

STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION

ALL-117-13.47

SHAWNEE TOWNSHIP  
ALLEN COUNTY

PROJECT DESCRIPTION

Reconstruction of 0.02 Miles of S.R. 117 at the intersection of Shawnee Rd. including a left turn lane on Shawnee Rd. and new traffic signals.

1997 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.

I hereby approve these plans and declare that the making of this improvement will require the closing to traffic of the highway and that detours will be provided as indicated on Sheet 11.

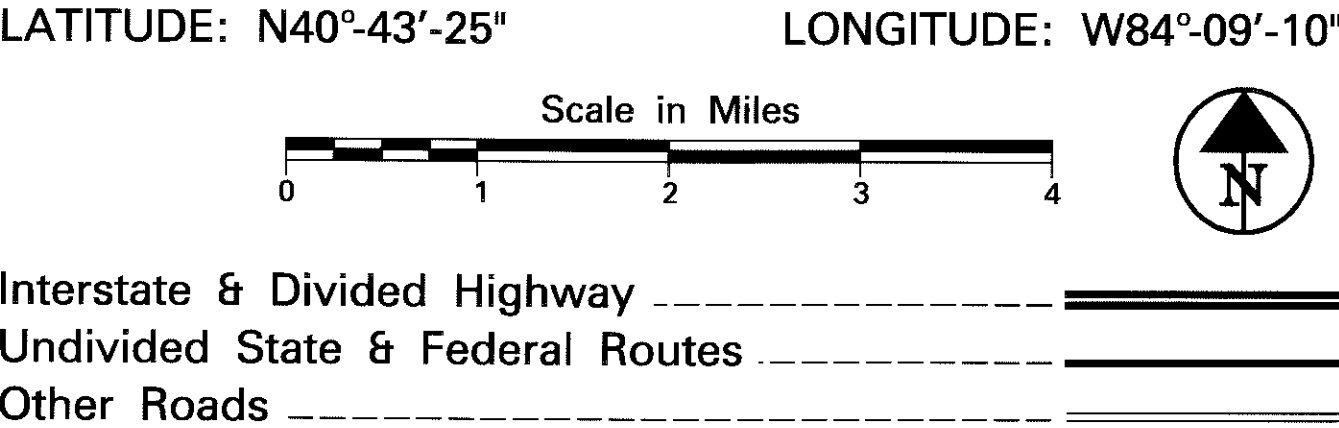
Approved   
Date 8/16/01 District Deputy Director

Approved   
Date 8-23-01 Director, Department of Transportation

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LOCATION MAP



DESIGN DESIGNATION

|                             |   |           |
|-----------------------------|---|-----------|
| Current A.D.T. (2000)       | = | 17,100    |
| Design Year A.D.T. (2020)   | = | 20,300    |
| Design Hourly Volume (2020) | = | 1,830     |
| Directional Distribution    | = | 55%       |
| Trucks (24 Hour B & C)      | = | 3%        |
| Design Speed                | = | 45 m.p.h. |
| Legal Speed                 | = | 45 m.p.h. |

Design Functional Classification = Urban Principal Arterial

DESIGN EXCEPTIONS

| Design Feature       | Approval Date | See Sheet |
|----------------------|---------------|-----------|
| Horizontal Alignment | 5-30-2000     | 2         |
| Superelevation       | 5-30-2000     | 4         |

UNDERGROUND UTILITIES

TWO WORKING DAYS BEFORE YOU DIG

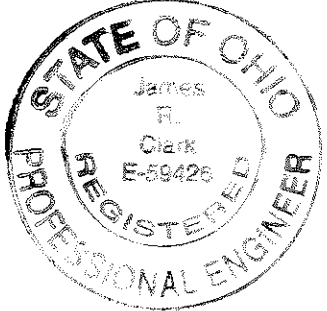
Call... 800-362-2764 (Toll free)

OHIO UTILITIES PROTECTION SERVICE

NON-MEMBERS MUST BE CALLED DIRECTLY

Plan Prepared By:  
DISTRICT NO. 1  
OHIO DEPARTMENT OF  
TRANSPORTATION

ENGINEERS SEAL



Signed   
Date 8-16-01

| SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS |          |           |          |           |          |            |         |
|-------------------------------------------------------|----------|-----------|----------|-----------|----------|------------|---------|
| BP-3.1                                                | 7-28-00  | HW-2.1M   | 7-12-95  | TC-21.10  | 1-19-01  | TC-83.20   | 5-1-00  |
| BP-4.1                                                | 7-28-00  | HW-2.2M   | 7-12-95  | TC-21.20  | 1-19-01  | TC-84.20   | 5-1-00  |
| BP-5.1                                                | 7-28-00  |           |          | TC-41.20  | 1-19-01  | TC-85.20   | 5-1-00  |
|                                                       |          | DM-1.1M   | 10-21-97 | TC-41.40M | 3-31-94  |            |         |
| RM-1.1                                                | 4-29-99  | DM-1.2M   | 10-21-97 | TC-42.20M | 3-31-94  | MT-35.10M  | 1-30-95 |
| RM-2.1M                                               | 7-12-95  | DM-4.3    | 4-29-99  | TC-52.10M | 7-29-94  | MT-35.11M  | 1-30-95 |
| RM-4.2M                                               | 10-21-97 | DM-4.4    | 4-29-99  | TC-52.20M | 7-29-94  | MT-95.31M  | 4-25-94 |
| MH-1.2M                                               | 9-6-95   |           |          | TC-65.10M | 11-01-95 | MT-95.41M  | 4-25-94 |
| CB-1.1M                                               | 7-12-95  | HL-30.11M | 3-31-95  | TC-65.12M | 11-01-95 | MT-99.10M  | 1-30-95 |
| CB-2.1M                                               | 7-12-95  | HL-30.21M | 3-31-95  | TC-71.10M | 9-01-93  | MT-101.60M | 4-25-94 |
| CB-2.2M                                               | 7-12-95  | HL-30.22M | 3-31-95  | TC-81.10  | 5-1-00   | MT-105.10M | 4-25-94 |
|                                                       |          | HL-50.11M | 3-31-95  | TC-82.10  | 5-1-00   | MT-105.11M | 4-25-94 |

| SUPPLEMENTAL SPECIFICATIONS |          |
|-----------------------------|----------|
| 806                         | 9-9-97   |
| 814                         | 6-2-98   |
| 829                         | 7-28-98  |
| 830                         | 10-21-98 |
| 870                         | 3-27-01  |
| 877                         | 4-13-99  |
| 899                         | 10-21-98 |
| 905                         | 4-1-98   |
| 906                         | 5-5-98   |
| 907                         | 10-21-98 |
| 908                         | 3-28-00  |

| SPECIAL PROVISIONS |
|--------------------|
|                    |

FEDERAL PROJECT No.  
TE21-G010(633)

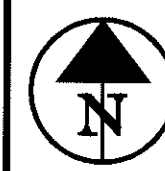
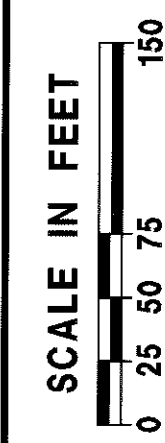
PID No.  
19314

CONSTRUCTION PROJECT No.

RAILROAD INVOLVEMENT  
NONE

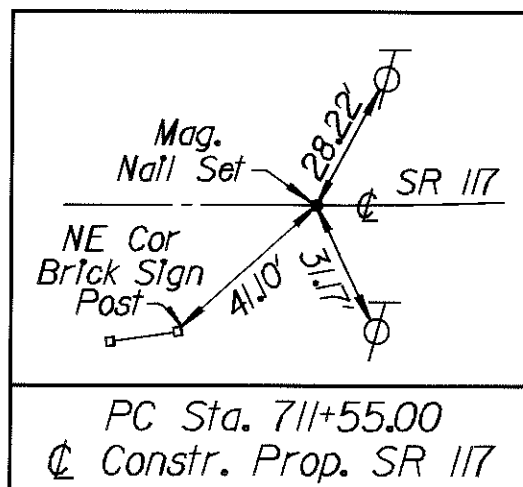
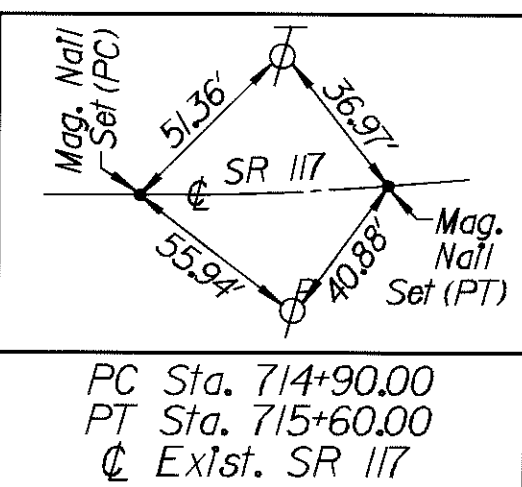
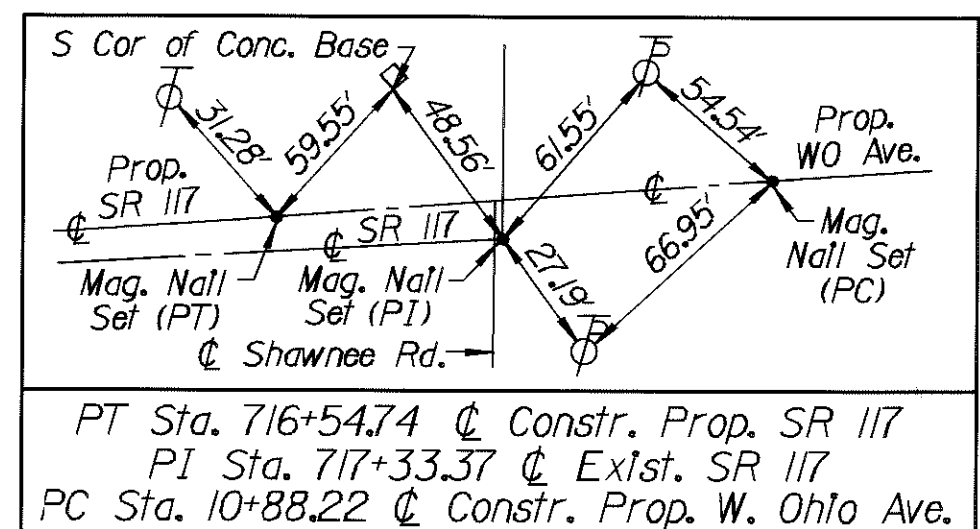
ALL-117-13.47





SCHEMATIC PLAN

ALL -117-13.47



B.M. \*2, Elev. 866.73  
Spike In Power Pole  
Sta. 712+99.0, 26.2' Lt.

B.M. \*4, Elev. 868.43  
Spike In Power Pole  
Sta. 721+80.8, 34.7' Lt.

CURVE 1 DATA  
PROPOSED S.R. 117

PI Sta. 714+05.00  
 $\Delta = 4^{\circ}34'24''$  Lt.  
 $D_c = 0^{\circ}54'55''$   
 $R = 6,260.68'$   
 $T = 250.00'$   
 $L = 499.73'$   
 $E = 4.99'$   
PC Sta. 711+55.00  
PT Sta. 716+54.74

CURVE 4 DATA  
EXISTING S.R. 117

PI Sta. 726+27.14  
 $\Delta = 1^{\circ}16'00''$  Rt.  
 $D_c = 0^{\circ}16'00''$   
 $R = 21,485.92'$   
 $T = 237.51'$   
 $L = 475.00'$   
 $E = 1.31'$   
PC Sta. 723+89.63  
PT Sta. 728+64.63

CURVE 3 DATA  
EXISTING S.R. 117

PI Sta. 722+05.07  
 $\Delta = 44^{\circ}30'39''$  Rt.  
 $D_c = 24^{\circ}00'04''$   
 $NDC = 8^{\circ}45''$  Max.  
 $R = 238.72'$   
 $T = 97.69'$   
 $L = 185.45'$   
 $E = 19.22'$   
PC Sta. 721+07.38  
PT Sta. 722+92.83

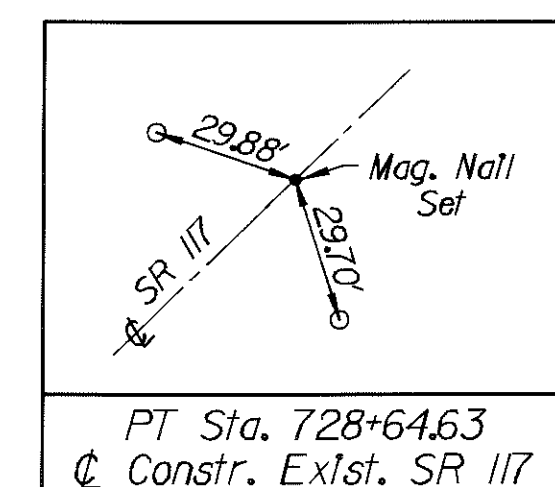
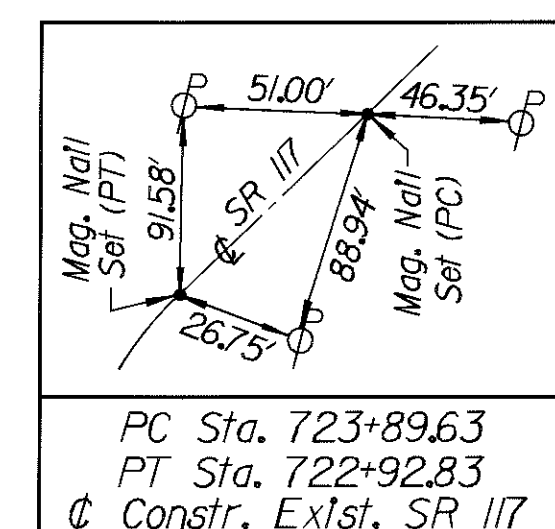
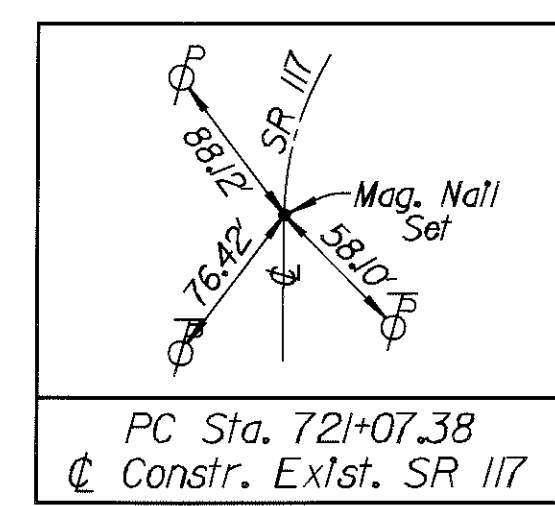
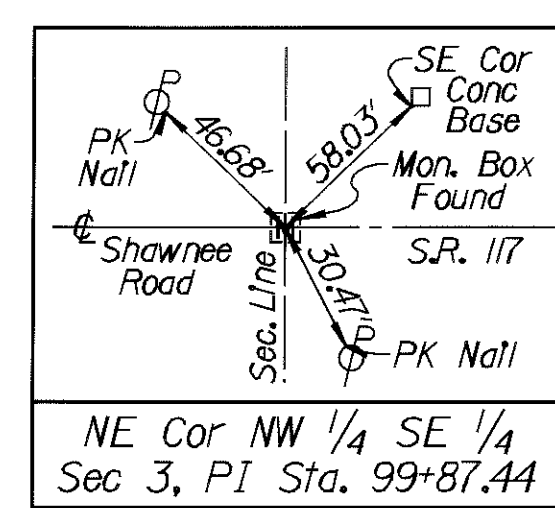
NDC = Normal Design Criteria

B.M. \*3, Elev. 869.92  
Chiseled 'x' In Conc Pad  
Sta. 717+78.6, 45.9' Rt.

B.M. \*1, Elev. 866.05  
Spike In Power Pole  
Sta. 97+66.7, 40.3' Rt.

CURVE 5 DATA  
PROP. WESTERN OHIO AVE.

PI Sta. 12+38.22  
 $\Delta = 4^{\circ}30'46''$  Rt.  
 $D_c = 1^{\circ}30'18''$   
 $R = 3,806.86'$   
 $T = 150.00'$   
 $L = 299.84'$   
 $E = 2.95'$   
PC Sta. 10+88.22  
PT Sta. 13+88.06



MONUMENT LEGEND

- ~ RR Spike Found
- MNS ~ Mag. Nail Set
- ~ Existing Monument Box

ALLEN COUNTY  
SHAWNEE TOWNSHIP  
NE 1/4 SECTION 3  
T 4 S R 6 E

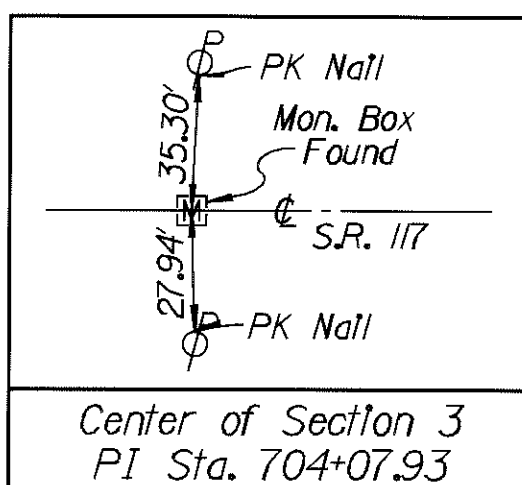
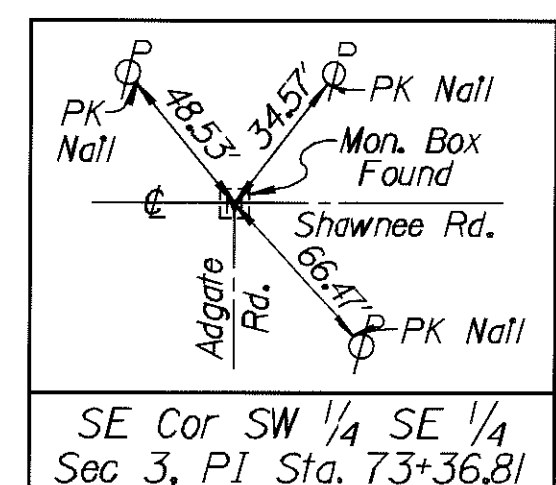
BEGIN WORK  
S.R. 117  
STA. 707+72

BEGIN PROJECT  
STA. 711+10  
S.L.M. 13.47

END WORK  
STA. 13+95  
WESTERN OHIO AVE.

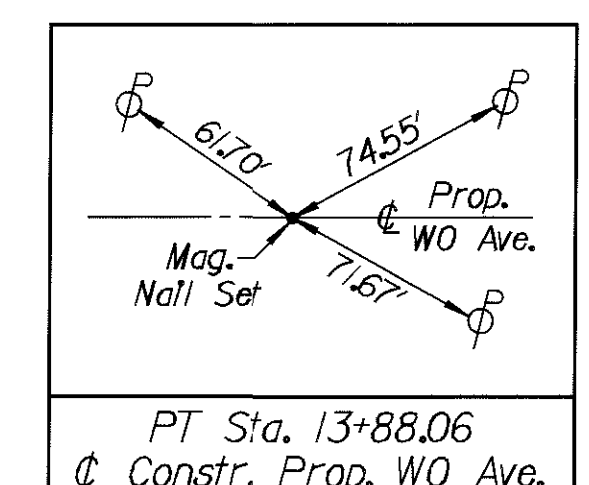
CURVE 2 DATA  
EXISTING S.R. 117

PI Sta. 715+25.01  
 $\Delta = 3^{\circ}29'59''$  Lt.  
 $D_c = 4^{\circ}59'59''$   
 $R = 1,460.00'$   
 $T = 35.01'$   
 $L = 70.00'$   
 $E = 0.53'$   
PC Sta. 714+90.00  
PT Sta. 715+60.00



BEGIN WORK  
STA. 94+00  
SHAWNEE RD.

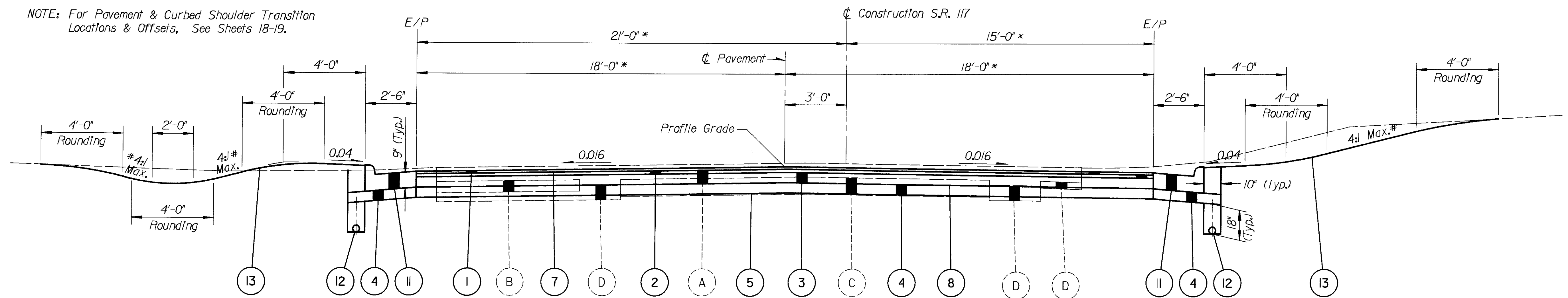
SE CORNER  
SW 1/4 SE 1/4 SEC. 3  
Sta. 73+36.81  
Q Constr. Shawnee Rd.





DESIGN FILE : I:\pdr\19314\all\17gy.dgn  
USERNAME : nyondere  
DATE : 10-AUG-2001  
TIME : 12:07

NOTE: For Pavement & Curbed Shoulder Transition  
Locations & Offsets, See Sheets 18-19.



### NORMAL SECTION

APPLIES @:

Sta. 718+00 to Sta. 719+80 = 180.0 Lin Ft  
Total = 180.0 Lin Ft

\* Varies along Radius @ Intersection

# See Cross Sections

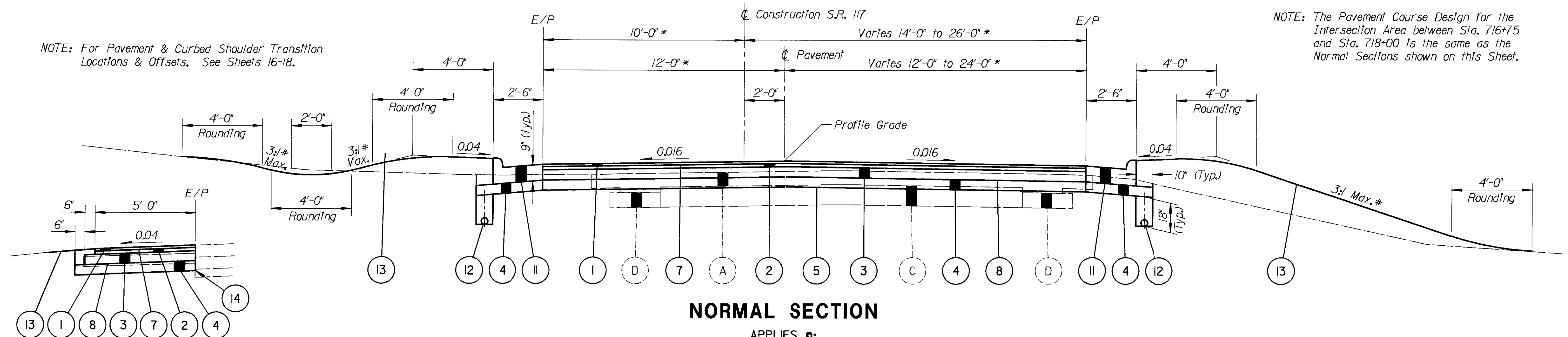
### PROPOSED LEGEND

#### EXISTING LEGEND

- (A) Asphalt Concrete
- (B) Bituminous Aggregate Base
- (C) Waterbound Macadam
- (D) Aggregate

- (1) Item 448 1-1/4" Asphalt Concrete Surface Course, Type 1, PG64-22, as per Plan
- (2) Item 448 1-3/4" Asphalt Concrete Intermediate Course, Type 2, PG64-22
- (3) Item 301 6" Bituminous Aggregate Base, PG64-22
- (4) Item 304 6" Aggregate Base
- (5) Item 203 Subgrade Compaction
- (6) Item 407 Tack Coat (See General Note)
- (7) Item 407 Tack Coat for Intermediate Course (See General Note)
- (8) Item 408 Bituminous Prime Coat applied at a rate of 0.40 Gallons per Sq Yd
- (9) Item 448 Asphalt Concrete Intermediate Course, Type 1, PG64-22 (Variable Thickness)
- (11) Item 830 Combination Curb and Gutter, Type 2
- (12) Item 605 4" Shallow Pipe Underdrain
- (13) Item 659 Seeding and Mulching
- (14) Item 255 Full Depth Pavement Sawing
- (15) Item 254 Pavement Planing, Bituminous (2" Min. - 3" Max. Thickness)
- (16) Item 203 Excavation

NOTE: For Pavement & Curbed Shoulder Transition  
Locations & Offsets, See Sheets 16-18.



### NORMAL SECTION

APPLIES @:

Sta. 711+10 to Sta. 716+75 = 565.0 Lin Ft  
Total = 565.0 Lin Ft

NOTE: Variable Thickness Locations for Item 304 Aggregate Base are shown on Cross Sections, Sheets 24-26.

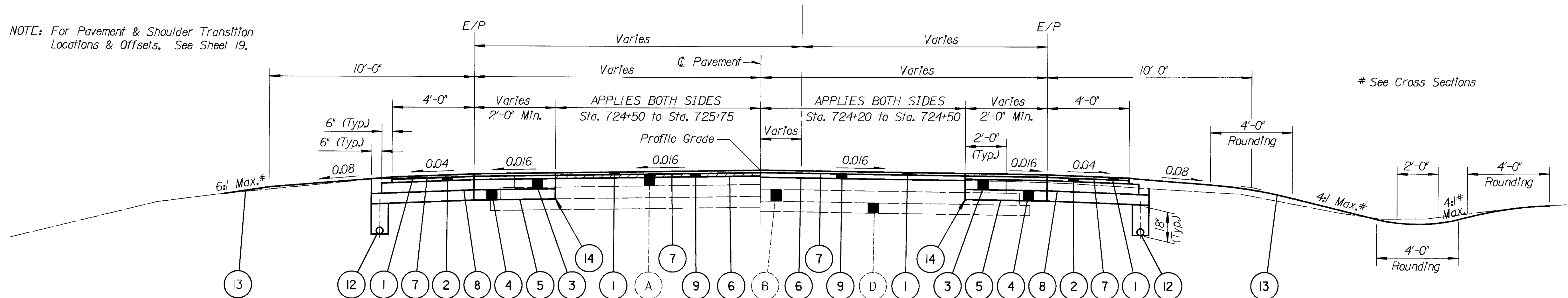
#### SHOULDER SECTION

APPLIES LEFT SIDE

Sta. 707+95 to Sta. 711+10



NOTE: For Pavement & Shoulder Transition Locations & Offsets, See Sheet 19.



## NORMAL SECTION

APPLIES @:

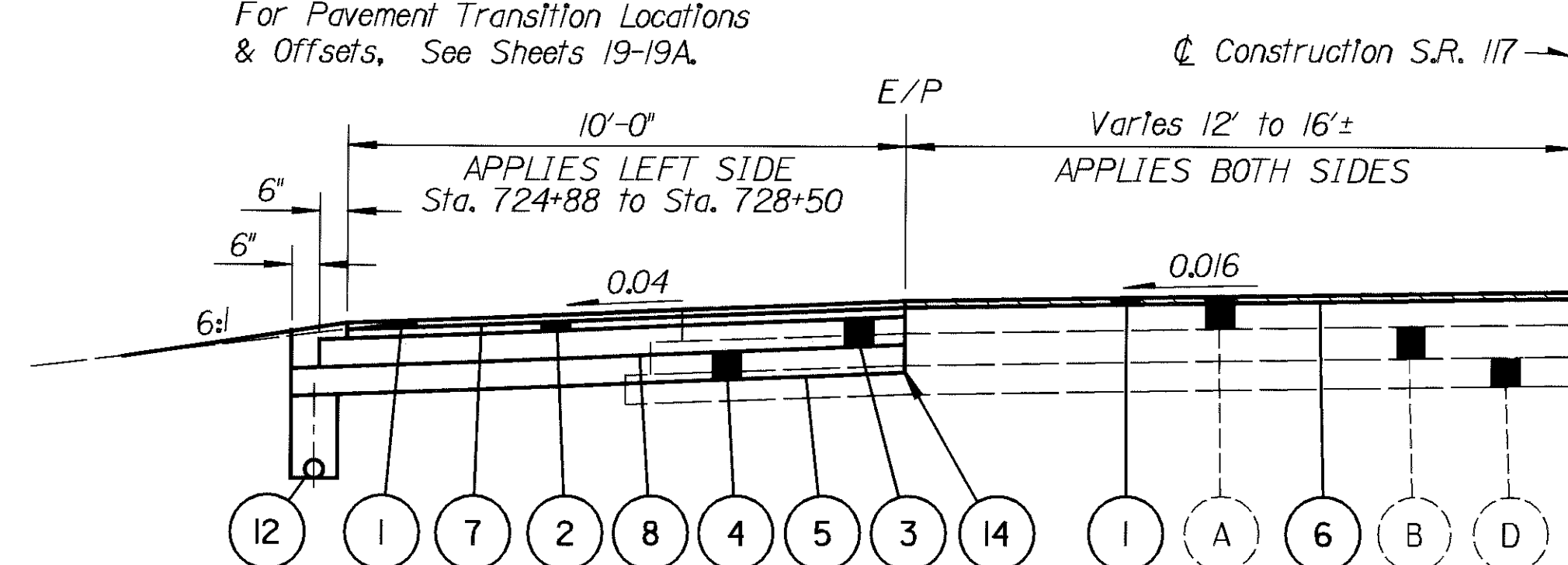
Sta. 724+20 to Sta. 725+75 = 155.0 Lin Ft  
Total = 155.0 Lin Ft

NOTE: For Location & Offset of  $\phi$  Pavement, See Schematic Plan, Sheet 2.

## EXISTING LEGEND

- (A) Asphalt Concrete
- (B) Bituminous Aggregate Base
- (D) Aggregate

For Pavement Transition Locations & Offsets, See Sheets 19-19A.



## NORMAL SECTION

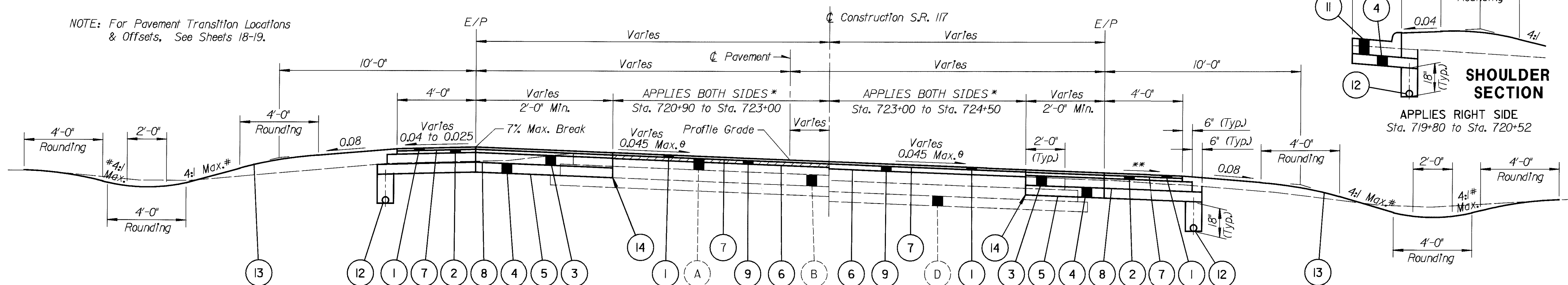
APPLIES @:

Sta. 725+75 to Sta. 731+27 = 552.0 Lin Ft  
Total = 552.0 Lin Ft

## PROPOSED LEGEND

- |              |                                                                      |               |                                                                            |               |                                                            |
|--------------|----------------------------------------------------------------------|---------------|----------------------------------------------------------------------------|---------------|------------------------------------------------------------|
| (1) Item 448 | 1-1/4" Asphalt Concrete Surface Course, Type 1, PG64-22, as per Plan | (7) Item 407  | Tack Coat for Intermediate Course (See General Note)                       | (13) Item 659 | Seeding and Mulching                                       |
| (2) Item 448 | 1-3/4" Asphalt Concrete Intermediate Course, Type 2, PG64-22         | (8) Item 408  | Bituminous Prime Coat applied at a rate of 0.40 Gallons per Sq Yd          | (14) Item 255 | Full Depth Pavement Sawing                                 |
| (3) Item 301 | 6" Bituminous Aggregate Base, PG64-22                                | (9) Item 448  | Asphalt Concrete Intermediate Course, Type 1, PG64-22 (Variable Thickness) | (15) Item 254 | Pavement Planing, Bituminous (2" Min. - 3" Max. Thickness) |
| (4) Item 304 | 6" Aggregate Base                                                    | (11) Item 830 | Combination Curb and Gutter, Type 2                                        | (16) Item 254 | Pavement Planing, Bituminous (1 1/4" Thickness)            |
| (5) Item 203 | Subgrade Compaction                                                  | (12) Item 605 | 4" Shallow Pipe Underdrain                                                 | (17) Item 203 | Excavation                                                 |

NOTE: For Pavement Transition Locations & Offsets, See Sheets 18-19.



## SUPERELEVATED SECTION

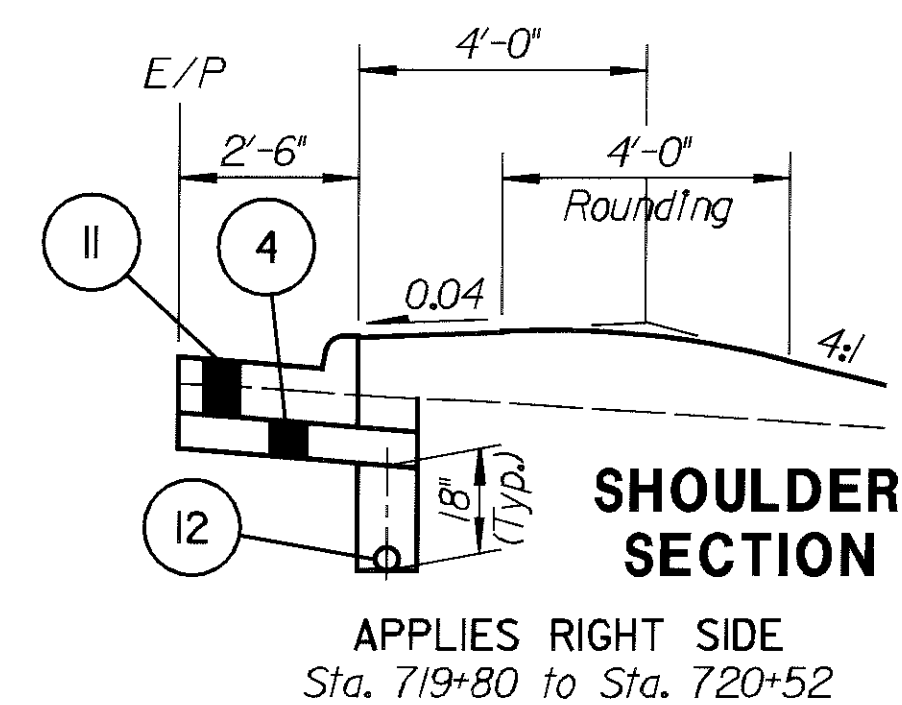
APPLIES @:

Sta. 719+80 to Sta. 724+20 = 440.0 Lin Ft  
Total = 440.0 Lin Ft

\*\* 0.04 or Rate of Superelevation If greater

Normal Design Criteria = 0.083 Max.

\* Superelevated Section is Full Depth Replacement from Sta. 719+80 to Sta. 720+90 as shown on Normal Section on Sheet 3.



## SHOULDER SECTION

APPLIES RIGHT SIDE  
Sta. 719+80 to Sta. 720+52



DESIGN FILE : I:\pd\9314\dl117gy.dgn  
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DATE : 10-AUG-2001  
TIME : 12:08



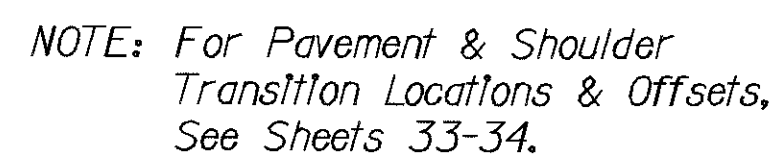
APPLIES @:

Sta. 97+76 to Sta. 99+50 =  $\frac{174.0 \text{ Lin Ft}}{174.0 \text{ Lin Ft}}$

Figure 1 is a plan view of the test section. It shows a horizontal duct with a top wall and a bottom wall. The top wall has a series of rectangular blocks (A, I, 7, 2, B, 10, 6, C) mounted on it. The bottom wall has a series of rectangular blocks (A, I, 7, 2, B, 10, 6, C) mounted on it. The flow direction is from left to right, indicated by an arrow labeled 'Dogwood Drive'. The inlet is on the left, and the outlet is on the right. The distance from the inlet to the first block (A) is 4'-0". The distance between the first block (A) and the last block (C) is 13'-0" ±. The flow velocity is 0.08. The flow rate is 6:1 Max. The flow is labeled 'Varies'.

- 1 Item 448 1-1/4" Asphalt Concrete Surface Course, Type 1, PG64-22, as per Plan
- 2 Item 448 1-3/4" Asphalt Concrete Intermediate Course, Type 2, PG64-22
- 3 Item 301 6" Bituminous Aggregate Base, PG64-22
- 4 Item 304 6" Aggregate Base
- 5 Item 203 Subgrade Compaction

|                                                                                          |          |                                                                            |                                                                                          |          |                                                            |
|------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------|------------------------------------------------------------|
|  6    | Item 407 | Tack Coat (See General Note)                                               |  11   | Item 830 | Combination Curb and Gutter, Type 2                        |
|  7    | Item 407 | Tack Coat for Intermediate Course (See General Note)                       |  12   | Item 605 | 4" Shallow Pipe Underdrain                                 |
|  8    | Item 408 | Bituminous Prime Coat applied at a rate of 0.40 Gallons per Sq Yd          |  13   | Item 659 | Seeding and Mulching                                       |
|  9  | Item 448 | Asphalt Concrete Intermediate Course, Type I, PG64-22 (Variable Thickness) |  14 | Item 255 | Full Depth Pavement Sawing                                 |
|  10 | Item 301 | Bituminous Aggregate Base, PG64-22 (Variable Thickness)                    |     | Item 254 | Pavement Planing, Bituminous (2" Min. - 3" Max. Thickness) |
|                                                                                          |          |                                                                            |     | Item 203 | Excavation                                                 |



APPLIES @:

Sta. 94+05 to Sta. 97+76 =  $\frac{371.0 \text{ Lin Ft}}{}$

Total = 371.0 Lin Ft

☐ A Asphalt Concrete

☐ B Bituminous Aggregate Base

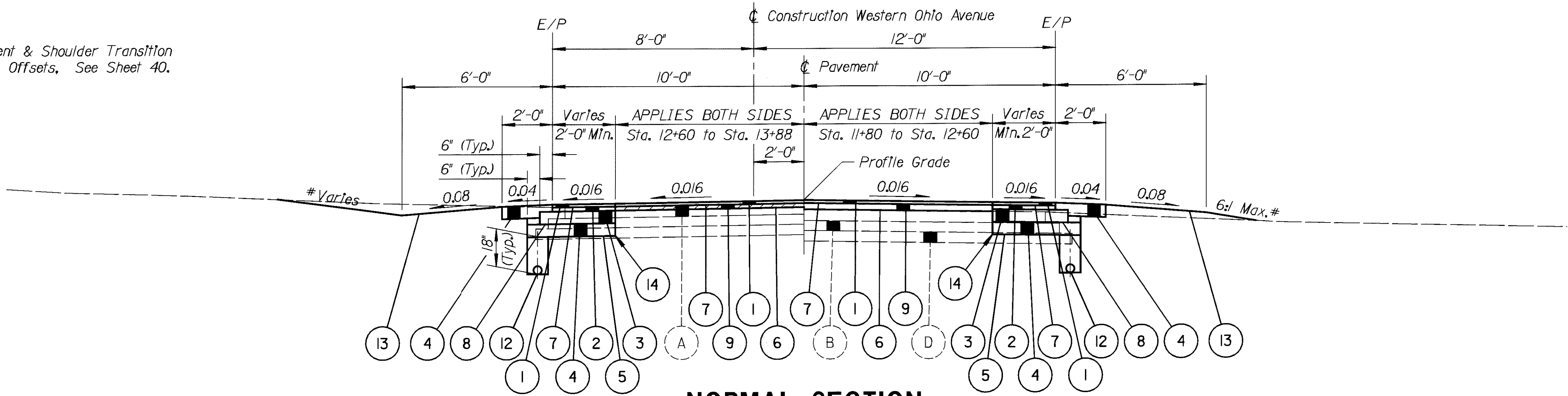
☐ D Aggregate



DESIGN FILE : I:\p\19314\all\17gy.dgn  
USERNAME : nyondere

DATE : 10-AUG-2001  
TIME : 12:09

NOTE: For Pavement & Shoulder Transition  
Locations & Offsets, See Sheet 40.



**NORMAL SECTION**

APPLIES @:

Sta. 11+80 to Sta. 13+88.06 = 208.06 Lin Ft  
Total = 208.06 Lin Ft

\* Varies along Radius @ Intersection  
# See Cross Sections

**EXISTING LEGEND**

- (A) Asphalt Concrete
- (B) Bituminous Aggregate Base
- (C) Waterbound Macadem
- (D) Aggregate

- (1) Item 448 1 1/4" Asphalt Concrete Surface Course, Type 1, PG64-22, as per Plan
- (2) Item 448 1 3/4" Asphalt Concrete Intermediate Course, Type 2, PG64-22
- (3) Item 301 6" Bituminous Aggregate Base, PG64-22
- (4) Item 304 6" Aggregate Base

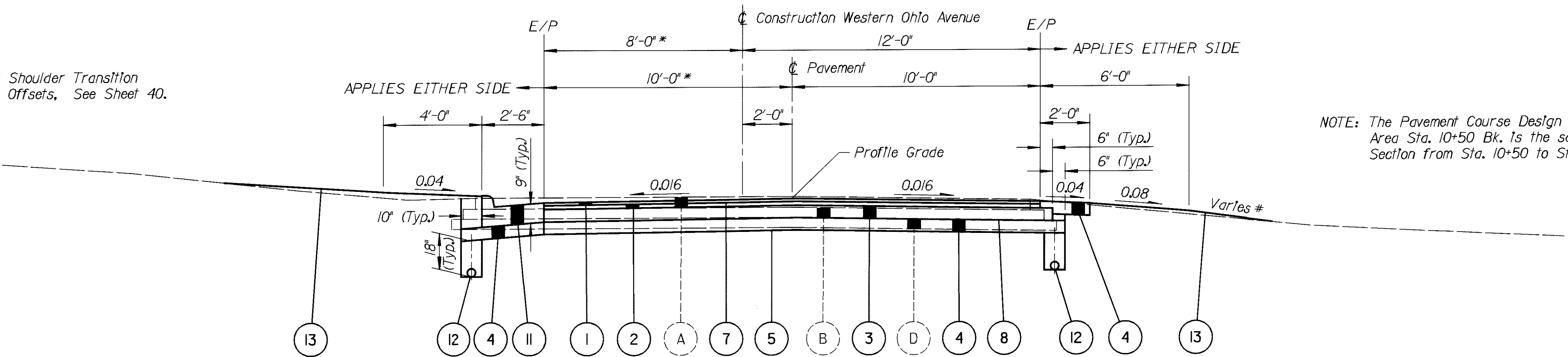
- (5) Item 203 Subgrade Compaction
- (6) Item 407 Tack Coat (See General Note)
- (7) Item 407 Tack Coat for Intermediate Course (See General Note)
- (8) Item 408 Bituminous Prime Coat applied at a rate of 0.40 Gallons per Sq Yd

**PROPOSED LEGEND**

- (9) Item 448 Asphalt Concrete Intermediate Course, Type 1, PG64-22 (Variable Thickness)
- (11) Item 830 Combination Curb and Gutter, Type 2
- (12) Item 605 4" Shallow Pipe Underdrain

- (13) Item 659 Seeding and Mulching
- (14) Item 255 Full Depth Pavement Sawing
- (15) Item 254 Pavement Planing, Bituminous (2" Min. - 3" Max. Thickness)
- (16) Item 203 Excavation

NOTE: For Curbed Shoulder Transition  
Locations & Offsets, See Sheet 40.



**NORMAL SECTION**

APPLIES @:

Sta. 10+50 to Sta. 11+80 = 130.0 Lin Ft  
Total = 130.0 Lin Ft

NOTE: The Pavement Course Design for the Intersection  
Area Sta. 10+50 Bk. Is the same as the Normal  
Section from Sta. 10+50 to Sta. 11+80.



DESIGN FILE : i:\pd\9314\c1117gn.dgn  
USERAME : nvondere

DATE : 10-AUG-2001  
TIME : 12:12

ELEVATION DATUM

ALL ELEVATIONS ARE BASED ON U.S.G.S. DATUM.

ROUNDING

THE ROUNDING AT SLOPE BREAKPOINTS SHOWN ON THE TYPICAL SECTIONS APPLY TO ALL CROSS SECTIONS EVEN THOUGH OTHERWISE SHOWN.

UTILITY OWNERSHIP

LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS:

TELEPHONE

SPRINT  
122 S. ELIZABETH ST.  
LIMA, OHIO 45802  
419-222-6220

CABLE

TIME WARNER CABLE  
3100 ELIDA RD.  
LIMA, OHIO 45805  
419-331-1111

ELECTRIC

AEP  
2738 N. MAIN ST.  
FINDLAY, OHIO 45807  
419-425-7545

SANITARY  
WATER

CITY OF LIMA  
UTILITIES DEPARTMENT  
50 TOWN SQUARE  
LIMA, OHIO 45801  
419-228-5462

GAS

WEST OHIO GAS  
150 S. JACKSON ST.  
LIMA, OHIO 45801  
419-226-4700

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

CONVERSION OF STANDARD DRAWINGS

THE METRIC STANDARD DRAWINGS REFERENCED IN THIS PLAN SHALL BE CONVERTED TO ENGLISH UNITS USING THE SI (METRIC) TO ENGLISH CONVERSION FACTORS PROVIDED IN SECTION 109.011 OF THE 1997 CONSTRUCTION AND MATERIALS SPECIFICATIONS. THE APPENDIX OF ASTM E 380 SHALL BE UTILIZED FOR ANY ADDITIONAL CONVERSION FACTORS REQUIRED. CONVERSIONS SHALL BE APPROPRIATELY PRECISE AND SHALL REFLECT STANDARD INDUSTRY ENGLISH VALUES WHERE SUITABLE.

CONTINGENCY QUANTITIES

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED FOR SUCH ITEMS SHALL BE INCORPORATED INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

WORK LIMITS

THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. THE INSTALLATION AND OPERATION OF ALL TEMPORARY TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS SHALL BE PROVIDED BY THE CONTRACTOR WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE PLACED BY THE CONTRACTOR WITH THE ENGINEER'S CONCURRENCE FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES:

|          |                                                   |   |      |        |
|----------|---------------------------------------------------|---|------|--------|
| ITEM 601 | ROCK CHANNEL PROTECTION,<br>TYPE C WITH FILTER    | = | 50   | CU YD  |
| ITEM 601 | ROCK CHANNEL PROTECTION,<br>TYPE C WITHOUT FILTER | = | 80   | CU YD  |
| ITEM 870 | COMMERCIAL FERTILIZER                             | = | 0.06 | TON    |
| ITEM 870 | WATER                                             | = | 4    | M GAL  |
| ITEM 877 | TEMPORARY SEEDING AND MULCHING                    | = | 1300 | SQ YD  |
| ITEM 877 | TEMPORARY PERIMETER<br>FILTER FABRIC FENCE        | = | 2000 | LIN FT |
| ITEM 877 | TEMPORARY DITCH CHECK<br>FILTER FABRIC FENCE      | = | 50   | LIN FT |
| ITEM 877 | TEMPORARY INLET PROTECTION<br>FILTER FABRIC FENCE | = | 100  | LIN FT |
| ITEM 877 | TEMPORARY SLOPE DRAINS                            | = | 50   | LIN FT |
| ITEM 877 | SEDIMENT REMOVAL                                  | = | 25   | CU YD  |

EROSION CONTROL

ITEM 601 IS PROVIDED IN THE PLANS FOR EROSION CONTROL. ROCK OF A STABLE NATURE SHALL NOT BE REMOVED IN ORDER TO PLACE THIS ITEM. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES FOR THE ITEM WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION. IN ADDITION, THIS ITEM SHALL MEET THE REQUIREMENT OF 108.04.

ITEM 870 SEEDING AND MULCHING

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES, AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE BASED ON THESE LIMITS.

SEEDING AND MULCHING OF LAWNS

IN ADDITION TO "AREAS IN FRONT OF RESIDENCES" REFERRED TO IN 870.13, THE SPECIAL PREPARATION SHALL BE EXTENDED TO ENCOMPASS ALL LAWNS AND/OR LAWN-LIKE AREAS AS DETERMINED BY THE ENGINEER.

CLEARING AND GRUBBING

ALL TREES AND STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE CONSTRUCTION LIMITS SHALL BE REMOVED UNDER THE LUMP SUM BID FOR ITEM 201, CLEARING AND GRUBBING. THE FOLLOWING IS AN APPROXIMATE NUMBER OF TREES AND STUMPS TO BE REMOVED.

| SIZES | NO. TREES | NO. STUMPS | TOTAL |
|-------|-----------|------------|-------|
| 18"   | 18        | 1          | 19    |
| 30"   | 2         | 1          | 3     |

ITEM 448 ASPHALT CONCRETE SURFACE COURSE,  
TYPE 1, PG64-22, AS PER PLAN

THIS ITEM SHALL MEET ALL REQUIREMENTS OF THE SPECIFICATIONS FOR 401, 441, AND 448 WITH THE FOLLOWING EXCEPTION:

1) NO RECYCLED ASPHALT PAVEMENT SHALL BE USED IN THE SURFACE COURSE.

ALL COSTS ASSOCIATED WITH THE EQUIPMENT, LABOR AND MATERIALS NECESSARY FOR SUPPLYING AND PLACING THIS ITEM SHALL BE INCLUDED IN THE PRICE BID PER CUBIC YARD FOR ITEM 448 ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22, AS PER PLAN.

ITEM 407 TACK COAT AND ITEM 407 TACK COAT  
FOR INTERMEDIATE COURSE

THE RATE OF APPLICATION OF THE 407 TACK COAT SHALL BE SUBJECT TO ADJUSTMENT AS DIRECTED BY THE ENGINEER. FOR ESTIMATING PURPOSES ONLY, THE PLAN QUANTITIES INDICATE AN AVERAGE APPLICATION RATE OF:

|                                            |   |                     |
|--------------------------------------------|---|---------------------|
| ITEM 407 TACK COAT                         | = | 0.075 GAL PER SQ YD |
| ITEM 407 TACK COAT FOR INTERMEDIATE COURSE | = | 0.075 GAL PER SQ YD |

CONSTRUCTION NOISE

| ESTIMATED QUANTITIES                            |          |        |                                                   |
|-------------------------------------------------|----------|--------|---------------------------------------------------|
| ITEM                                            | QUANTITY | UNIT   | DESCRIPTION                                       |
| 201                                             | LUMP     |        | CLEARING AND GRUBBING                             |
| 601                                             | 50       | CU YD  | ROCK CHANNEL PROTECTION,<br>TYPE C WITH FILTER    |
| 601                                             | 80       | CU YD  | ROCK CHANNEL PROTECTION,<br>TYPE C WITHOUT FILTER |
| 870                                             | 0.06     | TON    | COMMERCIAL FERTILIZER                             |
| 870                                             | 4        | M GAL  | WATER                                             |
| 877                                             | 1300     | SQ YD  | TEMPORARY SEEDING AND MULCHING                    |
| 877                                             | 2000     | LIN FT | TEMPORARY PERIMETER<br>FILTER FABRIC FENCE        |
| 877                                             | 50       | LIN FT | TEMPORARY DITCH CHECK<br>FILTER FABRIC FENCE      |
| 877                                             | 100      | LIN FT | TEMPORARY INLET PROTECTION<br>FILTER FABRIC FENCE |
| 877                                             | 50       | LIN FT | TEMPORARY SLOPE DRAINS                            |
| 877                                             | 25       | CU YD  | SEDIMENT REMOVAL                                  |
| QUANTITIES CARRIED TO GENERAL SUMMARY, SHEET 13 |          |        |                                                   |

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GENERAL NOTES

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CROSSINGS AND CONNECTIONS TO EXISTING  
PIPES AND UTILITIES

WHERE PLANS PROVIDE FOR A PROPOSED CONDUIT TO BE CONNECTED TO, OR CROSS OVER OR UNDER AN EXISTING SEWER OR UNDERGROUND UTILITY, THE CONTRACTOR SHALL LOCATE THE EXISTING PIPES OR UTILITIES BOTH AS TO LINE AND GRADE BEFORE STARTING TO LAY THE PROPOSED CONDUIT.

IF IT IS DETERMINED THAT THE ELEVATION OF THE EXISTING CONDUIT, OR EXISTING APPURTENANCE TO BE CONNECTED, DIFFERS FROM THE PLAN ELEVATION OR RESULTS IN A CHANGE IN THE PLAN CONDUIT SLOPE, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED CONDUIT WHICH WILL BE AFFECTED BY THE VARIANCE IN THE EXISTING ELEVATIONS.

IF IT IS DETERMINED THAT THE PROPOSED CONDUIT WILL INTERSECT AN EXISTING SEWER OR UNDERGROUND UTILITY AS SHOWN ON THE PLAN, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED CONDUIT WHICH WOULD BE AFFECTED BY THE INTERFERENCE WITH AN EXISTING UTILITY.

PAYMENT FOR ALL THE OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT 603 CONDUIT ITEM.

RESIDENTIAL AND COMMERCIAL DRAINAGE CONNECTIONS

EXISTING ROOF DRAINS, FOOTER DRAINS OR YARD DRAINS DISTURBED BY THE WORK SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS BY CONNECTING A CONDUIT THROUGH THE CURB OR INTO A DRAINAGE STRUCTURE. THE LOCATION, TYPE, SIZE AND GRADE OF THE CONDUIT REQUIRED TO REPLACE OR EXTEND THE EXISTING DRAIN WILL BE DETERMINED BY THE ENGINEER.

THE FOLLOWING CONDUIT TYPES MAY BE USED: 707.33, 707.41 NON-PERFORATED, 707.42, 707.43, 707.45, 707.46, 707.47, 707.51, 707.52 PS46 MIN.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE WORK NOTED ABOVE:

|          |                    |   |    |        |
|----------|--------------------|---|----|--------|
| ITEM 603 | 4" CONDUIT, TYPE C | = | 20 | LIN FT |
| ITEM 603 | 4" CONDUIT, TYPE F | = | 20 | LIN FT |

MAINTENANCE OF EXISTING DRAINAGE STRUCTURES

THE CONTRACTOR SHALL KEEP ALL EXISTING DRAINAGE STRUCTURES AND DITCHES IN SATISFACTORY OPERATING CONDITIONS WITH POSITIVE FLOWING INLETS AND OUTLETS UNTIL THE PROPOSED DRAINAGE STRUCTURES AND DITCHES ARE CAPABLE OF PROVIDING ADEQUATE DRAINAGE FOR THE ROADWAY, MEDIAN AND SHOULDERS. ALL WORK SHALL DONE IN ACCORDANCE WITH SPEC. 105.14.

MONUMENTS

MONUMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS AS SHOWN ON THE STANDARD CONSTRUCTION DRAWINGS AND AT THE LOCATIONS SHOWN ON SHEET 59.

ITEM SPECIAL - MAILBOX SUPPORT

THIS WORK SHALL CONSIST OF FURNISHING AND ERECTING MAILBOX SUPPORTS AND ANY ASSOCIATED MOUNTING HARDWARE IN ACCORDANCE WITH PLAN DETAILS, AND ATTACHING AN OWNER-SUPPLIED MAILBOX AT LOCATIONS SPECIFIED IN THE PLAN, OR OTHERWISE ESTABLISHED BY THE ENGINEER.

WOOD POSTS SHALL BE NOMINAL 4" BY 4" SQUARE OR 4-1/2" DIAMETER ROUND, AND CONFORM TO 710.14.

STEEL POSTS SHALL BE NOMINAL PIPE SIZE 2" I.D., AND CONFORM TO AASHTO M 181.

HARDWARE (PLATES, SCREWS, BOLTS, ECT.) SHALL BE COMMERCIAL-GRADE GALVANIZED STEEL.

POSTS SHALL BE SET PER THE FIRST PARAGRAPH OF 606.03, AND SHALL IN NO INSTANCE BE ENCASED IN CONCRETE.

SUPPORT HARDWARE SHALL ACCOMMODATE EITHER A SINGLE OR A DOUBLE MAILBOX INSTALLATION, AND NO MORE THAN TWO BOXES MAY BE MOUNTED ON A SINGLE POST.

THE MAILBOX SHALL BE SECURELY AND NEATLY ATTACHED BY THE CONTRACTOR TO THE NEW SUPPORT. THE CONTRACTOR SHALL FURNISH ALL NECESSARY ATTACHMENT HARDWARE (NUTS, BOLTS, PLATES, SPACERS, AND WASHERS) AS NECESSARY TO ACCOMMODATE THE COMPLETE INSTALLATION.

IN THE ABSENCE OF A NEW BOX SUPPLIED BY THE OWNER, THE CONTRACTOR SHALL SALVAGE THE EXISTING BOX AND PLACE IT ON THE NEW SUPPORT. DUE CARE SHALL BE EXERCISED IN SUCH AN OPERATION, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING ANY BOX DAMAGED BY IMPROPER HANDLING ON HIS PART, AS JUDGED AND DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE LOCAL POST MASTER REGARDING THE TIMING OF THE MOVEMENT OF ANY MAILBOX TO A NEW LOCATION.

PAYMENT UNDER THIS ITEM SHALL BE LIMITED TO FINAL PERMANENT INSTALLATIONS. TEMPORARY INSTALLATIONS SHALL BE IN ACCORDANCE WITH 107.12. HOWEVER, THE SAME MATERIAL AND SIZE LIMITATIONS AS FOR PERMANENT INSTALLATIONS SHALL APPLY.

MAILBOX SUPPORTS, COMPLETE IN PLACE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH, FOR ITEM SPECIAL MAILBOX SUPPORT.

ITEM 608 CONCRETE STEPS, TYPE B, AS PER PLAN

THE CONCRETE STEPS SHALL BE CONSTRUCTED USING THE DIMENSIONS AS SHOWN IN THE DETAIL ON SHEET 46.

ALL COSTS ASSOCIATED WITH THE EQUIPMENT, LABOR AND MATERIALS NECESSARY FOR SUPPLYING AND PLACING THIS ITEM SHALL BE INCLUDED IN THE PRICE BID PER LINEAR FOOT FOR ITEM 608 CONCRETE STEPS, TYPE B, AS PER PLAN.

ENVIRONMENTAL COMMITMENTS

THE ENVIRONMENTAL DOCUMENT WAS APPROVED 5/31/01 AND CONTAINED THE FOLLOWING CONSTRUCTION RELATED ITEMS THAT THE CONTRACTOR AND PROJECT ENGINEER ARE TO ENSURE ARE CARRIED OUT. IF THEY CANNOT BE FOLLOWED THE DISTRICT PLANNING AND PROGRAM ADMINISTRATOR SHOULD BE NOTIFIED IMMEDIATELY.

1. NO TREES THAT CONTAIN SUITABLE SUMMER BROOD REARING AND/OR ROOSTING FOR THE INDIANA BAT WILL BE REMOVED BETWEEN 04/15 TO 9/15 WHEN THE BATS WOULD BE UTILIING SUCH HABITATS.
2. IN ORDER TO MINIMIZE ANY ADVERSE CONSTRUCTION NOISE IMPACTS, ANY POWER OPERATED CONSTRUCTION TYPE DEVICE SHALL NOT BE OPERATED BETWEEN THE HOURS OF 9:00 PM AND 7:00 AM. IN ADDITION, ANY SUCH DEVICE SHALL NOT BE OPERATED AT ANY TIME IN SUCH A MANNER THAT THE NOISE CREATED SUBSTANTIALLY EXCEEDS THE NOISE CUSTOMARILY AND NECESSARILY ATTENDANT TO THE REASONABLE AND EFFICIENT PERFORMANCE OF SUCH EQUIPMENT.

| ESTIMATED QUANTITIES                            |          |        |                    |
|-------------------------------------------------|----------|--------|--------------------|
| ITEM                                            | QUANTITY | UNIT   | DESCRIPTION        |
|                                                 |          |        |                    |
| 603                                             | 20       | LIN FT | 4" CONDUIT, TYPE C |
| 603                                             | 20       | LIN FT | 4" CONDUIT, TYPE F |
| QUANTITIES CARRIED TO GENERAL SUMMARY, SHEET 13 |          |        |                    |

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ITEM 614 MAINTAINING TRAFFIC

THE CONTRACTOR SHALL MAINTAIN TRAFFIC AT ALL TIMES (EXCEPT AS NOTED IN THE DETOUR NOTE ON THIS SHEET) IN ACCORDANCE WITH THE REQUIREMENTS OF SPEC. 614, THESE MAINTENANCE OF TRAFFIC NOTES AND DETAILS AND THE TRAFFIC CONTROL DETAILS DESCRIBED IN THESE PLANS. THE MINIMUM LANE WIDTH FOR TRAFFIC CONTROL SHALL BE 11 FEET AT ALL TIMES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ORGANIZE HIS WORK IN SUCH A MANNER TO PROVIDE THE MOST SAFETY WITH THE LEAST INCONVENIENCE TO THE TRAVELING PUBLIC.

THE CONTRACTOR SHALL SUBMIT, IN WRITING, A SCHEDULE OF OPERATIONS TO THE ENGINEER AND RECEIVE APPROVAL BEFORE WORK IS STARTED ON THE PROJECT.

NO EXTENSIONS OF TIME SHALL BE GRANTED FOR DELAYS IN MATERIAL DELIVERIES, UNLESS SUCH DELAYS ARE INDUSTRY-WIDE, OR FOR LABOR STRIKES, UNLESS SUCH STRIKES ARE AREA-WIDE.

PAYMENT FOR FURNISHING, ERECTING, MAINTAINING AND REMOVING SIGNS, BARRICADES, CONES, MARKERS, ALL TEMPORARY PAVEMENT MARKINGS, TEMPORARY RAISED PAVEMENT MARKERS, PORTABLE CONCRETE BARRIER, PORTABLE CONCRETE BARRIER END TREATMENTS, OBJECT MARKERS, ETC... SHALL BE INCLUDED IN THE LUMP SUM ITEM BID ITEM 614 MAINTAINING TRAFFIC, AS PER PLAN.

THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, MAINTAIN, AND REMOVE ALL ADDITIONAL SIGNS OR TRAFFIC CONTROL DEVICES DEEMED NECESSARY BY THE ENGINEER WITH ALL ASSOCIATED COSTS INCLUDED IN THE LUMP SUM PRICE BID ITEM 614 MAINTAINING TRAFFIC, AS PER PLAN.

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE UNIT PRICE BID ITEM 614 MAINTAINING TRAFFIC, AS PER PLAN.

DETOURS AND CLOSURES

THE FOLLOWING ROADS MAY REQUIRE THE CLOSING OF THE ROAD TO TRAFFIC. THESE ROADS ARE AS FOLLOWS:

SR 117  
SHAWNEE RD.  
WESTERN OHIO AVE.

THE MAXIMUM LENGTH OF CLOSURE AND LIQUDATED DAMAGES FOR ROADS CLOSED TO TRAFFIC ARE LISTED AS FOLLOWS:

| ROAD              | MAXIMUM LENGTH OF CLOSURE |
|-------------------|---------------------------|
| SR 117            | 60 DAYS                   |
| SHAWNEE RD.       | 30 DAYS                   |
| WESTERN OHIO AVE. | 30 DAYS                   |

ONCE CLOSURE OF A ROAD IS MADE, THE CONTRACTOR SHALL DILIGENTLY PURSUE THE WORK TO MINIMIZE THE INCONVENIENCE TO THE TRAVELING PUBLIC. THE CONTRACTOR SHALL SCHEDULE HIS WORK SO AS TO COMPLETE ROAD CLOSURES BETWEEN JUNE 3RD\*AND AUGUST 16TH\*TO MITIGATE INCONVENIENCE TO SCHOOLS AND THE TRAVELING PUBLIC. ANY ROAD CLOSURES BEFORE JUNE 3RD\*OR AFTER AUGUST 16TH\*SHALL RESULT IN ACCESSMENT OF LIQUIDATED DAMAGES AS STATED BELOW.

THE NUMBER OF CONSECUTIVE CALENDAR DAYS SHOWN ABOVE SHALL BE CONSIDERED AS AN INTERIM COMPLETION DATE (SECTION 108) AND FOR EACH CALENDAR DAY BEYOND THOSE DAYS THAT THE ROAD REMAINS CLOSED TO TRAFFIC, THE CONTRACTOR SHALL BE ASSESSED LIQUIDATED DAMAGES IN THE AMOUNT PER 108.07. THE ROADS MAY BE CLOSED CONCURRENTLY, BUT ACCESS TO ALL PROPERTIES MUST BE MAINTAINED AT ALL TIMES.

THE CONTRACTOR SHALL NOTIFY THE ROADWAY SERVICES ENGINEER, PROJECT ENGINEER AND COUNTY AND CITY ENGINEER AT LEAST FOURTEEN (14) CALENDAR DAYS PRIOR TO THE CLOSURE OF ANY ROAD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING, INSTALLING, MAINTAINING AND REMOVING THE GATES AND BARRICADES (AT THE APPROXIMATE WORK LIMITS) & THE ADVANCE WARNING SIGNS AS SHOWN ON STANDARD DRAWING MT-101.60M.

\*2002

ALTERNATE METHODS

IF THE CONTRACTOR SO ELECTS, THEY MAY SUBMIT ALTERNATE METHODS FOR MAINTENANCE OF TRAFFIC PROVIDED THE INTENT OF THE ABOVE PROVISIONS ARE FOLLOWED AND NO ADDITIONAL INCONVENIENCE TO THE TRAVELING PUBLIC RESULTS THERE FROM. NO ALTERNATE PLAN SHALL BE PLACED INTO EFFECT UNTIL APPROVAL HAS BEEN GRANTED, IN WRITING, BY THE DISTRICT CONSTRUCTION ENGINEER.

ACCESS TO ADJACENT PROPERTY

ACCESS TO ADJACENT PROPERTY WITHIN THE WORK LIMITS ON THE VARIOUS ROADS SHALL BE MAINTAINED BY THE CONTRACTOR AT ALL TIMES, AS PER 614.02(a). THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER FOR THE MAINTENANCE OF LOCAL TRAFFIC:

ITEM 410 TRAFFIC COMPACTED AGGREGATE, TYPE A = 100 CU YD

PAVEMENT MARKING

PRIOR TO PLACEMENT OF ANY TEMPORARY PAVEMENT MARKINGS, THE CONTRACTOR SHALL COMPLETELY OBLITERATE, AS PER SPEC. 641.10, ALL EXISTING PAVEMENT MARKINGS THAT WOULD CREATE CONFUSION OR CONFLICT WITH THE TEMPORARY PAVEMENT MARKINGS. PAYMENT FOR THIS COMPLETE REMOVAL SHALL BE INCLUDED IN THE PERTINENT 614 ITEM.

ITEM SPECIAL REPLACEMENT SIGN

FLAT SHEET SIGNS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLAN, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT SIGNS SHALL BE NEW. OTHER MATERIALS MAY BE IN USED BUT GOOD CONDITION SUBJECT TO APPROVAL OF THE ENGINEER.

PAYMENT FOR THE NEW SIGNS SHALL BE MADE AT THE CONTRACT PRICE BID PER SQUARE METER FOR ITEM SPECIAL, REPLACEMENT SIGN, AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF THE DAMAGED SIGNS, HARDWARE AND SUPPORTS, AND PROVIDING THE NECESSARY REPLACEMENT HARDWARE, SUPPORTS, ECT. THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY.

ITEM SPECIAL REPLACEMENT SIGN = 40 SQ FT

ITEM SPECIAL REPLACEMENT DRUM

DRUMS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT DRUMS SHALL BE NEW.

PAYMENT FOR THE NEW DRUMS SHALL BE MADE AT THE CONTRACT PRICE PER EACH ITEM SPECIAL, REPLACEMENT DRUM, AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF THE DAMAGED DRUM, AND PROVIDING AND MAINTAINING THE REPLACEMENT DRUM IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS FOR THE ORIGINAL DRUM. THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY.

ITEM SPECIAL REPLACEMENT DRUM = 20 EACH

MOVEMENT OF DRUMS

THE ROW OF DRUMS ALONG A CLOSED LANE SHALL BE MOVED OUT OF THE OPEN LANE ONTO THE NEW PAVEMENT AS SOON AS PAVING OPERATIONS PERMIT.

TRENCH FOR WIDENING

TRENCH EXCAVATION FOR BASE WIDENING ADJACENT TO TRAVELED LANES SHALL BE ONLY ON ONE SIDE OF THE PAVEMENT AT A TIME. THE OPEN TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED WITH DRUMS OR BARRICADES AT ALL TIMES. PLACEMENT OF PROPOSED SUBBASE AND BASE MATERIAL SHALL FOLLOW AS CLOSELY AS POSSIBLE BEHIND EXCAVATION OPERATIONS. THE LENGTH OF WIDENING TRENCH WHICH IS OPEN AT ANY ONE TIME SHALL BE HELD TO A MINIMUM AND SHALL AT ALL TIMES BE SUBJECT TO APPROVAL OF THE ENGINEER.

OVERNIGHT TRENCH CLOSING

THE BASE WIDENING SHALL BE COMPLETED TO A DEPTH OF NO MORE THAN 1½" INCHES BELOW THE EXISTING PAVEMENT BY THE END OF EACH WORK DAY AND USE OW-171 AND OWP-171 SIGNS. NO TRENCH SHALL BE LEFT OPEN DURING NONWORKING HOURS EXCEPT FOR A SHORT LENGTH (25 FEET OR LESS) OF A WORK SECTION AT THE END OF THE TRENCH. THIS NOTE ALSO APPLIES TO ALL AREAS EXCEPT IN AREAS PROTECTED BY PORTABLE CONCRETE BARRIER. IN CASE WORK MUST BE SUSPENDED BECAUSE OF INCLEMENT WEATHER OR OTHER REASONS, THE TRENCH FOR THE UNCOMPLETED BASE WIDENING SHALL BE BACKFILLED AT THE DIRECTION OF THE ENGINEER.

NOTICE OF CLOSURE SIGNS

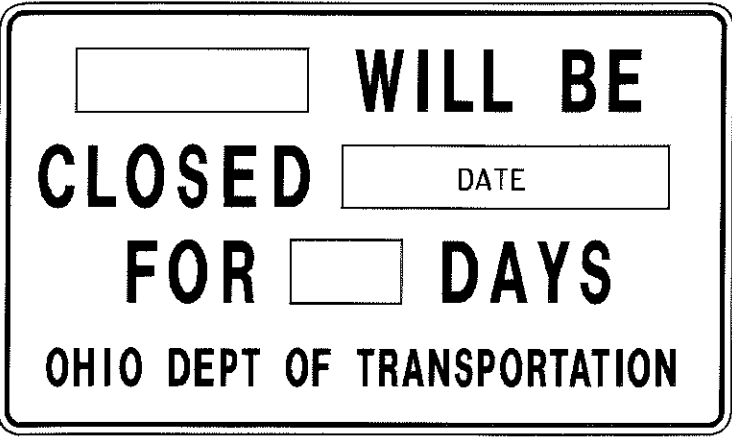
THE CONTRACTOR SHALL NOTIFY THE DISTRICT ONE ROADWAY SERVICES ADMINISTRATOR A MINIMUM OF TWENTY-ONE (21) DAYS IN ADVANCE OF THE PLANNED DATE OF CLOSURE. AT THAT TIME THE CONTRACTOR SHALL ARRANGE FOR THE PICK UP OF THE "NOTICE OF CLOSURE" SIGNS FROM THE DISTRICT WHICH THEN SHALL BE ERECTED BY THE CONTRACTOR AT LEAST 14 DAYS IN ADVANCE OF THE SCHEDULED CLOSURE. THE SIGNS SHALL BE ERECTED ON THE RIGHT SIDE OF THE ROAD FACING TRAFFIC. THE SIGNS SHALL BE ERECTED AT THE POINT OF CLOSURE AND BE PLACED SO AS NOT TO INTERFERE WITH THE VISIBILITY OF ANY OTHER TRAFFIC CONTROL SIGNS. AFTER THE ROAD IS OPENED TO THROUGH TRAFFIC AND THE "NOTICE OF CLOSURE" SIGNS ARE NO LONGER NEEDED THE CONTRACTOR IS SUBSEQUENTLY RESPONSIBLE FOR RETURNING THE SIGNS TO THE DISTRICT.

AN OC-60B SIGN SHALL BE USED ON THE FOLLOWING LOCAL ROADS:

SHAWNEE ROAD - SR 117 - WESTERN OHIO AVENUE

PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 614 MAINTAINING TRAFFIC AND SHALL INCLUDE ERECTING, MAINTAINING AND REMOVING THE SIGNS INCLUDING SUPPORTS.

NOTE:  
THE CONTRACTOR IS TO FILL IN THE ROAD, DATE AND DURATION.



OC-60B

| ESTIMATED QUANTITIES                            |          |       |                                     |
|-------------------------------------------------|----------|-------|-------------------------------------|
| ITEM                                            | QUANTITY | UNIT  | DESCRIPTION                         |
| 410                                             | 100      | CU YD | TRAFFIC COMPACTED AGGREGATE, TYPE A |
| 614                                             | LUMP     |       | MAINTAINING TRAFFIC, AS PER PLAN    |
| SPECIAL                                         | 40       | SQ FT | REPLACEMENT SIGN                    |
| SPECIAL                                         | 20       | EACH  | REPLACEMENT DRUM                    |
| QUANTITIES CARRIED TO GENERAL SUMMARY, SHEET 14 |          |       |                                     |



THE CONTRACTOR SHALL PROTECT THE ENDS OF ANY PORTABLE CONCRETE BARRIER WITH EITHER A TAPERED END SECTION OR A TEMPORARY IMPACT ATTENUATOR AS SPECIFIED IN THESE PLANS AND THE STANDARD DRAWINGS.

SHOULD TAPERED END SECTIONS BE USED AT THE APPROACH END OF P.C.B. RUNS THE TAPERED END SECTIONS SHALL BE LOCATED AT LEAST 17 FEET FROM THE EDGE OF THE TRAVELED LANE. THE CROSS SLOPE OF THE APPROACH EMBANKMENT SHALL BE A MAXIMUM OF 10:1. THE PLACEMENT AND SUBSEQUENT REMOVAL OF ANY GRADING REQUIRED SHALL BE INCLUDED IN THE LUMP SUM BID ITEM 614 MAINTAINING TRAFFIC AND SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO PERFORM THE WORK DESCRIBED. SHOULDERS AT NO EXPENSE TO THE STATE.

SHOULD THE CONTRACTOR ELECT TO USE TEMPORARY IMPACT ATTENUATORS, THIS WORK SHALL CONSIST OF FURNISHING QUADGUARD TEMPORARY IMPACT ATTENUATORS, MODEL QZ2406Y. THIS SHALL INCLUDE ALL RELATED HARDWARE AS REQUIRED BY THE MANUFACTURER TO CONSTRUCT A COMPLETE AND FUNCTIONAL QUADGUARD TEMPORARY IMPACT ATTENUATOR SYSTEM. THE ATTENUATORS SHALL BE PLACED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND AT THE LOCATIONS SHOWN ON THE PLANS. THE IMPACT ATTENUATOR SHALL BE MANUFACTURED BY THE ENERGY ABSORPTION SYSTEMS, INC., ONE EAST WACKER DRIVE, CHICAGO, ILLINOIS 60601: TELEPHONE (312) 467-6750.

FOR ANY TEMPORARY INSTALLATION, THE NOSE COVER SHALL MEET THE REQUIREMENTS OF STANDARD DRAWING MT-95.81. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSPECTION, REPAIRING, AND OTHERWISE RESTORING THE IMPACT ATTENUATOR IN ACCORDANCE WITH THE MANUFACTURER'S MAINTENANCE INSTRUCTIONS WHILE IT IS IN USE ON THE PROJECT. SUCH REPAIRS SHALL BE PERFORMED WITHIN 12 HOURS OF THE INCIDENT WHICH CAUSED DAMAGE TO THE PROJECT. IN ADDITION TO ANY EXTRA UNITS SUPPLIED FOR THIS PROJECT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING ALL NECESSARY MATERIALS, LABOR, AND EQUIPMENT REQUIRED TO PERFORM THE ABOVE DESCRIBED RESTORATION OF THE ATTENUATOR.

PAYMENT FOR THE ABOVE WORK SHALL INCLUDE FURNISHING, INSTALLING MAINTAINING, REMOVING AND RE-ERECTING, REMOVAL FROM THE PROJECT UPON COMPLETION, RESTORATION AFTER EACH VEHICLE IMPACT OF THE TEMPORARY IMPACT ATTENUATOR, INCLUDING ALL LABOR, TOOLS, EQUIPMENT AND MISCELLANEOUS HARDWARE AND MATERIALS NECESSARY TO COMPLETE THESE ITEMS OF WORK.

PAYMENT FOR ALL ABOVE WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614 MAINTAINING TRAFFIC, AS PER PLAN.

THIS STANDARD TYPE OF P.C.B. SHALL BE FURNISHED AND INSTALLED AS PER STD. DWG. RM-4.2M. ALL BARRIERS SHALL USE "J-J" HOOKS OR CONNECTING PIN AND STEEL ROD CONNECTOR METHOD OF CONNECTING THE SECTIONS TOGETHER. NO TONGUE AND GROOVE CONNECTIONS SHALL BE PERMITTED.

ALL PCB SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE PROJECT AND FURNISHING, INSTALLING, MAINTAINING AND SUBSEQUENTLY REMOVING ALL PCB SHALL BE INCLUDED IN THE LUMP SUM PRICE BID ITEM 614 MAINTAINING TRAFFIC AS PER PLAN. ALL PCB SHALL BE IN GOOD SHAPE, FREE OF CRACKS, SPALLING OR ANY OTHER DAMAGE OR DETERIORATION. PCB SHALL BE USED AT LOCATIONS REQUIRED BY THE DROPOFF IN WORK ZONES SHEET INCLUDED IN THESE PLANS.

BARRIER REFLECTORS AND OBJECT MARKERS SHALL BE INSTALLED ON ALL PORTABLE CONCRETE BARRIER USED FOR TRAFFIC CONTROL. BARRIER REFLECTORS, OBJECT MARKERS AND THEIR INSTALLATION SHALL CONFORM TO THE APPROPRIATE PROPOSAL NOTE AND SHALL BE SPACED AT 25 FEET. BASIS OF PAYMENT SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614 MAINTAINING TRAFFIC, AS PER PLAN AND SHALL INCLUDE ALL LABOR, EQUIPMENT, HARDWARE AND INCIDENTALS REQUIRED TO PERFORM THE WORK.

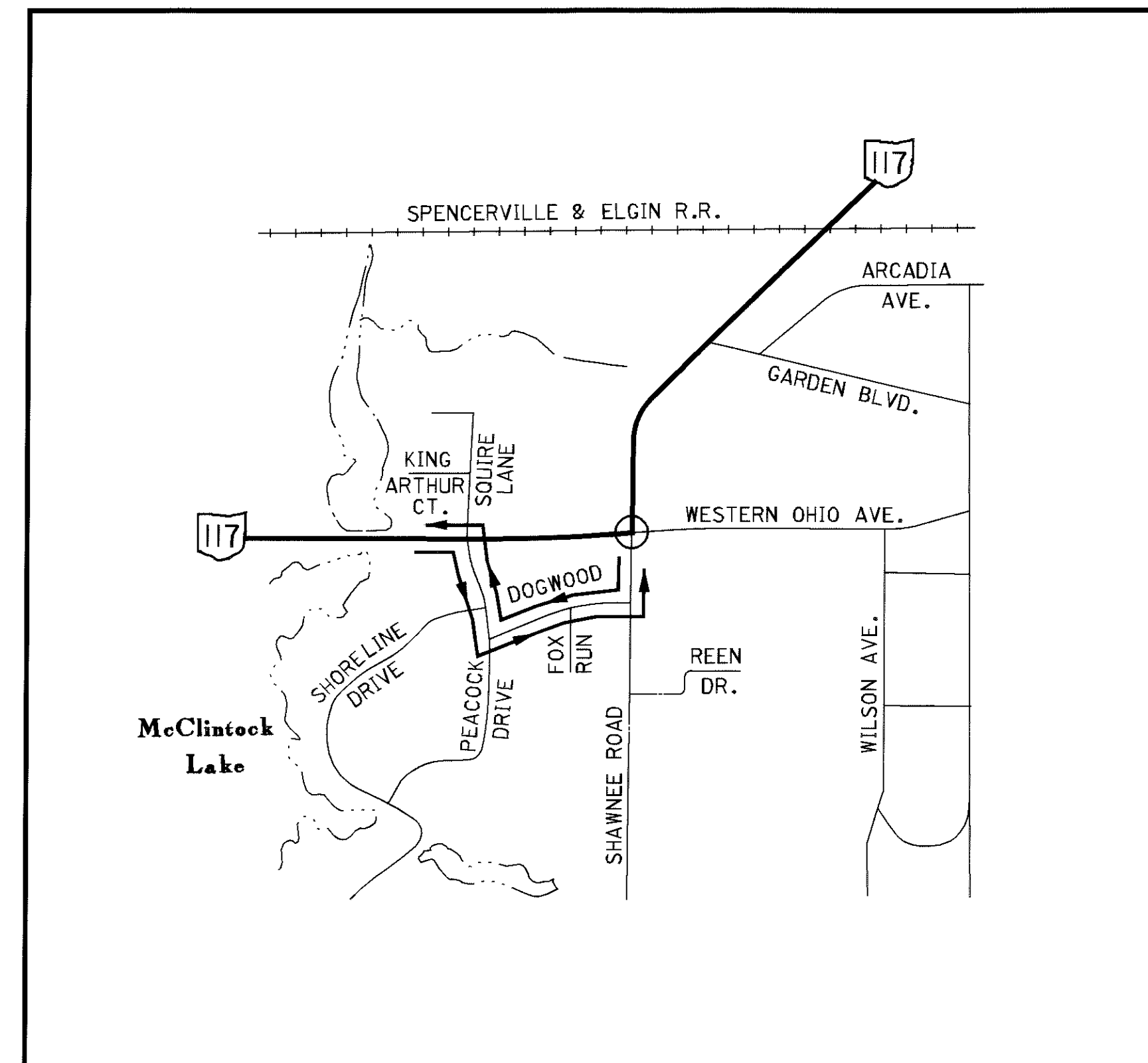
IN ADDITION TO THE OFFICIAL, SIGNED DETOUR ROUTE, A LOCAL ROUTE HAS BEEN DETERMINED TO BE THE SECONDARY, UNSIGNED DETOUR ROUTE OR "DESIGNATED LOCAL DETOUR ROUTE" FOR EACH OFFICIAL ROUTE. THESE ROUTES ARE SHOWN ON THIS SHEET. DURING THE TIME THAT TRAFFIC IS DETOURED, THE CONTRACTOR SHALL MAINTAIN THIS ROUTE IN A CONDITION WHICH IS REASONABLY SMOOTH AND FREE FROM HOLES, RUTS, RIDGES, BUMPS, DUST AND STANDING WATER. ONCE THE DETOUR IS REMOVED AND TRAFFIC RETURNED TO ITS NORMAL PATTERN, THE DESIGNATED LOCAL DETOUR ROUTE SHALL BE RESTORED TO A CONDITION THAT IS EQUIVALENT TO THAT WHICH EXISTED PRIOR TO ITS USE FOR THIS PURPOSE. ALL SUCH WORK SHALL BE PERFORMED WHEN AND AS DIRECTED BY THE ENGINEER.

