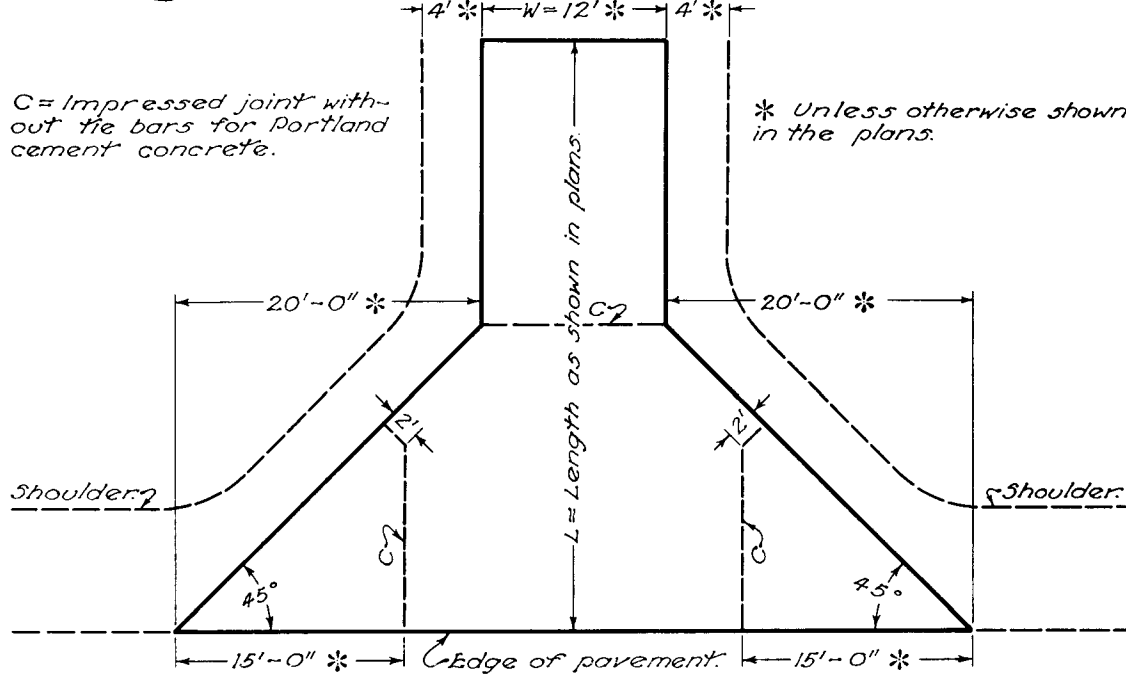
### TYPE 1 ASPHALT CONCRETE CURB

|                                                               |                                               |
|---------------------------------------------------------------|-----------------------------------------------|
| BUREAU OF ROADWAY DESIGN<br>OHIO DEPARTMENT OF TRANSPORTATION |                                               |
| <b>RESURFACING</b>                                            |                                               |
| STANDARD<br>CONSTRUCTION<br>DRAWING                           | BP-5                                          |
| APPROVED <i>E. J. Schaefer</i> ENGR., R.D.                    | DATE<br>6-1-65<br>1-1-71<br>6-1-72<br>8-11-75 |

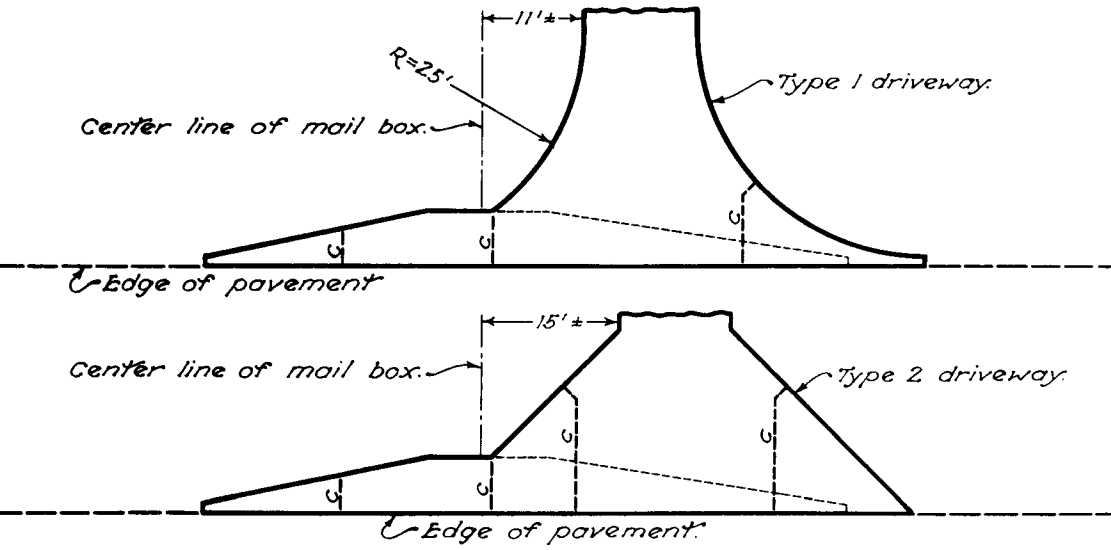
# DRIVEWAYS



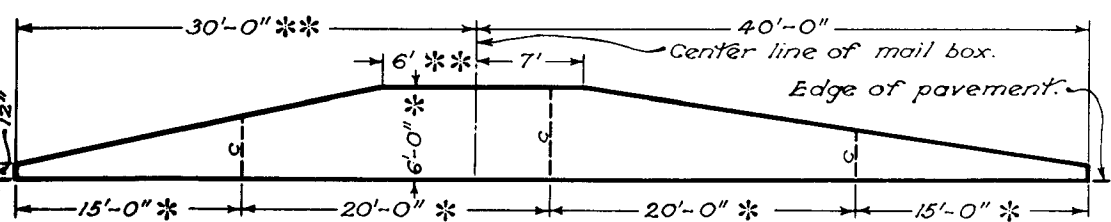
TYPE 1 DRIVEWAY



TYPE 2 DRIVEWAY



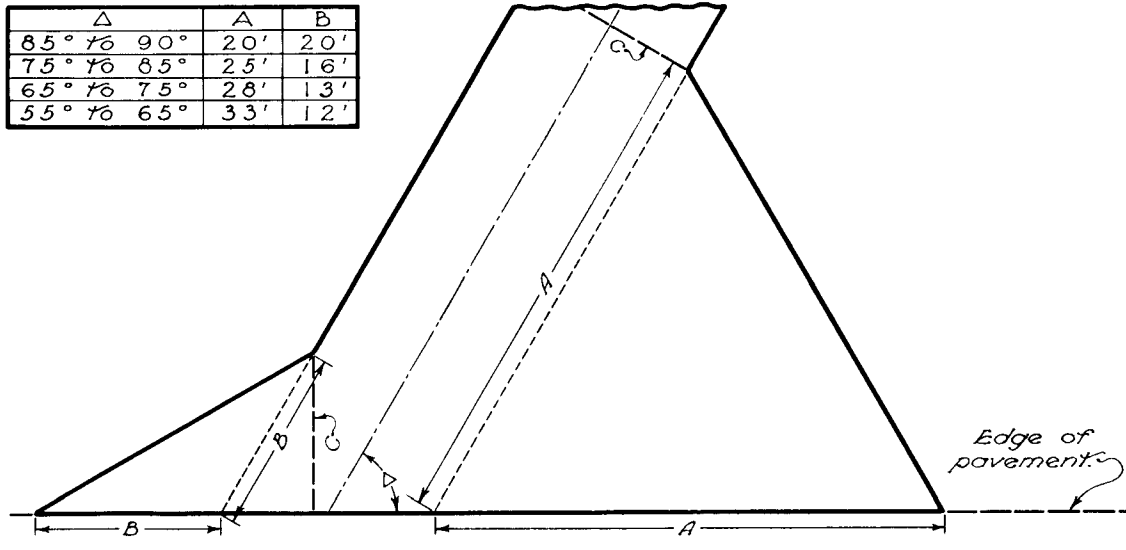
COMBINED DRIVEWAY & MAIL BOX APPROACH



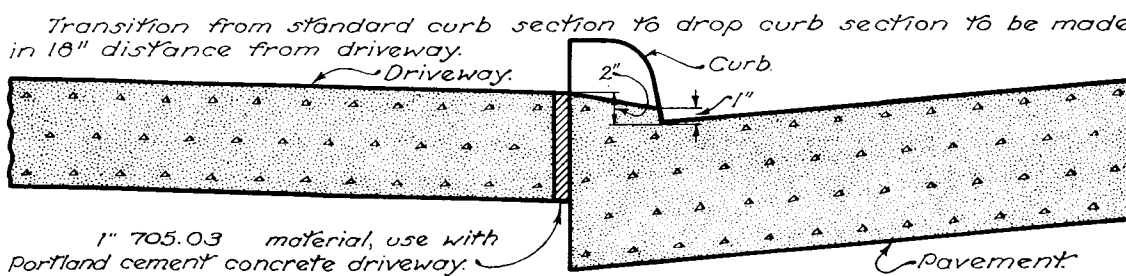
\* Unless otherwise shown in plan.  
 \*\* Add 2 feet for each additional mail box.

TYPICAL MAIL BOX APPROACH

| Δ          | A   | B   |
|------------|-----|-----|
| 85° to 90° | 20' | 20' |
| 75° to 85° | 25' | 16' |
| 65° to 75° | 28' | 13' |
| 55° to 65° | 33' | 12' |



TYPE 2 SKEWED DRIVEWAY



DROP CURB DETAILS AT DRIVEWAYS

## NOTES

**GENERAL:** The design details shown hereon shall govern the construction of driveways unless otherwise shown in the project plans.

The pavement type and thickness shall be specified in the project plans.

Driveway and mail box approaches shall be combined when feasible.

**JOINTS:** Impressed joints for portland cement concrete driveways shall be 1/4" minimum width by 3"± depth and shall be sealed with 705.01 or 705.02.

In addition to the joints shown hereon, impressed joints without tie bars shall be placed in portland cement concrete driveways at intervals not to exceed seventeen feet in the portion of the driveway back of the flare.

BUREAU OF LOCATION AND DESIGN  
 OHIO DEPARTMENT OF HIGHWAYS

DATE  
 6-1-65

## DRIVEWAYS

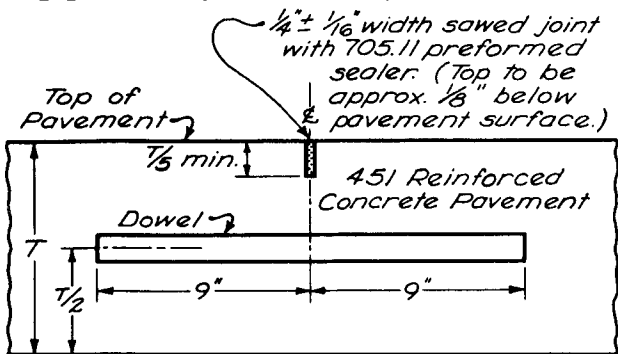
STANDARD  
 CONSTRUCTION  
 DRAWING

BP-6

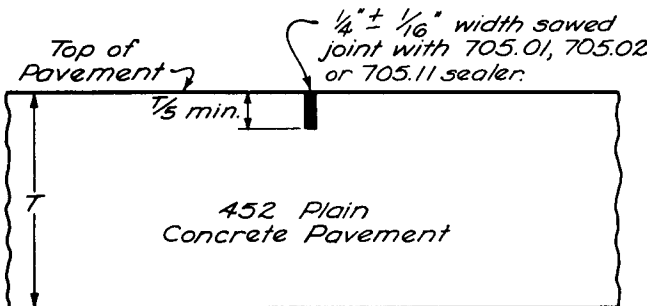
APPROVED *R. D. K. ENGR. L. & D.*

# TRANSVERSE JOINTS

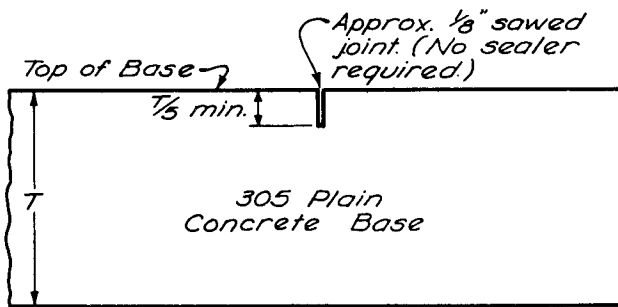
## CONTRACTION JOINTS



SECTION - 451 PAVEMENT

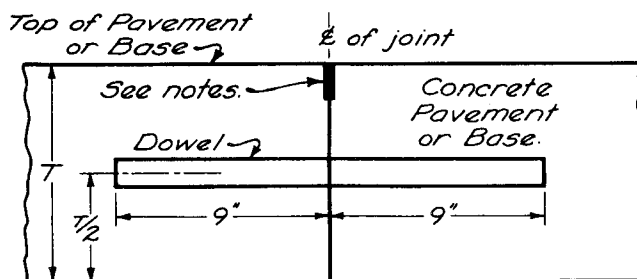


SECTION - 452 PAVEMENT



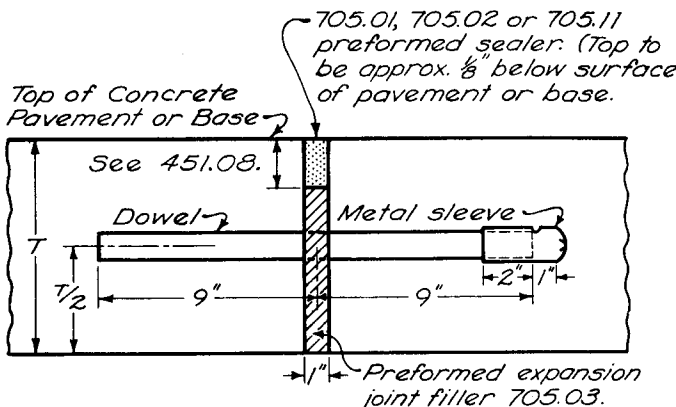
SECTION - 305 BASE

## CONSTRUCTION JOINT

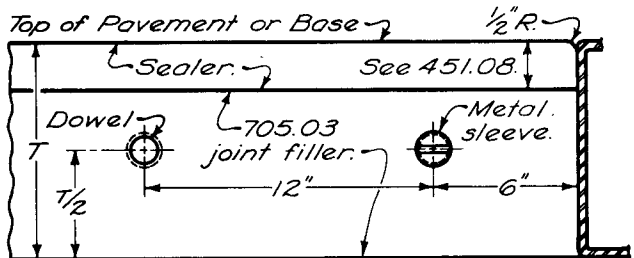


SECTION THROUGH CONSTRUCTION JOINT

## EXPANSION JOINT



SECTION THROUGH EXPANSION JOINT



SIDE ELEVATION OF EXPANSION JOINT

**GENERAL:** Notes and details shown on this drawing shall be considered in conjunction with and supplemental to the pertinent specifications for portland cement concrete pavements and bases, and incidentals related thereto.

All joints shall be constructed normal to the centerline of the pavement lane unless otherwise directed.

Where dowels are specified, they shall be round, straight steel bars of the size indicated in the following table, and shall be shop coated with a suitable rust inhibitor. Dowels shall be spaced at 12" centers, beginning 6" from the longitudinal joint.

| DOWEL SIZE            |                   |
|-----------------------|-------------------|
| THICKNESS OF PAVEMENT | DIAMETER OF DOWEL |
| 8" or less            | 1"                |
| 9"                    | 1 1/8"            |
| 10"                   | 1 1/4"            |
| over 10"              | as shown on plans |

**ASSEMBLY:** Each joint assembly used to hold dowels in position shall be continuous between longitudinal joints or between longitudinal joint and pavement edge. The assembly shall be firmly held in proper position by at least eight 1/2" steel pins driven at an angle to brace the assembly from lateral and vertical displacement during the placing of the concrete. These pins shall be at least 18" in length. Two of these pins shall be driven opposite each other at each end

of the assembly and the remaining pins shall be driven in staggered positions on each side of the assembly. In exceptional cases where it is impracticable to use the 18" length pins, such as where hardpan or rock is encountered, the Engineer may authorize use of shorter pins provided the assembly is held firmly. Where the assembly is placed on granular material which may allow settlement or distortion of the assembly, a minimum of 6 steel plates, each having a bearing area of approximately 25 square inches and a cross-section which will not bend under the imposed load, shall be placed under the assembly. One plate shall be used at each of the four end pins. The remaining plates shall be spaced uniformly on each side of the assembly. The method of staking and placing bearing plates shall be approved by the Engineer.

Dowel spacing is shown for pavement lanes of even foot widths. Where other widths are specified, standard cages may be used with dowel spacings adjusted as follows:

The 6" dowel spacing shall be maintained at the longitudinal joint. The spacing at the outer edge of the lane may be increased up to 12". Where an odd width of lane occurs, a dowel shall be placed 6" from the outer edge of the lane if the standard cage would provide for a space exceeding 12". Such a dowel shall be held rigidly in proper position by a method satisfactory to the Engineer, or a dowel cage of greater length than required may be used by cutting the assembly and splicing to attain the required length.

This drawing is intended for use with a uniform depth pavement. When the project involves the placing of variable depth pavement, the joint components shall be held in place in accordance with the method shown in the plan or as approved by the Engineer.

**EXPANSION JOINTS:** Expansion joint filler shall be placed at 90° to the dowels, both horizontally and vertically, and shall be held rigidly in position. Joint filler shall be continuous for the full width of each lane.

Smooth dowels shall be used, and free movement shall be provided by applying a coating of an oil such as S.A.E. 140 or other "bond-breaking" material just prior to placing the concrete. One free end of each dowel shall be equipped, after coating, with a metal sleeve approximately 3" long, designed with crimped end and overlapping seams, fitting closely around the dowel. Each sleeve shall be provided with a depression or interior projection to act as a stop for the dowel, sufficiently distant from the crimped end to allow 1" for longitudinal dowel movement with pavement expansion. In lieu of this requirement, any other means may be used if approved by the Director.

Proper size dowel holes shall be punched or drilled into the preformed expansion joint filler in order to insure tight fitting dowels.

**CONTRACTION JOINTS:** Dowels shall be used in contraction joints in 451 reinforced concrete pavement. They shall be smooth bars, and free movement shall be provided by applying a coating of an oil such as S.A.E. 140 or other "bond-breaking" material just prior to placing the concrete.