THE FOLLOWING ESTIMATED QUANTITIES ARE PROVIDED FOR USE AS DIRECTED BY THE ENGINEER TO MAINTAIN AND SUBSEQUENTLY RESTORE THE DESIGNATED LOCAL DETOUR ROUTE:

|          |                                                                  |   |    |        |
|----------|------------------------------------------------------------------|---|----|--------|
| ITEM 301 | BITUMINOUS AGGREGATE BASE, PG64-22                               | = | 10 | CU YD  |
| ITEM 304 | AGGREGATE BASE                                                   | = | 10 | CU YD  |
| ITEM 407 | TACK COAT                                                        | = | 10 | GALLON |
| ITEM 408 | BITUMINOUS PRIME COAT                                            | = | 50 | GALLON |
| ITEM 448 | ASPHALT CONCRETE SURFACE COURSE,<br>TYPE 1, PG64-22, AS PER PLAN | = | 5  | CU YD  |

THE CONTRACTOR SHALL FURNISH AND APPLY WATER AND CALCIUM CHLORIDE FOR DUST CONTROL AS DIRECTED BY THE ENGINEER. THE FOLLOWING CONTINGENCY QUANTITIES HAVE BEEN INCLUDED FOR DUST CONTROL PURPOSES:

ITEM 616 WATER = 200 M GAL  
ITEM 616 CALCIUM CHLORIDE = 5 TON



Scale in Feet

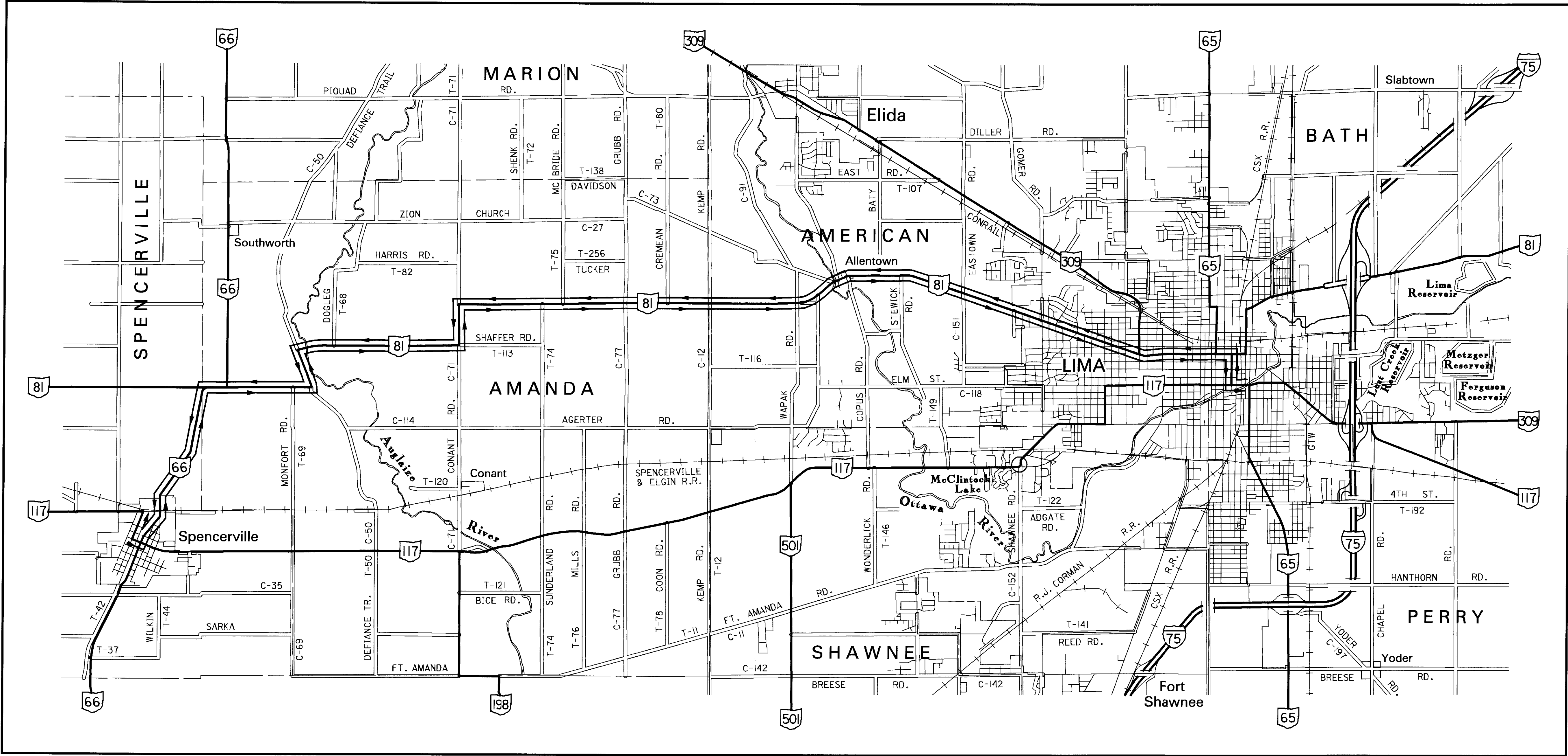


0 500 1000

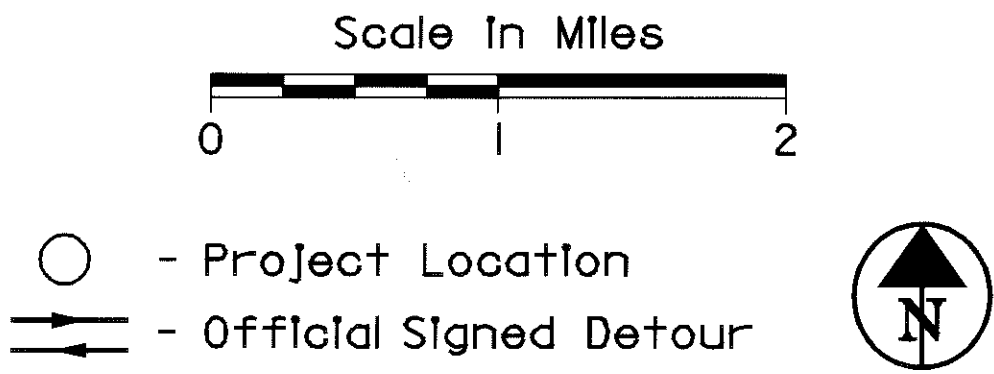
 - Project Location  
 - Designated Local Detour
 

| ESTIMATED QUANTITIES                            |          |        |                                                                  |
|-------------------------------------------------|----------|--------|------------------------------------------------------------------|
| ITEM                                            | QUANTITY | UNIT   | DESCRIPTION                                                      |
| 301                                             | 10       | CU YD  | BITUMINOUS AGGREGATE BASE, PG64-22                               |
| 304                                             | 10       | CU YD  | AGGREGATE BASE                                                   |
| 407                                             | 10       | GALLON | TACK COAT                                                        |
| 408                                             | 50       | GALLON | BITUMINOUS PRIME COAT                                            |
| 448                                             | 5        | CU YD  | ASPHALT CONCRETE SURFACE COURSE,<br>TYPE 1, PG64-22, AS PER PLAN |
| 616                                             | 200      | M GAL  | WATER                                                            |
| 616                                             | 5        | TON    | CALCIUM CHLORIDE                                                 |
| QUANTITIES CARRIED TO GENERAL SUMMARY, SHEET 14 |          |        |                                                                  |





OFFICIAL SIGNED DETOUR MAP





DESIGN FILE : I:\pdp\19314\all\17mtfn.dgn  
USERNAME : nvondere

DATE : 10-AUG-2001  
TIME : 12:17

DROPOFFS IN WORK ZONE NOTES

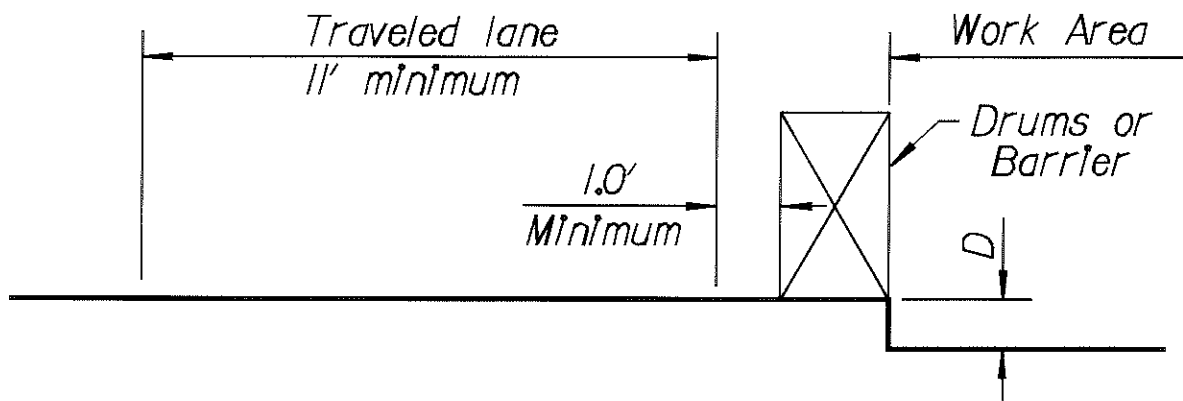
1. IT IS INTENDED THAT THIS SHEET BE USED FOR TREATMENT OF DROPOFFS THAT DEVELOP DURING CONSTRUCTION OPERATIONS, AND THAT ARE NOT OTHERWISE PROVIDED FOR IN THE CONSTRUCTION PLANS. ALL LABOR, EQUIPMENT OR MATERIALS TO IMPLEMENT THE DROPOFF TREATMENTS SPECIFIED HEREON SHALL BE INCLUDED FOR PAYMENT IN THE LUMP SUM BID FOR ITEM 614 MAINTAINING TRAFFIC, AS PER PLAN.
2. WHILE THE NEED FOR CERTAIN ADVISORY SIGNING IS NOTED HEREON, IT IS NOT INTENDED THAT THIS BE INDICATIVE OF ALL SIGNING THAT MAY BE REQUIRED TO ADVISE OR WARN MOTORISTS, AND ALL REQUIREMENTS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD) MUST BE FULFILLED.
3. WHERE CONCRETE BARRIER IS SPECIFIED, IT SHALL BE IN ACCORDANCE WITH STANDARD CONSTRUCTION DRAWING RM-4.2M AND ITEM 622.
4. WHEN DRUMS ARE SPECIFIED FOR A DROPOFF CONDITION, A MINIMUM NUMBER OF FOUR DRUMS SHALL BE USED. SPACING SHALL BE AS INDICATED IN THE PLANS OR AS SPECIFIED IN THE OMUTCD.
5. PORTABLE CONCRETE BARRIER SHALL BE PLACED ON THE SAME LEVEL AS THE TRAFFIC SURFACE AND SHALL NOT ENCROACH ON LANE WIDTH(S) DESIGNATED AS THE MINIMUM REQUIRED FOR TRAFFIC USE. WHERE DRUMS ARE USED AND THEIR PRESENCE WOULD REDUCE TRAVELED LANE WIDTHS TO LESS THAN 10', DRUMS MAY BE PLACED ON THE OPPOSITE LEVEL FROM THAT OF TRAFFIC PROVIDED THE DROPOFF DEPTH DOES NOT EXCEED 5" AND APPROVAL IS GRANTED BY THE PROJECT ENGINEER.
6. FOR LOCATIONS, SUCH AS LANE SHIFTS, LANE CLOSURES, ECT., WHERE TRAFFIC IS REQUIRED TO NEGOTIATE ANY DIFFERENCE IN ELEVATION BETWEEN PAVEMENTS, A 3:1 SLOPE TREATMENT SIMILAR TO THE OPTIONAL WEDGE TREATMENT SHALL BE PROVIDED.

PAVEMENT RECONSTRUCTION AND WIDENING WORK:

- A. LENGTHS GREATER THAN 60 FEET - PROTECT AS SHOWN ON THIS SHEET.
- B. LENGTHS OF 60 FEET OR LESS -  
DRUMS MAY BE USED AS A SEPARATOR ADJACENT TO THE TRAVELED LANE.

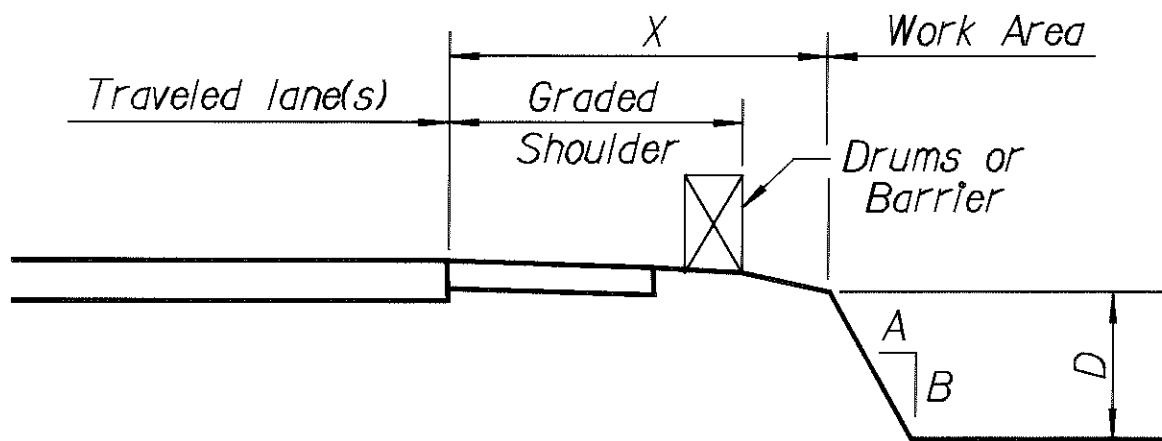
WORK AREA PROTECTION  
ADJACENT TO TRAVELED LANES

| D (In.) | TREATMENT                                                        |
|---------|------------------------------------------------------------------|
| ≤5      | Maintain lanes utilizing drums as shown below.                   |
| >5-24   | Lane closure utilizing portable concrete barrier as shown below. |



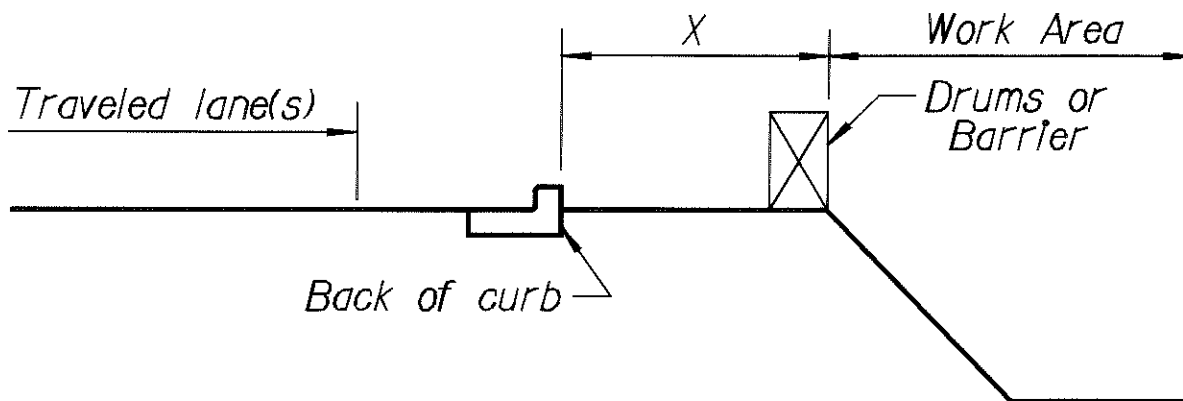
WORK AREA PROTECTION  
BEYOND TREATED SHOULDER

USE FOR: Uncurbed Facilities



| X (Ft.) | D (In.) | A/B              | Treatment Required |
|---------|---------|------------------|--------------------|
| 0-30    | Any     | 3:1 or Flatter   | None               |
| 4-12    | <12     | Steeper than 3:1 | Drums              |
| 4-12    | >12     | Steeper than 3:1 | Barrier            |
| >12-30  | <24     | Steeper than 3:1 | Drums              |
| >12-30  | >24     | Steeper than 3:1 | Barrier            |
| >30     | Any     | Any              | None               |

USE FOR: Curbed facilities, where the curb is 6" or greater

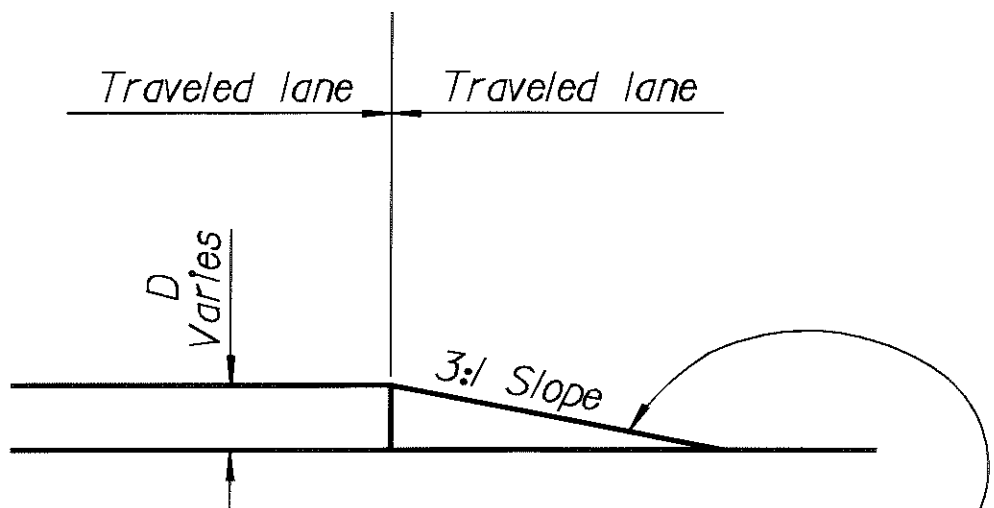


| X (Ft.) | Treatment Required |
|---------|--------------------|
| 0-10    | Drums              |
| >10     | None               |

OPTIONAL WEDGE TREATMENT

(MILLING OR RESURFACING)

1. This treatment may be used between traveled lanes.
2. OW-171 and OWP-171 signs required.



Firm and unyielding material to be removed prior to placing the abutting pavement course, unless otherwise permitted to remain by the plans or specifications. All cost associated with the supplying, placing and removing this material shall be included in the price bid Item 614 Maintaining Traffic, as per plan.



DESIGN FILE : I:\pdc\9314\c1117g9.dgn  
USERNAME : nvondere

DATE : 10-AUG-2001  
TIME : 12:19

| SHEET NO. |    |   |    |  |        |     |      |    |    |    |  | ITEM    | ITEM EXT. | TOTAL  | UNIT   | DESCRIPTION                                      | SEE SHEET NO. |
|-----------|----|---|----|--|--------|-----|------|----|----|----|--|---------|-----------|--------|--------|--------------------------------------------------|---------------|
| 7         | 8  | 9 | 10 |  | 44     | 45  | 46   | 47 | 48 | 51 |  |         |           |        |        |                                                  |               |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        |                                                  |               |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        | ROADWAY                                          |               |
| LUMP      |    |   |    |  |        |     |      |    |    |    |  | 201     | 11000     | LUMP   |        | CLEARING AND GRUBBING                            |               |
|           |    |   |    |  |        |     | 13   |    |    |    |  | 202     | 30200     | 13     | LIN FT | STEPS REMOVED                                    |               |
|           |    |   |    |  |        | 192 |      |    |    |    |  | 202     | 32000     | 192    | LIN FT | CURB REMOVED                                     |               |
|           |    |   |    |  |        | 135 |      |    |    |    |  | 202     | 35100     | 135    | LIN FT | PIPE REMOVED, 24" AND UNDER                      |               |
|           |    |   |    |  |        |     | 12.5 |    |    |    |  | 202     | 38200     | 12.5   | LIN FT | GUARDRAIL REMOVED FOR REUSE                      |               |
|           |    |   |    |  |        |     |      |    |    | 56 |  | 202     | 54100     | 56     | EACH   | RAISED PAVEMENT MARKER REMOVED FOR STORAGE       |               |
|           |    |   |    |  |        | 8   |      |    |    |    |  | 202     | 58100     | 8      | EACH   | CATCH BASIN REMOVED                              |               |
|           |    |   |    |  |        |     | 722  |    |    |    |  | 202     | 75000     | 722    | EACH   | FENCE REMOVED                                    |               |
|           |    |   |    |  |        |     | 1    |    |    |    |  | 202     | 98100     | 1      | EACH   | REMOVAL MISC.: BUSINESS SIGN REMOVED             |               |
|           |    |   |    |  |        |     | 1    |    |    |    |  | 202     | 98100     | 1      | EACH   | REMOVAL MISC.: CONCRETE SIGN FOUNDATION REMOVED  |               |
|           |    |   |    |  |        |     | 3491 |    |    |    |  | 203     | 12000     | 3491   | CU YD  | EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION |               |
|           |    |   |    |  |        |     | 1064 |    |    |    |  | 203     | 20000     | 1064   | CU YD  | EMBANKMENT                                       |               |
|           |    |   |    |  | 10,753 |     |      |    |    |    |  | 203     | 50000     | 10,753 | SQ YD  | SUBGRADE COMPACTION                              |               |
|           |    |   |    |  |        |     | 11   |    |    |    |  | 604     | 38500     | 11     | EACH   | MONUMENT ASSEMBLY                                |               |
|           |    |   |    |  |        |     | 15   |    |    |    |  | 608     | 41001     | 15     | LIN FT | CONCRETE STEPS, TYPE B, AS PER PLAN              | 46            |
|           |    |   |    |  |        |     | 4    |    |    |    |  | SPECIAL | 69050000  | 4      | EACH   | MAILBOX SUPPORT                                  | 8             |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        |                                                  |               |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        | EROSION CONTROL                                  |               |
| 50        |    |   |    |  |        |     |      |    |    |    |  | 601     | 32200     | 50     | CU YD  | ROCK CHANNEL PROTECTION, TYPE C WITH FILTER      |               |
|           |    |   |    |  |        |     | 9    |    |    |    |  | 601     | 32300     | 9      | CU YD  | ROCK CHANNEL PROTECTION, TYPE D WITH FILTER      |               |
| 80        |    |   |    |  |        |     |      |    |    |    |  | 601     | 34200     | 80     | CU YD  | ROCK CHANNEL PROTECTION, TYPE C WITHOUT FILTER   |               |
|           |    |   |    |  |        |     | 1    |    |    |    |  | 870     | 00100     | 1      | EACH   | SOIL ANALYSIS TEST                               |               |
|           |    |   |    |  |        |     | 371  |    |    |    |  | 870     | 00200     | 371    | CU YD  | PLACING TOPSOIL                                  |               |
|           |    |   |    |  |        |     | 6679 |    |    |    |  | 870     | 10000     | 6679   | SQ YD  | SEEDING AND MULCHING                             |               |
| 0.06      |    |   |    |  |        |     | 0.90 |    |    |    |  | 870     | 20000     | 0.96   | TON    | COMMERCIAL FERTILIZER                            |               |
| 4         |    |   |    |  |        |     | 36   |    |    |    |  | 870     | 35000     | 40     | M GAL  | WATER                                            |               |
| 1300      |    |   |    |  |        |     |      |    |    |    |  | 877     | 10000     | 1300   | SQ YD  | TEMPORARY SEEDING AND MULCHING                   |               |
| 2000      |    |   |    |  |        |     |      |    |    |    |  | 877     | 30100     | 2000   | LIN FT | TEMPORARY PERIMETER FILTER FABRIC FENCE          |               |
| 50        |    |   |    |  |        |     |      |    |    |    |  | 877     | 30200     | 50     | LIN FT | TEMPORARY DITCH CHECK FILTER FABRIC FENCE        |               |
| 100       |    |   |    |  |        |     |      |    |    |    |  | 877     | 30300     | 100    | LIN FT | TEMPORARY INLET PROTECTION FILTER FABRIC FENCE   |               |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        |                                                  |               |
| 50        |    |   |    |  |        |     |      |    |    |    |  | 877     | 40000     | 50     | LIN FT | TEMPORARY SLOPE DRAINS                           |               |
| 25        |    |   |    |  |        |     |      |    |    |    |  | 877     | 60000     | 25     | CU YD  | SEDIMENT REMOVAL                                 |               |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        |                                                  |               |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        | DRAINAGE                                         |               |
|           |    |   |    |  |        |     | 0.5  |    |    |    |  | 602     | 20000     | 0.5    | CU YD  | CONCRETE MASONRY                                 |               |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        |                                                  |               |
|           | 20 |   |    |  |        |     |      |    |    |    |  | 603     | 00200     | 20     | LIN FT | 4" CONDUIT, TYPE C                               |               |
|           | 20 |   |    |  |        |     |      |    |    |    |  | 603     | 00406     | 20     | LIN FT | 4" CONDUIT, TYPE F                               |               |
|           |    |   |    |  |        |     | 49   |    |    |    |  | 603     | 01500     | 49     | LIN FT | 6" CONDUIT, TYPE F                               |               |
|           |    |   |    |  |        |     | 4    |    |    |    |  | 603     | 02600     | 4      | LIN FT | 8" CONDUIT, TYPE F                               |               |
|           |    |   |    |  |        |     | 44   |    |    |    |  | 603     | 03100     | 44     | LIN FT | 10" CONDUIT, TYPE B                              |               |
|           |    |   |    |  |        |     | 10   |    |    |    |  | 603     | 03300     | 10     | LIN FT | 10" CONDUIT, TYPE C                              |               |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        |                                                  |               |
|           |    |   |    |  |        |     | 210  |    |    |    |  | 603     | 04400     | 210    | LIN FT | 12" CONDUIT, TYPE B                              |               |
|           |    |   |    |  |        |     | 677  |    |    |    |  | 603     | 04600     | 677    | LIN FT | 12" CONDUIT, TYPE C                              |               |
|           |    |   |    |  |        |     | 6    |    |    |    |  | 603     | 05900     | 6      | LIN FT | 15" CONDUIT, TYPE B                              |               |
|           |    |   |    |  |        |     | 277  |    |    |    |  | 603     | 06100     | 277    | LIN FT | 15" CONDUIT, TYPE C                              |               |
|           |    |   |    |  |        |     | 411  |    |    |    |  | 603     | 07400     | 411    | LIN FT | 18" CONDUIT, TYPE B                              |               |
|           |    |   |    |  |        |     | 244  |    |    |    |  | 603     | 07600     | 244    | LIN FT | 18" CONDUIT, TYPE C                              |               |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        |                                                  |               |
|           |    |   |    |  |        |     | 2    |    |    |    |  | 604     | 00400     | 2      | EACH   | CATCH BASIN, NO. 3                               |               |
|           |    |   |    |  |        |     | 9    |    |    |    |  | 604     | 00800     | 9      | EACH   | CATCH BASIN, NO. 3A                              |               |
|           |    |   |    |  |        |     | 9    |    |    |    |  | 604     | 04500     | 9      | EACH   | CATCH BASIN, NO. 2-2B                            |               |
|           |    |   |    |  |        |     | 4    |    |    |    |  | 604     | 31500     | 4      | EACH   | MANHOLE, NO. 3                                   |               |
|           |    |   |    |  |        |     | 8    |    |    |    |  | 604     | 34500     | 8      | EACH   | MANHOLE ADJUSTED TO GRADE                        |               |
|           |    |   |    |  |        |     | 1    |    |    |    |  | 604     | 36600     | 1      | EACH   | PRECAST REINFORCED CONCRETE OUTLET               |               |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        |                                                  |               |
|           |    |   |    |  |        |     | 4590 |    |    |    |  | 605     | 05100     | 4590   | LIN FT | 4" SHALLOW PIPE UNDERDRAIN                       |               |
|           |    |   |    |  |        |     | 150  |    |    |    |  | 605     | 05200     | 150    | LIN FT | 4" UNCLASSIFIED PIPE UNDERDRAIN                  |               |
|           |    |   |    |  |        |     |      |    |    |    |  |         |           |        |        |                                                  |               |

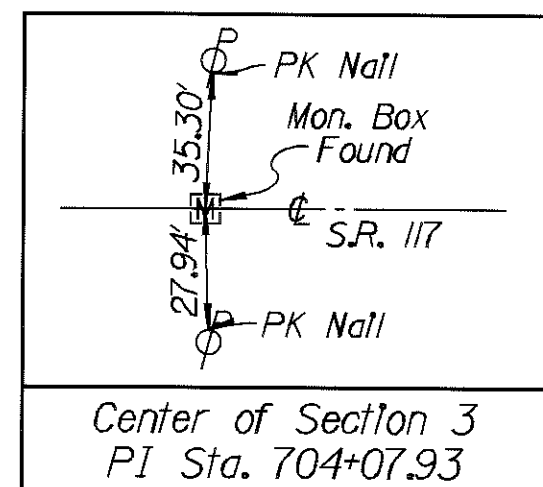


DESIGN FILE : I:\p\d\19314\civil\Tgg.dgn  
USERNAME : nvondere

DATE : 10-AUG-2001  
TIME : 12:20

| SHEET NO. |   |      |     |  |      |      |    |     |     |       |  | ITEM    | ITEM<br>EXT. | TOTAL | UNIT   | DESCRIPTION                                                   | SEE<br>SHEET<br>NO. |
|-----------|---|------|-----|--|------|------|----|-----|-----|-------|--|---------|--------------|-------|--------|---------------------------------------------------------------|---------------------|
| 7         | 8 | 9    | 10  |  | 44   | 45   | 46 | 47  | 48  | 51    |  |         |              |       |        |                                                               |                     |
|           |   |      |     |  |      |      |    |     |     |       |  |         |              |       |        | PAVEMENT                                                      |                     |
|           |   |      |     |  | 4295 |      |    |     |     |       |  | 254     | 01000        | 4295  | SQ YD  | PAVEMENT PLANING, BITUMINOUS                                  |                     |
|           |   |      |     |  | 2985 |      |    |     |     |       |  | 255     | 20000        | 2985  | LIN FT | FULL DEPTH PAVEMENT SAWING                                    |                     |
|           |   |      |     |  | 1222 |      |    |     |     |       |  | 301     | 46000        | 1222  | CU YD  | BITUMINOUS AGGREGATE BASE, PG64-22                            |                     |
|           |   |      |     |  | 1670 |      |    | 116 | 137 |       |  | 304     | 20000        | 1923  | CU YD  | AGGREGATE BASE                                                |                     |
|           |   |      |     |  | 432  |      |    |     |     |       |  | 407     | 10000        | 432   | GALLON | TACK COAT                                                     |                     |
|           |   |      |     |  | 764  |      |    | 33  | 41  |       |  | 407     | 14000        | 838   | GALLON | TACK COAT FOR INTERMEDIATE COURSE                             |                     |
|           |   |      |     |  | 2847 |      |    | 176 | 218 |       |  | 408     | 10000        | 3241  | GALLON | BITUMINOUS PRIME COAT                                         |                     |
|           |   |      |     |  | 203  |      |    |     |     |       |  | 448     | 46020        | 203   | CU YD  | ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, PG64-22         |                     |
|           |   |      |     |  | 349  |      |    | 22  | 27  |       |  | 448     | 46050        | 398   | CU YD  | ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64-22         |                     |
|           |   |      |     |  | 417  |      |    | 15  | 19  |       |  | 448     | 47021        | 451   | CU YD  | ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22, AS PER PLAN | 7                   |
|           |   |      |     |  |      | 2171 |    |     |     |       |  | 830     | 12000        | 2171  | LIN FT | COMBINATION CURB AND GUTTER, TYPE 2                           |                     |
|           |   |      |     |  |      | 143  |    |     |     |       |  | 830     | 26000        | 143   | LIN FT | CURB, TYPE 6                                                  |                     |
|           |   |      |     |  |      | 74   |    |     |     |       |  | 830     | 50000        | 74    | SQ YD  | 4' CONCRETE TRAFFIC ISLAND                                    |                     |
|           |   |      |     |  |      |      |    |     |     |       |  |         |              |       |        | TRAFFIC CONTROL                                               |                     |
|           |   |      |     |  |      |      |    |     |     | 38    |  | 621     | 00100        | 38    | EACH   | RAISED PAVEMENT MARKER                                        |                     |
|           |   |      |     |  |      |      |    |     |     | 159.0 |  | 630     | 02100        | 159.0 | LIN FT | GROUND MOUNTED SUPPORT, NO. 2 POST                            |                     |
|           |   |      |     |  |      |      |    |     |     | 158.5 |  | 630     | 03100        | 158.5 | LIN FT | GROUND MOUNTED SUPPORT, NO. 3 POST                            |                     |
|           |   |      |     |  |      |      |    |     |     | 1     |  | 630     | 08500        | 1     | EACH   | STREET NAME SIGN SUPPORT                                      |                     |
|           |   |      |     |  |      |      |    |     |     | 4     |  | 630     | 79500        | 4     | EACH   | SIGN SUPPORT ASSEMBLY, POLE MOUNTED                           |                     |
|           |   |      |     |  |      |      |    |     |     | 101.9 |  | 630     | 80102        | 101.9 | SQ FT  | SIGN, FLAT SHEET, TYPE G                                      |                     |
|           |   |      |     |  |      |      |    |     |     | 24    |  | 630     | 84900        | 24    | EACH   | REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL                   |                     |
|           |   |      |     |  |      |      |    |     |     | 13    |  | 630     | 85100        | 13    | EACH   | REMOVAL OF GROUND MOUNTED SIGN AND REERECTION                 |                     |
|           |   |      |     |  |      |      |    |     |     | 28    |  | 630     | 86002        | 28    | EACH   | REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL           |                     |
|           |   |      |     |  |      |      |    |     |     | 1.00  |  | 642     | 00090        | 1.00  | MILE   | EDGE LINE                                                     |                     |
|           |   |      |     |  |      |      |    |     |     | 0.65  |  | 642     | 00290        | 0.65  | MILE   | CENTER LINE                                                   |                     |
|           |   |      |     |  |      |      |    |     |     | 570   |  | 829     | 18020        | 570   | LIN FT | CHANNELIZING LINE, TYPE C                                     |                     |
|           |   |      |     |  |      |      |    |     |     | 118   |  | 829     | 18070        | 118   | LIN FT | STOP LINE, TYPE C                                             |                     |
|           |   |      |     |  |      |      |    |     |     | 550   |  | 829     | 20120        | 550   | LIN FT | TRANSVERSE LINE, TYPE C                                       |                     |
|           |   |      |     |  |      |      |    |     |     | 12    |  | 829     | 20620        | 12    | EACH   | LANE ARROW, TYPE C                                            |                     |
|           |   |      |     |  |      |      |    |     |     | 3     |  | 829     | 20750        | 3     | EACH   | WORD ON PAVEMENT, 96", TYPE C                                 |                     |
|           |   |      |     |  |      |      |    |     |     |       |  |         |              |       |        | TRAFFIC SIGNALS                                               |                     |
|           |   |      |     |  |      |      |    |     |     |       |  |         |              |       |        | FOR TRAFFIC SIGNAL QUANTITIES                                 | 53                  |
|           |   |      |     |  |      |      |    |     |     |       |  |         |              |       |        | MAINTENANCE OF TRAFFIC                                        |                     |
|           |   |      | 10  |  |      |      |    |     |     |       |  | 301     | 46000        | 10    | CU YD  | BITUMINOUS AGGREGATE BASE, PG64-22                            |                     |
|           |   |      | 10  |  |      |      |    |     |     |       |  | 304     | 20000        | 10    | CU YD  | AGGREGATE BASE                                                |                     |
|           |   |      | 10  |  |      |      |    |     |     |       |  | 407     | 10000        | 10    | GALLON | TACK COAT                                                     |                     |
|           |   |      | 50  |  |      |      |    |     |     |       |  | 408     | 10000        | 50    | GALLON | BITUMINOUS PRIME COAT                                         |                     |
|           |   | 100  |     |  |      |      |    |     |     |       |  | 410     | 10000        | 100   | CU YD  | TRAFFIC COMPACTED AGGREGATE, TYPE A                           |                     |
|           |   |      | 5   |  |      |      |    |     |     |       |  | 448     | 47021        | 5     | CU YD  | ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22, AS PER PLAN | 7                   |
|           |   | 40   |     |  |      |      |    |     |     |       |  | SPECIAL | 61412500     | 40    | SQ FT  | REPLACEMENT SIGN                                              | 9                   |
|           |   | 20   |     |  |      |      |    |     |     |       |  | SPECIAL | 61412600     | 20    | EACH   | REPLACEMENT DRUM                                              | 9                   |
|           |   |      | 200 |  |      |      |    |     |     |       |  | 616     | 10000        | 200   | M GAL  | WATER                                                         |                     |
|           |   |      | 5   |  |      |      |    |     |     |       |  | 616     | 20000        | 5     | TON    | CALCIUM CHLORIDE                                              |                     |
|           |   | LUMP |     |  |      |      |    |     |     |       |  | 614     | 11001        | LUMP  |        | MAINTAINING TRAFFIC, AS PER PLAN                              | 9                   |
|           |   |      |     |  |      |      |    |     |     |       |  | 623     | 10000        | LUMP  |        | CONSTRUCTION LAYOUT STAKES                                    |                     |
|           |   |      |     |  |      |      |    |     |     |       |  | 624     | 10000        | LUMP  |        | MOBILIZATION                                                  |                     |
|           |   |      |     |  |      |      |    |     |     |       |  | 806     | 16010        | 6     | MONTH  | FIELD OFFICE, TYPE B                                          |                     |

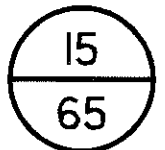




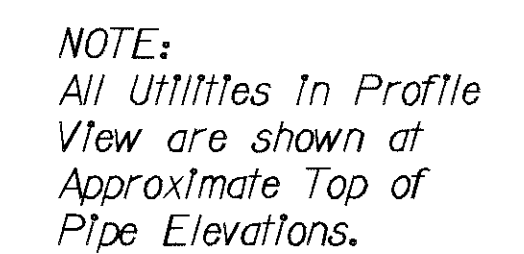
### # Plug & Abandon

- ## MONUMENT LEGEND
- R.F. ~ PK Nail Found
  - ①R.F. ~ Iron Pln Fd. w/ID Cap
  - ⊙R.F. ~ Iron Pipe Found
  - ✕ ~ RR Spike Found
  -  ~ Existing Monument Box
  -  ~ Proposed Monument Box
  - © Mag. Nail Set

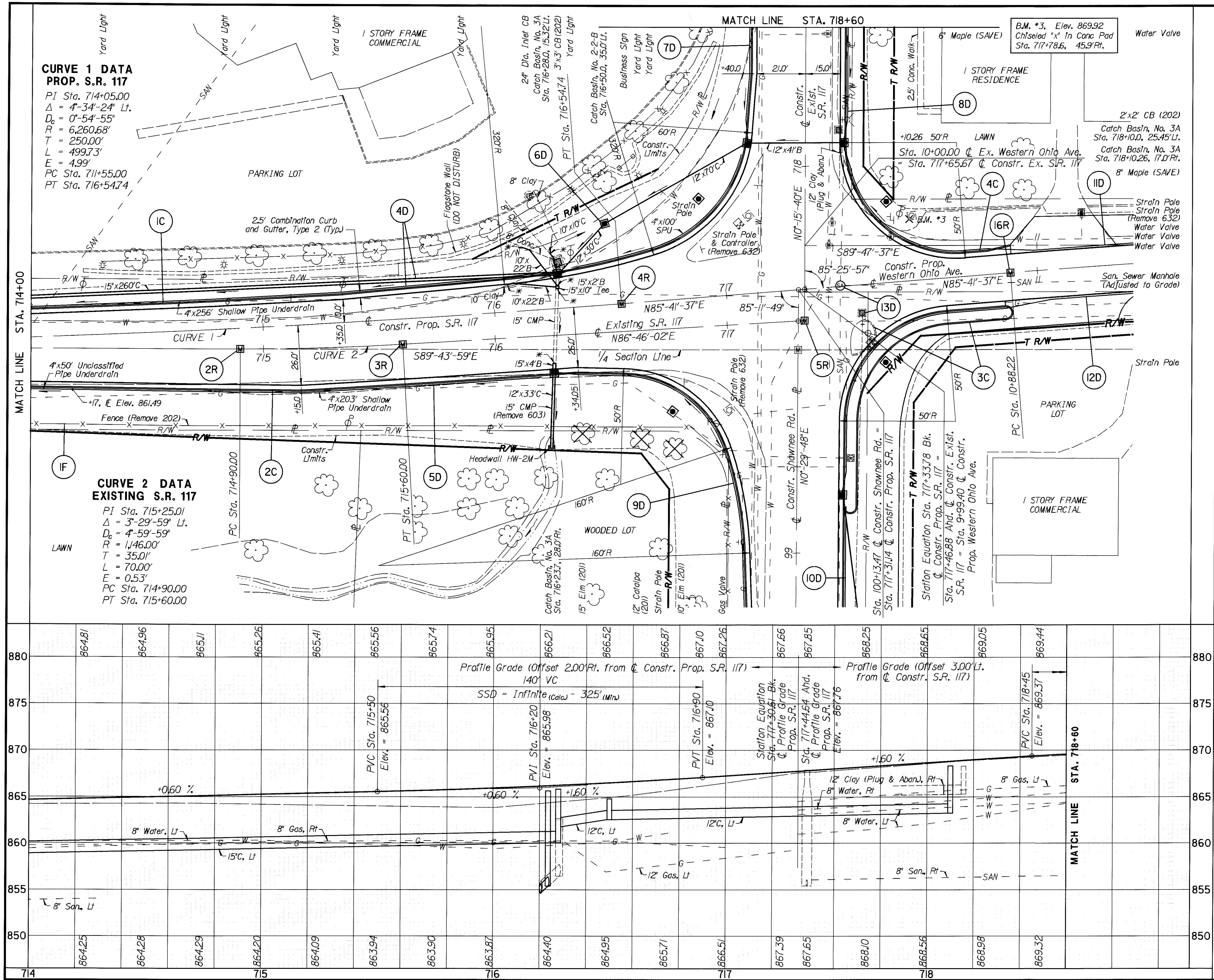
NOTE:  
All Utilities in Profile  
View are shown at  
Approximate Top of  
Pipe Elevations.



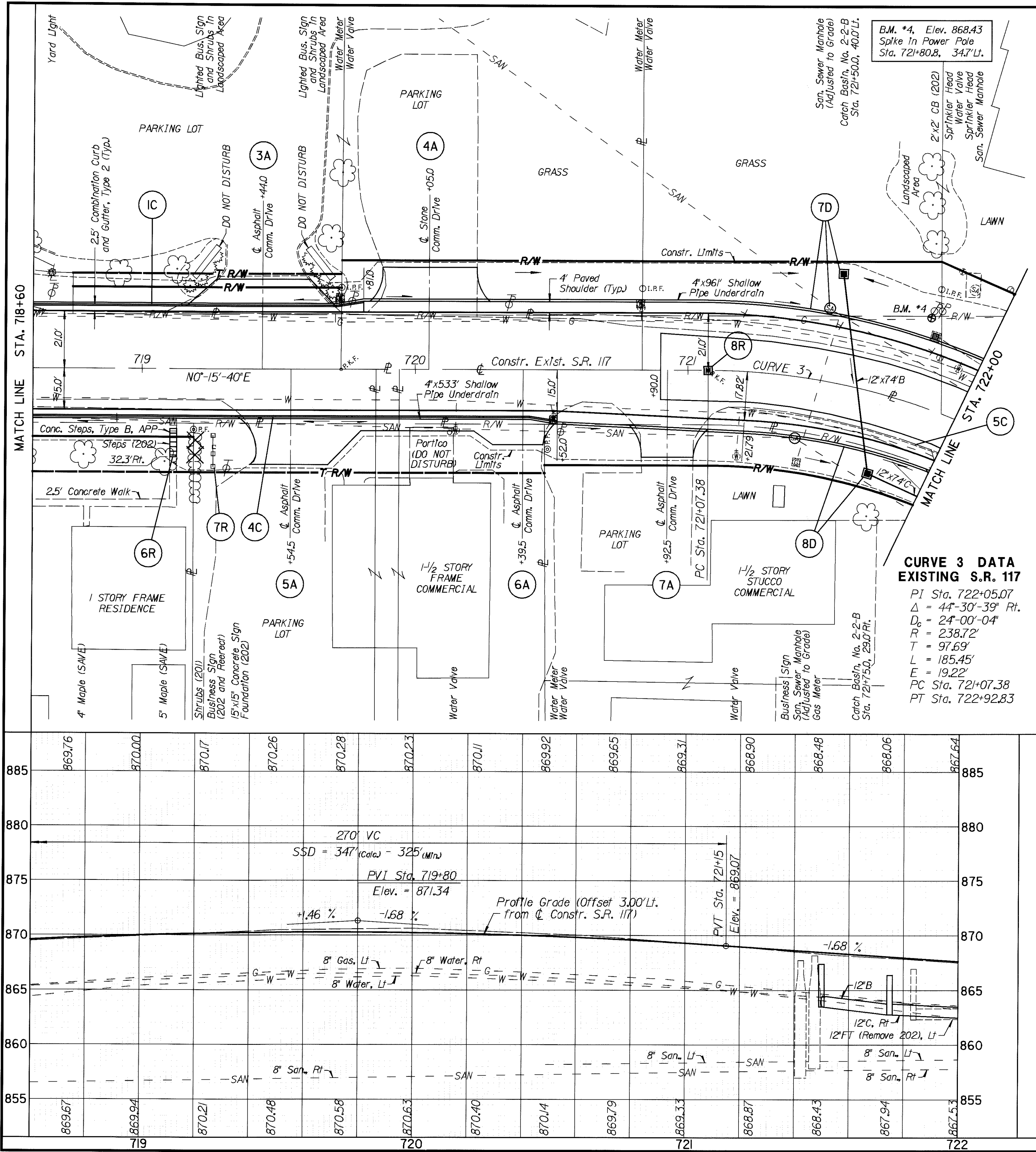












| SUPERELEVATION TABLE |        |        |                    |                             |                         |            |        |                |         |
|----------------------|--------|--------|--------------------|-----------------------------|-------------------------|------------|--------|----------------|---------|
| LEFT SIDE            |        |        | CENTERLINE CONTROL |                             |                         | RIGHT SIDE |        |                |         |
| Edge Elevation       | Slope  | Width  | Station            | Profile Grade Offset (Left) | Profile Grade Elevation | Width      | Slope  | Edge Elevation | Remarks |
| 865.88               | -0.016 | 13.99' | 724+20             | 1.32'                       | 866.10                  | 14.22'     | -0.016 | 865.87         | NC      |
| 865.84               | -0.009 | 14.25' | 724+00             | 1.57'                       | 865.97                  | 14.90'     |        | 865.73         |         |
| 865.89               | Level  | 14.55' | 723+77             | 1.88'                       | 865.89                  | 15.70'     |        | 865.64         | 1/2L    |
| 865.90               | +0.001 | 14.57' | 723+75             | 1.91'                       | 865.89                  | 15.78'     |        | 865.64         |         |
| 866.04               | +0.010 | 14.89' | 723+50             | 2.25'                       | 865.89                  | 16.65'     |        | 865.62         |         |
| 866.18               | +0.016 | 15.10' | 723+34             | 2.46'                       | 865.94                  | 17.20'     | -0.016 | 865.66         | CR      |
| 866.28               | +0.019 | 15.21' | 723+25             | 2.59'                       | 865.99                  | 17.52'     | -0.019 | 865.66         |         |
| 866.60               | +0.028 | 15.53' | 723+00             | 2.93'                       | 866.17                  | 18.39'     | -0.028 | 865.66         |         |
| 866.72               | +0.031 | 15.62' | 722+92.83          | 3.00'                       | 866.24                  | 18.62'     | -0.031 | 865.66         | PT      |
| 867.04               | +0.038 | 15.84' | 722+75             |                             | 866.44                  | 18.84'     | -0.038 | 865.72         |         |
| 867.44               | +0.045 | 16.09' | 722+55             |                             | 866.72                  | 19.10'     | -0.045 | 865.86         | FS      |
| 867.53               |        | 16.16' | 722+50             |                             | 866.80                  | 19.16'     |        | 865.94         |         |
| 867.96               |        | 16.48' | 722+25             |                             | 867.22                  | 19.48'     |        | 866.34         |         |
| 868.40               |        | 16.81' | 722+00             |                             | 867.64                  | 19.81'     |        | 866.75         |         |
| 868.83               |        | 17.14' | 721+75             |                             | 868.06                  | 20.14'     |        | 867.15         |         |
| 869.27               |        | 17.47' | 721+50             |                             | 868.48                  | 20.47'     |        | 867.56         |         |
| 869.36               | +0.045 | 17.53' | 721+45             |                             | 868.57                  | 20.53'     | -0.045 | 867.65         | FS      |
| 869.58               | +0.038 | 17.78' | 721+25             |                             | 868.90                  | 20.78'     | -0.038 | 868.11         |         |
| 869.75               | +0.031 | 18.00' | 721+07.38          |                             | 869.19                  | 20.62'     | -0.031 | 868.55         | PC      |
| 869.81               | +0.028 |        | 721+00             |                             | 869.31                  | 20.25'     | -0.028 | 868.74         |         |
| 869.99               | +0.019 |        | 720+75             |                             | 869.65                  | 19.08'     | -0.019 | 869.29         |         |
| 870.05               | +0.016 |        | 720+66             |                             | 869.76                  | 18.66'     | -0.016 | 869.46         | CR      |
| 870.10               | +0.010 |        | 720+50             |                             | 869.92                  | 18.00'     |        | 869.63         |         |
| 870.13               | +0.001 |        | 720+25             |                             | 870.11                  |            |        | 869.82         |         |
| 870.12               | Level  |        | 720+23             |                             | 870.12                  |            |        | 869.83         | 1/2L    |
| 870.07               | -0.009 |        | 720+00             |                             | 870.23                  |            |        | 869.94         |         |
| 869.99               | -0.016 | 18.00' | 719+80             | 3.00'                       | 870.28                  | 18.00'     | -0.016 | 869.99         | NC      |

- Pavement Removed (203)
- Item 254 Pavement Planting, Bituminous

| ESTIMATED QUANTITIES |    |
|----------------------|----|
| See Sheet            |    |
| DRAINAGE "D"         | 45 |
| SIDE APPROACH "A"    | 47 |
| CURB "C"             | 45 |
| ROADWAY "R"          | 46 |

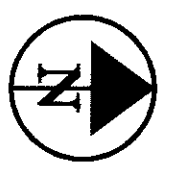
NOTE:  
For Curb End Section Details, See Sheets 45.

NOTE:  
For Proposed Drainage Stations, Offsets and Elevations, See Cross Sections, Sheets 27-29.

NOTE:  
All Utilities in Profile View are shown at Approximate Top of Pipe Elevations.

#### MONUMENT LEGEND

- PK.F. ~ PK Nail Found  
I.P.F. ~ Iron Pin Fd. w/ID Cap  
R.P.F. ~ Iron Pipe Found  
X ~ RR Spike Found  
M ~ Existing Monument Box  
M ~ Proposed Monument Box  
Mag. Nail Set



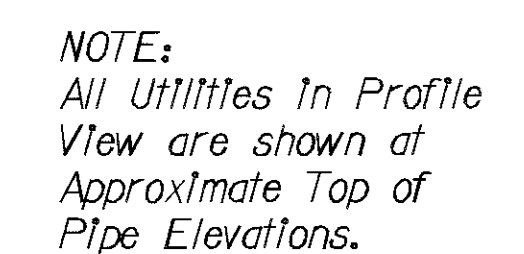
HORIZONTAL SCALE IN FEET  
0 10 20 40

PLAN AND PROFILE - S.R. 117  
STA. 718+60 TO STA. 722+00

ALL-117-13.47

18  
65

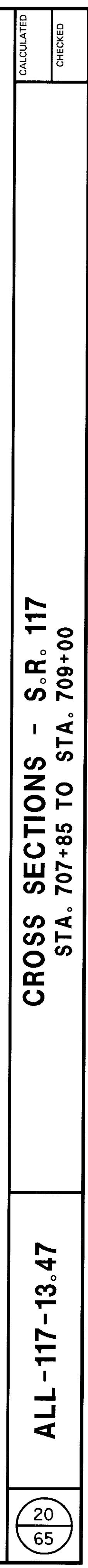












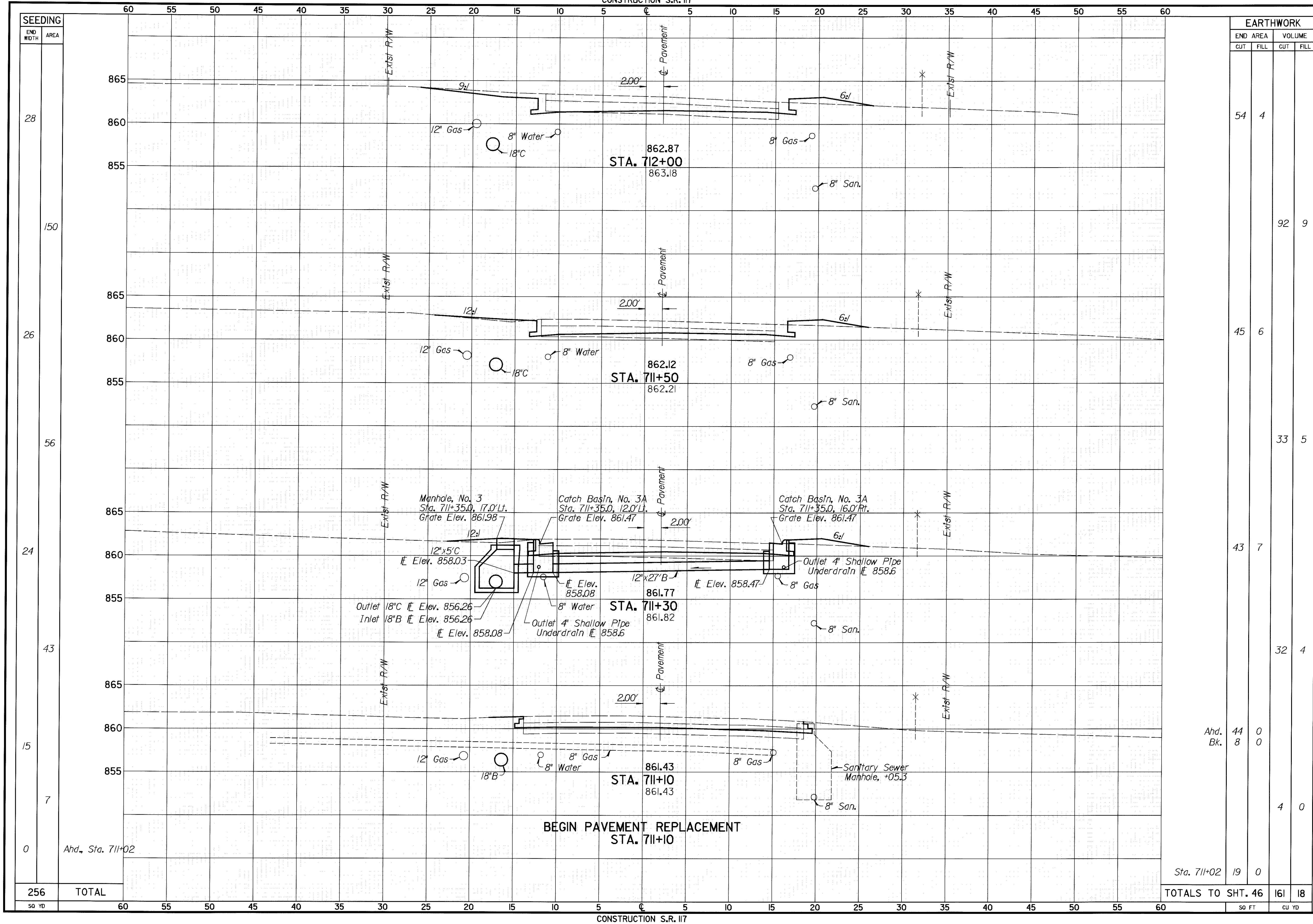






DESIGN FILE : I:\pdp\9314\all\7gxsr.dgn  
USERNAME : nyondere

DATE : 10-AUG-2001  
TIME : 12:59



CROSS SECTIONS - S.R. 117  
STA. 711+10 TO STA. 712+00

ALL - 117 - 13.47

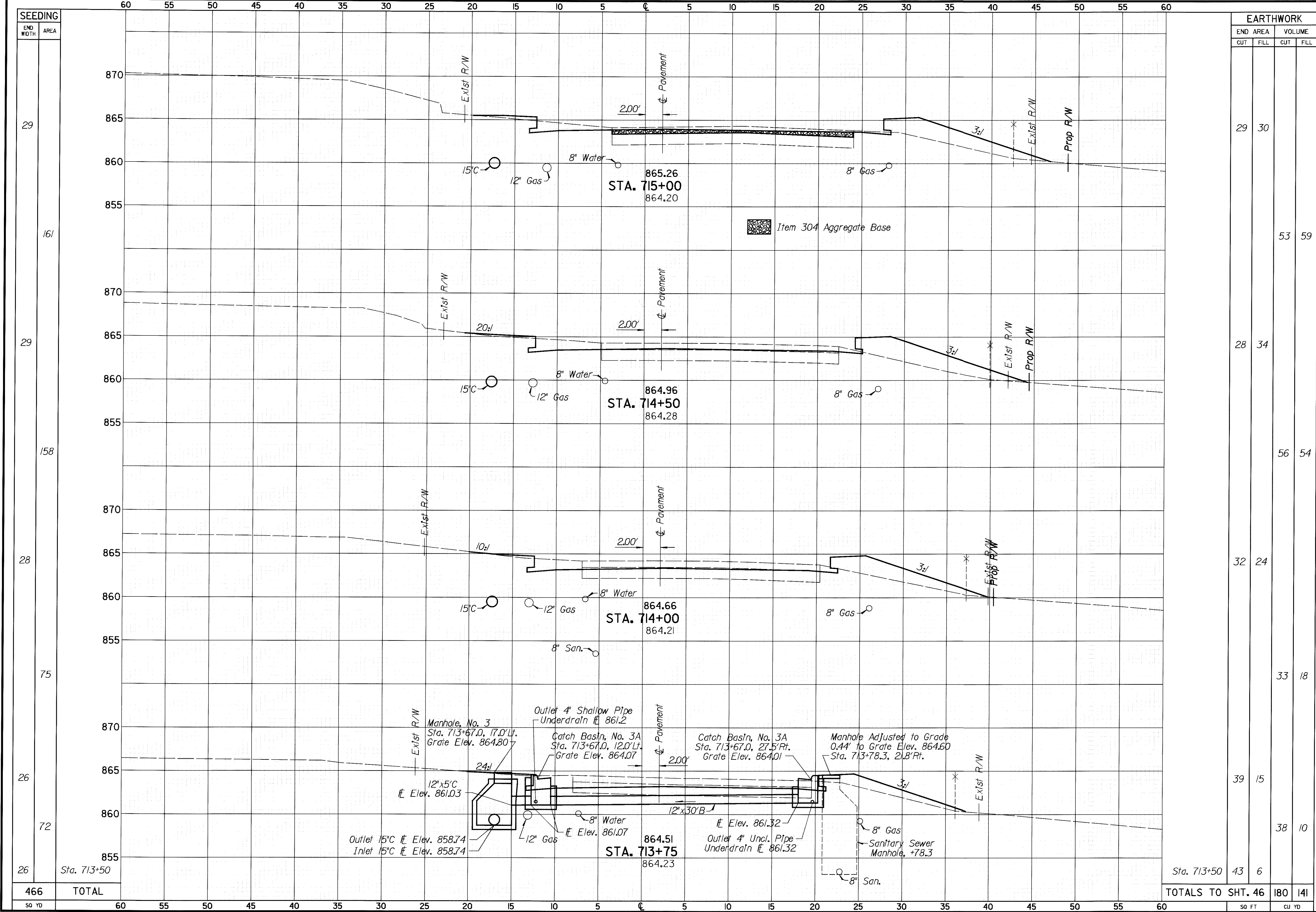
22  
65



|                                                                                                                                                                                                                                                                                                                      |                          |                                                                       |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------|------------|
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|                                                                                                                                                                                                                                                                                                                      |                          |                                                                       | CHECKED    |



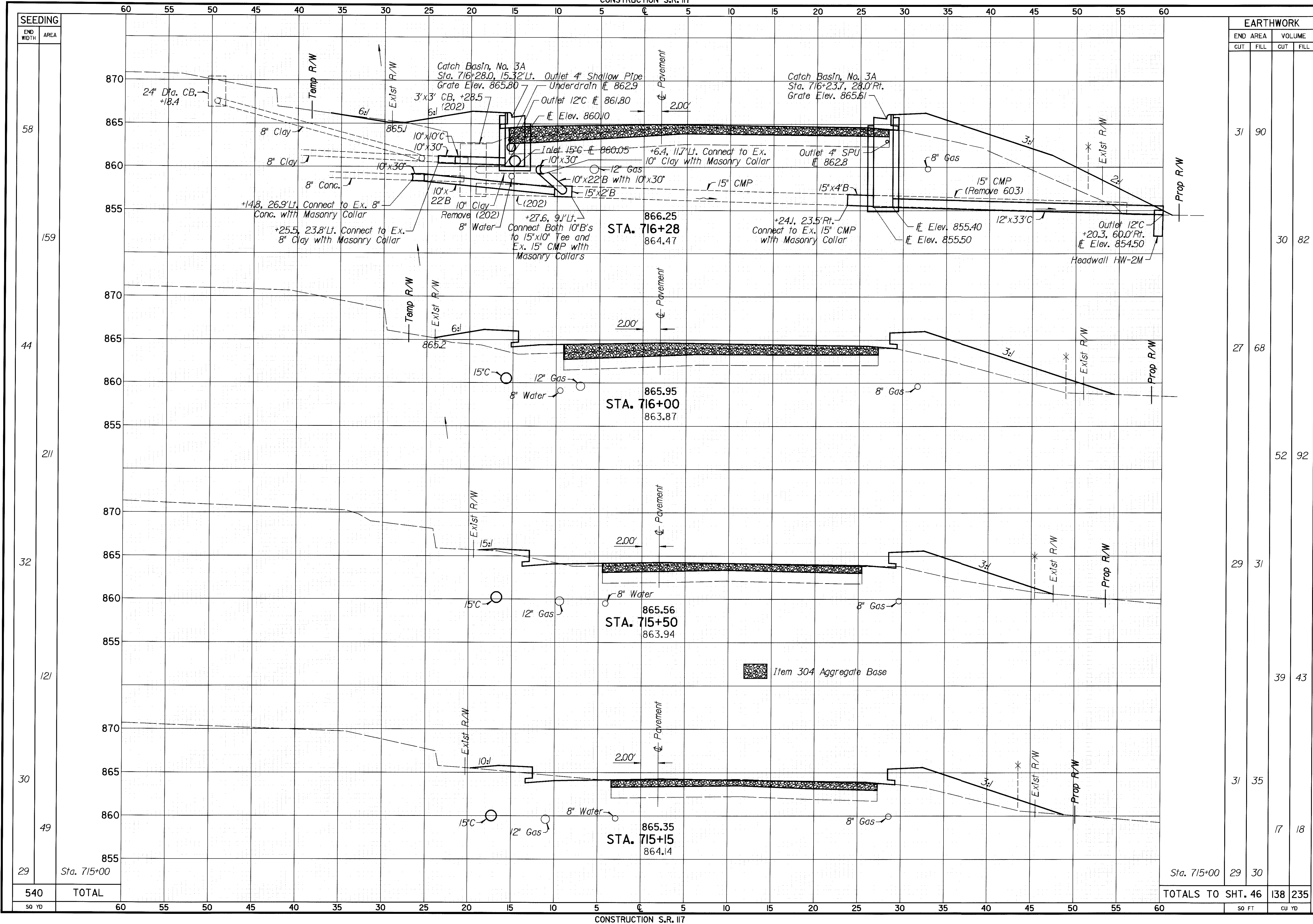
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TIME : 12:57  
DESIGN FILE : I:\pdx\19314\all\7gxsr.dgn  
USERNAME : nvondere





DESIGN FILE : I:\pdp\19314\all\7gxsr.dgn  
USERNAME : nvondere

DATE : 10-AUG-2001  
TIME : 12:56



CROSS SECTIONS - S.R. 117  
STA. 715+15 TO STA. 716+28

ALL-117-13.47

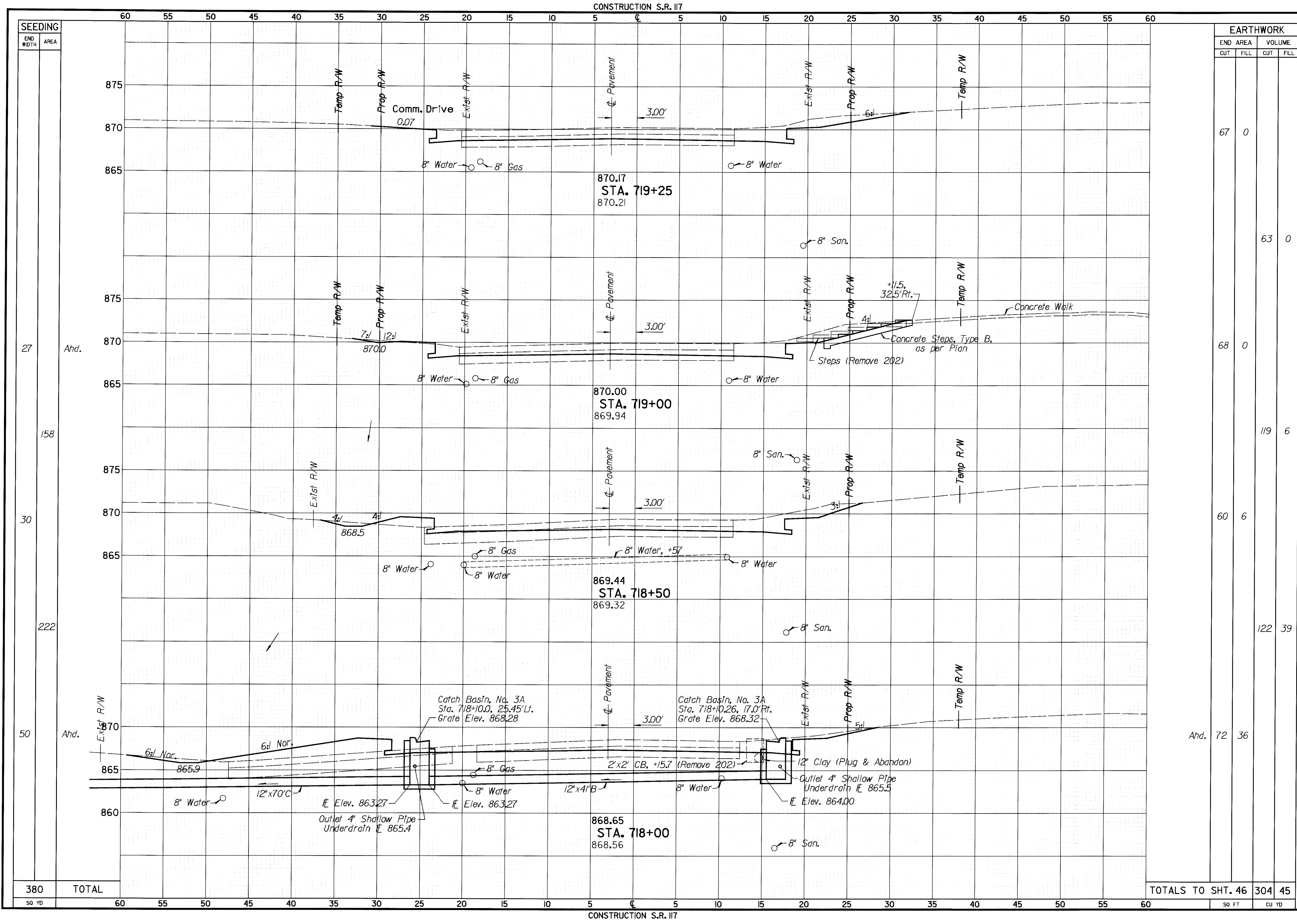
25  
65



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                       |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------|
| <div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin-right: 10px;"> <div style="width: 50%; height: 50%; border: 1px solid black; border-radius: 50%; display: flex; align-items: center; justify-content: center;">26</div> <div style="width: 50%; height: 50%; border: 1px solid black; border-radius: 50%; display: flex; align-items: center; justify-content: center;">65</div> </div> <div style="text-align: center;"> <b>ALL -117-13.47</b> </div> </div> | <b>CROSS SECTIONS - S.R. 117</b><br><b>STA. 716+50 TO STA. 716+75</b> |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CALCULATED                                                            | CHECKED |



DESIGN FILE : I:\pdl\9314\all7gxsr.dgn  
USERNAME : nvondero  
DATE : 10-AUG-2001  
TIME : 12:54



| SEEDING   |       |
|-----------|-------|
| END WIDTH | AREA  |
| 27        |       |
| 158       |       |
| 30        |       |
| 222       |       |
| 50        |       |
| 380       | TOTAL |
| SO YD     |       |

| EARTHWORK         |      |        |      |
|-------------------|------|--------|------|
| END AREA          |      | VOLUME |      |
| CUT               | FILL | CUT    | FILL |
| 67                | 0    |        |      |
|                   |      | 63     | 0    |
| 68                | 0    |        |      |
|                   |      | 119    | 6    |
| 60                | 6    |        |      |
|                   |      | 122    | 39   |
| Ahd.              | 72   | 36     |      |
| TOTALS TO SHT. 46 |      | 304    | 45   |
| SO FT             |      | CU YD  |      |

CALCULATED

CHECKED

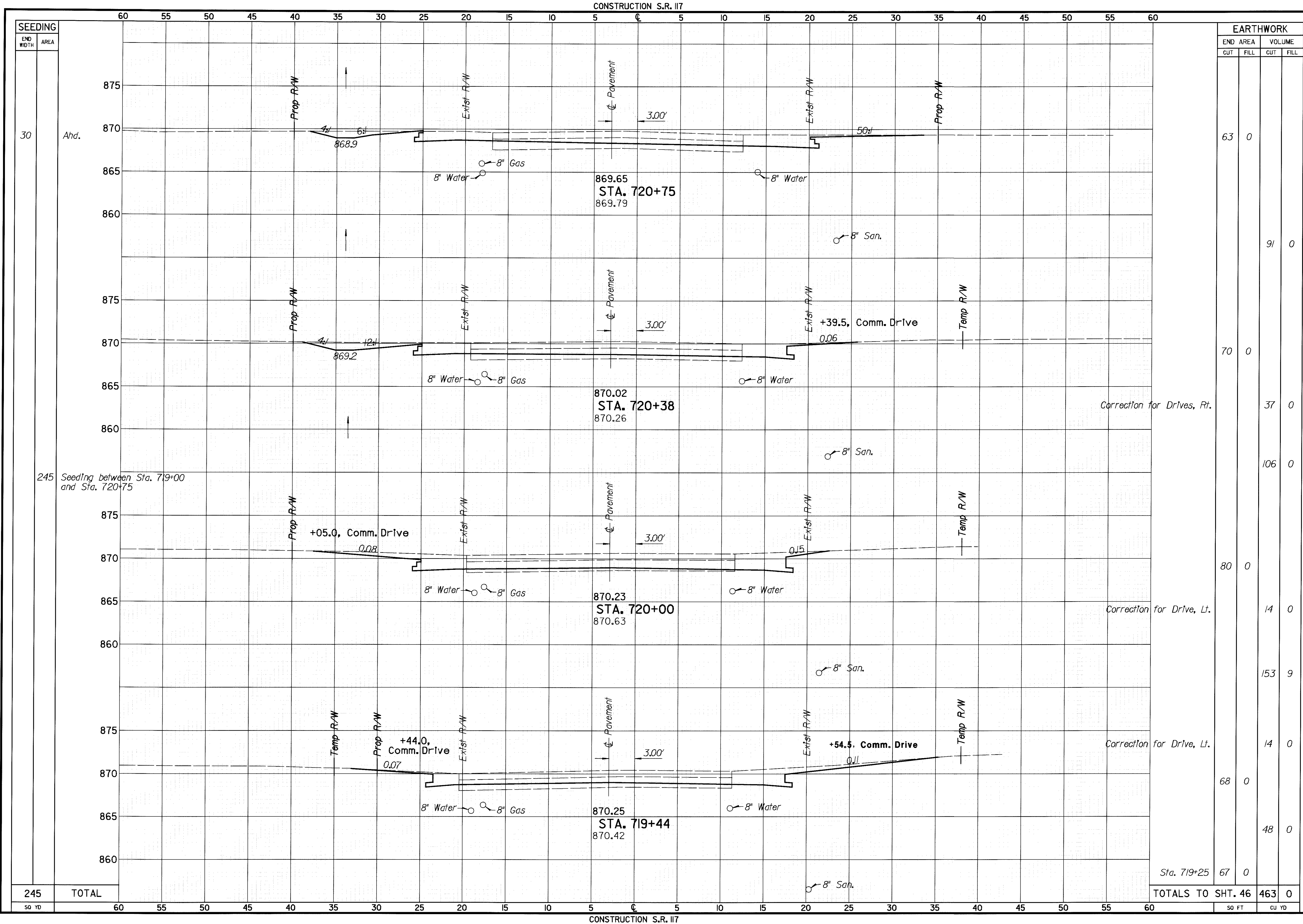
CROSS SECTIONS - S.R. 117  
STA. 718+00 TO STA. 719+25

ALL - 117 - 13.47

27  
65



DESIGN FILE : I:\pdp\19314\all7gxsr.dgn  
USERNAME : nvondera  
DATE : 10-AUG-2001  
TIME : 12:53



CROSS SECTIONS - S.R. 117  
STA. 719+44 TO STA. 720+75

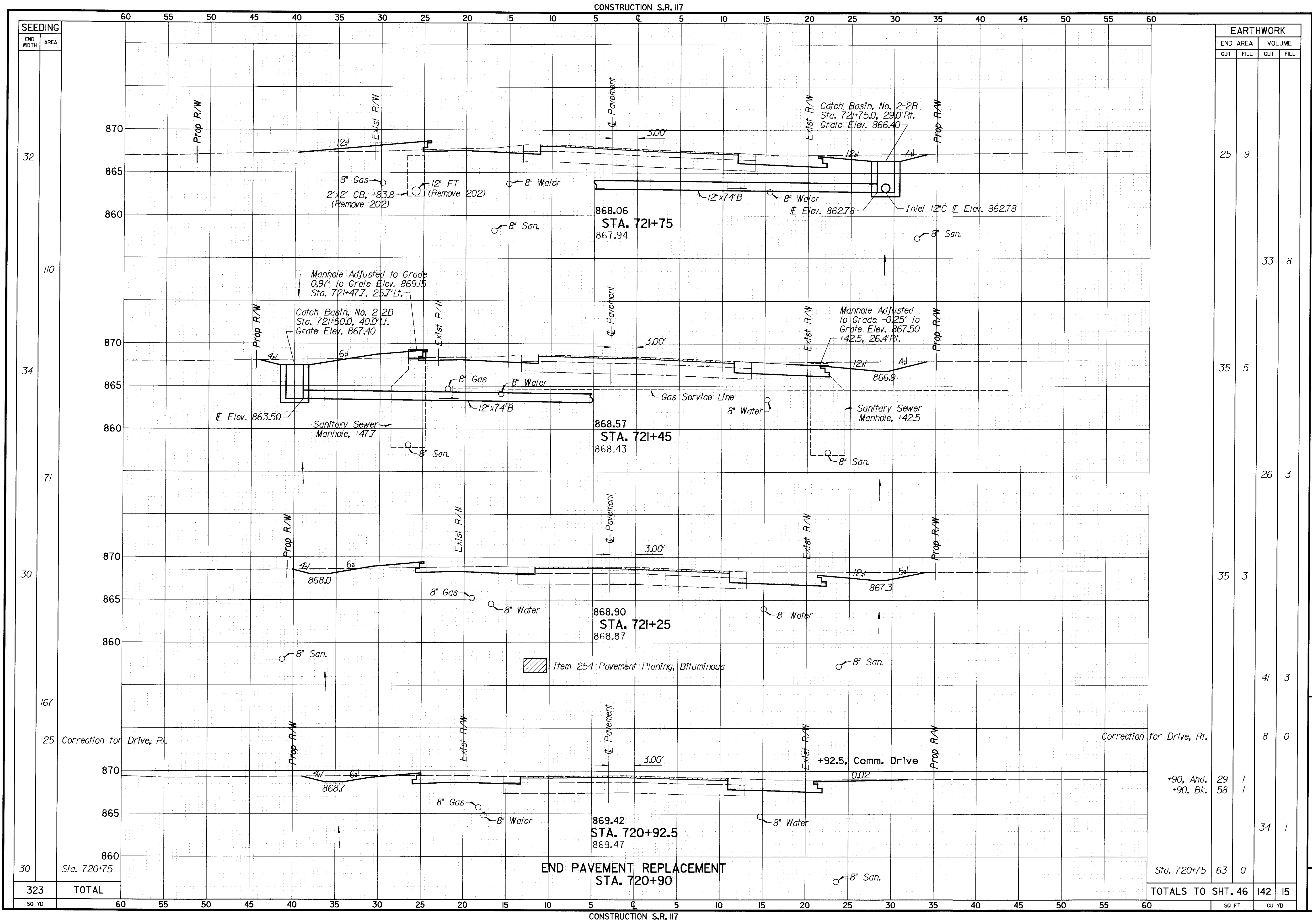
ALL - 117 - 13.47

28  
65



DESIGN FILE : I:\p\19314\all\7gxsr.dgn  
USERNAME : nvondere

DATE : 10-AUG-2001  
TIME : 12:52



| SEEDING |                           | EARTHWORK         |      |        |      |
|---------|---------------------------|-------------------|------|--------|------|
| END     | AREA                      | END               | AREA | VOLUME |      |
| CUT     | FILL                      | CUT               | FILL | CUT    | FILL |
| 32      |                           | 25                | 9    |        |      |
| 110     |                           |                   |      | 33     | 8    |
| 34      |                           | 35                | 5    |        |      |
| 71      |                           |                   |      | 26     | 3    |
| 30      |                           | 35                | 3    |        |      |
| 167     |                           |                   |      | 41     | 3    |
| -25     | Correction for Drive, Rt. |                   |      | 8      | 0    |
| 30      | Sta. 720+75               | +90, Ahd.         | 29   | 1      |      |
|         |                           | +90, Bk.          | 58   | 1      |      |
| 323     | TOTAL                     |                   |      | 34     | 1    |
|         |                           | Sta. 720+75       | 63   | 0      |      |
|         |                           | TOTALS TO SHT. 46 | 142  | 15     |      |