Contraction joints of the type specified shall

be spaced in accordance with the following table:

| CONTRACTION JOINT SPACING        |                                |
|----------------------------------|--------------------------------|
| TYPES OF PAVEMENT OR BASE        | MAXIMUM SPACING BETWEEN JOINTS |
| 451 Reinforced Concrete Pavement | 40 lin. ft.                    |
| 452 Plain Concrete Pavement      | 17 lin. ft.                    |
| 305 Plain Concrete Base          | 17 lin. ft.                    |

**CONSTRUCTION JOINTS:** Smooth dowels shall be used in transverse construction joints in all portland cement concrete pavement and base. The joint shall be formed by using an adequate bulkhead that will provide a straight joint. The bulkhead shall have openings provided for dowel bars spaced as outlined under "ASSEMBLY." The bulkhead shall be shaped to fit the typical section of the pavement or base. Dowels shall be held rigidly in position during the placing of the concrete.

Construction joints in reinforced concrete pavement may be located at a contraction joint or between contraction joints, provided they are not closer than 10 feet to another parallel joint. In plain concrete pavement or concrete base a construction joint shall not be located closer than 5 feet to another parallel joint.

Kerf and seal conforming in all respects to details shown for contraction joints shall be provided at each construction joint in 451 and 452 pavements.

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

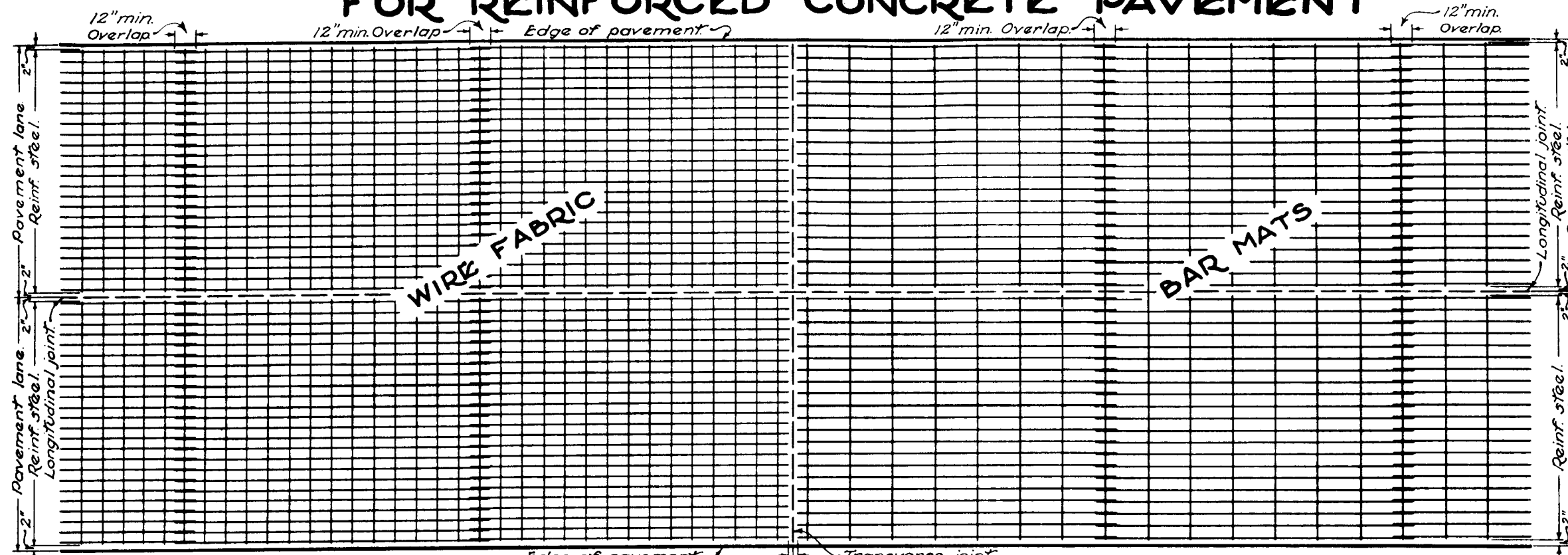
PAVEMENT JOINTS

STANDARD CONSTRUCTION DRAWING BP-4

APPROVED *R.E. Little* ENGR. L. & D.

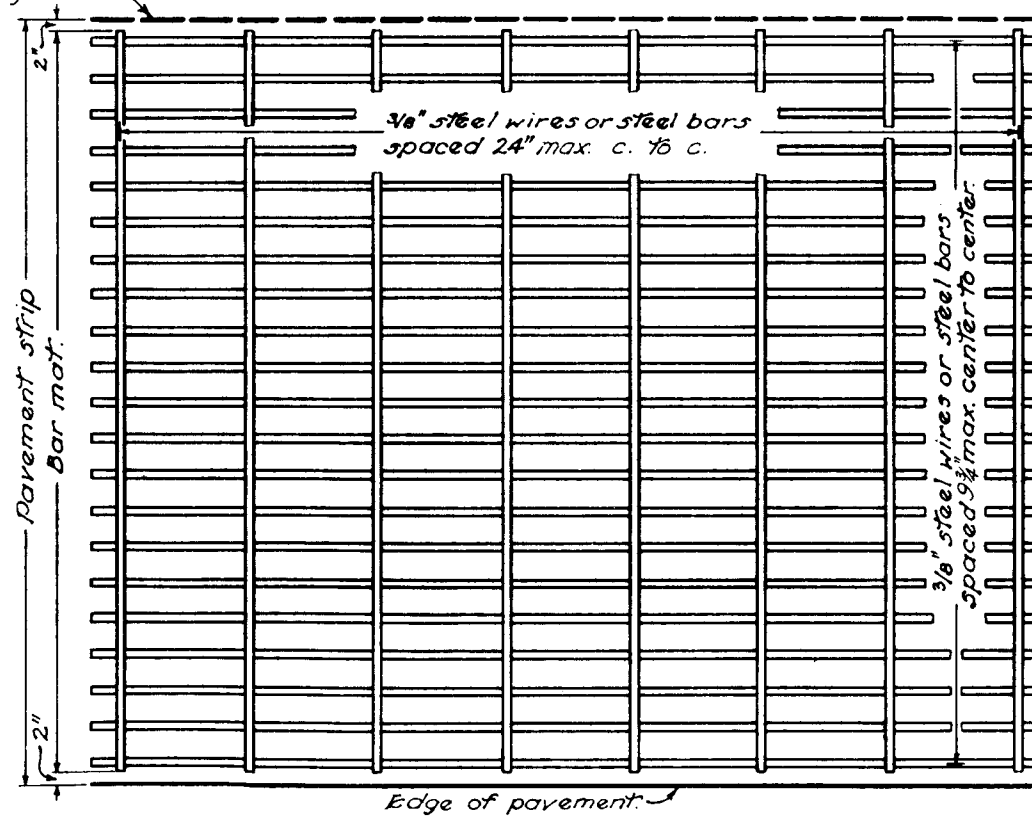
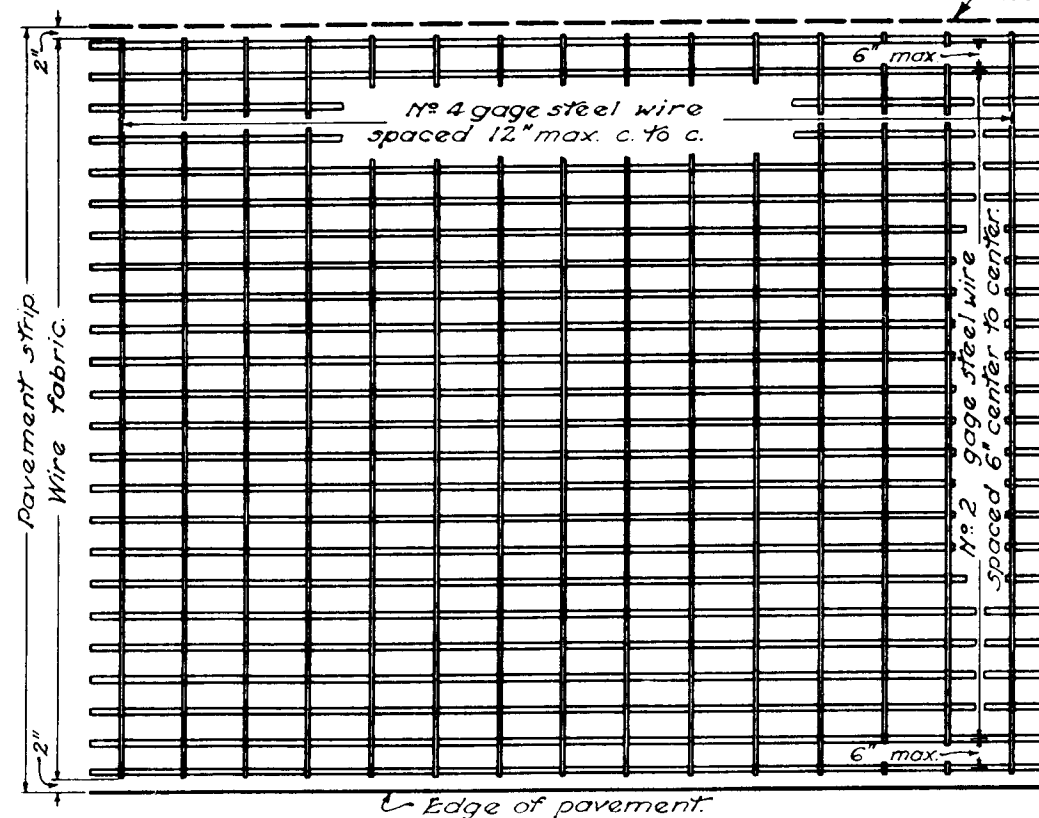
DATE  
6-1-65  
1-10-67  
12-1-68  
1-1-71

# STEEL REINFORCING FOR REINFORCED CONCRETE PAVEMENT



WIRE FABRIC

BAR MATS



## NOTES

Steel reinforcing in normal or wider lane widths may consist of two units with an approved longitudinal hinge. The hinge shall consist of No. 4 gage steel wires connecting the two units such that the longitudinal members on either side of the hinge will be properly spaced when the reinforcing is in final position.

The distance from the top of the concrete pavement to the reinforcing steel may vary from  $2\frac{1}{2}$  inches to  $T + 1$  inch, where  $T$  = thickness of the concrete pavement.

The requirement for clearance between the transverse joints and the ends of wire or bar reinforcing is modified to the extent that the clearance may be 12" plus or minus 2" if the Contractor installs the dowel bars by using a dowel installing machine.

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

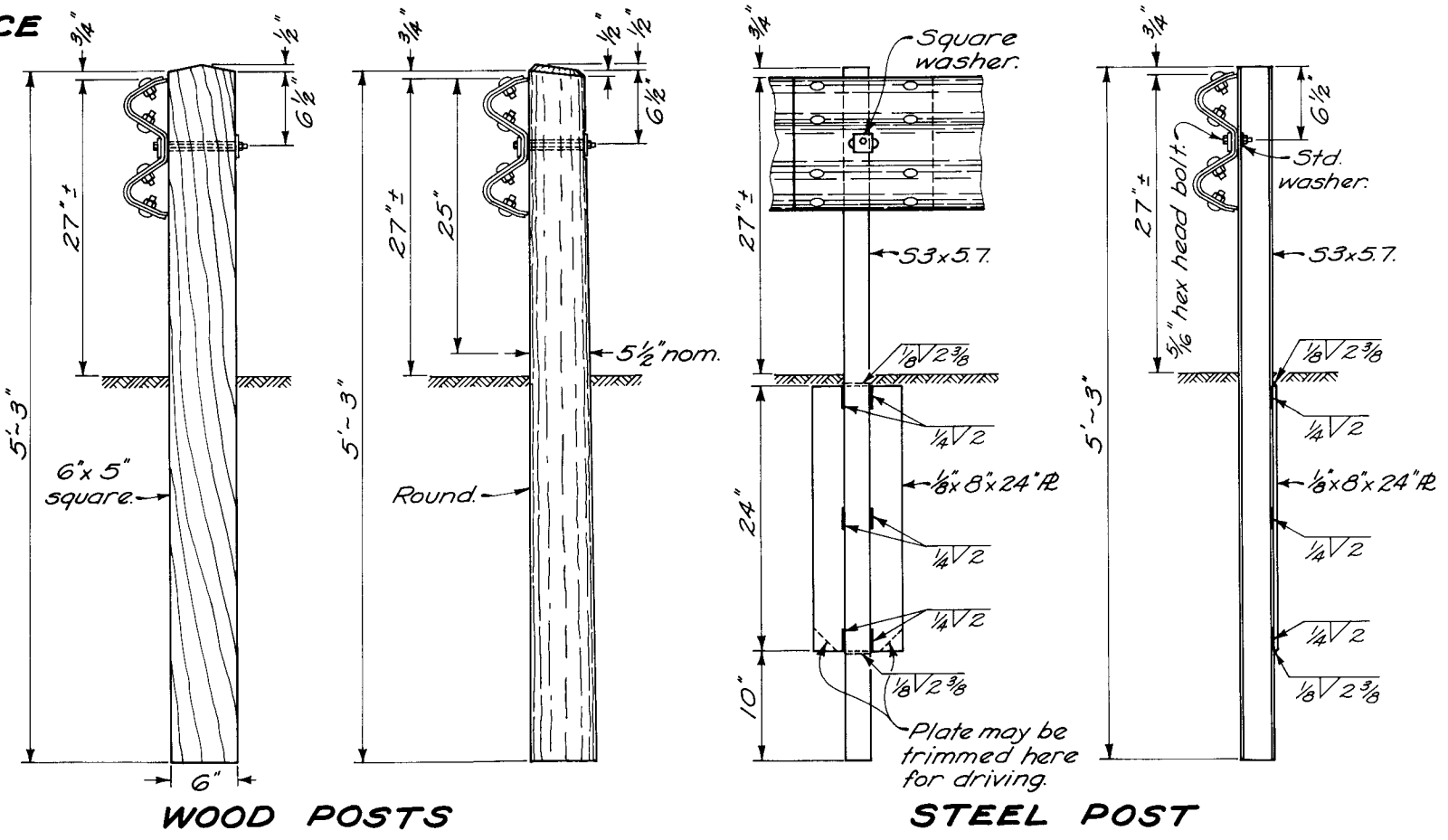
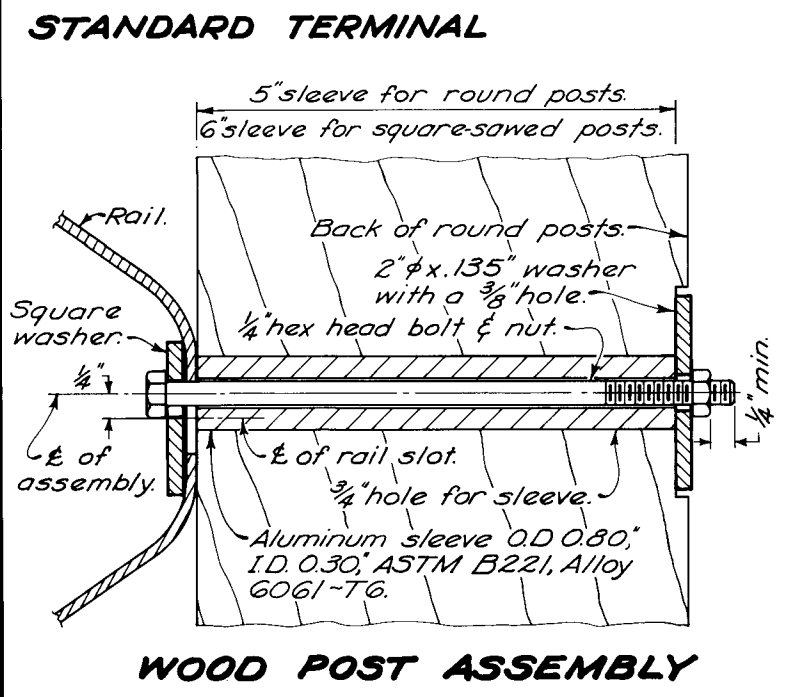
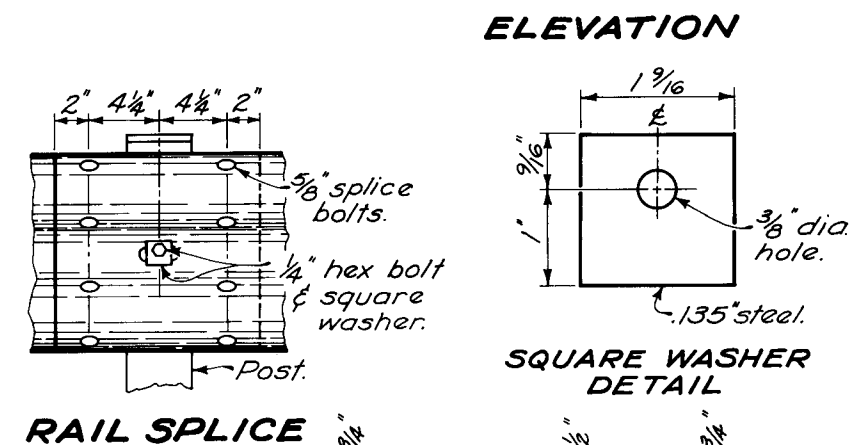
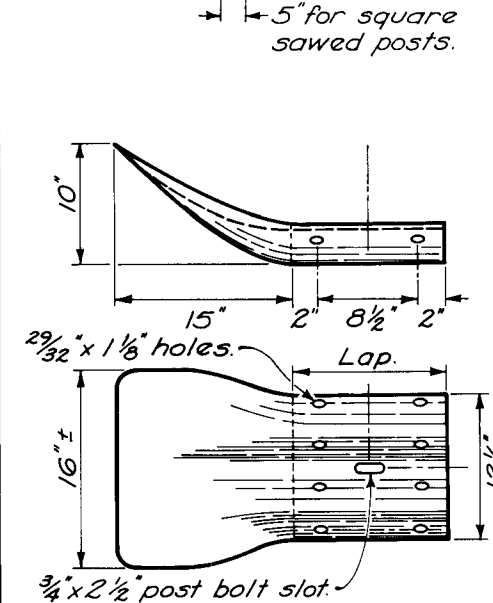
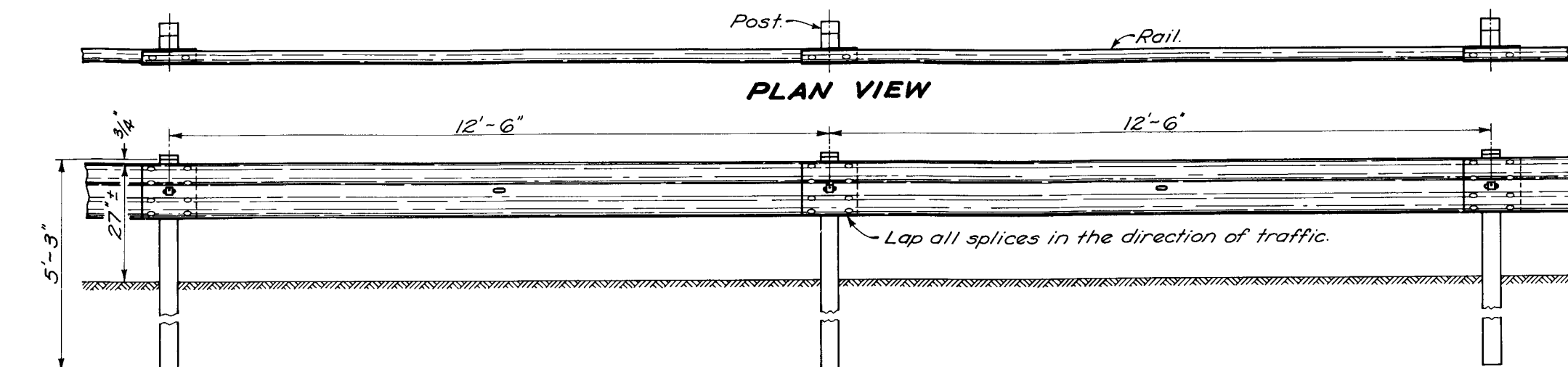
**PAVEMENT  
REINFORCING**

STANDARD  
CONSTRUCTION  
DRAWING

**BP-2**

APPROVED *R. E. L. L.* ENGR. L. & D.