CROSS SECTIONS - S.R. 117  
STA. 720+92.5 TO STA. 721+75

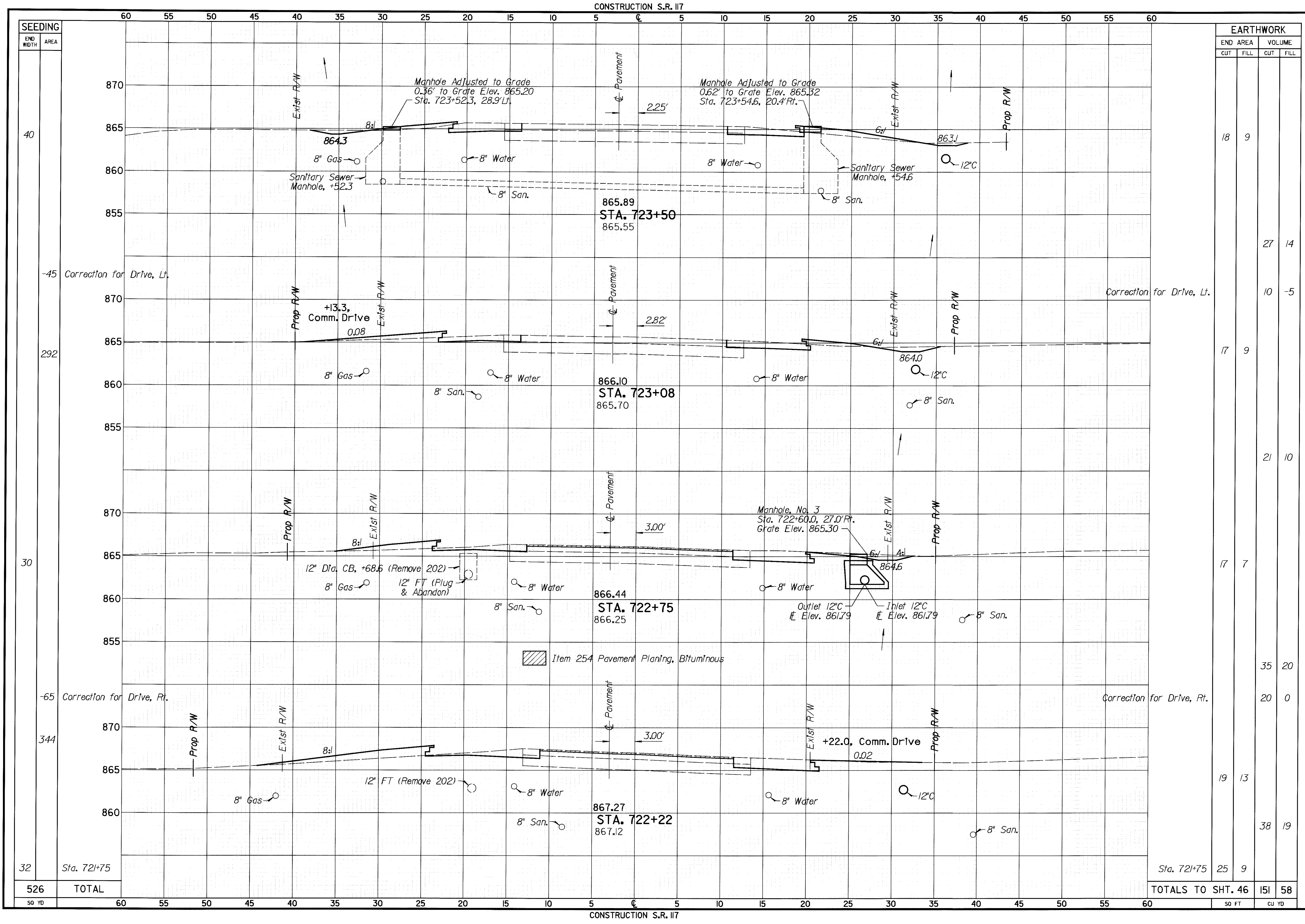
ALL -117-13.47

29  
65



DESIGN FILE : I:\pdp\9314\all7gxsr.dgn  
USER NAME : nvondero

DATE : 10-AUG-2001  
TIME : 12:52



| SEEDING   |             |
|-----------|-------------|
| END WIDTH | AREA        |
| 40        |             |
| 292       |             |
| 30        |             |
| 344       |             |
| 32        | Sta. 721+75 |
| 526       | TOTAL       |

| EARTHWORK         |      |        |      |
|-------------------|------|--------|------|
| END AREA          |      | VOLUME |      |
| CUT               | FILL | CUT    | FILL |
| 18                | 9    |        |      |
|                   |      | 27     | 14   |
|                   |      | 10     | -5   |
| 17                | 9    |        |      |
|                   |      | 21     | 10   |
| 17                | 7    |        |      |
|                   |      | 35     | 20   |
|                   |      | 20     | 0    |
| 19                | 13   |        |      |
|                   |      | 38     | 19   |
| 25                | 9    |        |      |
| TOTALS TO SHT. 46 |      | 151    | 58   |

CALCULATED

CHECKED

CROSS SECTIONS - S.R. 117  
STA. 722+22 TO STA. 723+50

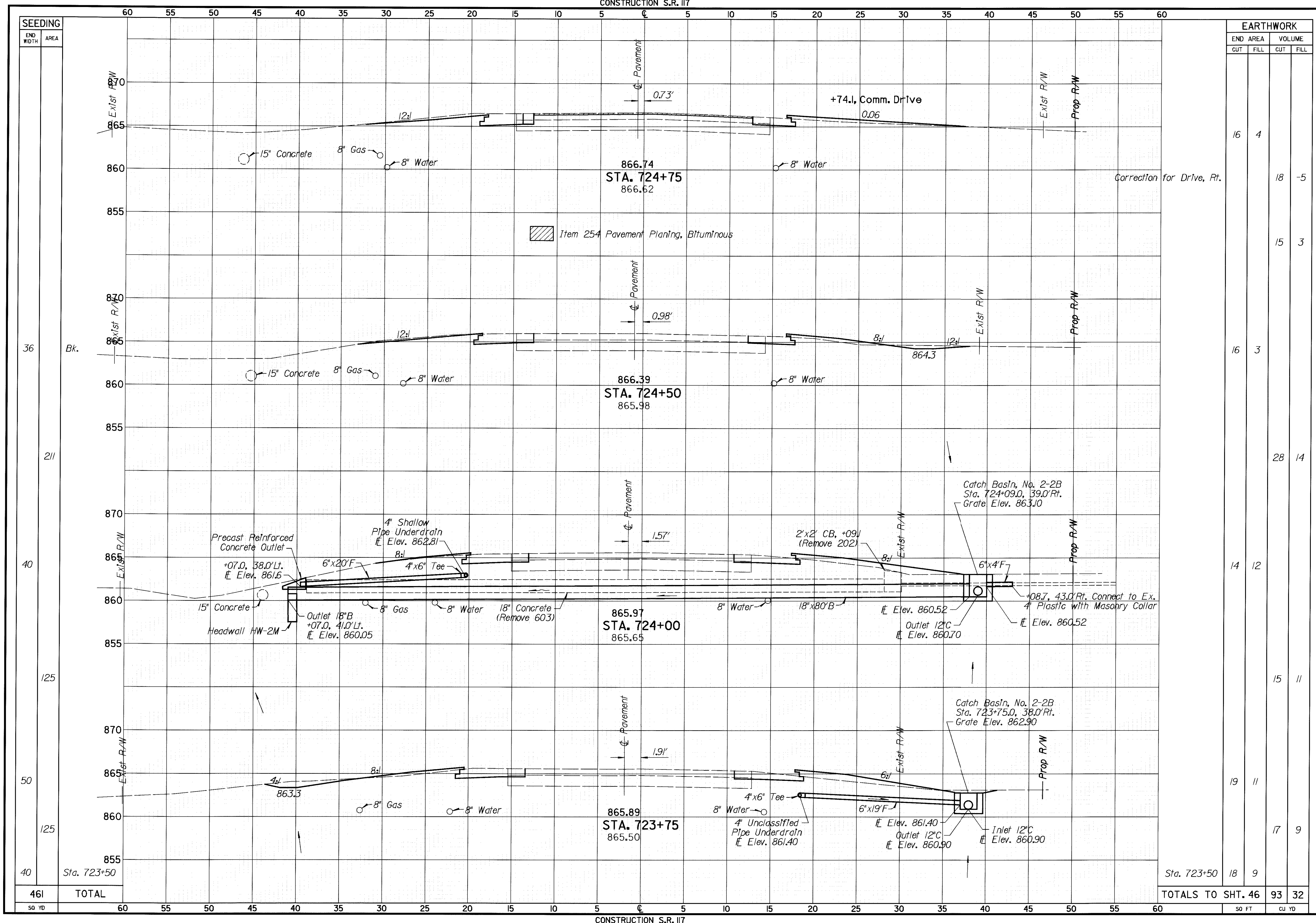
ALL - 117 - 13.47

30  
65



DESIGN FILE : I:\pds\9314\c117\gxsr.dgn  
USERNAME : nvondere

DATE : 10-AUG-2001  
TIME : 12:51



| SEEDING   |       |
|-----------|-------|
| END WIDTH | AREA  |
| 36        |       |
| 211       |       |
| 40        |       |
| 125       |       |
| 50        |       |
| 125       |       |
| 40        |       |
| 461       | TOTAL |
| SO YD     |       |

| EARTHWORK         |      |        |      |
|-------------------|------|--------|------|
| END AREA          |      | VOLUME |      |
| CUT               | FILL | CUT    | FILL |
| 16                | 4    |        |      |
|                   |      | 18     | -5   |
|                   |      | 15     | 3    |
| 16                | 3    |        |      |
|                   |      | 28     | 14   |
| 14                | 12   |        |      |
|                   |      | 15     | 11   |
| 19                | 11   |        |      |
|                   |      | 17     | 9    |
| 18                | 9    |        |      |
| TOTALS TO SHT. 46 |      | 93     | 32   |
| SO FT             |      | CU YD  |      |

CALCULATED

CHECKED

CROSS SECTIONS - S.R. 117  
STA. 723+75 TO STA. 724+75

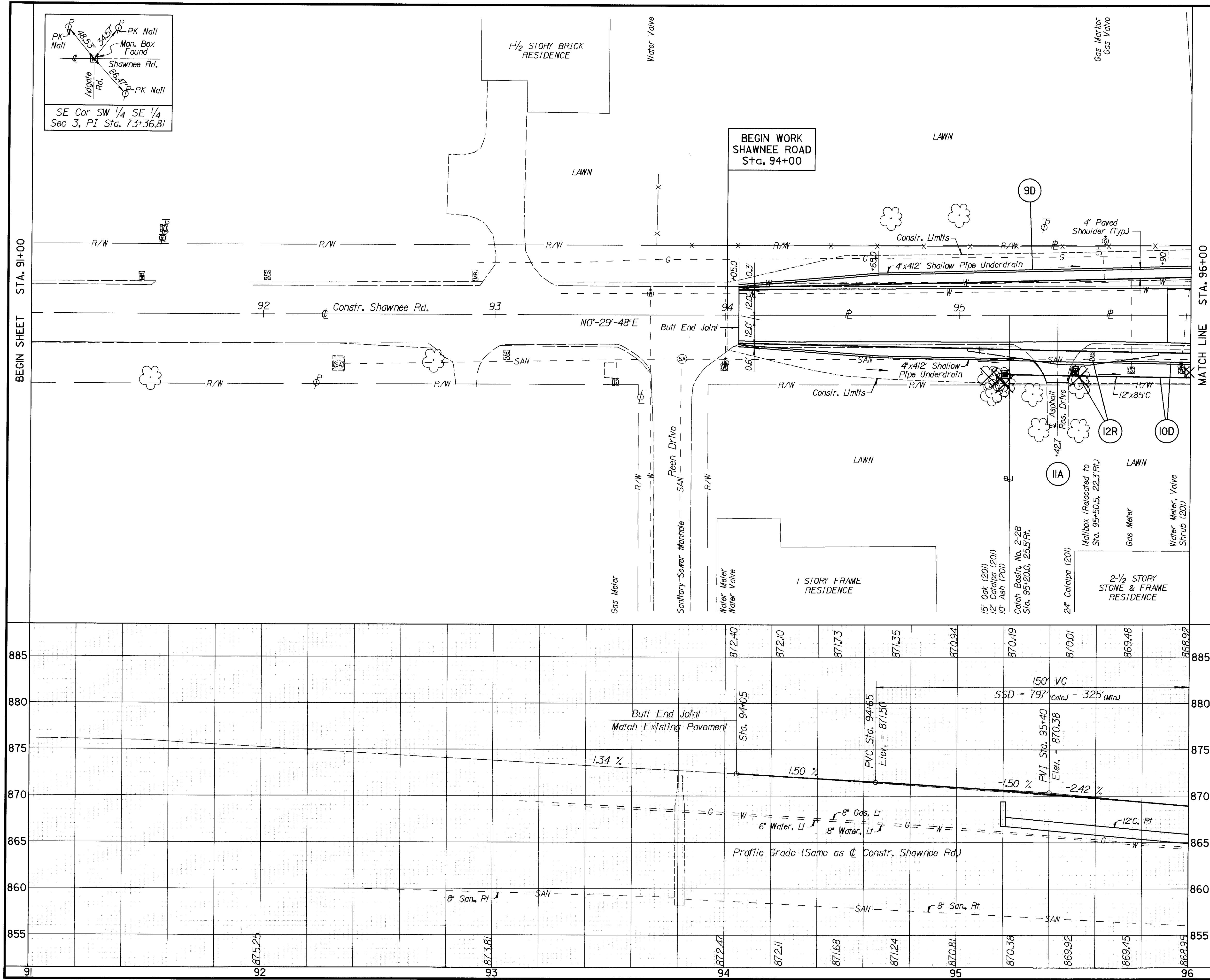
ALL - 117 - 13.47

31  
65



|                                                                                                                                                                                                                                                                                                                                         |                                                                       |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------|
| <div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; margin-right: 10px;"> <div style="text-align: center;">32</div> <div style="text-align: center;">65</div> </div> <div style="text-align: center;"> <b>ALL-117-13.47</b> </div> </div> | <b>CROSS SECTIONS - S.R. 117</b><br><b>STA. 725+00 TO STA. 725+75</b> | CALCULATED |
|                                                                                                                                                                                                                                                                                                                                         |                                                                       | CHECKED    |





| ESTIMATED QUANTITIES |           |
|----------------------|-----------|
|                      | See Sheet |
| DRAINAGE "D"         | 45        |
| SIDE APPROACH "A"    | 48        |
| ROADWAY "R"          | 46        |

- Pavement Removed (203)
- Item 254 Pavement Planing, Bituminous

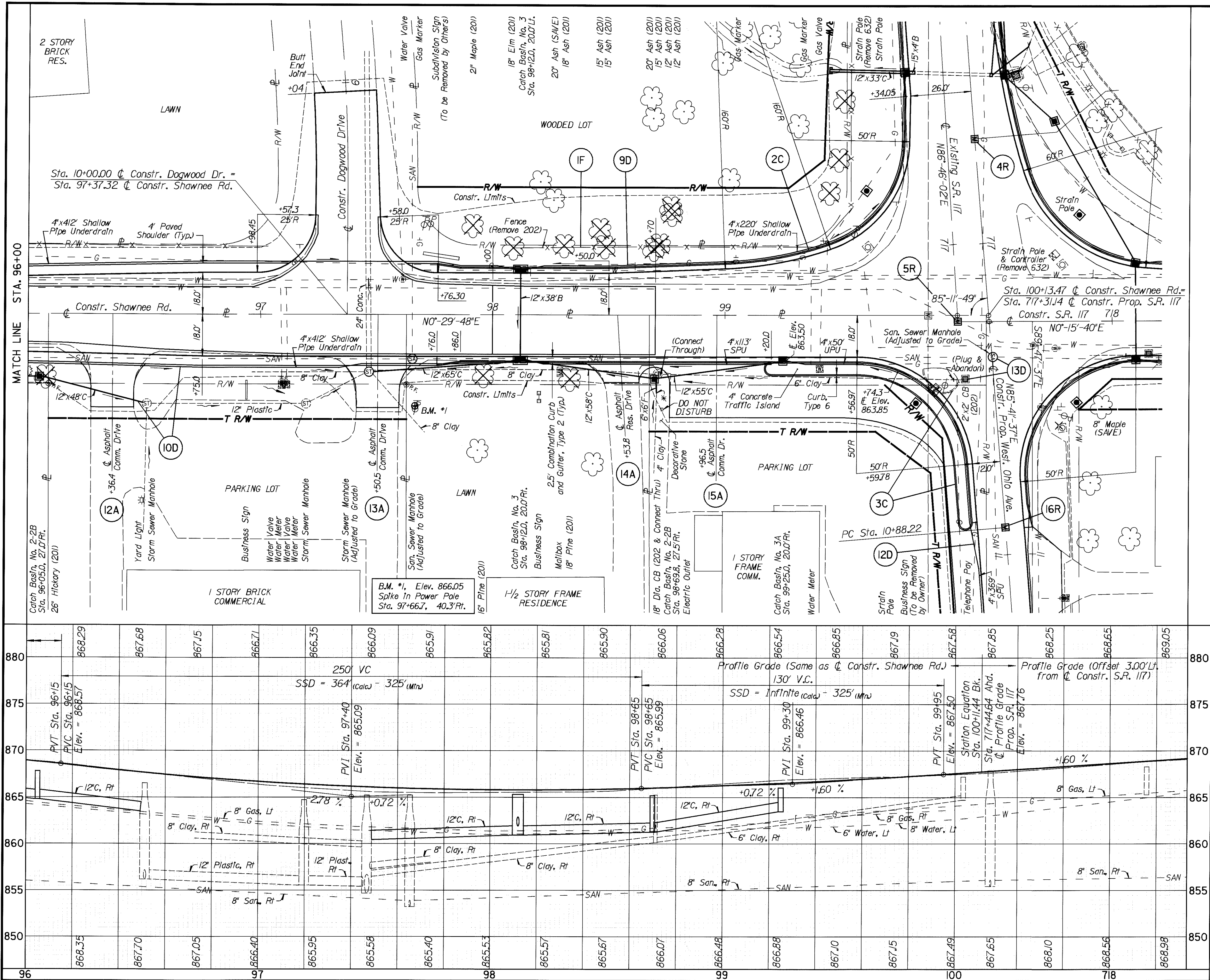
**MONUMENT LEGEND**

- ⊙ R.F. ~ PK Nail Found
- ⊙ I.R.F. ~ Iron Pin Fd. w/ID Cap
- ⊙ R.F. ~ Iron Pipe Found
- ⊗ ~ RR Spike Found
- ⊞ ~ Existing Monument Box
- ⊞ ~ Proposed Monument Box
- ⊙ Mag. Nail Set

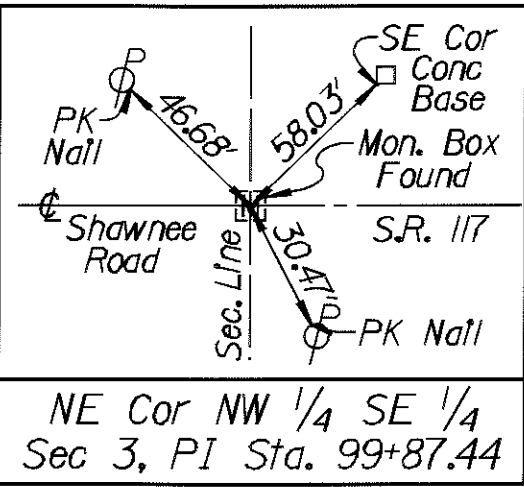
NOTE:  
For Proposed Drainage  
Stations, Offsets and  
Elevations, See Cross  
Sections, Sheets 35-39.

NOTE:  
All Utilities in Profile  
View are shown at  
Approximate Top of  
Pipe Elevations.





| ESTIMATED QUANTITIES |       |
|----------------------|-------|
| See Sheet            |       |
| DRAINAGE "D"         | 45    |
| SIDE APPROACH "A"    | 48    |
| CURB "C"             | 45    |
| FENCE "F"            | 46    |
| ROADWAY "R"          | 46    |
| TRAFFIC SIGNAL       |       |
| Quantities & Details | 52-58 |



- Pavement Removed (203)
- Item 254 Pavement Planing, Bituminous

- MONUMENT LEGEND**
- R.K.F. ~ PK Nail Found
  - ⊙ I.R.F. ~ Iron Pin Fd. w/ID Cap
  - ⊙ R.F. ~ Iron Pipe Found
  - ⊗ ~ RR Spike Found
  - ⊞ ~ Existing Monument Box
  - ⊞ ~ Proposed Monument Box
  - ⊙ Mag. Nail Set

\* Masonry Collar as per DM-1JM

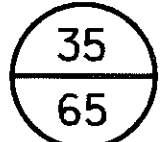
NOTE:  
For Intersection Detail, See Sheet 49.

NOTE:  
For Curb End Section Details, See Sheets 45.

NOTE:  
For Proposed Drainage Stations, Offsets and Elevations, See Cross Sections, Sheets 35-39.

NOTE:  
All Utilities in Profile View are shown at Approximate Top of Pipe Elevations.

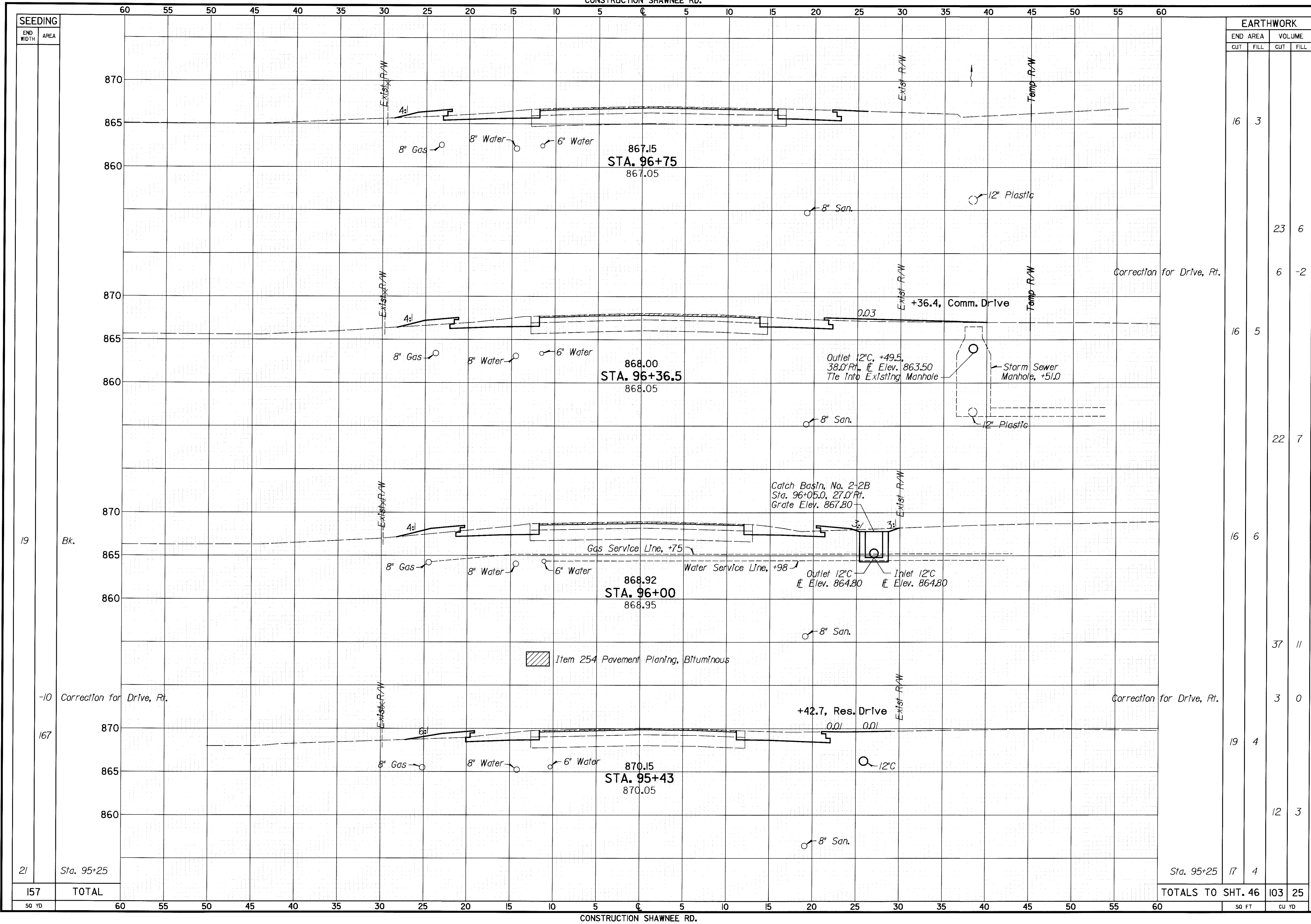






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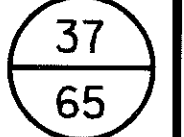


CROSS SECTIONS - SHAWNEE ROAD  
STA. 95+43 TO STA. 96+75

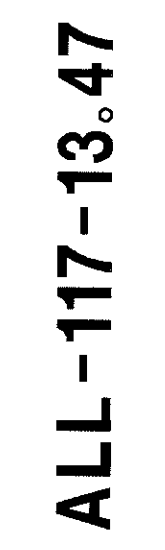
ALL - 117 - 13.47

36  
65





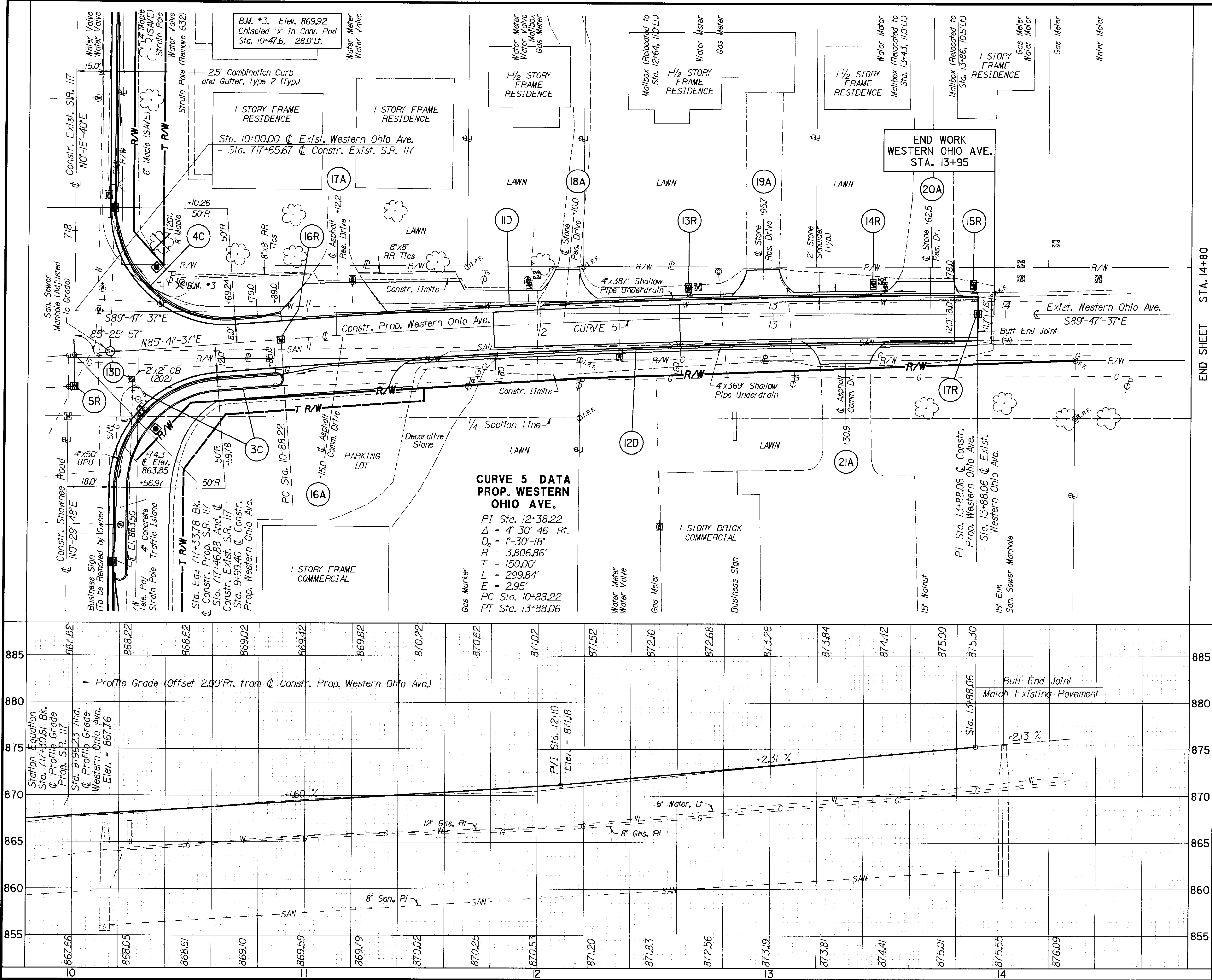






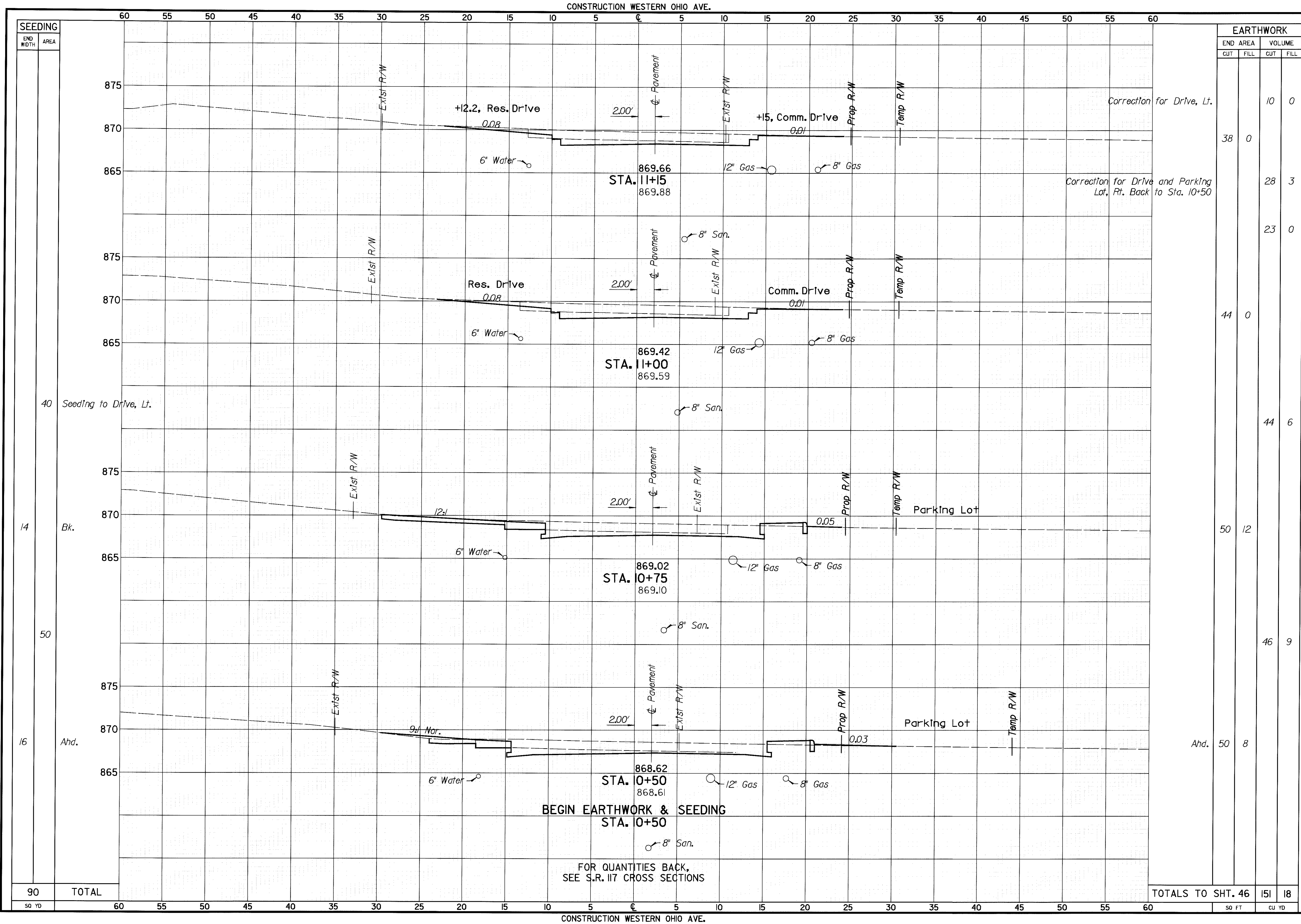
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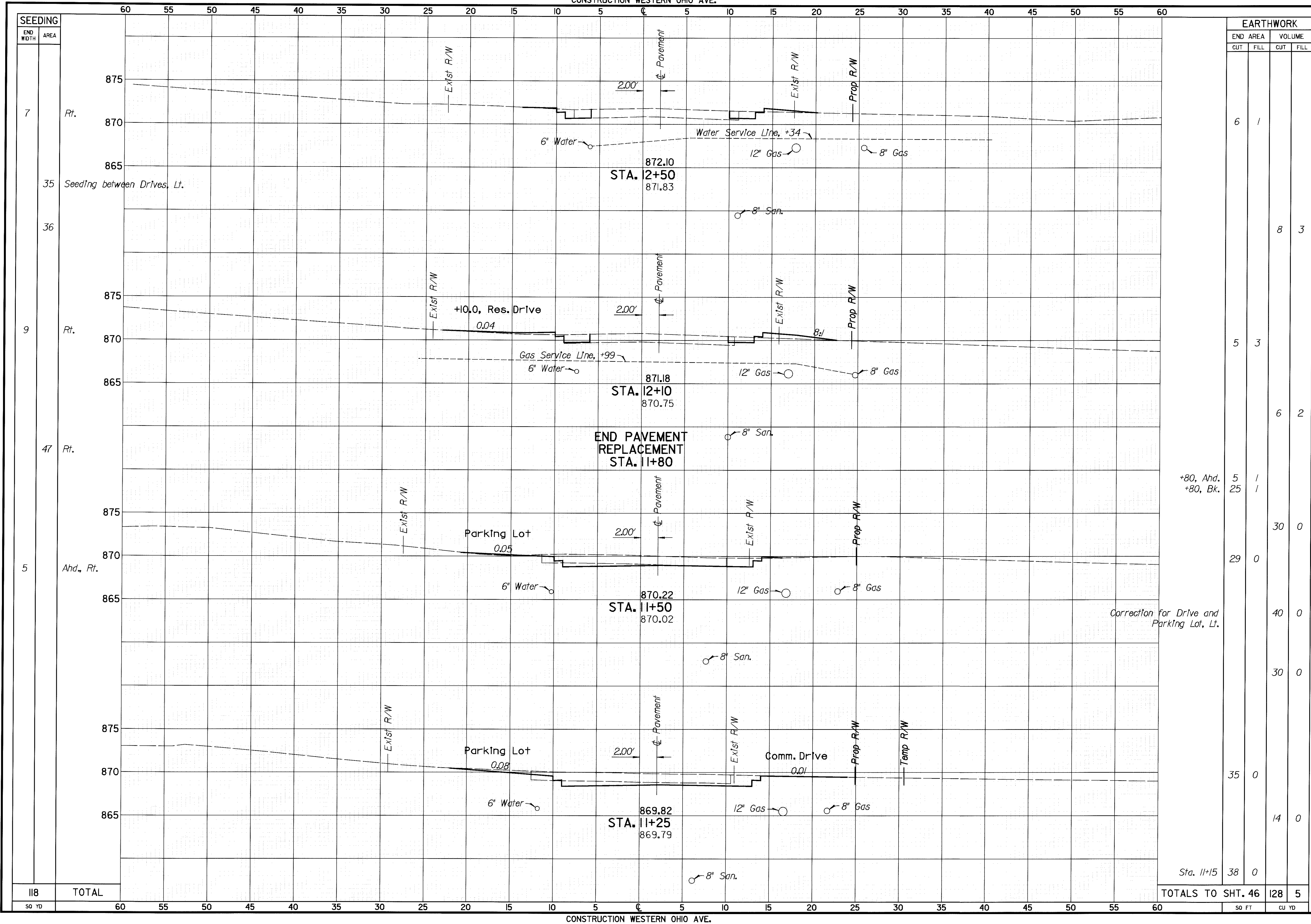
CROSS SECTIONS - WESTERN OHIO AVE.  
STA. 10+50 TO STA. 11+15

ALL - 117 - 13.47

41  
65



DESIGN FILE : I:\pdp\9314\all\7gxwo.dgn  
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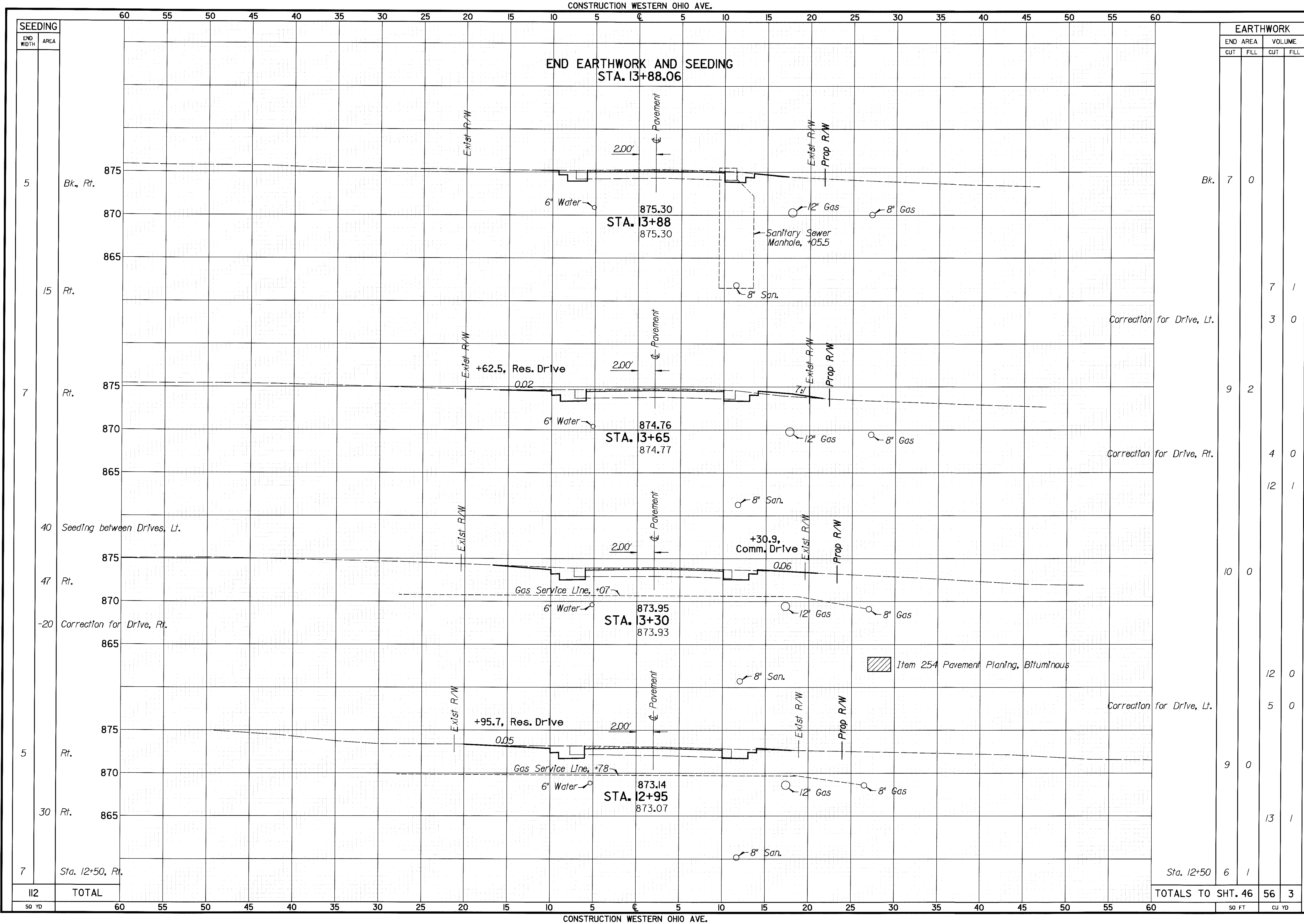
CROSS SECTIONS - WESTERN OHIO AVE.  
STA. 11+25 TO STA. 12+50

ALL -117-13.47



DESIGN FILE : I:\pdd\9314\all17g\w.o.dgn  
USER NAME : nvondere

DATE : 10-AUG-2001  
TIME : 13:17



| EARTHWORK         | END AREA |      | VOLUME |      | CALCULATED | CHECKED |
|-------------------|----------|------|--------|------|------------|---------|
|                   | CUT      | FILL | CUT    | FILL |            |         |
|                   |          |      |        |      |            |         |
| Bk.               | 7        | 0    |        |      |            |         |
|                   |          |      | 7      | 1    |            |         |
|                   |          |      | 3      | 0    |            |         |
|                   | 9        | 2    |        |      |            |         |
|                   |          |      | 4      | 0    |            |         |
|                   |          |      | 12     | 1    |            |         |
|                   | 10       | 0    |        |      |            |         |
|                   |          |      | 12     | 0    |            |         |
|                   |          |      | 5      | 0    |            |         |
|                   | 9        | 0    |        |      |            |         |
|                   |          |      | 13     | 1    |            |         |
| Sta. 12+50        | 6        | 1    |        |      |            |         |
| TOTALS TO SHT. 46 | 56       | 3    |        |      |            |         |
| SO FT             |          |      | CU YD  |      |            |         |

CROSS SECTIONS - WESTERN OHIO AVE.  
STA. 12+95 TO STA. 13+88

ALL -117-13.47

43  
65



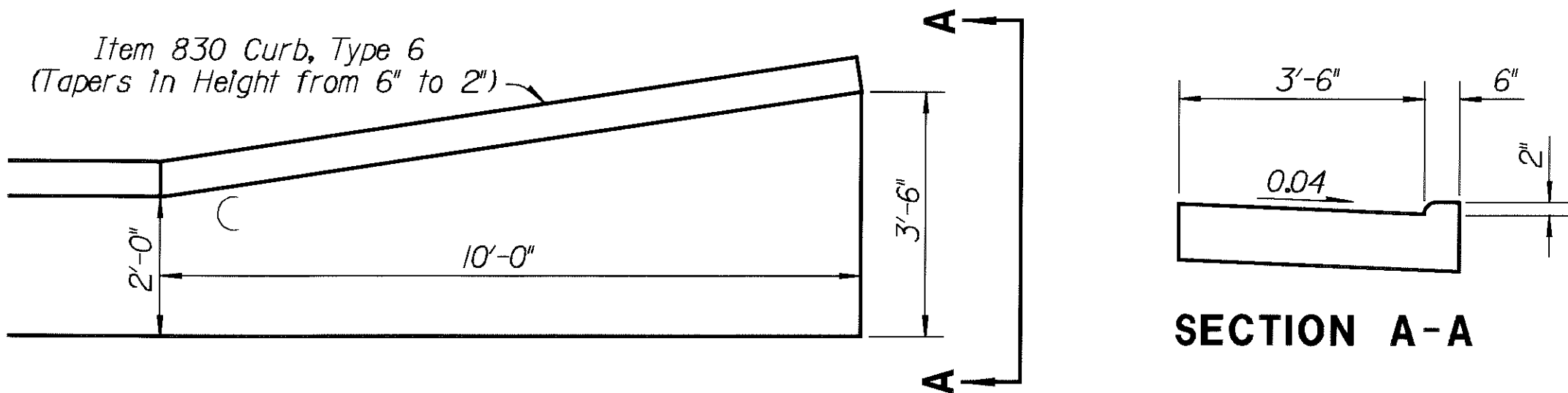
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TIME : 13:34

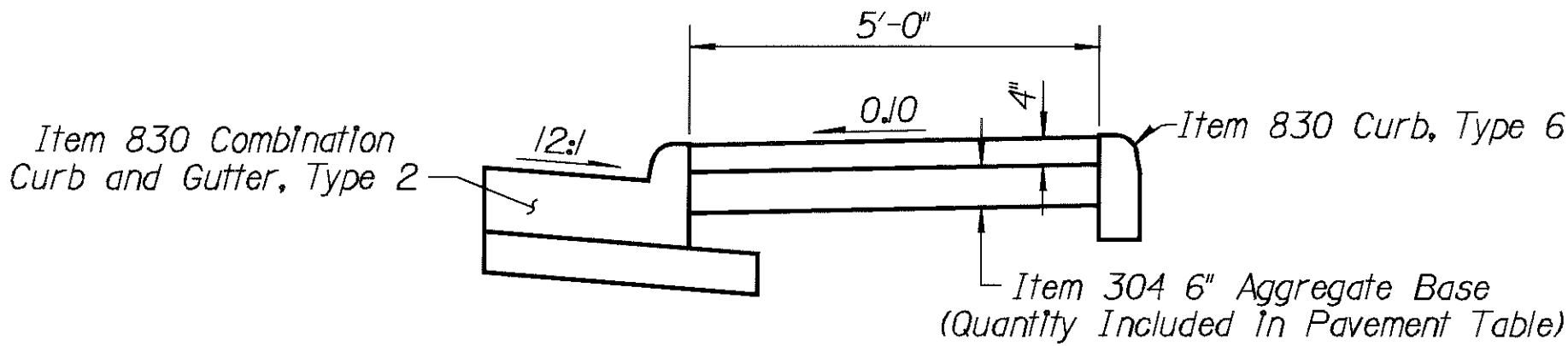
| LOCATION                                                                                                                                   | LENGTH | WIDTH  | TOTAL AREA                                                                                  | 203                    | 254                                            |                                                             | 255                           |  | 301                                                |                                                          | 304                      |                                |  | 407             | 407                                     | 408                                                                   | 448                                                                      | 448                                                                       | 448                                                                       |  |
|--------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|---------------------------------------------------------------------------------------------|------------------------|------------------------------------------------|-------------------------------------------------------------|-------------------------------|--|----------------------------------------------------|----------------------------------------------------------|--------------------------|--------------------------------|--|-----------------|-----------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|--|
|                                                                                                                                            |        |        |                                                                                             | Subgrade<br>Compaction | Pavement Planing<br>Bituminous<br>(1 1/4" Th.) | Pavement Planing<br>Bituminous<br>(2" Min.<br>- 3" Max Th.) | Full Depth<br>Pavement Sawing |  | Bituminous<br>Aggregate<br>Base, PG64-22<br>(T=6") | Bituminous<br>Aggregate<br>Base, PG64-22<br>(T=Variable) | Aggregate Base<br>(T=6") | Aggregate Base<br>(T=Variable) |  | Tack Coat       | Tack Coat for<br>Intermediate<br>Course | Bituminous Prime<br>Coat applied at<br>a rate of 0.40<br>Gallon/Sq Yd | Asphalt Concrete<br>Intermediate<br>Course, Type 1,<br>PG64-22 (T= Var.) | Asphalt Concrete<br>Intermediate<br>Course, Type 2,<br>PG64-22 (T=1 3/4") | Asphalt Concrete<br>Surface Course,<br>Type 1, PG64-22,<br>APP (T=1 1/4") |  |
| Station                                                                                                                                    | LIn Ft | LIn Ft | Sq Yd                                                                                       | Sq Yd                  | Sq Yd                                          | Sq Yd                                                       | LIn Ft                        |  | Cu Yd                                              | Cu Yd                                                    | Cu Yd                    | Cu Yd                          |  | Gallon          | Gallon                                  | Gallon                                                                | Cu Yd                                                                    | Cu Yd                                                                     | Cu Yd                                                                     |  |
| S.R. 117                                                                                                                                   |        |        |                                                                                             |                        |                                                |                                                             |                               |  |                                                    |                                                          |                          |                                |  |                 |                                         |                                                                       |                                                                          |                                                                           |                                                                           |  |
| 707+95 to 711+10<br>(Shoulder & Squire Lane)                                                                                               | 315.0  | Varies | 217.12<br>233.11<br>249.01                                                                  | 72.70                  |                                                |                                                             | 315                           |  | 38.85                                              |                                                          | 41.50                    |                                |  |                 | 16.28                                   |                                                                       |                                                                          | 10.55                                                                     | 7.54                                                                      |  |
| 711+10 to 716+75<br>(Includes Shoulders)                                                                                                   | 565.0  | Varies | 2242.12<br>1932.80<br>2347.48                                                               | 2242.12                |                                                |                                                             |                               |  | 322.13                                             |                                                          | 391.25                   | 310.00                         |  |                 | 144.96                                  | 773.12                                                                |                                                                          | 93.96                                                                     | 67.11                                                                     |  |
| Intersection between 716+75 & 718+00 &<br>99+50 (Shawnee Rd) & 10+50 (WO Ave)<br>(Includes Shoulders & Aggregate<br>under Concrete Island) |        | Varies | 1115.58<br>1020.82<br>1130.28                                                               | 1115.58                |                                                |                                                             |                               |  | 170.14                                             |                                                          | 188.38                   |                                |  |                 | 76.56                                   | 408.33                                                                |                                                                          | 49.62                                                                     | 35.46                                                                     |  |
| 718+00 to 725+75<br>(Includes Shoulders)                                                                                                   | 775.0  | Varies | 3512.00<br>869.09<br>2236.05<br>2463.60<br>1274.88<br>3443.93<br>2169.05                    | 3512.00                |                                                | 869.09                                                      | 994                           |  | 372.68                                             |                                                          | 410.60                   |                                |  | 95.62           | 258.30                                  |                                                                       | 89.24                                                                    |                                                                           | 119.58                                                                    |  |
| 725+75 to 731+27<br>(Includes Shoulders)                                                                                                   |        |        | 288.89<br>304.20<br>319.51                                                                  | 288.89                 |                                                |                                                             | 275                           |  | 50.70                                              |                                                          | 53.25                    |                                |  |                 | 21.67                                   | 121.68                                                                |                                                                          | 14.04                                                                     | 10.03                                                                     |  |
| Miscellaneous Quantities                                                                                                                   |        |        | 1725<br>775                                                                                 |                        | 1725<br>775                                    |                                                             |                               |  |                                                    |                                                          |                          |                                |  | 129.38<br>58.13 |                                         |                                                                       |                                                                          |                                                                           | 59.90                                                                     |  |
| SHAWNEE ROAD                                                                                                                               |        |        |                                                                                             |                        |                                                |                                                             |                               |  |                                                    |                                                          |                          |                                |  |                 |                                         |                                                                       |                                                                          |                                                                           |                                                                           |  |
| 94+05 to 99+50<br>(Includes Shoulders, Mailbox Approach<br>& Aggregate under Concrete Island)                                              | 545.0  | Varies | 2431.52<br>698.76<br>960.39<br>1181.74<br>1343.95<br>2314.56<br>970.99<br>934.25<br>2314.56 | 2431.52                |                                                | 698.76                                                      | 970                           |  | 160.07                                             |                                                          | 196.96                   |                                |  | 100.80          | 173.59                                  |                                                                       | 98.56                                                                    |                                                                           |                                                                           |  |
| DOGWOOD DRIVE                                                                                                                              |        |        |                                                                                             |                        |                                                |                                                             |                               |  |                                                    |                                                          |                          |                                |  |                 |                                         |                                                                       |                                                                          |                                                                           |                                                                           |  |
| 9+04 to 9+82 (E/P Shawnee Rd.)<br>(Includes Shoulders along Shawnee<br>Road to End of Rad11)                                               | 78.0   | Varies | 274.18<br>236.15*<br>221.34                                                                 | 274.18                 |                                                |                                                             |                               |  |                                                    | 37.50                                                    |                          |                                |  | 20.56           |                                         |                                                                       |                                                                          | 10.94                                                                     | 10.43                                                                     |  |
| *9+33 to 9+87.4                                                                                                                            |        |        |                                                                                             |                        |                                                |                                                             |                               |  |                                                    |                                                          |                          |                                |  |                 | 16.60                                   |                                                                       |                                                                          |                                                                           |                                                                           |  |
| WESTERN OHIO AVENUE                                                                                                                        |        |        |                                                                                             |                        |                                                |                                                             |                               |  |                                                    |                                                          |                          |                                |  |                 |                                         |                                                                       |                                                                          |                                                                           |                                                                           |  |
| 10+50 to 13+88.06<br>(Includes Shoulders & Aggregate<br>under Concrete Island)                                                             | 338.06 | Varies | 816.42<br>227.54<br>418.98<br>647.63<br>367.52<br>753.25<br>385.72                          | 816.42                 |                                                | 227.54                                                      | 431                           |  | 69.83                                              |                                                          | 107.94                   |                                |  | 27.56           | 56.50                                   |                                                                       | 147.0                                                                    |                                                                           | 261.5                                                                     |  |
| Subtotals                                                                                                                                  |        |        |                                                                                             | 10,753.41              | 2500                                           | 1795.39                                                     | 2985                          |  | 1184.40                                            | 37.50                                                    | 1389.88                  | 310.00                         |  | 432.05          | 764.46                                  | 2846.78                                                               | 202.50                                                                   | 348.71                                                                    | 416.57                                                                    |  |
| TOTALS CARRIED TO SHEETS 13-14                                                                                                             |        |        |                                                                                             | 10,753                 | 4295                                           |                                                             | 2985                          |  | 1222                                               |                                                          | 1670                     |                                |  | 432             | 764                                     | 2847                                                                  | 203                                                                      | 349                                                                       | 417                                                                       |  |



| DRAINAGE "D"               |            |                    |                    |                             |                        |                                                           |                     |                    |         |            |    |            |     |            |     |                       |                        |                          |                   |                                 |                                             |                               |                                    |                  |       |         |           |             |            |
|----------------------------|------------|--------------------|--------------------|-----------------------------|------------------------|-----------------------------------------------------------|---------------------|--------------------|---------|------------|----|------------|-----|------------|-----|-----------------------|------------------------|--------------------------|-------------------|---------------------------------|---------------------------------------------|-------------------------------|------------------------------------|------------------|-------|---------|-----------|-------------|------------|
| Reference No.              | Sheet No.  | Location           |                    | 202                         |                        | 601                                                       | 602                 | 603                |         |            |    |            |     |            |     | 604                   |                        |                          |                   |                                 |                                             | 605                           |                                    | Bends & Branches |       |         |           |             |            |
|                            |            |                    |                    | Pipe Removed<br>24" & Under | Catch Basin<br>Removed | Rock Channel<br>Protection,<br>Type D w/Filter<br>(T=24") | Concrete<br>Masonry | Conduit<br>(Ln Ft) |         |            |    |            |     |            |     | Catch Basin,<br>No. 3 | Catch Basin,<br>No. 3A | Catch Basin,<br>No. 2-2B | Manhole,<br>No. 3 | Manhole<br>Adjusted to<br>Grade | Precast<br>Reinforced<br>Concrete<br>Outlet | 4" Shallow<br>Pipe Underdrain | 4" Unclassified<br>Pipe Underdrain |                  |       |         |           |             |            |
|                            |            |                    |                    |                             |                        |                                                           |                     |                    |         |            |    |            |     |            |     |                       |                        |                          |                   |                                 |                                             |                               |                                    |                  |       |         |           |             |            |
|                            |            | From               | To                 | Ln Ft                       | Each                   | Cu Yd                                                     | Cu Yd               | 6"<br>F            | 8"<br>F | 10"<br>B C |    | 12"<br>B C |     | 15"<br>B C |     | 18"<br>B C            |                        | Each                     | Each              | Each                            | Each                                        | Each                          | Each                               | Ln Ft            | Ln Ft | 10"x30" | 4"x6" Tee | 15"x10" Tee | 18"x8" Tee |
| 1D                         | 15, 16     | 707+84 Lt (SR 117) | 711+35 Lt (SR 117) |                             |                        | 6.5                                                       |                     |                    | 4       |            |    |            |     |            | 331 | 29                    |                        |                          |                   | /                               |                                             |                               |                                    |                  |       |         |           | /           |            |
| 2D                         | 16         | 711+35 Lt (SR 117) | 713+67 Lt (SR 117) |                             | 1                      |                                                           |                     |                    |         |            |    | 9          |     | 17         |     | 215                   |                        | /                        | /                 | /                               |                                             |                               | 222                                |                  |       |         |           |             |            |
| 3D                         | 16         | 711+35 Rt (SR 117) | 713+62 Rt (SR 117) |                             |                        |                                                           |                     |                    |         |            | 27 |            |     |            |     |                       |                        | /                        |                   |                                 |                                             |                               | 227                                |                  |       |         |           |             |            |
| 4D                         | 16, 17     | 713+67 Lt (SR 117) | 716+28 Lt (SR 117) |                             |                        |                                                           |                     |                    |         |            |    | 5          |     | 260        |     |                       |                        | /                        |                   | /                               |                                             |                               | 256                                |                  |       |         |           |             |            |
| 5D                         | 16, 17     | 713+67 Rt (SR 117) | 716+18 Rt (SR 117) |                             |                        |                                                           |                     |                    |         |            | 30 |            |     |            |     |                       |                        | /                        |                   |                                 | /                                           |                               | 203                                | 50               |       |         |           |             |            |
| 6D                         | 17         | 716+13 Lt (SR 117) | 718+10 Rt (SR 117) | 35                          | 1                      |                                                           |                     |                    |         | 44         | 10 |            | 100 | 2          |     |                       |                        | /                        | /                 |                                 |                                             |                               | 100                                |                  | 3     |         | /         |             |            |
| 7D                         | 17-19A     | 718+10 Lt (SR 117) | 727+50 Lt (SR 117) | 100                         | 2                      |                                                           |                     | 20                 |         |            | 74 |            |     |            |     |                       |                        | /                        | /                 |                                 | 2                                           | /                             | 961                                |                  |       | /       |           |             |            |
| 8D                         | 17, 18, 19 | 718+10 Rt (SR 117) | 725+75 Rt (SR 117) |                             | 2                      | 22                                                        | 0.31                | 23                 |         |            | 41 | 219        |     |            | 80  |                       |                        | /                        | 3                 | /                               | 2                                           |                               | 708                                | 50               |       | /       |           |             |            |
| 9D                         | 17, 33, 34 | 94+00 Lt (Shawnee) | 716+24 Rt (SR 117) |                             |                        |                                                           | 0.20                |                    |         |            |    | 38         | 33  | 4          |     |                       | /                      | /                        |                   |                                 |                                             |                               | 632                                |                  |       |         |           |             |            |
| 10D                        | 17, 33, 34 | 94+00 Rt (Shawnee) | 99+25 Rt (Shawnee) |                             | 1                      |                                                           |                     | 6                  |         |            |    |            | 311 |            |     |                       | /                      | /                        | 3                 |                                 | 2                                           |                               | 525                                |                  |       |         |           |             |            |
| 11D                        | 17, 40     | 718+10 Rt (SR 117) | 13+78 Lt (W Ohio)  |                             |                        |                                                           |                     |                    |         |            |    |            |     |            |     |                       |                        |                          |                   |                                 |                                             |                               | 387                                |                  |       |         |           |             |            |
| 12D                        | 17, 34, 40 | 99+25 Rt (Shawnee) | 13+78 Rt (W Ohio)  |                             |                        |                                                           |                     |                    |         |            |    |            |     |            |     |                       |                        |                          |                   |                                 |                                             |                               | 369                                | 50               |       |         |           |             |            |
| 13D                        | 17, 34, 40 | 10+15 C (W Ohio)   | 10+23 Rt (W Ohio)  |                             | 1                      |                                                           |                     |                    |         |            |    |            |     |            |     |                       |                        |                          |                   | /                               |                                             |                               |                                    |                  |       |         |           |             |            |
| TOTALS CARRIED TO SHEET 13 |            |                    |                    | 135                         | 8                      | 9                                                         | 0.5                 | 49                 | 4       | 44         | 10 | 210        | 677 | 6          | 277 | 411                   | 244                    | 2                        | 9                 | 9                               | 4                                           | 8                             | 1                                  | 4590             | 150   |         |           |             |            |



CURB END SECTION DETAIL

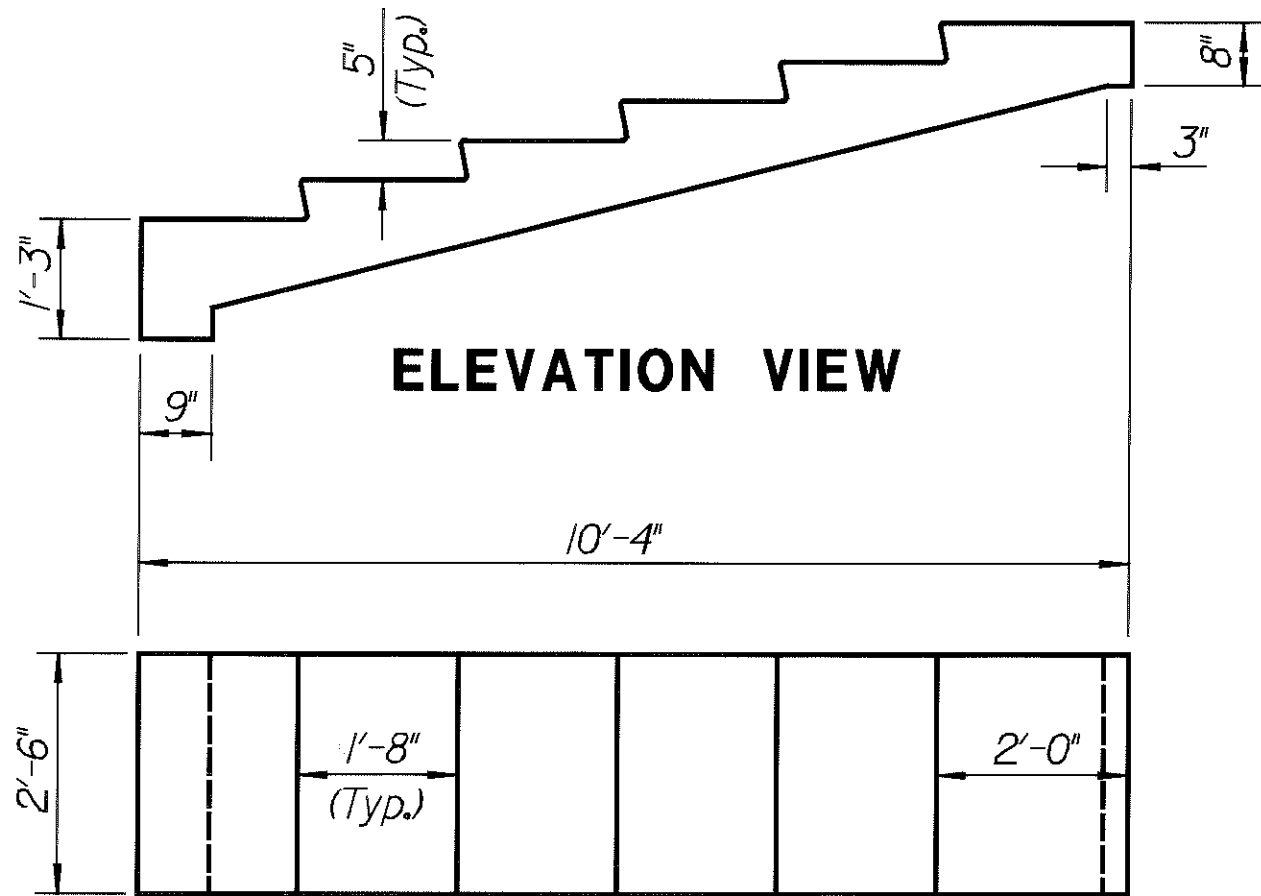


ITEM 830 4" CONCRETE TRAFFIC ISLAND

| CURB "C"                        |            |                    |                    |                 |                                           |              |                               |
|---------------------------------|------------|--------------------|--------------------|-----------------|-------------------------------------------|--------------|-------------------------------|
| Reference No.                   | Sheet No.  | Location           |                    | 202             | 830                                       |              |                               |
|                                 |            |                    |                    | Curb<br>Removed | Combination<br>Curb and Gutter,<br>Type 2 | Curb, Type 6 | 4" Concrete<br>Traffic Island |
|                                 |            | From               | To                 | Ln Ft           | Ln Ft                                     | Ln Ft        | Sq Yd                         |
| 1C                              | 16, 17, 18 | 711+20 Lt (SR 117) | 719+81 Lt (SR 117) |                 | 785.3                                     |              |                               |
| 2C                              | 16, 17, 34 | 711+20 Rt (SR 117) | 97+76 Lt (Shawnee) |                 | 764.7                                     |              |                               |
| 3C                              | 17, 34, 40 | 97+76 Rt (Shawnee) | 10+85 Rt (W Ohio)  | 23              | 277.6                                     | 143.4        | 73.9                          |
| 4C                              | 17, 18, 40 | 10+89 Lt (W Ohio)  | 720+52 Rt (SR 117) |                 | 343.1                                     |              |                               |
| 5C                              | 18, 19     | 721+24 Rt (SR 117) | 722+93 Rt (SR 117) | 169             |                                           |              |                               |
| TOTAL CARRIED TO SHEETS 13 & 14 |            |                    |                    | 192             | 2171                                      | 143          | 74                            |

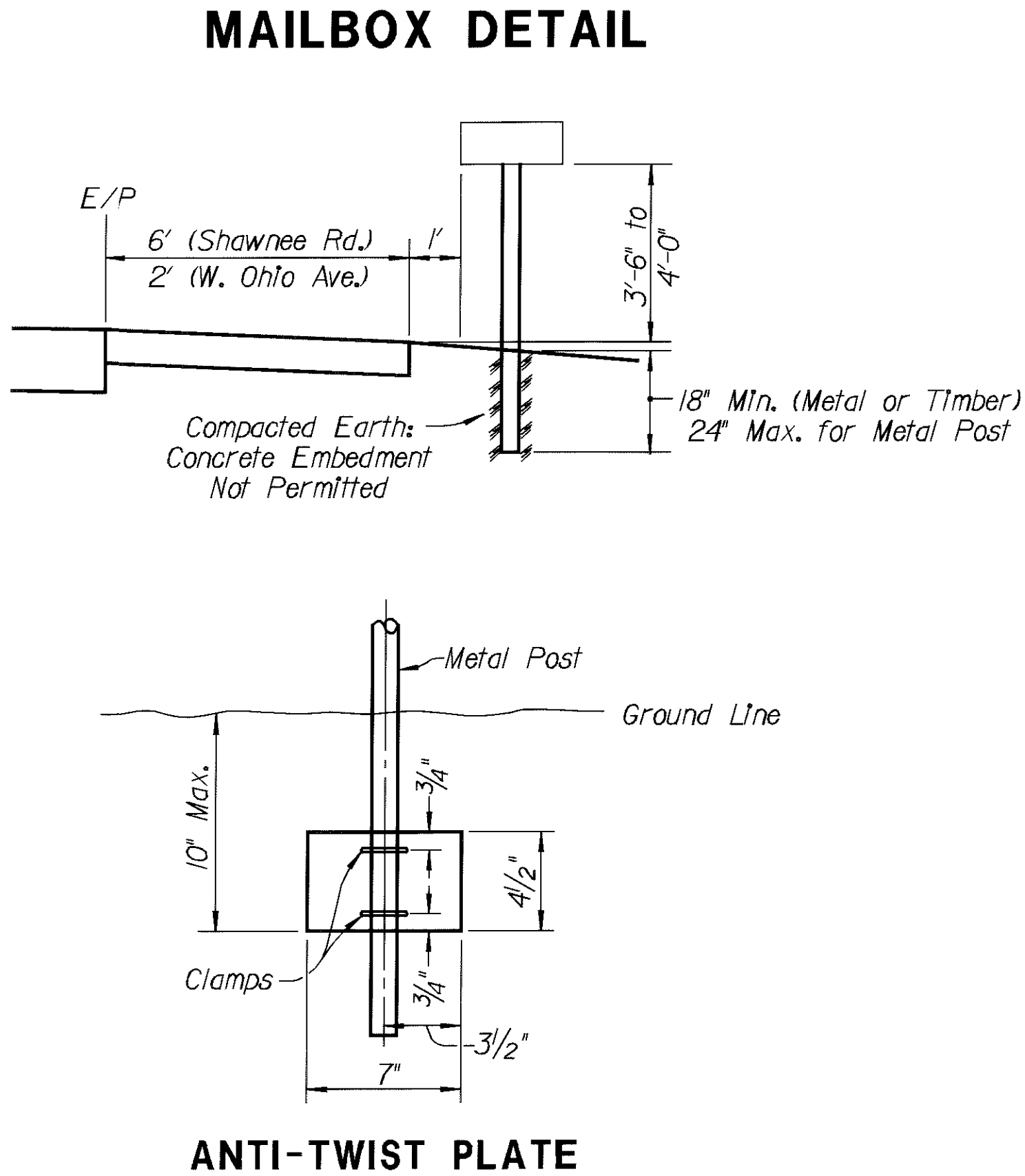


| GUARDRAIL "G" AND FENCE "F" |            |                    |                      |                                   |                  |
|-----------------------------|------------|--------------------|----------------------|-----------------------------------|------------------|
| Reference No.               | Sheet No.  | Location           |                      | 202                               |                  |
|                             |            |                    |                      | Guardrail<br>Removed<br>for Reuse | Fence<br>Removed |
|                             |            | From               | To                   | Ln Ft                             | Ln Ft            |
| IG                          | 15         | 707+87 Lt (SR 117) | 708+99.5 Lt (SR 117) | 12.5                              |                  |
| IF                          | 16, 17, 34 | 711+13 Rt (SR 117) | 98+09 Lt (Shawnee)   |                                   | 722              |
| TOTALS CARRIED TO SHEET 13  |            |                    |                      | 12.5                              | 722              |



ITEM 608 CONCRETE STEPS,  
 TYPE B, AS PER PLAN

NOTE: For Additional Details,  
 See Std. Dwg. RM 21M.



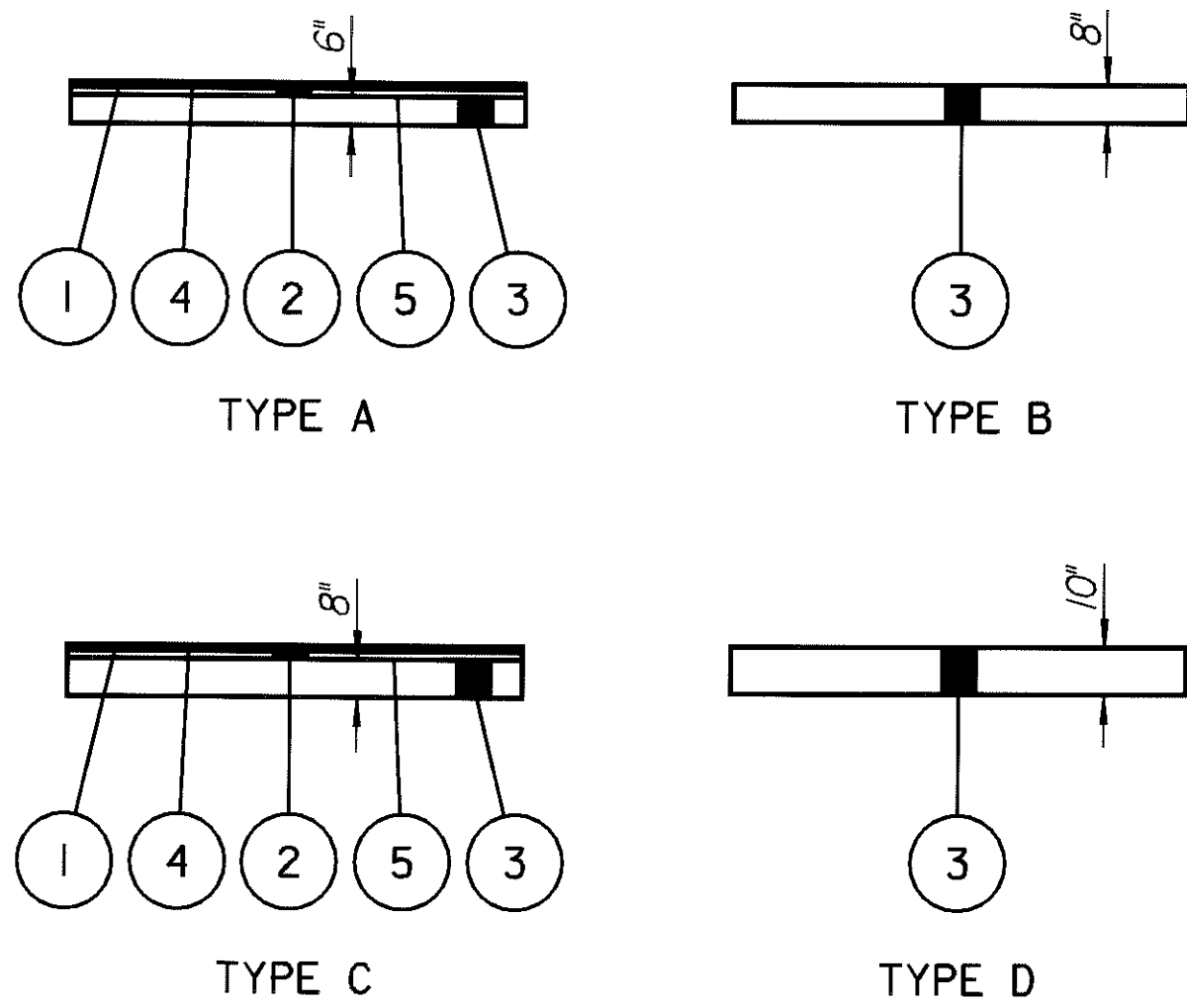
| SEEDING                    |          |                         | EARTHWORK |                                                           |            |
|----------------------------|----------|-------------------------|-----------|-----------------------------------------------------------|------------|
| Sheet No.                  | Location | 870                     | Sheet No. | 203                                                       |            |
|                            |          | Seeding and<br>Mulching |           | Excavation<br>Not Including<br>Embankment<br>Construction | Embankment |
|                            |          | Sq Yd                   |           | Cu Yd                                                     | Cu Yd      |
| 20                         | SR 117   | 128                     | 20        | 35                                                        | 0          |
| 21                         |          | 180                     | 21        | 76                                                        | 0          |
| 22                         |          | 256                     | 22        | 161                                                       | 18         |
| 23                         |          | 412                     | 23        | 338                                                       | 29         |
| 24                         |          | 466                     | 24        | 180                                                       | 141        |
| 25                         |          | 540                     | 25        | 138                                                       | 235        |
| 26                         |          | 470                     | 26        | 398                                                       | 175        |
| 27                         |          | 380                     | 27        | 304                                                       | 45         |
| 28                         |          | 245                     | 28        | 463                                                       | 0          |
| 29                         |          | 323                     | 29        | 142                                                       | 15         |
| 30                         |          | 526                     | 30        | 151                                                       | 58         |
| 31                         |          | 461                     | 31        | 93                                                        | 32         |
| 32                         |          | 430                     | 32        | 172                                                       | 39         |
| 35                         | Shawnee  | 237                     | 35        | 58                                                        | 21         |
| 36                         |          | 157                     | 36        | 103                                                       | 25         |
| 37                         |          | 400                     | 37        | 43                                                        | 28         |
| 38                         |          | 566                     | 38        | 170                                                       | 90         |
| 39                         |          | 182                     | 39        | 131                                                       | 87         |
| 41                         | W Ohio   | 90                      | 41        | 151                                                       | 18         |
| 42                         |          | 118                     | 42        | 128                                                       | 5          |
| 43                         |          | 112                     | 43        | 56                                                        | 3          |
| TOTALS                     |          | 6679                    |           | 3491                                                      | 1064       |
| TOTALS CARRIED TO SHEET 13 |          |                         |           |                                                           |            |

| MISCELLANEOUS CALCULATIONS                      |                                                                                                    |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 870                                             | COMMERCIAL FERTILIZER<br>Seeding and Mulching = 6679 Sq Yd<br>(6679X9X1/1000X30X1/2000) = 0.90 Ton |
| 870                                             | SOIL TEST ANALYSIS = 1 Each                                                                        |
| 870                                             | PLACING TOPSOIL<br>(6679X1/1000X55.6) = 371 Cu Yd                                                  |
| 870                                             | WATER<br>(2X6679X9X1/1000X300X1/1000) = 36 M Gal                                                   |
| QUANTITIES CARRIED TO GENERAL SUMMARY, SHEET 13 |                                                                                                    |

| ROADWAY "R"               |            |                          |                  |                                           |                                                         |      |       |      |
|---------------------------|------------|--------------------------|------------------|-------------------------------------------|---------------------------------------------------------|------|-------|------|
| Reference No.             | Sheet No.  | Location                 | 202              |                                           |                                                         | 604  | 608   | 690  |
|                           |            |                          | Steps<br>Removed | Removal Misc.<br>Business Sign<br>Removed | Removal Misc.<br>Concrete Sign<br>Foundation<br>Removed |      |       |      |
|                           |            |                          | Ln Ft            | Each                                      | Each                                                    | Each | Ln Ft | Each |
| 1R                        | 16         | PC 711+55.00 C (PSR 117) |                  |                                           |                                                         | /    |       |      |
| 2R                        | 17         | PC 714+90.00 C (ESR 117) |                  |                                           |                                                         | /    |       |      |
| 3R                        | 17         | PT 715+60.00 C (ESR 117) |                  |                                           |                                                         | /    |       |      |
| 4R                        | 17, 34     | PT 716+54.74 C (PSR 117) |                  |                                           |                                                         | /    |       |      |
| 5R                        | 17, 34, 40 | PI 717+33.37 C (ESR 117) |                  |                                           |                                                         | /    |       |      |
| 6R                        | 18         | 719+11.5 Rt (SR 117)     | 12.5             |                                           |                                                         |      | 15.0  |      |
| 7R                        | 18         | 719+26.0 Rt (SR 117)     |                  | /                                         | /                                                       |      |       |      |
| 8R                        | 18         | PC 721+07.38 C (ESR 117) |                  |                                           |                                                         | /    |       |      |
| 9R                        | 19         | PT 722+92.83 C (ESR 117) |                  |                                           |                                                         | /    |       |      |
| 10R                       | 19         | PC 723+89.63 C (ESR 117) |                  |                                           |                                                         | /    |       |      |
| 11R                       | 19A        | PT 728+64.63 C (ESR 117) |                  |                                           |                                                         | /    |       |      |
| 12R                       | 33         | 95+50.5 Rt (Shawnee)     |                  |                                           |                                                         |      |       | /    |
| 13R                       | 40         | 12+64.0 Lt (W Ohio)      |                  |                                           |                                                         |      |       | /    |
| 14R                       | 40         | 13+43.0 Lt (W Ohio)      |                  |                                           |                                                         |      |       | /    |
| 15R                       | 40         | 13+86.0 Lt (W Ohio)      |                  |                                           |                                                         |      |       | /    |
| 16R                       | 17, 34, 40 | PC 10+88.22 C (W Ohio)   |                  |                                           |                                                         | /    |       |      |
| 17R                       | 40         | PT 13+88.06 C (W Ohio)   |                  |                                           |                                                         | /    |       |      |
| TOTAL CARRIED TO SHEET 13 |            |                          | 13               | 1                                         | 1                                                       | 11   | 15    | 4    |



TYPICAL SECTIONS - DRIVES



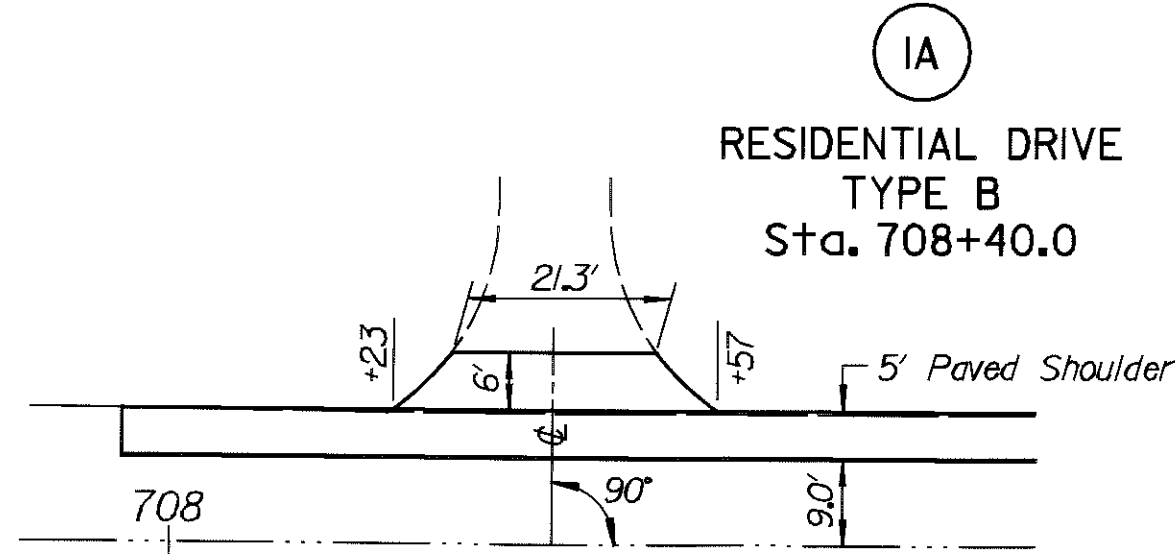
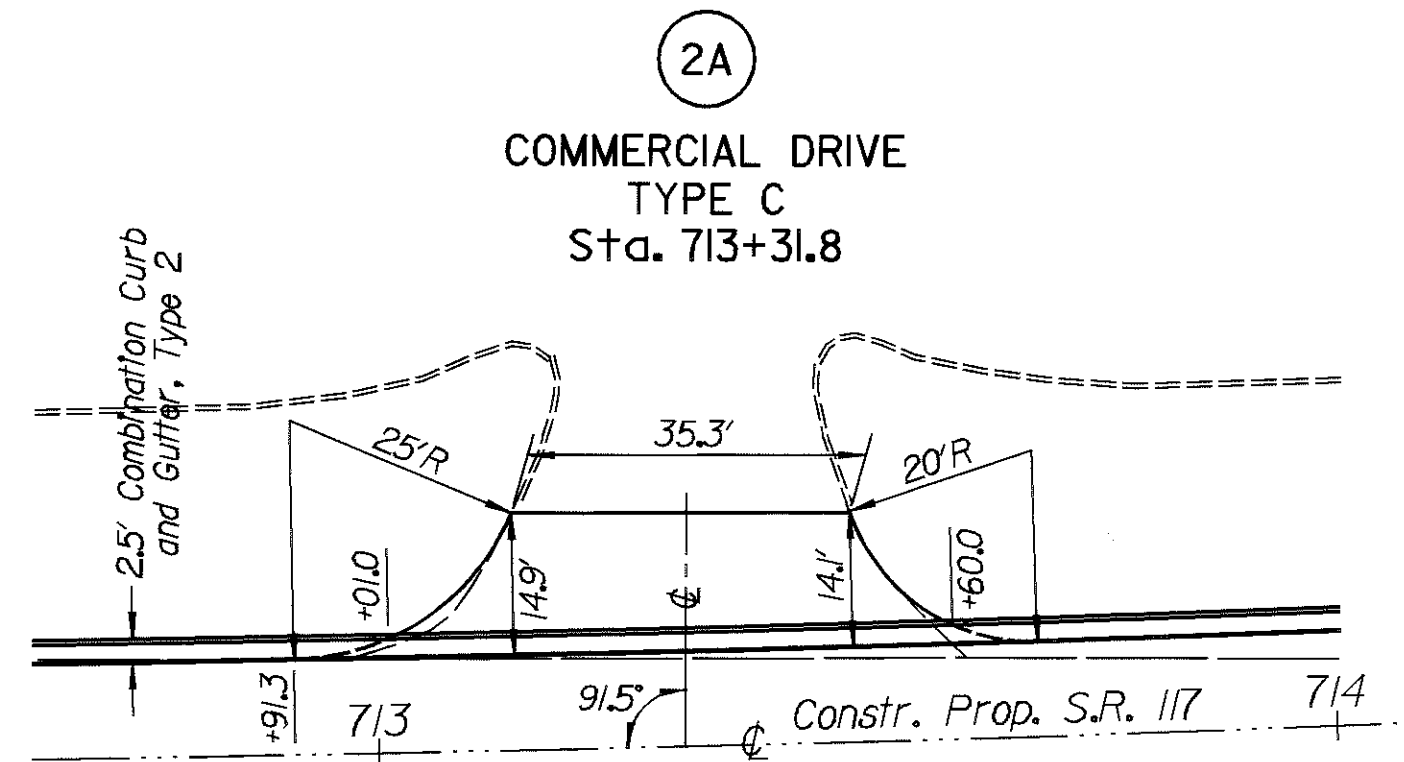
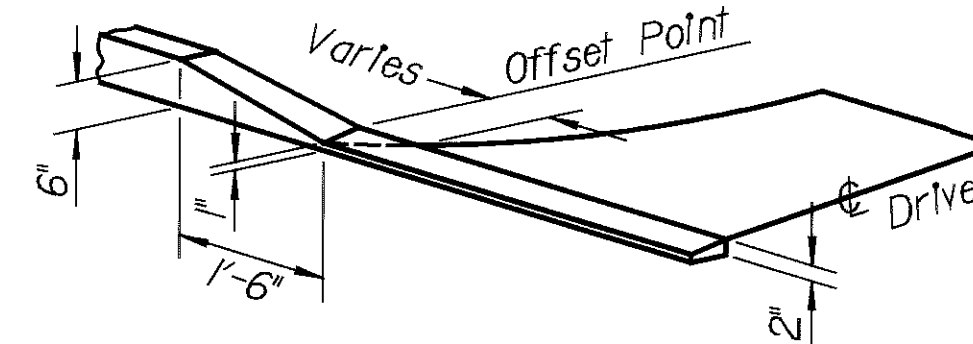
PROPOSED LEGEND