DATE:  
6-1-65  
1-10-67  
1-17-68  
12-1-68



**NOTES**

**STEEL POSTS** shall be 53x5.7 710.15 with a 1/8"x8"x24" steel plate welded to the back as shown, galvanized after fabrication. Post bolts shall be 5/16" by 1 1/4" hex head full body bolts, ASTM A-307, Grade A, with a minimum of 9/8" unthreaded. Provide a 1 1/2"x.135" square steel washer between post bolt and rail and one standard round steel washer between post and nut.

**WOOD POSTS:** Pressure treated wood posts 710.14 may be 5"x6" square sawed or 5 1/2" plus or minus 1/2" diameter round, measured at a point 25" below top of rail. Post bolts shall be 1/4" hex head full body bolts, ASTM A-307, Grade B. Provide a 1 1/2"x.135" square steel washer between post bolt and rail, and a 2"x.135" round steel washer between post and nut. Aluminum pipe sleeve shall conform with ASTM B-221 Alloy 6061-T6.

**POST SPACING ON CURVES** shall be in accordance with the following:

| Radius of Curvature                 | Post Spacing |
|-------------------------------------|--------------|
| 220 feet and over.                  | 12'-6"       |
| Between 110 feet and 220 feet.      | 6'-3"        |
| 110 feet incl. to 75 feet.          | 4'-2"        |
| 75 feet incl. to 50 feet incl.      | 3'-1 1/2"    |
| Less than 50 feet, not recommended. |              |

**GUARD POSTS** shall conform with the details and requirements for Type 7 wood posts except that posts shall be spaced 6'-0" center to center unless otherwise shown on the plans, and shall be pressure treated with pentachlorophenol prior to painting. Guard posts shall be painted with one prime coat and two finish coats of white paint 708.05.

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

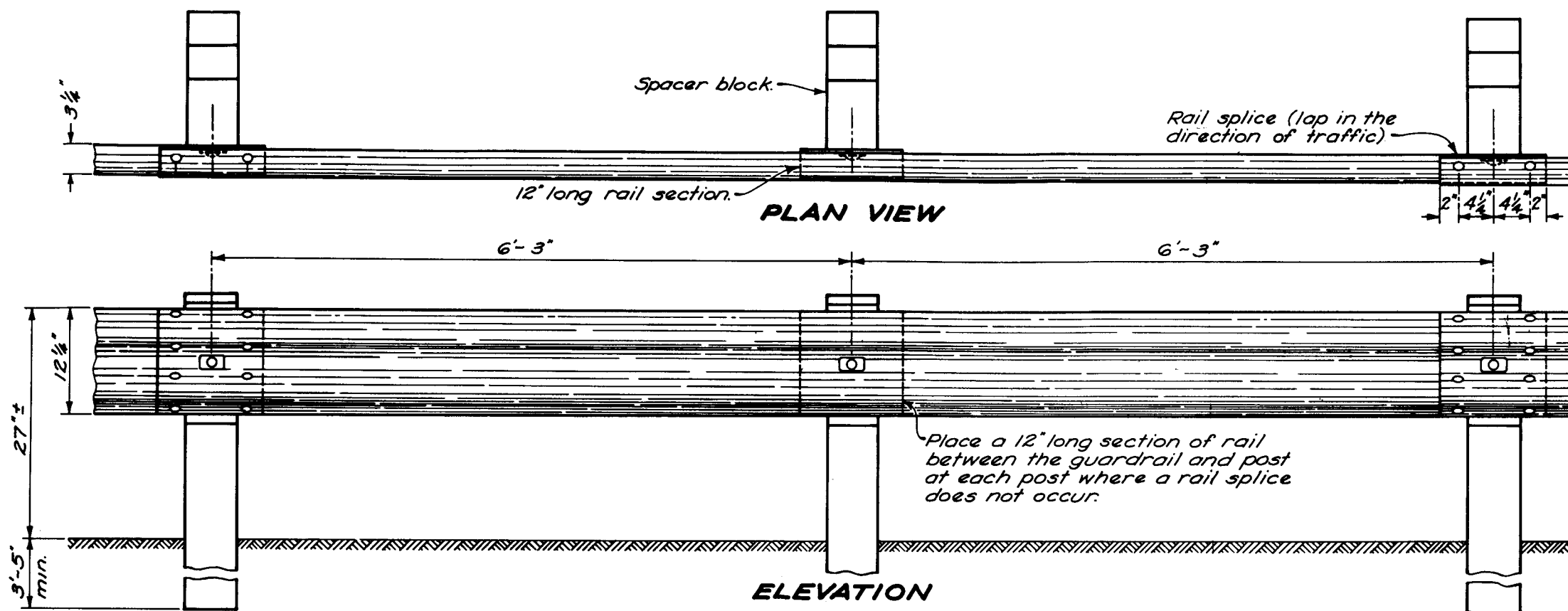
**GUARDRAIL  
TYPE 7**

STANDARD  
CONSTRUCTION  
DRAWING

GR-2A

APPROVED *R.E. Latta* ENGR., L. & D.

DATE 1-1-71



## NOTES

**POSTS** may be round (single rail only) or 6"x8" square - sawed pressure-treated wood or W6x8.5 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 11" at the butt with uniform taper from top to butt.

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 after posts are set. Posts set or driven to within 1/2" of grade need not be trimmed.

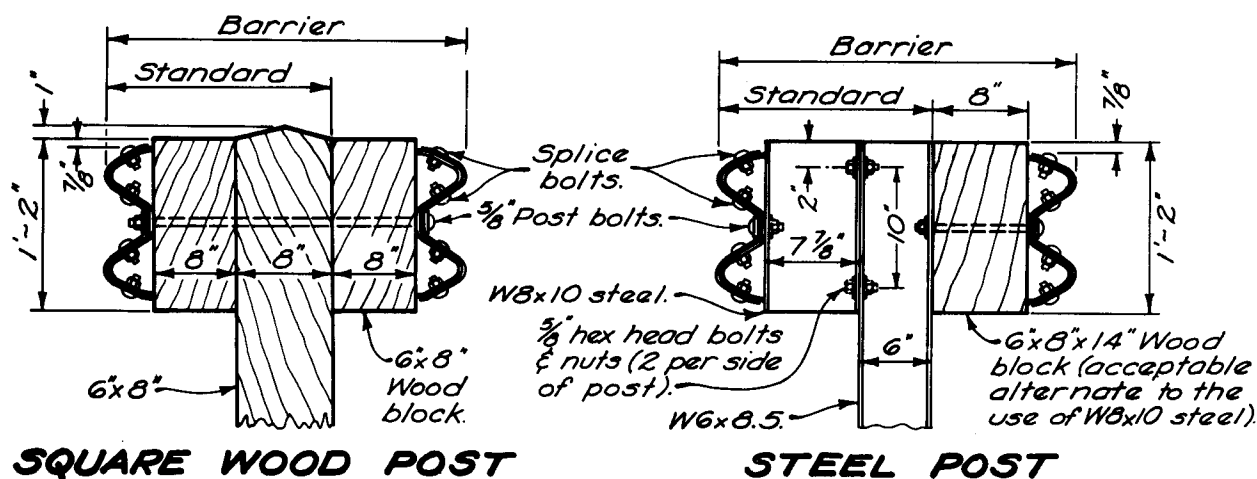
Cost of inlet mounted post to be included in the unit price bid for type 5 barrier guardrail.

**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:** Standard galvanized washers of appropriate size are required on post bolts where special washers are not indicated.

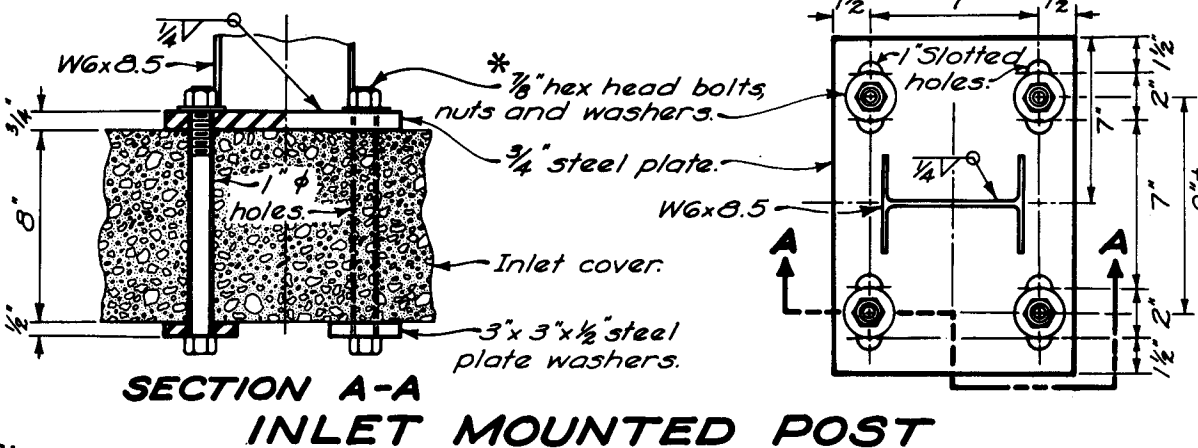
**BARRICADE GUARDRAIL** shall be mounted on Type 5 posts with 5/8" post bolts and washers as specified hereon. Omit spacer blocks, anchor assemblies and intermediate posts. Place standard terminals at each end (see Standard Construction Drawing GR-2A for detail).

\* 1/8" threaded self-drilling anchors with 1/8"x2 1/4" hex head bolts may be substituted. Self-drilling anchors may be of the snap-off chuck-end type or of the flush-end type conforming to Federal Specification No. FF-S-325, Group III, Type 1(a) or (c).



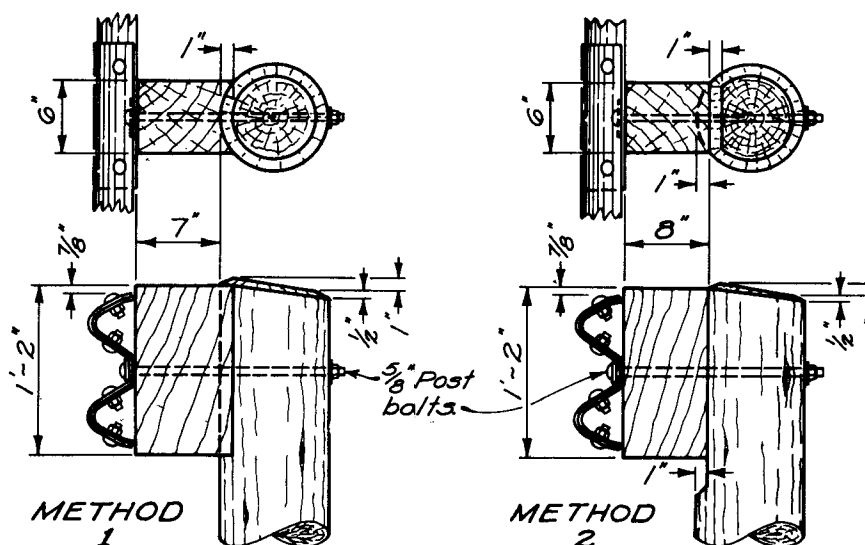
**SQUARE WOOD POST**

**STEEL POST**



**SECTION A-A**

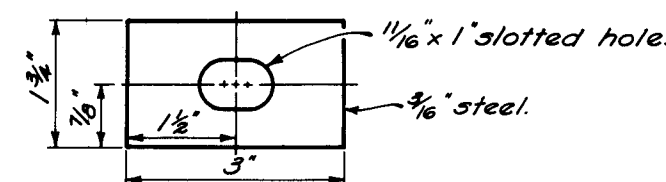
**INLET MOUNTED POST**



Alternate methods of placing the spacer blocks on the round posts may be submitted for consideration and approval by the Engineer.

**ROUND WOOD POSTS**

Place one rectangular washer between bolt head or nut and the face of rail. All other washers indicated above are standard.



**POST BOLT WASHER**

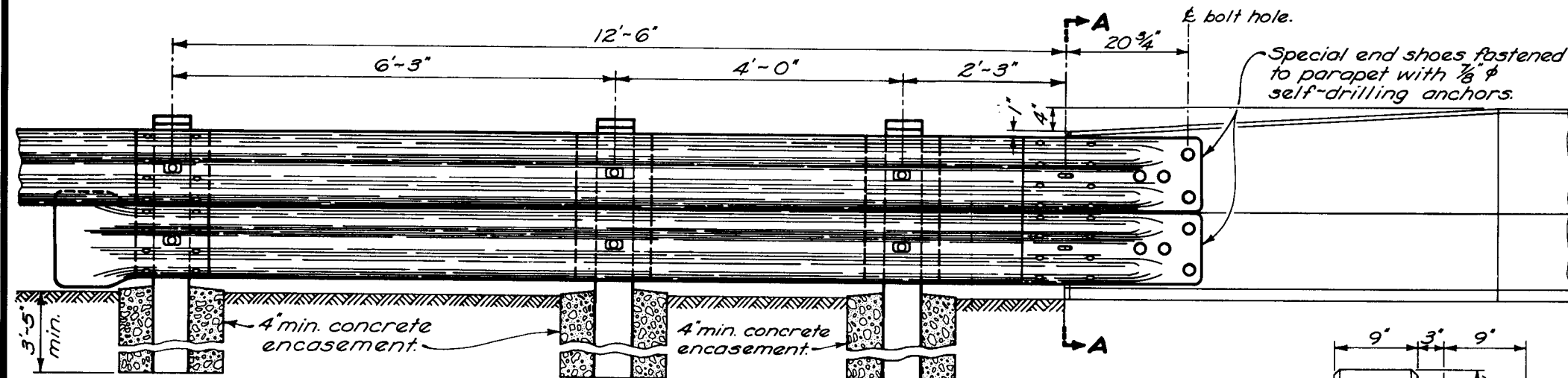
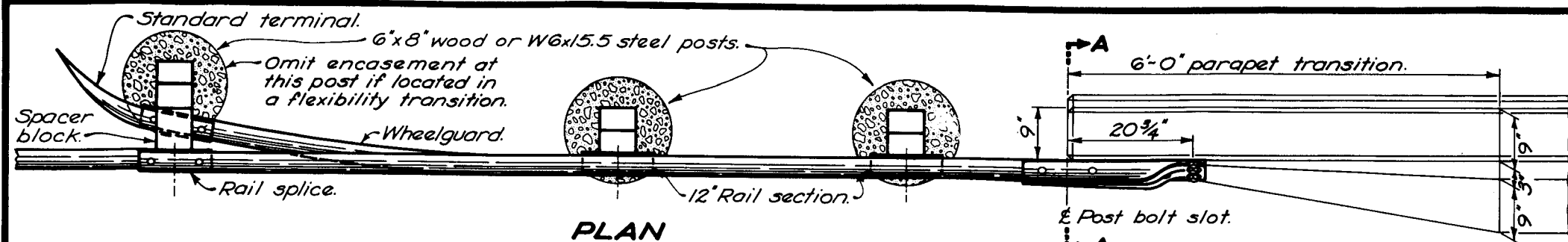
BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

**GUARDRAIL  
TYPE 5**

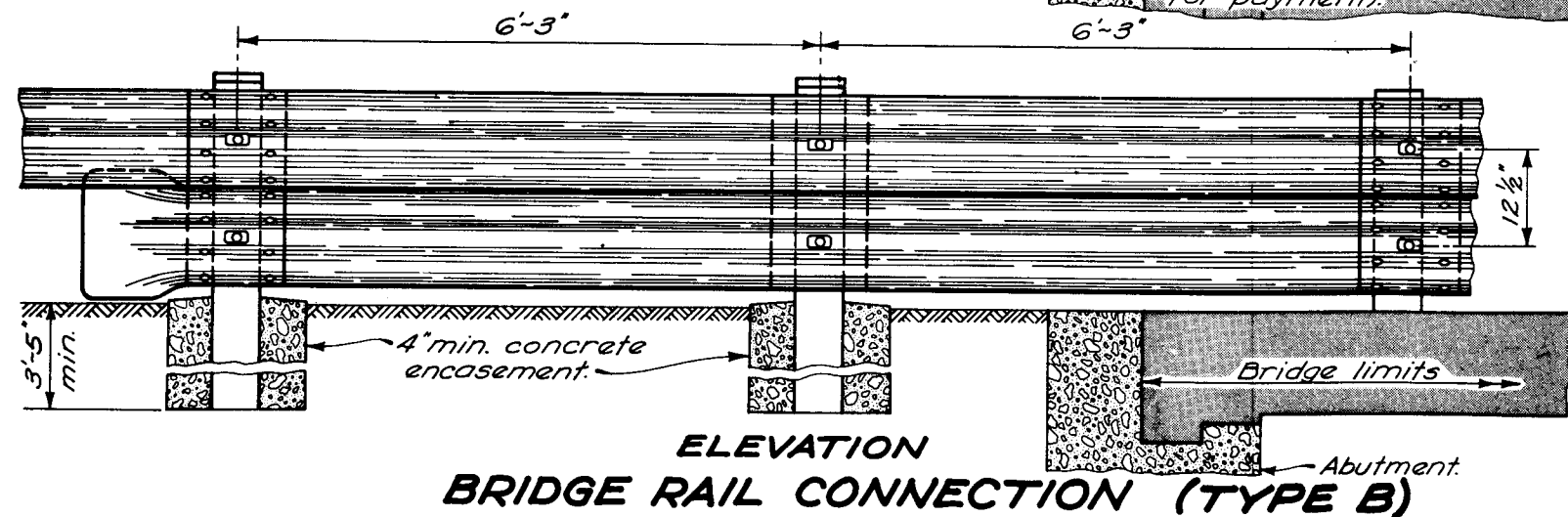
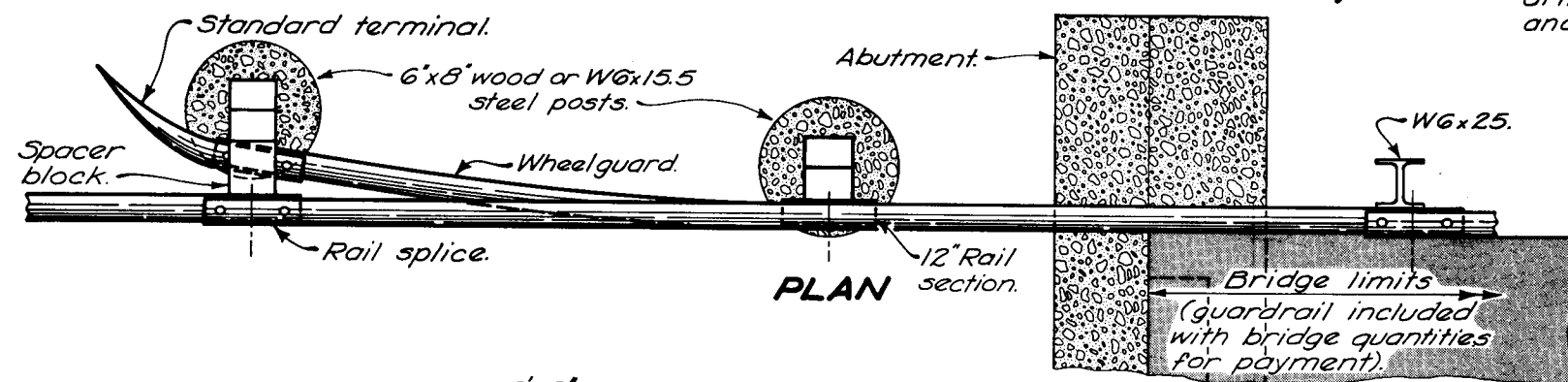
STANDARD  
CONSTRUCTION  
DRAWING **GR-2B**

APPROVED: *[Signature]* ENGR. L. & D.