- 1 Item 448 1-1/4" Asphalt Concrete Surface Course, Type 1, PG64-22, as per Plan
- 2 Item 448 1-3/4" Asphalt Concrete Intermediate Course, Type 2, PG64-22
- 3 Item 304 Aggregate Base (Thickness as Shown)
- 4 Item 407 Tack Coat for Intermediate Course (See General Note)
- 5 Item 408 Bituminous Prime Coat applied at a rate of 0.40 Gallons per Sq Yd

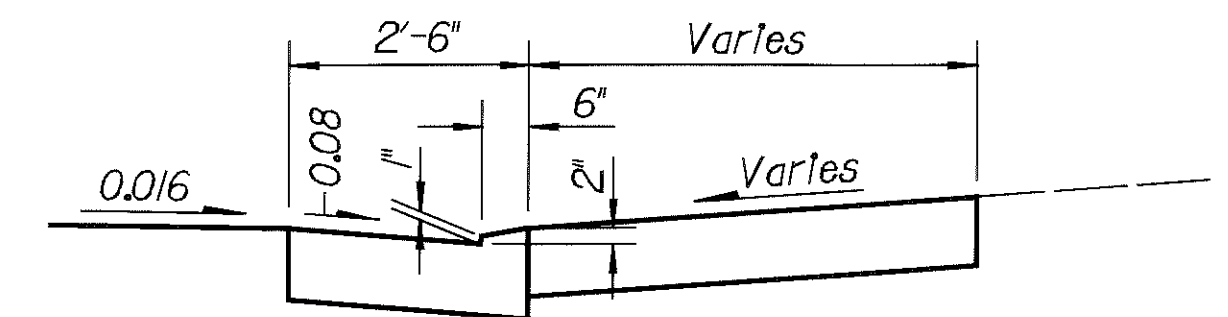
SIDE APPROACHES "A"

| Reference No.              | Sheet No. | Location             | Type  | Total Area | 304            | 407                               | 408                                                  | 448                                                            |
|----------------------------|-----------|----------------------|-------|------------|----------------|-----------------------------------|------------------------------------------------------|----------------------------------------------------------------|
|                            |           |                      |       |            | Aggregate Base | Tack Coat for Intermediate Course | Bituminous Prime Coat, applied at 0.40 Gallons/Sq Yd | Asphalt Concrete Intermediate Course, Type 2, PG64-22 (1-3/4") |
|                            |           |                      |       | Sq Yd      | Cu Yd          | Gallon                            | Gallon                                               | Cu Yd                                                          |
| 1A                         | 15        | 708+40.0 Lt (SR 117) | Res.  | 18.0       | 4.0            |                                   |                                                      |                                                                |
| 2A                         | 16        | 713+31.8 Lt (SR 117) | Comm. | 58.0       | 12.9           | 4.4                               | 23.2                                                 | 2.8                                                            |
| 3A                         | 18        | 719+44.0 Lt (SR 117) | Comm. | 46.6       | 10.4           | 3.5                               | 18.6                                                 | 2.3                                                            |
| 4A                         | 18        | 720+05.0 Lt (SR 117) | Comm. | 51.5       | 14.3           |                                   |                                                      |                                                                |
| 5A                         | 18        | 719+54.5 Rt (SR 117) | Comm. | 92.2*      | 20.5           | 6.9                               | 36.9                                                 | 4.5                                                            |
| 6A                         | 18        | 720+39.5 Rt (SR 117) | Comm. | 28.0       | 6.2            | 2.1                               | 11.2                                                 | 1.4                                                            |
| 7A                         | 18        | 720+92.5 Rt (SR 117) | Comm. | 26.9       | 6.0            | 2.0                               | 10.8                                                 | 1.3                                                            |
| 8A                         | 19        | 723+13.3 Lt (SR 117) | Comm. | 46.3       | 10.3           | 3.5                               | 18.5                                                 | 2.3                                                            |
| 9A                         | 19        | 722+22.0 Rt (SR 117) | Comm. | 64.7       | 14.4           | 4.9                               | 25.9                                                 | 3.1                                                            |
| 10A                        | 19        | 724+74.1 Rt (SR 117) | Comm. | 77.9       | 17.3           | 5.8                               | 31.2                                                 | 3.8                                                            |
| TOTALS CARRIED TO SHEET 14 |           |                      |       |            | 116            | 33                                | 176                                                  | 22                                                             |

\* Includes Pavement Area to Sta. 720+21.5



ISOMETRIC VIEW



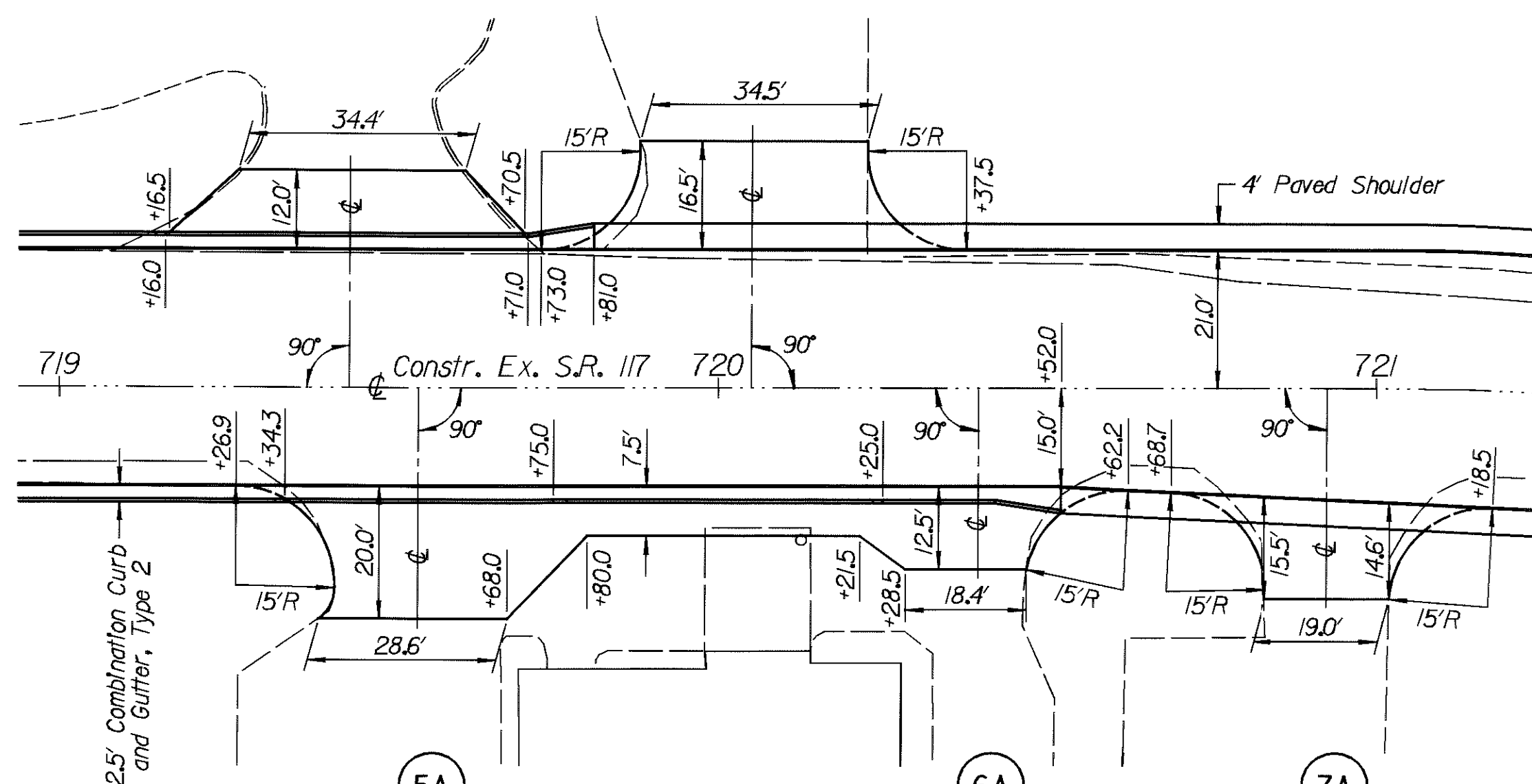
DRIVEWAY PROFILE

DRIVEWAY DETAILS AT CURB

3A COMMERCIAL DRIVE TYPE C Sta. 719+44.0

4A COMMERCIAL DRIVE TYPE D Sta. 720+05.0

S.R. 117



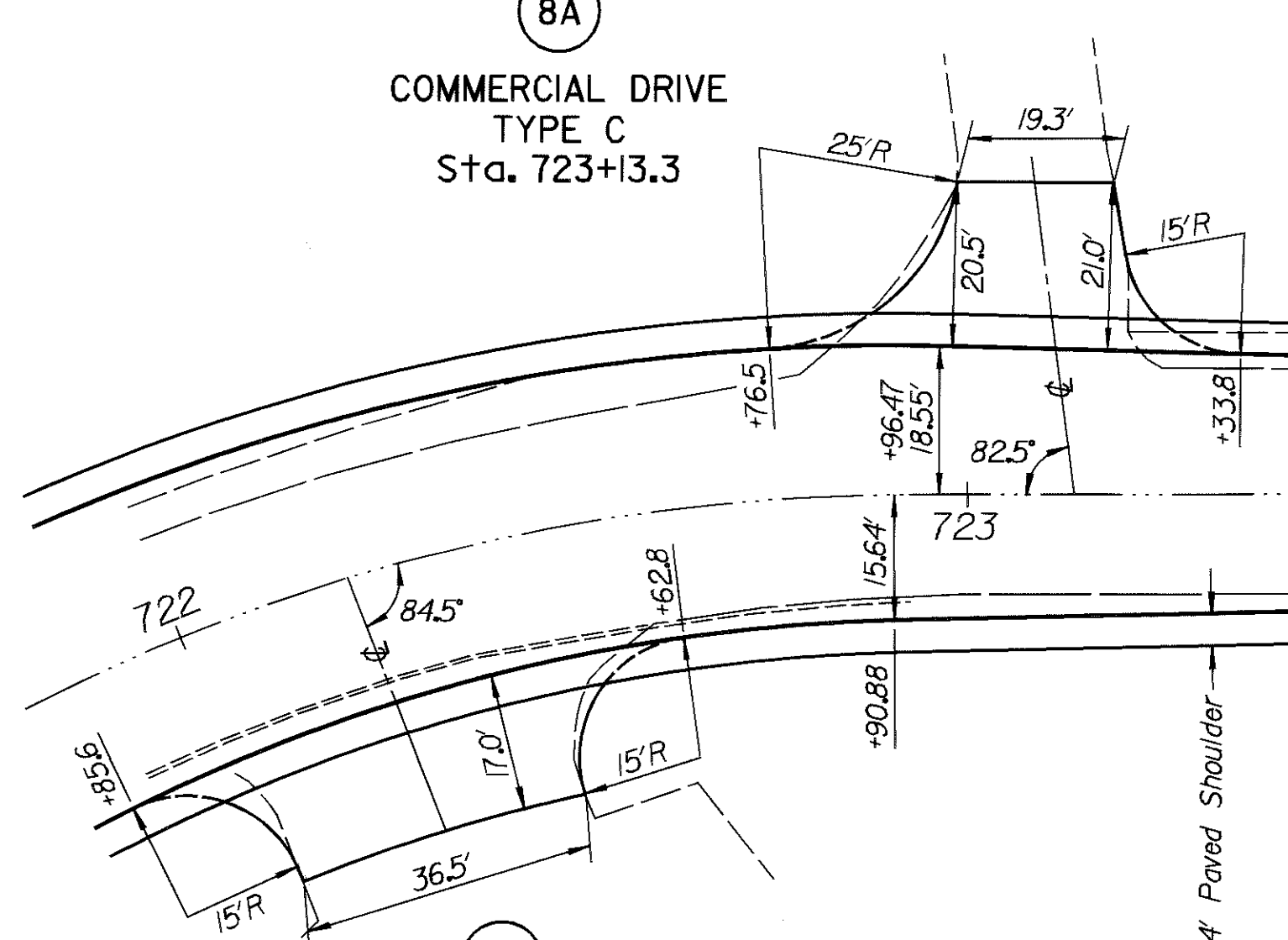
5A COMMERCIAL DRIVE TYPE C Sta. 719+54.5

6A COMMERCIAL DRIVE TYPE C Sta. 720+39.5

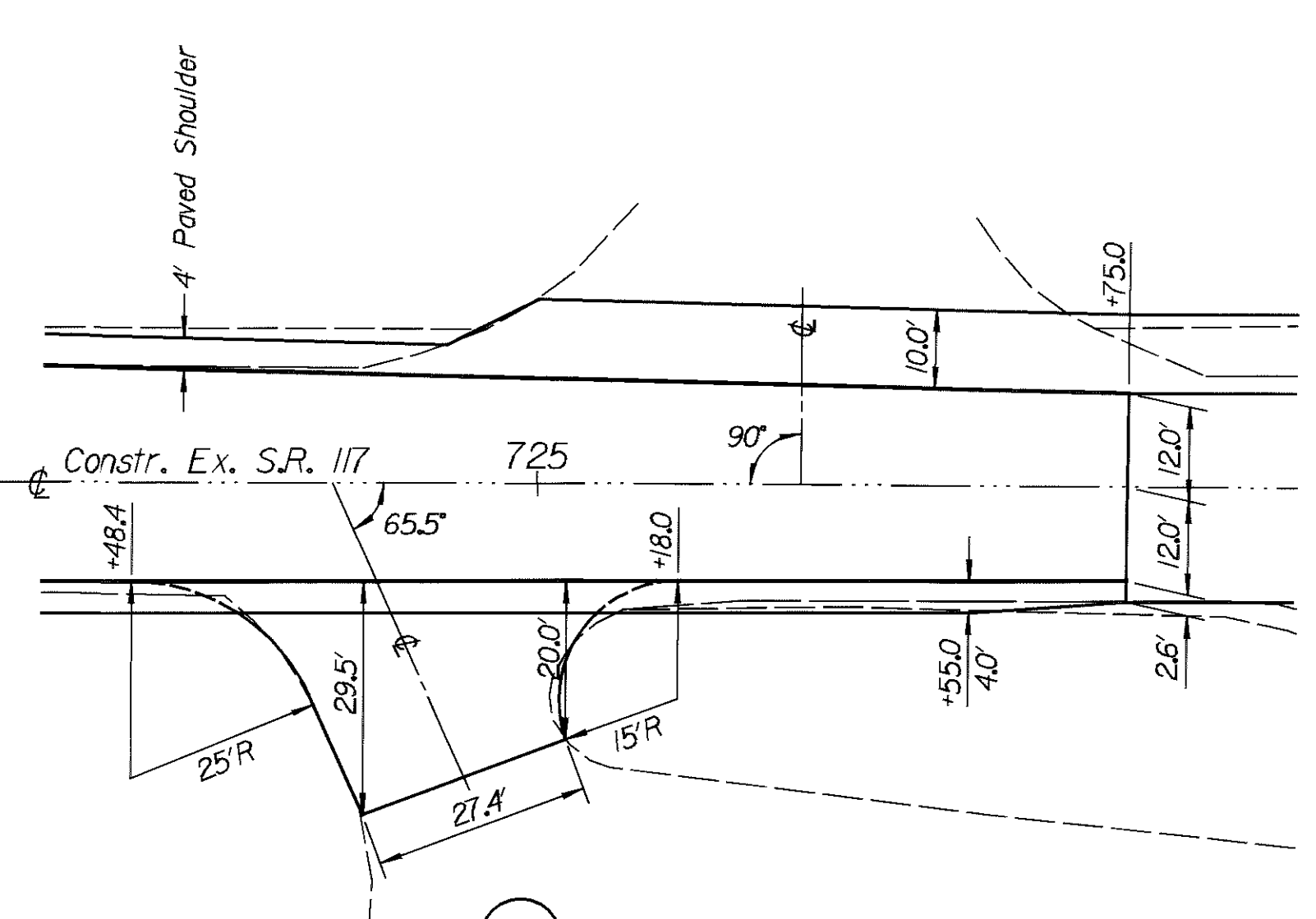
7A COMMERCIAL DRIVE TYPE C Sta. 720+92.5

S.R. 117

8A COMMERCIAL DRIVE TYPE C Sta. 723+13.3



9A COMMERCIAL DRIVE TYPE C Sta. 722+22.0



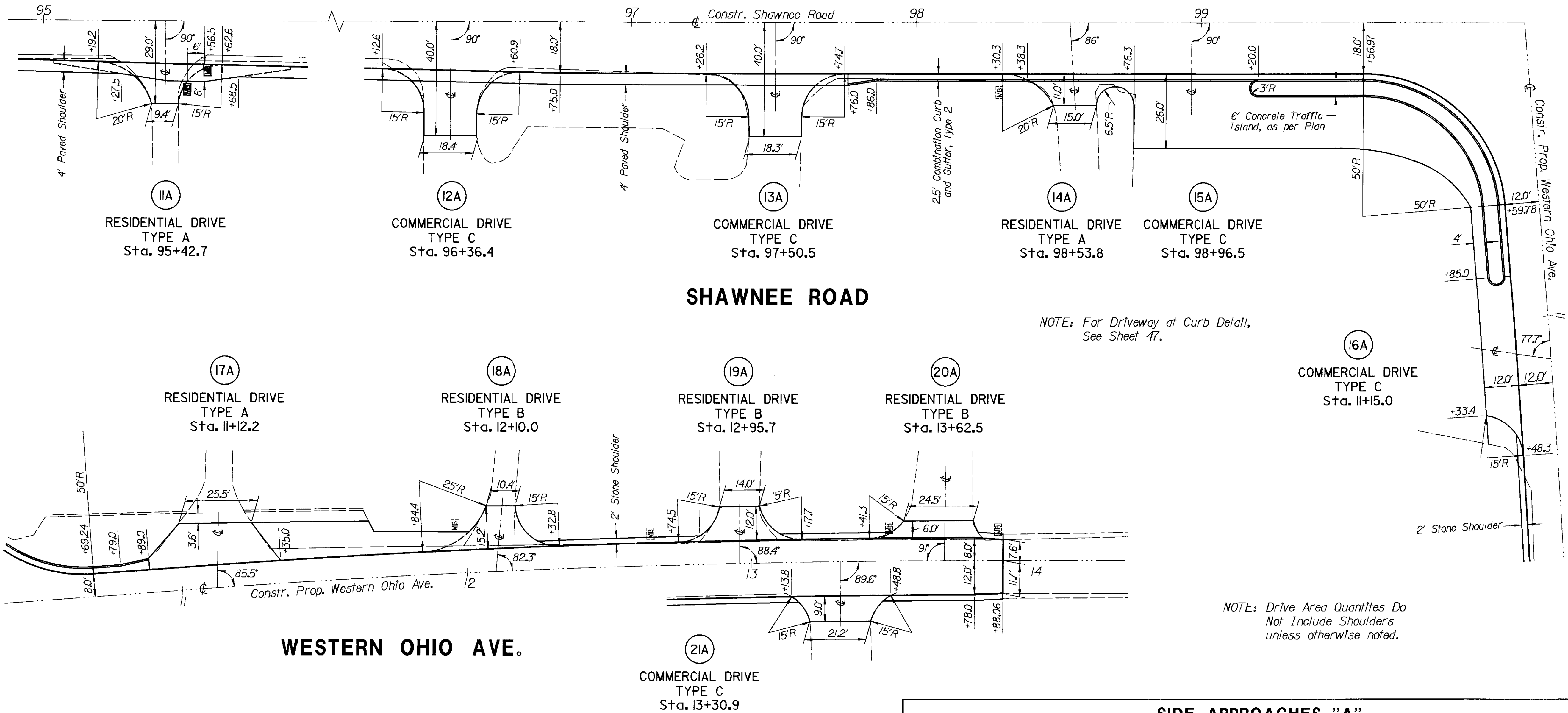
10A COMMERCIAL DRIVE TYPE C Sta. 724+74.1

NOTE: Drive Area Quantities Do Not Include Shoulders unless otherwise noted.

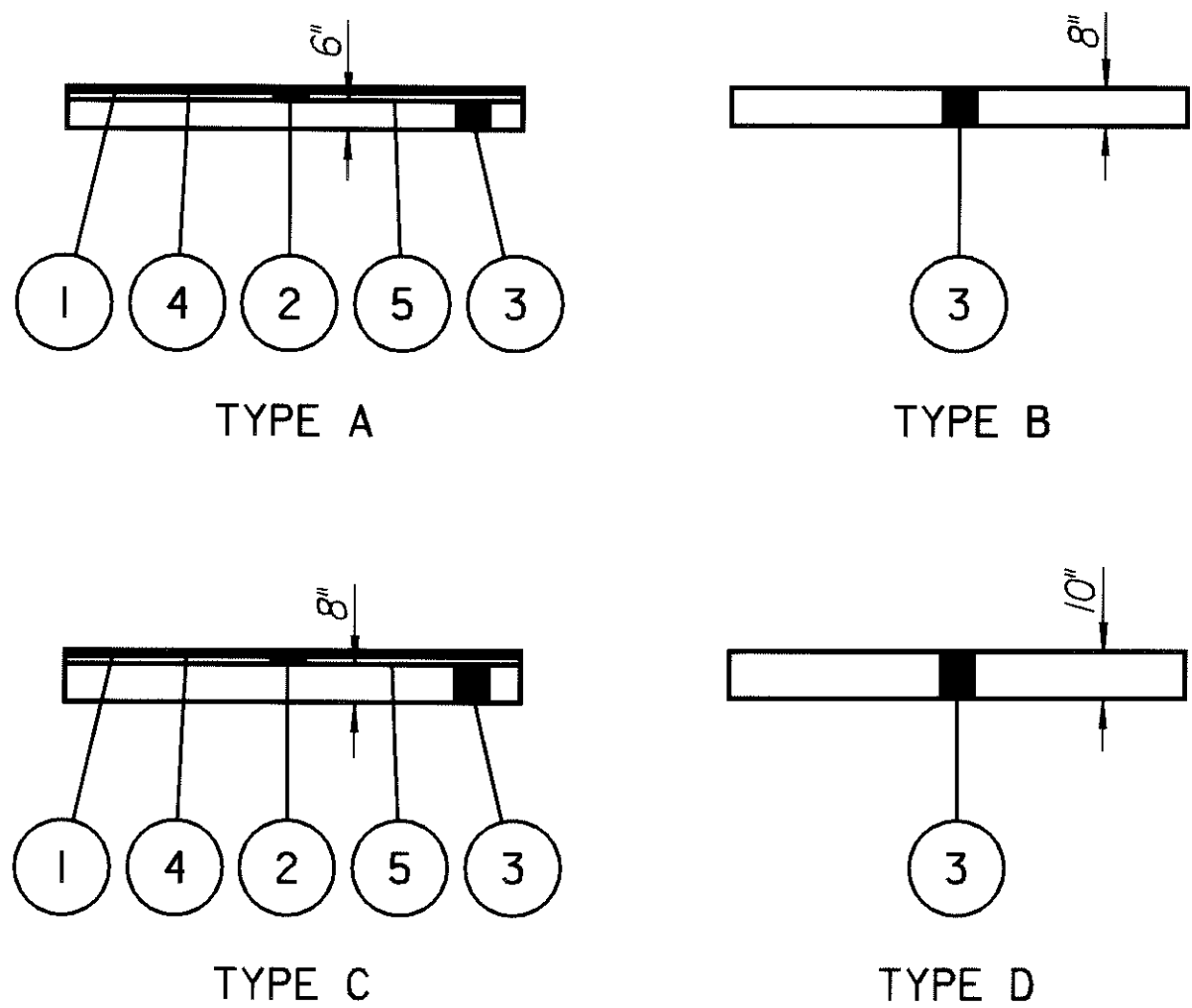


DESIGN FILE : I:\pdp\19314\civil\7gm.dgn  
USERNAME : nyondere

DATE : 10-AUG-2001  
TIME : 13:36



TYPICAL SECTIONS - DRIVES



PROPOSED LEGEND

- 1 Item 448 1-1/4" Asphalt Concrete Surface Course, Type 1, PG64-22, as per Plan
- 2 Item 448 1-3/4" Asphalt Concrete Intermediate Course, Type 2, PG64-22
- 3 Item 304 Aggregate Base (Thickness as Shown)
- 4 Item 407 Tack Coat for Intermediate Course (See General Note)
- 5 Item 408 Bituminous Prime Coat applied at a rate of 0.40 Gallons per Sq Yd

SIDE APPROACHES "A"

| Reference No.              | Sheet No. | Location             | Type  | Total Area | 304            |  | 407    | 408    | 448                                                 |                                                                  |
|----------------------------|-----------|----------------------|-------|------------|----------------|--|--------|--------|-----------------------------------------------------|------------------------------------------------------------------|
|                            |           |                      |       |            | Aggregate Base |  |        |        | Bituminous Prime Coat, applied at 0.40 Gallon/Sq Yd | Asphalt Concrete Intermediate Course, Type 2, PG64-22 (T=1-3/4") |
|                            |           |                      |       | Sq Yd      | Cu Yd          |  | Gallon | Gallon | Cu Yd                                               | Cu Yd                                                            |
| 11A                        | 33        | 95+42.7 Rt (Shawnee) | Res.  | 11.8       | 2.0            |  | 0.9    | 4.7    | 0.6                                                 | 0.4                                                              |
| 12A                        | 34        | 96+36.4 Rt (Shawnee) | Comm. | 42.3       | 9.4            |  | 3.2    | 16.9   | 2.1                                                 | 1.5                                                              |
| 13A                        | 34        | 97+50.5 Rt (Shawnee) | Comm. | 40.8       | 9.1            |  | 3.1    | 16.3   | 2.0                                                 | 1.4                                                              |
| 14A                        | 34        | 98+53.8 Rt (Shawnee) | Res.  | 19.8       | 3.3            |  | 1.5    | 7.9    | 1.0                                                 | 0.7                                                              |
| 15A                        | 34        | 98+96.5 Rt (Shawnee) | Comm. | 279.2 #    | 62.0           |  | 20.9   | 111.7  | 13.6                                                | 9.7                                                              |
| 16A                        | 40        | 11+15.0 Rt (W Ohio)  | Comm. | 54.8       | 12.2           |  | 5.1 *  | 27.1 * | 3.3 *                                               | 2.4 *                                                            |
| 17A                        | 40        | 11+12.2 Lt (W Ohio)  | Res.  | 50.7       | 8.5            |  | 4.6 *  | 24.3 * | 3.0 *                                               | 2.1 *                                                            |
| 18A                        | 40        | 12+10.0 Lt (W Ohio)  | Res.  | 88.6 #     | 19.7           |  |        |        |                                                     |                                                                  |
| 19A                        | 40        | 12+95.7 Lt (W Ohio)  | Res.  | 20.3       | 4.5            |  |        |        |                                                     |                                                                  |
| 20A                        | 40        | 13+62.5 Lt (W Ohio)  | Res.  | 12.1       | 2.7            |  |        |        |                                                     |                                                                  |
| 21A                        | 40        | 13+30.9 Rt (W Ohio)  | Comm. | 16.7       | 3.7            |  | 1.8 *  | 9.5 *  | 1.2 *                                               | 0.8 *                                                            |
| TOTALS CARRIED TO SHEET 14 |           |                      |       |            | 137            |  | 41     | 218    | 27                                                  | 19                                                               |

\* Includes Quantity for Shoulder

# Includes Parking Lot to Sta. 10+85  
## Includes Parking Lot to Sta. 11+25





A horizontal scale bar with markings at 0, 5, 10, and 20 feet. The scale is oriented horizontally, with the 0 mark on the left and the 20 mark on the right.

|            |         |
|------------|---------|
| CALCULATED | CHECKED |
|------------|---------|

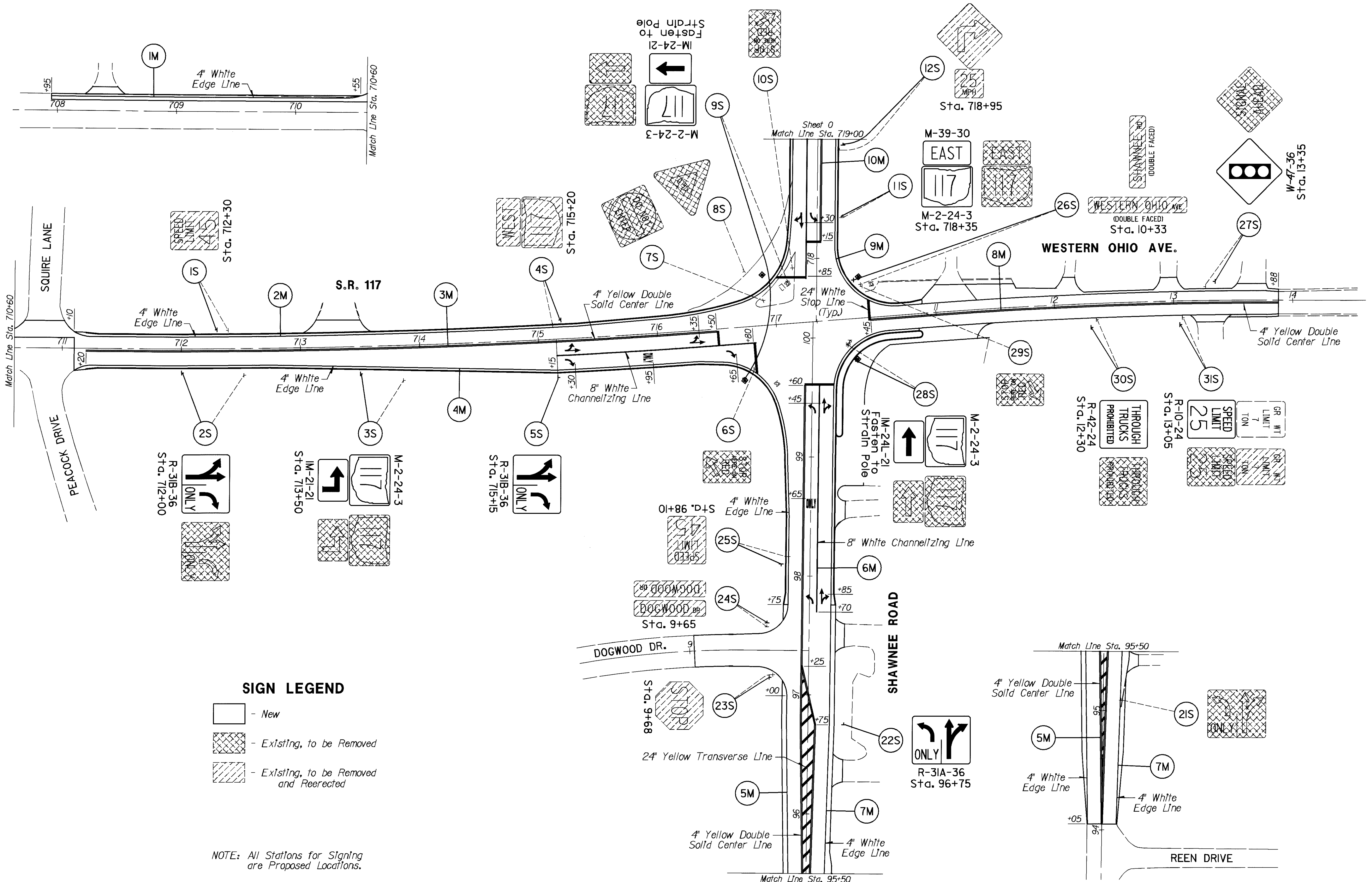
## INTERSECTION DETAIL

ALL-117-13.47

49  
65



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DATE : 10-AUG-2001  
TIME : 13:38

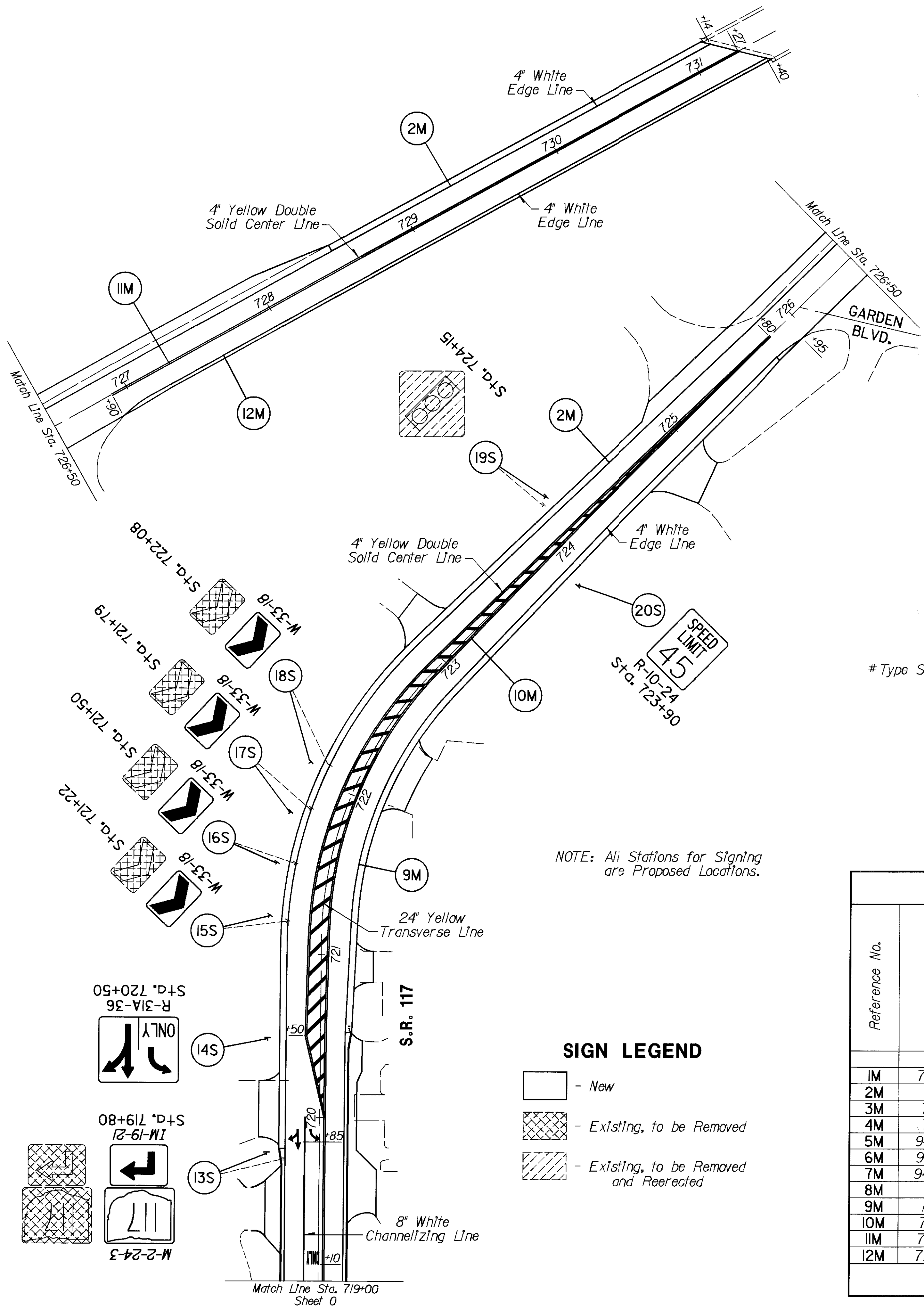


**SIGN LEGEND**

|  |                                         |
|--|-----------------------------------------|
|  | - New                                   |
|  | - Existing, to be Removed               |
|  | - Existing, to be Removed and Reerected |

NOTE: All Stations for Signing are Proposed Locations.





# Type S

| SIGNS "S"                 |                        |      |           |         |                                          |                                          |                             |                                           |                                |                                                   |                                                        |                                                              |
|---------------------------|------------------------|------|-----------|---------|------------------------------------------|------------------------------------------|-----------------------------|-------------------------------------------|--------------------------------|---------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------|
| Reference No.             | Location<br>(Proposed) | Side | Code No.  | Size    | 630                                      |                                          |                             |                                           |                                |                                                   |                                                        |                                                              |
|                           |                        |      |           |         | Ground Mounted<br>Support,<br>No. 2 Post | Ground Mounted<br>Support,<br>No. 3 Post | Street Name<br>Sign Support | Sign Support<br>Assembly, Pole<br>Mounted | Sign,<br>Flat Sheet,<br>Type G | Removal of<br>Ground Mounted<br>Sign and Disposal | Removal of<br>Ground Mounted<br>Sign and<br>Reerection | Removal of<br>Ground Mounted<br>Post Support<br>and Disposal |
|                           |                        |      |           |         | L/n Ft                                   | L/n Ft                                   | Each                        | Each                                      | Sq Ft                          | Each                                              | Each                                                   | Each                                                         |
| 1S                        | 712+30 (SR 117)        | Lt   |           |         |                                          |                                          |                             |                                           |                                |                                                   |                                                        |                                                              |
| 2S                        | 712+00 (SR 117)        | Rt   | R-31B-36  | 36"x30" | 10.5/10.5                                |                                          |                             |                                           | 7.5                            | 1                                                 |                                                        | 1                                                            |
| 3S                        | 713+50 (SR 117)        | Rt   | M-2-24-3  | 30"x24" |                                          | 10.5                                     |                             |                                           | 5.0                            | 2                                                 |                                                        | 2                                                            |
|                           |                        |      | IM-21-21  | 21"x15" |                                          |                                          |                             |                                           | 2.2                            |                                                   |                                                        |                                                              |
| 4S                        | 715+20 (SR 117)        | Lt   |           |         |                                          | 11.5                                     |                             |                                           |                                |                                                   | 2                                                      | 1                                                            |
| 5S                        | 715+15 (SR 117)        | Rt   | R-31B-36  | 36"x30" | 10.5/10.5                                |                                          |                             |                                           | 7.5                            |                                                   |                                                        |                                                              |
| 6S                        | 716+79 (SR 117)        | Rt   |           |         |                                          |                                          |                             |                                           |                                | 1                                                 |                                                        | 1                                                            |
| 7S                        | 716+91 (SR 117)        | Lt   |           |         |                                          |                                          |                             |                                           |                                | 1                                                 |                                                        | 1                                                            |
| 8S                        | 716+76 (SR 117)        | Lt   |           |         |                                          |                                          |                             |                                           |                                | 1                                                 |                                                        | 1                                                            |
| 9S                        | 716+70 (SR 117)        | Rt   | M-2-24-3  | 30"x24" |                                          |                                          |                             | 1                                         | 5.0                            | 2                                                 |                                                        |                                                              |
|                           |                        |      | IM-24-21  | 21"x15" |                                          |                                          |                             | 1                                         | 2.2                            |                                                   |                                                        |                                                              |
| 10S                       | 717+92 (SR 117)        | Lt   |           |         |                                          |                                          |                             |                                           |                                | 1                                                 |                                                        | 1                                                            |
| 11S                       | 718+35 (SR 117)        | Rt   | M-2-24-3  | 30"x24" |                                          | 11.5                                     |                             |                                           | 5.0                            | 2                                                 |                                                        | 1                                                            |
|                           |                        |      | M-39-30   | 30"x15" |                                          |                                          |                             |                                           | 3.1                            |                                                   |                                                        |                                                              |
| 12S                       | 718+95 (SR 117)        | Rt   |           |         | 12.5/12.5                                |                                          |                             |                                           |                                |                                                   | 2                                                      | 2                                                            |
| 13S                       | 719+80 (SR 117)        | Lt   | M-2-24-3  | 30"x24" |                                          | 10.5                                     |                             |                                           | 5.0                            | 2                                                 |                                                        | 1                                                            |
|                           |                        |      | IM-19-21  | 21"x15" |                                          |                                          |                             |                                           | 2.2                            |                                                   |                                                        |                                                              |
| 14S                       | 720+50 (SR 117)        | Lt   | R-31A-36  | 36"x30" | 10.5/10.5                                |                                          |                             |                                           | 7.5                            |                                                   |                                                        |                                                              |
| 15S                       | 721+22 (SR 117)        | Lt   | W-33-18   | 18"x24" |                                          | 10.0                                     |                             |                                           | 3.0                            | 1                                                 |                                                        | 1                                                            |
| 16S                       | 721+50 (SR 117)        | Lt   | W-33-18   | 18"x24" |                                          | 10.0                                     |                             |                                           | 3.0                            | 1                                                 |                                                        | 1                                                            |
| 17S                       | 721+79 (SR 117)        | Lt   | W-33-18   | 18"x24" |                                          | 10.0                                     |                             |                                           | 3.0                            | 1                                                 |                                                        | 1                                                            |
| 18S                       | 722+08 (SR 117)        | Lt   | W-33-18   | 18"x24" |                                          | 10.0                                     |                             |                                           | 3.0                            | 1                                                 |                                                        | 1                                                            |
| 19S                       | 724+15 (SR 117)        | Lt   |           |         | 12.5/12.5                                |                                          |                             |                                           |                                |                                                   | 1                                                      | 2                                                            |
| 20S                       | 723+90 (SR 117)        | Rt   | R-10-24   | 24"x30" |                                          | 10.5                                     |                             |                                           | 5.0                            |                                                   |                                                        |                                                              |
| 21S                       | 95+08 (Shawnee)        | Rt   |           |         |                                          |                                          |                             |                                           |                                | 1                                                 |                                                        | 1                                                            |
| 22S                       | 96+75 (Shawnee)        | Rt   | R-31A-36  | 36"x30" | 10.5/10.5                                |                                          |                             |                                           | 7.5                            |                                                   |                                                        |                                                              |
| 23S                       | 9+68 (Dogwood)         | Rt   |           |         |                                          | 10.5                                     |                             |                                           |                                |                                                   | 1                                                      | 1                                                            |
| 24S                       | 9+65 (Dogwood)         | Lt   |           |         |                                          | 10.5 #                                   |                             |                                           |                                |                                                   | 2                                                      | 1                                                            |
| 25S                       | 98+10 (Shawnee)        | Lt   |           |         |                                          | 10.5                                     |                             |                                           |                                |                                                   | 1                                                      | 1                                                            |
| 26S                       | 10+33 (W Ohio)         | Lt   |           |         |                                          |                                          | 1                           |                                           |                                |                                                   | 2                                                      | 1                                                            |
| 27S                       | 13+35 (W Ohio)         | Lt   | W-47-36   | 36"x36" | 12.5/12.5                                |                                          |                             |                                           | 9.0                            | 1                                                 |                                                        | 1                                                            |
| 28S                       | 10+32 (W Ohio)         | Rt   | M-2-24-3  | 30"x24" |                                          |                                          |                             | 1                                         | 5.0                            | 2                                                 |                                                        |                                                              |
|                           |                        |      | IM-24L-21 | 21"x15" |                                          |                                          |                             | 1                                         | 2.2                            |                                                   |                                                        |                                                              |
| 29S                       | 10+65 (W Ohio)         | Lt   |           |         |                                          |                                          |                             |                                           |                                | 1                                                 |                                                        | 1                                                            |
| 30S                       | 12+30 (W Ohio)         | Rt   | R-42-24   | 24"x24" |                                          | 10.0                                     |                             |                                           | 4.0                            | 1                                                 |                                                        | 1                                                            |
| 31S                       | 13+05 (W Ohio)         | Rt   | R-10-24   | 24"x30" |                                          | 12.0                                     |                             |                                           | 5.0                            | 1                                                 | 1                                                      | 1                                                            |
| TOTAL CARRIED TO SHEET 14 |                        |      |           |         | 159.0                                    | 158.5                                    | 1                           | 4                                         | 101.9                          | 24                                                | 13                                                     | 28                                                           |

| PAVEMENT MARKING "M"            |                    |                    |                                            |                        |              |           |             |                           |                   |                         |                    |                               |
|---------------------------------|--------------------|--------------------|--------------------------------------------|------------------------|--------------|-----------|-------------|---------------------------|-------------------|-------------------------|--------------------|-------------------------------|
| Reference No.                   | Location           |                    | 202                                        | 621                    |              | 642       |             | 829                       |                   |                         |                    |                               |
|                                 |                    |                    | Raised Pavement Marker Removed for Storage | Raised Pavement Marker |              | Edge Line | Center Line | Channelizing Line, Type C | Stop Line, Type C | Transverse Line, Type C | Lane Arrow, Type C | Word On Pavement, 96", Type C |
|                                 |                    |                    |                                            | 2-Way Yellow           | 2-Way Wh/Red |           |             |                           |                   |                         |                    |                               |
|                                 | From               | To                 | Each                                       | Each                   | Each         | Mile      | Mile        | L/n Ft                    | L/n Ft            | L/n Ft                  | Each               | Each                          |
| 1M                              | 707+95 Lt (SR 117) | 710+55 Lt (SR 117) |                                            |                        |              | 0.049     |             |                           |                   |                         |                    |                               |
| 2M                              | 711+10 Lt (SR 117) | 731+14 Lt (SR 117) |                                            |                        |              | 0.368     |             |                           |                   |                         |                    |                               |
| 3M                              | 711+20 C (SR 117)  | 716+82 C (SR 117)  | 24                                         | 7                      | 4            |           | 0.100       | 165                       | 38                |                         | 4                  | 1                             |
| 4M                              | 711+10 Rt (SR 117) | 97+75 Lt (Shawnee) |                                            |                        |              | 0.147     |             |                           |                   |                         |                    |                               |
| 5M                              | 94+05 Lt (Shawnee) | 97+00 Lt (Shawnee) |                                            |                        |              | 0.056     |             |                           |                   |                         |                    |                               |
| 6M                              | 94+05 C (Shawnee)  | 99+62 C (Shawnee)  |                                            |                        |              |           | 0.166       | 190                       | 25                | 190                     | 4                  | 1                             |
| 7M                              | 94+05 Rt (Shawnee) | 11+05 Rt (W Ohio)  |                                            |                        |              | 0.127     |             |                           |                   |                         |                    |                               |
| 8M                              | 11+43 C (W Ohio)   | 13+88 C (W Ohio)   |                                            |                        |              |           | 0.046       |                           | 18                |                         |                    |                               |
| 9M                              | 10+89 Lt (W Ohio)  | 725+95 Rt (SR 117) |                                            |                        |              | 0.163     |             |                           |                   |                         |                    |                               |
| 10M                             | 717+83 C (SR 117)  | 725+80 C (SR 117)  | 26                                         | 16                     | 5            |           | 0.252       | 215                       | 37                | 360                     | 4                  | 1                             |
| 11M                             | 726+90 C (SR 117)  | 731+27 C (SR 117)  | 6                                          | 6                      |              |           | 0.083       |                           |                   |                         |                    |                               |
| 12M                             | 726+90 Rt (SR 117) | 731+40 Rt (SR 117) |                                            |                        |              | 0.085     |             |                           |                   |                         |                    |                               |
| TOTAL CARRIED TO SHEETS 13 & 14 |                    |                    | 56                                         | 38                     |              | 1.00      | 0.65        | 570                       | 118               | 550                     | 12                 | 3                             |



SCALE IN FEET  
0 20 40 80

CALCULATED  
CHECKED

TRAFFIC CONTROL PLAN

ALL-117-13.47

51  
65



DESIGN FILE : I:\pdr\9314\Traffic Signal\9314cn.dgn  
USERNAME : nvondere

DATE : 10-AUG-2001  
TIME : 13:39

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS A PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 120 DAYS FOLLOWING THE COMPLETION OF THE 10 DAY PERFORMANCE TEST. IN THE EVENT OF UNSATISFACTORY OPERATION, THE CONTRACTOR SHALL CORRECT FAULTY INSTALLATIONS, MAKE REPAIRS AND REPLACE DEFECTIVE PARTS WITH NEW PARTS OF EQUAL OR BETTER QUALITY. EQUIPMENT, MATERIAL AND LABOR COSTS INCURRED IN CORRECTING AN UNSATISFACTORY OPERATION SHALL BE BORNE BY THE CONTRACTOR.

THE GUARANTEE SHALL COVER THE FOLLOWING ITEMS OF THE TRAFFIC CONTROL SYSTEM: CONTROLLERS AND ASSOCIATED EQUIPMENT, DETECTOR UNITS, INTERCONNECTION ITEMS AND MASTER CONTROL EQUIPMENT.

CUSTOMARY MANUFACTURER'S GUARANTEES FOR THE FOREGOING ITEMS SHALL BE TURNED OVER TO THE STATE OR THE MAINTAINING AGENCY FOLLOWING ACCEPTANCE OF THE EQUIPMENT.

THE COST OF GUARANTEEING THE TRAFFIC CONTROL SYSTEM WILL BE INCIDENTAL TO AND INCLUDED IN THE CONTRACT UNIT PRICE OF THE VARIOUS ITEMS MAKING UP THE SYSTEM.

UTILITY OWNERSHIP

LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS:

|                                                                         |                                                                                                     |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| TELEPHONE                                                               | CABLE                                                                                               |
| SPRINT<br>122 S. ELIZABETH ST.<br>LIMA, OHIO 45802<br>419-222-6220      | TIME WARNER CABLE<br>3100 ELIDA RD.<br>LIMA, OHIO 45805<br>419-331-1111                             |
| ELECTRIC                                                                | SANITARY                                                                                            |
| AEP<br>2738 N. MAIN ST.<br>FINDLAY, OHIO 45807<br>419-425-7545          | WATER<br>CITY OF LIMA<br>UTILITIES DEPARTMENT<br>50 TOWN SQUARE<br>LIMA, OHIO 45801<br>419-228-5462 |
| GAS                                                                     |                                                                                                     |
| WEST OHIO GAS<br>150 S. JACKSON ST.<br>LIMA, OHIO 45801<br>419-226-4700 |                                                                                                     |

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

POWER SUPPLY FOR TRAFFIC SIGNALS

ELECTRIC POWER SHALL BE OBTAINED FROM THE OHIO POWER COMPANY AT THE LOCATION ON THE PLANS. POWER SUPPLIED SHALL BE 120 VOLTS.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE TRAFFIC SIGNAL GENERAL SUMMARY FOR THE WORK NOTED ABOVE:

ITEM 632 POWER SERVICE = 1 EACH

INSPECTION

THE SIGNALS SHALL BE INSPECTED JUST PRIOR TO THE START OF THE TEN DAY PERFORMANCE TEST SPECIFIED IN CMS 632.27(6). ALL OTHER CONSTRUCTION PAY ITEMS SHALL BE COMPLETED INCLUDING THE ELECTRICAL TESTS SPECIFIED IN 632.27(1)-(4) AND FUNCTIONAL TEST SPECIFIED IN 632.27(5).

THE PROJECT ENGINEER SHALL NOTIFY THE APPROPRIATE ROADWAY SERVICES PERSONNEL AT DISTRICT ONE (1) OF THE COMPLETION OF SIGNAL CONSTRUCTION PRIOR TO THE TEN DAY PERFORMANCE TEST. TWO(2) WEEKS NOTICE SHOULD BE GIVEN. THE DISTRICT ONE (1) CONSTRUCTION DEPARTMENT SHALL FOLLOW ALL PROCEDURES SET FORTH IN THE STANDARD OPERATING PROCEDURE OPS-211 SECTION D, PARAGRAPH 3 AND THE DIVISION OF CONSTRUCTION STANDARD OPERATING PROCEDURE PH-C-104. ALL DEFICIENCIES FOUND DURING THE FINAL INSPECTION SHALL BE CORRECTED BEFORE THE COMPLETION OF THE TEN DAY BURN TEST. ANY MAJOR DEFICIENCIES WHICH MAY EFFECT THE OPERATION OF THE SYSTEM SHALL CONSTITUTE A RE-START OF THE TEN(10) DAY BURN TEST AFTER CORRECTIONS ARE COMPLETED. THE TEN(10) DAY BURN TEST MUST BE SUCCESSFULLY COMPLETED BEFORE THE SYSTEM WILL BE ACCEPTED.

ITEM 632 REMOVAL OF TRAFFIC SIGNAL INSTALLATION

THE CONTRACTOR SHALL REMOVE THE EXISTING SIGNAL CONTROLLER/ CABINET AND SIGNAL HEADS FOR SALVAGE BY ODOT DISTRICT ONE. THE CONTRACTOR SHALL NOTIFY MIKE HALKER @ (419) 228-4847 WHEN ITEMS ARE AVAILABLE TO BE PICKED UP. THE CONTRACTOR SHALL DISPOSE AT NO EXTRA COST TO THE PROJECT THOSE ITEMS NOT PICKED UP BY THE DISTRICT BY COMPLETION OF THE PROJECT.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE TRAFFIC SIGNAL GENERAL SUMMARY FOR THE WORK NOTED ABOVE:

ITEM 632 REMOVAL OF TRAFFIC SIGNAL INSTALLATION = 1 EACH

STRAIN POLE FOUNDATION ELEVATION

THE ACTUAL ELEVATION OF THE FOUNDATION SHALL BE IN ACCORDANCE WITH TC-21.20 PROVIDED THE EXISTING SLOPE IS LESS THAN 6:1.

AT LOCATIONS WHERE THE EXISTING SLOPE IS 6:1 OR GREATER, THE BURIED DEPTH OF FOUNDATION AS SHOWN IN THE STANDARD DRAWING TC-21.20 SHALL APPLY TO THE LOW SIDE OF THE SLOPE AND THE TOP OF THE FOUNDATION SHALL BE SET 2" ABOVE THE EXISTING SURFACE ON THE HIGH SIDE OF THE SLOPE. THE ADDITIONAL DEPTH OF FOUNDATION NECESSARY TO MEET THESE REQUIREMENTS SHALL BE ADDED TO THE FORM TOP.

CONCRETE FOR CABINET FOUNDATION, AS PER PLAN

BECAUSE OF THE USE OF THE CABINET RISER, THE HEIGHT OF THE CABINET FOUNDATION ABOVE THE GROUND LINE SHALL BE MODIFIED TO BE 4" INSTEAD OF THE 12" SHOWN ON STANDARD CONSTRUCTION DRAWING TC-83.20.

ITEM 632 VEHICULAR SIGNAL HEAD, 3 SECTION, 12" LENS, 1-WAY, AS PER PLAN

THIS ITEM SHALL CONFORM TO ITEM 632 EXCEPT THE ENTRANCE FITTING SHALL BE OF THE TRISTUD DESIGN WITH SERRATED RINGS IN ORDER TO ACHIEVE POSITIVE LOCKING. LENS SHALL BE GLASS.

ITEM 633 CONTROLLER, MISC.: MODEL 2070L WITH MODEL 332 CABINET AND ACCESSORIES, INSTALLATION ONLY

THE CONTRACTOR SHALL PICKUP THIS ITEM AT THE DISTRICT ONE TRAFFIC YARD. THE 2070L CONTROLLER AND THE PREWIRED MODEL 332 CABINET SHALL BE GROUND MOUNTED. THE CONTRACTOR SHALL SUPPLY ANCHOR BOLTS AND CONDUIT ELLS FOR INSTALLATION IN THE FOUNDATION, IF NECCESARY. THE CONTRACTOR SHALL PROGRAM THE CONTROLLER AND THE CONFLICT MONITOR. SECTION 633 OF THE "STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECIFICATIONS" SHALL BE COMPLIED WITH AS IF THE CONTRACTOR PURCHASED AND SUPPLIED THIS EQUIPMENT.

ODOT DISTRICT ONE - SIGNAL SHOP  
2100 N. WEST STREET  
LIMA, OHIO 45801

THE CONTRACTOR SHALL NOTIFY MIKE HALKER @ (419) 222-9055 EXT. 271 FIVE WORKING DAYS IN ADVANCE TO ARRANGE FOR THESE ITEMS TO BE PICKED UP.

THE FOLLOWING ITEM HAS BEEN INCLUDED IN THE TRAFFIC SIGNAL GENERAL SUMMARY FOR THE WORK NOTED ABOVE AND SHALL INCLUDE ALL LABOR, MATERIALS AND INCIDENTALS REQUIRED TO COMPLETE THE JOB IN A SATISFACTORY WORKMAN LIKE MANNER.

ITEM 633 CONTROLLER, MISC.: MODEL 2070L WITH MODEL 332 CABINET ACCESSORIES, INSTALLATION ONLY = 1 EACH

STRAIN POLE, TYPE TC-81.10, DESIGNS 6 & 7, INSTALLATION ONLY, AS PER PLAN

THE CONTRACTOR SHALL PICKUP THESE ITEMS AT THE DISTRICT ONE TRAFFIC YARD: STRAIN POLES, TYPE TC-81.10, ONE DESIGN 6 & THREE DESIGN 7. SECTION 632 OF THE "STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECIFICATIONS" SHALL BE COMPLIED WITH AS IF THE CONTRACTOR PURCHASED AND SUPPLIED THIS EQUIPMENT.

ODOT DISTRICT ONE - SIGNAL SHOP  
2100 N. WEST STREET  
LIMA, OHIO 45801

THE CONTRACTOR SHALL NOTIFY MIKE HALKER @ (419) 222-9055 EXT. 271 FIVE WORKING DAYS IN ADVANCE TO ARRANGE FOR THESE ITEMS TO BE PICKED UP.

THE FOLLOWING ITEMS INCLUDED IN THE TRAFFIC SIGNAL GENERAL SUMMARY FOR THE WORK NOTED ABOVE SHALL INCLUDE ALL LABOR, MATERIALS AND INCIDENTALS REQUIRED TO COMPLETE THE JOB IN A SATISFACTORY WORKMAN LIKE MANNER.

| ESTIMATED QUANTITIES                                           |          |      |                                                                                      |
|----------------------------------------------------------------|----------|------|--------------------------------------------------------------------------------------|
| ITEM                                                           | QUANTITY | UNIT | DESCRIPTION                                                                          |
| 632                                                            | 1        | EACH | POWER SERVICE                                                                        |
| 632                                                            | 1        | EACH | REMOVAL OF TRAFFIC SIGNAL INSTALLATION                                               |
| 633                                                            | 1        | EACH | CONTROLLER, MISC.: MODEL 2070L WITH MODEL 332 CABINET ACCESSORIES, INSTALLATION ONLY |
| QUANTITIES CARRIED TO TRAFFIC SIGNAL GENERAL SUMMARY, SHEET 53 |          |      |                                                                                      |

CALCULATED  
CHECKED

TRAFFIC SIGNAL GENERAL NOTES

ALL -117-13.47



[illegible]

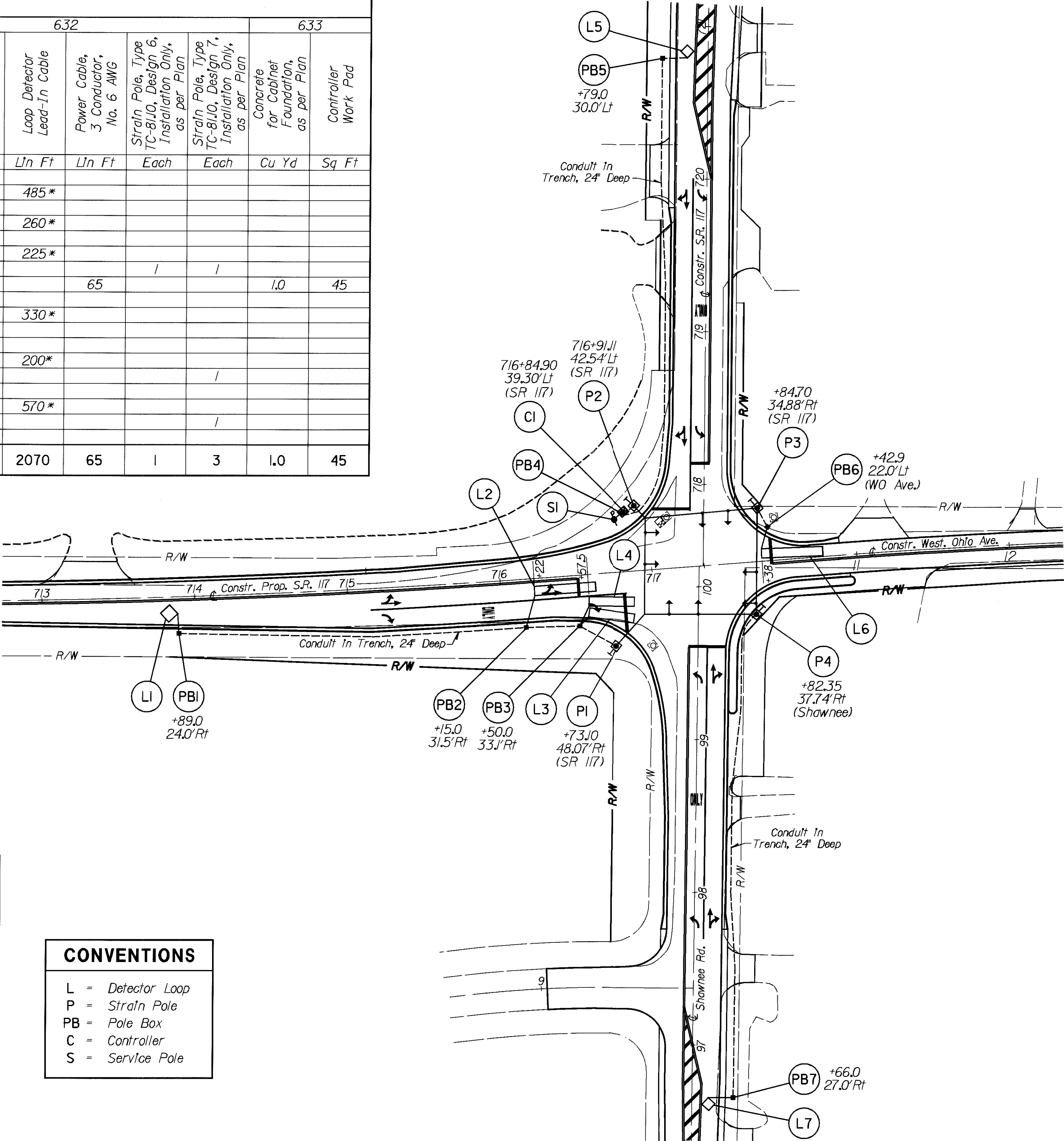
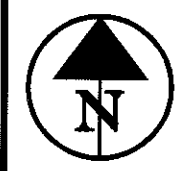


| TRAFFIC SIGNALS     |     |                        |                        |                     |                          |                          |            |               |                           |                                |                                           |                                                                             |                                                                             |                                                       |                        |
|---------------------|-----|------------------------|------------------------|---------------------|--------------------------|--------------------------|------------|---------------|---------------------------|--------------------------------|-------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------|------------------------|
| Location            |     | 625                    |                        |                     |                          |                          |            | 632           |                           |                                |                                           |                                                                             |                                                                             | 633                                                   |                        |
|                     |     | Conduit,<br>713.04, 2" | Conduit,<br>713.04, 3" | Trench,<br>24" Deep | Pull Box,<br>713.08, 18" | Pull Box,<br>713.08, 24" | Ground Rod | Detector Loop | Strain Pole<br>Foundation | Loop Detector<br>Lead-In Cable | Power Cable,<br>3 Conductor,<br>No. 6 AWG | Strain Pole, Type<br>TC-810, Design 6,<br>Installation Only,<br>as per Plan | Strain Pole, Type<br>TC-810, Design 7,<br>Installation Only,<br>as per Plan | Concrete<br>for Cabinet<br>Foundation,<br>as per Plan | Controller<br>Work Pad |
| From                | To  | L'n Ft                 | L'n Ft                 | L'n Ft              | Each                     | Each                     | Each       | Each          | Each                      | L'n Ft                         | L'n Ft                                    | Each                                                                        | Each                                                                        | Cu Yd                                                 | Sq Ft                  |
| L1                  | PB1 |                        |                        |                     |                          |                          |            | 1             |                           | 485*                           |                                           |                                                                             |                                                                             |                                                       |                        |
| PB1                 | PB2 | 228                    |                        | 228                 | 1                        |                          |            | 1             |                           | 260*                           |                                           |                                                                             |                                                                             |                                                       |                        |
| L2                  | PB2 |                        |                        |                     |                          |                          |            | 1             |                           |                                |                                           |                                                                             |                                                                             |                                                       |                        |
| PB2                 | PB3 | 35                     |                        | 35                  | 1                        |                          |            |               |                           | 225*                           |                                           |                                                                             |                                                                             |                                                       |                        |
| L3 & L4             | PB3 |                        |                        |                     |                          |                          |            | 2             |                           |                                |                                           |                                                                             |                                                                             |                                                       |                        |
| PB3                 | PB4 | 35                     | 16                     | 40                  | 1                        |                          | 2          |               | 2                         |                                |                                           | 1                                                                           | 1                                                                           |                                                       |                        |
| PB4                 | SI  |                        | 10                     | 6                   |                          | 1                        | 1          |               |                           |                                | 65                                        |                                                                             |                                                                             | 1.0                                                   | 45                     |
| L5                  | PB5 |                        |                        |                     |                          |                          |            | 1             |                           | 330*                           |                                           |                                                                             |                                                                             |                                                       |                        |
| PB5                 | PB4 | 315                    |                        | 315                 | 1                        |                          |            |               |                           |                                |                                           |                                                                             |                                                                             |                                                       |                        |
| L6                  | PB6 |                        |                        |                     |                          |                          |            | 1             |                           | 200*                           |                                           |                                                                             | 1                                                                           |                                                       |                        |
| PB6                 | PB4 | 14                     |                        | 14                  | 1                        |                          | 1          |               | 1                         |                                |                                           |                                                                             |                                                                             |                                                       |                        |
| L7                  | PB7 |                        |                        |                     |                          |                          |            | 1             |                           | 570*                           |                                           |                                                                             | 1                                                                           |                                                       |                        |
| PB7                 | PB4 | 320                    |                        | 320                 | 1                        |                          | 1          |               | 1                         |                                |                                           |                                                                             |                                                                             |                                                       |                        |
| CARRIED TO SHEET 53 |     | 947                    | 26                     | 958                 | 6                        | 1                        | 5          | 7             | 4                         | 2070                           | 65                                        | 1                                                                           | 3                                                                           | 1.0                                                   | 45                     |

\* Measured Distance from Pull Box to Controller

| LEGEND |                                     |
|--------|-------------------------------------|
|        | ~ Signal Strain Pole                |
|        | ~ Existing Signal Strain Pole       |
|        | ~ Signal Pull Box                   |
|        | ~ Based Mounted Controller          |
|        | ~ Existing Based Mounted Controller |
|        | ~ Service Pole                      |
|        | ~ Signal Head                       |
|        | ~ Conduit Stub                      |

| CONVENTIONS |                 |
|-------------|-----------------|
| L           | = Detector Loop |
| P           | = Strain Pole   |
| PB          | = Pole Box      |
| C           | = Controller    |
| S           | = Service Pole  |



HORIZONTAL  
SCALE IN FEET  
0 20 40 80

CALCULATED  
CHECKED

TRAFFIC SIGNAL PLAN

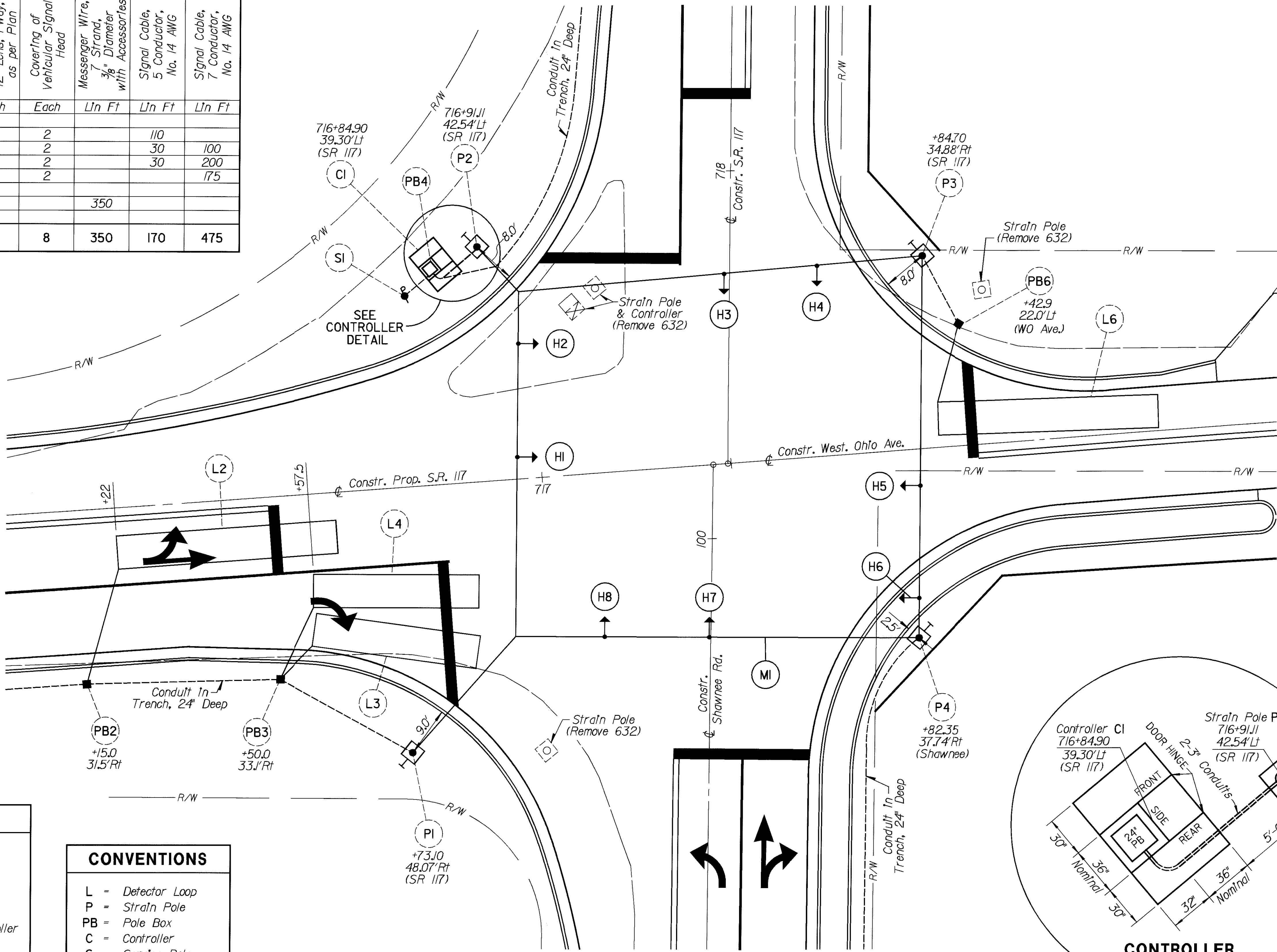
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DESIGN FILE : I:\pdp\9314\Traffic Signal\9314cpl.dgn  
USERNAME : mvondere

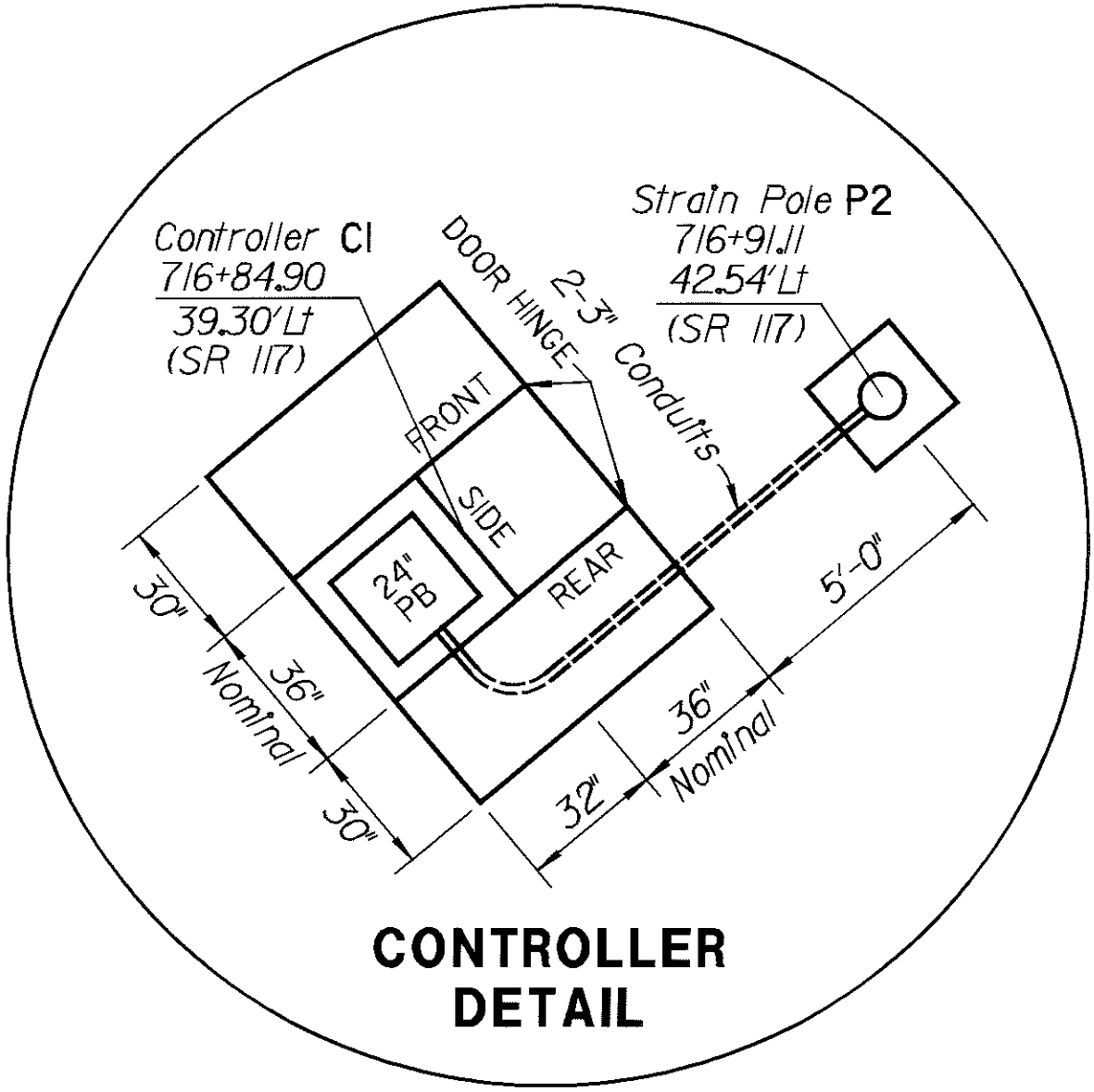
DATE : 10-AUG-2001  
TIME : 13:43

| TRAFFIC SIGNALS     |    |                                                              |                                 |                                                          |                                       |                                       |
|---------------------|----|--------------------------------------------------------------|---------------------------------|----------------------------------------------------------|---------------------------------------|---------------------------------------|
| Location            |    | 632                                                          |                                 |                                                          |                                       |                                       |
|                     |    | Vehicle Signal Head, 3 Section, 12" Lens, 1-Way, as per Plan | Covering of Vehicle Signal Head | Messenger Wire, 7 Strand, 3/8" Diameter with Accessories | Signal Cable, 5 Conductor, No. 14 AWG | Signal Cable, 7 Conductor, No. 14 AWG |
| From                | To | Each                                                         | Each                            | LIn Ft                                                   | LIn Ft                                | LIn Ft                                |
| H1                  | CI | 2                                                            | 2                               |                                                          | 110                                   |                                       |
| H4                  | CI | 2                                                            | 2                               |                                                          | 30                                    | 100                                   |
| H6                  | CI | 2                                                            | 2                               |                                                          | 30                                    | 200                                   |
| H7                  | CI | 2                                                            | 2                               |                                                          |                                       | 175                                   |
| MI                  |    |                                                              |                                 | 350                                                      |                                       |                                       |
| CARRIED TO SHEET 53 |    | 8                                                            | 8                               | 350                                                      | 170                                   | 475                                   |



| LEGEND |                                   |
|--------|-----------------------------------|
|        | ~ Signal Strain Pole              |
|        | ~ Existing Signal Strain Pole     |
|        | ~ Signal Pull Box                 |
|        | ~ Based Mounted Controller        |
|        | ~ Exlst. Based Mounted Controller |
|        | ~ Service Pole                    |
|        | ~ Signal Head                     |
|        | ~ Conduit Stub                    |

| CONVENTIONS |                  |
|-------------|------------------|
| L           | = Detector Loop  |
| P           | = Strain Pole    |
| PB          | = Pole Box       |
| C           | = Controller     |
| S           | = Service Pole   |
| H           | = Signal Head    |
| M           | = Messenger Wire |





DESIGN FILE : I:\pdp\9314\Traffic Signal\9314CDI.dgn  
USERNAME : mvoederg  
DATE : 10-AUG-2001  
TIME : 13:45

ACTUATED

TRAFFIC SIGNAL CONTROLLER TIMING CHART

INTERSECTION *S.R. 117 & Shawnee Road*

MAINTAINING AGENCY *ODOT*

START UP

START IN: Y/R FLASH ☒; ALL RED ☐

TIME FOR FLASH OR ALL RED *10*

FIRST PHASE(S) \* *2* & \* *6*

COLOR DISPLAYED: GREEN ☒ YELLOW ☐

DUAL ENTRY ☐

REST IN RED: RING 1 ☐; RING 2 ☐

OVERLAP

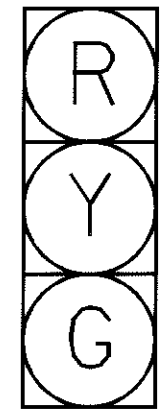
*A**B**C**D*

PHASES

INTERVAL OR FEATURE

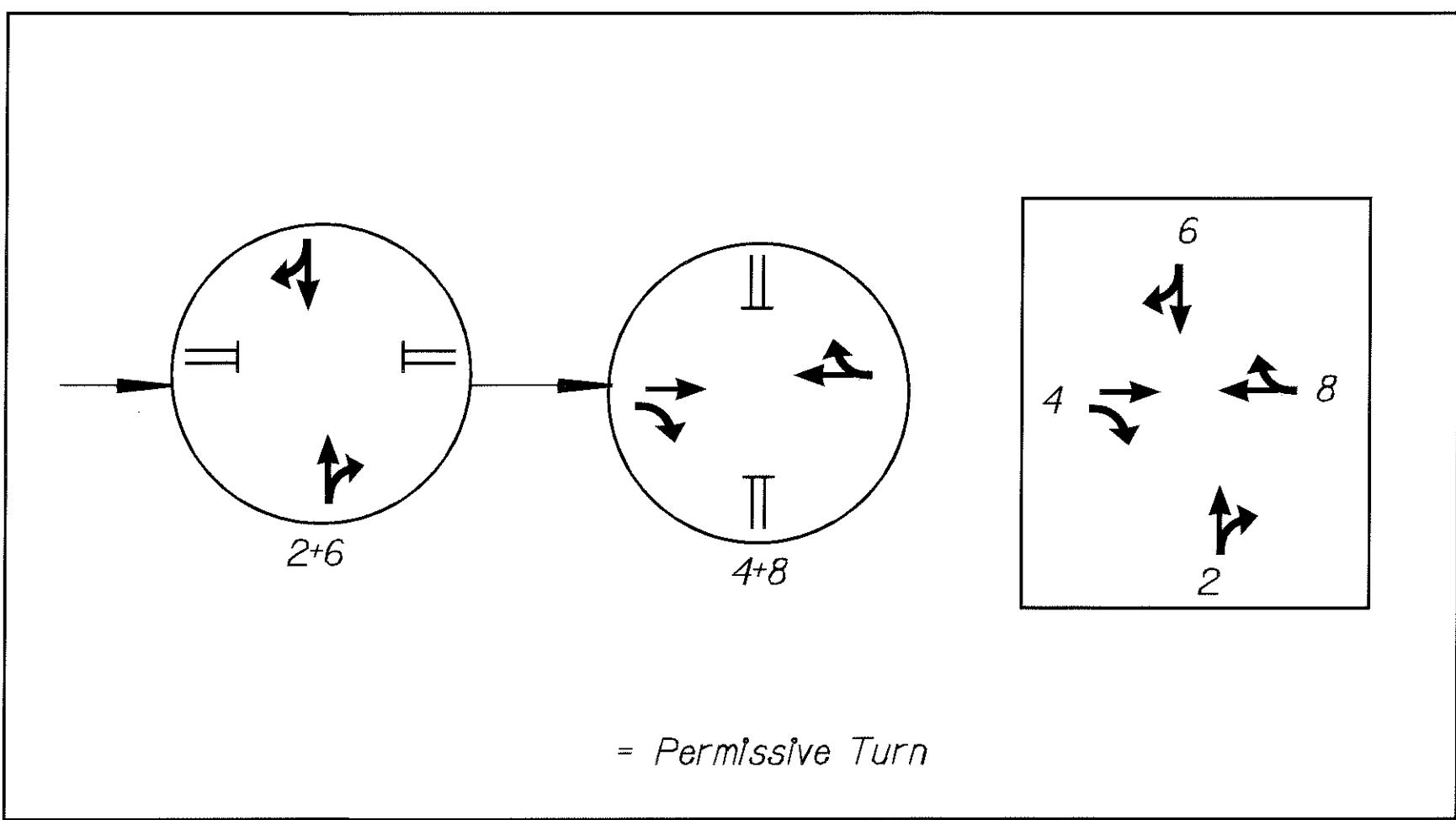
CONTROLLER MOVEMENT NO.