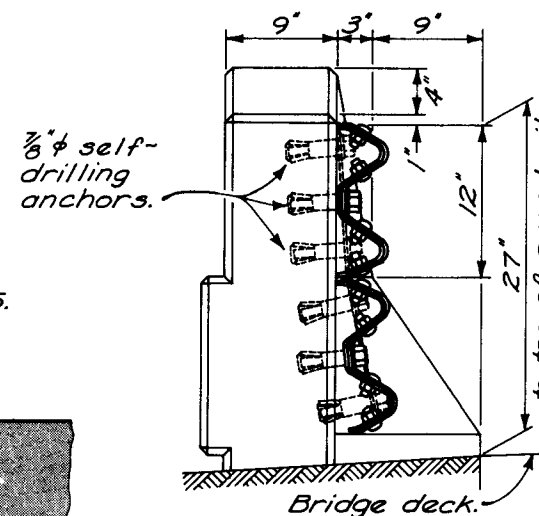
DATE  
2-15-60  
1-1-71  
11-9-71



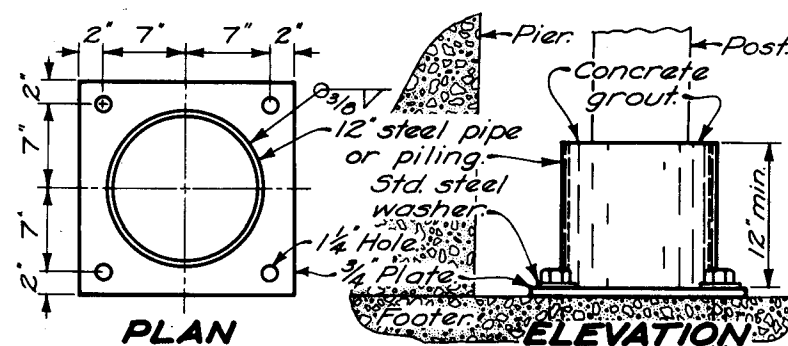
**PARAPET CONNECTION (TYPE A)**



**BRIDGE RAIL CONNECTION (TYPE B)**



**SECTION A-A**



**FOOTING ANCHOR**

## NOTES

**WHEELGUARD:** The wheelguard shall be required on all uncurbed approach connections, and on all uncurbed trailing connections on two-lane highways. Where the wheelguard is omitted at uncurbed trailing and connections on directional roadways, standard Type 5 posts with offset blocks shall be provided in the bridge terminal assemblies.

**ANCHORS:** Self-drilling anchors with 3/8"x1 1/2" galvanized bolts and washers shall be used to fasten the special end shoes to the concrete parapet.

Self-drilling anchors with 3/4"x2" bolts and washers may be used on the footing anchor. Footing anchor and hardware need not be galvanized.

Self-drilling anchors may be of the snap-off chuck-end type or flush-end type conforming to Federal Specification No. FF-S-325, Group III, Type 1(a) or (c).

**TYPE B CONNECTION:** Where guardrail is used as bridge railing the approach length on directional roadways and at both ends on two-lane highways shall be not less than 125 feet excluding the anchor assembly. The trailing length on directional roadways shall be not less than 25 feet plus anchor assembly. For special end shoe detail see Standard Drawing GR-4.

**PAYMENT:** Price bid for bridge terminal assemblies shall include the additional cost, in excess of normal guardrail cost, for steel posts, concrete encasement and wheelguards. Price bid for Type A assemblies shall also include the cost of special end shoes and self-drilling anchors.

Cost of footing anchor shall be included in the unit price bid for guardrail.

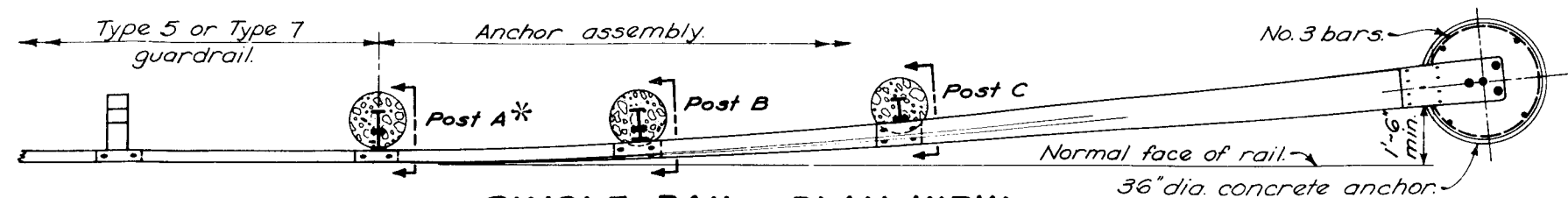
BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

**BRIDGE  
TERMINAL  
ASSEMBLIES**

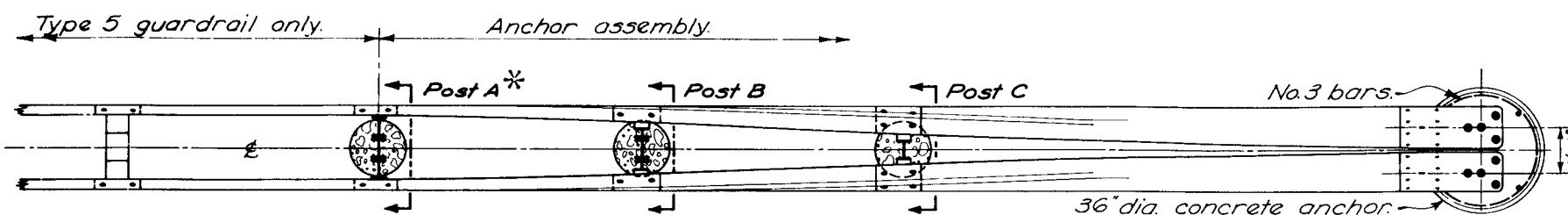
STANDARD  
CONSTRUCTION  
DRAWING  
GR-3

APPROVED: *[Signature]* ENGR., L. & D.

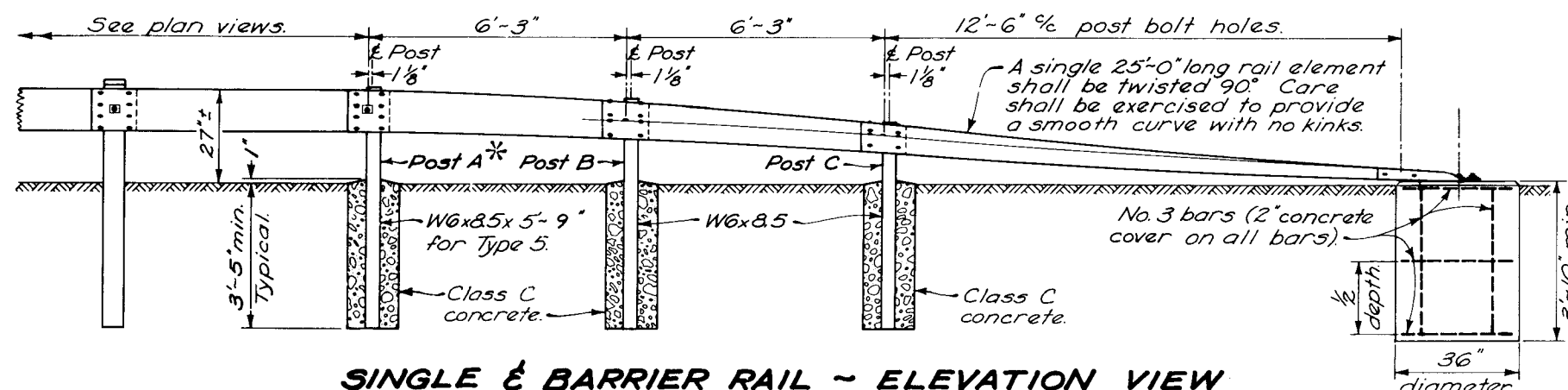
DATE  
11-9-'71



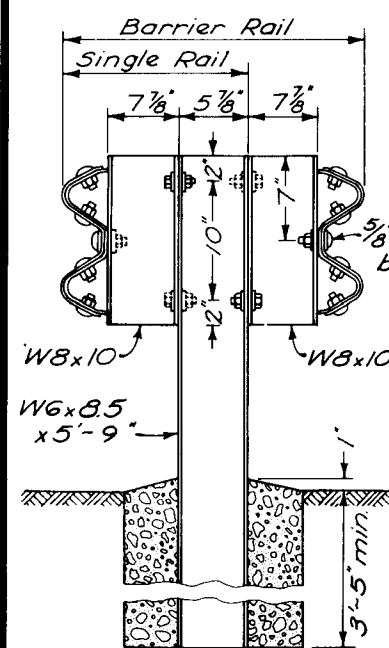
**SINGLE RAIL - PLAN VIEW**



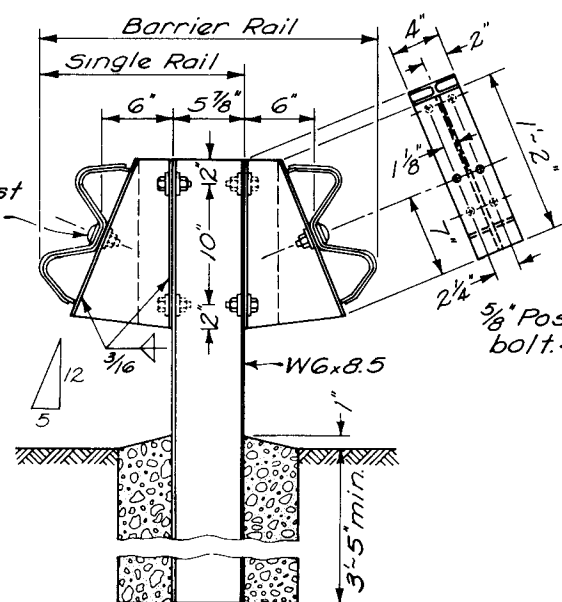
**BARRIER RAIL - PLAN VIEW**



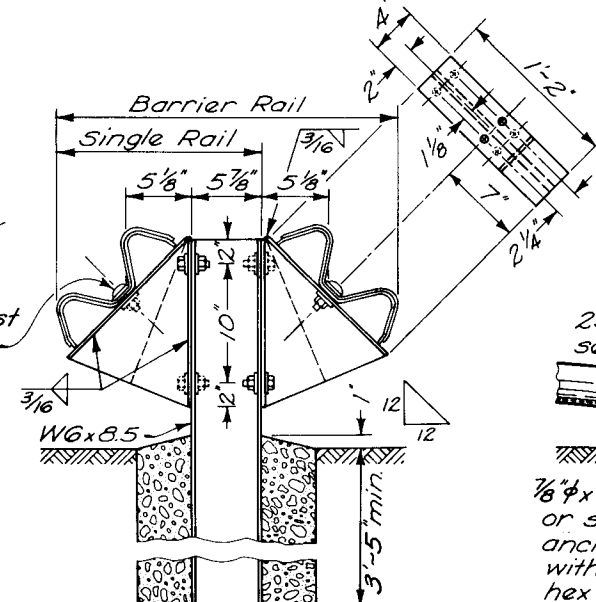
**SINGLE & BARRIER RAIL - ELEVATION VIEW**



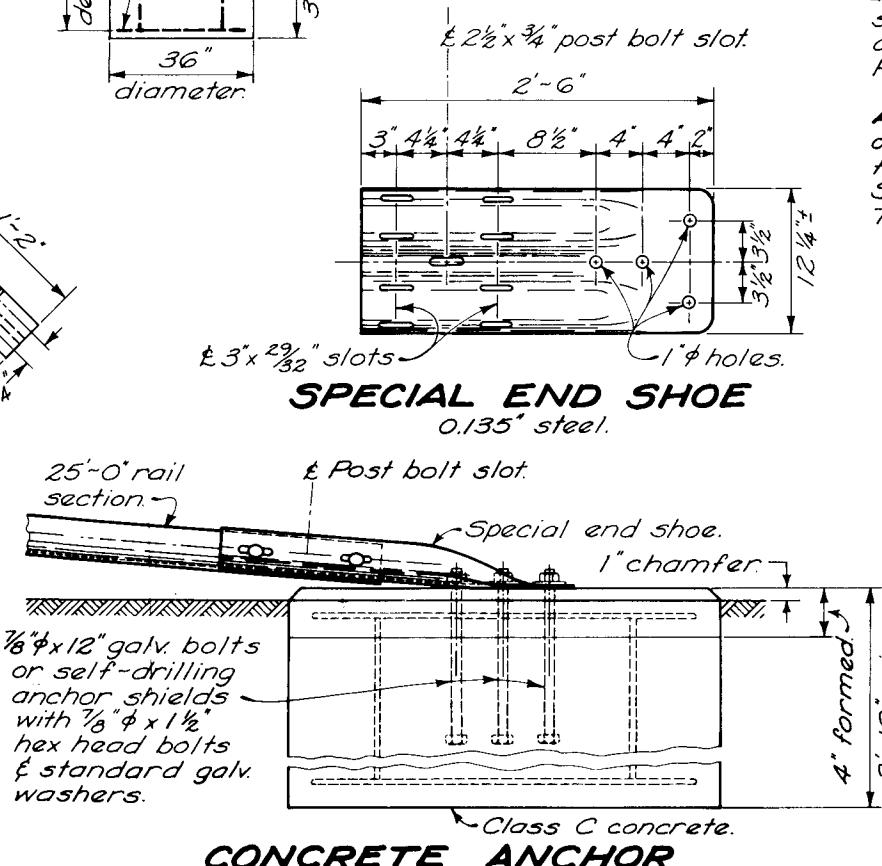
**POST A\***



**POST B**



**POST C**



**SPECIAL END SHOE**  
0.135" steel.

**CONCRETE ANCHOR**

## NOTES

**GENERAL:** For details not shown, see Standard Drawings GR-2A or GR-2B. All steel parts shall be galvanized in accordance with 710.06 or 710.10, whichever may apply.

**ANCHOR ASSEMBLY** shall be used at each free end of either Type 5 or Type 7 guardrail or barrier rail.

The 1'-6" flare offset from normal face of rail, shown in the plan view (for single rail installations), will be utilized only where shoulder width is insufficient for providing standard offsets shown on GR-5 and GR-6. Use of the 1'-6" offset will generally be limited to upgrading existing highways for safety or the construction or reconstruction of highways with design traffic less than 1000 ADT or design speeds less than 50 mph.

**SPACERS** for Posts B and C shall be made of 3/16" steel plate 710.15, or two sections of W6x8.5 or W8x10 cut in the web (see dashed line) and welded together on both sides.

All steel spacers and posts may be provided with additional bolt holes so that these items will not be required to be made right and left handed.

Spacers shall be fastened to their posts with two 5/8" hexhead bolts and nuts with standard washers on both sides.

**POST BOLT WASHERS:** Place one rectangular washer (see GR-2B for detail) between post bolt head or nut and the face of rail.

All other washers indicated on this drawing are standard galvanized steel of the appropriate size.

**CONCRETE ANCHOR:** Form top 4" of anchor and slope the top to conform to slope of the adjacent ground. The 36" diameter anchor may be replaced by a 2'-6" square anchor at the contractor's option.

**CONCRETE:** All concrete shall be Class C. Minimum post encasement shall be 4".

\* Single rail details are shown for Type 5 guardrail. Where anchor assembly is attached to Type 7 guardrail, Post A shall be a standard Type 7 line post set in concrete, and the spacer block shall be omitted. Post bolt shall be 5/8" φ.

**ANCHORS:** Self-drilling anchors may be of the snap-off chuck-end type or the flush-end type conforming to Federal Specification No. FF-S-325, Group III, Type 1(a) or (c).

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

**ANCHOR ASSEMBLY**

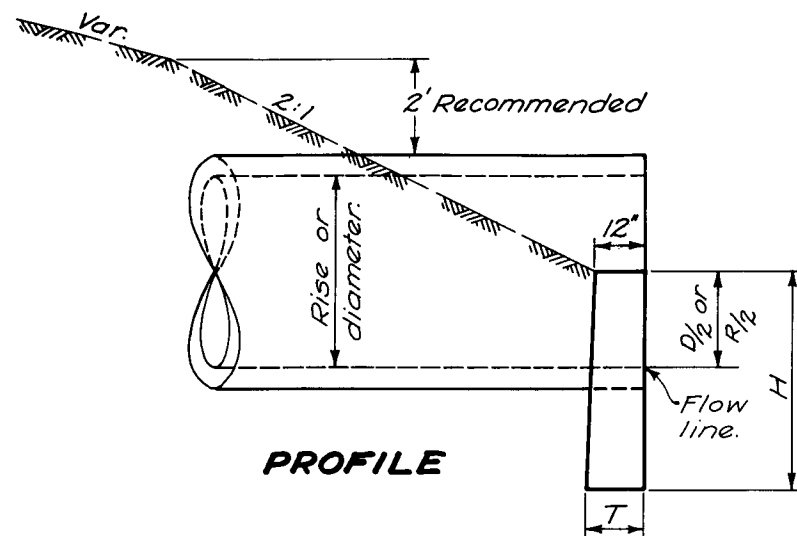
STANDARD CONSTRUCTION DRAWING  
**GR-4**

APPROVED *E. J. Shay* ENGR., L. & D.

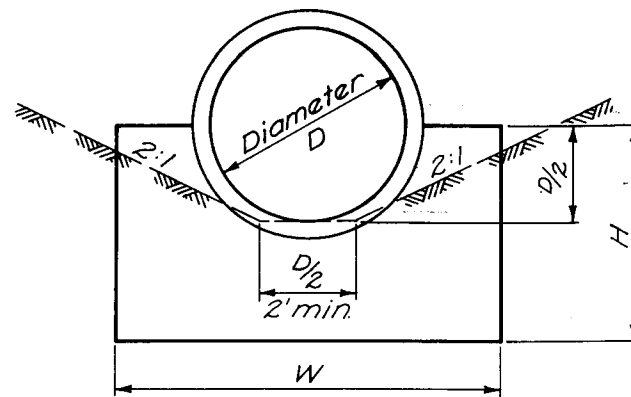
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11-9-71



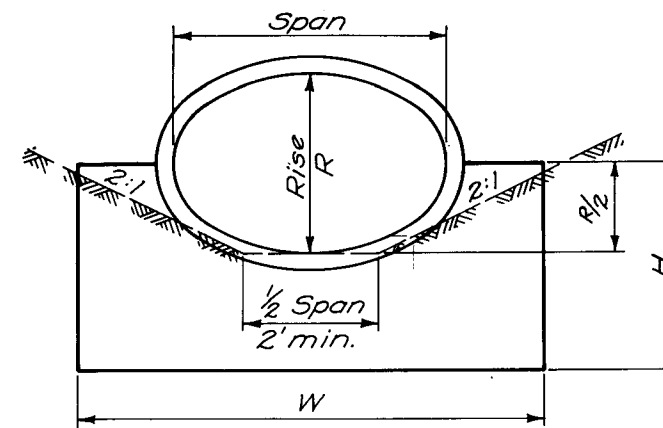




PROFILE



CIRCULAR  
CONCRETE PIPE



ELLIPTICAL

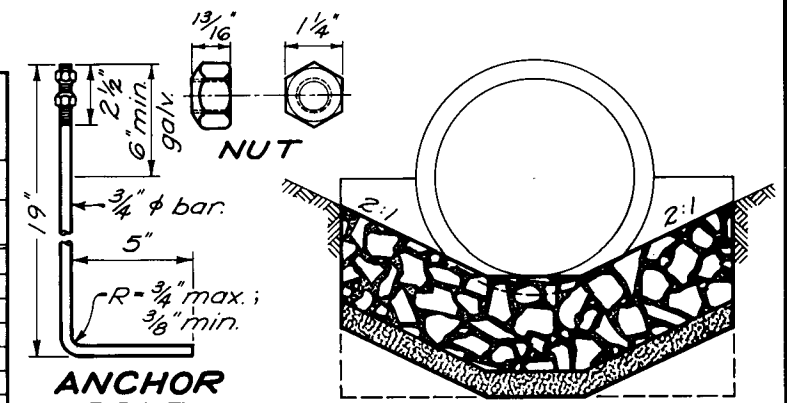
**NOTES**

**CONCRETE** for headwalls shall be Class C.

**ANCHOR BOLTS** (as detailed) for anchoring upstream end of metal pipes shall meet ASTM A307. The top 6" min. of bolt shall be galvanized according to ASTM A153. Nuts (as detailed) shall meet ASTM A325 and A153. Cost of anchors shall be included in the unit price bid per linear foot of 603 Conduit. Unless otherwise specified, anchor bolts shall be used only on pipes with span or rise greater than 24 inches.

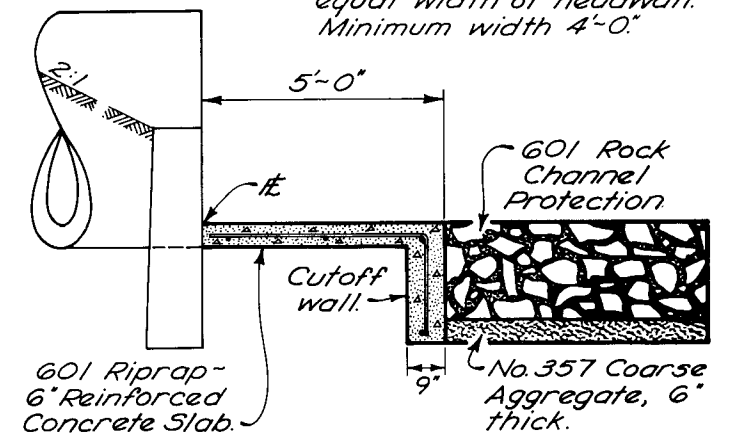
| HEADWALL FOR CONCRETE PIPE |        |        |     |                |            |      |         |        |     |                |
|----------------------------|--------|--------|-----|----------------|------------|------|---------|--------|-----|----------------|
| CIRCULAR                   |        |        |     |                | ELLIPTICAL |      |         |        |     |                |
| D                          | W      | H      | T   | Conc. Cu. Yds. | Span       | Rise | W       | H      | T   | Conc. Cu. Yds. |
| 12"                        | 2'-0"  | 3'-0"  | 12" | .20            |            |      |         |        |     |                |
| 15"                        | 2'-6"  | 3'-2"  | 12" | .25            |            |      |         |        |     |                |
| 18"                        | 3'-0"  | 3'-3"  | 12" | .31            | 23"        | 14"  | 3'-5"   | 3'-2"  | 12" | .33            |
| 21"                        | 3'-6"  | 3'-4"  | 12" | .37            |            |      |         |        |     |                |
| 24"                        | 4'-0"  | 3'-6"  | 12" | .43            | 30"        | 19"  | 4'-2"   | 3'-4"  | 12" | .42            |
| 27"                        | 4'-6"  | 3'-8"  | 12" | .49            | 34"        | 22"  | 4'-7"   | 3'-5"  | 12" | .46            |
| 30"                        | 5'-0"  | 3'-9"  | 12" | .56            | 38"        | 24"  | 5'-0"   | 3'-6"  | 12" | .50            |
| 33"                        | 5'-6"  | 3'-10" | 12" | .62            | 42"        | 27"  | 5'-5"   | 3'-7"  | 12" | .55            |
| 36"                        | 6'-0"  | 4'-0"  | 12" | .69            | 45"        | 29"  | 5'-10"  | 3'-8"  | 12" | .59            |
| 39"                        | 6'-6"  | 4'-2"  | 12" | .77            | 49"        | 32"  | 6'-6"   | 3'-10" | 12" | .67            |
| 42"                        | 7'-0"  | 4'-3"  | 12" | .84            | 53"        | 34"  | 7'-2"   | 4'-0"  | 14" | .82            |
| 48"                        | 8'-0"  | 4'-6"  | 14" | 1.09           | 60"        | 38"  | 8'-5"   | 4'-2"  | 14" | 1.01           |
| 54"                        | 9'-3"  | 4'-9"  | 14" | 1.32           | 68"        | 43"  | 9'-8"   | 4'-4"  | 16" | 1.32           |
| 60"                        | 10'-6" | 5'-6"  | 16" | 1.93           | 76"        | 48"  | 11'-0"  | 5'-0"  | 16" | 1.79           |
| 66"                        | 11'-9" | 5'-9"  | 18" | 2.42           | 83"        | 53"  | 12'-4"  | 5'-2"  | 18" | 2.23           |
| 72"                        | 13'-0" | 6'-0"  | 18" | 2.77           | 91"        | 58"  | 13'-7"  | 5'-5"  | 18" | 2.53           |
| 78"                        | 14'-3" | 6'-3"  | 20" | 3.37           | 98"        | 63"  | 14'-10" | 5'-7"  | 20" | 3.07           |
| 84"                        | 15'-6" | 6'-6"  | 22" | 4.05           | 106"       | 68"  | 16'-2"  | 5'-10" | 20" | 3.42           |
| 90"                        | 16'-9" | 6'-9"  | 22" | 4.51           | 113"       | 72"  | 17'-6"  | 6'-0"  | 22" | 4.05           |
| 96"                        | 18'-0" | 7'-0"  | 24" | 5.31           |            |      |         |        |     |                |
| 102"                       | 19'-3" | 7'-3"  | 26" | 6.20           |            |      |         |        |     |                |
| 108"                       | 20'-6" | 7'-6"  | 26" | 6.78           |            |      |         |        |     |                |
| 114"                       | 21'-9" | 7'-9"  | 28" | 7.81           |            |      |         |        |     |                |
| 120"                       | 23'-0" | 8'-0"  | 30" | 8.93           |            |      |         |        |     |                |

| HEADWALL FOR CORRUGATED METAL PIPE |        |        |     |                |           |      |        |       |     |                |
|------------------------------------|--------|--------|-----|----------------|-----------|------|--------|-------|-----|----------------|
| CIRCULAR                           |        |        |     |                | PIPE ARCH |      |        |       |     |                |
| D                                  | W      | H      | T   | Conc. Cu. Yds. | Span      | Rise | W      | H     | T   | Conc. Cu. Yds. |
| 12"                                | 2'-0"  | 3'-0"  | 12" | .21            |           |      |        |       |     |                |
| 15"                                | 2'-6"  | 3'-2"  | 12" | .27            | 18"       | 11"  | 3'-0"  | 3'-0" | 12" | .31            |
| 18"                                | 3'-0"  | 3'-3"  | 12" | .33            | 22"       | 13"  | 3'-6"  | 3'-0" | 12" | .37            |
| 21"                                | 3'-6"  | 3'-4"  | 12" | .39            | 25"       | 16"  | 4'-0"  | 3'-2" | 12" | .43            |
| 24"                                | 4'-0"  | 3'-6"  | 12" | .46            | 29"       | 18"  | 4'-6"  | 3'-3" | 12" | .48            |
| 27"                                | 4'-6"  | 3'-8"  | 12" | .53            |           |      |        |       |     |                |
| 30"                                | 5'-0"  | 3'-9"  | 12" | .60            | 36"       | 22"  | 5'-6"  | 3'-5" | 12" | .61            |
| 33"                                | 5'-6"  | 3'-10" | 12" | .68            |           |      |        |       |     |                |
| 36"                                | 6'-0"  | 4'-0"  | 12" | .76            | 43"       | 27"  | 6'-6"  | 3'-7" | 12" | .74            |
| 39"                                | 6'-6"  | 4'-2"  | 12" | .84            |           |      |        |       |     |                |
| 42"                                | 7'-0"  | 4'-3"  | 12" | .92            | 50"       | 31"  | 7'-8"  | 3'-9" | 12" | .90            |
| 48"                                | 8'-0"  | 4'-6"  | 12" | 1.10           | 58"       | 36"  | 9'-0"  | 4'-0" | 12" | 1.09           |
| 54"                                | 9'-3"  | 4'-9"  | 12" | 1.33           | 65"       | 40"  | 10'-0" | 4'-2" | 12" | 1.25           |
| 60"                                | 10'-6" | 5'-6"  | 12" | 1.78           | 72"       | 44"  | 11'-0" | 4'-4" | 12" | 1.43           |
| 66"                                | 11'-9" | 5'-9"  | 12" | 2.06           | 73"       | 55"  | 13'-0" | 4'-9" | 12" | 1.84           |
| 72"                                | 13'-0" | 6'-0"  | 12" | 2.37           | 87"       | 63"  | 15'-6" | 5'-2" | 14" | 2.56           |
| 78"                                | 14'-3" | 6'-3"  | 14" | 2.94           | 103"      | 71"  | 18'-6" | 5'-6" | 16" | 3.50           |
| 84"                                | 15'-6" | 6'-6"  | 14" | 3.30           | 114"      | 77"  | 20'-0" | 5'-9" | 18" | 4.18           |
| 90"                                | 16'-9" | 6'-9"  | 16" | 4.00           |           |      |        |       |     |                |
| 96"                                | 18'-0" | 7'-0"  | 16" | 4.40           |           |      |        |       |     |                |
| 102"                               | 19'-3" | 7'-3"  | 18" | 5.28           |           |      |        |       |     |                |
| 108"                               | 20'-6" | 7'-6"  | 20" | 6.21           |           |      |        |       |     |                |
| 114"                               | 21'-9" | 7'-9"  | 22" | 7.25           |           |      |        |       |     |                |
| 120"                               | 23'-0" | 8'-0"  | 24" | 8.38           |           |      |        |       |     |                |



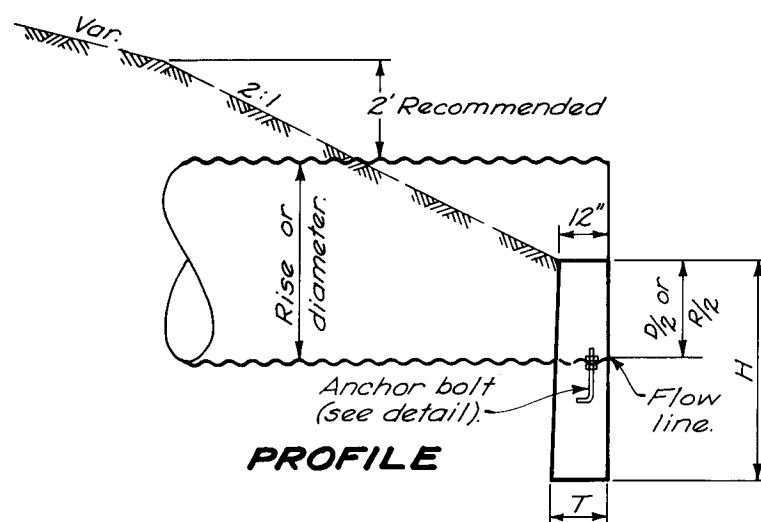
ANCHOR BOLT

Width of protection shall equal width of headwall. Minimum width 4'-0".

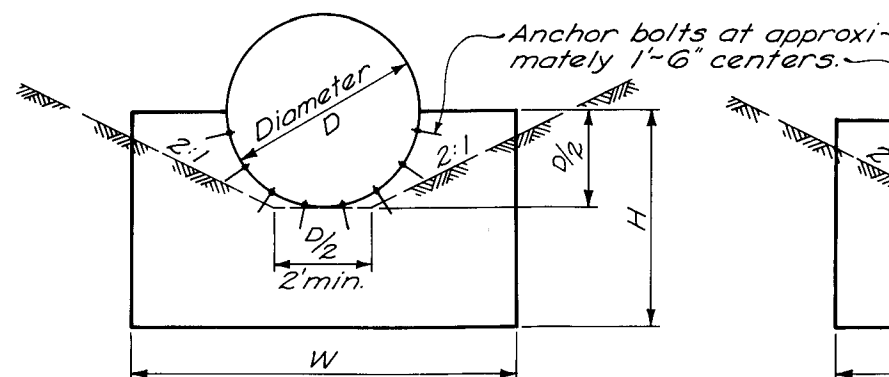


**CHANNEL PROTECTION DETAIL**

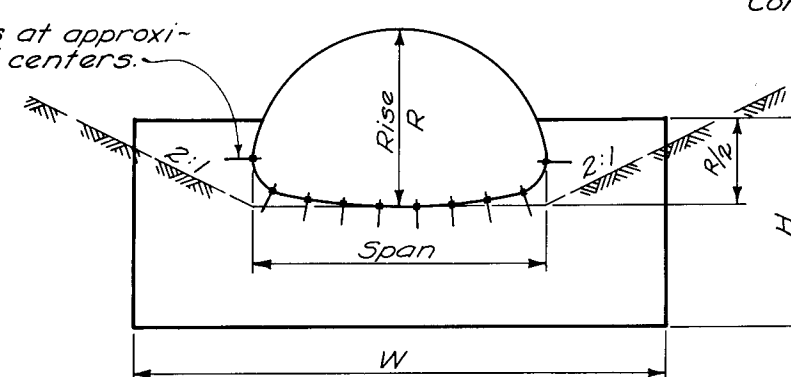
Cutoff wall depth (2'-6" min.) is variable to match required thickness of rock.