|                                    |                     |   |     |   |     |   |     |   |     |
|------------------------------------|---------------------|---|-----|---|-----|---|-----|---|-----|
|                                    |                     | 1 | 2   | 3 | 4   | 5 | 6   | 7 | 8   |
| INTERSECTION MOVEMENT              |                     |   | ↑   |   | →   |   | ↓   |   | ←   |
| MINIMUM GREEN (INITIAL) (SEC.)     |                     |   | 15  |   | 9   |   | 15  |   | 9   |
| ADDED INITIAL * (SEC./ACTUATION)   |                     |   | 1.5 |   | -   |   | 1.5 |   | -   |
| PASSAGE TIME (PRESET GAP) (SEC.)   |                     |   | 0.5 |   | 0.5 |   | 0.5 |   | 0.5 |
| TIME BEFORE REDUCTION * (SEC.)     |                     |   | 20  |   | -   |   | 20  |   | -   |
| MAXIMUM VARIABLE INITIAL * (SEC.)  |                     |   | 25  |   | -   |   | 25  |   | -   |
| MINIMUM GAP * (SEC.)               |                     |   | 3   |   | -   |   | 3   |   | -   |
| TIME TO REDUCE * (SEC.)            |                     |   | 5   |   | -   |   | 5   |   | -   |
| MAXIMUM GREEN I 7pm.-11am. (SEC.)  |                     |   | 45  |   | 20  |   | 45  |   | 20  |
| MAXIMUM GREEN II 11am.-7pm. (SEC.) |                     |   |     |   |     |   |     |   |     |
| YELLOW CHANGE (SEC.)               |                     |   | 4.5 |   | 3.5 |   | 4.5 |   | 3   |
| ALL RED CLEARANCE (SEC.)           |                     |   | 2.0 |   | 2.0 |   | 2.0 |   | 2.0 |
| FLASH                              |                     |   | Y   |   | R   |   | Y   |   | R   |
| RECALL                             | MAXIMUM (ON/OFF)    |   |     |   |     |   |     |   |     |
|                                    | MINIMUM (ON/OFF)    |   | ON  |   | OFF |   | ON  |   | OFF |
|                                    | PEDESTRAIN (ON/OFF) |   |     |   |     |   |     |   |     |
| MEMORY (ON/OFF)                    |                     |   | OFF |   | OFF |   | OFF |   | OFF |
| CALL TO NON-ACTUATED               |                     |   |     |   |     |   |     |   |     |
| VOLUME DENSITY CONTROLS            |                     |   |     |   |     |   |     |   |     |

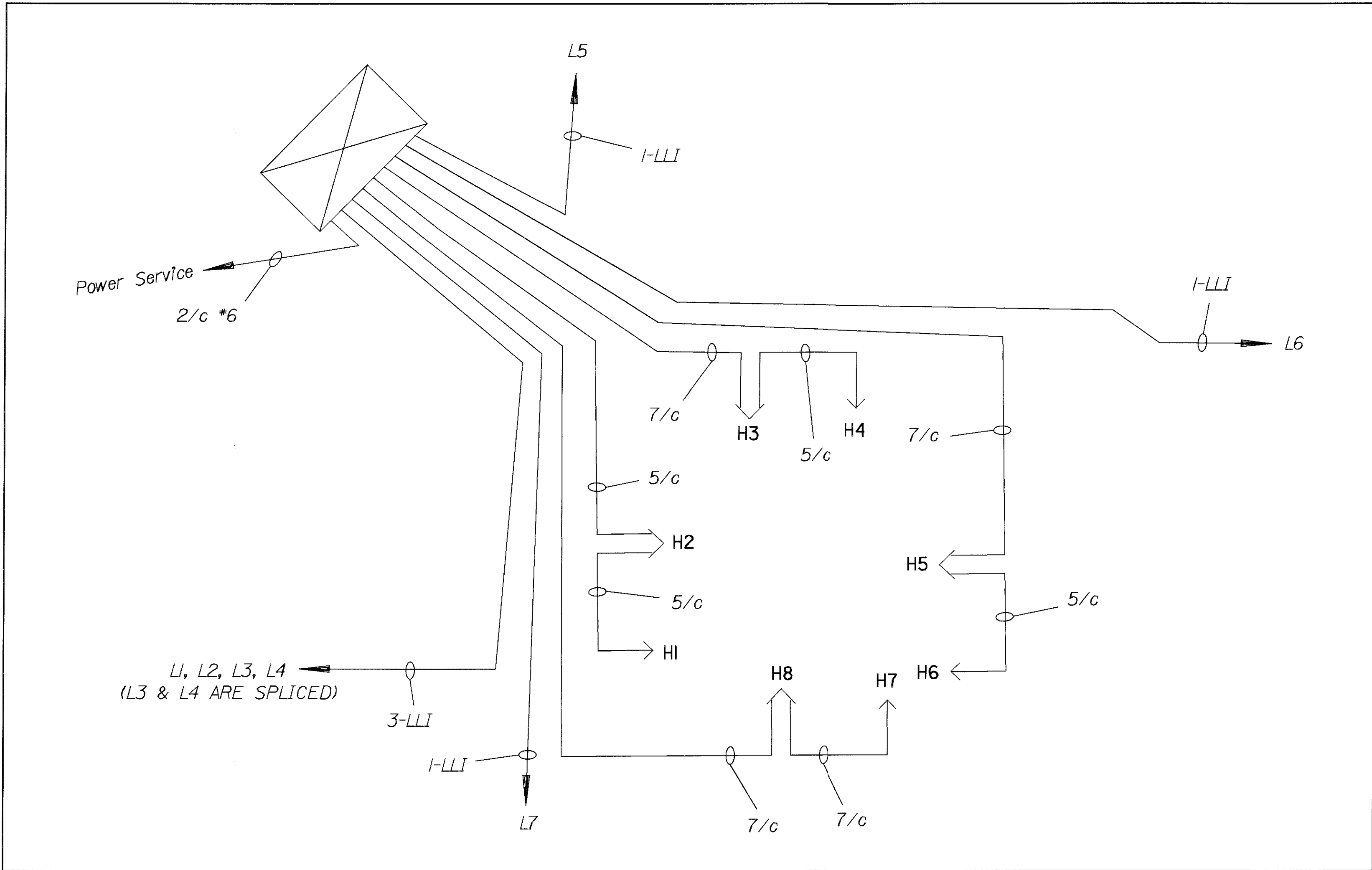


H1-H8

| DETECTOR CHART |      |          |              |           |                  |                           |              |            |           |
|----------------|------|----------|--------------|-----------|------------------|---------------------------|--------------|------------|-----------|
| LOOP           | SIZE | MODE     | DELAY (Sec.) | EXTENSION | ASSOCIATED PHASE | DELAY INHIBIT PHASE GREEN | No. of Turns | INPUT FILE | TERMINALS |
| L1             | 6x6  | Pulse    |              | 1.5       | 4                | -                         | 4            | I          | 6D,E      |
| L2             | 6x40 | Presence |              |           | 4                | -                         | 3            | I          | 6J,K      |
| L3             | 6x30 | Presence | 10           |           | 4                | -                         | 3            | I          | 7D,E      |
| L4             | 6x30 | Presence | 10           |           | 4                | -                         | 3            | I          | 7D,E      |
| L5             | 6x6  | Pulse    |              | 2.5       | 6                | -                         | 4            | J          | 2D,E      |
| L6             | 6x40 | Presence | 10           |           | 8                | -                         | 3            | J          | 6D,E      |
| L7             | 6x6  | Pulse    |              | 2.5       | 2                | -                         | 4            | I          | 2D,E      |



PHASE DIAGRAM



WIRING DIAGRAM

CALCULATED  
CHECKED

TRAFFIC SIGNAL DETAILS

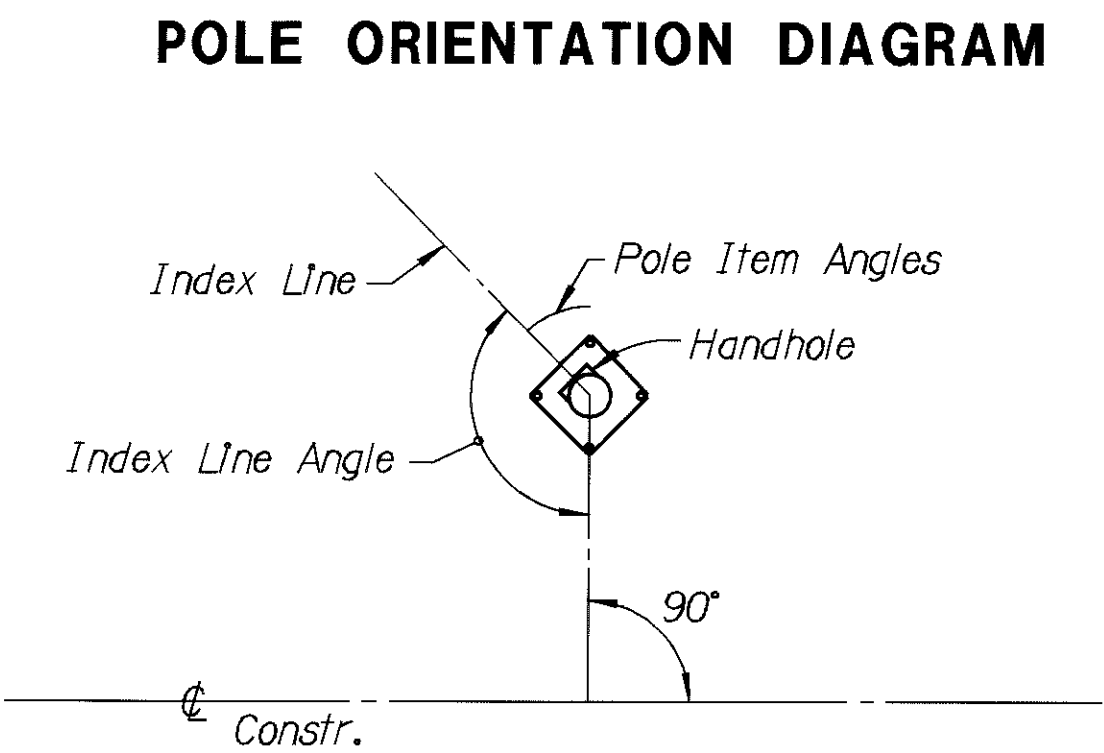
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65

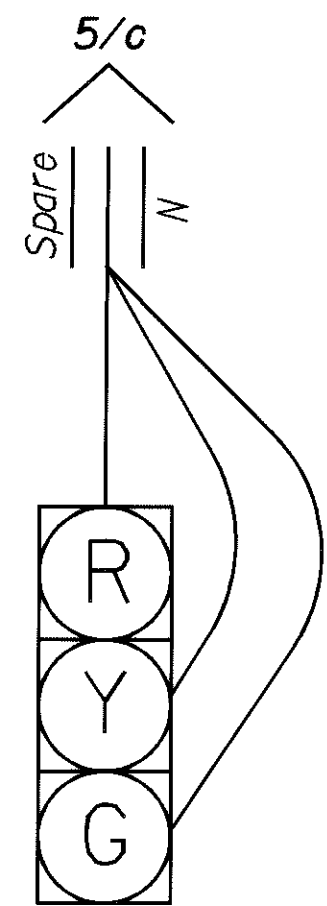


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USERNAME : nvondere

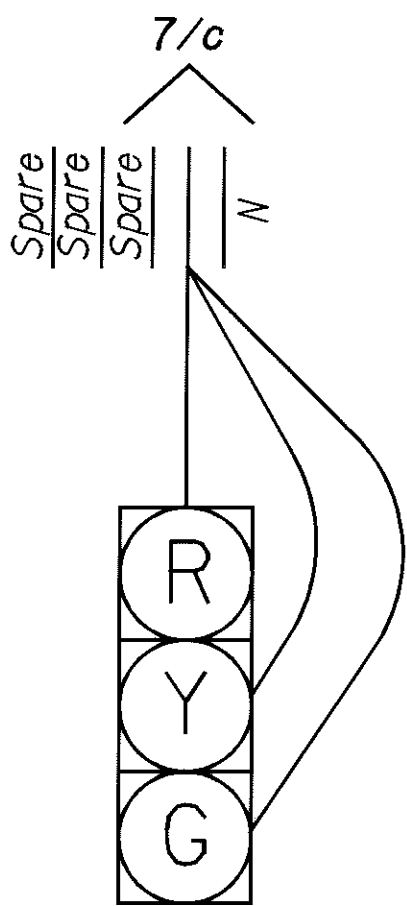
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TIME : 13:45



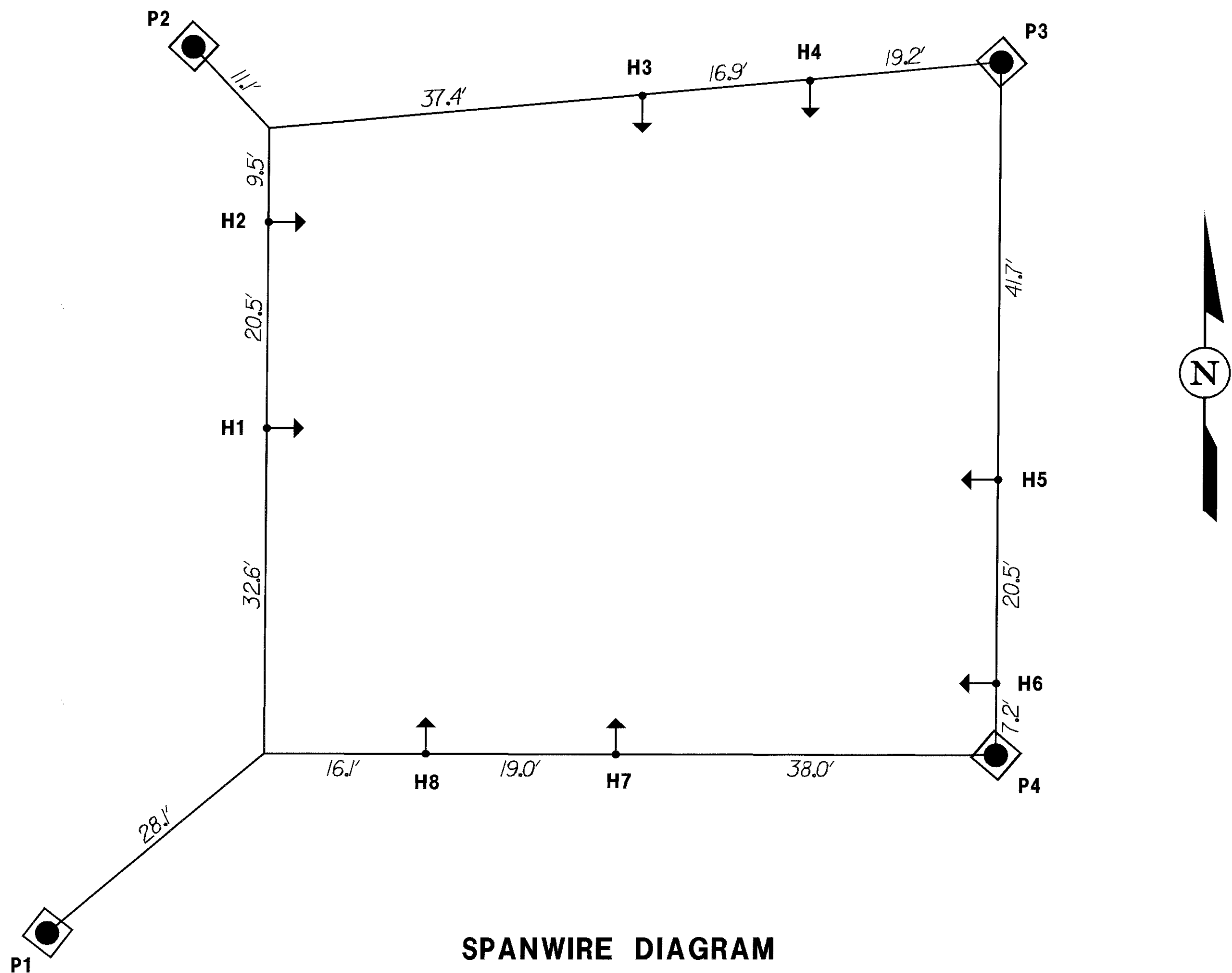
- NOTE: 1. ALL ANGLES MEASURED CLOCKWISE  
2. INDEX LINE GOES THROUGH THE CENTER OF THE HANDHOLE



H1, H2  
H4, H6



H3, H5  
H7, H8



| POLE ORIENTATION CHART |             |             |                    |          |                      |                  |                   |               |                       |
|------------------------|-------------|-------------|--------------------|----------|----------------------|------------------|-------------------|---------------|-----------------------|
| POLE No.               | POLE DESIGN | POLE HEIGHT | STATION            | OFFSET   | FOUNDATION ELEVATION | INDEX LINE ANGLE | SIGNAL CABLE ENT. | POWER SERVICE | CAPPED 2" SPARE COND. |
| P1                     | 6           | 32          | 716+70.33 (SR 117) | 44.75'Rt | 865.49               | 225°             | 180°              |               | /                     |
| P2                     | 7           | 30          | 716+91.11 (SR 117) | 42.54'Lt | 867.32               | 135°             | 180°              | 60°           | /                     |
| P3                     | 7           | 30          | 717+84.70 (SR 117) | 34.88'Rt | 869.55               | 135°             | 180°              |               | /                     |
| P4                     | 7           | 30          | 99+82.35 (Shawnee) | 37.74'Rt | 867.60               | 225°             | 180°              |               | /                     |

CALCULATED  
CHECKED

TRAFFIC SIGNAL DETAILS

ALL -117-13.47



THE CONTROLLER SUPPLIED SHALL BE COMPLETE WITH THE SPECIFIED CABINET INCLUDING ALL NECESSARY COMPONENTS AND CABLES NOT SPECIFICALLY MENTIONED BELOW. ALL EQUIPMENT AND CABINETS SHALL CONFORM TO ODOT SPECIFICATIONS 633, 733 AND THE FOLLOWING:

SPECIFICATIONS FOR THESE CONTROLLERS SHALL BE "TRANSPORTATION ELECTRICAL EQUIPMENT SPECIFICATIONS", CALIFORNIA DEPARTMENT OF TRANSPORTATION, NOVEMBER 19, 1998, INCLUDING ALL ADDENDA.

MODEL 2070 UNIT CHASSIS  
MODEL 2070-1B, CPU MODULE  
MODEL 2070-2A, FIELD I/O FOR 170 CABINET  
MODEL 2070-3B, FRONT PANEL, DISPLAY B (40 CHAR. x 8 LINES)  
MODEL 2070-4A OR 2070-4B, POWER SUPPLY

5. THE CONTROLLER UNIT SHALL HAVE ALL NECESSARY SOFTWARE TO EMULATE A NEMA EIGHT (8) PHASE, FULL-ACTUATED, SIGNAL OPERATION WITH OVERLAPS, PREEMPTION, INTERNAL TBC AND PEDESTRIAN MOVEMENTS.

CONFLICT MONITORS SHALL BE ON THE ODOT PRE-APPROVED LIST (S.S. 962). TWO SETS OF OPERATIONS INSTRUCTIONS AND MONITOR SCHEMATICS SHALL BE SUPPLIED WITH EACH MONITOR. PERMISSIVE CHANNELS SHALL BE PROGRAMMED WITH THE USE OF A DIODE CARD (CALTRANS STANDARD) WHICH SHALL BE INCLUDED WITH THE MONITOR.

CABINETS SHALL BE CONSTRUCTED OF ALUMINUM AND SHALL BE SUPPLIED UNPAINTED. ANODIC COATING IS NOT REQUIRED. CABINETS SHALL BE FULLY EQUIPPED WITH CONFLICT MONITOR, FLASHERS, AC ISOLATORS, DC ISOLATORS, AND FLASH TRANSFER RELAYS. THE APPROPRIATE NUMBER OF SWITCH PACKS AND MODEL 222 LOOP DETECTOR SENSOR UNITS SHALL BE SUPPLIED TO OPERATE THE INTERSECTION AS SHOWN IN THE PLANS. ALL COMPONENTS SHALL MEET CALTRANS SPECIFICATIONS AND SHALL BE ON THE OPL AS APPLICABLE.

THE FRONT OF THE INPUT AND OUTPUT FILES SHALL BE LABELED USING A WRITABLE TAPE. IN THE CASE OF THE OUTPUT FILE, THE TAPE SHALL CLEARLY DESIGNATE THE PURPOSE OF THE CORRESPONDING SWITCH PACK. AN EXAMPLE OF SWITCH PACK LABELING IS 'PHASE 2' OR 'PHASE 2 PED'. IN THE CASE OF THE INPUT FILE, THE TAPE SHALL CLEARLY DESIGNATE THE PURPOSE OF THE CORRESPONDING DETECTOR UNIT. EVERY USED CHANNEL OF THE 222 DETECTOR SHALL BE LABELED. AN EXAMPLE OF DETECTOR UNIT LABELING IS 'PHASE 2 C' OR 'PHASE 2 EC' OR 'PHASE 2 EXT' WHERE:

- C - IS A CALL INPUT ONLY DURING RED
- EC - IS EXTEND AND CALL DURING RED, YELLOW AND GREEN
- EXT - IS AN EXTENSION ONLY DURING GREEN

1. OUTPUT FILES SHALL BE 'HARDWIRED'. NO PRINTED CIRCUIT WIRING SHALL BE USED IN THE OUTPUT FILE EXCEPT FOR THE RED MONITOR BOARD.

4. FIELD WIRING FOR LOOP DETECTOR LEAD-IN CABLES AND PEDESTRIAN DETECTORS SHALL BE TERMINATED ON A LOWER LOOP INPUT PANEL. EDCO MODEL SRA-6LCA, SRA-6LCB OR SRA-6LC SURRESTORS SHALL BE PROVIDED ON THE LOWER INPUT PANEL FOR PROTECTION AGAINST INCOMING ELECTRICAL SURGES AND LIGHTNING. FIELD WIRING TERMINALS ON THE LOWER INPUT PANEL SHALL BE LABELED BY A PERMANENT SCREENING PROCESS TO IDENTIFY THE INPUT FILE (I OR J), THE INPUT FILE SLOT NUMBER (1-14) AND THE CHANNEL TERMINAL (D, E, J OR K). AN EXAMPLE IS 'I4-K' STANDING FOR INPUT FILE 'I'; SLOT 4; CHANNEL TERMINAL 'K'.

2. A RACK MOUNTED DETECTOR TEST PANEL SHALL BE FURNISHED WITH SEPARATE TEST SWITCHES FOR ALL POSSIBLE VEHICLE AND PEDESTRIAN PHASES. THE SWITCHES SHALL BE THREE (3) POSITION 'ON/OFF/MOMENTARY ON' SWITCHES.

4. AN ALUMINUM SHELF WITH INTEGRAL STORAGE COMPARTMENT SHALL BE PROVIDED IN THE RACK BELOW THE CONTROLLER. THE STORAGE COMPARTMENT WILL HAVE TELESOPING DRAWER GUIDES FOR FULL EXTENSION. THE COMPARTMENT TOP SHALL HAVE A NON-SLIP PLASTIC LAMINATE ATTACHED.

6. A LAYER OF 3/4" WHITE STYROFOAM OR EQUIVALENT INSULATING SHEETING SHALL BE APPLIED TO THE INTERIOR OF THE CABINET. THE INSULATION SHALL COVER THE TOP AND FOUR SIDES EXCEPT FOR STRUCTURAL RIBS, VENT AND FAN OPENINGS, LOCK LINKAGES, SHELF BRACKETS AND OTHER NECESSARY FUNCTIONAL AREAS. THE INTERIOR SURFACE OF THE THERMAL INSULATION SHALL NOT BE COVERED WITH A METALLIC FOIL OR ANY OTHER ELECTRICALLY CONDUCTIVE SUBSTANCE.

THIS ITEM SHALL ALLOW SIGNAL ELECTRICIANS TO OPERATE THE TRAFFIC SIGNAL DURING POWER OUTAGES, WITHOUT OPENING THE CABINET DOOR OR CONNECTING OR DISCONNECTING PERMANENT POWER CABLES. THE ENCLOSURE SHALL BE INSTALLED ON THE POWER PANEL SIDE OF THE CONTROLLER CABINET. DESIGN AND LAYOUT OF THE CONTROLLER CABINET SHALL DETERMINE EXACT PLACEMENT OF THE ENCLOSURE BUT IT SHOULD BE PLACED NEAR THE TOP OF GROUND MOUNTED CABINETS AND ABOUT 5 FEET FROM THE GROUND ON POLE MOUNTED CABINETS. THE ENCLOSURE SHALL BE SEALED WITH A HIGH QUALITY SILICON CAULK AND ALL HOLES DRILLED INTO THE SIDE OF THE CONTROLLER CABINET SHALL BE CAULKED

COST FOR ALL OF THE ABOVE INCLUDING LABOR, MATERIAL, TOOLS AND EQUIPMENT TO PROVIDE AND INSTALL A COMPLETELY OPERATIONAL CABINET AND CONTROLLER SHALL BE INCLUDED IN THE BID ITEM PRICE FOR 633 ITEM SPECIAL, CONTROLLER, MODEL 2070L, WITH MODEL 332 CABINET AND ACCESSORIES.

( ) - JUMPERED TO UPPER CHANNEL  
C - INPUT ONLY DURING RED  
EC - EXTEND AND CALL (RED, YELLOW, GREEN)  
EXT - INPUT ONLY DURING GREEN

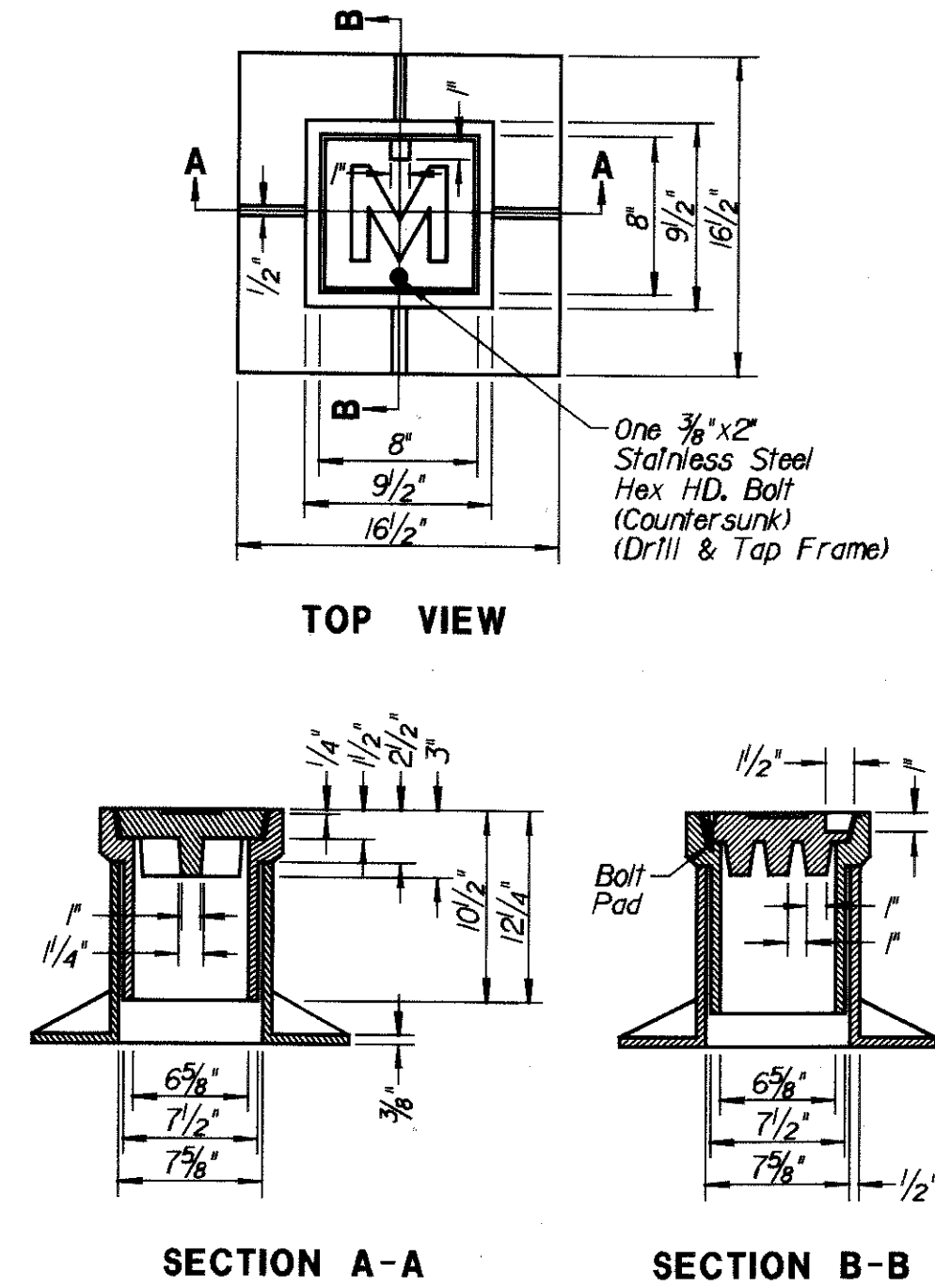
625 PULLBOX, 713.08, 24"  
633 CONTROLLER WORK PAD  
633 CONC. FOR CAB. FOUNDATION

## CONTROLLER DETAILS



Centerline monuments, centerline monument assemblies and centerline reference monuments are shown on Standard Construction Drawing RM-1J (Rev. 4-29-99) of the Ohio Department of Transportation. The placing of the monuments shall be under the direction of a registered surveyor and are to be set, as shown, by the highway contractor at the time of construction. Any alterations, with prior approval of the Department of Transportation, shall be noted and O.D.O.T. shall be notified of the new locations.

### ADJUSTABLE CENTERLINE MONUMENT DETAILS



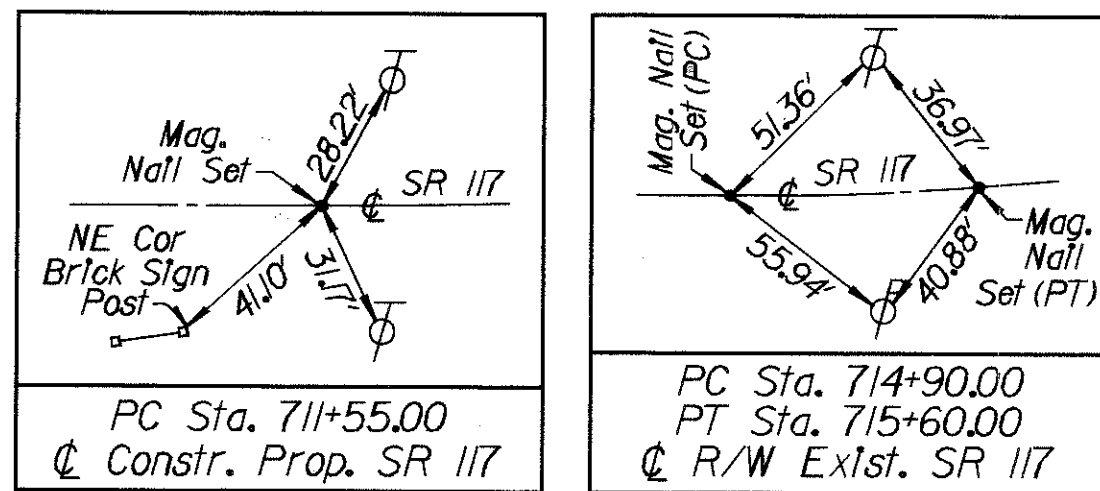
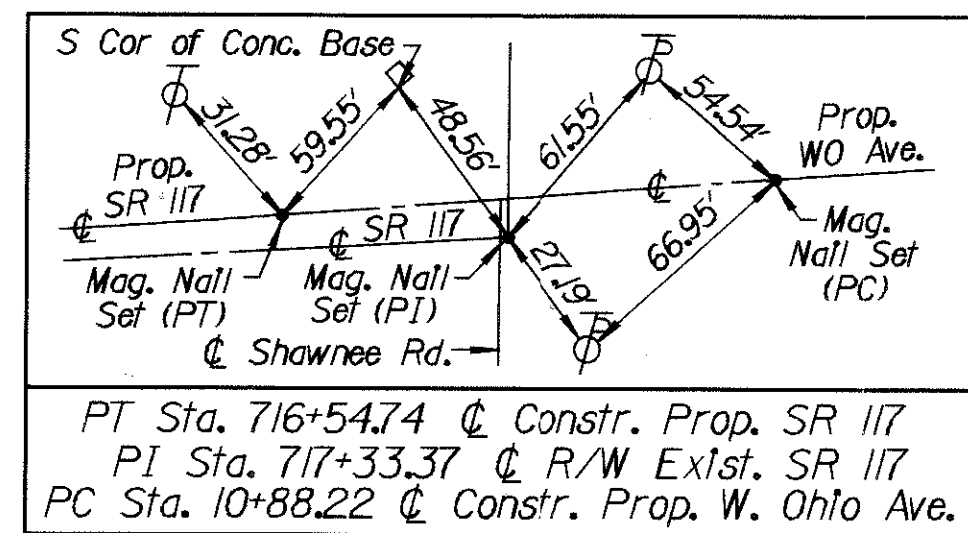
### LOCATIONS OF MONUMENTS

Centerline Monuments are to be set during construction at the following Stations at a Tolerance of  $\pm 0.02$  Ft.

| STATION                                    | OFFSET | NORTHING    | EASTING      |
|--------------------------------------------|--------|-------------|--------------|
| <b>1/4 R/W Exst. S.R. 117</b>              |        |             |              |
| PC 714+90.00                               | 0.00'  | 389153.2234 | 1510604.1125 |
| PT 715+60.00                               | 0.00'  | 389155.0346 | 1510674.0764 |
| PI 717+33.37                               | 0.00'  | 389164.8111 | 1510847.1705 |
| PC 721+07.38                               | 0.00'  | 389153.8193 | 1510848.8746 |
| PT 722+92.83                               | 0.00'  | 389705.8602 | 1510918.213  |
| PC 723+89.63                               | 0.00'  | 389774.5801 | 1510986.2961 |
| PT 728+64.63                               | 0.00'  | 390108.0658 | 1511324.5315 |
| <b>1/4 Constr. Prop. S.R. 117</b>          |        |             |              |
| PC 711+55.00                               | 0.00'  | 389154.7843 | 1510269.1179 |
| PT 716+54.74                               | 0.00'  | 389172.3923 | 1510768.4093 |
| <b>1/4 Constr. Prop. Western Ohio Ave.</b> |        |             |              |
| PC 10+88.22                                | 0.00'  | 389184.9974 | 1510935.7997 |
| PT 13+88.06                                | 0.00'  | 389195.7207 | 1511235.3753 |

### MONUMENT LEGEND

- ~ Existing Monument Box
- ~ Proposed Monument Box
- @ Mag. Nail Set
- X ~ RR Spike Found
- @ I.R.F. ~ Iron Pin Found w/ID Cap



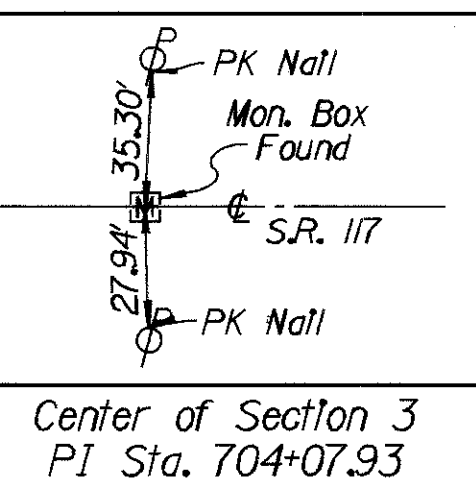
### CURVE 1 DATA PROPOSED S.R. 117

PI Sta. 714+05.00  
 $\Delta = 4^\circ 34' 24''$  Lt.  
 $D_0 = 0^\circ 54' 55''$   
 $R = 6,260.68'$   
 $T = 250.00'$   
 $L = 499.73'$   
 $E = 4.99'$   
 PC Sta. 711+55.00  
 PT Sta. 716+54.74

1/4 Section Line  
 Sta. 704+07.93, 1/4 Section Line  
 CENTER OF SEC. 3  
 Sta. 704+07.93, 1/4 Section Line  
 Monument Box Found

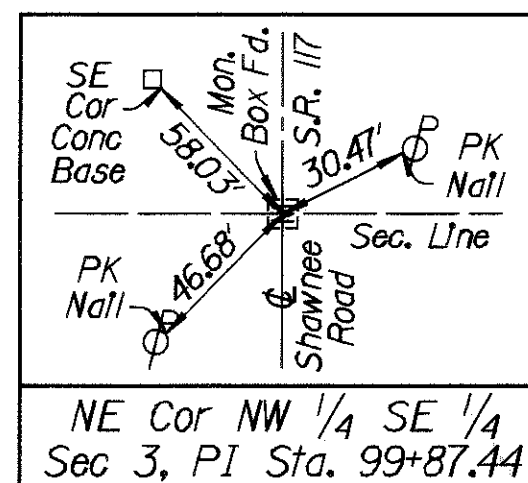
### CURVE 2 DATA EXISTING S.R. 117

PI Sta. 715+25.01  
 $\Delta = 3^\circ 29' 59''$  Lt.  
 $D_0 = 4^\circ 59' 59''$   
 $R = 1,446.00'$   
 $T = 35.01'$   
 $L = 70.00'$   
 $E = 0.53'$   
 PC Sta. 714+90.00  
 PT Sta. 715+60.00



ALLEN COUNTY  
 SHAWNEE TOWNSHIP  
 SE 1/4 SECTION 3  
 T 4 S R 6 E

SE CORNER  
 SW 1/4 SE 1/4 SEC. 3  
 Sta. 73+36.81, 1/4 Section Line  
 Monument Box Found



## ALL-117-13.47 SHAWNEE TOWNSHIP SEC. 3 - T4S-R6E ALLEN COUNTY

ALLEN COUNTY  
 SHAWNEE TOWNSHIP  
 NE 1/4 SECTION 3  
 T 4 S R 6 E

### CURVE 4 DATA EXISTING S.R. 117

PI Sta. 726+27.14  
 $\Delta = 1^\circ 16' 00''$  Rt.  
 $D_0 = 0^\circ 16' 00''$   
 $R = 21,485.92'$   
 $T = 237.51'$   
 $L = 475.00'$   
 $E = 1.31'$   
 PC Sta. 723+89.63  
 PT Sta. 728+64.63

### CURVE 3 DATA EXISTING S.R. 117

PI Sta. 722+05.07  
 $\Delta = 44^\circ 30' 39''$  Rt.  
 $D_0 = 24^\circ 00' 04''$   
 $R = 238.72'$   
 $T = 97.69'$   
 $L = 185.45'$   
 $E = 19.22'$   
 PC Sta. 721+07.38  
 PT Sta. 722+92.83

### CURVE 5 DATA PROP WESTERN OHIO AVE.

PI Sta. 12+38.22  
 $\Delta = 4^\circ 30' 46''$  Rt.  
 $D_0 = 1^\circ 30' 18''$   
 $R = 3,806.86'$   
 $T = 150.00'$   
 $L = 299.84'$   
 $E = 2.95'$   
 PC Sta. 10+88.22  
 PT Sta. 13+88.06

Station Equation  
 Sta. 717+33.78 Bk. 1/4 Constr. Prop. S.R. 117 =  
 Sta. 717+46.88 Ahd. 1/4 R/W & Constr. Exst. S.R. 117  
 = Sta. 9+99.40 1/4 Constr. Prop. Western Ohio Ave.  
 Sta. 100+13.47 1/4 R/W & Constr. Shawnee Rd.  
 = Sta. 717+31.14 1/4 Constr. Prop. S.R. 117  
 Sta. 100+00.00 1/4 R/W & Constr. Shawnee Rd.  
 = Sta. 717+30.67 1/4 R/W & Exst. S.R. 117

1/4 Section Line  
 Sta. 99+87.44 1/4 R/W & Constr. Shawnee Rd.

### BASIS OF BEARINGS

All Bearings shown are based on an Ohio Grid State Plane Coordinates, North Zone. Conversion Factor is 3.281094202088010 or Project Combined Factor x 3.28083333.

CENTER OF SECTION 3  
 (N)389158.265 (E)509522.056 English Ground  
 NE CORNER NW 1/4 SE 1/4 SECTION 3  
 (N)389152.04 (E)510844.368 English Ground

### BASIS OF EXISTING R/W

The Existing Centerline of R/W and R/W Width for S.R. 117 and Western Ohio Avenue was determined from the ALL-117-8.66 and ALL-117-13.64 Right of Way Plans on file at the O.D.O.T. District One Office, Lima.

The Existing Centerline of R/W and R/W Width for Shawnee Road was determined from the Allen County, Ohio Right of Way Map on file at the Allen County Engineer's Office, Lima.

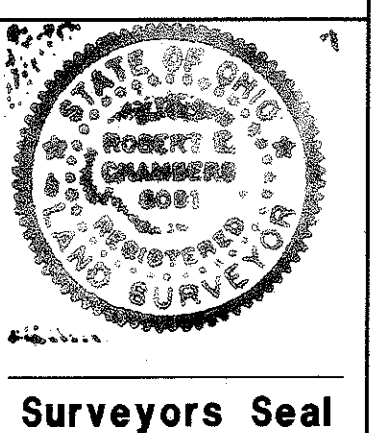
I hereby certify that this is a true delineation of a survey made by the Ohio Department of Transportation, Lima, Ohio.

The establishment of the property lines and existing right of way lines shown on this plan as of this date was performed by me or under my direct supervision.

By Robert E. Chambers  
 Surveyor's Name  
 Surveyor No. 4081 Date 8-29-2000

Received AUG 31 2000  
 Recorded AUG 31 2000  
 Book 08 Page 94

County Recorder



SCALE IN FEET  
 0 75 150 300

PID No.  
 19314

CENTERLINE PLAT

ALL-117-13.47

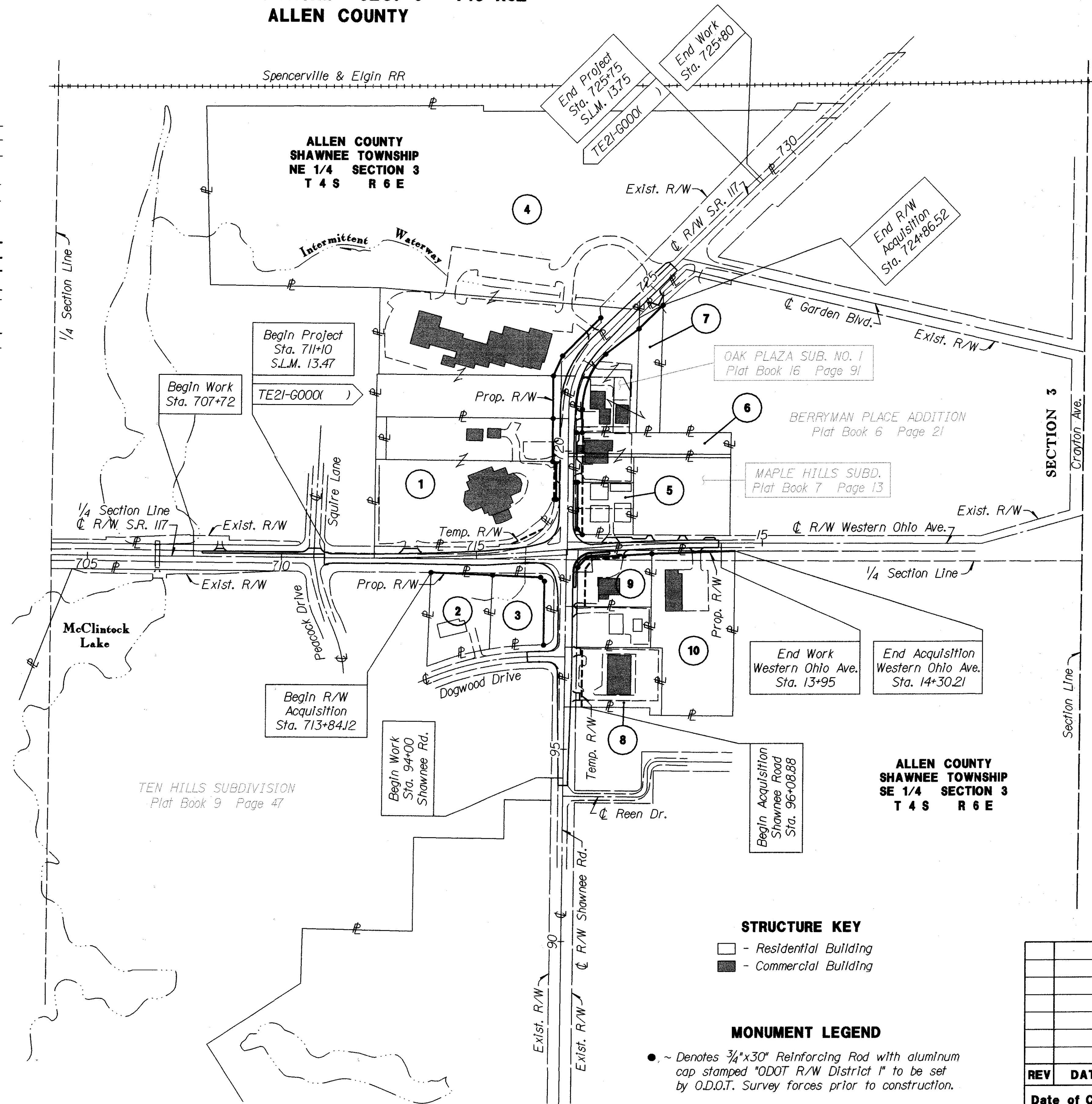
1/7

65



|                                                                                    |                                                                                     |                         |                     |                 |                                                                                      |       |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------|---------------------|-----------------|--------------------------------------------------------------------------------------|-------|
|  |  | PID No.<br><b>19314</b> | <b>PROPERTY MAP</b> | ALL -117 -13.47 |  | 2 / 7 |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------|---------------------|-----------------|--------------------------------------------------------------------------------------|-------|

|                                        |             |                    |
|----------------------------------------|-------------|--------------------|
|                                        |             |                    |
|                                        |             |                    |
|                                        |             |                    |
|                                        |             |                    |
|                                        |             |                    |
|                                        |             |                    |
|                                        |             |                    |
| <b>REV</b>                             | <b>DATE</b> | <b>DESCRIPTION</b> |
| <b>Date of Completion      8-29-00</b> |             |                    |





DESIGN FILE : I:\p\19314\all\17rs.dgn  
USERNAME : nvondero  
DATE : 06-APR-2001  
TIME : 07:11

TOTAL NUMBER OF:  
10 OWNERSHIPS 0 OWNERSHIPS WITH STRUCTURES INVOLVED  
14 PARCELS 1 OWNERSHIPS WITH "P" ITEMS  
0 TOTAL TAKES

GRANTEE:  
ALL RIGHT OF WAY ACQUIRED IN THE NAME OF  
STATE OF OHIO UNLESS OTHERWISE SHOWN.

NET RESIDUE = RECORD - TOTAL PRO - NET TAKE

| PARCEL | OWNER                                                                                                             | SHEET NO. | OWNERS RECORD |      | AUDITOR'S PARCEL NO. | RECORD AREA | TOTAL P.R.O. | GROSS TAKE | P.R.O. IN TAKE | NET TAKE | STRUC-TURE | NET RESIDUE |       | TYPE FUND | REMARKS AND PERSONALTY                                                                                                                                                                                                                              | AS ACQUIRED |      |
|--------|-------------------------------------------------------------------------------------------------------------------|-----------|---------------|------|----------------------|-------------|--------------|------------|----------------|----------|------------|-------------|-------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------|
|        |                                                                                                                   |           | Book          | Page |                      | Acres       | Acres        | Acres      | Acres          | Acres    |            | Left        | Right |           |                                                                                                                                                                                                                                                     | Book        | Page |
| 1SH    | T.R. Chiles Family Co.                                                                                            | 4, 5      | 429           | 277  | 46-0308-02-004.000   | 1.930       | 0            | 0.023      | 0              | 0.023    |            | 1.907       |       | State     |                                                                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           | 808           | 648  | 46-0308-02-005.000   | 1.170       | 0.051        | 0.101      | 0.051          | 0.050    |            | 1.069       |       |           |                                                                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           |               |      | Total SH             | 3.100       | 0            | 0.124      | 0.051          | 0.073    |            | 2.976       |       |           |                                                                                                                                                                                                                                                     |             |      |
| 1T     |                                                                                                                   |           |               |      |                      |             |              | 0.012      |                | 0.012    |            |             |       |           | To Grade Slopes and Place Conduit                                                                                                                                                                                                                   |             |      |
| 1T1    |                                                                                                                   |           |               |      |                      |             |              | 0.011      |                | 0.011    |            |             |       |           | To Reconstruct Drive and Grade Slopes                                                                                                                                                                                                               |             |      |
|        |                                                                                                                   |           |               |      | Total T              |             |              | 0.023      |                | 0.023    |            |             |       |           |                                                                                                                                                                                                                                                     |             |      |
| 2SH    | P. Perant and Erma R. Perant                                                                                      | 4         | 612           | 709  | 46-0304-03-002.000   | 0.785       | 0            | 0.010      | 0              | 0.010    |            |             |       |           | Lot 21532 (Ten Hills Subdivision P.B. 9 PG. 47)                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           | 366           | 210  |                      |             |              |            |                |          |            |             | 0.775 |           |                                                                                                                                                                                                                                                     |             |      |
| 3SH    | Beverly Hersh                                                                                                     | 4, 6      | 556           | 173  | 46-0304-03-001.000   | 0.689       | 0            | 0.037      | 0              | 0.037    |            |             |       |           | Lot 21531 (Ten Hills Subdivision P.B. 9 PG. 47)<br>To be Acquired In the name of Allen County<br>* Subdivision Sign to be Removed by Others                                                                                                         |             |      |
| 3SHV   |                                                                                                                   |           | 366           | 210  |                      |             | 0            | 0.089      | 0              | 0.089    |            |             |       |           |                                                                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           |               |      |                      |             | 0            | 0.126      | 0              | 0.126    |            |             | 0.563 |           |                                                                                                                                                                                                                                                     |             |      |
| 4SH    | H.C.F. Inc., an Ohio Corporation                                                                                  | 5         | 845           | 142  | 46-0308-02-005.001   | 1.250       | 0.061        | 0.111      | 0.061          | 0.050    | P (4)      | 1.139       |       |           | Yard Light to be Removed by Owner<br>2 Sprinkler Heads to be Removed by Owner<br>Valve to be Removed by Owner<br>* 5 Sprinkler Heads                                                                                                                |             |      |
|        |                                                                                                                   |           | 845           | 142  | 46-0308-02-006.000   | 2.630       | 0.195        | 0.178      | 0.135          | 0.043    |            | 2.392       |       |           |                                                                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           | 845           | 142  | 46-0308-02-001.000   | 14.648      | 1.171        | 0          | 0              | 0        |            | 13.477      |       |           |                                                                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           |               |      | Total SH             | 18.528      | 1.427        | 0.289      | 0.196          | 0.093    |            | 17.008      |       |           |                                                                                                                                                                                                                                                     |             |      |
| 5SH    | Continl Enterprises                                                                                               | 4, 5, 7   | 861           | 738  | 46-0308-03-021.000   | 0.455       | 0            | 0.017      | 0              | 0.017    |            |             |       | 0.438     | Lots 18448, 18449 (Maple Hill Subd. P.B. 7 PG. 13)<br>To Reconstruct Concrete Steps, Grade Slopes<br>and Remove Trees<br>* RR Tiles                                                                                                                 |             |      |
| 5T     |                                                                                                                   |           |               |      |                      |             |              | 0.038      |                | 0.038    |            |             |       |           |                                                                                                                                                                                                                                                     |             |      |
| 6T     | Kevin Everhardt and Stephanie Everhardt                                                                           | 5         | 793           | 41   | 46-0308-03-020.000   | 0.893       | 0.004        | 0.053      |                | 0.053    |            |             |       |           | Lot 18450 (Maple Hill Subd. P.B. 7 PG. 13) &<br>Lot 44 (Berryman Place Addition P.B. 6 PG. 21)<br>To Reconstruct Drives, Remove Shrubs, Grade<br>Slopes and Remove Sign                                                                             |             |      |
|        |                                                                                                                   |           |               |      |                      |             |              |            |                |          |            |             |       |           |                                                                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           |               |      |                      |             |              |            |                |          |            |             |       |           |                                                                                                                                                                                                                                                     |             |      |
| 7SH    | Norman L. Shutt and Marilyn S. Shutt                                                                              | 5         | 634           | 714  | 46-0308-03-019.002   | 0.300       | 0            | 0.050      | 0              | 0.050    |            |             | 0.250 |           | Lot 28168 (Oak Plaza Sub. No. 1 P.B. 16 PG. 91)<br>Lot 28170 (Oak Plaza Sub. No. 1 P.B. 16 PG. 91)<br><br>Lot 43 (Berryman Place Addition P.B. 6 PG. 21)                                                                                            |             |      |
|        |                                                                                                                   |           | 634           | 714  | 46-0308-03-019.001   | 0.064       | 0            | 0.010      | 0              | 0.010    |            |             | 0.054 |           |                                                                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           | 634           | 714  | 46-0308-03-019.000   | 0.400       | 0.130        | 0.172      | 0.130          | 0.042    |            |             | 0.228 |           |                                                                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           | 634           | 714  | 46-0308-03-018.000   | 0.447       | 0.027        | 0.047      | 0.027          | 0.020    |            |             | 0.400 |           |                                                                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           |               |      | Total SH             | 1.211       | 0.157        | 0.279      | 0.157          | 0.122    |            |             | 0.932 |           |                                                                                                                                                                                                                                                     |             |      |
| 8TV    | The Joseph T. Cardone Trust,<br>Joseph T. Cardone and/or<br>Carmella A. Cardone Trustees<br>and Gilbert E. Lentol | 6         | 785           | 775  | 46-0304-02-006.000   | 0.900       | 0.106        | 0.053      |                | 0.053    |            |             |       |           | To Reconstruct Drives and Place Conduit<br>To be Acquired In the name of Allen County<br>* Business Sign                                                                                                                                            |             |      |
|        |                                                                                                                   |           |               |      |                      |             |              |            |                |          |            |             |       |           |                                                                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           |               |      |                      |             |              |            |                |          |            |             |       |           |                                                                                                                                                                                                                                                     |             |      |
| 9SHV   | Michael O. Kinkle                                                                                                 | 4, 6, 7   | 842           | 56   | 46-0304-02-007.000   | 0.732       | 0.100        | 0.168      | 0.100          | 0.068    |            |             | 0.564 |           | To be Acquired In the name of Allen County<br>To Reconstruct Drives and Parking Lot<br>Dumpster on Temporary Right of Way<br>1 Post Business Sign and Portable Lighted Sign<br>to be Removed by Owner<br>To be Acquired In the name of Allen County |             |      |
| 9TV    |                                                                                                                   |           |               |      |                      |             |              | 0.070      |                | 0.070    |            |             |       |           |                                                                                                                                                                                                                                                     |             |      |
|        |                                                                                                                   |           |               |      |                      |             |              |            |                |          | S (2)      |             |       |           |                                                                                                                                                                                                                                                     |             |      |
| 10SHV  | F.H.S. Development Co.                                                                                            | 7         | 735           | 387  | 46-0304-02-006.001   | 1.949       | 0            | 0.020      | 0              | 0.020    |            |             | 1.929 | State     | To be Acquired In the name of Allen County                                                                                                                                                                                                          |             |      |

NOTE: TEMPORARY RIGHT OF WAY IS FOR A PERIOD OF  
ONE YEAR FROM THE DATE OF CONSTRUCTION.

NOTE: UNDER NO CIRCUMSTANCES ARE TEMPORARY EASEMENTS  
TO BE USED FOR STORAGE OF MATERIALS OR EQUIPMENT  
BY THE CONTRACTOR UNLESS NOTED OTHERWISE.

\* DENOTES RIGHT OF WAY ENCROACHMENT

|                            |          |                                              |
|----------------------------|----------|----------------------------------------------|
| 7                          | 4-06-01  | Added Owner to Parcel 8                      |
| 6                          | 3-29-01  | Deleted Lot 46-0308-03-019.003 from Parcel 7 |
| 5                          | 3-26-01  | Added P Items and Encroachments to Parcel 4  |
| 4                          | 3-26-01  | Revised 9SH to 9SHV and 9T to 9TV            |
| 3                          | 3-26-01  | Added Parcel 3SHV                            |
| 2                          | 1-05-01  | Added Remove Trees to Remarks for Parcel 5T  |
| 1                          | 10-11-00 | Revision to Remarks for Parcel 6T            |
| REV                        | DATE     | DESCRIPTION                                  |
| Date of Completion 8-29-00 |          |                                              |



# STRUCTURE KEY

- Residential Building
- Commercial Building

# MONUMENT LEGEND

- PK.F. ~ PK Nail Found
- PI.R.F. ~ Iron Pin Found with I.D. Cap
- OP.F. ~ Iron Pipe Found
- Existing Monument Box
- Proposed Monument Box @ Mag. Nail Set
- Denotes 3/4 x 30 Reinforcing Rod with aluminum cap stamped "ODOT R/W District I" to be set by O.D.O.T. Survey forces prior to construction.

ALLEN COUNTY  
SHAWNEE TOWNSHIP  
NE 1/4 SECTION 3  
T 4 S R 6 E

# BASIS OF EXISTING R/W

The Existing Centerline of R/W and R/W Width for S.R. 117 and Western Ohio Avenue was determined from the ALL-117-8.66 and ALL-117-13.64 Right of Way Plans on file at the O.D.O.T. District One Office, Lima.

The Existing Centerline of R/W and R/W Width for Shawnee Road was determined from the Allen County, Ohio Right of Way Map on file at the Allen County Engineer's Office, Lima.

# CURVE 1 DATA PROP. S.R. 117

PI Sta. 714+05.00  
 $\Delta = 4^{\circ}34'24''$  Lt.  
 $D_c = 0^{\circ}54'55''$   
 $R = 6,260.68'$   
 $T = 250.00'$   
 $L = 499.73'$   
 $E = 4.99'$   
PC Sta. 711+55.00  
PT Sta. 716+54.74

$\Delta = 45^{\circ}18'33''$  Lt.  
 $R = 115.00'$   
 $L = 90.94'$  (E)  
 $C = 88.59'$   
C Bear N64-06'-46"E

# CURVE 2 DATA EXISTING S.R. 117

PI Sta. 715+25.01  
 $\Delta = 3^{\circ}29'59''$  Lt.  
 $D_c = 4^{\circ}59'59''$   
 $R = 1,146.00'$   
 $T = 35.01'$   
 $L = 70.00'$   
 $E = 0.53'$   
PC Sta. 714+90.00  
PT Sta. 715+60.00

Pavement Removed (203)

\* Masonry Collar, as per DM-1JM

T.R. Chiles Family Co.

ALLEN COUNTY  
SHAWNEE TOWNSHIP  
SE 1/4 SECTION 3  
T 4 S R 6 E

TEN HILLS SUBDIVISION  
Plat Book 9 Page 47

\* - Denotes Right of Way Encroachment

For Full Description of Parcel 3, See Sht. 6

$\Delta = 90^{\circ}13'47''$  Rt.  
 $R = 25.00'$   
 $L = 39.37'$  (D)  
 $C = 35.42'$   
C Bear S44-37'-06"E

SEE SHEET 6

| REV                | DATE    | DESCRIPTION                                  |
|--------------------|---------|----------------------------------------------|
| 3                  | 6-05-01 | Changed Removal of Trees to Save In Parcel 5 |
| 2                  | 3-26-01 | Added Parcel 3SHV                            |
| 1                  | 1-05-01 | Added Removal of Trees In Parcel 5           |
| Date of Completion |         | 8-29-00                                      |

ALL-117-13.47

4 / 7

62  
65

RIGHT OF WAY PLAN - S.R. 117  
STA. 713+20 TO STA. 718+60

PID No.  
19314

SCALE IN FEET  
0 10 20 40



- (A) Sta. 99+87.44 @ R/W & Constr. Shawnee Rd.
- (B) Sta. 100+00.00 @ R/W & Constr. Shawnee Rd.  
= Sta. 717+30.67 @ R/W & Exst. S.R. 117
- (C) PI Sta. 717+33.37 @ R/W & Exst. S.R. 117

Cont'l Enterprises  
46-0308-03-021.000

For Description of Parcel 5, See Sht. 7

Sta. 10+00.00 @ R/W & Ex. Western Ohio Ave.  
= Sta. 717+65.67 @ R/W & Constr. S.R. 117

Michael O. Kinkle  
For Description of Parcel 9, See Sht. 7

# @ R/W & Exst. S.R. 117 Stationing  
@ @ R/W Shawnee Road Stationing



DESIGN FILE : I:\pdx\19314\all\17r.p.dgn  
USER NAME : nvondere

DATE : 05-JUN-2001  
TIME : 13:48

MATCH LINE STA. 718+60 SEE SHEET 4

| REV                | DATE     | DESCRIPTION                                                |
|--------------------|----------|------------------------------------------------------------|
| 6                  | 6-05-01  | Changed Removal of Trees to Save In Parcel 5               |
| 5                  | 3-29-01  | Changed Lot 28169 In Par. 7 to Property Lines              |
| 4                  | 3-26-01  | Added Sprinkler Heads In Parcel 4                          |
| 3                  | 1-05-01  | Deleted "and Reerect" from Business Sign (202) In Parcel 6 |
| 2                  | 1-05-01  | Added Removal of Trees In Parcel 5                         |
| 1                  | 12-05-00 | Added Do Not Disturb for Portico In Parcel 6               |
| Date of Completion |          | 8-29-00                                                    |

ALLEN COUNTY  
SHAWNEE TOWNSHIP  
NE 1/4 SECTION 3  
T 4 S R 6 E

|                                                                                                                        |                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| $\Delta = 27^{\circ}07'-06''$ Rt.<br>$R = 218.72'$<br>$L = 103.52'$<br>$C = 102.56'$<br>C Bear $N13^{\circ}49'-13''$ E | $\Delta = 12^{\circ}27'-28''$ Rt.<br>$R = 238.72'$<br>$L = 51.91'$<br>$C = 51.80'$<br>C Bear $N38^{\circ}32'-34''$ E   |
| $\Delta = 0^{\circ}09'-54''$ Rt.<br>$R = 21,485.92'$<br>$L = 61.84'$<br>$C = 61.84'$<br>C Bear $N44^{\circ}51'-15''$ E | $\Delta = 44^{\circ}30'-39''$ Rt.<br>$R = 203.72'$<br>$L = 158.26'$<br>$C = 154.32'$<br>C Bear $N22^{\circ}30'-59''$ E |

(B)  $N57^{\circ}41'-09''$ W, 24.97'

BERRYMAN PLACE ADDITION  
Plat Book 6 Page 21  
Lot 43  
46-0308-03-018.000

Norman L. Shutt and  
Marilyn S. Shutt

#### STRUCTURE KEY

- Residential Building
- Commercial Building

\* - Denotes Right of Way Encroachment

#### MONUMENT LEGEND

- PK.F. ~ PK Nail Found
- IR.F. ~ Iron Pin Found with I.D. Cap
- IP.F. ~ Iron Pipe Found
- ~ Existing Monument Box
- ~ Proposed Monument Box @ Mag. Nail Set
- ~ Denotes  $\frac{3}{4}$ "x30" Reinforcing Rod with aluminum cap stamped "ODOT R/W District 1" to be set by O.D.O.T. Survey forces prior to construction.

- Pavement Removed (203)
- Item 254 Pavement Planing, Bituminous

#### CURVE 4 DATA EXISTING S.R. 117

PI Sta. 726+27.14  
 $\Delta = 1^{\circ}16'-00''$  Rt.  
 $D_0 = 0^{\circ}16'-00''$   
 $R = 21,485.92'$   
 $T = 237.51'$   
 $L = 475.00'$   
 $E = 1.31'$   
PC Sta. 723+89.63  
PT Sta. 728+64.63

#### CURVE 3 DATA EXISTING S.R. 117

PI Sta. 722+05.07  
 $\Delta = 44^{\circ}30'-39''$  Rt.  
 $D_0 = 24^{\circ}00'-04''$   
 $R = 238.72'$   
 $T = 97.69'$   
 $L = 185.45'$   
 $E = 19.22'$   
PC Sta. 721+07.38  
PT Sta. 722+92.83

RIGHT OF WAY PLAN - S.R. 117  
STA. 718+60 TO STA. 725+25

ALL -117-13.47

5 / 7  
63  
65

PID No.  
19314

SCALE IN FEET  
0 10 20 40





DESIGN FILE : I:\p\19314\chili7p.dgn  
USER NAME : nvondere  
DATE : 22-MAY-2001  
TIME : 07:54

### STRUCTURE KEY

- Residential Building
- Commercial Building

### MONUMENT LEGEND

- PK.F. ~ PK Nail Found
- IR.F. ~ Iron Pin Found with I.D. Cap
- IR.P. ~ Iron Pipe Found
- ~ Existing Monument Box
- ~ Proposed Monument Box @ Mag. Nail Set
- Denotes 3/4"x30" Reinforcing Rod with aluminum cap stamped "ODOT R/W District 1" to be set by O.D.O.T. Survey forces prior to construction.

ALLEN COUNTY  
SHAWNEE TOWNSHIP  
SE 1/4 SECTION 3  
T 4 S R 6 E

- (A) Sta. 99+87.45 @ R/W & Constr. Shawnee Rd.
- (B) Sta. 100+00.00 @ R/W & Constr. Shawnee Rd.  
= Sta. 717+30.67 @ R/W & Exst. S.R. 117
- (C) PI Sta. 717+33.37 @ R/W & Exst. S.R. 117

Δ = 90°-13'-47" Rt.  
R = 25.00'  
L = 39.37'  
C = 35.42'  
C Bear S44°-37'-06"E (D)

Δ = 90°-00'-00" Rt.  
R = 25.00'  
L = 39.27'  
C = 35.36'  
C Bear S45°-29'-48"W (E)

2 STORY  
BRICK  
RES.

# @ R/W & Exst. S.R. 117 Stationing  
@ @ R/W Shawnee Road Stationing

Sta. 10+00.00 @ R/W & Constr. Dogwood Dr. =  
Sta. 97+37.32 @ R/W & Constr. Shawnee Rd.

TEN HILLS SUBDIVISION  
Plat Book 9 Page 47

Beverly Hersh  
Lot 21531  
46-0304-03-001.000

WOODED LOT

LAWN

Michael O. Kinkle  
46-0304-02-007.000

SEE SHEET 4

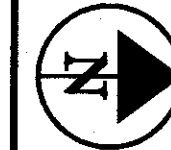
SEE SHEET 7

RIGHT OF WAY PLAN - SHAWNEE ROAD  
STA. 95+70 TO STA. 100+13.47

ALL-117-13.47

6/7

64  
65



SCALE IN FEET  
0 10 20 40

PID No.  
19314

- Pavement Removed (203)
- Item 254 Pavement Planing, Bituminous

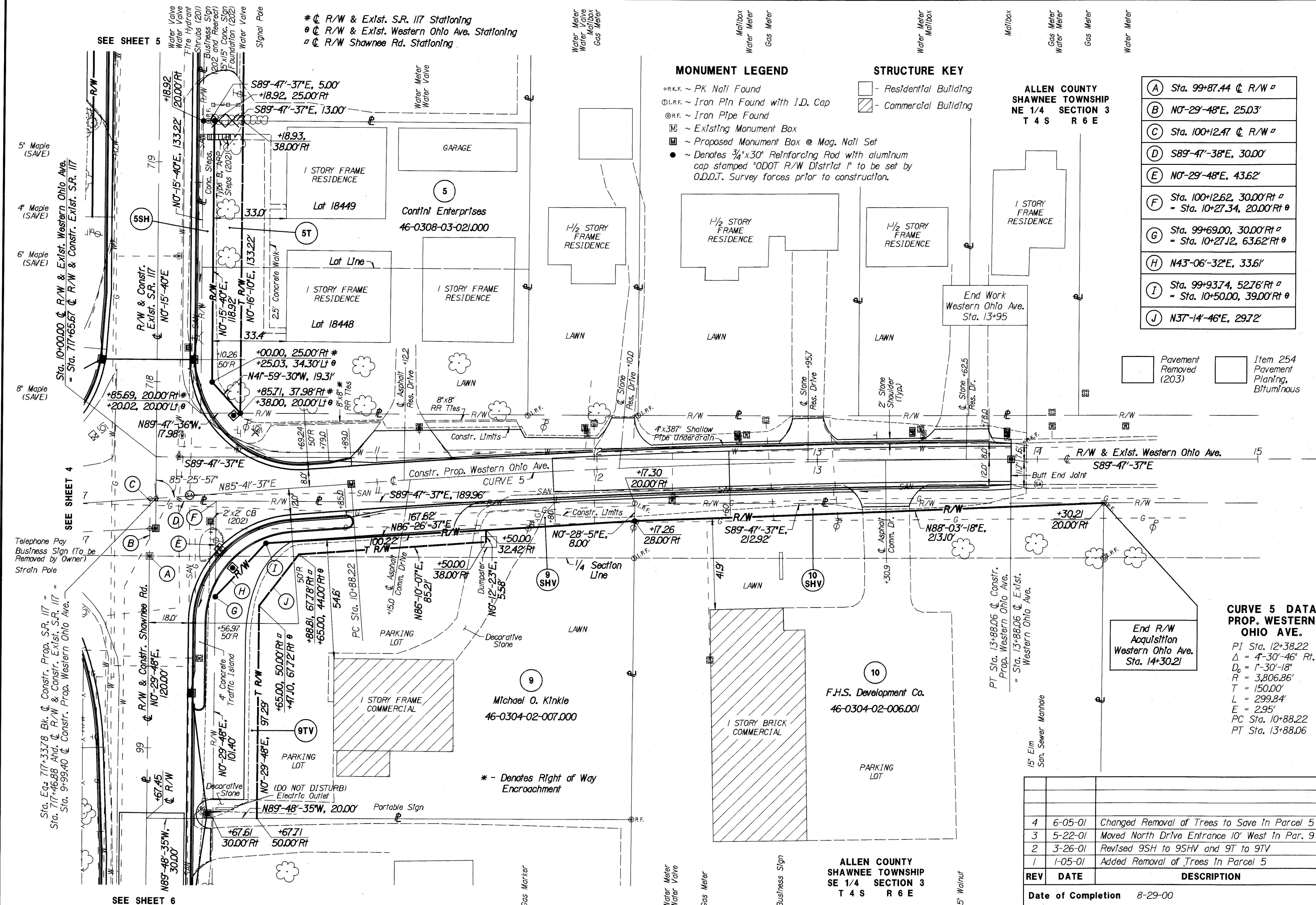
| REV                | DATE    | DESCRIPTION                                                                                  |
|--------------------|---------|----------------------------------------------------------------------------------------------|
| 3                  | 5-22-01 | Added Removal of trees at 97+96 & 98+33 Rt.<br>Moved North Drive Entrance 10' West In Par. 9 |
| 2                  | 4-06-01 | Added Owner to Parcel 8                                                                      |
| 1                  | 3-26-01 | Added Parcel 3SHV<br>Revised 9SH to 9SHV and 9T to 9TV                                       |
| Date of Completion |         | 8-29-00                                                                                      |

Begin R/W  
Acquisition  
Shawnee Rd.  
Sta. 96+08.88

The Joseph T. Cardone Trust,  
Joseph T. Cardone and/or  
Carmella A. Cardone Trustees  
and Gilbert E. Lentol

\* - Denotes Right of Way Encroachment





# C R/W & Exst. S.R. 117 Stationing  
o C R/W & Exst. Western Ohio Ave. Stationing  
□ C R/W Shawnee Rd. Stationing

- MONUMENT LEGEND**
- o R.F. ~ PK Nail Found
  - o I.R.F. ~ Iron Pin Found with I.D. Cap
  - o R.F. ~ Iron Pipe Found
  - ~ Existing Monument Box
  - ~ Proposed Monument Box @ Mag. Nail Set
  - ~ Denotes 3/4"x30" Reinforcing Rod with aluminum cap stamped "ODOT R/W District 1" to be set by O.D.O.T. Survey forces prior to construction.
- STRUCTURE KEY**
- - Residential Building
  - ▨ - Commercial Building

ALLEN COUNTY  
SHAWNEE TOWNSHIP  
NE 1/4 SECTION 3  
T 4 S R 6 E

- (A) Sta. 99+87.44 @ R/W
- (B) N0°-29'-48"E, 25.03'
- (C) Sta. 100+12.47 @ R/W
- (D) S89°-47'-38"E, 30.00'
- (E) N0°-29'-48"E, 43.62'
- (F) Sta. 100+12.62, 30.00' Rt = Sta. 10+27.34, 20.00' Rt
- (G) Sta. 99+69.00, 30.00' Rt = Sta. 10+27.12, 63.62' Rt
- (H) N43°-06'-32"E, 33.61'
- (I) Sta. 99+93.74, 52.76' Rt = Sta. 10+50.00, 39.00' Rt
- (J) N37°-14'-46"E, 29.72'

□ Pavement Removed (203)  
□ Item 254 Pavement Planing, Bituminous

**CURVE 5 DATA  
PROP. WESTERN OHIO AVE.**  
PI Sta. 12+38.22  
Δ = 4°-30'-46" Rt.  
D<sub>b</sub> = 1°-30'-18"  
R = 3,806.86'  
T = 150.00'  
L = 299.84'  
E = 2.95'  
PC Sta. 10+88.22  
PT Sta. 13+88.06

| REV                | DATE    | DESCRIPTION                                   |
|--------------------|---------|-----------------------------------------------|
| 4                  | 6-05-01 | Changed Removal of Trees to Save In Parcel 5  |
| 3                  | 5-22-01 | Moved North Drive Entrance 10' West In Par. 9 |
| 2                  | 3-26-01 | Revised 9SH to 9SHV and 9T to 9TV             |
| 1                  | 1-05-01 | Added Removal of Trees In Parcel 5            |
| Date of Completion |         | 8-29-00                                       |



STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION  
SUPPLEMENTAL SPECIFICATION 806

FIELD OFFICE  
September 9, 1997

806.01 Description  
806.02 General  
806.03 Computer Equipment for Field Office  
806.04 Basis of Payment

**806.01 Description.** This item shall consist of providing, maintaining and subsequently removing a field office for the exclusive use of the Department for the duration of the contract at a location approved by the Engineer. The field office will be designated as Type A, B or C.

**806.02 General.** The field office shall be available and completely functional at a time directed by the Engineer. The office shall have a minimum ceiling height of 2.1 m (7 feet) and have provisions for maintaining room temperature between 20 and 27 C (68 and 80 F). The Type C field office shall have a separate enclosed room for the Engineer. The Contractor shall provide and maintain telephone and electric service. One phone shall be connected to a recorded answering device. One speaker phone shall be required for Type B or Type C facilities. All field office types shall have one copying machine ;the copier shall be provided with all necessary maintenance and paper supplies, and be capable of producing multiple copies of documents up to 216 by 356 mm (8 1/2 by 14-inch) in size. The Type B and Type C field offices shall have a facsimile machine.

The office shall be provided with potable hot and cold water. The office shall also have neat, sanitary, enclosed toilet accommodations; associated lavatory and sanitary supplies shall be furnished. Portable facilities may be provided with the approval of the Engineer.

On all projects requiring moisture and density control of construction materials, the field office shall contain a storage box for a nuclear density gauge in accordance with drawings on file with the Director.

Additional requirements for field office and office equipment are as specified in the following table:

| FIELD OFFICE                                            |          |          |           |
|---------------------------------------------------------|----------|----------|-----------|
| Item                                                    | Type A   | Type B   | Type C    |
| Floor Space, m <sup>2</sup> (sq. ft.).....              | 14 (150) | 46 (500) | 93 (1000) |
| Telephone .....                                         | 2        | 4        | 4         |
| Base Radio & 4-Hand Held Units <sup>1</sup> .....       | --       | --       | 1         |
| 10 Column Electronic Calculator with Tape .....         | 1        | 2        | 3         |
| Desk and Chair Set .....                                | 1        | 3        | 5         |
| Work Tables, 750 by 1800 mm (30 by 72-inch) .....       | 1        | 2        | 3         |
| 4 Drawer, Legal Size, Lockable Metal File Cabinet ..... | --       | 1        | 2         |
| 2 Drawer, Metal File Cabinet ...                        | 1        | 2        | 2         |
| Portable Fire Extinguishers - Type 2A10BC-5# .....      | 1        | 1        | 2         |
| All Weather Parking Spaces ...                          | 4        | 8        | 10        |
| Plan Rack <sup>2</sup> .....                            | 1        | 1        | 2         |

1. Units shall be capable of transmitting and receiving voice communication between office and any area on the project site.

2. Capable of handling the breakdown of 559x864 mm (22x34 inch) sized plans in to 10 sections.

The preceding requirements for the field office may be modified only upon written approval of the Engineer.

**806.03 Computer Equipment for Field Office.** Where required, the Contractor shall furnish, install, and maintain the following computer hardware and software in the field office required by this item for the life of the contract. All computer hardware and software furnished shall be for the exclusive use of the Engineer and staff and shall be operable at the same time as the field office.

This system shall not experience down time exceeding 48 hours from notification by the Engineer. The Contractor shall replace stolen, vandalized, or units otherwise inoperable within 48 hours after notification by the Engineer. Upon completion of the contract, the hardware and software furnished by the Contractor shall remain the property of the Contractor.

**Computer Hardware**

- (1) One IBM PC compatible computer with an Intel Pentium processor (or equal) operating at a minimum 200 MHz. The computer shall be provided with the following **minimum** requirements:
  - a. 2.1 Gigabyte hard disk
  - b. 32 Megabytes RAM



- c. one 3.5 inch., 1.44 MB floppy drive
- d. one 8x CD-ROM drive
- e. 101 key keyboard
- f. 15 inch Hi-Res Super VGA Color Monitor 1024 X 768 resolution with .28 dot pitch and Hi-Res Super VGA Card with 2 Megabytes of Video RAM.
- g. 2 Button Microsoft compatible mouse with appropriate software, compatible with required software.
- h. At least 1 parallel port and 1 serial interface port and 1 mouse port.
- i. one 56K firmware upgradeable 3Com compatible modem

(2) Hewlett Packard LaserJet compatible (PCL3 emulation) 6 page per minute printer or approved equal and parallel printer cable.

(3) Surge Protector. 15 amp six outlet with circuit breaker control, phone line circuit surge protection and a surge indicator light.

#### Computer Software

The Contractor shall furnish, load, and maintain the following software on the computers provided in the field offices: Microsoft Windows 95 (with games removed) and the Corel Professional Edition Office Suite Version 8.

All computer hardware and software shall be maintained by the Contractor during the life of the contract. Information for proposed "equal" equipment shall be submitted to the Engineer and be approved prior to use.

Along with the furniture under 806.02, the Contractor shall also provide the necessary stands, tables, etc. to accommodate the computer system.

**806.04 Basis of Payment.** The field office will be paid for at the contract price bid, which price shall be full compensation for furnishing, maintaining and subsequently removing the field office and all incidentals necessary to complete this item. The field office and any required computer equipment shall be paid on a monthly basis. The contract bid price shall be full compensation for furnishing, setting up, maintaining, and subsequently removing the specified computer hardware and software from the field office.

| Item | Unit  | Description                         |
|------|-------|-------------------------------------|
| 806  | Month | Field office, Type _____            |
| 806  | Month | Computer equipment for field office |

**STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION  
SUPPLEMENTAL SPECIFICATION 814**

**EMBANKMENT CONSTRUCTION USING PETROLEUM CONTAMINATED SOIL**

**June 2, 1998**

- 814.01 Description**
- 814.02 Restrictions on Usage**
- 814.03 Materials**
- 814.04 Construction Requirements**
- 814.05 Method of Measurement**
- 814.06 Basis of Payment**

**814.01 Description:** This work shall consist of using Petroleum Contaminated Soil (PCS) material, and/or constructing a mixture of PCS material and embankment material in accordance with these specifications and in reasonably close conformity with the lines shown on the plans or established by the Engineer; mixed, spread, compacted, shaped and finished.

The Contractor may elect to use PCS material as embankment material or may excavate PCS material detailed in the contract or found in the work. It is not a requirement of this specification to use the PCS material in the embankment. The use of PCS material may be allowed as per this specification.

Item 203, Roadway Excavation and Embankment shall apply: deviations from these are as follows.

**814.02 Restrictions of Usage.** The Contractor shall certify to the Engineer that the PCS material does not exceed the petroleum constituent concentrations stated in OAC 1301: 7-9-16(I)(1)(c)(ii)(b). These values are provided below:

|               |                       |
|---------------|-----------------------|
| Benzene       | 35 parts per million  |
| Toluene       | 109 parts per million |
| Ethylbenzene  | 32 parts per million  |
| Total Xylenes | 165 parts per million |

This certification shall include test results from an independent environmental consultant approved by the Department. The consultant shall perform BTEX testing by using United States Environmental Protection Agency (USEPA) test method SW 846 method 8020 or equivalent method. These tests shall be performed on every 90 metric tons (100 tons) of PCS used on the project.

The Contractor shall submit this certification and information in a suitable format to the Engineer 10 working days prior to the intended usage.

PCS shall not be allowed within the top 1.0 m (3 feet) of the final subgrade elevation or within 1.5

m (5 feet) from any exposed surface.

The final PCS material shall produce a stable embankment. The source, materials, construction and compaction techniques shall be approved by the Engineer.