PROFILE



CIRCULAR  
CORRUGATED METAL PIPE



PIPE ARCH

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

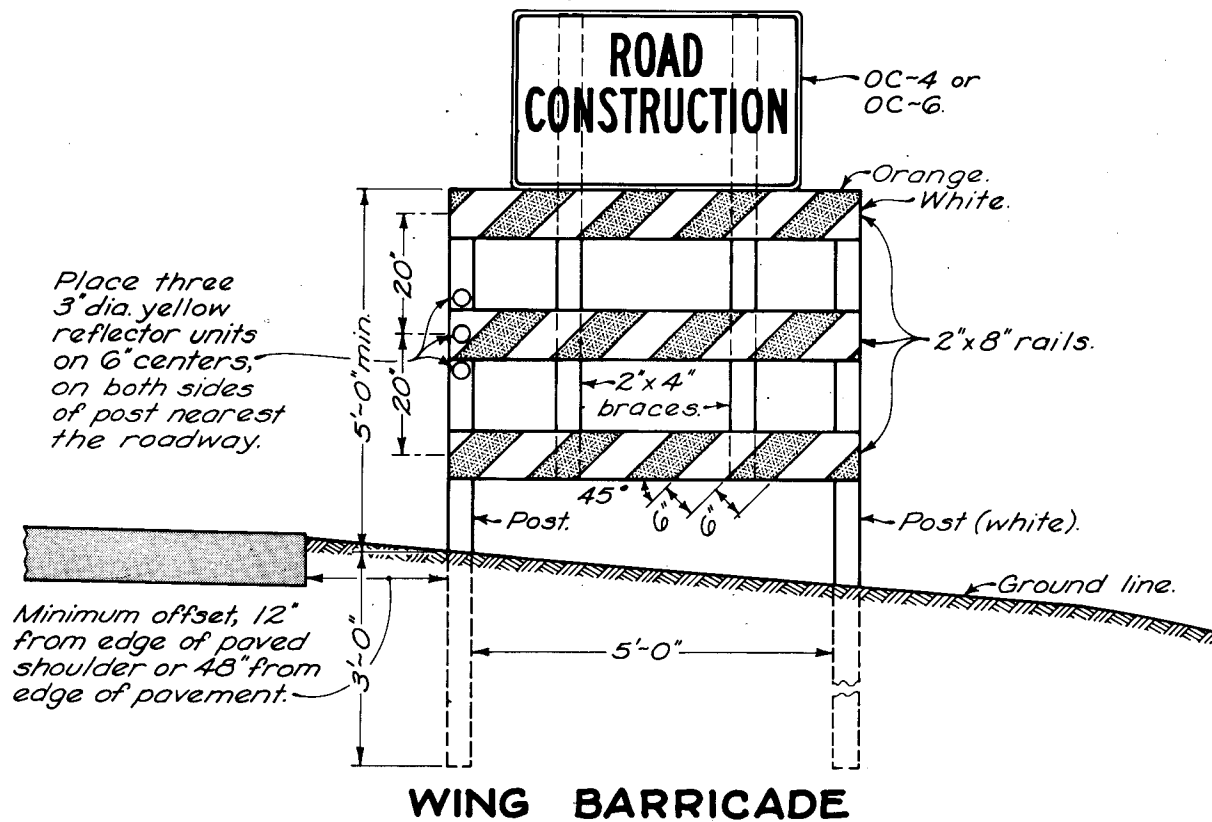
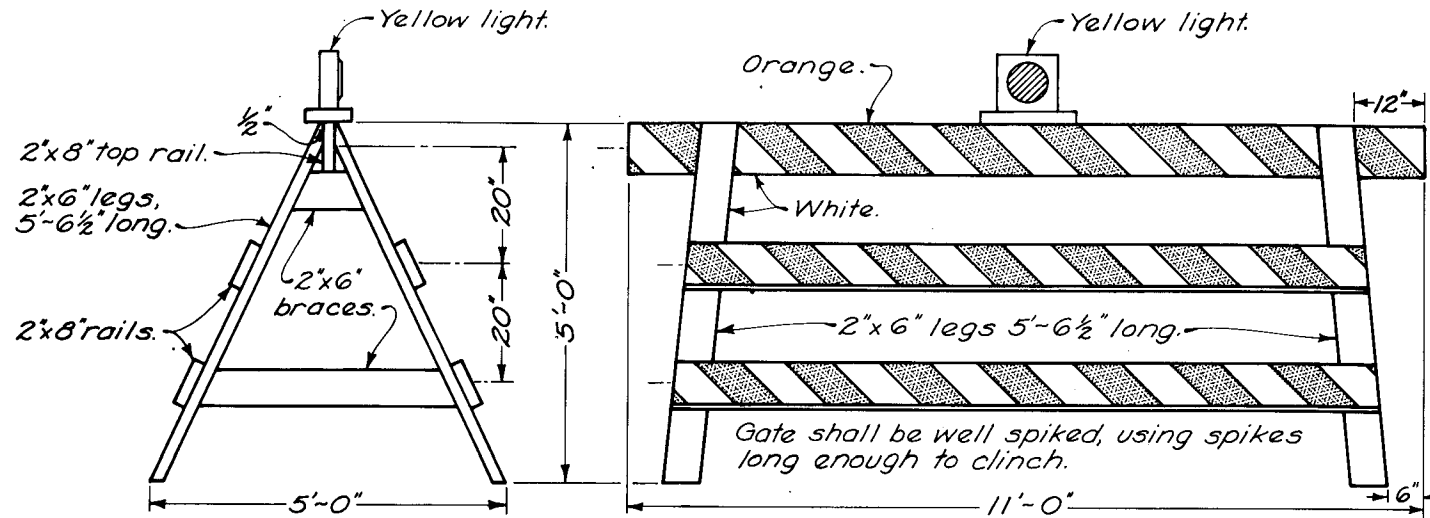
DATE 1-1-70

**HEADWALLS**

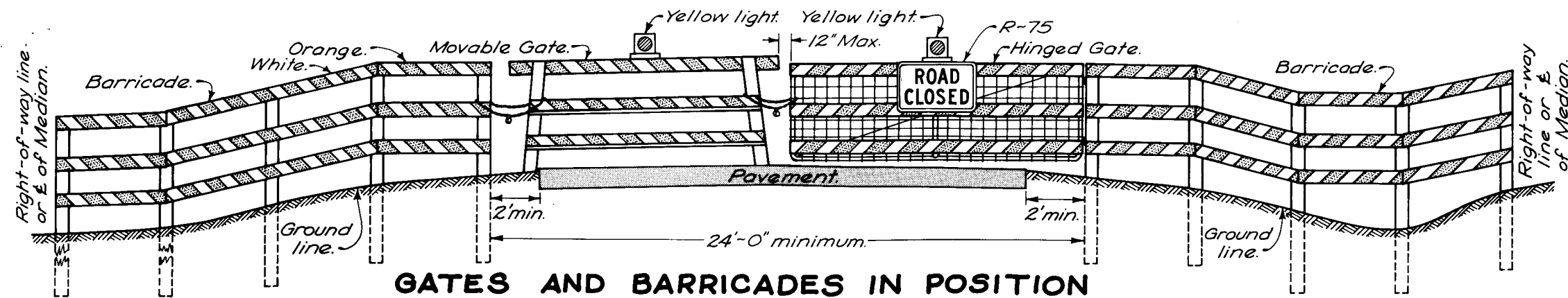
STANDARD CONSTRUCTION DRAWING HW-4

APPROVED *R.E. Balth* ENGR. L. & D.

## MOVABLE GATE



# WING BARRICADE



## NOTES

**BARRICADES** shall be constructed according to details shown. Where traffic is maintained during construction, wing barricades shall be used on each shoulder: (1) at both ends of the project, (2) on all interchange entrance ramps or on the cross road preceding the entrance ramp, (3) on all other major approach roads as directed by the Engineer. When the road is closed to traffic, barricades and gates shall be used to effectively close the entire roadway including the median of divided highways. In urban areas and at locations where it is impracticable to extend the barricade to the right-of-way line because of a sidewalk or other obstruction, the ends of the barricade shall be located as directed by the Engineer to effect the desired closing of the highway.

**PAINTING AND REFLECTORIZATION:** All rails of the barricades and gates shall be reflectorized with orange and white reflectorized sheeting in 6" wide alternate stripes which slope downward toward the center line of the road at an angle of 45°. All three rails of the Road Closed barricade shall be striped on the side facing traffic. All three rails of the wing barricade and all gate rails shall be striped on both sides. All posts, braces, gate legs and any unstriped rails shall be painted white.

**GATES:** One gate shall be erected for each traffic lane. Gates shall be chained and padlocked to one another and to adjacent posts of the barricades. Chains shall be  $\frac{1}{4}$ " stock or larger with welded links.

A hinged gate may be used and shall be an approved 12 by 4 steel frame farm type, or a type approved by the Engineer. The gate shall be hung on hinge screw hooks, or as otherwise approved. Striping similar to that used on the movable gate shall be accomplished with 1"x8" lumber or with metal strips fastened to the gate. The gate shall be supported at the center in an approved manner.

**YELLOW LIGHT:** Each gate shall be equipped with a steady burning yellow light, conspicuously visible at all distances up to 1000' under normal atmospheric conditions. The light, operated by battery, electric generator, commercial power or propane gas, shall be in operation at all times between sunset and sunrise during the period the highway is closed.

**SIGNS:** Where the road is closed to traffic by the erection of gates and barricades, a ROAD CLOSED sign (R-75) shall be mounted on the gate as shown. On three-lane pavement, the sign shall be mounted on the middle gate facing traffic.

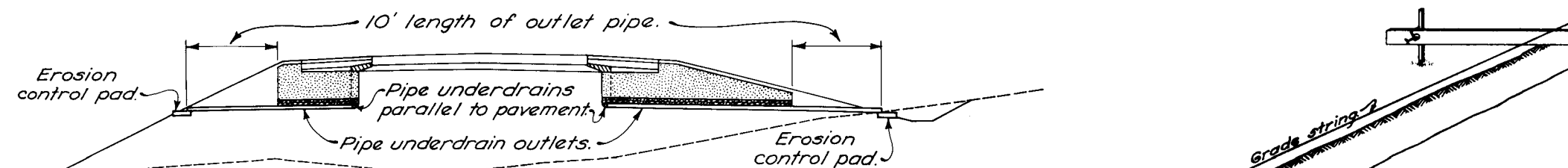
Where traffic is maintained, a ROAD CONSTRUCTION TRAFFIC MAINTAINED sign (OC-4) shall be used on the right shoulder wing barricade on the approaches to major construction or maintenance jobs less than 2 miles in length. A ROAD CONSTRUCTION NEXT MILES sign (OC-6) shall be used on the right shoulder wing barricade on the approaches to any major construction or maintenance job of 2 miles or more in length. An END CONSTRUCTION sign (OC-8) shall be erected above the right hand wing barricade facing traffic leaving the construction section. The signs on the wing barricades shall be erected above the top rail of the wing barricade on braces, as detailed hereon.

**LUMBER** used in the construction of the gates and barricades shall be No. 1 common yellow pine or No. 1 common Douglas fir, surfaced on four sides standard, or other materials approved by the Engineer. All sizes are nominal.

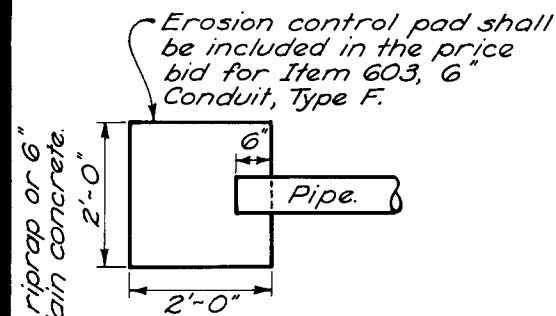
**POSTS** shall be sound 4"x4" sawed or 4½" round. Rails of the barricade shall be bolted to the posts with 5/8" bolts.

|                                                               |                                                          |
|---------------------------------------------------------------|----------------------------------------------------------|
| BUREAU OF ROADWAY DESIGN<br>OHIO DEPARTMENT OF TRANSPORTATION |                                                          |
| <b>BARRICADES<br/>AND GATES</b>                               | DATE<br>6-1-65<br>5-1-66<br>11-1-68<br>6-20-69<br>6-1-73 |
| STANDARD<br>CONSTRUCTION<br>DRAWING                           | <b>MC-3</b>                                              |
| APPROVED <i>E. J. Schaefer</i> ENGR., R. D.                   |                                                          |

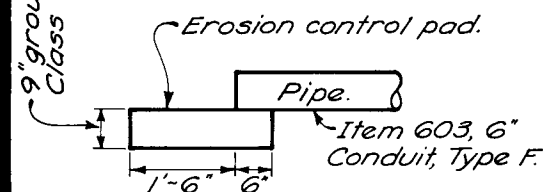
# CONSTRUCTION METHODS



**UNDERDRAIN OUTLET SECTION**

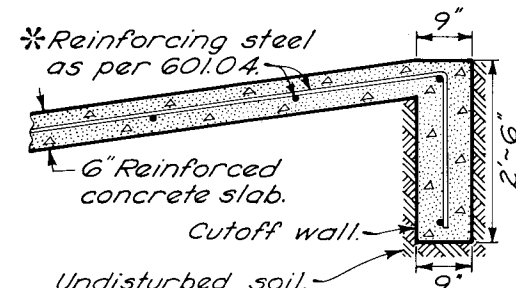


**PLAN**

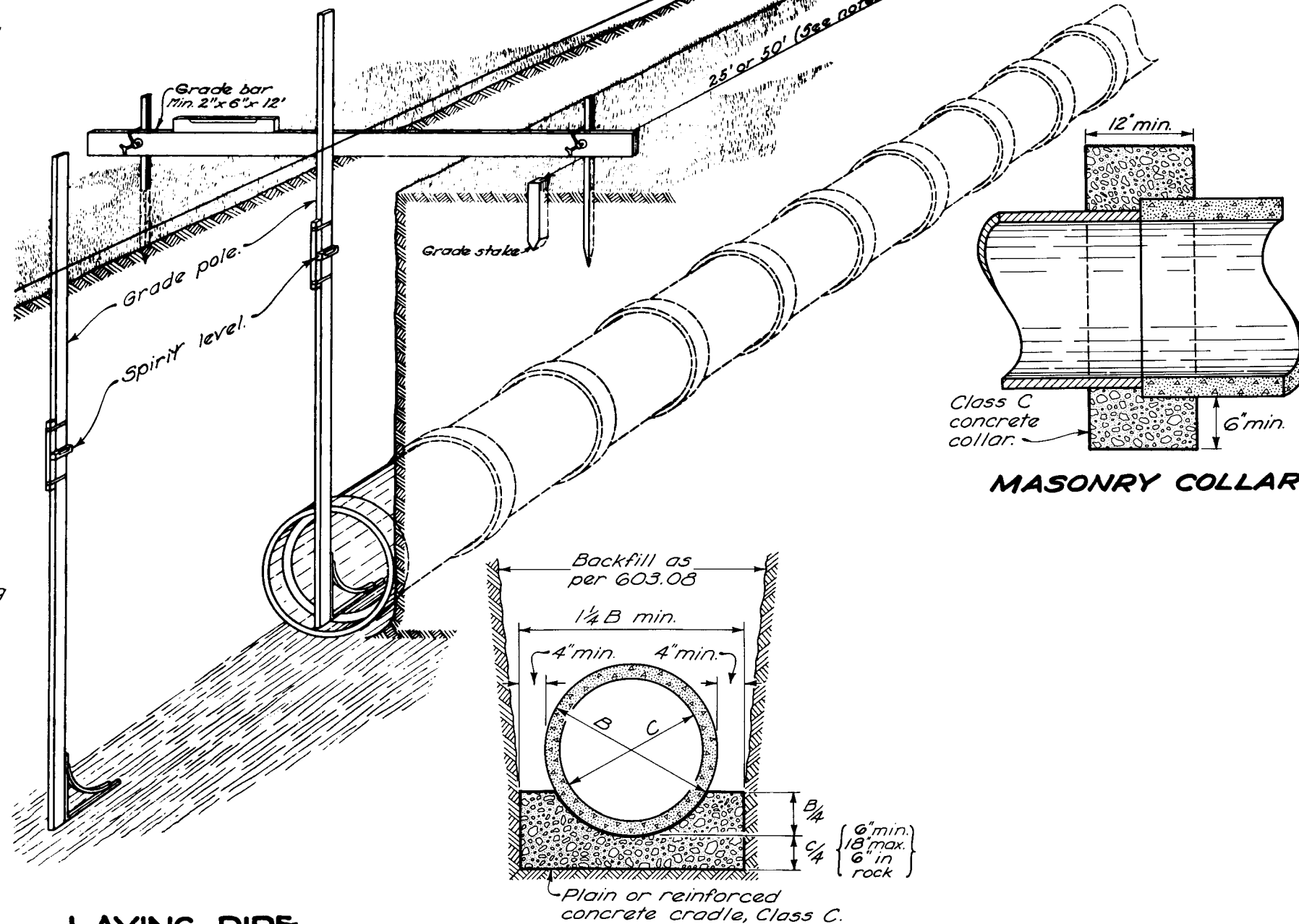


**PROFILE  
PIPE UNDERDRAIN  
OUTLET**

\*If wire fabric is used in the slab,  
#4 bars @ 24" centers, overlapping  
the fabric 12", may be used in the  
cutoff wall.

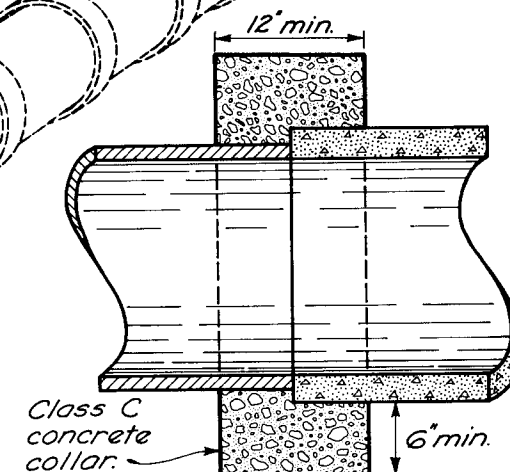


**RIPRAP CUTOFF WALL**  
Cutoff wall shall be included in  
the price bid for Item 601 Riprap-  
6" Reinforced Concrete Slab.



**LAYING PIPE**

**CONCRETE CRADLE  
CLASS A BEDDING**



**MASONRY COLLAR**

## NOTES

**GRADE STAKES** shall be set at the  
following intervals:  
For grades less than 0.70% ~25 ft.  
For grades of 0.70% and over ~50 ft.

**GRADE POLE** shall be a straight  
pole dressed with corners rounded, size  
depending on length but approximately  
1" x 2". The pole shall be equipped with a  
metal bracket on the bottom with a  
projecting length of 12". Notches shall  
be cut on the pole for the depth of the  
flowline below the grade string and  
for the depth of trench. A spirit level  
shall be used on the pole to determine  
when the pole is vertical.

**ALTERNATE METHODS:** The  
Engineer may approve other methods  
of determining alignment and gradient  
of pipe lines if the Contractor can  
demonstrate that the same degree of  
accuracy can be obtained as can be  
obtained by use of the method shown  
on this drawing.

**MASONRY COLLARS:** Where  
plans require that a pipe extension be  
joined to the end of an existing pipe  
with a butt joint, a collar shall be  
provided and the cost shall be included  
in the price bid for new conduit.