**814.03 Materials.** The PCS material shall meet the requirements of Item 203 and the following additional requirements:

The PCS material shall be classified by an independent soils consultant approved by the Department as per Section 4.3 of the Department's "Specifications for Subsurface Investigation Manual". The soils consultant shall determine the suitability of the material under Item 203 Embankment Materials.

The soils consultant shall make a moisture density curve in accordance with AASHTO T 99 for every 225 metric tons (250 tons) of PCS material.

The soils consultant shall submit the above information in a suitable format to the Engineer at least 7 working days prior to the proposed work. This report shall be written and sealed by a Registered Professional Engineer.

**814.04 Construction Requirements.** The outer soil cover shall be raised uniformly with the PCS material. At no time shall the PCS material be dumped or spread on soft areas, in jurisdictional wetland, or in standing water.

The layers of PCS material shall be alternated with other Department approved soil layers (other than PCS material).

PCS material shall be spread on the embankment or subgrade in 200 mm (8 inch) loose lifts.

Compaction shall be performed with a sheeps foot roller, self propelled roller or other approved equipment. The compaction operation shall be coordinated with the spreading operation to minimize the amount of PCS material spread out on the embankment. In no case shall the PCS material be left spread out and uncompacted overnight.

The PCS material shall be compacted at a moisture content to obtain the required density and embankment stability. The PCS mixture shall be compacted to a density required under 203.12 or to a density determined by 203.09(b). Any water needed to bring the material to the specified moisture shall be uniformly mixed throughout the lift.

**814.05 Method of Measurement.** The PCS material shall be paid as per the 203 Items in the contract documents.

**814.06 Basis of Payment.** The contract unit price per cubic meter(cubic yard) for the 203 Items in the contract documents shall include full compensation for furnishing all testing and certification documentation, labor, materials and incidentals for doing all work involved with the PCS material.

STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION  
  
SUPPLEMENTAL SPECIFICATION 829  
HEAT-FUSED PREFORMED PLASTIC PAVEMENT MARKING

July 28, 1998

**829.01 Description**  
**829.02 Materials**  
**829.03 Equipment**  
**829.04 Application**  
**829.05 Basis of Payment**

**829.01 Description.** This work shall consist of furnishing and applying heat-fused preformed plastic for use as auxiliary pavement marking in accordance with 641 and the additional requirements as described herein.

**829.02 Material.** Heat-fused preformed plastic pavement marking materials shall be prequalified in accordance with Supplement 1047, and conform to the following:

|                            |        |
|----------------------------|--------|
| Type A - 90 mil thickness  |        |
| Type B - 125 mil thickness |        |
| Type C - 125 mil thickness |        |
| Glass beads                | 740.10 |

The pavement marking material and glass beads will be field service tested as a system. Those systems performing satisfactorily will be considered for addition to the Prequalified List. The Office of Materials Management will maintain a list of prequalified materials. The Department reserves the right to perform random performance check sampling of materials.

**829.03 Equipment.** Equipment for applying the heat-fused preformed plastic pavement marking material shall be recommended by the manufacturer.

For Type A material this equipment shall include: a propane torch to preheat the pavement and post-heat the material to the manufacturer's specifications, and an infrared thermometer to assure that both the pavement and the material have been properly heated and do not exceed the manufacturer's specified application temperature.

For Type B and Type C material this equipment shall include: a propane torch to remove moisture from the pavement and heat the material to the manufacturer's specifications. An infrared

thermometer is not required for this application.

**829.04 Application.** The heat-fused preformed plastic pavement marking material shall be applied to the clean and dry pavement surfaces in accordance to the manufacturer's recommendations. Primer sealer shall be applied on portland cement concrete pavements for proper adhesion only if the manufacturer requires its use.

Lines 300 mm (12 inches) wide or less shall be formed by one piece; lines wider than 300 mm (12 inches) shall be formed by no more than two pieces. Separate pieces shall not overlap, but may be separated by a gap not greater than 6 mm (1/4 inch).

Heat-fused preformed plastic material subject to premature adhesion or contamination before placement shall not be used.

Type A (90-mil thickness) Material Application on Asphalt Concrete and Portland Cement Concrete Pavements: The pavement shall be clean and free of debris and moisture. The pavement shall be uniformly pre-heated to 177 C (350 F) by the use of a propane torch. The material shall be placed on the warm surface as soon as practical and then uniformly post-heated to 205 C (400 F). The post-heating process of material application should begin as quickly as possible. Extended post-heating may be required on concrete having a high moisture content. It shall be allowed to cool naturally and solidify before being exposed to traffic.

Type A material shall contain intermix glass beads throughout. Drop-on glass beads are not required.

Type B and Type C (125-mil thickness) Material Application on Asphalt Concrete and Portland Cement Concrete Pavements: The pavement shall be clean and free of debris and moisture. It will not be necessary to pre-heat the pavement to a specific temperature, nor will an infrared thermometer be required. The material shall be placed on the surface at ambient temperature and then uniformly post-heated. During heating, the material will bubble and develop an off-white color, indicating that sufficient heat has been applied. It shall be allowed to cool naturally and solidify before being exposed to traffic.

Type B material shall contain intermix glass beads throughout. Drop-on glass beads shall also be applied to the surface at the rate and within the temperature range as recommended by the manufacturer.

Type C material shall contain intermix glass beads throughout. Drop-on glass beads are not required.

**829.05 Basis of Payment.** Payment for accepted quantities complete in place will be made at contract prices, or prices adjusted in accordance with 641.11, for:

| Item | Unit                | Description                  |
|------|---------------------|------------------------------|
| 829  | Meter (linear foot) | Channelizing line, Type ____ |
| 829  | Meter (linear foot) | Stop line, Type ____         |



|     |                                                          |                                                 |
|-----|----------------------------------------------------------|-------------------------------------------------|
| 829 | Meter (linear foot)                                      | Crosswalk line, Type _____                      |
| 829 | Meter (linear foot)                                      | Transverse line, Type _____                     |
| 829 | Each                                                     | Handicap symbol marking, Type _____             |
| 829 | Each                                                     | Railroad symbol marking, Type _____             |
| 829 | Each                                                     | School symbol marking, ____mm (in.), Type _____ |
| 829 | Meter (linear foot)                                      | Parking lot stall marking, Type _____           |
| 829 | Each                                                     | Lane arrow, Type _____                          |
| 829 | Each                                                     | Word on a pavement, ____mm (in.), Type _____    |
| 829 | Meter (linear foot)                                      | Dotted line, ____mm (in.), Type _____           |
| 829 | Each, meter (linear foot),<br>square meter (square foot) | Removal of pavement marking                     |

STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION  
  
SUPPLEMENTAL SPECIFICATION 830  
CURBING, CONCRETE MEDIANS AND TRAFFIC ISLANDS

October 21, 1998

**830.01 Description**

**830.02 Materials**

**830.03 Stone Curb**

**830.04 Cast in Place Concrete Curb and Combination Curb and Gutter**

**830.05 Asphalt Concrete Curb**

**830.06 Concrete Median and Traffic Island**

**830.07 Method of Measurement**

**830.08 Basis of Payment**

**830.01 Description.** This work shall consist of furnishing and constructing curb, combination curb and gutter, medians and islands of the specified materials and types, in reasonably close conformity with the lines, grades and cross sections shown on the plans or established by the Engineer. This item shall also include necessary excavation and backfill, furnishing and installing joint materials, and the disposal of surplus excavation and discarded materials in accordance with 203.

**830.02 Materials.** Materials shall be:

|                                   |                                |
|-----------------------------------|--------------------------------|
| Concrete (Class C) .....          | 499                            |
| Tie bar steel, epoxy coated ..... | 709.00, 709.01, 709.03, 709.05 |
| Joint sealer .....                | 705.11, 705.04                 |
| Preformed filler .....            | 705.03                         |
| Coated dowel bars. ....           | 709.13                         |

Sandstone shall be the best quality of Berea or Amherst gray sandstone, or sandstone of equal quality.

Asphalt curb shall meet 448 Intermediate Course, Type 1, designed for medium traffic, PG 64-22.

If a 448 mix is used, the asphalt concrete shall meet the composition requirements of 441 with the fine aggregate content set at the maximum permitted under this composition. Mineral filler meeting the requirements of 703.07 may be added provided the composition requirements of 441 are met. The method of introducing mineral filler shall be approved by the Laboratory.

**830.03 Stone Curb.** New sandstone curbs shall be as follows:

(a) Cutting and Dressing. Ninety-five percent of all straight curb shall be at least 5 feet (1.5

m) in length, with no piece less than 42 inches (1.1 m) except an occasional stone as short as 30 inches (0.8 m) may be used for closure. On curves of 50 feet (15 m) or greater radius, straight curb jointed radially may be used, in which case the lengths may be shorter than 42 inches (1.1 m) but not less than 36 inches (0.9 m). For curves and corners less than 50 feet (15 m) radius, the lengths shall be not less than 36 inches (0.9 m) and shall be dressed, jointed and set to the radii called for. All curb used for curves and corners shall be approximately uniform in length.

All curb shall be dressed to a straight edge on top and on the exposed face and ends to a depth below the gutter elevation of at least 6 inches (150 mm). The ends shall be dressed at right angles to the face for straight curb and radially for curb on curves. No slack or hollow joints shall be permitted. No projections shall remain after dressing the ends, which under expansion, would create contact with the end of the adjacent curb to cause spalling. The edge next to the gutter shall be cut to a 3 inch (75 mm) radius and the top dressed to a 1/4 inch (6 mm) bevel rising from the exposed face. All hand dressed curb shall be brought to the width called for by means of a pitching tool used on the edge at the back.

(b) Setting. The curb shall be set with a backward batter or incline from the vertical of 1 in 20 and on a thoroughly compacted subgrade. In clay soils or soils of a character that do not permit free drainage, a firm bed of porous material a minimum of 3 inches (75 mm) deep shall be placed as a foundation for curb. The curb shall be settled into place with a heavy rammer, and backed to a minimum width of 4 inches (100 mm) with porous backing to within 6 inches (150 mm) of the top. The balance of the backfill shall be brought to the level of the top of the curb for a distance of 2 feet (0.6 m) back, with soil or other acceptable material. Backing shall be thoroughly tamped in layers not exceeding 6 inches (150 mm) in thickness, loose measurement, with an approved tamper or rammer. As much of the backfilling and tamping as is consistent with alignment of the curb shall be done at the time the stone is first set. Circular curb shall be set in 499 Class C concrete when called for on the plans, 6 inches (150 mm) deep. The concrete shall be in a plastic state when the curb is placed. The concrete shall extend the width of the curb plus 6 inches (150 mm) behind the curb and shall be brought up behind the curb to within 4 inches (100 mm) of the top.

(c) Joints. The space between ends of adjacent sections of curbing below the dressed portion shall not be less than 1/8 inch (3 mm) at any point and shall not exceed 4 inches (100 mm). The joints between the dressed portion of adjacent sections of curbing shall be cushioned with 1/8-inch (3 mm) thick expansion joint material trimmed flush with the curbing on all edges.

If sandstone curb is placed after the pavement is placed, any joint remaining shall be filled with dry sand to within 2 inches (50 mm) of the surface of the pavement and the upper 2 inches (50 mm) shall be filled with bituminous material. Care shall be exercised in filling this joint so that no bituminous material comes in contact with the exposed surface of the curb.

(d) Resetting Curb. When specifically permitted by the plan, acceptable stone curb removed from the work under 202 may be used, to the extent available, in lieu of the furnishing of new stone curb. Such Salvaged curb shall be used continuously at locations designated by the Engineer. Interspersing of salvaged and new curb will not be permitted. Necessary storing and hauling of salvaged curb shall be a responsibility of the Contractor. All provisions for cutting and dressing, setting, and joints shall apply to salvaged curb.

**830.04 Cast-in-Place Concrete Curb and Combination Curb and Gutter.** These items

shall be as follows:

(a) Forms and joints. Curb forms shall be approved metal forms. They shall be securely braced and held to line and grade specified. Approved flexible forms of steel or wood may be used for construction of circular curb where radius is 200 feet (60 m), or less. The inner surface of the forms shall be clean and coated with a form release agent immediately before the concrete is placed.

All curb and combination curb and gutter not constructed integral with, or tied to, the base or pavement shall have 1/4-inch (6 mm) contraction joints constructed at 10 foot (3.0 m) intervals. The joint may be constructed with the use of metal separator plates, by the use of a grooving tool, or sawed in accordance with 451. The depth of joint shall average 2 inches (50 mm) or more for combination curb and gutter, and for curb shall average 1/5 or more of the curb height. Where expansion joints occur in the abutting pavement, they shall be provided for by separation of the section being placed with 1 inch (25 mm) 705.03 preformed filler.

When the curb is integral with, or tied to, the base or pavement, joints of the type used in the pavement shall be constructed in the curb and sealed with the same material. The joints shall be spaced identically with the joints in the base or pavement.

Curb forms shall be left in place for such length of time that the removal of same does not crack, shatter or otherwise injure the concrete.

Where the curbs built under this item are to later serve as a support for a finishing machine in the placing of a surface course, the alignment of the supporting edges shall be such that the distance between the curbs shall nowhere vary more than 1/2 inch (13 mm) from that specified.

(b) Placing. The concrete shall be placed in the forms, prepared as above described, and vibrated in such a manner as to eliminate all voids.

Concrete for curb which is to be integral with the concrete base or pavement shall be placed while the concrete is plastic, except when the presence of finishing equipment on the forms at the end of the day's run makes this impossible. When this condition prevails No. 5 (No. 15M) tie bars shall be placed vertically in the pavement at 1 foot (0.3 m) intervals and in a line 3 inches (75 mm) inside of and parallel to the edge forms. These tie bars shall extend to within 1 1/2-inches (38 mm) of the subgrade or subbase and 2 inches (50 mm) above the pavement surface when placed. Immediately before the concrete curb is placed, the surface of the pavement or base on which the concrete curb is to be placed shall be flushed with mortar which contains one part cement to two parts sand. The mortar shall be worked into the surface cavities by brushing.

(c) Curb Machine. Concrete curb or curb and gutter may be placed with a self-propelled machine. The proper density and cross section shall be obtained by forcing the concrete through a mold of the proper cross section. Where a track is used the track on which the machine operates shall be set and held to the exact line and grade given by the Engineer. The concrete shall be of such consistency that it that it can be molded into the desired shape and then will remain as placed without slumping of the vertical faces.

(d) Finishing. The top of the curb shall be floated in such a manner to thoroughly compact the concrete and produce a smooth and even surface. The addition of extra mortar to secure this result will not be permitted. The edge of the curb shall be rounded by the use of a tool especially designed for the purpose. The exposed face of the curb shall be rubbed with a float immediately after removing the forms. Unnecessary tool marks shall be eliminated. The finished surface shall be free of irregularities and waves and shall be uniform in texture.

(e) Protection. Concrete curb, and combination curb and gutter shall be cured in accordance with 451 except that membrane cure shall be applied at a rate of not less than 1 gallon per 200 square feet (1 L/5m<sup>2</sup>) of surface.

**830.05 Asphalt Concrete Curb.** The specified asphalt concrete material shall be furnished and placed to form a curb of the required cross section by one of the following methods or by any other method approved by the Engineer.

Method 1. After completion of the surface course, the area to be occupied by the curb shall be painted or sprayed with bituminous material meeting the requirements of 407.02 and applied at the rate of 0.15 gallons per square yard (0.7 L/m<sup>2</sup>). Only the area to be occupied by the curb shall be so treated. The curb shall then be placed with a hand-operated or self-propelled machine consisting of a hopper and power-driven screw which forces the material through a tube by an extrusion method. The proper density and cross section of the curb shall be obtained by forcing the material through a die attached to the end of the extrusion tube.

Method 2. The material for the curb shall be placed as an independent operation preceding the final rolling of the surface course upon which the curb is to be placed. Loose material of sufficient height shall be placed and shaped by hand methods using suitable templates or by other means that will produce the specified cross section. The loose material shall then be compacted to final cross section dimensions by use of a hand-operated mechanical vibrating tamper equipped with a compacting shoe of such shape that will produce the specified cross section of the curb.

**830.06 Concrete Median and Traffic Island.** Concrete medians and traffic islands shall be constructed on the accepted, prepared subgrade, subbase or the completed and accepted base course or old pavement. These items shall be as follows:

(a) Forms and Joints. Forms shall be approved metal forms. They shall be securely braced and held to line and grade specified. Approved flexible forms of metal or wood may be used for construction of radii 200 feet (60 m) and less. The inner surface of the forms shall be clean and coated with a form release agent immediately before the concrete is placed.

All medians and traffic islands not anchored to the pavement shall have 1/4-inch (6 mm) contraction joints constructed at 10 foot (3.0 m) intervals. The joint may be constructed with the use of metal separator plates, by the use of a grooving tool, or sawed in accordance with 451. The depth of joint shall average 2 inches (50 mm) or more.

When the median or island is anchored to the pavement per the standard drawings, joints of the same type used in the pavement shall be constructed in the median or island. The joints shall be spaced identically with the joints in the pavement.

Forms shall be left in place for such length of time that the removal of same does not crack, shatter or otherwise injure the concrete.

(b) Placing. When placing the median or island on subgrade or subbase, the subgrade or subbase shall be sprinkled with water at such times and in such manner as directed by the Engineer so that it will be in a thoroughly moistened condition when the concrete is deposited thereon.

The concrete shall be placed in the forms and vibrated in such a manner as to eliminate all voids.

(c) Mechanical Placement. Medians and traffic islands may be placed with a self-propelled



machine. The proper density and cross section shall be obtained by forcing the concrete through a mold of the proper cross section. Where a track is used the track on which the machine operates shall be set and held to the exact line and grade given by the Engineer. The concrete shall be of such consistency that it can be molded into the desired shape and remain as placed without slumping of the vertical faces.

(d) Finishing. The top of the median or island shall be given a broom, turf, or similar texture. The addition of extra mortar to secure this result will not be permitted. The edges shall be rounded by the use of a tool especially designed for this purpose. The exposed faces shall be rubbed with a float immediately after removing the forms. Unnecessary tool marks shall be eliminated. The finished surface shall be free of irregularities and waves and shall be uniform in texture.

(e) Protection. Concrete medians and traffic islands shall be cured in accordance with 451 except that membrane cure shall be applied at a rate of not less than 1 gallon per 200 square feet (1 L/5m<sup>2</sup>) of surface.

**830.07 Method of Measurement.** The length of curb or combination curb and gutter measured will be the actual number of linear feet (meters) complete in place, measured along the front face of the curb section.

The quantity of concrete median or traffic island measured shall be the number of square yards (square meters) or the number of cubic yards (cubic meters) complete in place.

**830.08 Basis of Payment.** Payment for accepted quantities will be made at the contract price for:

| Item | Unit                                                       | Description                             |
|------|------------------------------------------------------------|-----------------------------------------|
| 830  | Linear foot (meter)                                        | Sandstone curb                          |
| 830  | Linear foot (meter)                                        | Curb, Type _____                        |
| 830  | Linear foot (meter)                                        | Combination curb and gutter, Type _____ |
| 830  | Linear foot (meter)                                        | Asphalt concrete curb, Type _____       |
| 830  | Square yard or cubic yard<br>(square meter or cubic meter) | Concrete traffic island                 |
| 830  | Square yard or cubic yard<br>(square meter or cubic meter) | Concrete median                         |

STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION  
SUPPLEMENTAL SPECIFICATION 870  
SEEDING AND MULCHING

August 10, 1999

|        |                                            |
|--------|--------------------------------------------|
| 870.01 | Description                                |
| 870.02 | Testing of Soil                            |
| 870.03 | Agricultural Lime                          |
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| 870.23 | Inter-seeding                              |
| 870.24 | Method of Measurement                      |
| 870.25 | Performance                                |
| 870.26 | Basis of Payment                           |

**870.01 Description.** This work shall consist of placing topsoil, preparing the seed bed, furnishing all seed, agricultural lime, commercial fertilizer, mulching material and placing and incorporating as specified. Seeding and mulching shall be performed in stages as per Supplemental Specification 877.

The Contractor shall place the seed and mulch within 7 days of obtaining final grade. If it is anticipated that the areas will be disturbed by future work, the area shall be temporary seeded (Class 7) and mulched as per Supplemental Specification 877.

Areas to be seeded shall include all areas within the right of way and as described in the plans. All areas outside the specified limits where the vegetation has been disturbed or destroyed by the Contractor including those defined in CMS 104.06 shall be restored and seeded in accordance with these specifications by the Contractor at no additional cost to the Department.

**870.02 Testing of Soil.** Contractor shall have a Standard Test performed of the soil. This test measures soil acidity or alkalinity and will indicate if additional lime is required above the standard. The tests should be taken near final grade but prior to seeding. There shall be at least one test per 20 acres (8.1 hectares).

How to Take a Soil Sample: In a random pattern, 15-20 cores should be taken at a depth of 6 to 7 inches (150 to 180 mm). Cores should be mixed together with one pint retained for testing. Large sites having different soil conditions may require more than one test. Test results shall be made available to the Engineer. Corrections to any deficiencies in nutrients or pH shall be made by following the test report recommendations.

Ohio County Extension offices can provide the Contractor with a soil sample kit and testing locations.

**870.03 Agricultural Lime.** Agricultural lime shall be obtained by the Contractor from a dealer or manufacturer whose brands and grades are registered or licensed by the State of Ohio, Department of Agriculture.

**870.04 Testing of Agricultural Liming Materials.** Liming materials shall be tested in accordance with Supplement 1007.

**870.05 Lime Application Rates.** For the basis of quality control agricultural ground limestone, having a minimum total neutralizing power (TNP) of 90+ percent, at least 40 percent passing a No. 100 (150 µm) sieve and 95 percent passing a No. 8 (2.36 mm) sieve, 100 percent of Ag-ground shall be applied. Application shall be at 92 pounds per 1000 sq ft (2 ton/acre). This rate shall be standard grade.

Other available forms of liming materials may be applied depending on their potential to neutralize soil acidity. An increase or decrease in the application rates, depending on the form used, are determined from the Table 7-2 "Equivalent Amounts of Liming Materials" found in Bulletin 472, "Ohio Agronomy Guide", published by the Cooperative Extension Service, The Ohio State University.

Changes to the lime requirements will be determined by the pH test, as indicated on the soil analysis results. A slightly acid soil (pH 6.5) is recommended. Agricultural lime shall be applied to the surface.

**870.06 Commercial Fertilizer.** Commercial fertilizer shall be obtained by the Contractor from a dealer or manufacturer whose brands and grades are registered or licensed by the State of Ohio, Department of Agriculture.

Fertilizer may be dry or liquid in analysis specified or in the same ratio as specified. The standard application rate shall be 20 pounds per 1000 sq ft (0.1 kg/m<sup>2</sup>) of 10-20-10. Another analysis in the same ratio (1:2:1) may be used by varying the application rate. The soil test results will recommend corrective fertilizer application rates if needed above and beyond the standard. Fertilizer shall be

applied in an even pattern over all areas.

**870.07 Topsoil.** Topsoil shall consist of loose, friable, loamy topsoil without admixture of subsoil or refuse. For topsoil to be considered loamy, Topsoil should be screened through a 3/4 inch to 1½ inch (19.0 to 37.5 mm) harp screen and shall contain no more than 40 percent clay.

Acceptable topsoil shall contain not less than 3 percent or more than 20 percent organic matter as determined by loss on ignition of samples oven dried to constant weight at 212° F (100° C).

**870.08 Compost.** Acceptable compost shall include Ohio EPA rated Class IV compost, EQS biosolids compost or approved equal. Compost shall have a Nitrogen content of 1.4 percent or above. Compost shall be obtained from an Ohio EPA approved facility. Contractor shall provide the Engineer with the facility name and location prior to delivery.

**870.09 Seeds.** All grass seed shall be obtained by the Contractor from a dealer or grower who is registered or licensed by the State of Ohio, Department of Agriculture.

All grass seed specified shall meet the current specifications on file with the Department as to percentage purity, weed seed and germination. All grass seed to be used under this item shall be on an approved list kept on file at the Laboratory, and shall meet the requirements of these specifications. Minimum germination rates for cool season turfgrass species are listed in Table 1.

**GERMINATION RATES: TABLE 1**

| Species             | Minimum Percent | High Quality Percent |
|---------------------|-----------------|----------------------|
| Kentucky Bluegrass  | 80              | 85                   |
| Fine Fescue         | 85              | 90                   |
| Perennial Ryegrass  | 85              | 90                   |
| Annual Ryegrass     | 85              | 90                   |
| Tall Fescue         | 85              | 90                   |
| Creeping Red Fescue | 85              | 90                   |

Seed shall be dated within the last 9 months of testing. No seed will be accepted with a date of test exceeding 9 months prior to the date of sowing. The Department reserves the right to test, reject or approve all seed after delivery. All seeds are to be furnished as separate species and cultivars, packaged or bagged separately, and labeled, tagged or marked in accordance with ORC 907.03.

Cool season turf Classes 1, 2, and 3 as listed in Table 2 shall be composed of no less than two and no more than four cultivars of the same species. Newer improved cultivars should be used when possible.

**870.10 Legumes.** All leguminous seeds shall be inoculated or treated with the proper amount of pure nitrogen-fixing bacteria selected for maximum vitality, not more than one year old, and mixed with sufficient water to thoroughly wet the seed. All culture shall be subject to approval.

If sown hydraulically, the inoculant shall be 4 times the rate specified by the inoculant manufacturer. Inoculant and sticking agent shall be placed directly into the slurry and thoroughly mixed immediately before seeding. Seed shall be sown as soon as possible after inoculation. Seed left standing more than 24 hours shall be re-inoculated before sowing. All seed shall be mixed on the project.

Preinoculated seed will be considered as inoculated at not more than one time the rate specified by the inoculant manufacturer. Additional inoculation will be required on preinoculated seed to comply with the above specifications.

**870.11 Native Grasses and Wildflowers.** The seed quantities indicated per 1000 square feet (m²) as listed in Table 2, Classes 4, 5 and 6 shall be the amounts of pure live seed (PLS) for each species listed. Seed which has actual pure live seed (PLS) yield according to tests less than the intended yield, will have the specified quantity adjusted to meet the intended PLS yields.

All seed supplied under Classes 4, 5 and 6 shall only be that which is grown from an approved midwest or northern grower. The states where seed may be obtained from are Ohio, Michigan, Illinois, Wisconsin, Indiana, Minnesota, Iowa, North Dakota or South Dakota. Native seed may be obtained outside this area with the Engineer’s approval. Annual seed listed in Class 5A may be obtained from any commercial grower or dealer and shall have been produced within the continental US. If the listed varieties are not available, other varieties may be substituted only with prior approval from the Engineer.

Sixty days prior to seeding, the Contractor shall provide for approval, a written description for the Class 4, 5 and 6 mixtures showing the percentage by weight (mass) of each kind of seed. This description shall also include the following:

- a. Name and location of the seed supplier.
- b. Origin and date of harvest of each kind of seed.
- c. A statement of the purity and germination of the seed.



SEED MIXTURES: TABLE 2

| CLASS - TYPE                                          | SEEDS                                                                                                                                                                                                                                                                                                                                                       | Lbs/1000 Sq Ft               | Kg/1000 m <sup>2</sup>       |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------|
| 1 Lawn Mixture                                        | Kentucky Bluegrass ( <i>Poa pratensis</i> )                                                                                                                                                                                                                                                                                                                 | 1.5                          | 7.32                         |
|                                                       | Creeping Red Fescue ( <i>Festuca rubra</i> )                                                                                                                                                                                                                                                                                                                | 1.5                          | 7.32                         |
|                                                       | Annual Ryegrass ( <i>Lolium multiflorum</i> )                                                                                                                                                                                                                                                                                                               | 1.0                          | 4.88                         |
|                                                       | Perennial Ryegrass, turf type ( <i>Lolium perenne</i> )                                                                                                                                                                                                                                                                                                     | 1.0                          | 4.88                         |
| 2 Roadside Mixture                                    | Kentucky Bluegrass ( <i>Poa pratensis</i> )                                                                                                                                                                                                                                                                                                                 | 1.5                          | 7.32                         |
|                                                       | Kentucky 31 Fescue ( <i>Festuca arundinacea</i> var. KY 31)                                                                                                                                                                                                                                                                                                 | 2.0                          | 9.76                         |
|                                                       | Perennial Ryegrass ( <i>Lolium perenne</i> )                                                                                                                                                                                                                                                                                                                | 1.5                          | 7.32                         |
| 3A Slope Mixture<br>(flatter than or equal to 3:1)    | Use Mixtures 2, 3B, 3C or 4B.                                                                                                                                                                                                                                                                                                                               |                              |                              |
| 3B Low Growing<br>Slope Mixture<br>(steeper than 3:1) | Hard Fescue ( <i>Festuca longifolia</i> )                                                                                                                                                                                                                                                                                                                   | 1.3                          | 6.35                         |
|                                                       | Creeping Red Fescue ( <i>Festuca rubra</i> )                                                                                                                                                                                                                                                                                                                | 0.8                          | 3.90                         |
|                                                       | Annual Ryegrass ( <i>Lolium multiflorum</i> )                                                                                                                                                                                                                                                                                                               | 0.23                         | 1.12                         |
| 3C Crown Vetch<br>Mixture<br>(steeper than 3:1)       | Crown Vetch ( <i>Coronilla varia</i> )                                                                                                                                                                                                                                                                                                                      | 0.9                          | 4.39                         |
|                                                       | Perennial Ryegrass ( <i>Lolium perenne</i> )                                                                                                                                                                                                                                                                                                                | 1.8                          | 8.79                         |
|                                                       | Annual Ryegrass ( <i>Lolium multiflorum</i> )                                                                                                                                                                                                                                                                                                               | 0.3                          | 1.46                         |
| 4A Native Grass<br>Mixture                            | Big Blue Stem ( <i>Andropogon gennadii</i> )                                                                                                                                                                                                                                                                                                                | 0.07                         | 0.34                         |
|                                                       | Indian Grass ( <i>Sorghastrum nutans</i> )                                                                                                                                                                                                                                                                                                                  | 0.09                         | 0.44                         |
|                                                       | Switch Grass ( <i>Panicum virgatum</i> )                                                                                                                                                                                                                                                                                                                    | 0.02                         | 0.097                        |
|                                                       | Annual Ryegrass ( <i>Lolium multiflorum</i> )                                                                                                                                                                                                                                                                                                               | 0.11 (spring)<br>0.34 (fall) | 0.54 (spring)<br>1.66 (fall) |
|                                                       |                                                                                                                                                                                                                                                                                                                                                             |                              |                              |
| 4B Low Growing<br>Native Grass                        | Little Blue Stem ( <i>Andropogon scoparius</i> )                                                                                                                                                                                                                                                                                                            | 0.18                         | 0.88                         |
|                                                       | Side-Oats Gramma ( <i>Bouteloua curtipendula</i> )                                                                                                                                                                                                                                                                                                          | 0.04                         | 0.19                         |
|                                                       | Prairie Dropseed ( <i>Sporobolus heterolepis</i> )                                                                                                                                                                                                                                                                                                          | 0.04                         | 0.19                         |
|                                                       | Annual Ryegrass ( <i>Lolium multiflorum</i> )                                                                                                                                                                                                                                                                                                               | 0.11 (spring)<br>0.34 (fall) | 0.54 (spring)<br>1.66 (fall) |
|                                                       |                                                                                                                                                                                                                                                                                                                                                             |                              |                              |
| 5A Annual and<br>Perennial<br>Wildflower Mixture      | Annual Mixture (below)                                                                                                                                                                                                                                                                                                                                      | 0.07                         | 0.34                         |
|                                                       | Perennial Wildflower Mixture (below)                                                                                                                                                                                                                                                                                                                        | 0.28                         | 1.37                         |
|                                                       |                                                                                                                                                                                                                                                                                                                                                             |                              |                              |
|                                                       | Annuals Mixture - not exceeding 25% by weight of any one species of the following:<br>Corn Poppy ( <i>Papaver rhoeas</i> )<br>Cosmos ( <i>Cosmos bipinnatus</i> )<br>Yellow Cosmos ( <i>Cosmos sulphureus</i> )<br>Cornflower ( <i>Centaurea cyanus</i> )<br>Rocket Larkspur ( <i>Delphinium ajacis</i> )<br>Indian Blanket ( <i>Gaillardia pulchella</i> ) |                              |                              |
|                                                       | Perennial Wildflower Mixture - not exceeding 5% by weight PLS of any one species of the following:<br>Black-eyed Susan ( <i>Rudbeckia hirta</i> )<br>Purple Coneflower ( <i>Echinacea purpurea</i> )<br>Lance-leaved Coreopsis ( <i>Coreopsis lanceolata</i> )                                                                                              |                              |                              |
|                                                       |                                                                                                                                                                                                                                                                                                                                                             |                              |                              |

| CLASS - TYPE                                 | SEEDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lbs/1000 Sq Ft                             | Kg/1000 m <sup>2</sup>       |      |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|------------------------------|------|
| 5B Native<br>Wildflower and<br>Grass Mixture | Native Wildflower Mixture - not exceeding 5% by weight PLS of any one species of the following:<br>Butterflyweed (Asclepias tuberosa)<br>New England Aster (Aster novae-angliae)<br>Partridge Pea (Cassia fasciculata)<br>Purple Coneflower (Echinacea purpurea)<br>Rattlesnake Master (Eryngium yuccifolium)<br>Ox-eye Sunflower (Heliopsis helianthoides)<br>Bergamot (Monarda fistulosa)<br>Grey-headed Coneflower (Ratibida pinnata)<br>Orange Coneflower (Rudbeckia fulgida)<br>Prairie Dock (Silphium terebinthin)<br>Whorled Rosinweed (Silphium trifolium)<br>Stiff Goldenrod (Solidago rigida) | 0.34                                       | 1.66                         |      |
|                                              | Grass Mixture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                            |                              |      |
|                                              | Big Blue Stem (Andropogan gerardii)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.046                                      | 0.224                        |      |
|                                              | Little Blue Stem (Schizachyrium scoparium)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.069                                      | 0.337                        |      |
|                                              | Indian Grass (Sorghastrum nutans)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.023                                      | 0.112                        |      |
|                                              | Annual Ryegrass (Lolium multiflorum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.92                                       | 4.49                         |      |
|                                              | 6 Wildlife Mixture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Big Blue Stem (Andropogon gernadi)         | 0.13                         | 0.63 |
|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Little Blue Stem (Andropogon scoparius)    | 0.18                         | 0.88 |
|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Indian Grass (Sorghastrum nutans)          | 0.13                         | 0.63 |
|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Ox-eye Sunflower (Heliopsis helianthoides) | 0.18                         | 0.88 |
| Prairie Dock (Silphium terebinthinaceum)     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.18                                       | 0.88                         |      |
| Purple Coneflower (Echinacea purpurea)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.18                                       | 0.88                         |      |
| Whorled Rosinweed (Silphium trifolium)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.11                                       | 0.54                         |      |
| Downy Sunflower (Hellanthus mollis)          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.07                                       | 0.34                         |      |
| New England Aster (Aster novae-angliae)      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.07                                       | 0.34                         |      |
| Annual Ryegrass (Lolium multiflorum)         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.11 (spring)<br>0.34 (fall)               | 0.54 (spring)<br>1.66 (fall) |      |
| 7 Temporary<br>Erosion Control<br>Mixture    | Annual Ryegrass (Lolium multiflorum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2.02                                       | 9.86                         |      |

**870.12 Site Preparation.** The Contractor shall complete all grading within the areas to be covered with the topsoil under this item necessary to bring the surface of the proposed grade to the lines indicated on the plans, and parallel to the proposed finished grade. These areas are to be free from rock or other foreign material of 3 inches (75 mm) or greater in any dimension, except for shale cuts.

**870.13 Placing Topsoil.** Topsoil shall be placed and spread over all the areas to a minimum depth of 2 inches. It should be incorporated into the existing soil at a depth of 2 to 4 inches (50 to 100 mm). Staging areas, temporary roads or heavily compacted areas are to be disked to a depth of 4 to 6 inches (100 to 150 mm). The area shall be made smooth and uniform and shall be in accordance with the finished grade and cross section shown in the plans or otherwise designated. Such loosening will be required to ensure a bond of the topsoil with the surface on which it is put and to form a uniform blend. Soil shall not be tilled if wet or overtilled to achieve desired seed bed.

Fertilizer, lime or other soil amendments shall be applied separately to the site after the soil test results have been forwarded to the Engineer. Amendments may be incorporated by disk, harrow or rake, at a depth of 2 to 4 inches, in the same operation.

The prepared surface of topsoil and soil shall be free of gullies, rivulets, crusting, caking and satisfactorily shaped and finished as provided in 203. This work shall be performed prior to seeding.

All seed bed areas, including slopes flatter than 2 to 1 shall be free of rock and other foreign material 2 inches (50 mm) or greater in any dimension. All seed bed areas with 2 to 1 slopes or steeper shall be free of rock and other foreign material 3 inches (75 mm) or greater in any dimension but shall not be fine graded. After topsoil is placed, the area shall be tracked back and forth to achieve good contact between soil and slope surface. Surface shall be raked smooth prior to seeding.

All seed bed areas in front of residences, commercial properties, etc. between curb and sidewalks or as indicated on the plans, shall be free of all stones 1 inch (25 mm) or greater in any dimension. Seed bed shall have a smooth surface. Hand raking will be required if site is inaccessible to machines or if machines do not provide results equivalent to hand raking.

Topsoil is not required for shale cuts steeper than 2:1. Shale cuts steeper than 2:1 shall be allowed to deteriorate to a soil type surface texture prior to seeding.

**870.14 Seeding Methods.** Seeding operation shall not be performed unless the area is properly prepared. Except with permission of the Engineer, the Contractor shall seed cool season grasses between August 15 to October 30. If permanent seeding is necessary prior to these months, seeding rates shall be increased by 10 percent. All seeding performed between October 15 and March 15 shall be temporary seeding in accordance with Supplemental Specification 877. Permanent seeding may be performed with permission for projects completed within the same calendar year.

Seeding shall be done prior to or concurrently with 660, 667, 668 or 670.

Crown vetch seeding shall not be permitted during September or October.

Wildflower classes 5 and 6 shall be seeded in the fall (September - October). Spring seeding may be allowed with approval. Class 4 shall be seeded during the spring (March - May) when possible.

Seeding native grasses and wildflowers in Classes 4, 5 and 6 shall be done with a rangeland type or native seed grass drill. Seeding natives shall be performed as a split rate application with no less than two passes in different directions. Broadcast seeding shall only be allowed with approval of the Engineer. Cultipacking or rolling will be required when broadcast seeding.

All seed shall be thoroughly mixed and then evenly sown over the prepared areas at the rates listed in Table 2. No seed shall be sown during high winds. Equipment shall be operated in a manner to ensure complete coverage of the entire area to be seeded. Immediately after sowing, the area shall receive a light raking followed by rolling on flat surfaces or tracking by dozer on slopes to

insure good seed soil-contact.

Seed and fertilizer mixtures in Classes 1, 2, 3 and 7 shall be applied with a hydraulic seeder between March 1 and October 15.

**870.15 Mulching Operation.** Materials used for mulching shall be straw, wood fiber, organic compost, or biosolids compost. Materials shall be reasonably free of weed seed, foreign materials, or other injurious materials that would prohibit seed germination.

Within 24 hours after any given area is seeded, straw mulch shall be evenly placed over all seeded areas at the following rates:

|                                      |                                              |
|--------------------------------------|----------------------------------------------|
| Seeding from March 15 to October 15: | 2 tons per acre (0.5 t/1000 m <sup>2</sup> ) |
| Seeding from October 15 to March 15: | 3 tons per acre (0.7 t/1000 m <sup>2</sup> ) |

Mulching materials shall be kept in place with asphalt emulsion applied at a minimum rate of 60 gallons per ton (250 L/t) of mulch or with tackifiers per the manufacturer's recommendations. An additional application at a rate of 30 gallons per ton (125 L/t) of mulch shall be applied to the shoulder area, starting at the berm edge and extending out for a distance of 10 feet (3m). Asphalt emulsion for vegetative mulch shall conform to 702.04. Emulsion shall be nontoxic to plants and shall be so prepared that will not change in transportation or storage.

Displaced mulch shall be replaced at once but only after all work proceeding the seeding operation or that which was damaged during the mulching operation has been acceptably repaired.

**870.16 Wood Fiber Mulch.** Fiber mulch shall consist of pure wood fibers manufactured expressly from clean wood chips. The chips shall be processed in such a manner as to contain no lead paint, varnish, printing ink, petroleum based compounds or seed germination inhibitors. Fiber shall not be produced from unknown origin recycled material such as sawdust, paper, cardboard or residue from chlorine bleached pulp and paper mills.

The cellulose wood fiber mulch must maintain uniform suspension in water under agitation and shall blend with grass seed, fertilizer and other additives to form a homogeneous slurry. Tackifiers shall be manufacturer approved.

Using standard hydraulic mulching equipment, pure wood fiber mulch, tackifier, seed and fertilizer slurry shall be applied evenly over the soil surface in a one-step operation. Hydraulic application shall occur from March 1 to October 15 only. Applications rates are as follows:

|                     |                                                        |
|---------------------|--------------------------------------------------------|
| Flat surfaces:      | 35 pounds per 1000 sq ft (170 kg/1000 m <sup>2</sup> ) |
| Slopes 3:1 or less: | 46 pounds per 1000 sq ft (225 kg/1000 m <sup>2</sup> ) |

All slopes subject to windy conditions shall be seeded and mulched by hydraulic methods only.

**870.17 Compost.** Compost may be applied as a mulch instead of straw or wood fiber. Grass seed shall be thoroughly mixed with the compost and distributed over the prepared seed bed area using pneumatic equipment. Compost/seed mixture shall be applied to a minimum 1/4 inch (6 mm)

depth. Mulch covering with tackifier is not needed when using compost in this method. No additional compensation will be made for this substitution.

**870.18 Watering.** For permanent seeded areas (Classes 1 to 6) and all sodded areas, they shall be thoroughly watered, after seed has germinated, at the rate of 300 gallons per 1000 square feet (12.2 m<sup>3</sup>/1000 m<sup>2</sup>). The water shall be applied by means of a hydro-seeder or a water tank under pressure with a nozzle that will produce a spray that will not dislodge the mulch material. A second water application shall be made between 7 and 10 days after the first application, providing ½ inch (13 mm) or greater rainfall has not occurred within 7 days after the first application. When ½ inch (13 mm) or greater of rainfall has occurred within the first 7 day period, the second application may be delayed or omitted entirely, depending on weather conditions. Water shall be paid for and measured separately.

**870.19 Maintenance.** The Contractor shall maintain all seeded and mulched areas until final inspection. Damaged areas shall be repaired to the original condition and grade.

**870.20 Mowing.** Mowing may be required prior to permanent seeding and any time during the growing season following permanent seeding. The Contractor will be notified by the Engineer to begin mowing.

The Contractor shall use suitable equipment for mowing. Mowers shall be of the rotary, flail, disk or sickle type. Bunching or wind-rowing of mowed vegetation will not be permitted. The final cutting height shall be no less than 6 inches (150 mm). More than one pass may be required for each mowing.

**870.21 Fertilization: 2<sup>nd</sup> Application.** Permanently seeded areas shall be fertilized with an application of 12-12-12 no less than 3 months after installation. Fertilizer shall be broadcast evenly over the surface without incorporation at a rate of 10 pounds per 1000 sq ft (0.05 kg/m<sup>2</sup>). This shall be performed after all repair seeding and mulching or inter-seeding has been completed.

**870.22 Repair Seeding and Mulching.** The Contractor shall repair all damage or erosion of the seeded and mulched areas. The Department will pay for these repairs.

The repairs shall be made prior to completion of the project by reworking or reshaping to grade. Reworking or reshaping of the slopes shall include bringing in additional material, if necessary and using whatever equipment that is necessary to restore slopes to grade. Area shall then be fertilized, seeded, and mulched as per the specifications. Such work will be measured and paid for as "Repair Seeding and Mulching."

When damage or erosion of these areas occurs as a result of fault or negligence of the Contractor, the areas shall be satisfactorily repaired, fertilized, seeded and mulched at no additional cost to the Department.

**870.23 Inter-seeding.** Inter-seeding is the practice of seeding existing thin and spotty growing turf with a slit or drill type seeder. This work shall only be performed from March 15 to May 15 and

September 1 to October 15. Mowing may be required prior to seeding to achieve good seed soil contact. Cut material shall not be wind-rowed or left in a bunched condition.

A slit or drill type seeder shall be used. Exceptions may be when seeding steep slopes or inaccessible areas. Broadcast or hydraulic seeding methods may be used in these instances. Commercial fertilizer of 12-12-12 shall be broadcast over affected areas as specified. Water shall be applied at the rate specified in these areas to aid in seed/soil contact.

**870.24 Method of Measurement.** Topsoil, organic compost or other approved equal required to meet the specification shall be paid for by the number of cubic yards (cubic meters) furnished and placed. The quantity will be paid based on the amount shown in the plans. In the measurement of topsoil, organic compost, etc., no adjustment of the plan quantities or recalculation of the volumes shall be made for any volumes found different by less than five percent from the plan quantity. The Contractor shall accept the plan quantity with authorized changes as payment in full unless revised by the Engineer. The burden of proof of a plan discrepancy greater than five percent is on the Contractor. The Contractor shall submit supporting documentation concerning the possible changes.

The quantity of commercial fertilizer and agricultural lime will be the number of tons (kilograms) of each quantity of furnished, spread and incorporated.

Seeding and mulching will be the number of square yards (square meters) of the area seeded and mulched in accordance with these specifications. In the measurement of seeding and mulching, no adjustment of the plan quantities or recalculation of the areas shall be made for any areas found different by less than five percent from the plan quantity. The Contractor shall accept the plan quantity with authorized changes as payment in full unless revised by the Engineer. The burden of proof of a plan discrepancy greater than five percent is on the Contractor. The Contractor shall submit supporting documentation concerning the possible changes.

The quantity of repair seeding and mulching will be the number of square yards (square meters) of damaged or eroded areas reshaped, seeded and mulched.

The quantity of water shall be the amount in thousands of gallons (cubic meters) applied in accordance with the requirements of this item and measured in tanks, tank wagons or trucks of predetermined capacity, or by means of meters of a type satisfactory to the Engineer and furnished and installed by the contractor at his own expense, or determined by weight conversion.

The quantity of inter-seeding will be the number of square yards (square meters) of the seeded area.

Mowing satisfactorily performed will be measured in 1000 square foot units (square meters).

The quantity of soil analysis tests will be the number of tests submitted to the Engineer.

**870.25 Performance.** The Department will inspect all seeded areas no earlier than six months and no later than 12 months after final seeding. The Contractor shall repair, regrade, overseed, and



fertilize any area this inspection identifies without a uniform density of at least 70 percent grass cover.

Seeded areas damaged by traffic or erosion, due to no fault or negligence of the Contractor, shall also be regraded, refertilized, reseeded and remulched.

The Contractor shall be compensated for the above work and mobilization and demobilization by supplemental agreement.

**870.26 Basis of Payment.** Payment for accepted quantities will be made at contract prices for:

| Item | Unit                            | Description                 |
|------|---------------------------------|-----------------------------|
| 870  | Each                            | Soil analysis test          |
| 870  | Cubic yard<br>(cubic meter)     | Placing topsoil             |
| 870  | Ton (kilogram)                  | Commercial fertilizer       |
| 870  | Ton (kilogram)                  | Agricultural lime           |
| 870  | Square yard<br>(square meter)   | Seeding and mulching        |
| 870  | Square yard<br>(square meter)   | Repair seeding and mulching |
| 870  | M Gallons<br>(cubic meters)     | Water                       |
| 870  | Square yard<br>(square meter)   | Inter-seeding               |
| 870  | M Square feet<br>(square meter) | Mowing                      |

**STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION  
SUPPLEMENTAL SPECIFICATION 877  
TEMPORARY SEDIMENT AND EROSION CONTROL**

**April 13, 1999**

**877.01 Description**  
**877.02 Materials**  
**877.03 Construction Requirements**  
**877.04 Maintenance**  
**877.05 Performance**  
**877.06 Method of Measurement**  
**877.07 Basis of Payment**

**877.01 Description.** This work shall consist of temporary control measures as detailed in the plans and/or general notes during the life of the contract to control sediment and erosion through the use of straw or hay bales, dikes, slope protection, sediment pits, basins and dams, slope drains, coarse aggregate, mulches, grasses, filter fabrics, ditch lining, inlet protection and other erosion control devices or methods.

The permanent control provisions contained in the contract shall be coordinated with the temporary erosion control features to the extent practical to assure economical, effective and continuous erosion control throughout the construction and post-construction period.

Temporary controls are required for construction work outside the right-of-way in areas such as borrow pit operations, haul roads, equipment and material storage sites, waste areas, and temporary plant sites. This work will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor, with costs included in the contract prices bid for the items to which they apply.

**877.02 Materials.** Commercial fertilizer shall be (10-20-10) and shall conform to Item 659.

Temporary seeding and mulching shall consist of annual ryegrass (*Lolium multifolium*). Seed and mulching materials shall be applied in accordance with Item 659.

Temporary filter fabric ditch checks shall consist of 30 inch [0.8m] wide filter fabric with sound wood supports with maximum spacing of 10 feet [3.0m] on centers. Temporary inlet filter barriers shall consist of 18 inch [0.5m] wide filter fabric fence with a securely nailed 2 x 4 wood frame.

Temporary bale filter dikes and perimeter filter fabric fence shall consist of straw or hay bales, or 30 inch [0.8m] wide filter fabric fence with sound wood supports with a maximum

spacing of 10 feet [3.0m] on centers. All the above filter fabric fence shall meet the requirements of 712.09, Type C.

Temporary dikes shall consist of suitable 203 material.

Temporary slope drains shall consist of pipe, pipe caps, coarse aggregate, riprap, rock channel protection, or other materials. Sediment pits are not paid for separately but are included as part of slope drain construction.

Pipe caps shall be included in the unit bid price for the pipe. Pipe caps shall have a minimum diameter of 1/4 inch (6.4mm) holes and be specifically designed to connect to the pipe. There will be a minimum of one hole per square inch (645 mm<sup>2</sup>) of the cross sectional end area of the pipe cap.

Temporary sediment basins and dams shall be constructed by methods described in Item 203 Excavation and Embankment and Item 601 Rock Channel Protection, Type C or D with filter.

Temporary rock check dams shall be constructed of Item 601 Rock Channel Protection, Type C or D without filter.

Temporary ditch and slope protection shall meet the requirements of Item 670.

**877.03 Construction Requirements.** The Storm Water Pollution Prevention Plan (SWPPP) details the placement, location and description of the temporary and permanent erosion control items. The following descriptions shall be used to supplement the plan. The Contractor shall rearrange and modify the plan quantities to meet the field conditions and the National Pollutant Discharge Elimination System (NPDES) Permit.

When the plan does not have a SWPPP, the Contractor shall submit a plan detailing control feature locations and quantities at the pre-construction meeting.

In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal or State or local agencies, the more restrictive laws, rules, or regulations shall apply.

(A) Clearing and Grubbing. The Contractor shall limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, and borrow and fill operations as determined by the project conditions. The Contractor shall preserve existing vegetation where attainable and temporarily seed and mulch disturbed idle areas as stated.

Inactive cleared and grubbed areas that are scheduled to remain idle for more than 45 days shall be stabilized with vegetation (i.e. temporary seed and mulch) within 7 days following the clearing and grubbing operations. If an area is within 50 feet [15 m] of any water body (i.e. stream, river, pond, etc.), then it shall be vegetated within 2 days following

the clearing and grubbing operations.

(B) Installation of Control Features. Temporary erosion and sediment control items shall be installed as detailed and are to remain functional until the upper slope drainage areas are fully stabilized.

Temporary perimeter, ditch check or inlet filter fabric fence shall be constructed in accordance with Standard Drawing DM-4.4.

1. Temporary Perimeter Controls: Temporary perimeter filter fabric fence shall protect the following from sheet flow runoff: off right of way locations; off construction limit locations; around water bodies, wet lands or around other significant items designated on the plan.

Dikes shall be used to prevent flow from coming on to the project and to barren areas on the project.

The Contractor shall install perimeter filter fabric fence and dikes concurrent with the clearing and grubbing operations.

2. Inlet Protection: The Contractor shall use an 18 inch [0.5m] wide filter fabric fence supported around a storm drain inlet or manhole with securely nailed 2 x 4 inch (50 X 100 mm) lumber. The Contractor shall excavate a six inch (150 mm) trench around the inlet, and drive the posts six inches (150 mm) below the excavated trench bottom. The fabric shall be stretched around the frame, placing six inches of fabric in the trench and secure tightly. The fabric shall overlap on one side of the inlet so that the fabric ends are not attached to the same post. Backfill the excavated soil onto the fabric and compact tightly.

The Contractor shall construct the inlet protection as soon as the inlet is completed.

3. Temporary and Permanent Seeding: Use seed and mulch liberally during and after construction and before or during winter shut down. Temporary seeding areas shall be fertilized at one-half the specified rate of application in Item 659. Temporary seeding shall be annual ryegrass sown at 2 pounds per 1000 square feet [1 kg/100 m<sup>2</sup>] and mulched in accordance with Item 659. When project conditions prevent the incorporation of fertilizer into the soil and preparation of the seed bed cannot be performed in accordance with Item 659, these requirements may be waived. Temporary seed shall not be placed on frozen ground.

The Contractor shall place the permanent seed on all barren areas within 7 days of obtaining final grade. The Contractor shall place the temporary seed and mulch as stated under clearing and grubbing.

4. Slopes: Dikes, slope drains and ditches shall be installed to divert water from bare soil and to protect cut and fill slopes. The Contractor shall place dikes at the top of fill slopes to protect the sides slopes from erosion.

The Contractor shall install dikes and slope drains when no filling activity occurs for three or more weeks and when slope height is greater than 8 feet [2.5m].

The Contractor shall construct a ditch at the top of cut slopes prior to the cutting of the slope to reduce runoff potential.

5. Ditch Checks: Filter fabric fence or rock checks are placed to protect ditches from erosion and to filter sediment from flowing water. The checks are placed across the width of the ditch.

Filter fabric fences are installed for 2 acres (8,000 m<sup>2</sup>) or less of drainage area. Rock ditch checks are installed for 2 to 5 acres (8,000 to 20,000 m<sup>2</sup>) of drainage area. When no rock quantities are denoted for rock checks, use the calculated rock quantities from basins for the rock checks.

Ditch checks shall be installed in conjunction with sediment basins and dams when the above drainage areas are not exceeded.

The Contractor shall place the ditch checks as soon as the ditch is cut.

6. Bale Filter Dikes: Bale filter dikes shall be installed a few feet (meters) from the toe of a slope to filter and/or divert sediment to an appropriate control before it enters a water body on or off the project limits.

It is used to collect sediment for a maximum of:

- a) less than 1/4 acre [1,000 m<sup>2</sup>] without an outlet
- b) slope length of less than 100 feet [30 m] at a maximum slope of 2:1.
- c) use outlet or pit every 100 feet [30 m] for a 2:1 slope. Use a greater spacing for flatter slopes.

Bale filter dikes shall be constructed in accordance with Standard Drawing DM- 4.3. When filter fabric is used for the bale filter dike, the location is accordance with Standard Drawing DM-4.3 and the construction details shown in Standard Drawing DM-4.4 are used.

The Contractor shall construct the bale filter dikes concurrent with the grubbing operations.

7. Sediment Dams or Basins: Basins and dams are placed and used at concentrated and critical flow locations to settle sediment out before leaving the project. Use basins at the bottom of a ravine, at a culvert inlet or outlet, along or at the end of the ditch and at any concentrated sediment exit point of the project. Use a basin quantity of 67 cubic yards for every acre of drainage area (125 m<sup>3</sup> per 10,000 m<sup>2</sup>).

The Contractor shall construct sediment dams and basins at the first step of grading and within 7 days of commencing grubbing operations.



8. River, Stream and Water Body Protection: Protect all streams or water bodies passing through or on the project. Use filter fabric or bale filter dikes to line the water edges. Divert project sediment flow by using dike and slope protection. A combination of the above or other control features can be used.

The Contractor shall construct the above features concurrent with the grubbing operations.

a) Stream Relocation: Fully stabilize the new stream channel prior to diverting flow into the new channel.

b) Stream and River Crossing: Provide a means for construction equipment to cross water courses without causing erosion of streambanks or deposits in the channel. Plan and locate crossings well in advance of needing them. Disturbance to water bodies shall be kept to a minimum. Crossings shall be kept to a minimum and as narrow as practical. Crossings shall be made in shallow areas rather than deep pools where possible. Clearing, grubbing and excavation of streambanks, bed and approach sections shall be kept to a minimum.

The provisions for conveyance shall anticipate high flows and shall not impede the movement of aquatic life.

If culverts are used, the following minimums shall apply: Place culverts on the existing stream bed to avoid a drop in waterfall at the downstream end of the pipe. Culvert diameter shall be at least three times the depth of normal stream flow at the point of the crossing. The minimum size culvert to be used shall be 18 inches [0.5m]. There shall be sufficient number of culverts to completely cross the channel from stream bank to stream bank with no more than 12 inches [0.3m] between each culvert.

All fill and surface material placed in the channel, around the culverts or on the surface of the crossing shall be clean non toxic dump rock fill Type B, C, or D. Extend placed rock up slope from original stream bank to catch and remove erodible material from equipment.

Aggregate used does not need to be removed. Care should be taken to avoid any impoundment or restriction to fish passage. All pipes must be removed upon project completion.

The stream crossing work will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor, with costs included in the contract bid prices for the items to which they apply.

When the normal water elevation is shown on the plan, the Contractor shall construct crossings to accommodate a water elevation at least one foot (0.3m) above the stated normal water elevation. Fording in accordance with 107.21 is not allowed.

**877.04 Maintenance.** Temporary erosion control features shall be properly maintained.

The Contractor shall maintain these items with the concurrence of the Engineer. When the Contractor properly places the erosion control items in the contract in accordance with the contract documents, then the Department will pay for the additional cost to maintain or replace these items of work by the unit bid prices, agreed unit prices or by 109.04. Silt removed from erosion control features shall be disposed of in accordance with 203.05.

The Engineer or appointed inspector will check the temporary and permanent erosion control features every 7 days or within 24 hours of any rainfall of more than ½-inch (10 mm).

(A) Temporary Perimeter, Ditch Checks, Inlet Protection Filter Fabric Fence, Dikes and Bale Filter Dikes. Trapped sediment shall be removed and cleaned when it reaches half the height of the lowest section. The Contractor shall make the appropriate corrections when the above fail or become non functional. The Contractor shall maintain the items until the up slope permanent grass coverage is 70 percent or better. The Contractor shall remove the items when the up slope permanent grass coverage is 70 percent or better.

(B) Temporary and Permanent Seed: The seed bed shall be thoroughly watered in accordance with the requirements of Item 659. The quantity of water will be measured and paid for as Item 659 water. Seeded areas shall be maintained until 70 percent or better cover is established. Temporary seeded areas shall be mowed and paid for in accordance with Item 659.

(C) Sediment Dams and Basins: Deposited sediment shall be removed when the initial volume has been reduced one-half. The Contractor shall make the appropriate corrections when these items fail or non functional. The Contractor shall remove the dams and basins when the permanent seed and mulch is placed on the entire project.

**877.05 Performance.** The Contractor shall install additional erosion control features, make adjustments to meet the field conditions, anticipated future work or corrections based on the weekly storm water inspections with the concurrence of the Engineer. The type and quantity will be paid by the unit bid prices, agreed unit prices or by 109.04.

In the event that the Contractor or its agents refuse or fail to adhere to the requirements of the 404 Permit, the 401 Water Quality Certification and/or the NPDES Storm Water Permit and as a result an assessment or fine is made or levied against the Ohio Department of Transportation, the Contractor shall reimburse the Department within ten (10) calendar days of the assessment or fine or the Department may withhold the amount of the fine from the Contractor's next pay estimate and deliver that sum to the permitting agencies issuing the assessment or fine.

These fines are not to be construed as a penalty but are liquidated damages to recover costs assessed against the Department due to the Contractor's refusal or failure to comply with the permit requirements.

If proper sediment and erosion controls are not being provided by the Contractor, progress estimates shall be withheld until proper controls are placed.

All temporary erosion control items shall be removed before the project is accepted. Removed materials shall become the property of the Contractor and shall be disposed of in accordance with Item 203.

**877.06 Method of Measurement.** Temporary erosion and sediment control work, completed and accepted, will be measured as follows:

- (A) All fertilized areas will be measured and paid for as Item 659 Commercial Fertilizer.
- (B) Temporary seeding and mulching will be measured by the square yard (square meter) of seeded and mulched area completed in accordance with these specifications.
- (C) Temporary slope drains will be measured by the linear foot (meter) complete in place.
- (D) Temporary Perimeter, Inlet Protection, Ditch Check, Filter Fabric Fence will be measured per linear foot (meter) in place. Bale filter dike will be paid under temporary perimeter fabric fence.
- (E) Rock required will be paid for under Item 601 Rock Channel Protection, Type C or D with or without filter.
- (F) Temporary sediment dams, and basins will be measured by the cubic yard (cubic meter) of excavation and embankment complete in place.
- (G) Temporary dikes will be measured by the cubic yard(cubic meter), of excavation and embankment complete in place.
- (H) Temporary slope or ditch protection will be measured by the square yard (square meter), complete in place.
- (I) Sediment Removal will be measured in cubic yards(cubic meters) completed in place. The sediment removed from dams, basins, inlet protection, ditch checks, perimeter filter fabric, bale filter dikes and all other types of filter fabrics, straw or hay bales or any other temporary sediment control items will be paid under this item.

In the event that temporary erosion and sediment control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled, such temporary work shall be performed by the Contractor at his expense.

**877.07 Basis of Payment:** Accepted quantities of temporary sediment and erosion control

work placed and measured as provided above, will be paid for under:

| Item | Unit                          | Description                                                                 |
|------|-------------------------------|-----------------------------------------------------------------------------|
| 877  | Square yard<br>(square meter) | Temporary seeding and mulching                                              |
| 877  | Linear foot (meter)           | Temporary slope drains                                                      |
| 877  | Cubic yard<br>(cubic meter)   | Temporary sediment basins and dams                                          |
| 877  | Linear foot (meter)           | Temporary perimeter, ditch check or inlet protection<br>filter fabric fence |
| 877  | Linear foot (meter)           | Temporary perimeter filter fabric fence                                     |
| 877  | Linear foot (meter)           | Temporary ditch check filter fabric fence                                   |
| 877  | Linear foot (meter)           | Temporary inlet protection filter fabric fence                              |
| 877  | Cubic yard<br>(cubic meter)   | Temporary dikes                                                             |
| 877  | Square yard<br>(square meter) | Temporary ditch protection                                                  |
| 877  | Square yard<br>(square meter) | Temporary slope protection                                                  |
| 877  | Cubic yard<br>(cubic meter)   | Sediment removal                                                            |

STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION  
  
SUPPLEMENTAL SPECIFICATION 899  
  
CONCRETE - GENERAL

October 21, 1998

|        |                                                      |
|--------|------------------------------------------------------|
| 899.01 | Description                                          |
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**899.01 Description.** This work shall consist of proportioning and mixing portland cement concrete.

**899.02 Materials.** Materials shall be:

|                                      |                              |
|--------------------------------------|------------------------------|
| Fine aggregate*                      | 703.02                       |
| Fly ash                              | 705.13                       |
| Coarse aggregate                     | 703.02, 703.13***            |
| Portland cement                      | 701.01, 701.02, 701.03       |
|                                      | 701.04, 701.05****           |
| Ground granulated blast furnace slag | ASTM C 989, grade 100 or 120 |
| Air entraining admixture.            | 705.10                       |
| Chemical admixture for concrete.     | 705.12**                     |

\*703.02 natural sand is required in 255, 451, 452, 453, 611, and 511 deck slabs.

\*\*Admixtures shall contain no more than 50 parts per million chloride ions by weight of cement.

\*\*\* Applies only to 451, 452 and 453.

\*\*\*\* Use of Slag-Modified Portland Cement meeting ASTM C 595M, Type I(SM) is permitted; acceptance shall be in accordance with 701 and Supplement 1028. Type I(SM) may be used only between April 1 to October 1, and when 705.10 Air-Entraining Admixture is added at the mixer. Type I(SM) may not be used with Options 1 and 3.

Water used in concrete shall be free from sewage, oil, acid, strong alkalies or vegetable matter, and also shall be free from clay and loam. Water which is potable is satisfactory for use in concrete.

**899.03 Proportioning.** Proportioning shall be based on pre-determined cement content. Except as otherwise provided herein, each cubic yard (cubic meter) of concrete shall contain the specified weight of cement as determined by the yield calculation. The yield shall be within  $\pm 1$  percent of the theoretical yield of 27.00 cubic feet (1 m<sup>3</sup>). The water-cement ratio shall not exceed the maximum specified. Below this limit, the quantity of water shall be adjusted to meet the slump requirements.

Concrete shall contain  $6 \pm 2$  percent of total air, except as noted herein.

Slump shall be maintained within the range shown as nominal slump in the following table. No concrete shall be used in the work that has a slump greater than that shown as maximum in the table. When the slump is found to exceed the limit of nominal slump but is within the maximum limit, occasional loads of concrete may be used, provided an immediate adjustment is made in the mixture to reduce the slump of succeeding loads to within the nominal range shown.

| Type of Work                                                    | Nom.<br>Slump<br>inch (mm)* | Max.<br>Slump<br>inch (mm)** |
|-----------------------------------------------------------------|-----------------------------|------------------------------|
| Concrete pavement (305, 451, 452, 453, 611, 615)                | 1-3 (25-75)                 | 4 (100)                      |
| Structural Concrete (511, 610, 622)                             | 1-4 (25-100)                | 5 (125)                      |
| Superstructure concrete (511)                                   | 2-4 (50-100)                | 4 (100)                      |
| Non-reinforced concrete (601, 602 603, 604, 608, 609, 612, 622) | 1-4 (25-100)                | 5 (125)                      |

\*This slump may be increased to 6 inches (150 mm) provided the increase is achieved by the addition of a chemical admixture meeting the requirements of 705.12, Type F or G.

\*\*This slump may be increased to 7 inches (180 mm) provided the increase is achieved by the addition of a chemical admixture meeting the requirements of 705.12, Type F or G.

Tests on the plastic concrete for pavement shall be made at the paving site or at a location designated by the Engineer. Tests for structure concrete shall be made at the site of the work at the point of placement.

The weights of fine and coarse aggregate shall be determined by the Engineer from the weights given in the Concrete Table. If high early strength concrete is specified, the Contractor may use high-early strength cement, additional cement, approved chemical admixtures, or a combination of these materials to achieve a modulus of rupture of 600 psi (4.2 MPa) in three days or less. If high-early-strength concrete is not specified, but is desirable to expedite the work, the Contractor may use these same materials at no additional cost to the state.

The weights specified in the Concrete Table were calculated for aggregates of the following bulk specific gravities: natural sand and gravel 2.62, limestone sand 2.68, limestone 2.65, and slag 2.30. The assumed specific gravities of fly ash and ground granulated blast furnace slag are 2.30 and 2.90, respectively. For aggregates of specific gravities differing more than plus or minus 0.02 from these, the weights in the table shall be corrected as indicated in paragraph (c).

| CONCRETE TABLE                         |                                   |                                     |                  |                              |                                           |
|----------------------------------------|-----------------------------------|-------------------------------------|------------------|------------------------------|-------------------------------------------|
| Quantities Per Cubic Yard (Meter)      |                                   |                                     |                  |                              |                                           |
| Type<br>of<br>Coarse<br>Aggre-<br>gate | Dry Aggregates                    |                                     |                  | Cement<br>Content<br>lb (kg) | Water-<br>Cement<br>Ratio<br>Maxi-<br>mum |
|                                        | Fine<br>Aggre-<br>gate<br>lb (kg) | Coarse<br>Aggre-<br>gate<br>lb (kg) | Total<br>lb (kg) |                              |                                           |
|                                        |                                   |                                     |                  |                              |                                           |
| CLASS C (Using No. 57 or No. 67 Size)  |                                   |                                     |                  |                              |                                           |
| Gravel                                 | 1160 (688)                        | 1735(1029)                          | 2895(1717)       | 600 (356)                    | 0.5                                       |
| Limestone                              | 1285(762)                         | 1630(967)                           | 2915(1729)       | 600(356)                     | 0.5                                       |
| Slag                                   | 1350(801)                         | 1360(807)                           | 2710(1608)       | 600(356)                     | 0.5                                       |
| CLASS F (Using No. 57 or No. 67 Size)  |                                   |                                     |                  |                              |                                           |
| Gravel                                 | 1270(753)                         | 1810(1074)                          | 3080(1827)       | 470(288)                     | 0.55                                      |
| Limestone                              | 1345(798)                         | 1730(1026)                          | 3075(1824)       | 470(288)                     | 0.55                                      |
| Slag                                   | 1380(819)                         | 1470(872)                           | 2850(1691)       | 470(288)                     | 0.55                                      |
| CLASS S (Using No. 57 or No. 67 Size)  |                                   |                                     |                  |                              |                                           |
| Gravel                                 | 1125(667)                         | 1735(1029)                          | 2860(1697)       | 715(424)                     | 0.44                                      |
| Limestone                              | 1260(747)                         | 1530(908)                           | 2790(1655)       | 715(424)                     | 0.44                                      |
| Slag                                   | 1280(759)                         | 1370(813)                           | 2650(1572)       | 715(424)                     | 0.44                                      |

On projects specifying 451, 452, or 453, the following requirements shall apply. If No. 57 or 67 Size is approved, the quantities per cubic yard (cubic meter) will be in accordance with the above concrete table. If sizes No. 7, 78, or 8 are approved, the concrete shall contain 8 plus or minus 2 percent air, and the quantities will be in accordance with the following table:



| Quantities Per Cubic Yard (Meter)        |                |                |            |                              |                                           |
|------------------------------------------|----------------|----------------|------------|------------------------------|-------------------------------------------|
| Type<br>of<br>Coarse<br>Aggre-<br>gate   | Dry Aggregates |                |            | Cement<br>Content<br>lb (kg) | Water-<br>Cement<br>Ratio<br>Maxi-<br>mum |
|                                          | Fine           | Coarse         | Total      |                              |                                           |
|                                          | Aggre-<br>gate | Aggre-<br>gate |            |                              |                                           |
|                                          | lb (kg)        | lb (kg)        |            |                              |                                           |
| CLASS C (Using No. 7, 78, or No. 8 Size) |                |                |            |                              |                                           |
| Gravel                                   | 1320(783)      | 1460(866)      | 2780(1649) | 600(356)                     | 0.5                                       |
| Limestone                                | 1380(819)      | 1410(837)      | 2790(1656) | 600(356)                     | 0.5                                       |

At any time during the construction period, the relative weights of fine and coarse aggregate as determined from the above table may be varied by the Engineer in order to insure a workable mix within the slump range and to control the yield. However, the total weight of aggregate per cubic yard (cubic meter) shall not be changed except as provided in the preceding paragraph as for the following conditions or both.

(a) For batch weights, the weights determined as described above shall be corrected to compensate for moisture contained in the aggregates at the time of use.

(b) If it is found impossible to prepare concrete of the proper consistency without exceeding the maximum water/cement ratio specified, a water reducing admixture conforming to requirements of 705.12 shall be used or the cement content shall be increased. However, the Contractor shall not be compensated for the admixture or additional cement which may be required by reason of such adjustment.

(c) If, during the progress of the work, the specific gravity of one or both of the aggregates changes, the batch weight shall be adjusted to conform to the new specific gravity.

(d) Unit weight determinations shall be made and the yield shall be calculated and maintained in accordance with ASTM C 138. Based on these determinations, the batch weights will be adjusted when necessary. However, the specified cement content shall be maintained within a tolerance of ± 1 percent and the maximum water-cement ratio shall not be exceeded.

(e) The amount of mixing water shall be adjusted for the moisture contained in the aggregate and for the moisture which they will absorb, in order to determine the amount of water to be added at the mixer.

(f) An approved set retarding admixture meeting the requirements of 705.12, Type B or Type D shall be required for concrete when the concrete temperature exceeds a nominal temperature of 75° F (24° C).

**899.04 Proportioning Options.** The Contractor may substitute one of the following options for all concrete items: The dry weights specified in these tables were calculated using the same specific gravities used in 899.03. The specific gravity used for ground granulated blast furnace (GGBF) slag is 2.90. Adjustments shall be made to the mix design due to specific gravities differing by more than 0.02. Other adjustments may be made as allowed in 899.03 and approved by the Engineer.

The requirements for Proportioning Option 1 are as follows. The cement content may be reduced as much as 15 per cent by weight with the substitution of an equivalent weight of fly ash meeting the requirements of 705.13. The water/cement ratio shall be based on the combined weight of cement and fly ash. Proportioning Option 1 shall meet the following Mix Design Concrete Table:

| Quantities Per Cubic Yard (Cubic Meter)        |                          |               |            |                        |                 |                        |
|------------------------------------------------|--------------------------|---------------|------------|------------------------|-----------------|------------------------|
| Type of Coarse Aggregate                       | Dry Aggregates           |               |            | Cement Content lb (kg) | Fly Ash lb (kg) | Water-CM Ratio Maximum |
| Fine Aggregate lb (kg)                         | Coarse Aggregate lb (kg) | Total lb (kg) |            |                        |                 |                        |
| CLASS C Option 1 (Using No. 57 or No. 67 Size) |                          |               |            |                        |                 |                        |
| Gravel                                         | 1140(676)                | 1700(1009)    | 2840(1685) | 510(303)               | 90(53)          | 0.50                   |
| Limestone                                      | 1260(748)                | 1595(946)     | 2855(1694) | 510(303)               | 90(53)          | 0.50                   |
| Slag                                           | 1320(783)                | 1330(789)     | 2650(1572) | 510(303)               | 90(53)          | 0.50                   |
| CLASS F Option 1 (Using No. 57 or No. 67 Size) |                          |               |            |                        |                 |                        |
| Gravel                                         | 1260(748)                | 1800(1068)    | 3060(1815) | 400(237)               | 70(42)          | 0.55                   |
| Limestone                                      | 1350(801)                | 1730(1026)    | 3080(1827) | 400(237)               | 70(42)          | 0.55                   |
| Slag                                           | 1380(819)                | 1475(875)     | 2855(1694) | 400(237)               | 70(42)          | 0.55                   |
| CLASS S Option 1 (Using No. 57 or No. 67 Size) |                          |               |            |                        |                 |                        |
| Gravel                                         | 1060(629)                | 1640(973)     | 2700(1602) | 608(361)               | 107(63)         | 0.44                   |
| Limestone                                      | 1230(730)                | 1490(884)     | 2720(1614) | 608(361)               | 107(63)         | 0.44                   |
| Slag                                           | 1220(724)                | 1300(771)     | 2520(1495) | 608(361)               | 107(63)         | 0.44                   |

| CLASS C Option 1 (Using No. 7, 78 or 8 Size) |           |           |            |          |        |      |
|----------------------------------------------|-----------|-----------|------------|----------|--------|------|
| Gravel                                       | 1310(777) | 1440(854) | 2750(1631) | 510(303) | 90(53) | 0.50 |
| Limestone                                    | 1350(801) | 1410(837) | 2760(1638) | 510(303) | 90(53) | 0.50 |

The requirements for Proportioning Option 2 are as follows. The cement content may be reduced as much as 50 pounds per cubic yard(30 kg/ m3), with the substitution of an equivalent volume of aggregate, provided the Contractor uses an approved water reducing admixture meeting the requirements of 705.12; Type A or Type D. Proportioning Option 2 shall meet the following Mix Design Concrete Table:

| Quantities Per Cubic Yard (Cubic Meter).       |                                   |                                     |                  |                              |                                           |
|------------------------------------------------|-----------------------------------|-------------------------------------|------------------|------------------------------|-------------------------------------------|
| Type<br>of<br>Coarse<br>Aggregate              | Dry Aggregates                    |                                     |                  | Cement<br>Content<br>lb (kg) | Water-<br>Cement<br>Ratio<br>Maxi-<br>mum |
|                                                | Fine<br>Aggre-<br>gate<br>lb (kg) | Coarse<br>Aggre-<br>gate<br>lb (kg) | Total<br>lb (kg) |                              |                                           |
| CLASS C Option 2 (Using No. 57 or No. 67 Size) |                                   |                                     |                  |                              |                                           |
| Gravel                                         | 1190(706)                         | 1785(1059)                          | 2975(1765)       | 550(326)                     | 0.50                                      |
| Limestone                                      | 1320(783)                         | 1675(994)                           | 2995(1777)       | 550(326)                     | 0.50                                      |
| Slag                                           | 1385(822)                         | 1395(828)                           | 2780(1649)       | 550(326)                     | 0.50                                      |
| CLASS F Option 2 (Using No. 57 or No. 67 Size) |                                   |                                     |                  |                              |                                           |
| Gravel                                         | 1315(780)                         | 1880(1115)                          | 3195(1896)       | 420(249)                     | 0.55                                      |
| Limestone                                      | 1410(837)                         | 1810(1074)                          | 3220(1910)       | 420(249)                     | 0.55                                      |
| Slag                                           | 1445(857)                         | 1540(914)                           | 2985(1771)       | 420(249)                     | 0.55                                      |
| CLASS S Option 2 (Using No. 57 or No. 67 Size) |                                   |                                     |                  |                              |                                           |
| Gravel                                         | 1120(664)                         | 1710(1015)                          | 2830(1679)       | 665(395)                     | 0.44                                      |
| Limestone                                      | 1290(765)                         | 1560(926)                           | 2850(1691)       | 665(395)                     | 0.44                                      |
| Slag                                           | 1270(753)                         | 1370(813)                           | 2640(1566)       | 655(395)                     | 0.44                                      |

| CLASS C Option 2 (Using No. 7, 78 or No. 8 Size) |           |           |            |          |      |
|--------------------------------------------------|-----------|-----------|------------|----------|------|
| Gravel                                           | 1370(813) | 1510(896) | 2880(1709) | 550(326) | 0.50 |
| Limestone                                        | 1420(842) | 1480(878) | 2900(1720) | 550(326) | 0.50 |

The requirements for Proportioning Option 3 are as follows. The Portland cement content may be reduced as much as 50 pounds per cubic yard(30 kg/m3 ) with the substitution of an equivalent volume of aggregate, provided the Contractor uses an approved water-reducing admixture meeting the requirements of 705.12, Type A or D. The cementitious materials content shall consist of a combination, by weight, of a minimum of 70 percent Type I or Type IA Portland cement (701.04 or 701.01), and a maximum of 30 percent ground granulated blast furnace slag, ASTM C 989, grade 100 or 120. Proportioning Option 3 shall meet the following Mix Design Concrete Table:

| Quantities Per Cubic Yard (Cubic Meter).       |                        |                          |               |                        |                   |                        |
|------------------------------------------------|------------------------|--------------------------|---------------|------------------------|-------------------|------------------------|
| Type of Coarse Aggregate                       | Dry Aggregates         |                          |               | Cement Content lb (kg) | GGBF Slag lb (kg) | Water-CM Ratio Maximum |
|                                                | Fine Aggregate lb (kg) | Coarse Aggregate lb (kg) | Total lb (kg) |                        |                   |                        |
| CLASS C Option 3 (Using No. 57 or No. 67 Size) |                        |                          |               |                        |                   |                        |
| Gravel                                         | 1185(703)              | 1775(1053)               | 2960(1756)    | 385(228)               | 165(98)           | 0.50                   |
| Limestone                                      | 1310(777)              | 1670(991)                | 2980(1768)    | 385(228)               | 165(98)           | 0.50                   |
| Slag                                           | 1385(822)              | 1385(822)                | 2770(1644)    | 385(228)               | 165(98)           | 0.50                   |
| CLASS F Option 3(Using No. 57 or No. 67 Size)  |                        |                          |               |                        |                   |                        |
| Gravel                                         | 1320(783)              | 1870(1109)               | 3190(1892)    | 294(174)               | 126(75)           | 0.55                   |
| Limestone                                      | 1400(831)              | 1810(1074)               | 3210(1905)    | 294(174)               | 126(75)           | 0.55                   |
| Slag                                           | 1440(854)              | 1535(911)                | 2975(1765)    | 294(174)               | 126(75)           | 0.55                   |

| CLASS S Option 3 (Using No. 57 or No. 67 Size) |           |            |            |          |          |      |
|------------------------------------------------|-----------|------------|------------|----------|----------|------|
| Gravel                                         | 1105(656) | 1715(1017) | 2820(1673) | 465(276) | 200(119) | 0.44 |
| Limestone                                      | 1280(759) | 1555(923)  | 2835(1682) | 465(276) | 200(119) | 0.44 |
| Slag                                           | 1270(753) | 1360(807)  | 2630(1560) | 465(276) | 200(119) | 0.44 |

| CLASS C Option 3 (Using No. 7, 78 or No. 8 Size) |           |           |            |          |         |      |
|--------------------------------------------------|-----------|-----------|------------|----------|---------|------|
| Gravel                                           | 1370(813) | 1500(890) | 2870(1703) | 385(228) | 165(98) | 0.50 |
| Limestone                                        | 1410(837) | 1480(878) | 2890(1715) | 385(228) | 165(98) | 0.50 |

GGBF = ground granulated blast furnace slag; CM = cementitious material.

The use of coarse aggregate in Portland cement concrete pavements is restricted by 703.13, as modified by the proposal.

Approval of Optional Mix Designs. A request to use any option design must be submitted to the Engineer for approval.

All admixtures used in the concrete mixture must be compatible and shall be dispensed in accordance with the manufacturer's recommendations.

If Portland cement with fly ash as an additive is used as described under Option 1 or ground granulated blast furnace slag is used under Option 3, the mix design shall be used only between April 1 and October 15, unless otherwise authorized by the Director. If Option 1 is used, an approved set retarding admixture meeting the requirements of 705.12, Type B or Type D shall be used if the concrete temperature exceeds a nominal temperature of 75° F (24° C) . If Option 2 or 3 is used, an approved water reducing set retarding admixture meeting the requirements of 705.12, Type D shall be used if the concrete temperature exceeds a nominal temperature of 75° F (24° C).

The proportioning adjustments under Options 1, 2 or 3 shall be the responsibility of the Contractor, and shall be in accordance with the ACI Standard "Recommended Practice for Selecting Proportions for Normal Weight Concrete" (ACI 211.1). The proportioning shall be based on developing an average compressive strength at 28 days of 4000 psi (28.0 MPa) for Class C, 3000 psi (21.0 Mpa) for Class F or 4500 psi (31.0 MPa) for Class S.