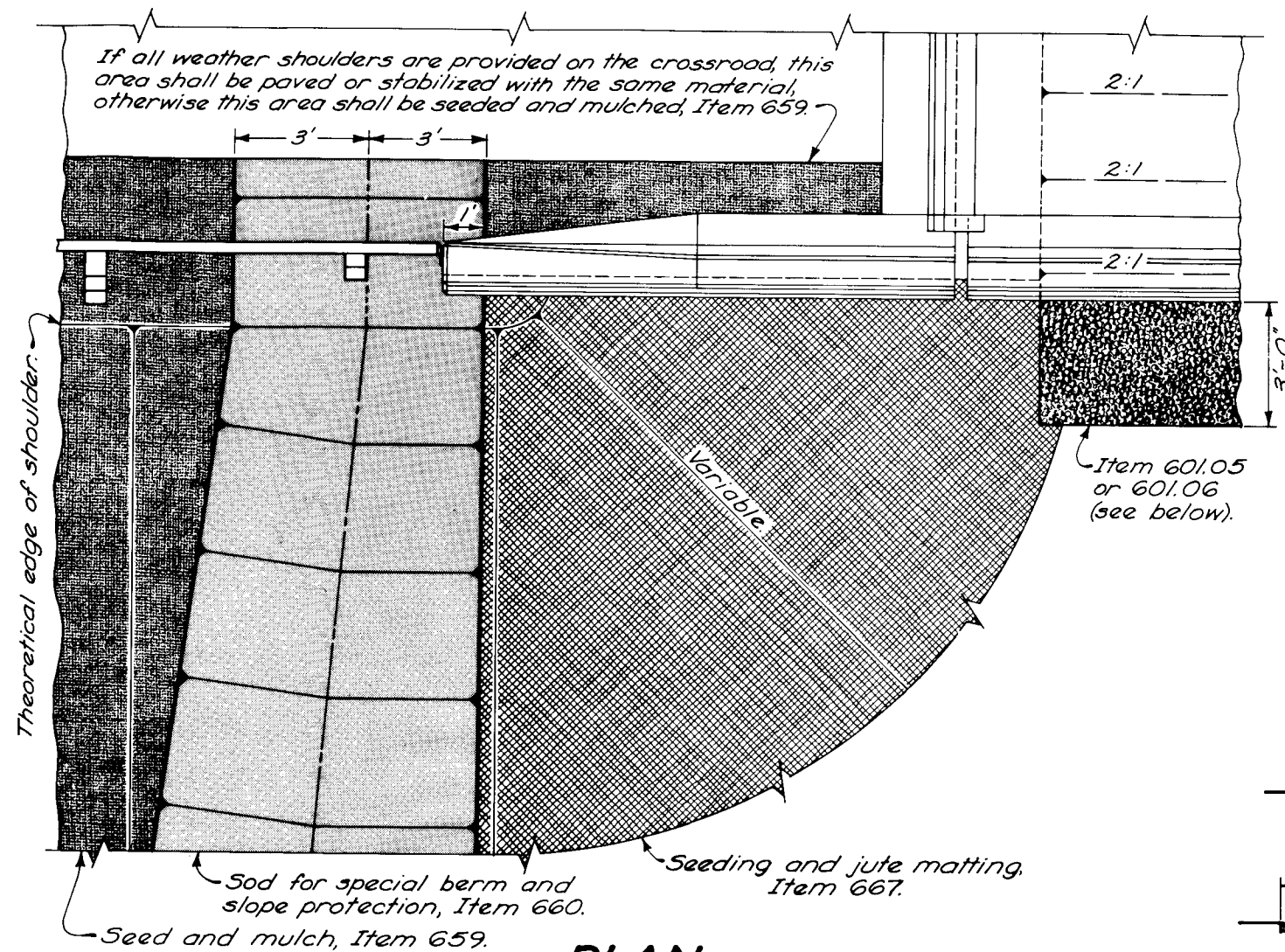
BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

**DRAINS  
AND  
SEWERS**

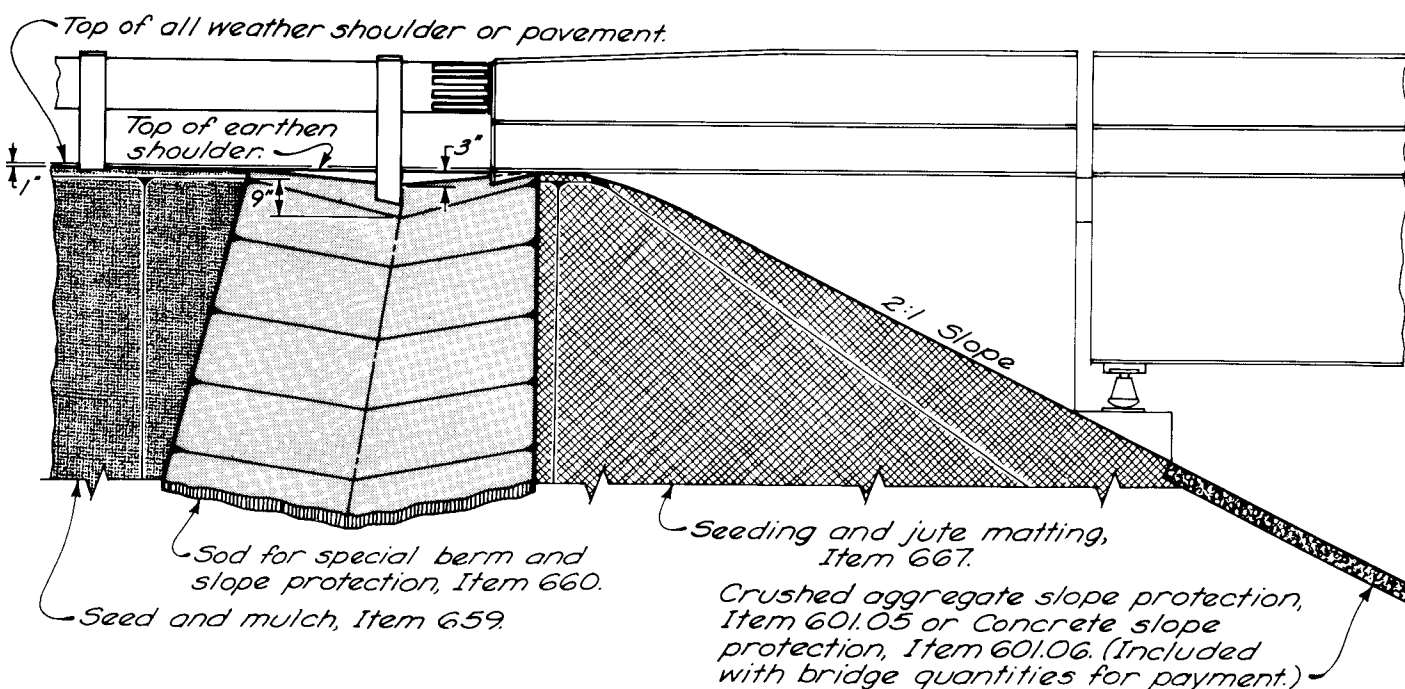
STANDARD  
CONSTRUCTION  
DRAWING  
APPROVED *R. E. Lath* ENGR. L. & D.

DATE:  
6-11-65  
6-13-69

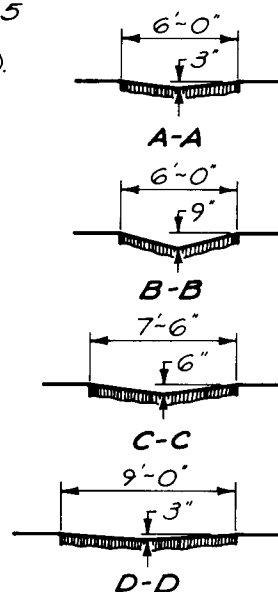
**MC-4**



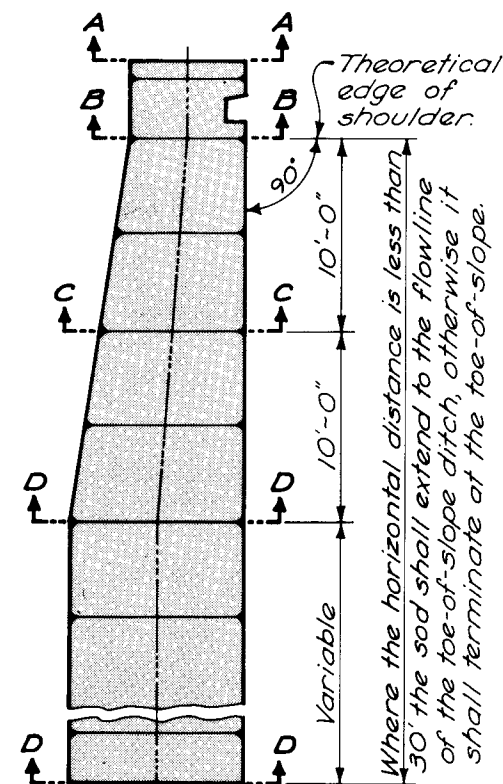
**PLAN**



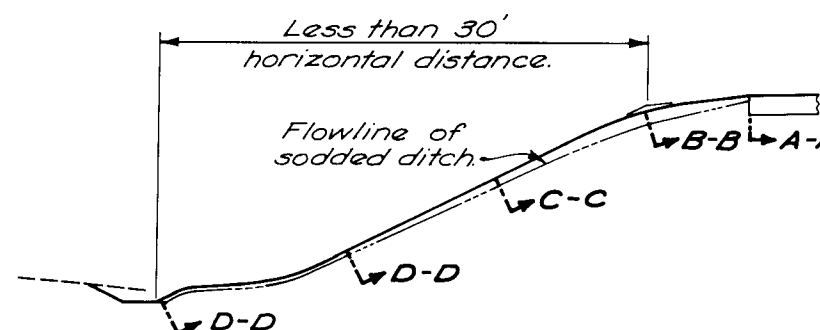
**ELEVATION**



**CROSS SECTIONS**



**PLAN**



**PROFILE**  
**SODDED DITCH DETAILS**

## NOTES

**USE:** Special berm and slope protection at each corner should generally be specified only where rate of side slope is steeper than 6:1. At each bridge corner where curb and parapet do not extend beyond the abutment, provide a sod gutter similar to the type shown hereon at the end of bridge curb.

**CONSTRUCTION:** Prior to placement of sod in the berm and slope, galvanized poultry fence shall be placed on the finished subgrade in strands which shall be at right angles to the direction of flow. Each strand shall be staked securely on top and bottom with stakes spaced at four-foot intervals and alternated in rows four feet apart.

**STAKES:** Wood stakes shall be 1"x1"x8" nominal size and shall be driven perpendicular to the ground and flush with the finished grade.

**FENCE:** The fence shall be straight line poultry fence or equivalent with strand width of four feet, having a two-inch mesh and all wires No. 20 gage, minimum. Each strand of fencing shall be fastened to adjacent strand at twelve-inch intervals by means of hog rings. The fence shall be secured to the wood stakes by metal staples.

**SOD:** Sod shall be laid in accordance with Construction and Materials Specifications, Item 660. The width of sod increases by 1'-6" for each 10'-0" of length beginning with 6'-0" width at the edge of shoulder, to 9'-0" in a distance of 20 feet. The sod then continues at 9'-0" width to the bottom of slope as shown.

**PAYMENT:** Payment for all the above shall be included in the unit price bid for Item 660 Sodding for Special Berm and Slope Protection, as per plan.

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

**SPECIAL BERM  
AND SLOPE  
PROTECTION**

STANDARD  
CONSTRUCTION  
DRAWING  
APPROVED *R.E. Bell* ENGR, L. & D.

DATE  
3-1-66  
10-1-68

MC-7

# INSPECTION WELL

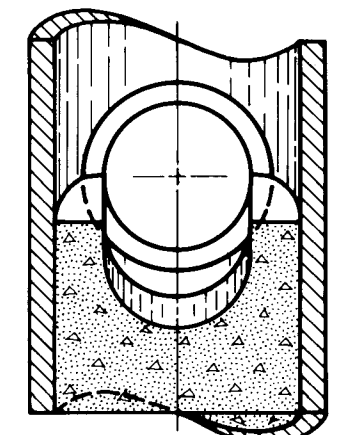
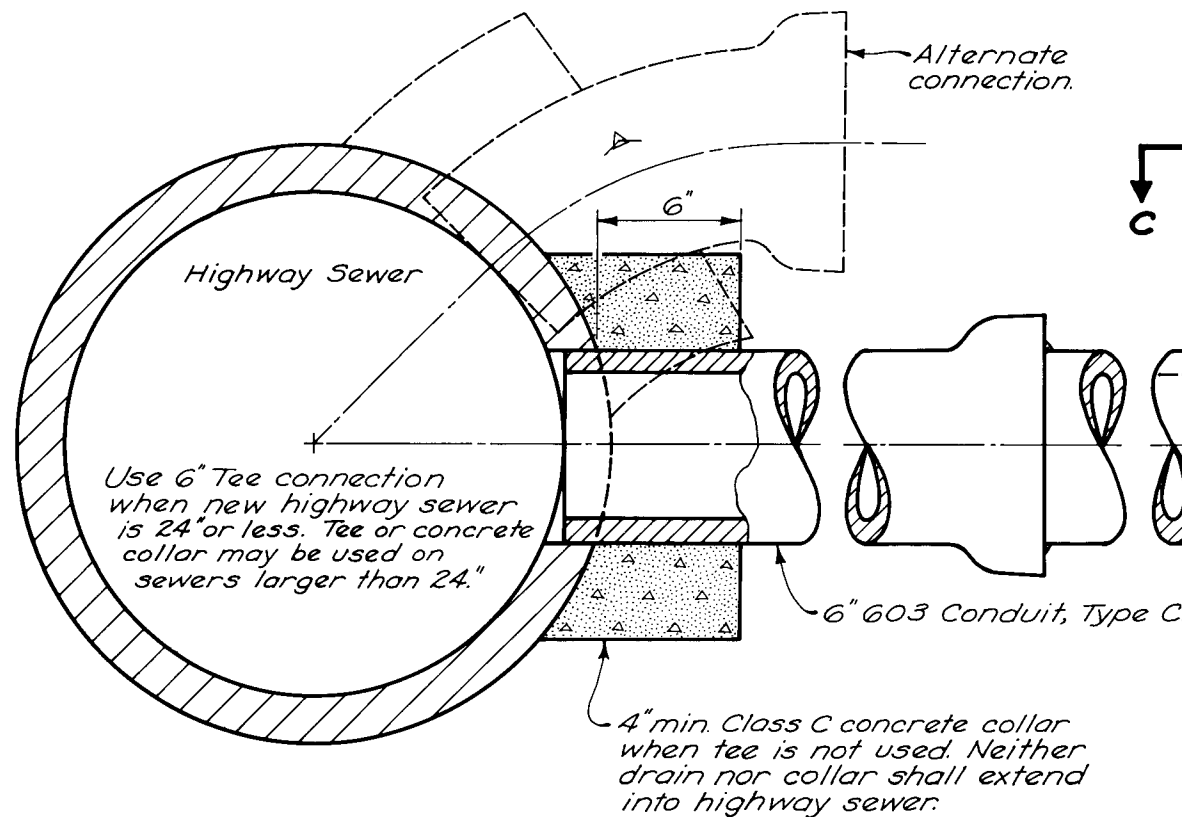
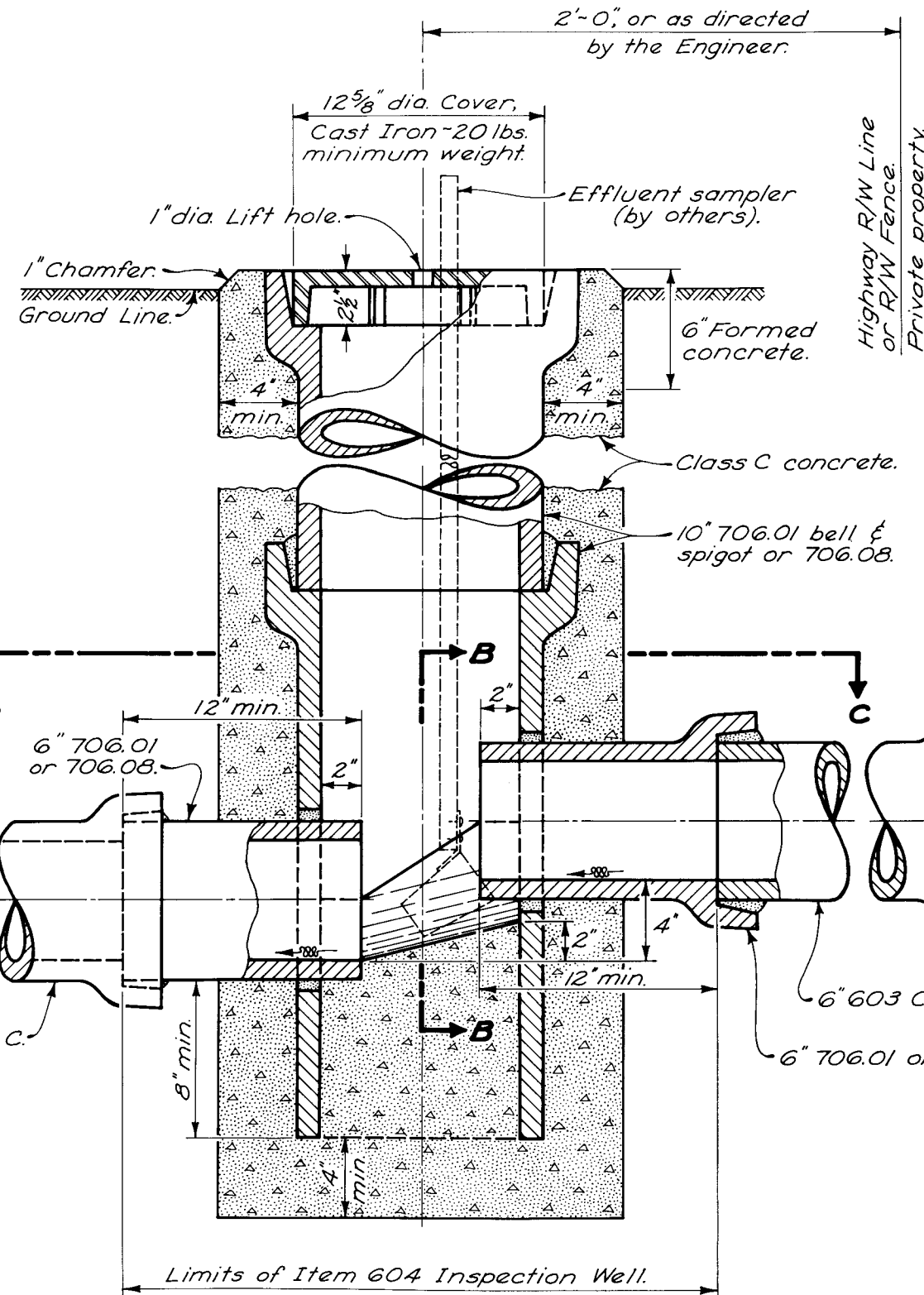
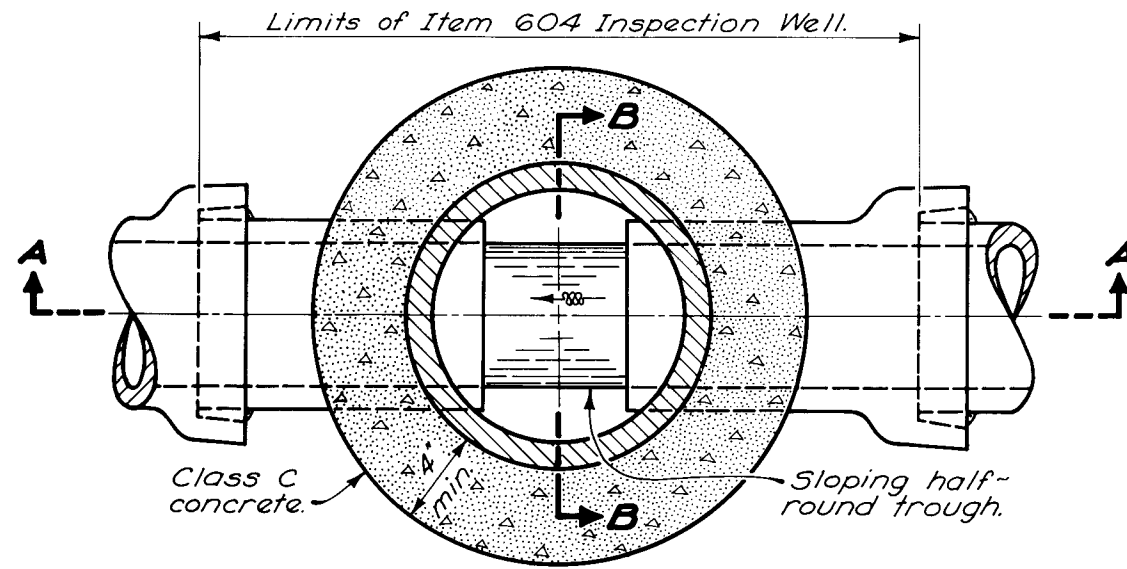
## NOTES

The Contractor shall advise the Engineer of all private drains encountered if connected to a building, septic tank, cesspool, filter bed, treatment plant or if discharging polluted water of any kind from other sources. Such drains will either be connected to the highway drainage system or plugged as directed by the Engineer. If connected to the highway storm sewer system, an inspection well shall be constructed as detailed hereon on each such drain unless the drain is to be connected to a catch basin, inlet or manhole or is to discharge into an open channel or ditch.