Optional mixes are not permitted with concrete bridge deck overlays using microsilica. For mixes used in latex modified and superplasticized dense concrete bridge deck overlays (Supplemental Specifications 847 and 848), and using Option 1 and 2, certified test data shall be provided for all requirements in accordance with Supplement 1045. Option 3 may not be used with concrete bridge deck overlays (Supplemental Specifications 847 and 848). The testing for Absorption, Scaling Resistance, and Volume Change will not be required for mixes used in dense concrete bridge deck overlays.

Only one source of fly ash shall be used in any one structure unless otherwise authorized by the Director. Bulk fly ash shall be stored in waterproof bins.

No option mixes shall be permitted in concrete mixes designed or intended to obtain high early strength.

#### 899.05 Additional Classes of Concrete for Rigid Replacement.

*Class FS.* This mixture is a fast-setting Portland cement concrete

for accelerated setting and strength development. The minimum cement content shall be 900 pounds per cubic yard (534 kg/m³ ) and the maximum water — cement ratio shall be 0.40. The rigid replacement may be opened to traffic after four hours provided test beams have attained a modulus of rupture of 400 psi (2.8 MPa).

The concrete shall be kept plastic by means of a Type B or D admixture until the surface has been textured. The Type B or D admixture shall be used in accordance with the manufacturer's recommendations.

Calcium chloride shall be added and mixed with each batch of concrete just prior to placement. If calcium chloride with 94-97 percent purity is used, the addition rate shall be 1.6 percent by weight of the cement. If calcium chloride with 70-80 percent purity is used, the addition rate shall be 2.0 percent by weight of the cement. When calcium chloride in a water solution is used, the water used shall be considered as part of the concrete mixing water and appropriate adjustments shall be made for its inclusion in the total concrete mixture.

Any other approved accelerating admixture may be used at the rate recommended by the manufacturer, provided it will produce the required strength in the allotted time.

Immediately after the curing compound has been applied, the replacements shall be

covered with polyethylene sheeting and further covered with building board as specified in ASTM C 208. The building board shall be wrapped in a black polyethylene sheeting and placed tight against the surrounding concrete and weighted down to protect the fresh concrete from the weather.

*Class MS.* This mixture is a moderate-setting portland cement

concrete for accelerated strength development. The rigid replacement may be opened to traffic after 24 hours provided test beams have attained a modulus of rupture of 400 psi (2.8 MPa). The minimum cement content shall be 800 pounds per cubic yard (475 kg/m3 ) and the maximum water-cement ratio shall be 0.43.

The proportioning of the concrete materials to meet the requirements of each class of rigid replacement concrete specified shall be the responsibility of the Contractor. The coarse aggregate may be any one of the following sizes: No. 57, No. 6, No. 67, or No. 8. When No. 8 size is used, the entrained air content shall be 8 ±2 percent. Otherwise, the entrained air content shall be 6 ±2 percent.

The Engineer's approval of the concrete mix design will be based on the Contractor's submitted proportions and the foregoing information.

#### 899.06 Equipment. Equipment shall be as follows:

(a) Batching Plants. Each plant shall be constructed and operated so that no intermingling of materials occurs prior to batching. The plant shall have weighing mechanisms which provide either a visible means of checking weights or a printed record. Dispensing mechanisms for water and admixtures shall have a visible means of checking quantities or shall produce a printed record.

Weighing mechanisms used for cement and aggregates shall weigh to an accuracy such that the weight indicated on the scale or printed ticket is within ± 0.5 percent of the correct weight. Devices for weighing or metering water shall measure to an accuracy of ± 1.0 percent throughout the range used.

All weighing and metering devices shall have been checked and their accuracy attested to within the 12-month period immediately prior to their use. This service may be performed by the Sealer of Weights and Measures or a scale servicing company. In lieu of the preceeding requirements, the concrete batch facilities may be approved if a Certificate of Performance has been issued by the National Ready Mixed Concrete Association.

To reach a capacity of 500 pounds (227 kg), ten standard test weights or the services of a scale servicing company shall be readily available for testing the weighing devices at the batch plant. All weights used in testing the weighing devices shall be sealed every 3 years by the Ohio Department of Agriculture.

Weighing and dispensing devices shall be tested as often as the Engineer may deem necessary to assure their continued accuracy.

(b) Mixers. Mixers and agitators shall conform to paragraphs 10, 11.2, 11.5 and 11.6 of AASHTO M 157, except that mechanical counters are permitted.

When a truck mixer is used for complete mixing, each batch of concrete shall be mixed for not less than 70 revolutions of the drum or blades at the rate of rotation designated on the metal plate on the mixer as mixing speed.

Bodies of nonagitating hauling equipment for concrete shall be smooth, mortartight, metal containers and shall be capable of discharging the concrete at a satisfactory controlled rate without segregation. Covers shall be provided when required by the Engineer. Trucks having dump bodies with rounded corners and no internal ribs or projections will be permitted for nonagitating hauling.

**899.07 Handling, Measuring and Batching Materials.** Aggregates from different sources and of different gradings shall not be stockpiled together. Aggregates that have become segregated, or mixed with earth or foreign material, shall be reworked or cleaned as directed by the Engineer, or rejected. Coarse aggregate shall be maintained with a uniform moisture content.

The fine aggregate and coarse aggregate shall be separately weighed in the respective amounts set by the Engineer as outlined in 899.03. Separate weighing devices shall be used for weighing the cement.

Batching shall be so conducted as to result in the weights of each material required within a tolerance of ± 1.0 percent for cement and ± 2.0 percent for aggregates. Water shall be measured by weight or volume to within a tolerance of ± 1.0 percent. Admixtures shall be dispensed to within ± 3.0 percent of the desired amount.

Methods and equipment for adding air-entraining agent or other admixture into the batch, when required, shall be approved by the Engineer.

#### 899.08 Concrete Batch Plant Tickets. The Contractor shall furnish the Engineer a concrete batch

plant ticket for each load of concrete delivered for use on the project. Batch tickets may be computer-generated, handwritten, or a combination. The ticket shall include, at a minimum, the information listed in Table I:

| TABLE I - EVERY BATCH TICKET                   |  |
|------------------------------------------------|--|
| Name of ready-mix batch plant                  |  |
| Batch Plant No                                 |  |
| Batch Plant Location                           |  |
| Serial number of ticket                        |  |
| Date                                           |  |
| Truck Number                                   |  |
| Class of Concrete                              |  |
| JMF#                                           |  |
| Time the load was batched                      |  |
| Size of Batch [cu yd (cu m)]                   |  |
| Actual weights of cementitious material:       |  |
| Cement [lbs(kg)]                               |  |
| Fly ash [lbs(kg)]                              |  |
| Ground granulated blast furnace slag [lbs(kg)] |  |
| Micro-silica [lbs(kg)]                         |  |
| Other                                          |  |
| Actual weights of aggregates:                  |  |
| Coarse [lbs(kg)]                               |  |
| Fine [lbs(kg)]                                 |  |
| Other                                          |  |
| Actual weight of water [lbs(kg)]               |  |
| Actual volume of admixtures:                   |  |
| Air entrainer [fl. oz. (mL)]                   |  |
| Superplasticizer [fl. oz. (mL)]                |  |
| Water reducer [fl. oz. (mL)]                   |  |
| Retarder [fl. oz. (mL)]                        |  |
| Other                                          |  |
| Aggregate moisture contents (%):               |  |
| Coarse Aggregate                               |  |
| Fine Aggregate                                 |  |
| Water Cement Ratio, leaving the plant          |  |

Batch tickets for each day's first load of concrete, for each JMF, shall also include the information in Table II below. The Table II information may be either included on the batch ticket or furnished on a separate form. The separate form may be computer-generated or handwritten, but the form must be physically attached to the batch ticket.

If during the concrete manufacturing process any of the information listed in Table II changes, the information in Table II shall be resubmitted with the first concrete batch ticket supplied with the changed concrete.

| TABLE II - FIRST TICKET EACH DAY, EACH JMF |  |
|--------------------------------------------|--|
| Cementitious Sources and Grade or Type:    |  |
| Cement                                     |  |
| Micro - Silica                             |  |
| Ground granulated Blast Furnace slag       |  |
| Fly Ash                                    |  |
| Other                                      |  |
| Admixtures - Brand and Type:               |  |
| Air entrainer                              |  |
| Retarder                                   |  |
| Water reducer                              |  |
| Superplasticizer                           |  |
| Other                                      |  |

Concrete batch ticket information conforms to ASTM C 94, section 13. Supporting data may be required by the Engineer to validate the basis for the furnished aggregate moisture contents. Cost for generating and supplying the information and the concrete batch tickets shall be included in the individual concrete items.

**899.09 Mixing Concrete.** The concrete may be mixed in a central mix plant or in truck mixers. The mixer shall be of an approved type.

When mixed in central mixers, the mixing time shall not be less than 60 seconds. Mixing time begins when all materials are in the drum and ends when the discharge begins. Transfer time in multiple drum mixers is included in mixing time. The contents of an individual mixer drum shall be removed before a succeeding batch is emptied therein.

Ready-mixed concrete shall be mixed and delivered in accordance with 899.04(b). Mixed concrete from the central mixers shall be transported in truck mixers, truck agitators, or trucks having nonagitating bodies. The concrete shall be delivered to the site of the work and discharge shall be completed within one hour after the combining of the water and the cement. If an approved set-retarding (705.12, Type B) or a water-reducing and set-retarding (705.12, Type D or G) admixture is used at the Contractor's expense, discharge shall be completed within 90 minutes after the combining of the water and the cement.

When concrete is delivered in transit mixers or agitators, additional water within the limits specified may be added and sufficient mixing performed to adjust the slump and to regenerate the specified air content throughout the batch, provided all these operations are performed prior to discharging any of the batch and within the above time limitations. When making these adjustments, the concrete shall be mixed a minimum of 30 revolutions at mixing speed.

Retempering after the start of discharge is permitted by the use of approved admixtures (705.12, Type F or G) when approved by the Engineer.

Admixtures containing more than 50 parts per million chloride by weight of cement will be permitted only when provided for in the contract, or upon written permission of the Director.

The procedure for making and testing of concrete beams shall be in accordance with the requirements of Supplement 1023 on file in the Office of the Director.

When mixed, all concrete shall have a temperature of not more than 90° F (32° C ), and the concrete shall be maintained under this temperature until deposited in the work.



**STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION 905  
OPEN HEARTH AND BASIC OXYGEN FURNACE STEEL SLAG AGGREGATE  
USED FOR ITEMS 203, 304, 306, 307, 410, 411, 617, 503 OR 603**

**April 1, 1998**

Material passing the 75  $\mu$ m(200 sieve) shall be less than 10 percent by weight.

No crushing of OH or BOF slag shall be allowed.

Identification of OH Slag. Clear, definitive and undisputable identification of the OH slag is required for OH slag used for Item 304 or for a non-surface course application in Items 617, 410 or 411.

The producer shall show the Department evidence that the material supplied is open hearth slag. This information shall consist of but not be limited to the following:

Steel producer, production dates, production rates, stockpiling dates, type of steel produced, and all known Department and non-Department projects where the material was previously used.

This identification of OH slag may be supplemented by other information approved by the Department or by using 10 years of good performance data. The producer shall submit to the Department projects where the OH slag has been used without expansion or tufa problems. The Department will review the above projects as part of the identification approval process.

All OH slag not identified as open hearth slag shall be considered basic oxygen furnace slag unless identified otherwise.

Tufa Performance Verified. Tufa is a precipitate form of calcium carbonate that can clog up the underdrain systems. Some OH slag sources clog up underdrain systems and some do not. Tufa performance verification will be based on field performance and Department's inspection of the underdrain systems.

Tufa performance verification is required for OH slag used for Item 304, or when OH slag is used for a non-surface course applications in Items 617, 410 or 411.

The producer shall submit to the Department past projects that are at least 10 years old that used the proposed OH slag source. The producer shall supply the Department with construction plans with the underdrains and underdrain outlets marked on the plans, or other suitable method, approved by the Department, showing the underdrain system. The producer shall mark the underdrain outlets in the field for inspection. The Department will inspect the underdrain systems for tufa deposits. If tufa deposits are found in the outlets or in the underdrain system, the OH slag source shall be rejected.

The following sources have previously been evaluated for tufa performance: Standard-Lafarge's Cuyahoga Heights and McDonald plants. Tufa performance verification is not required for these sources.

Open Hearth (OH) or Basic Oxygen Furnace (BOF) slag shall not be used for Aggregate or Soil for Item 603 Bedding or Backfill, for Items 306 Cement Treated Free Draining Base or 307 Non-Stabilized Drainage Base, Item 503.10 Backfill; or under, around or within 15 meters (50 feet) of any structure.

OH and BOF slag may be used in Item 203 Embankment, as defined in 203.02, if the OH or BOF slag is blended in a 3:1 mixture ( 3 parts natural soil and 1 part OH or BOF slag). The 3:1 mixture shall be placed at least 0.3m (1.0 ft) below the flow line of the underdrains or other drainage items susceptible to runoff as per 203.08. Aging and stock piling requirements of this specification are required.

OH and BOF slag may be used for surface course applications in Items 617, 410 and 411, if the OH and BOF slag meets the above specifications, and meets the aging and stock piling, deleterious substances, and crushing requirements of this specification.

BOF slag shall not be allowed for non-surface course applications in Items 304, 410, 411 or 617.

Recycled OH or BOF slag from Department or non-Department projects may be used in Item 203, or surface course applications in Items 617, 410 or 411, if the material meets the requirements of this specification.

OH slag may be used for Item 304 and for a non-surface course application in Items 617, 410 and 411, if the OH slag meets the above specifications and all the additions and deletions listed below;

Recycled OH or BOF slag from Department or non-Department projects shall not be allowed.

Deleterious substances (soft pieces) shall include soft lime, lime oxide or magnesia agglomerations or any foreign materials prone to rapid disintegration under construction processing and weathering conditions.

Deleterious substances( soft pieces) in accordance with Supplement 1029 ( hand crushing of soft pieces) shall be less than 3 percent by weight.

Aging and Stockpiling Requirements. All OH and BOF slag shall be stockpiled and aged as follows:

The material shall be graded and stockpiled into maximum size piles of 23,000 Metric ton (25,000 ton). Prior to and during the stock piling operation, these materials shall have water added to provide a uniform moisture content not less than their absorbed moisture. The stockpile shall be maintained in a moist condition during the required stock piling period.

The producer shall mix the stockpile when the outside surface of the pile has crusted over. The Department will inspect the stock pile every 2 months to ensure no crusting occurs. Frozen stockpile material shall not be mixed. The aging period shall be suspended when the stockpile is frozen for more than one month.

This aging period shall be at least 6 months in duration and shall start over if any new material is added to the pile during the aging period.

Expansion Testing. After the aging and stock piling requirements have been met, expansion testing is required for OH slag used for Item 304 or when OH slag is used for a non surface course applications in Item 617, Item 410 or Item 411.

Expansion Testing shall be performed in accordance with Pennsylvania Department of Transportation PTM No. 130, the ODOT equivalent to this test or expansion testing acceptable to ODOT.

The producer shall hire an independent AASHTO accredited and ODOT approved laboratory to perform at least half of the expansion testing. At the producer's option, up to half of the required expansion testing may be performed by the producer's lab. The Office of Materials Management shall observe the expansion testing and approve each independent and producer laboratory.

The expansion testing shall be performed for every 2300 metric tons (2500 tons) or fraction thereof of the material supplied.

The maximum allowable total expansion for each test shall be less than 0.50 percent. If any one test fails in the stockpile, the entire stockpile shall be rejected.

When sampling for expansion, the producer shall notify the Department at least 48 hours prior to the sampling. The Department will verify that the sample came from the correct stock pile and take independent spit samples , if required.

The expansion test data and a suitably presented summary of the expansion test data shall be submitted to the Department for approval. The Department reserves the right to perform independent testing to verify the laboratory results at any time.

The Department expansion test data shall take precedence over the producer or independent laboratory expansion testing results in the event of a conflict. The Department shall make the final determination on all conflicting data.

If the material fails the expansion testing, the material shall be stock piled for a minimum of 2 additional months from the date of last sampling and retested for expansion. No materials shall be approved for use until the material passes the expansion test.

**STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION  
SUPPLEMENTAL SPECIFICATION 906**

**ANTISTRIP ADDITIVE FOR ASPHALT CONCRETE**

**May 5, 1998**

On this project, if any gravel coarse aggregate or more than 25 percent natural sand or more than 20 percent reclaimed materials containing gravel coarse aggregate is used in any bituminous aggregate base designed in accordance with Supplement 1044 or any asphalt concrete designed in accordance with 441, then the Contractor shall perform the following additional tests:

1. Moisture damage potential test in accordance with Supplement 1051.
2. Washed gradation in accordance with AASHTO T 11 as modified by Supplement 1004.
3. Adherent fines test for each component in accordance with ASTM D 5711.

If the results of the moisture damage potential test show the Tensile Strength Ratio (TSR) of the bituminous aggregate base mix or asphalt concrete mix to be less than 0.70, then the mix shall be modified by one of the following antistrip additives:

**Liquid Antistrip Material** - The mix shall include liquid antistrip material at a rate of 0.50 to 1.00 percent by weight of the asphalt cement. The TSR of the bituminous aggregate base mix or asphalt concrete mix shall be greater than or equal to 0.80 after the addition of the liquid antistrip material.

**Hydrated Lime** - The mix shall include hydrated lime in the dry form at a rate of 1.0 percent by the dry weight of aggregate for asphalt concrete and 0.75 percent by the dry weight of aggregate for bituminous aggregate base. The hydrated lime shall meet the requirements of AASHTO M 303, Type 1. A list of approved sources of hydrated lime will be maintained by the Laboratory. To become an approved source, a source shall submit certified test data to the Laboratory showing their hydrated lime meets the requirements of AASHTO M 303, Type 1. Annual submittal of certified test data by January 1 each year will be necessary to maintain approval. The following information shall be provided to the Engineer for each shipment of hydrated lime: (1.) letter of certification; (2.) production date; (3.) shipment date; (4.) shipment destination; (5.) batch or lot number (6.) net weight.

The antistrip additive shall be included in the Contractors' mix design established in accordance with 441 or Supplement 1044. The following shall be submitted to the Laboratory with the proposed JMF:

1. All TSR data (before and after the addition of the antistrip additive).
2. Rate of addition of the liquid antistrip material, if used.
3. Product information, recent supplier State project information using the liquid antistrip material, and letter of certification (only for liquid antistrip material, if used).
4. Results of the washed gradation test of the individual components of the mix used in determining the combined gradation.
5. Results of the adherent fines testing for each component.

The Laboratory may perform additional tests in accordance with Supplements 1051, 1052, and 1004. These tests may be performed on material conforming to a proposed JMF or on material obtained during production of an approved JMF. If a change in the aggregate production is suspected, the District/Laboratory may require the Contractor to perform washed gradations on components and calculate adherent fines to determine the need for additional TSR review. The Laboratory may obtain samples of the hydrated lime at any time to verify quality. If the quality of the hydrated lime is in question, the Laboratory may require independent laboratory testing for the hydrated lime supplier.

Antistrip additives shall be stored and introduced into the mix in accordance with Supplement 1053. Prior to the start of production, the Laboratory shall approve the antistrip additive storage and feed systems. During production, if the antistrip additive is not being properly dispersed into the mix, the Laboratory may require modifications in the method of introducing the antistrip additive into the mix.

At the end of the project and at the end of each construction year on a multiple year project, the Contractor shall provide delivery tickets to the Engineer verifying the number of pounds of antistrip additive used is within 10 percent of the calculated amount of antistrip additive required for the total pounds of bitumen, based on the JMF, used in the bituminous aggregate base or asphalt concrete.

The cost of this additional testing and the addition of any antistrip additive shall be included in the contract price for the bituminous aggregate base or asphalt concrete.



**STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION 907**

**Sulphur Leachate Test for Air Cooled Blast Furnace Slag for Acceptance  
of Items 203, 304, 306, 307, 503, 603 and S.S.855 (Asphalt Treated Free Draining Base)**

**October 21, 1998**

**907.01 Description**

**907.02 Sampling Procedure**

**907.03 Sulphur Leachate Test Procedure and Criteria**

**907.01 Description.** Air cooled blast furnace slag used in Items 203, 304, 306, 307, 503, 603, and S.S.855 (Asphalt Treated Free Draining Base) must meet the requirements of this specification. This specification contains the required sampling procedure; sulphur leachate test procedure; and, the criteria that must be met for the material to be incorporated into the work.

**907.02 Sampling Procedure.** The following sampling method for obtaining samples of air cooled blast furnace slag for leachate tests shall be used:

1. Sampling: The material to be used should be sampled as the stockpile is being built.
2. When obtaining the sample after the stockpile is built: The sample may be taken by shovel or hand. The sample shall be selected randomly from both the exterior and interior of the stockpile. The producer shall use a heavy equipment for the excavation of the interior material.
3. Sampling Frequency: Each sample is to be taken in random increments over each 5200 tons (4720 metric tons) stockpiled.
4. Sample size and sample reduction: The field sample should be 80 to 100 pounds (35 to 45 kg). From this field sample, a test sample of 20 to 25 pounds (9 to 11 kg) shall be quartered out.
5. Documentation : Stockpile location and test results shall be maintained at the plant and shall be available upon request.

6. The Producer shall certify that this test has been performed prior to acceptance.

**907.03 Sulphur Leachate Test Procedure and Criteria.** The test procedure involves soaking the slag material in water for a specified period of time and then observing the color of the water. A greenish-yellow coloration indicates a problem. The smell of hydrogen sulfide(rotten eggs) usually accompanies the observation of colored water.

1. Equipment Needed:

- A. A five-gallon (19-liter) bucket for soaking the sample.
- B. Filter paper for filtering the water.
- C. A funnel through which to filter the water.
- D. A glass container for observing the water.
- E. A rock color chart. This chart is used for color comparisons and is distributed by the Geological Society of America
- F. Water shall be distilled or tap water let set in a bucket for a minimum of 12 hours.

2. Test Procedures.

A. Prepare a test sample of approximately 20 to 25 pounds (9 to 11 kg) from a field sample of approximately 100 pounds (45 kg).

B. For Item 306, Type 3 granular material in Item 603, and S.S.855(Asphalt Treated Free Draining Base), the test sample should then be rinsed over a No. 4 (4.75mm) sieve to remove any fines that may be clinging to the larger particles.

C. Place the test sample in bucket and fill with water until the sample is covered by at least ½ inch (13 mm) of water. Allow the sample to soak for 24 hours.

D. After soaking for 24 hours, thoroughly mix the water and collect a water sample of approximately 3.4 fl. oz. (100 mL).

E. Filter the water sample to remove the suspended solids which may interfere with the color observation.

F. If the color of the filtered water is equal to or darker than the moderate greenish- yellow color from the rock chart ( hue 10Y), the material fails. If the water appears clear or lighter than the moderate greenish-yellow color from the rock chart (hue 10Y), then allow the sample to soak for another 24 hours and repeat steps “D” through “F”.

G. If, after 48 hours, the water appears clear or less than the moderate greenish-yellow color from the rock chart (hue 10Y), then the material is acceptable.

**STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION 908**

**PERFORMANCE GRADE (PG) BINDER REQUIREMENTS**

**March 28, 2000**

|               |                                                |
|---------------|------------------------------------------------|
| <b>908.01</b> | <b>Performance Grade Binder Specifications</b> |
| <b>908.02</b> | <b>Contractor Storage Requirements</b>         |
| <b>908.03</b> | <b>Contractor Sampling Requirements</b>        |

**908.01 Performance Grade Binder Specifications.** The requirements of 702.01 shall be replaced with AASHTO Provisional Standard MP1-93, 1997 AASHTO Provisional Standard version for Performance Graded (PG) binders as modified below:

|                                                                     |         |
|---------------------------------------------------------------------|---------|
| PG 64-22 shall meet: Penetration, 77°F (25°C), 3.53 oz (100g), 5s - | 55 - 75 |
| PG 58-28 shall meet: Viscosity, poise, 140°F (60°C)-                | 800 min |

The Materials and Manufacture section 5 shall be modified for all performance grades (PG) as follows:

- 5.1 The performance grade binder shall be an asphalt cement from the refining of crude petroleum, or combination of asphalt cements from the refining of crude petroleum, or asphalt cements and suitable liquid from the refining of crude petroleum, and possible organic modifiers for performance enhancement. Material from the crude refining stream will be considered neat. Liquid from crude refining may be used for adjustments but shall not be used for the purpose of substitution of crude refined asphalt cement in a performance grade asphalt binder. In the event of a failure investigation where binders exhibit unusual properties a supplier may be requested by the Office of Materials Management to supply information about the makeup of a PG binder. Failure to cooperate will mean removal from certification.
- 5.2 A modifier may be any organic material of suitable manufacture that is proven compatible with asphalt cement (does not separate appreciably in routine storage), and that is dissolved, dispersed or reacted in asphalt cement to improve its performance. Performance enhancement is defined as a decrease in the temperature susceptibility of the asphalt cement while maintaining or improving desirable properties in a neat asphalt cement such as coatability, adhesiveness and cohesiveness. The use of modifiers shall be limited to 6.0 percent by performance grade binder weight.
- 5.3 The use of previously used materials must be approved by the Department. Since no standard test procedures exist for reprocessed materials (and original tests were not

developed with the use of such materials in mind), appropriate test methods may be chosen by the Department for review. Department approval does not relieve the performance grade binder supplier from full responsibility for content and use of any previously used material nor guarantee suitable performance enhancement as defined above. The detected presence in a performance grade binder sample of any unapproved previously used material will mean immediate removal from certification. Approved reprocessed materials will be limited to 6.0 percent by performance grade binder weight.

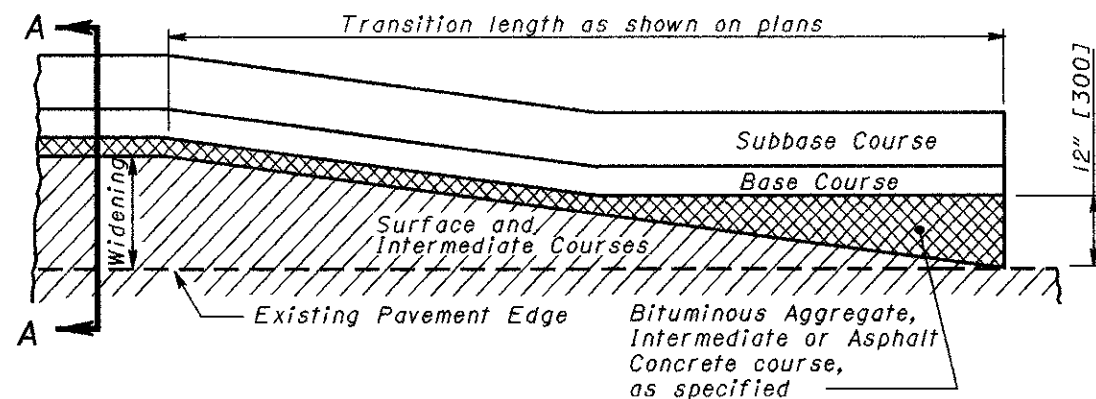
- 5.4 The performance grade asphalt binder shall be homogeneous, free from water and deleterious materials, and shall not foam when heated to 350°F (175°C). The asphalt binder (before modification or after modification if liquid modifier used) shall be proven fully compatible with a negative result by means of the Spot Test per AASHTO T 102 using standard naphtha solvent. If standard naphtha shows a positive result, a retest using 35 percent Xylene/ 65 percent Heptane (volume) may be used.
- 5.5 The performance grade asphalt binder shall be at least 99.0 percent soluble as determined by ASTM D 5546 or D 2042. Any insoluble component shall be substantially free of fibers and have discrete particles less than 75µm.

**908.02 Contractor Storage Requirements.** Storage of a performance grade binder shall be in accordance with 750.01, with the following additions:

1. If a Contractor is providing a binder other than a performance grade binder to customers other than the Department (excepting winter carryover work), a separate storage tank shall be used.
2. When the Contractor switches between different performance grade binders because of alternating mix types, a separate storage tank shall be used.
3. When the Contractor switches from any asphalt cement or other performance grade binder to a different performance grade binder using the same storage tank, the storage tank shall be at least 90 percent empty by tank height.

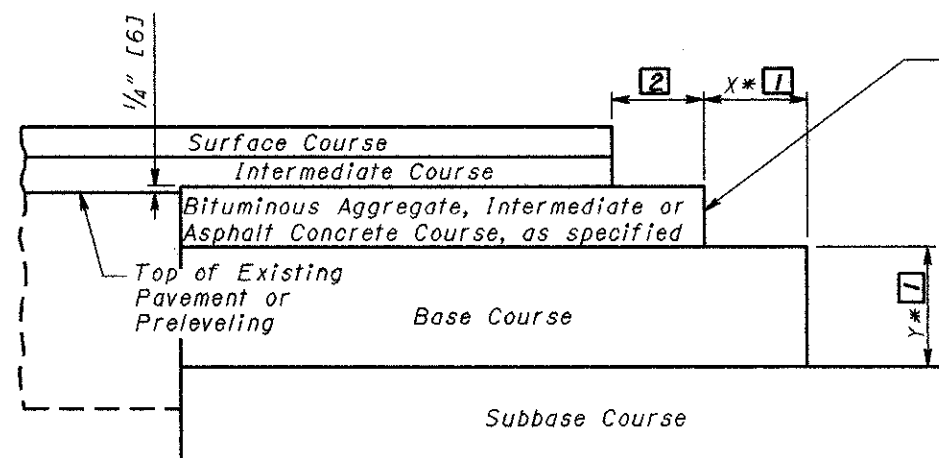
The Monitoring Team shall be notified before the delivery of the first load of each type of performance grade binder, with sufficient lead time to allow for verification of the condition of the storage tank. The Monitoring Team may sample the first storage tank load or give the Contractor permission to proceed with no tank verification, at their discretion.

**908.03 Contractor Sampling Requirements.** The Contractor shall take two 1 quart (1 liter) samples from the first transport truck load of performance grade binder before incorporation into the storage tank. The Contractor will label and date the samples and retain them in the plant laboratory for future reference by the Department, if necessary.



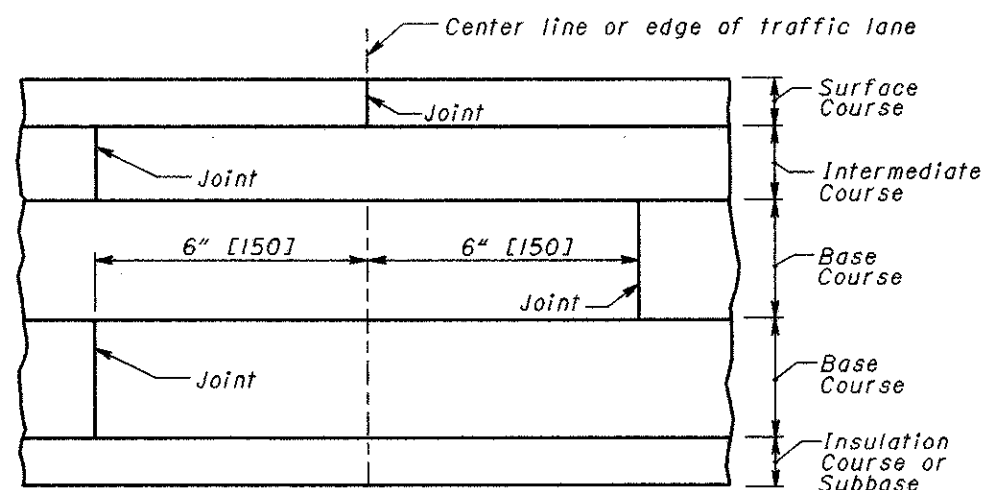
PLAN

# MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT



SECTION A-A

# COURSE DETAIL FOR WIDENING

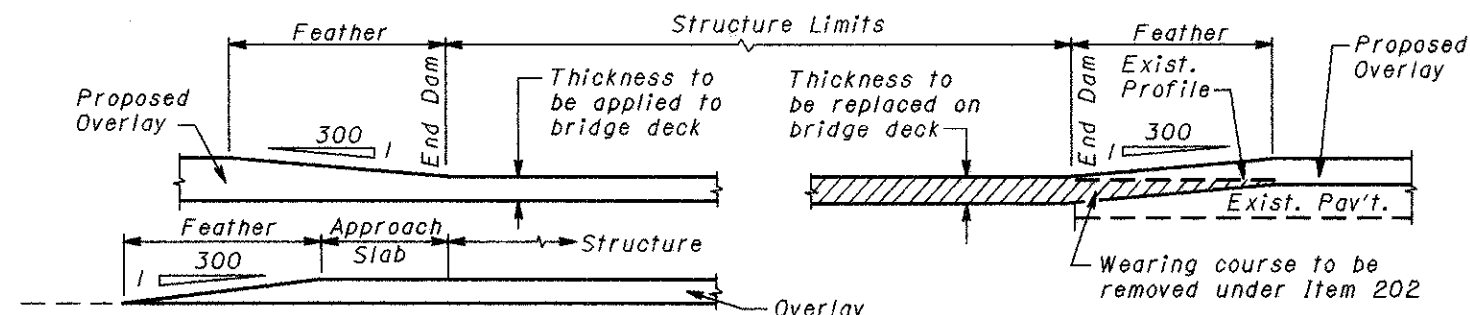


# LAPPING LONGITUDINAL JOINTS

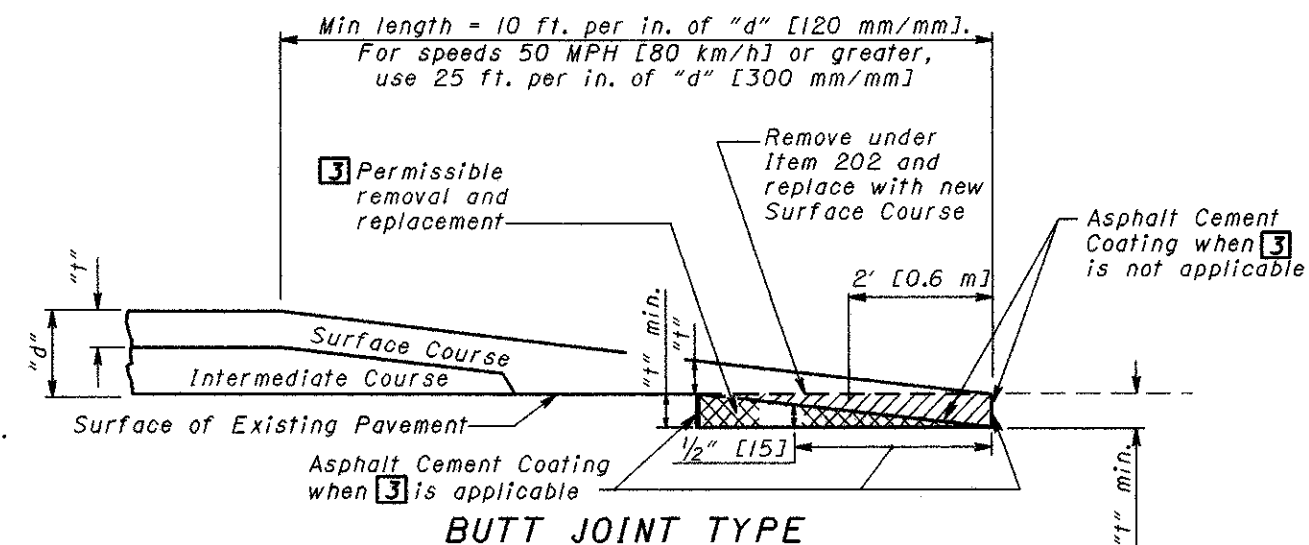
The Bituminous Aggregate in the upper part of the base widening shall finish approximately 1/4" [6] above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified it shall be placed prior to excavation of the widening trench and the upper course of the base widening shall finish approximately 1/4" [6] above the preleveling.

## LEGEND

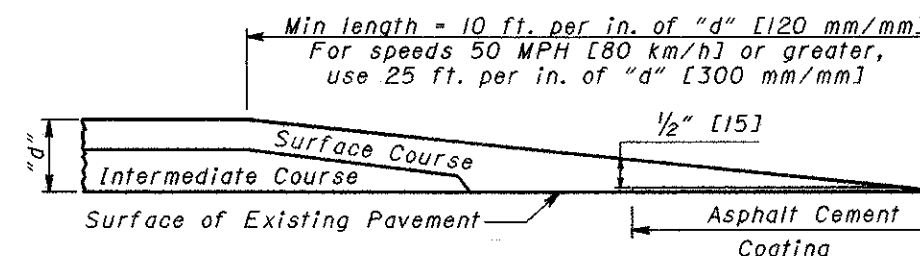
- 1 The extended width (X) of a base or subbase course shall be equal to the depth (Y) of that particular course, unless otherwise specified in the plans.
- 2 The extended width shall be equal to the thickness of the surface course plus the intermediate course, or 4 inches [100], whichever is greater.



# FEATHERING AT STRUCTURES



# BUTT JOINT TYPE



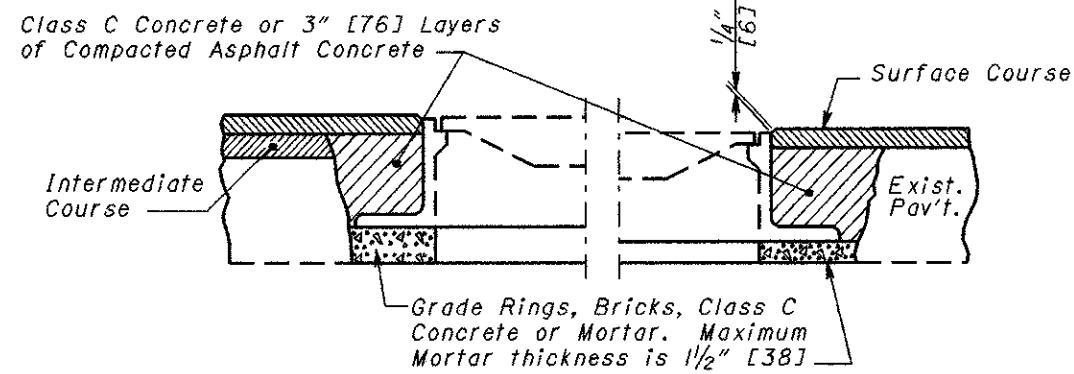
# TAPER EDGE TYPE

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

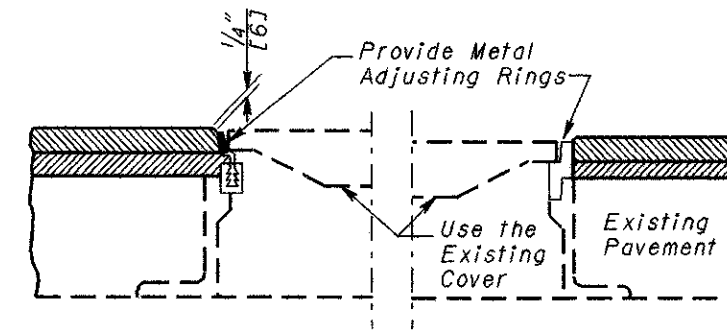
# PLACING FEATHERED AREAS

Values for "t" and "d" are obtained from the plan.





USING CONCRETE OR MORTAR



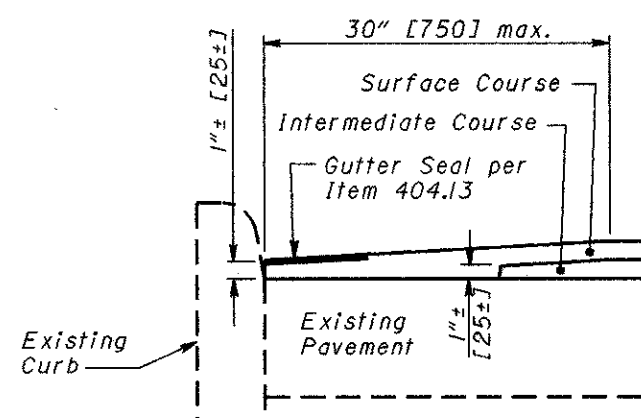
USING METAL ADJUSTING RINGS

Metal adjusting rings shall:

- (a) attach securely to the existing frame by welding or mechanical devices;
- (b) consist either of cast metal having an integral rim and seat, or be fabricated metal with a sturdy connection between the seat and rim; and
- (c) provide an even seat for the manhole cover.

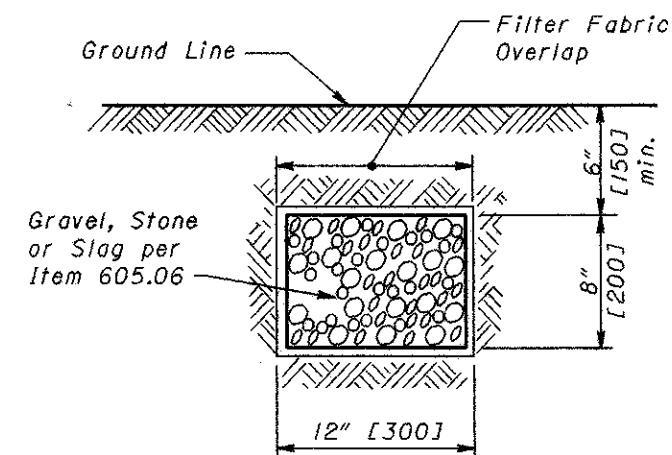
In addition, the adjusting ring type shall be a design acceptable to the local governmental agency responsible for street and sewer maintenance. Any installation unacceptable to the Engineer shall be replaced by the Contractor at his expense.

### MANHOLES ADJUSTED TO GRADE



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

GUTTER FINISH

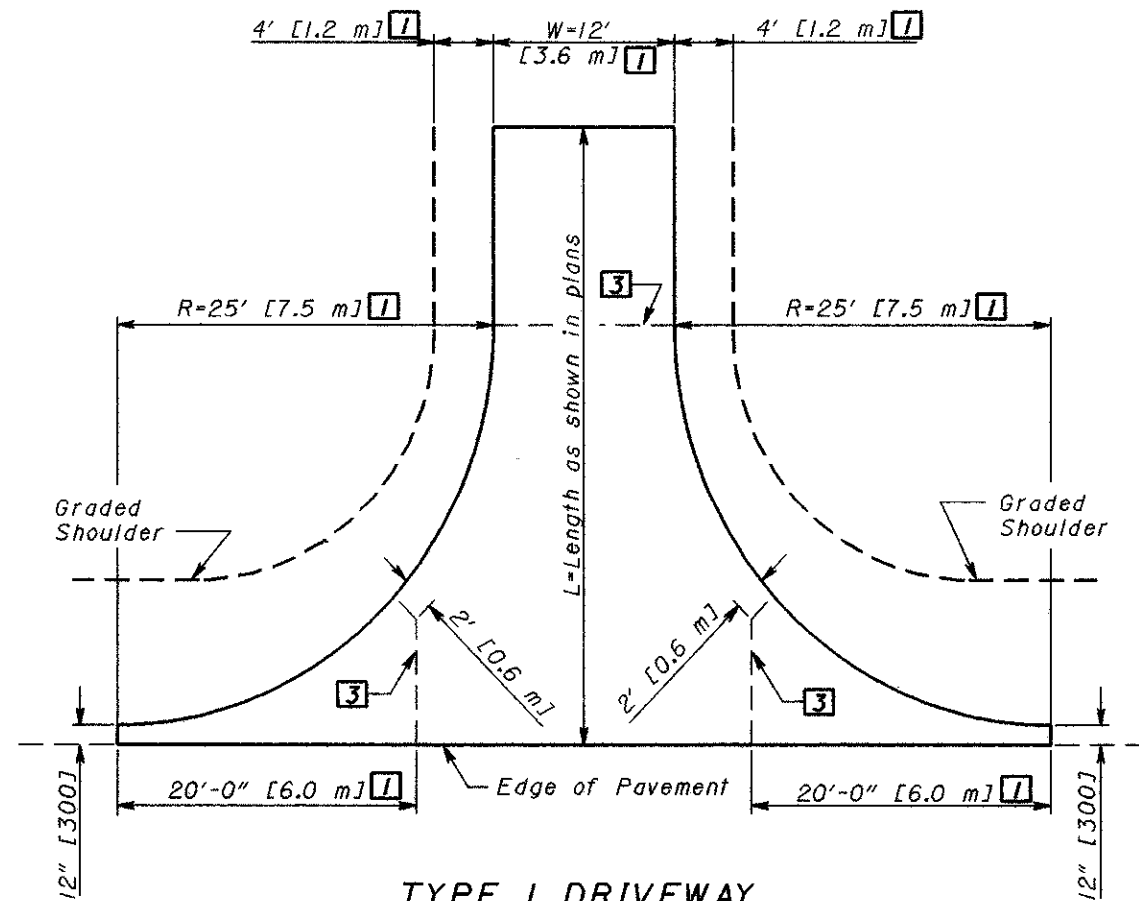
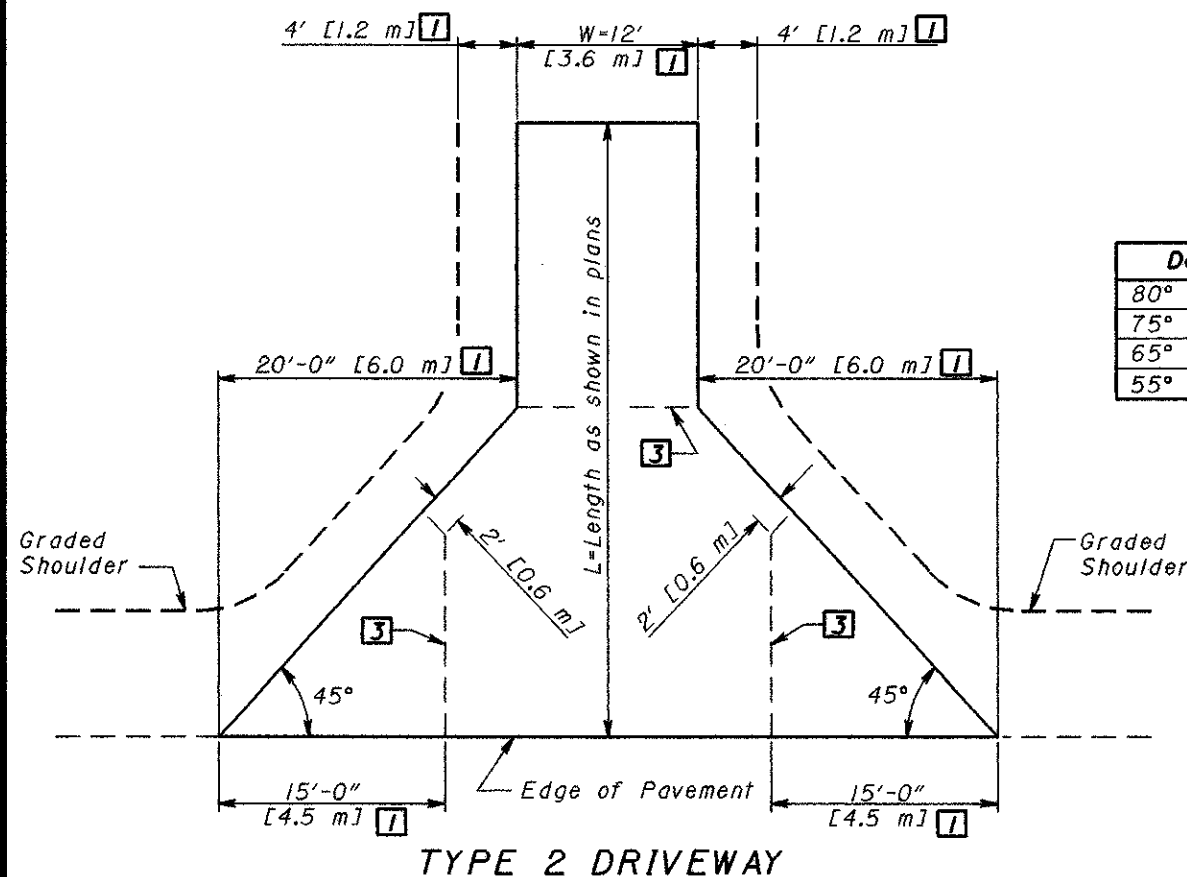
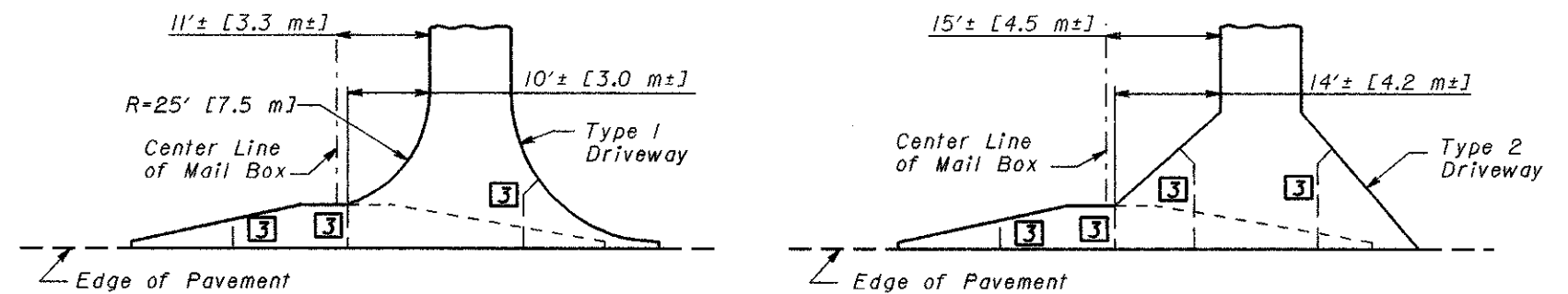


Aggregate drains to be placed where and as directed by Engineer. Provide Filter Fabric when specified as a separate pay item.

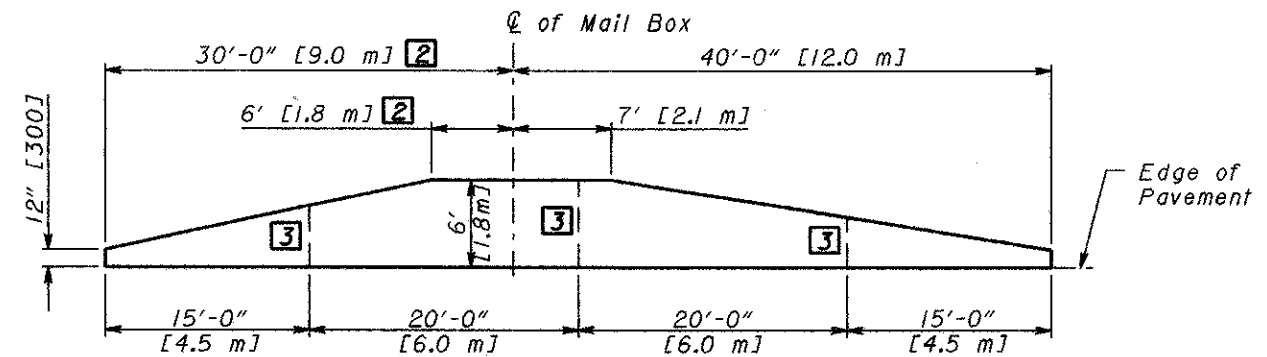
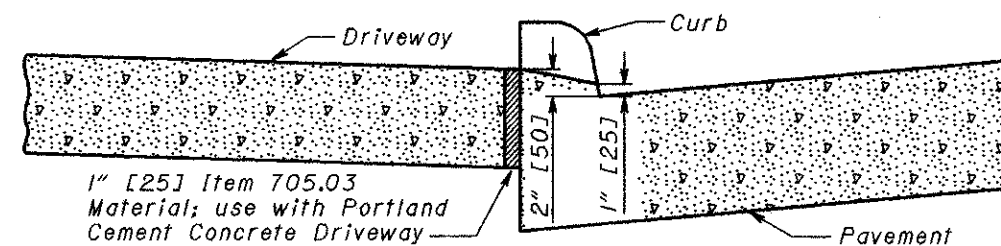
AGGREGATE DRAIN

THIS DRAWING REPLACES BP-3.1M DATED 10-28-94.

| NUMBER | BP-3.1 | STANDARD ROADWAY CONSTRUCTION DRAWING | ROADWAY ENGINEERING SERVICES | REVISIONS | STDS. ENGR. | DATE       |      |
|--------|--------|---------------------------------------|------------------------------|-----------|-------------|------------|------|
|        |        |                                       |                              |           |             | REVISED BY | DATE |
| 2      | 2      |                                       |                              |           |             |            |      |

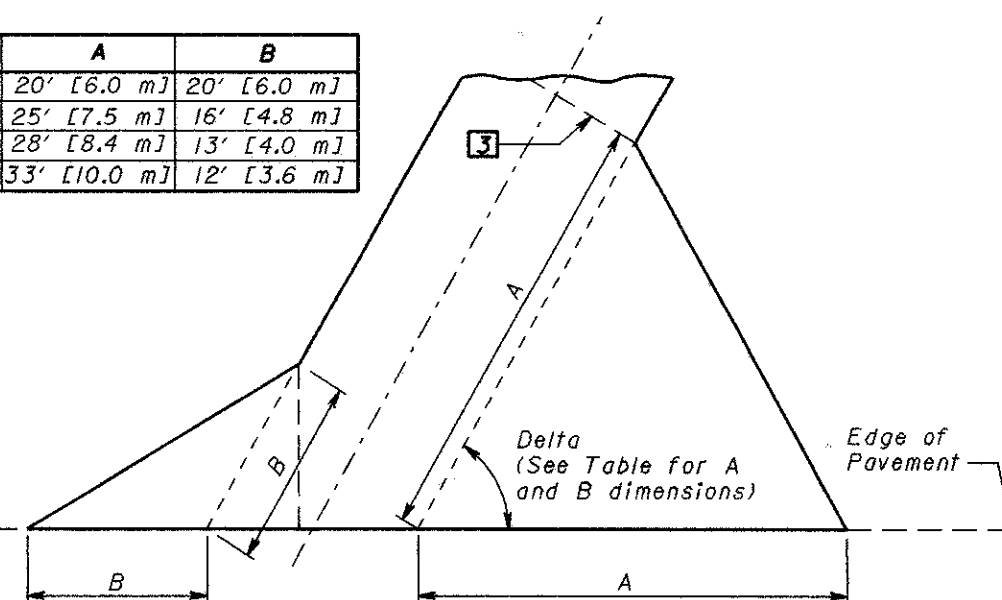


**COMBINED DRIVEWAY & MAIL BOX APPROACH**



**DROP CURB DETAILS AT DRIVEWAYS**

| Delta      | A            | B           |
|------------|--------------|-------------|
| 80° to 90° | 20' [6.0 m]  | 20' [6.0 m] |
| 75° to 85° | 25' [7.5 m]  | 16' [4.8 m] |
| 65° to 75° | 28' [8.4 m]  | 13' [4.0 m] |
| 55° to 65° | 33' [10.0 m] | 12' [3.6 m] |



**TYPE 2 SKEWED DRIVEWAY**

Transition from Standard Curb Section to Drop Curb Section to be made in 18" [450] distance from Driveway

## NOTES

**GENERAL:** The design details shown here 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.

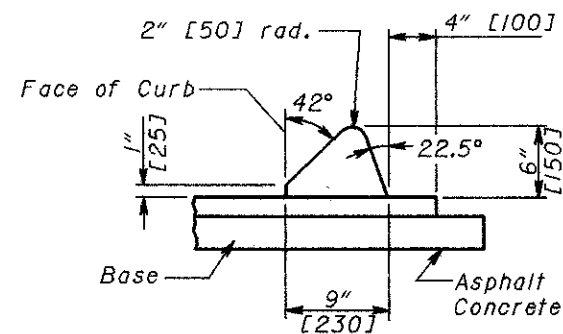
Driveway and mail box approaches shall be combined when feasible.

**JOINTS:** Impressed joints for portland cement concrete driveways shall be 1/4" [6] minimum width by 3" [75] depth and shall be sealed with Item 705.04 or ASTM D 1850.

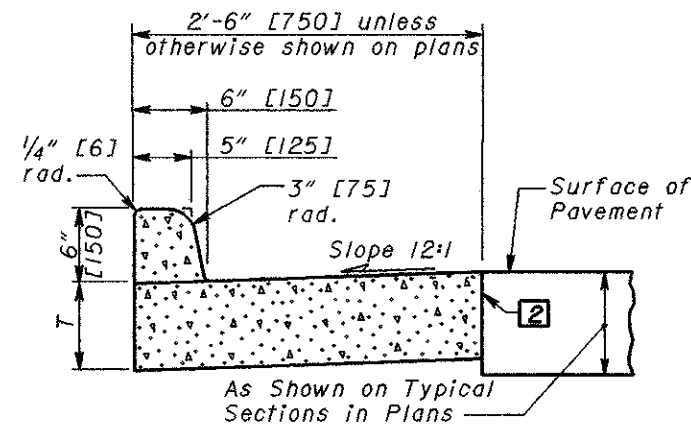
In addition to the joints shown here, impressed joints without tie bars shall be placed in portland cement concrete driveways at intervals not to exceed 17' [5.2 m] in the portion of the driveway beyond the flare.

## LEGEND

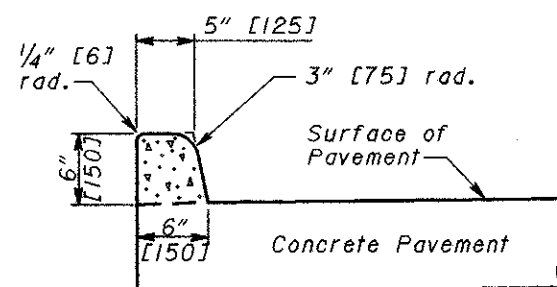
- 1 Unless otherwise shown in the plans.
- 2 Add 3' [0.9 m] for each additional Mail Box
- 3 Impressed Joint without Tie Bars for Portland Cement Surface



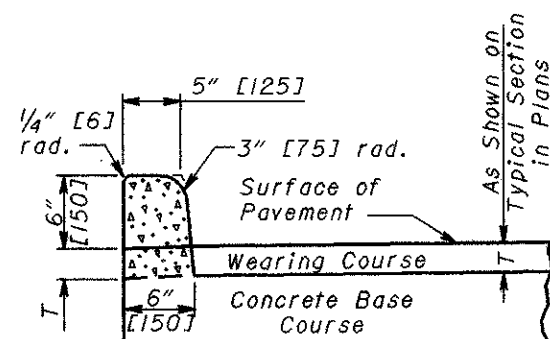
TYPE 1



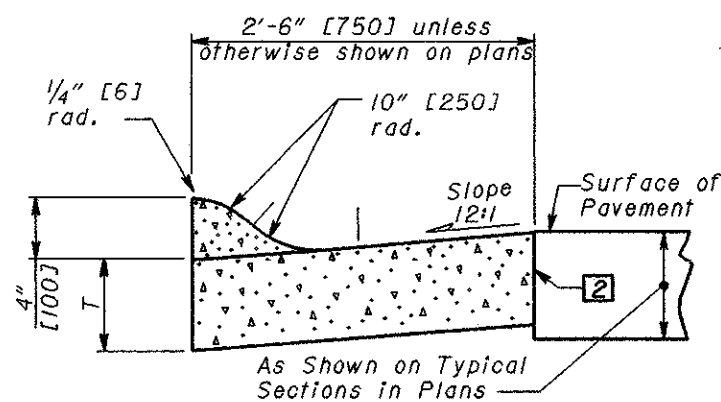
TYPE 2



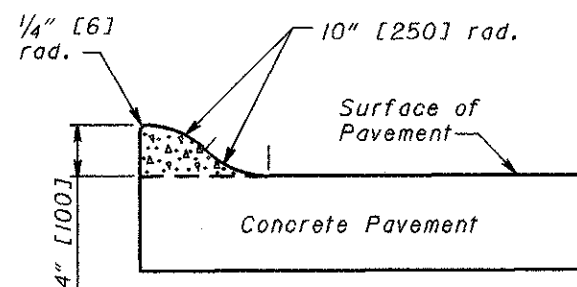
TYPE 2-A



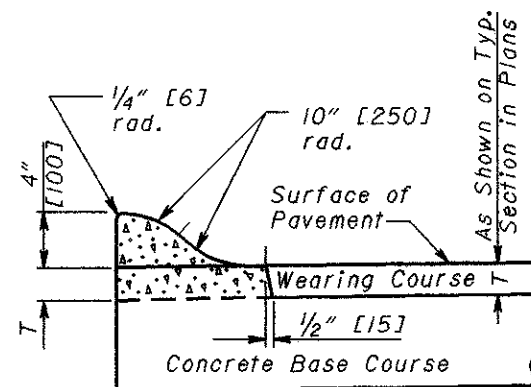
TYPE 2-B



TYPE 3



TYPE 3-A



TYPE 3-B

## NOTES

**GENERAL:** This drawing shows alternate types of curb that may be used on various types of pavement. The typical section of the project shows the type to be used, also the thickness of the edge of the pavement or the edge of the curb and gutter section.

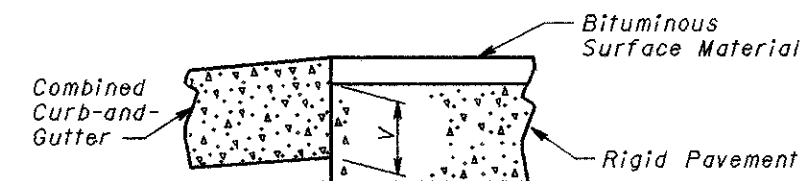
**JOINTS:** 1" [25] expansion joints shall extend up to the top of the curb and shall be constructed in the curb and gutter section in such a manner that the joint seal will extend the full width of the gutter and into the curb face a sufficient distance to seal the joint to an elevation of at least 2" [50] above the flow line of the gutter. Dowel bars shall be used in the curb and gutter section at expansion joints and to the surface of the pavement. Transverse expansion joint material shall meet the requirements of Item 705.03.

**GUTTER PLATE THICKNESS:** Thickness of gutter plate "T" shall be 9" [230] unless otherwise shown on the plans.

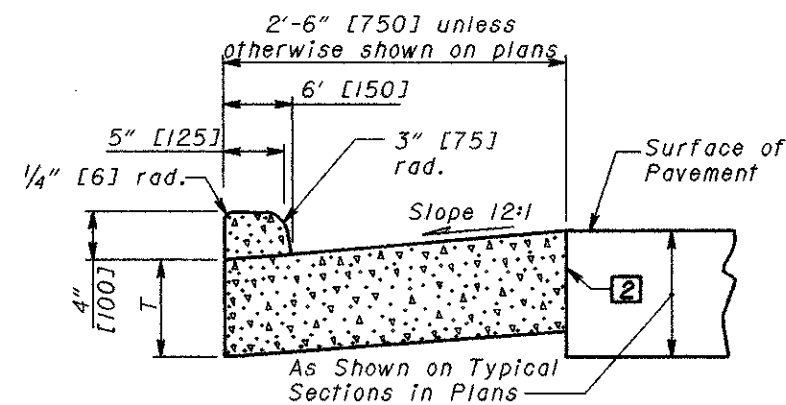
**TOLERANCES:** Dimensional tolerances are as follows:  
Curbs:  $-\frac{1}{32}$ " to  $+\frac{1}{4}$ " [-1 to +5],  
Gutters: 0 to  $+\frac{1}{2}$ " [0 to +12].

## LEGEND

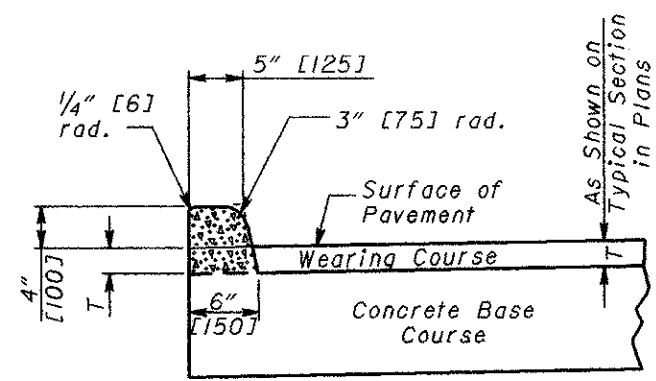
- 1 Expansion joint material and joint sealer are not required for the portion of the curb that is adjacent to a flexible pavement type. Both materials are required, as detailed, for the full height of rigid pavement and concrete bases.
- 2 Butt joints shall be provided between combined curb-and-gutter and new or existing rigid pavements, with tie bars or hook bolts provided at intervals of 5' [1.5 m]. See **SCD BP-2.1** for details of tie bars and hook bolts. If the combined curb-and-gutter adjoins a new rigid base or an existing rigid base or pavement that is to be surfaced with bituminous material, a butt joint shall also be provided. However, tie bars or hook bolts shall be omitted when the vertical overlap ("V" in detail below) between the curb-and-gutter and rigid pavement is less than 7" [175].



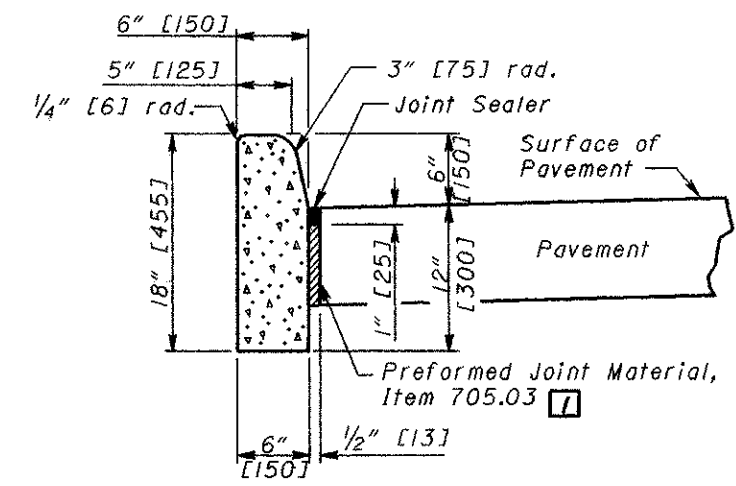




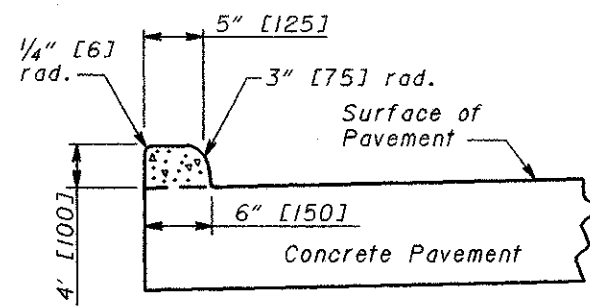
TYPE 4



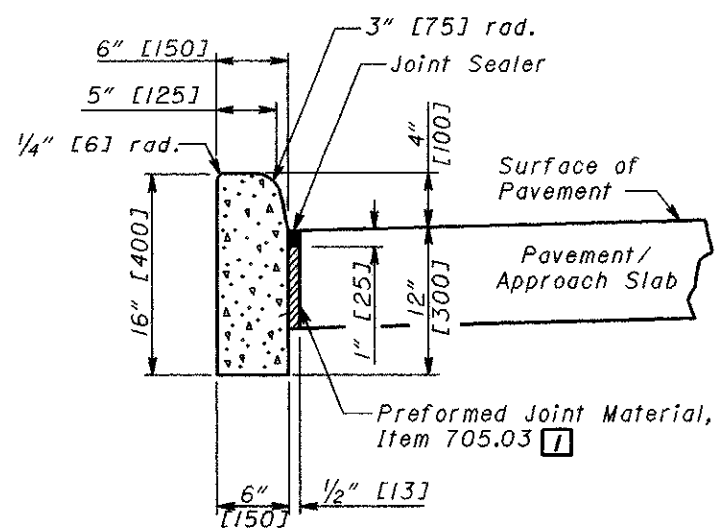
TYPE 4-B



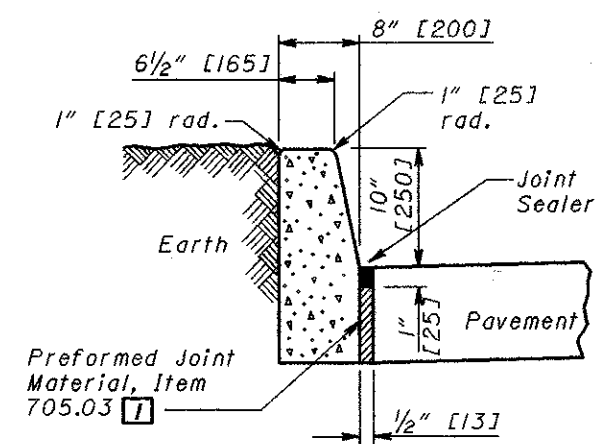
TYPE 6



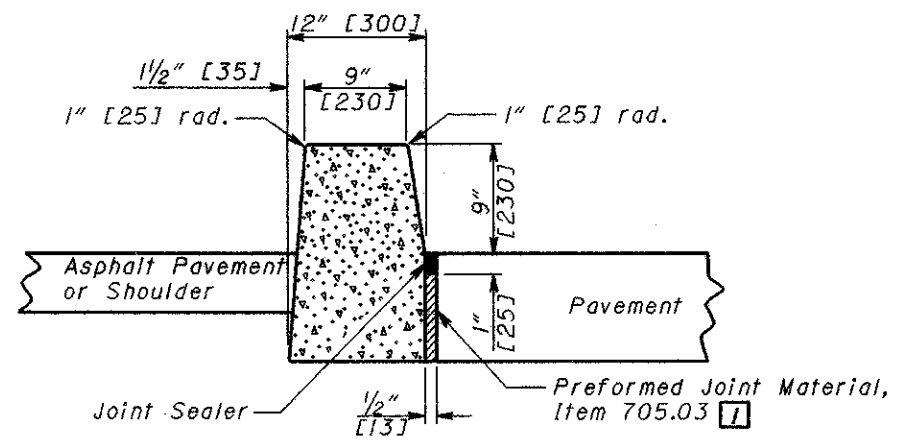
TYPE 4-A



TYPE 4-C



TYPE 7



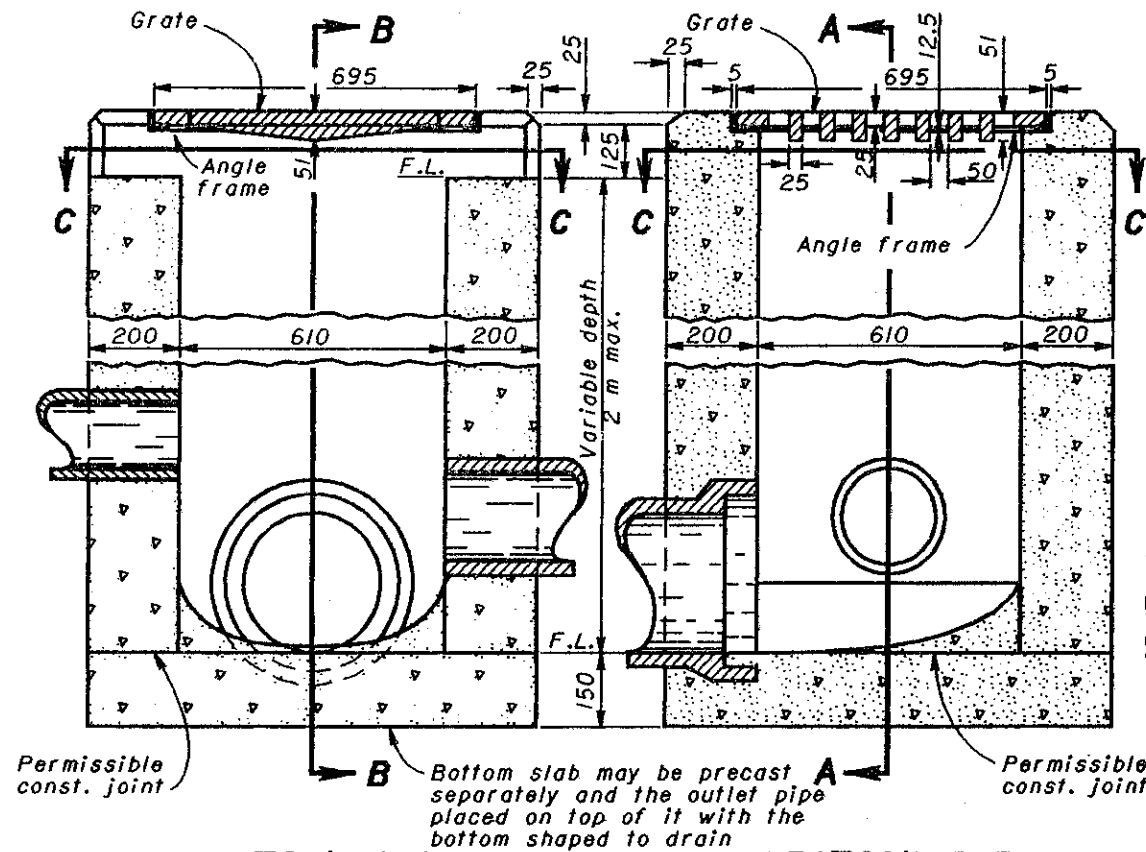
TYPE 8

See Sheet 1 of 2 for Notes and Legend.

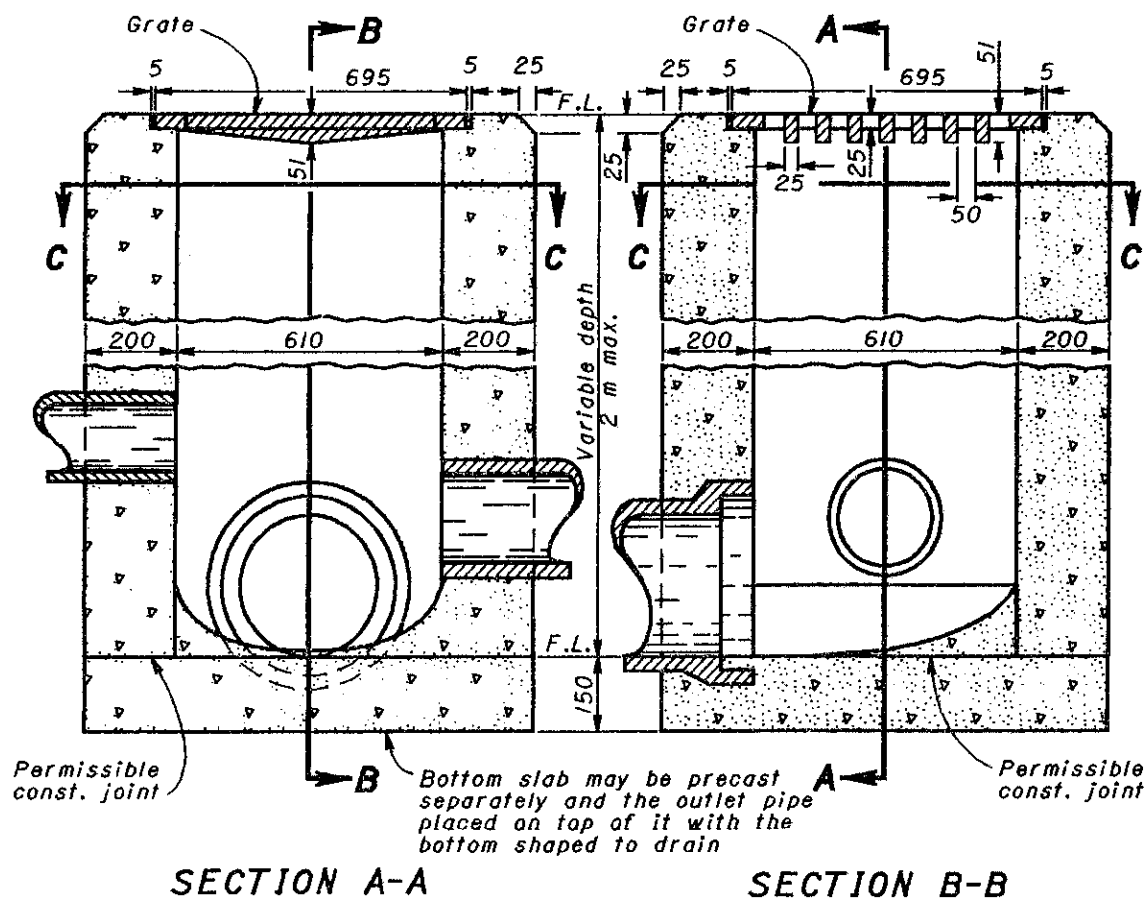
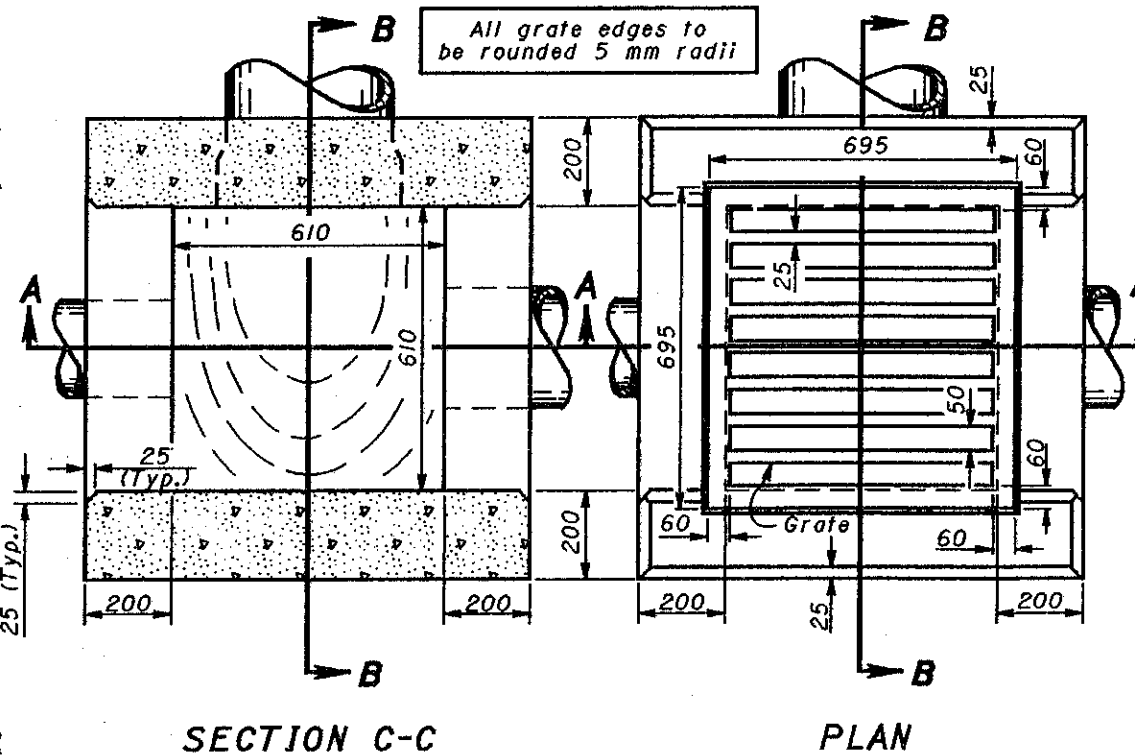
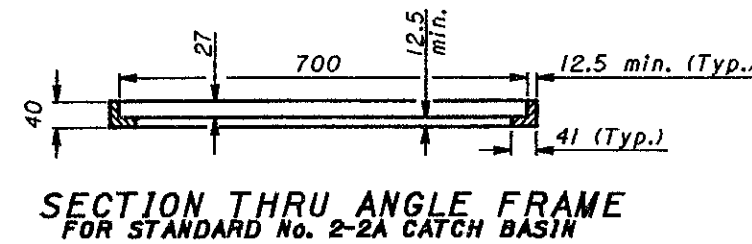
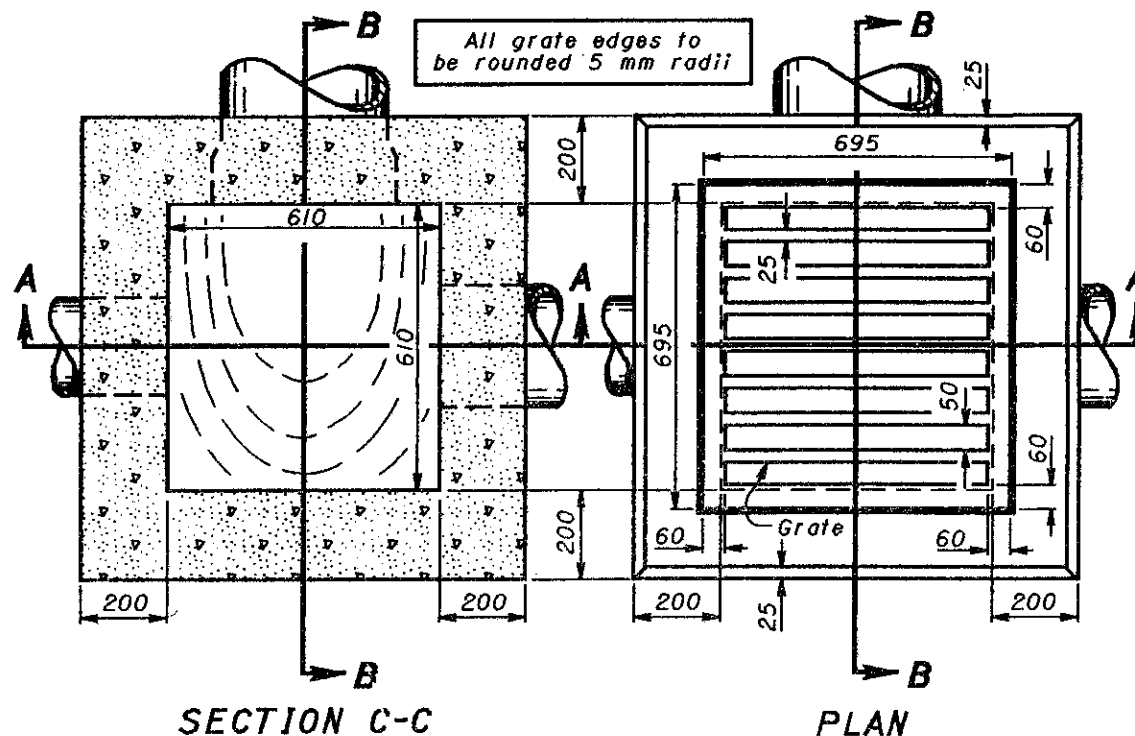
THIS DRAWING REPLACES BP-5.1M DATED 10-28-94.

| NUMBER | STANDARD ROADWAY CONSTRUCTION DRAWING        | ROADWAY ENGINEERING SERVICES | ALL metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted. | STDS. ENGR. M. Evans | REVISIONS | OHIO DEPARTMENT OF TRANSPORTATION |
|--------|----------------------------------------------|------------------------------|------------------------------------------------------------------------------------|----------------------|-----------|-----------------------------------|
| BP-5.1 | CONCRETE CURBS AND COMBINED CURB AND GUTTERS |                              |                                                                                    |                      |           |                                   |
| 2      |                                              |                              |                                                                                    |                      |           |                                   |

# CATCH BASIN No. 2-2A



# CATCH BASIN No. 2-2B



## NOTES

**GRATE AND FRAME:** The design shall be essentially the same and equally as strong as the one shown hereon.

**WALLS:** Brick or cast-in-place walls have a nominal thickness of 200 mm. Precast walls shall have a minimum thickness of 150 mm and be reinforced sufficiently to permit shipping and handling without damage. Brick shall not be used above the flow line of the side opening for Type 2-2A.