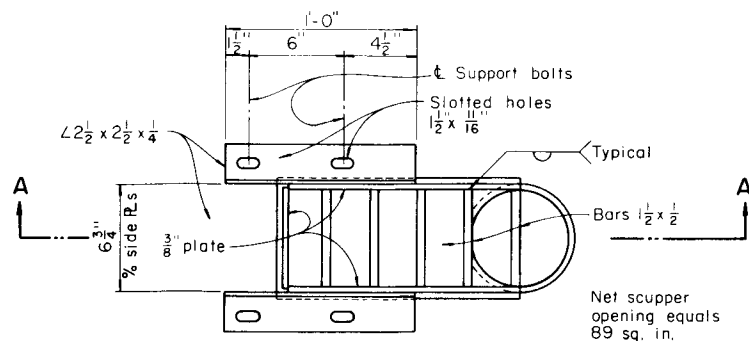
Cost of tapping the highway sewer, including the concrete collar or Tee, shall be included in the unit price bid per linear foot of 603 conduit.

Component parts of the inspection well may be job or factory cut and job assembled.

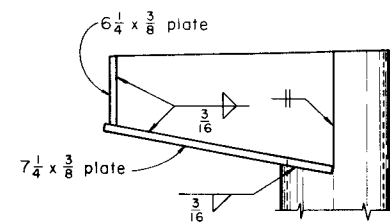
The work included in this item shall conform with the provisions of Item 604, including excavation and backfill, and shall be paid for at the contract unit price per each, Inspection Wells, complete in place.



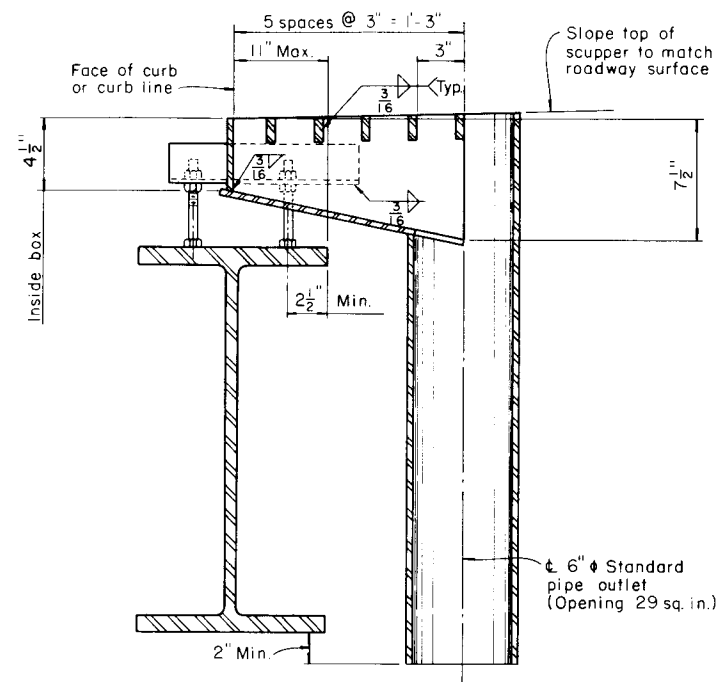
|                                                               |      |
|---------------------------------------------------------------|------|
| BUREAU OF ROADWAY DESIGN<br>OHIO DEPARTMENT OF TRANSPORTATION |      |
| DATE<br>12-1-67<br>6-12-75                                    |      |
| <b>INSPECTION WELL</b>                                        |      |
| STANDARD CONSTRUCTION DRAWING                                 | MC-8 |
| APPROVED <i>E. J. Schaefer</i> ENGR., R.D.                    |      |



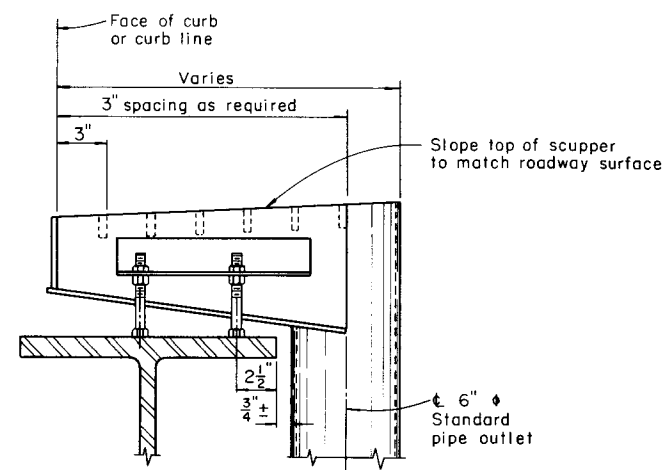
PLAN  
STANDARD SCUPPER



SCUPPER ELEVATION

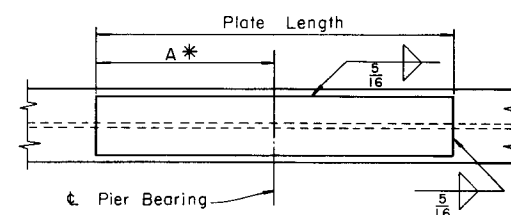


SECTION A-A

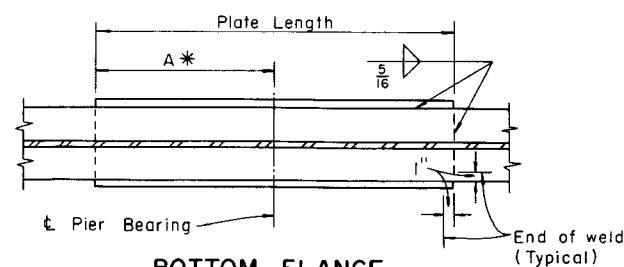


DETAIL A

Scupper elevation showing method for lengthening scupper where necessary to clear the flanges.



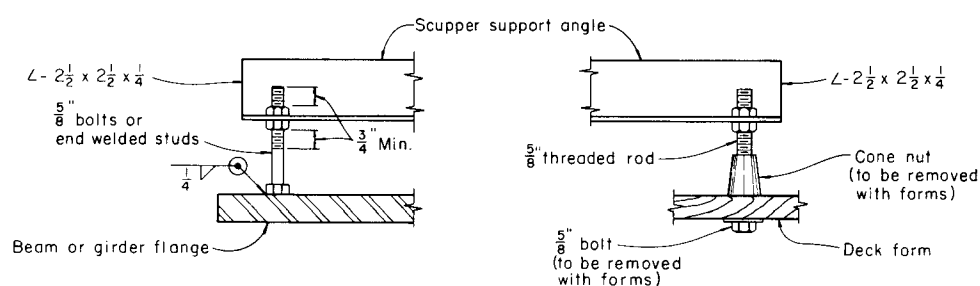
TOP FLANGE



BOTTOM FLANGE

### MOMENT PLATES

\* See Standard Drawings or project plans for dimension "A". Dimension "A" equals 1/2 plate length unless otherwise shown, in which case the plans shall indicate the span to which dimension "A" applies.



DETAIL B

DETAIL C

SCUPPER SUPPORT BOLTS

For scuppers that are not located adjacent to a beam or girder flange.

Scuppers shall be furnished in sufficient number to provide one square inch of net scupper opening for each 12 to 15 square feet of deck area to be drained. The downspout shall have at least one square inch of opening for each five square inch of net scupper opening, with a minimum nominal diameter of 6 inches.

Scupper should clear crossframes by at least 6" and abutments by 2'-6". They shall be no nearer to 1/2 of pier bearings than 0.10 of span length.

The support angles and support bolts are included with scupper for payment.

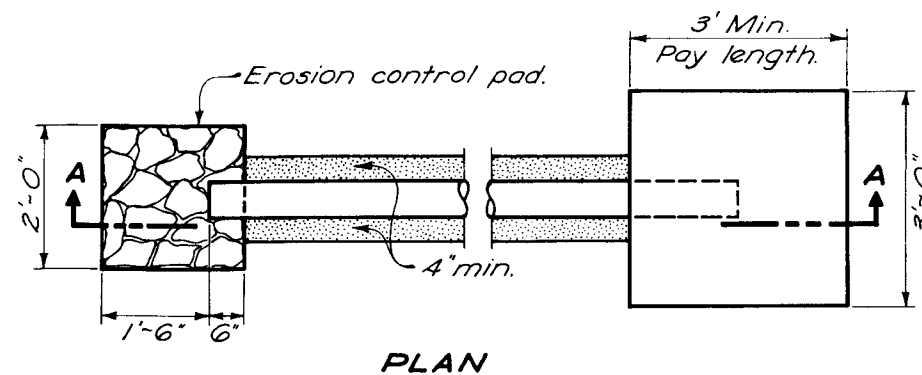
Scuppers, including support angles, shall be galvanized in accordance with 711.

|                           |                                                                                                     |               |                |                           |
|---------------------------|-----------------------------------------------------------------------------------------------------|---------------|----------------|---------------------------|
| REVISIONS                 | STATE OF OHIO<br>DEPARTMENT OF HIGHWAYS<br>DIVISION OF DESIGN AND CONSTRUCTION<br>BUREAU OF BRIDGES |               |                |                           |
|                           | STANDARD<br>SUPERSTRUCTURE DETAILS<br>FOR STEEL BEAM AND GIRDER BRIDGES                             |               |                |                           |
|                           | APPROVED: <i>C. F. Albrecht</i><br>DATE: 6-12-69<br>ENGINEER OF BRIDGES                             |               |                |                           |
|                           | PREPARED<br>MPB                                                                                     | TRACED<br>NRB | CHECKED<br>WJJ | REVIEWED<br>CDB RVH BFG   |
| DRAWING NUMBER<br>SD-1-69 |                                                                                                     |               |                | SHEET NO 3<br>OF 4 SHEETS |

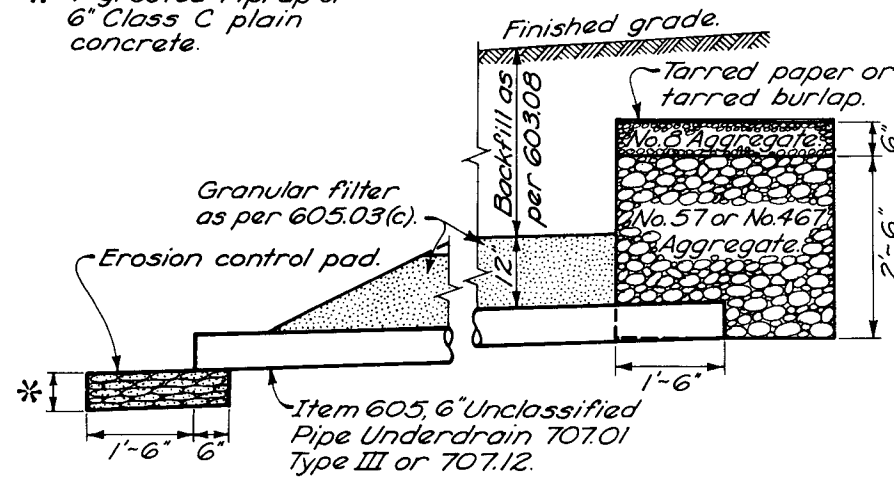
# ROADWAY ITEMS

## NOTES

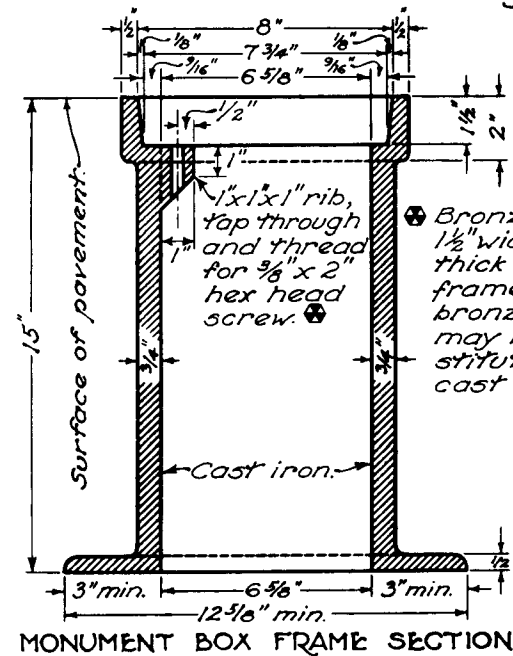
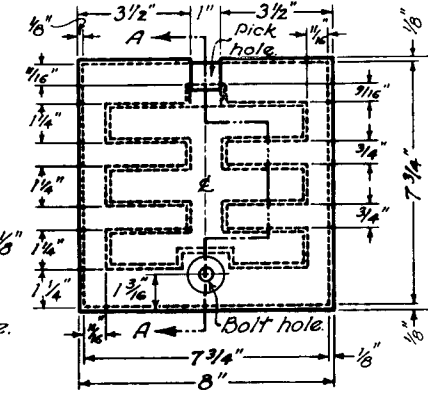
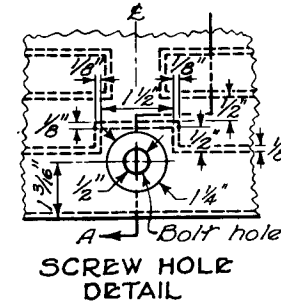
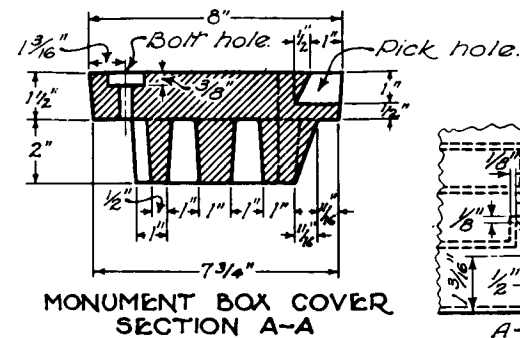
**SPRING DRAIN:** Aggregates, tarred paper or tarred burlap, erosion control pad, backfill and necessary excavation for spring drains shall be included for payment in the unit price bid per linear foot for Item 605, Aggregate Drains for Springs, as per plan.



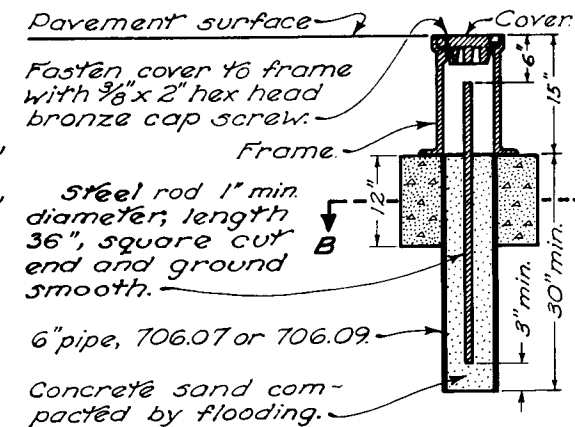
\* 9" grouted riprap or 6" Class C plain concrete.



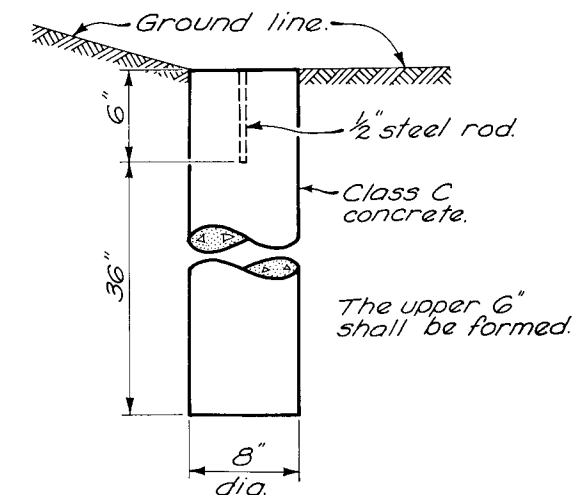
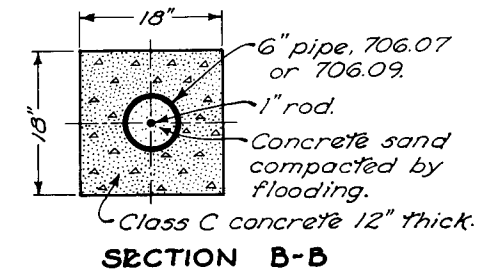
**SPRING DRAIN DETAIL**



**MONUMENT ASSEMBLY**



Cost of furnishing and placing monument box, steel rod, class C concrete, concrete sand and pipe included in price bid for 604 Monument Assembly.



|                                                              |             |
|--------------------------------------------------------------|-------------|
| BUREAU OF LOCATION AND DESIGN<br>OHIO DEPARTMENT OF HIGHWAYS |             |
| <b>ROADWAY<br/>ITEMS</b>                                     |             |
| STANDARD<br>CONSTRUCTION<br>DRAWING                          | <b>MC-1</b> |
| APPROVED <i>K.E. Batten</i> ENGR. L. & D.                    |             |

DATE  
6-1-69  
10-1-67  
6-13-69