**CONCRETE:** Cast-in-place concrete is to be Class C. All precast concrete shall meet the requirements of CMS 706.13 with a minimum of 4% entrained air in the hardened concrete and be marked with the catch basin number.

**PRECAST BASE:** If a precast base is used, it shall be set deep enough so that the top can be placed on the base to provide the grate elevation specified in the plans. Layers of brick shall not be used to adjust the top elevation.

**LOCATION AND ELEVATION:** When given on the plans, location and elevation are at the top center of the grate. When side openings are provided, the elevation shall be at the flow line of the side inlet.

**MINIMUM DEPTH:** The minimum depth of CB No. 2-2A shall be the outside diameter (O.D.) of the outlet pipe plus 180 mm. The minimum depth for CB No. 2-2B shall be the O.D. of the outlet pipe plus 105 mm.

**2-2B GRATE ELEVATION:** Grate elevation is to be placed 100 to 150 mm below normal ditch, returning to normal 3 to 5 m each side of inlet.

**OPENINGS:** Pipe openings shall be the O.D. of the pipe being supplied plus 50 mm when fabricated or field cut. The interstitial space shall be filled with grout per CMS 601.

**2-2A SIDE INLETS:** Inlets shall be provided on both sides of the No. 2-2A catch basin in sags and on upstream side only where the ditch has a continuous down grade past the catch basin. Side inlets shall not be used within the Clear Zone. The flow line should be 100 to 150 mm below the normal elevation of the ditch flow line, returning to normal within 3 to 5 m of the basin.

| CONSTRUCTION INFORMATION     |  |
|------------------------------|--|
| Minimum mass of grate, 54 kg |  |
| Minimum mass of frame, 18 kg |  |

All dimensions are in millimeters unless otherwise noted.



This Drawing Replaces CB-2-2 A & B.

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF TRANSPORTATION

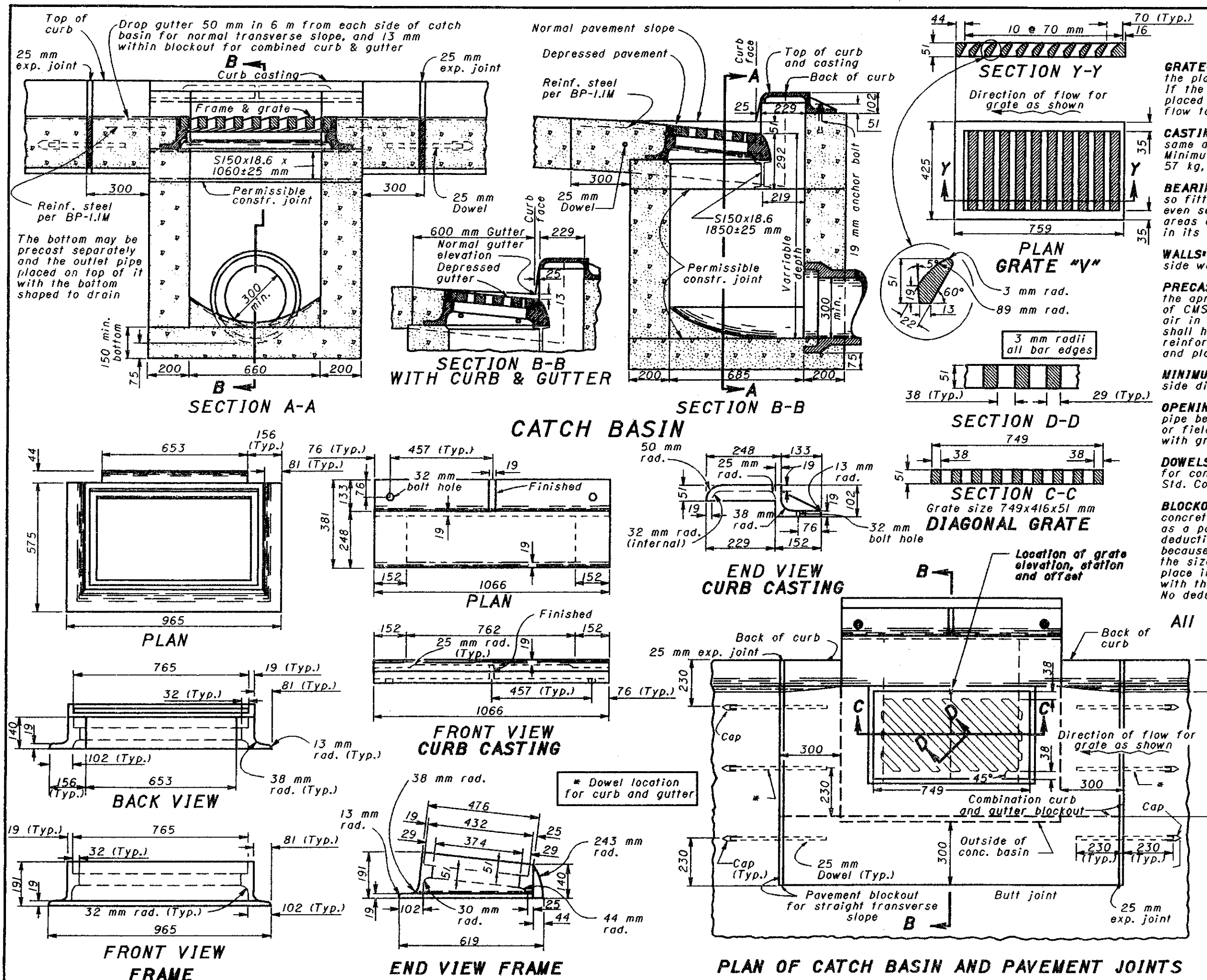
CATCH BASINS  
No's 2-2A & B

DATE  
7-12-95

STANDARD  
CONSTRUCTION  
DRAWING  
CB-1.1M

APPROVED *W. K. Hillman*  
ENGR., L & D





# NOTES

- GRATE:** The Grate "V" shall be provided unless the plans specifically require the diagonal grate. If the diagonal grate is specified, it shall be placed so that the diagonal bars direct drainage flow toward the curb.
- CASTINGS:** The design shall be essentially the same and equally as strong as those shown. Minimum mass: Curb Casting 77 kg, Standard Grate 57 kg, Frame 145 kg, and Grate "V" 47 kg.
- BEARING AREAS:** The frame and grate shall be so fitted and finished as to provide a firm and even seat. No projections shall exist on bearing areas of either casting and the grate shall seat in its frame without rocking.
- WALLS:** When used in place of concrete, brick side walls shall be 200 mm nominal thickness.
- PRECAST CONSTRUCTION:** Permitted, except for the apron. Concrete shall meet the requirements of CMS 706.13 with a minimum of 4% entrained air in the hardened concrete. Precast walls shall have a minimum thickness of 150 mm and reinforcing shall be sufficient to permit shipping and placement without damage.
- MINIMUM DEPTH:** The minimum depth shall be the outside diameter (O.D.) of the outlet pipe plus 360 mm.
- OPENINGS:** Pipe openings shall be the O.D. of the pipe being supplied plus 50 mm when fabricated or field cut. The interstitial space shall be filled with grout per CMS 601.
- DOWELS:** Four 25x460 mm dowels are required for concrete pavement or gutter and paid for as a part of the pavement or gutter with no deduction in pavement, curb or gutter quantities because of the castings. A Class C concrete apron the size of the 600 mm gutter shall be cast-in-place in asphalt pavement (no dowels required) with the cost included in the catch basin bid price. No deduction to be made in curb quantities.
- BLOCKOUT:** Blockouts shall be paved with Class C concrete in PCC pavement or gutter and paid for as a part of the pavement or gutter with no deduction in pavement, curb or gutter quantities because of the castings. A Class C concrete apron the size of the 600 mm gutter shall be cast-in-place in asphalt pavement (no dowels required) with the cost included in the catch basin bid price. No deduction to be made in curb quantities.

All dimensions are in millimeters unless otherwise noted.

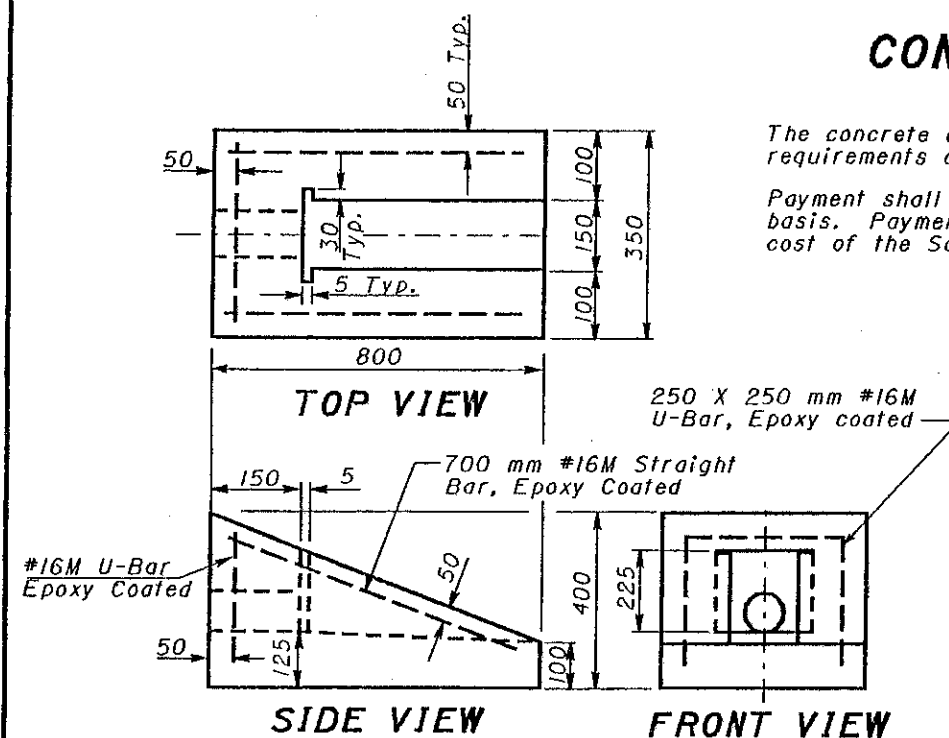


This Drawing Replaces CB-3A.

| BUREAU OF LOCATION AND DESIGN<br>OHIO DEPARTMENT OF TRANSPORTATION |                                    |
|--------------------------------------------------------------------|------------------------------------|
| <b>CATCH BASIN<br/>No. 3A</b>                                      |                                    |
| DATE<br>7-12-95                                                    |                                    |
| <b>STANDARD<br/>CONSTRUCTION<br/>DRAWING</b>                       |                                    |
| <b>CB-2.2M</b>                                                     |                                    |
| APPROVED                                                           | <i>D.K. Hulman</i><br>ENGR., L & D |

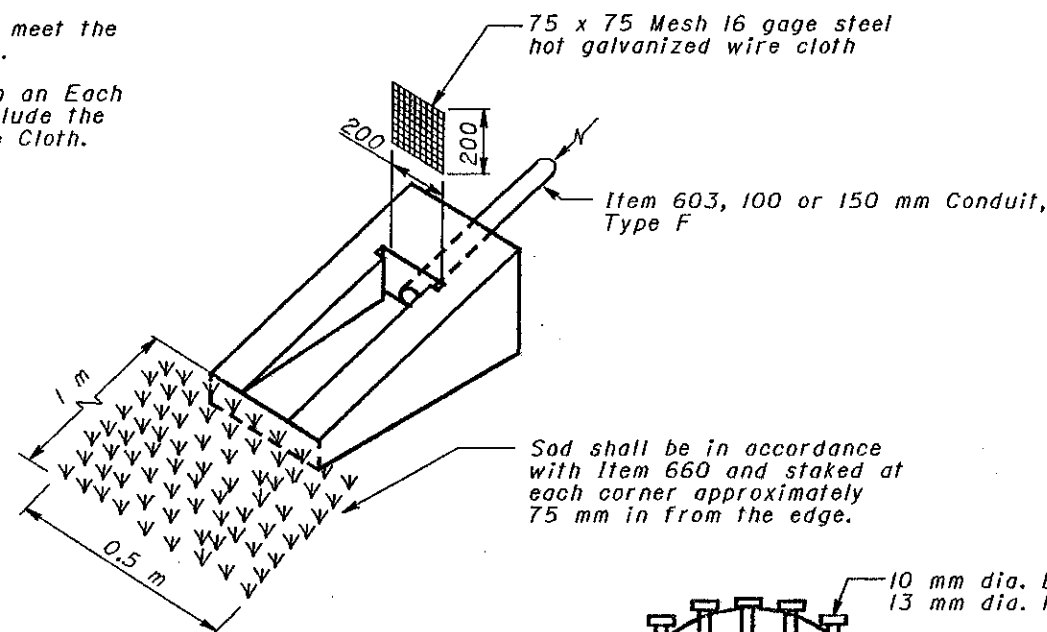


## CONSTRUCTION METHODS

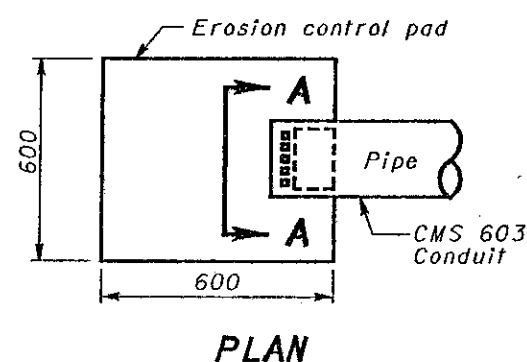
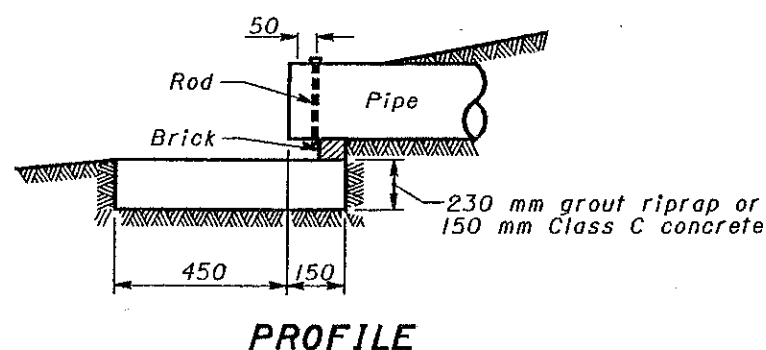
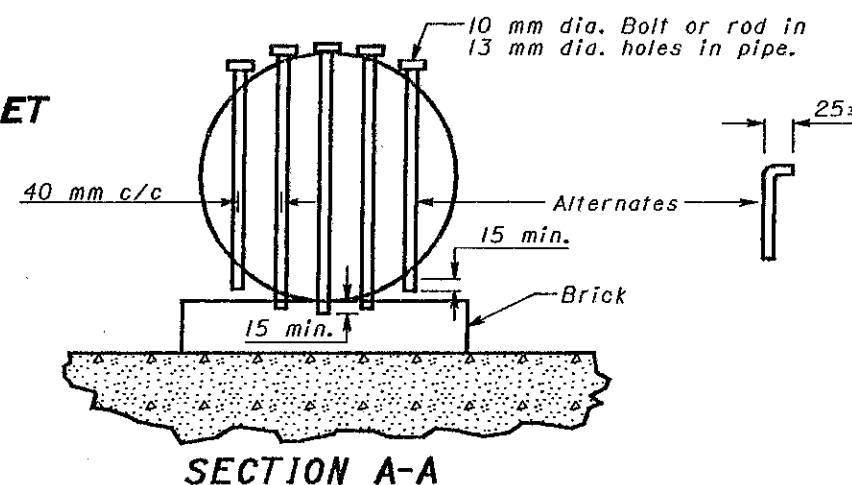
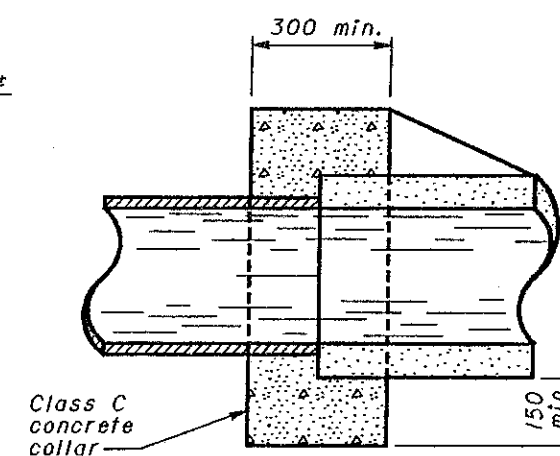


The concrete outlet shall meet the requirements of CMS 604.

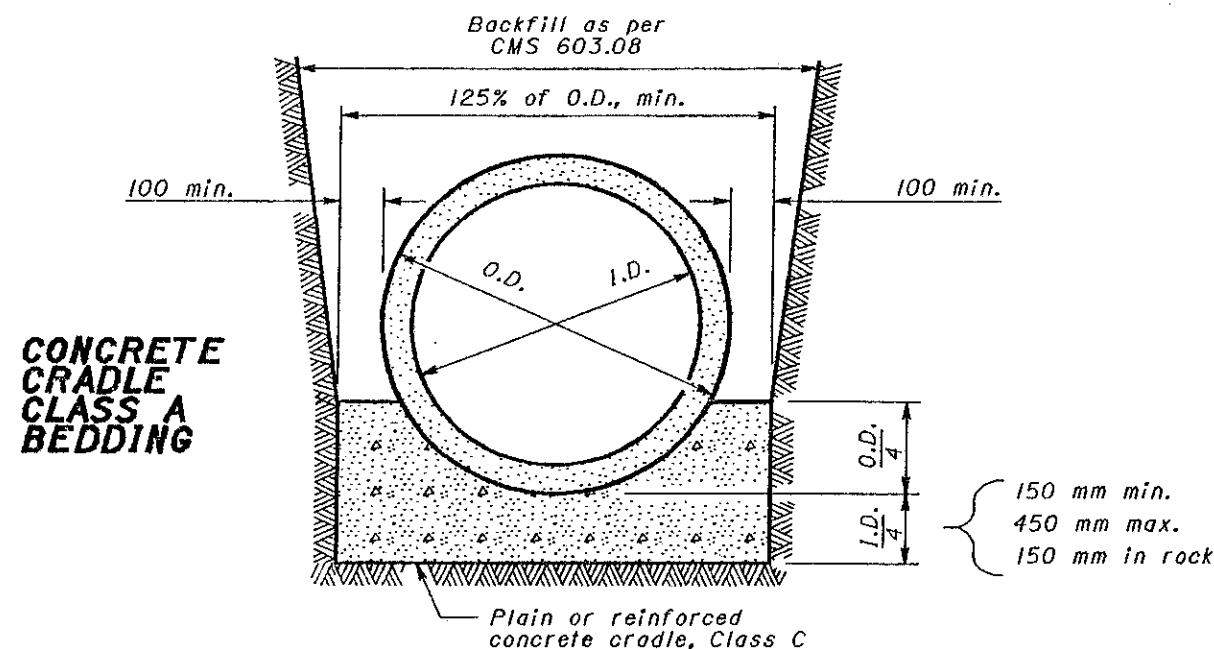
Payment shall be made on an Each basis. Payment shall include the cost of the Sod and Wire Cloth.



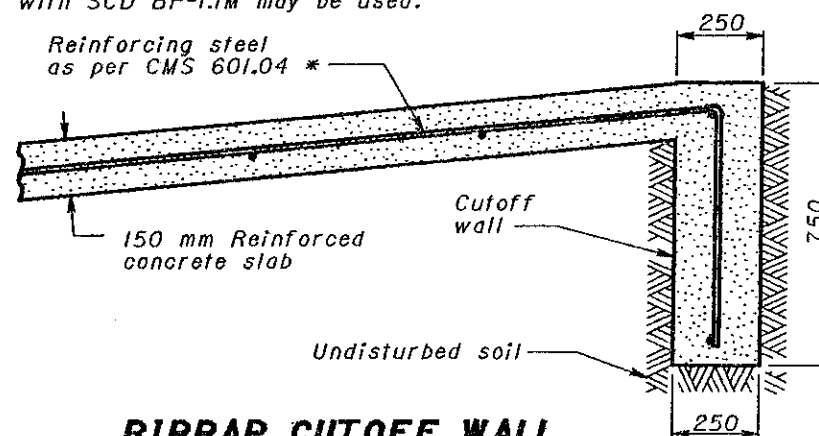
- Sod shall be in accordance with Item 660 and staked at each corner approximately 75 mm in from the edge.



**EROSION CONTROL PAD AND ANIMAL GUARD FOR OUTLET PIPE**



\* If wire fabric is used in the slab, #10M bars at 600 mm overlapping the fabric. 300 mm, or wire fabric in accordance with SCD BP-1.1M may be used.



**RIPRAP CUTOFF WALL**

The cost of the cutoff wall shall be included in the unit price bid for Item 601 Riprap using 150 mm reinforced concrete slab

## NOTES

**MASONRY COLLARS:** A masonry collar shall be provide where plans require that a pipe extension be joined to the end of an existing pipe with a butt joint. The cost shall be included in the unit price bid for the new conduit.

### EROSION CONTROL PAD AND ANIMAL GUARDS:

These items shall be provided at the outlet end of all farm drains except where they outlet into a drainage structure. The steel bolts or rods for the animal guard shall be galvanized per CMS 710.06. In lieu of drilling or punching the 13 mm diameter holes into the pipe, a metal collar meeting all of the above requirements may be clamped onto the pipe if approved by the Engineer.

Payment for the erosion control pads and animal guards shall be included in the unit price bid for Item 603 — mm Conduit, Type —.

## MASONRY COLLAR

*All dimensions are in millimeters  
unless otherwise noted.*



***This Drawing Replaces MC-4.***

OHIO DEPARTMENT OF TRANSPORTATION

## OUTLETS, DRAINS AND SEWERS

|             |
|-------------|
| <b>DATE</b> |
| 6-30-95     |
| 10-21-97    |

STANDARD  
CONSTRUCTION  
DRAWING **DM-1.1M**

APPROVED: Samuel T. Sutherland

# NOTES

**DESCRIPTION:** This item shall consist of furnishing and installing either a pipe underdrain system or a prefabricated edge drain system in accordance with the specifications and with the details on the plans or as directed by the Engineer.

**MATERIALS:** The underdrain shall either be a pipe underdrain system or a prefabricated edge drain system meeting the requirements of CMS 605.

**BASIS OF PAYMENT FOR PIPE UNDERDRAIN SYSTEM ONLY:** Work completed, accepted and measured under this item shall be paid for the contract unit price bid for Item 605 - 100 mm Shallow Pipe Underdrain. The price shall be full compensation for excavation and backfill; for furnishing materials, including materials for outlet fittings and Item 301; and for all labor, tools, equipment and incidentals necessary to complete the work.

**BASIS OF PAYMENT FOR SHALLOW UNDERDRAIN SYSTEM:** Work completed, accepted and measured under this item shall be paid for at the contract unit price bid for Item 605 - Shallow Underdrain. The price shall be full compensation for excavation and backfill; for removing and disposing of all surplus excavation in accordance with CMS 203; for furnishing materials, including materials for splices, outlet fittings, and Item 301; and for all labor, tools, equipment and incidentals necessary to complete the work associated with the installation of prefabricated edge drains or pipe underdrains.

**BASIS OF PAYMENT FOR PREFABRICATED EDGE DRAIN SYSTEM:** Work completed, accepted and measured under this item shall be paid for at the contract unit price bid for Item 605 - 450 mm Prefabricated Edge Drain. The price shall be full compensation for excavation and backfill; for removing and disposing of all surplus excavation in accordance with CMS 203; for furnishing materials, including materials for splices, outlet fittings, and Item 301; and for all labor, tools, equipment and incidentals necessary to complete the work associated with the installation of prefabricated edge drains or pipe underdrains.

All dimensions are in millimeters unless otherwise noted.



OHIO DEPARTMENT OF TRANSPORTATION

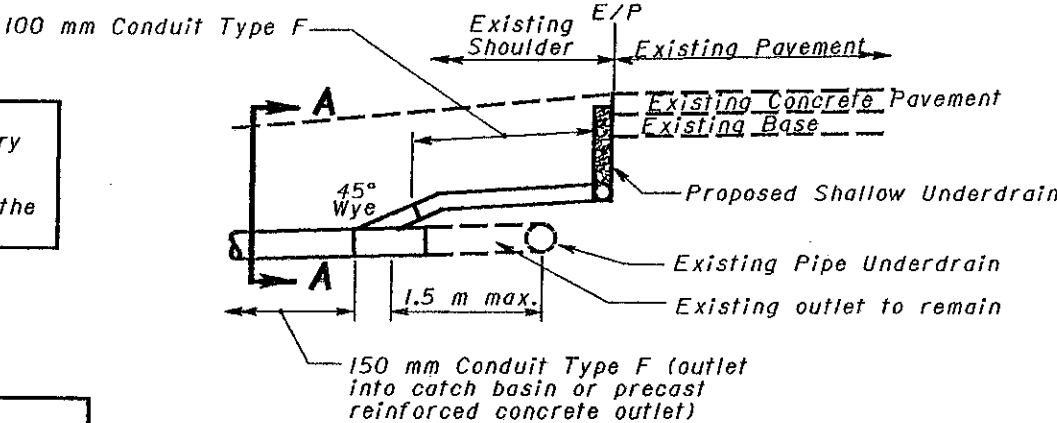
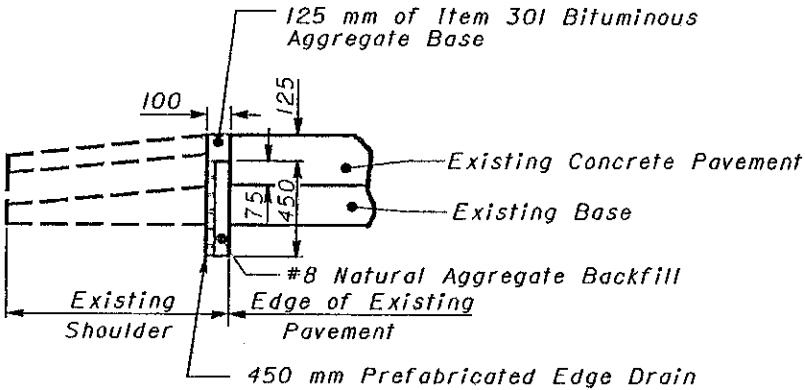
SHALLOW UNDERDRAINS

DATE  
6-30-95  
10-21-97

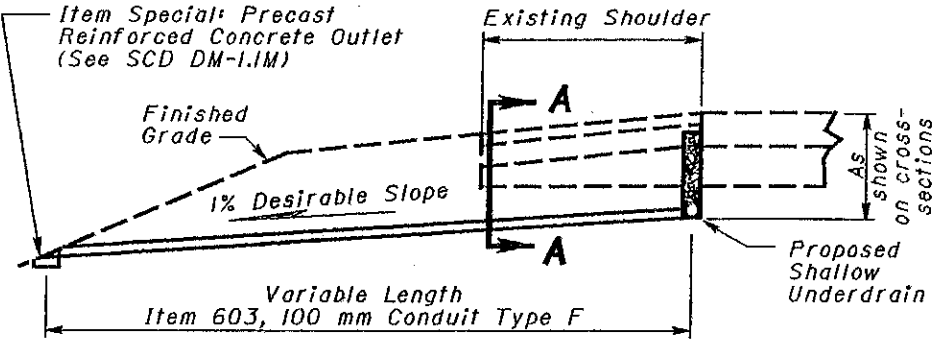
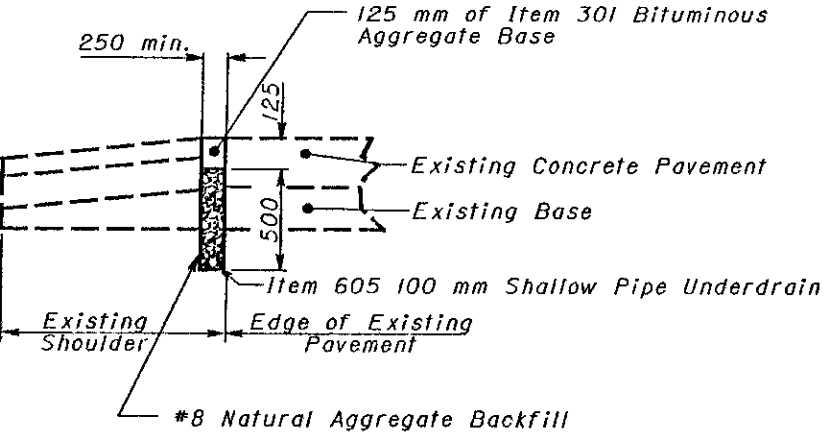
STANDARD CONSTRUCTION DRAWING DM-1.2M

APPROVED *[Signature]*

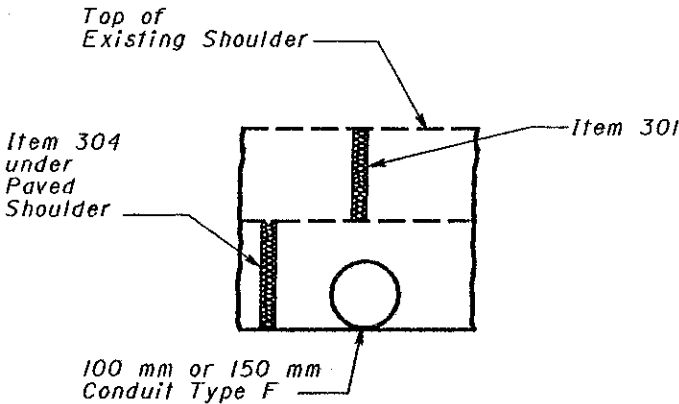
**NOTE:**  
The cost of the 100 mm Conduit Type F and necessary pipe bends and branches needed to connect the existing and proposed underdrains shall be included with the cost of the 150 mm Conduit Type F beyond the existing underdrain.



PREFABRICATED EDGE DRAIN SYSTEM



PIPE UNDERDRAIN SYSTEM



SECTION A-A

SHALLOW UNDERDRAIN SYSTEM

## STRAW OR HAY BALES

**BALE PLACEMENT:** Bales shall be tightly placed adjacently and entrenched 2" [50] to 3" [75] before staking; or a small amount of loose soil shall be lightly compacted along the upstream edge of the bales.

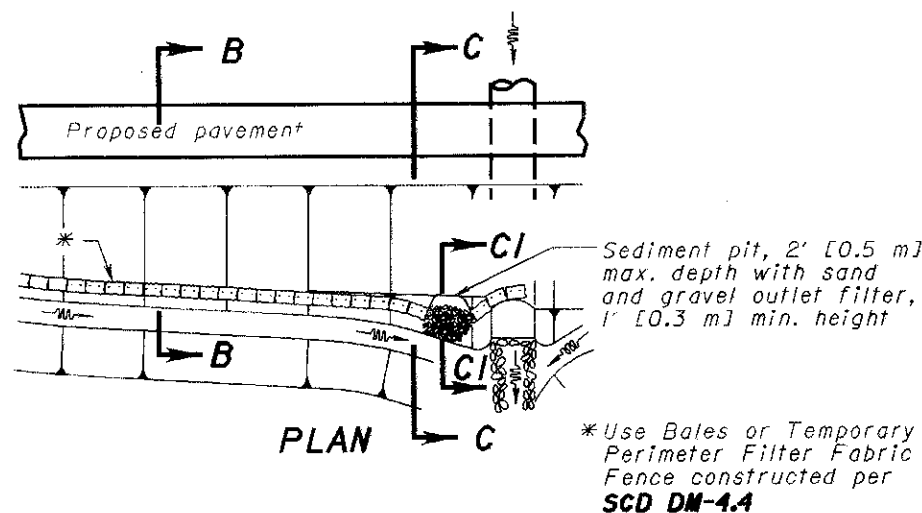
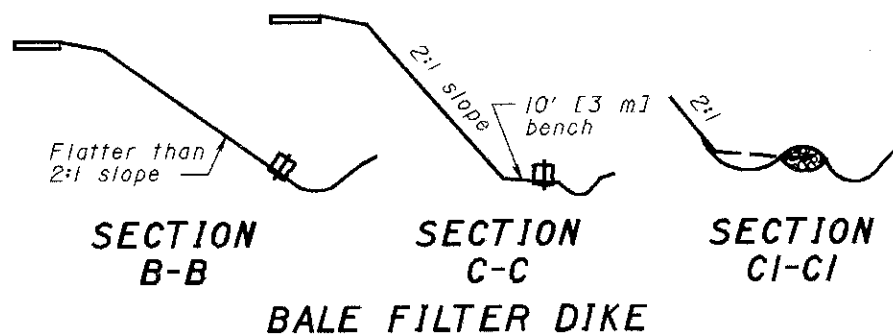
Each bale shall be firmly staked with a minimum of two stakes at least 3' [1 m] in length. Stakes shall be wooden 2"x2" [50x50], reinforcing bars or fence posts.

Loose straw or hay shall be wedged between and under staked bales.

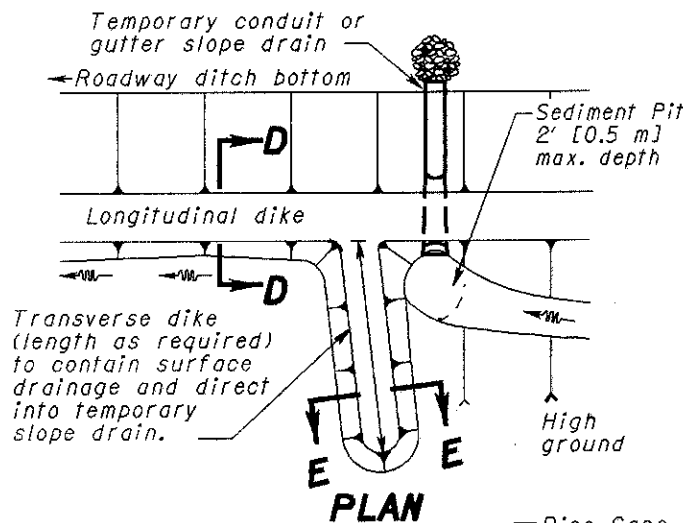
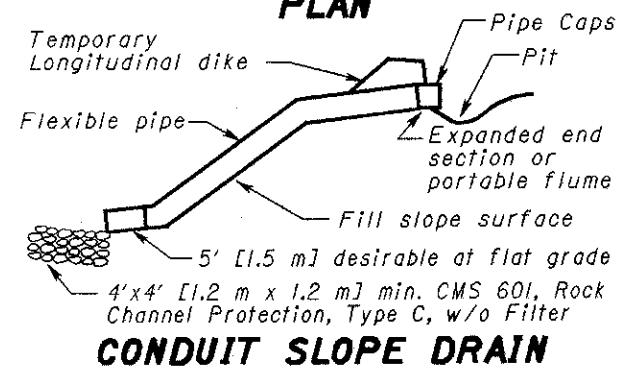
**PITS:** Sediment pits shall be provided and their cost included in the unit price bid for the adjacent SS 877 items.

**MAINTENANCE:** The maintenance or replacement will be paid for by the Department under unit bid prices, agreed unit price, or under 109.04.

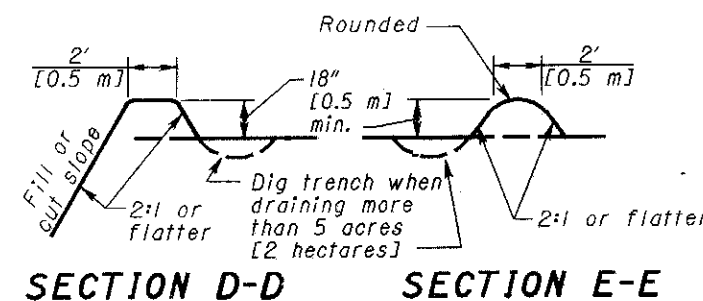
**BASIS OF PAYMENT:** Straw or hay bale installation shall be paid for under Item 877 - Temporary Perimeter Filter Fabric Fence. Cost will include placing, staking and removing.



## DIKES AND SLOPE PROTECTION



SECTION F-F  
GUTTER SLOPE DRAIN



SECTION D-D SECTION E-E

| TEMPORARY SLOPE DRAINS<br>RECOMMENDED SIZES |            |                 |                |                 |
|---------------------------------------------|------------|-----------------|----------------|-----------------|
| Area<br>in acres<br>[hectares]              | Pipe Sizes |                 |                | Gutter<br>depth |
|                                             | Smooth     | Corru-<br>gated | Half-<br>round |                 |
| 0-4 [0-1.6]                                 | 6" [150]   | 6" [150]        | 18" [450]      | 8" [200]        |
| 4-8 [1.6-3.2]                               | 8" [200]   | 12" [300]       | 18" [450]      | 8" [200]        |
| 8-12 [3.2-4.9]                              | 10" [250]  | 15" [375]       | 21" [525]      | 12" [300]       |

**GENERAL:** Dikes & drains shown shall be used when earthwork operations on slopes are higher than 8' [2.5 m] and fill operations are suspended for three weeks or more. Smaller dikes used at the end of a day's operation shall be considered as part of the earthwork. Temporary slope drains shall be suitably positioned and anchored to prevent movement or undermining.

**LONGITUDINAL DIKES:** Longitudinal dikes shall be constructed of suitable material as per CMS 203 and compacted to 85% of maximum density.

**CONDUITS:** Conduits for slope drains shall be corrugated steel pipe, corrugated or smooth plastic pipe, rubber conduit, or an approved equal.

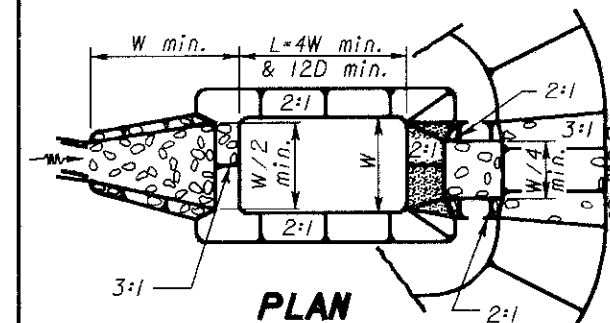
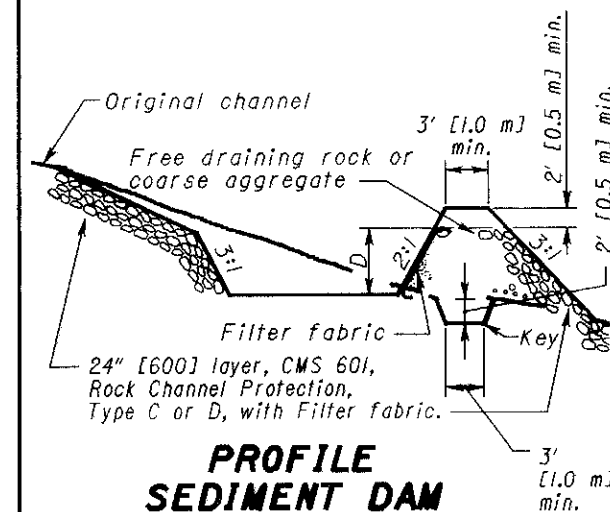
**GUTTERS:** Gutters for slope drains shall be lined with Type C rock channel protection, crushed aggregate slope protection, portland cement concrete, bituminous concrete, plastic sheeting (on slopes 4:1 max.), partial pipe sections or approved equal.

**PITS:** Sediment pits shall be provided and their cost included in the unit price bid for the adjacent items.

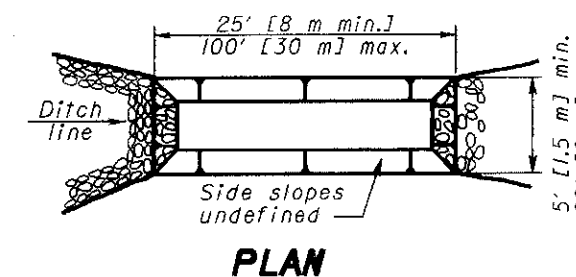
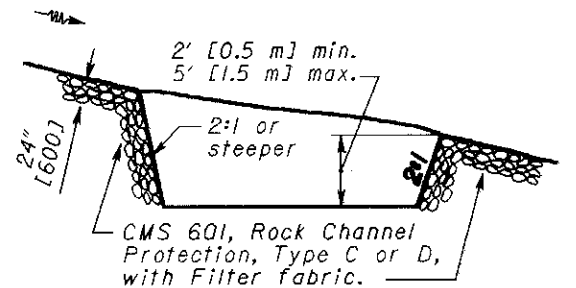
**MAINTENANCE:** Dikes and slope protection shall be acceptably maintained. The maintenance or replacement cost will be paid for by the Department under unit bid prices, agreed unit prices, or CMS 109.04.

**BASIS OF PAYMENT:** Temporary dikes shall be paid for under Item 877-Temporary Dikes. Temporary slope drains shall be paid for under Item 877-Temporary Slope Drains. Rock required shall be paid for under Item 60I, Rock Channel Protection, Type C, w/o Filter.

## SEDIMENT BASINS & DAMS



PROFILE  
SEDIMENT DAM



PROFILE  
SEDIMENT BASIN

**EMBANKMENT:** Sediment basin embankment construction shall be as per CMS 203.

**FILTERS:** Filter fabric shall be per CMS 60I.02 and installed per CMS 60I.08 or as detailed here. Such fabrics may be cleaned in lieu of replacement. The cost of all filter fabric required to construct the sediment basin or dam shall be included in the cost of the Item 60I, Rock Channel Protection, with Filter Fabric.

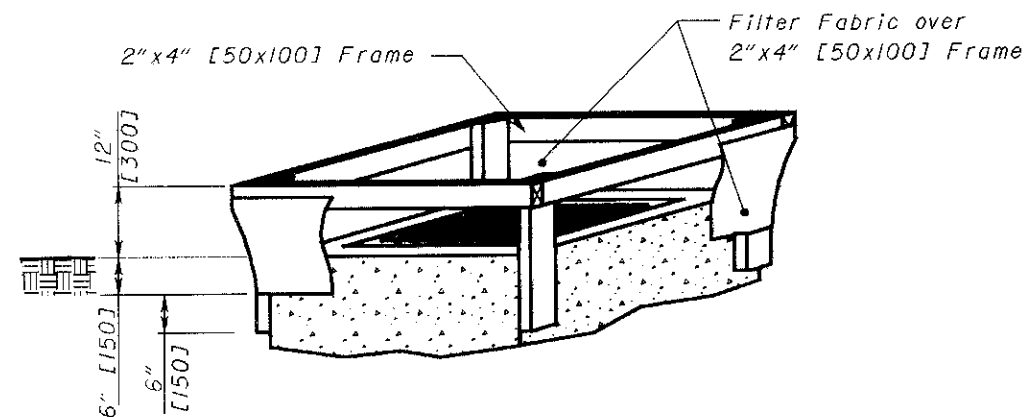
**SIZE:** The volume shown on the plans is the total storage volume required for the sediment basin or dam (67 cubic yards per acre [127 cubic meters per hectare]). A series of smaller basins or dams may be substituted for a larger basin or dam.

**MAINTENANCE:** Sediment pits, dams and basins shall be acceptably maintained. The maintenance or replacement cost will be paid for by the Department under unit bid prices, agreed unit prices, or CMS 109.04.

**BASIS OF PAYMENT:** Sediment Dams and Basins shall be paid for under Item 877-Sediment Basin and Dams. The pay quantity shall be the actual number of cubic yards [cubic meters] of excavation and embankment required to construct the basin or dam. Rock required shall be paid for under Item 60I, Rock Channel Protection, Type C or D, with Filter.

THIS DRAWING REPLACES  
DM-4.3M DATED 6-30-95.

# TEMPORARY INLET PROTECTION FILTER FABRIC FENCE

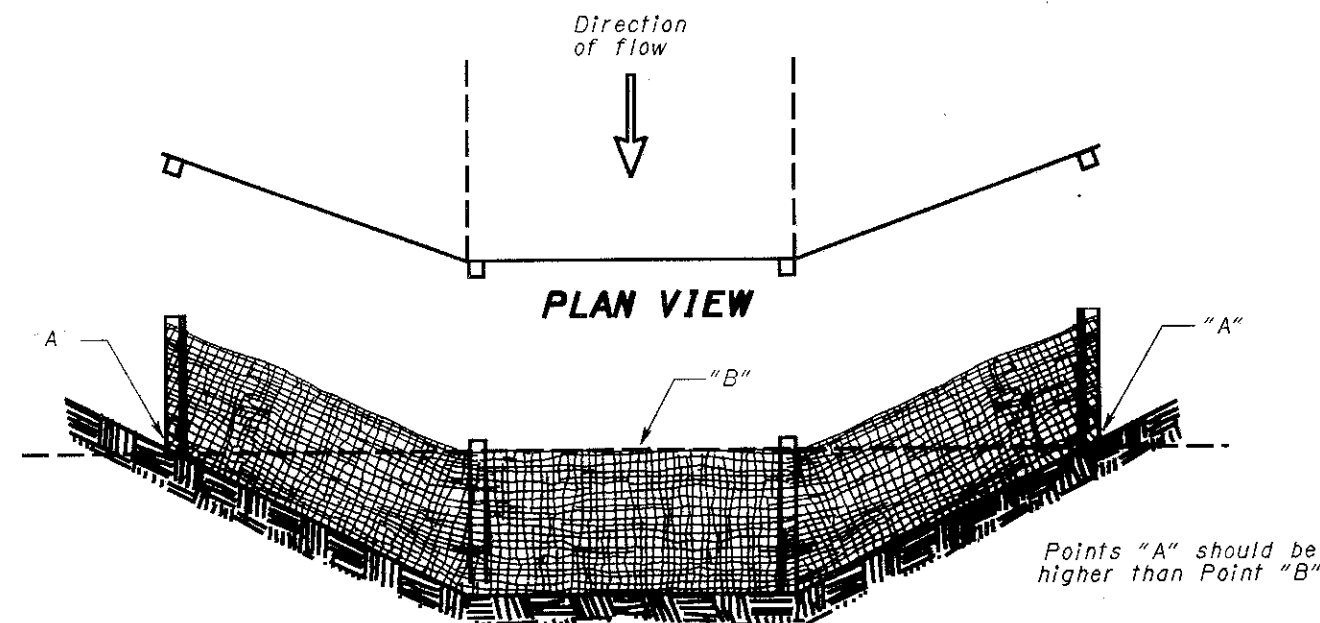


**MATERIALS:** Filter Fabric shall meet the requirements of CMS 712.09, Type C. The framing wood shall be construction grade 2"x4" [50x100] lumber.

**CONSTRUCTION:** Excavate a 6" [150] deep trench around the inlet, then drive the 2"x4" [50x100] posts 6" [150] below the excavated trench. Construct the wooden frame using the overlap joint detail shown above. The filter fabric shall be stretched around the wooden frame and securely fastened. The filter fabric shall overlap across one side of the inlet such that the ends of the filter fabric are not attached to the same post. Backfill and compact the excavated soil. Other devices may be used with the approval of the Director.

**MAINTENANCE:** The filter fabric shall be maintained to be functional. This shall include removal of trapped sediment and required cleaning, repair, and/or replacement of the filter fabric. The maintenance or replacement cost will be paid for by the Department under unit bid prices, agreed unit prices, or under CMS 109.04.

**PAYMENT:** The cost of all materials, construction and removal shall be paid for under **Item 877 - Temporary Inlet Protection Filter Fabric Fence, Linear Foot [Meter].**



ELEVATION VIEW

## PLACEMENT AND CONSTRUCTION OF DITCH CHECK FILTER FABRIC FENCE

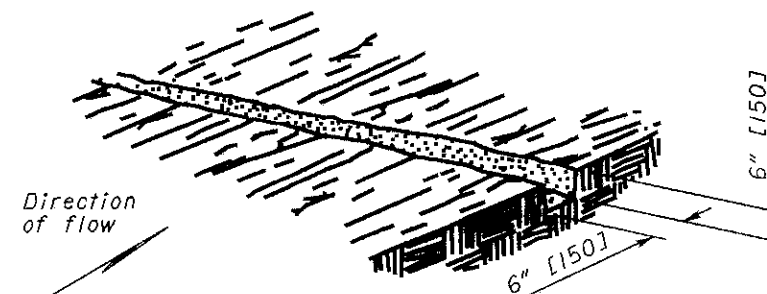
## NOTES

**MATERIALS:** Filter fabric shall meet the requirements of CMS 712.09, Type C. Support stakes shall be a minimum of 1.5"x1.5" [38x38], nominal, and shall be hardwood of sound quality. The stakes shall be driven a minimum of 6" [150] below the bottom of the filter fabric. The maximum spacing between support stakes shall be 10' [3 m].

**CONSTRUCTION:** The bottom of the fabric shall be buried 6" [150] below the ground. The ends of adjacent sections of fence shall be overlapped with the end stake of each section wrapped together prior to installation. The ground elevation of the fence shall be held constant except that the end elevations shall be raised upslope to prevent flow around the end of the fence.

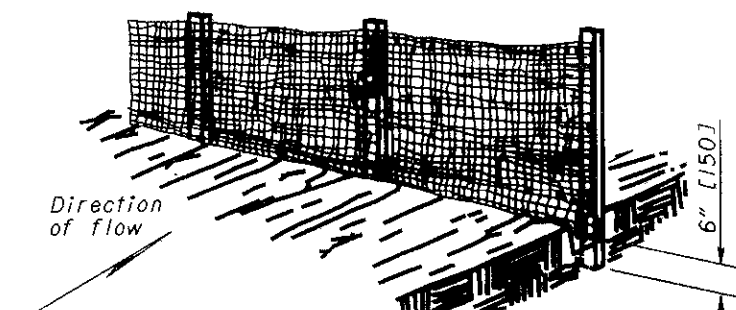
**MAINTENANCE:** The filter fabric fence shall be maintained to be functional. This shall include removal of trapped sediment and required cleaning, repair, and replacement of the filter fabric. The maintenance or replacement cost will be paid for by the Department under unit bid prices, agreed unit prices, or CMS 109.04.

**PAYMENT:** The cost of all materials, construction and removal shall be paid for under **Item 877 - Temporary Perimeter Filter Fabric Fence or Temporary Ditch Check Filter Fabric Fence, Linear Foot [Meter].**



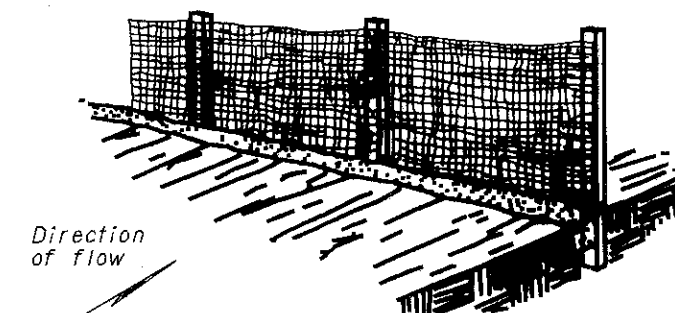
Excavate a 6"x6" [150x150] trench along the proposed fence line.

STEP 1



Place fabric and support stakes and extend fabric into the trench.

STEP 2

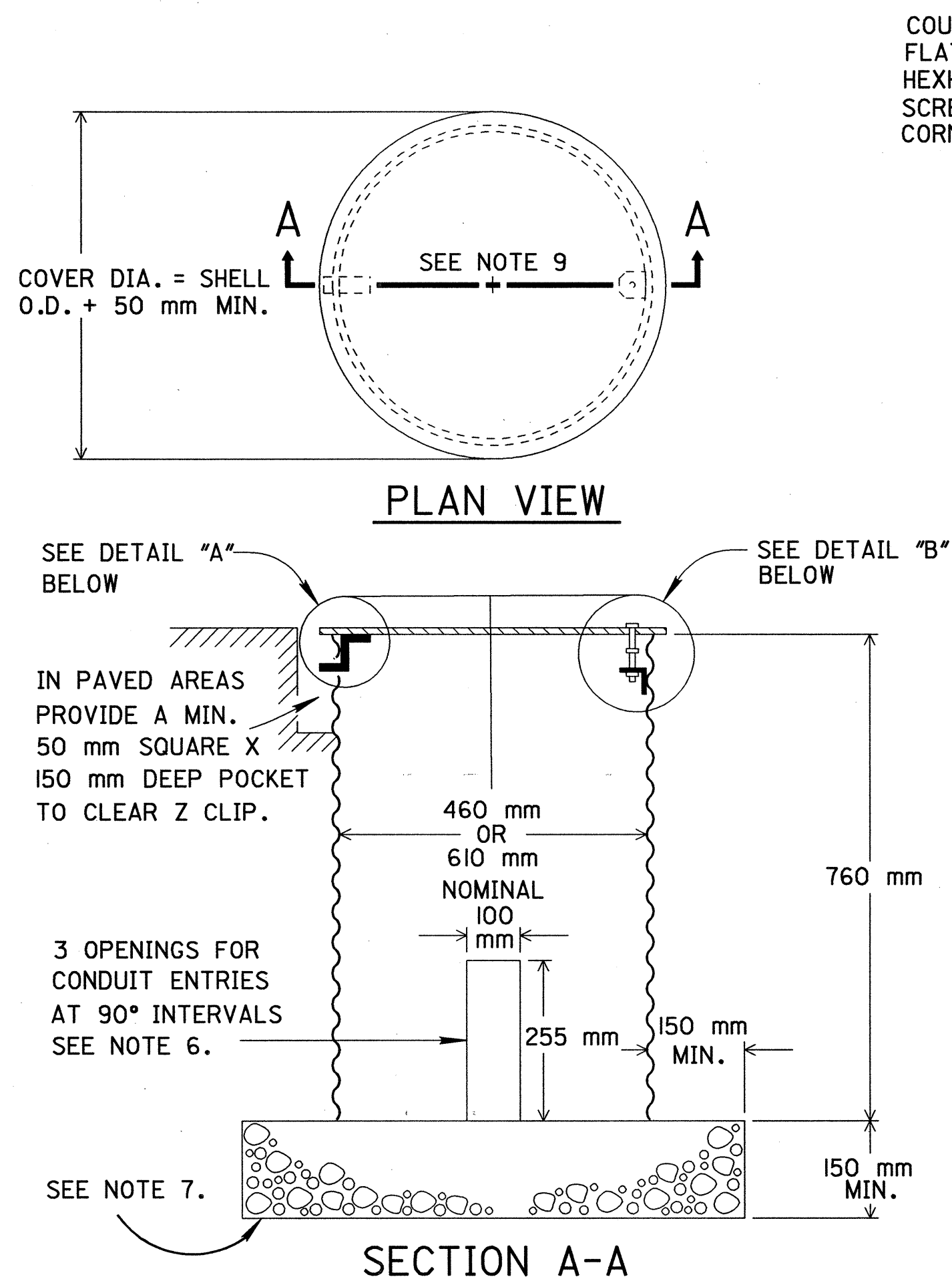


Backfill and compact the excavated soil.

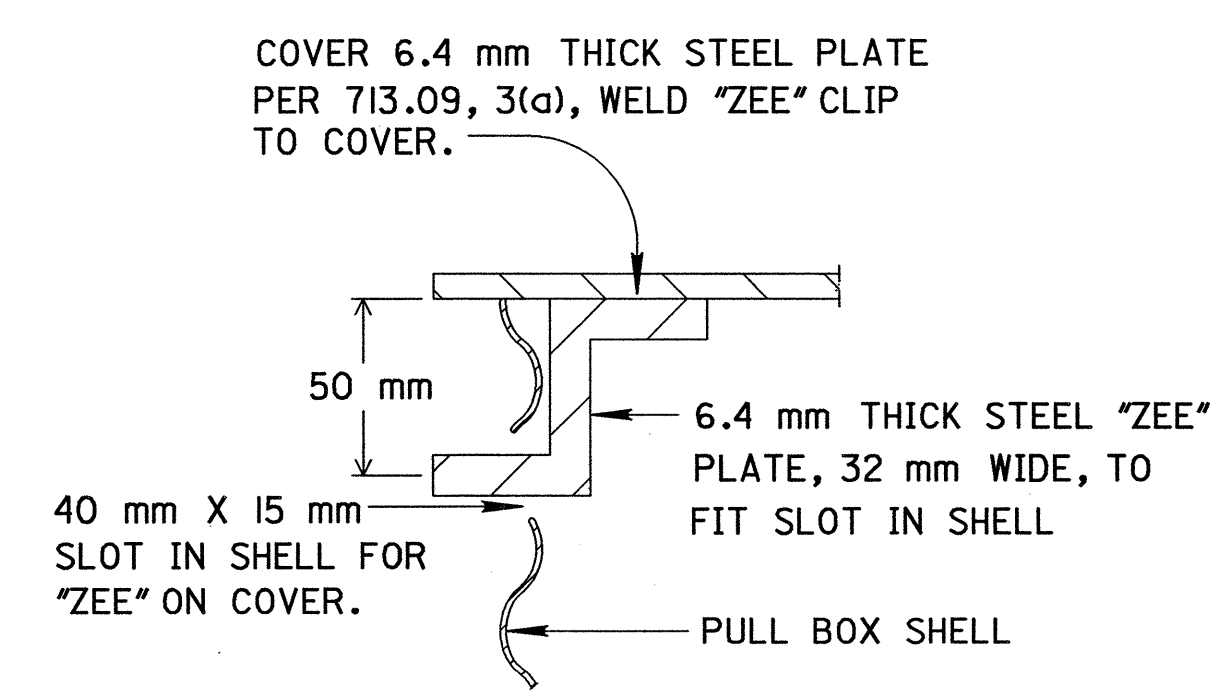
STEP 3

## PLACEMENT AND CONSTRUCTION OF PERIMETER FILTER FABRIC FENCE

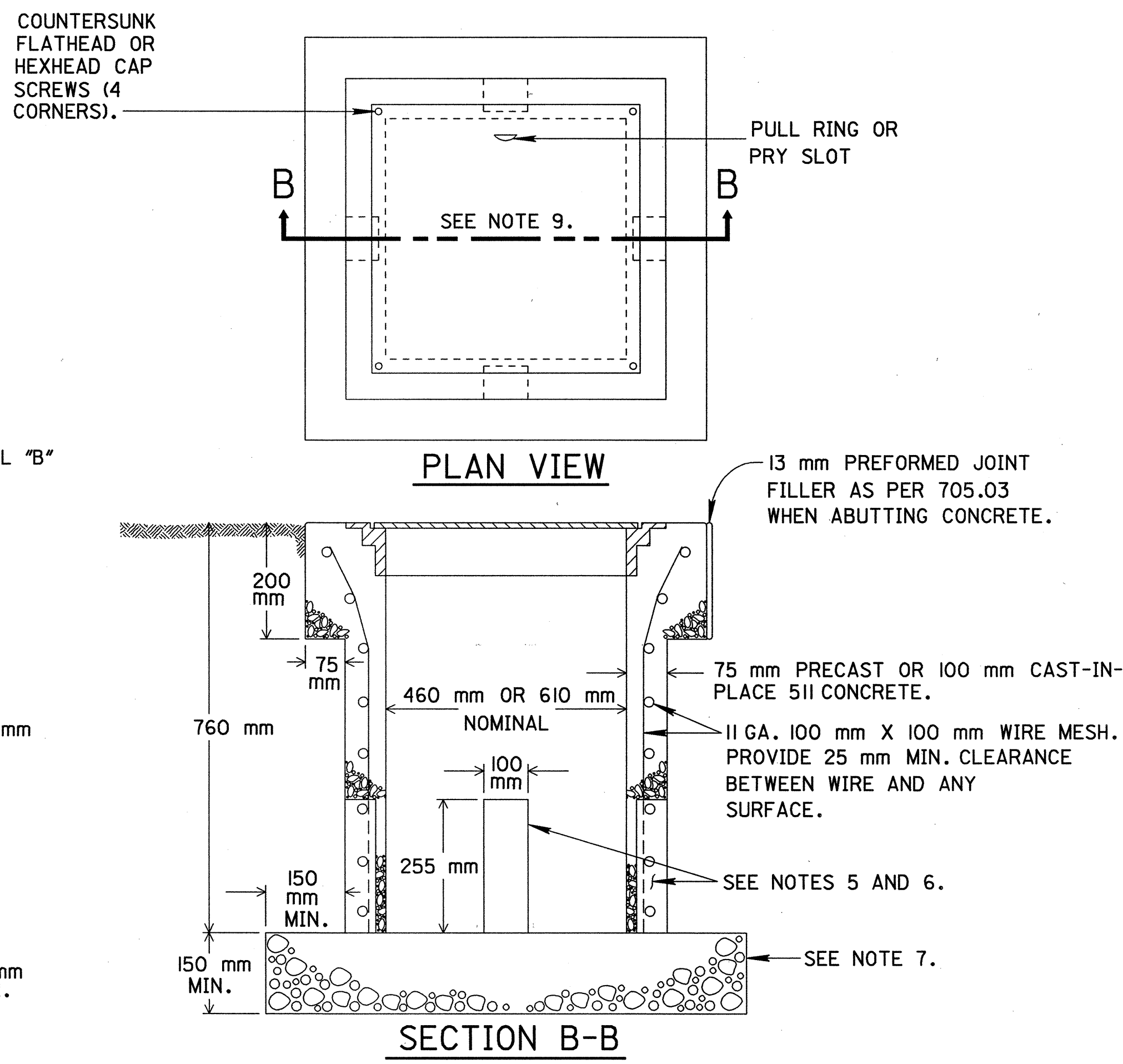




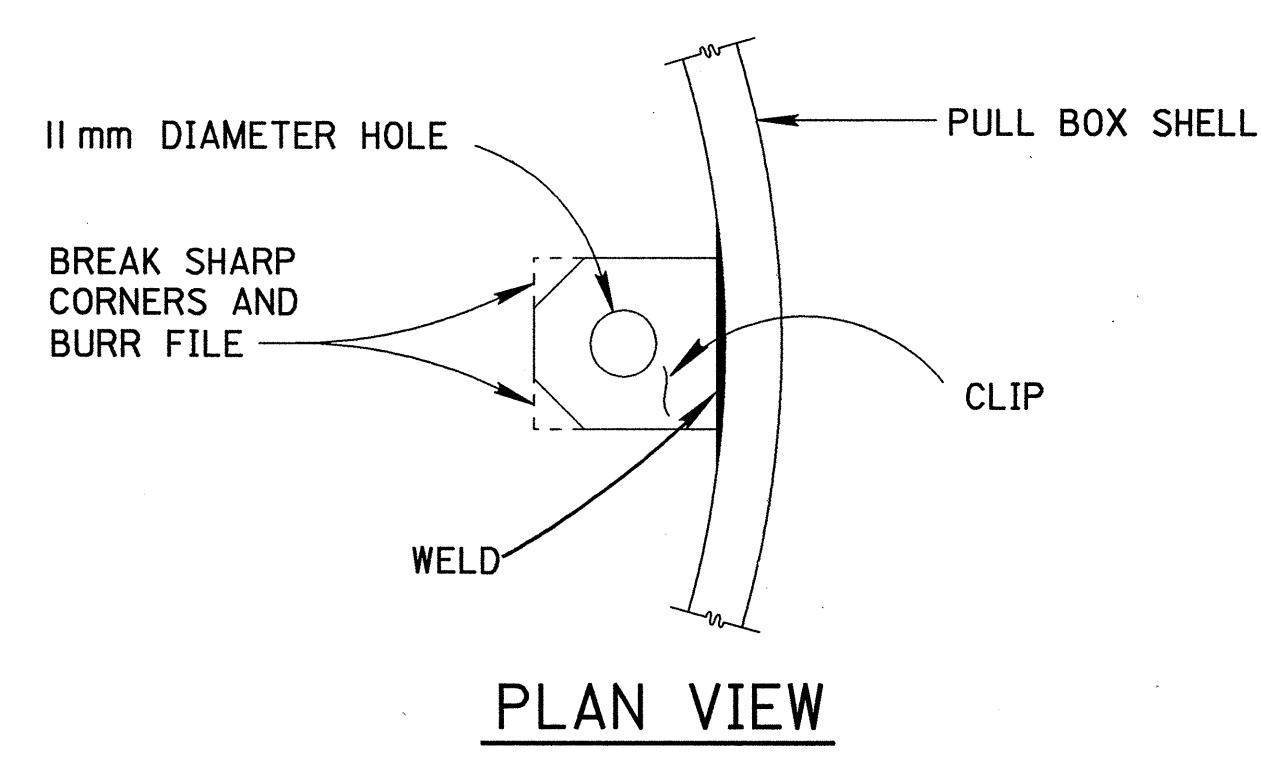
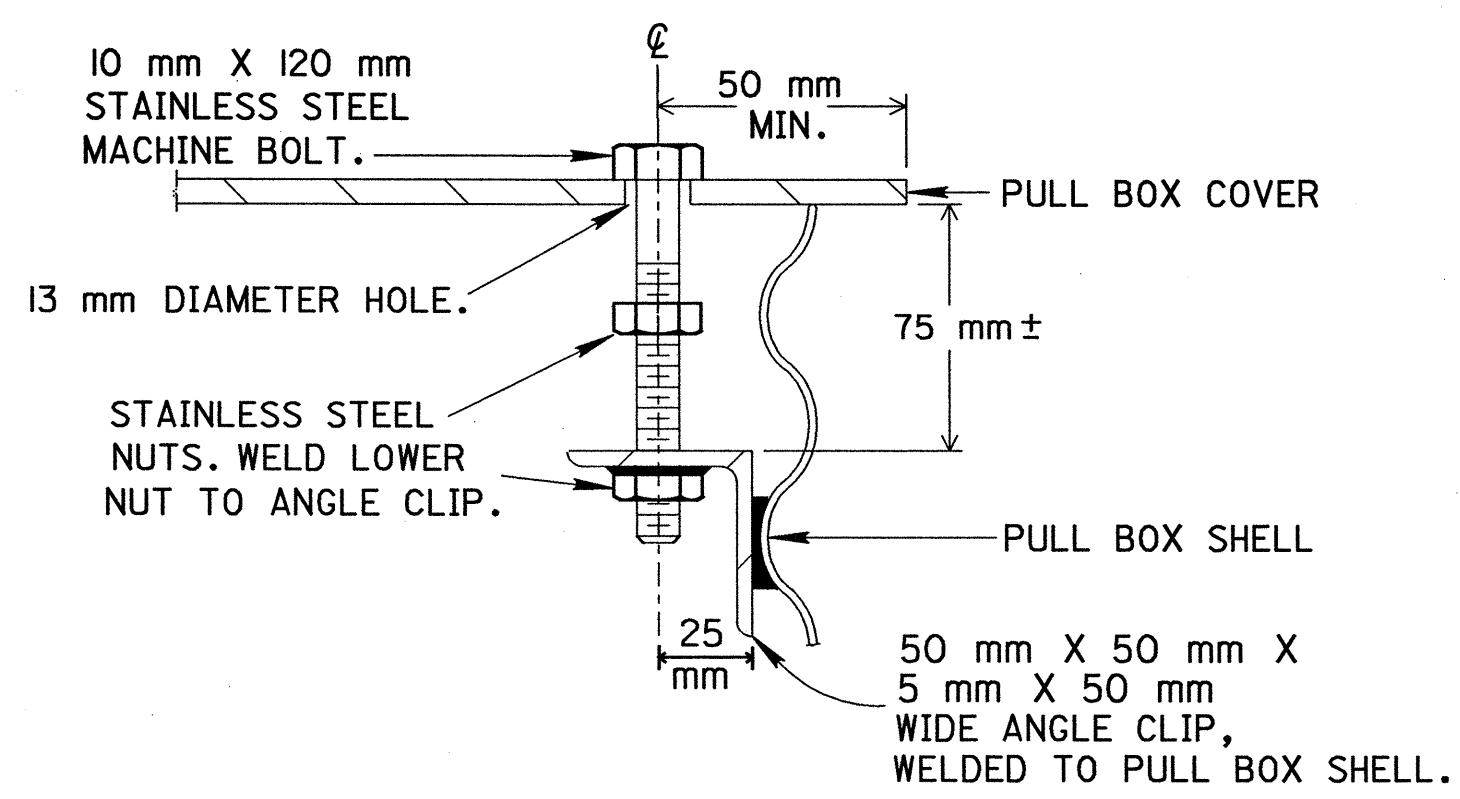
**CORRUGATED STEEL PULL BOX**



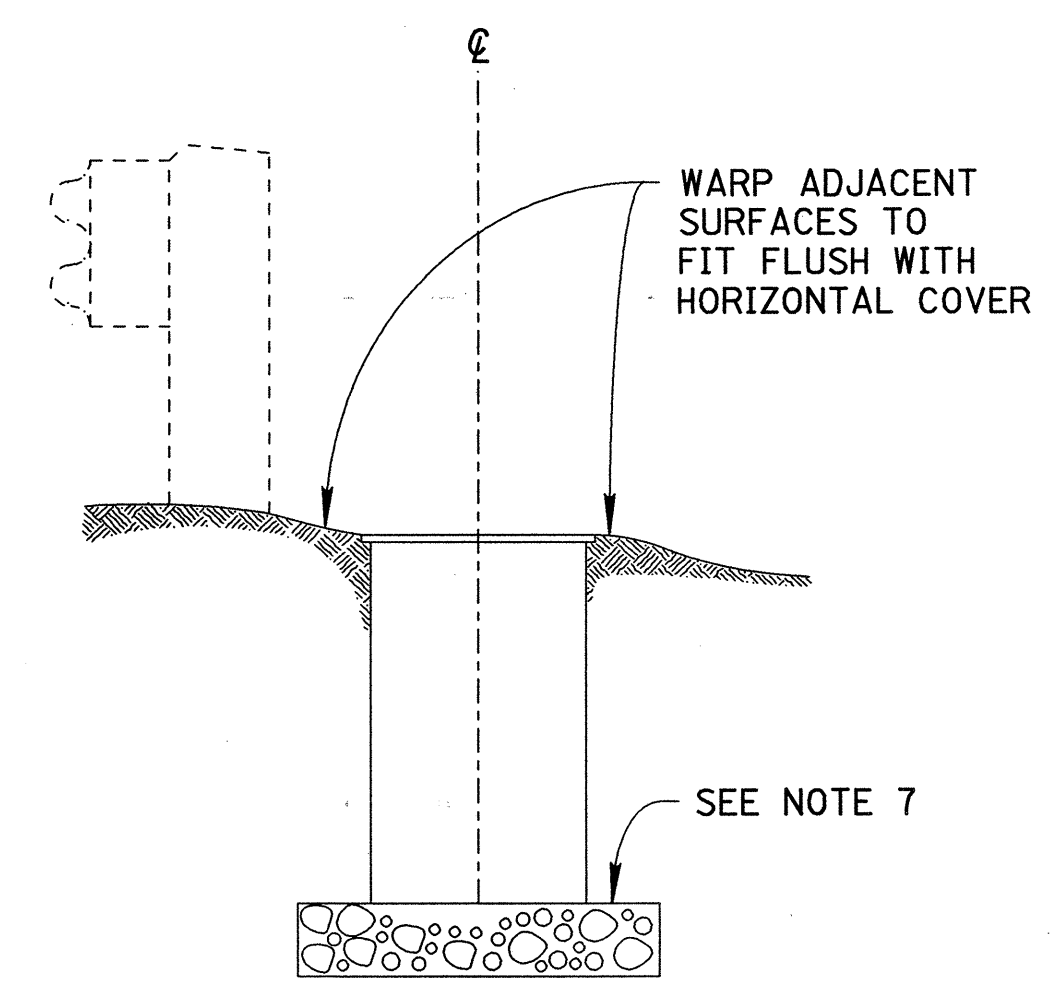
**ELEVATION DETAIL A**



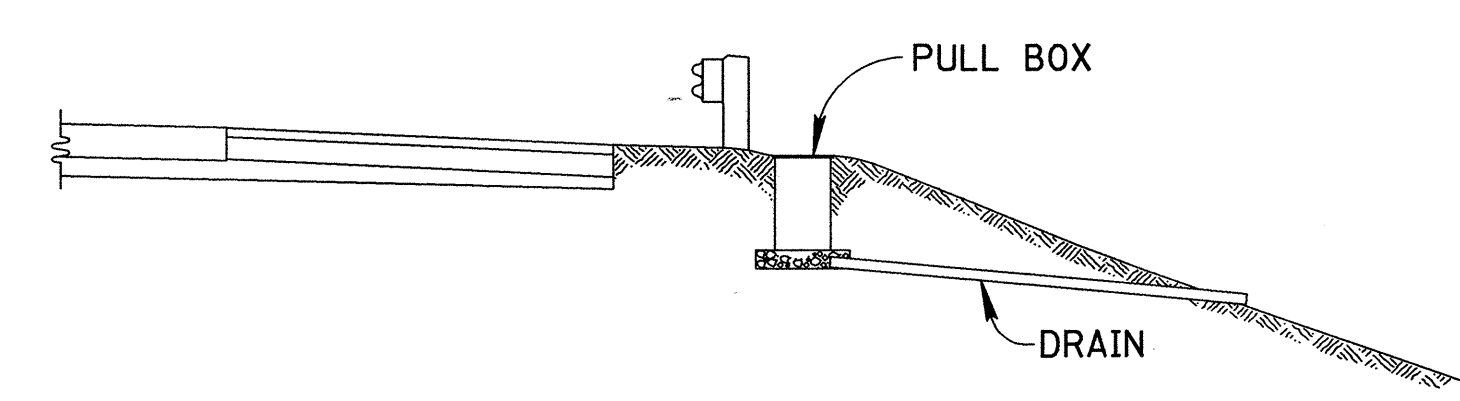
**CONCRETE PULL BOX**



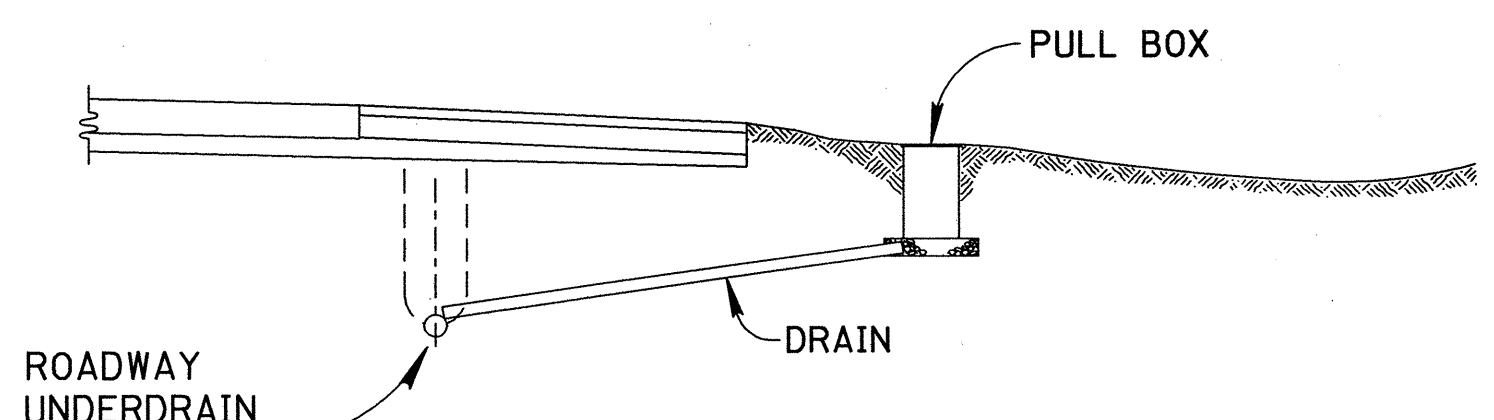
**ELEVATION DETAIL B**



**NORMAL INSTALLATION**



**INSTALLATION IN ROADWAY FILL SECTION**



**INSTALLATION IN ROADWAY CUT SECTION**

**UNDERDRAINS FOR PULL BOXES**

**NOTES**

- PULL BOXES SHALL CONFORM WITH 625.11, 713.08, 713.081 AND 713.09.
- CONCRETE PULL BOXES SHALL HAVE FERROUS METAL COVERS AND MATCHING FRAMES BY NEENAH, JOSAM OR ZURN FOUNDRIES, OR APPROVED EQUAL. COVERS MAY BE 13 mm MINIMUM GALVANIZED PLATE STEEL OR CAST IRON WITH REINFORCING RIBS.
- TAPERED THICKNESS CONCRETE PULL BOX WALLS MAY BE USED: HOWEVER, MINIMUM WALL THICKNESS SHALL BE AS INDICATED.
- LIFTING RINGS OR WIRE PULLING RINGS MAY BE INCORPORATED INTO PRECAST CONCRETE PULL BOX WALLS.
- CONDUIT ENTRIES FOR CAST-IN-PLACE CONCRETE PULL BOXES SHALL BE CAST AS REQUIRED. PRECAST PULL BOXES MAY HAVE BLOCKED OUT SECTIONS OF THE WALL AS KNOCKOUTS IN THE QUANTITY OF ONE PER WALL.
- UNUSED OPENING AREAS SURROUNDING CONDUITS SHALL BE BLOCKED AFTER CONDUIT INSTALLATION.
- AGGREGATE USED FOR PULL BOXES SHALL BE NO. 7 OR 8, AT LEAST 150 mm DEEP. COST FOR AGGREGATE SHALL BE INCLUDED WITH THE UNIT PRICE BID FOR EACH PULL BOX.
- PULL BOX DRAINS IN ACCORDANCE WITH 603 SHALL BE INSTALLED WHEN SPECIFIED, OR AS DIRECTED BY THE ENGINEER. ALTERNATE DRAIN LOCATION MAY BE USED WHEN NORMAL RUN WOULD EXCEED 6.1 m.
- SEE 713.09 FOR COVER MARKING REQUIREMENTS.



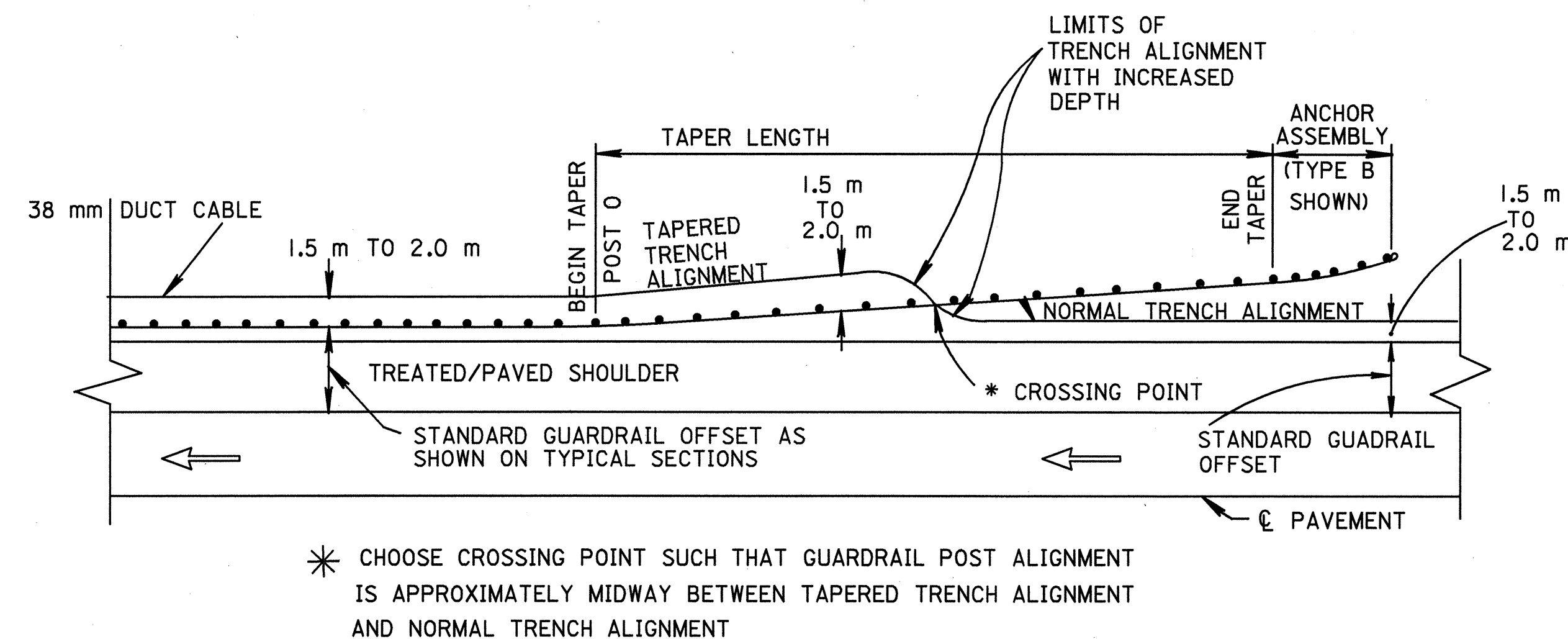
**metric units**

|                                                                                                      |                  |
|------------------------------------------------------------------------------------------------------|------------------|
| OFFICE OF TRAFFIC ENGINEERING<br>DIVISION OF ENGINEERING POLICY<br>OHIO DEPARTMENT OF TRANSPORTATION |                  |
| HIGHWAY LIGHTING                                                                                     | DATE<br>03/31/95 |
| PULL BOX DETAILS I                                                                                   |                  |
| STANDARD CONSTRUCTION DRAWING                                                                        | HL-30.11M        |
| APPROVED <i>[Signature]</i>                                                                          | ADMINISTRATOR    |

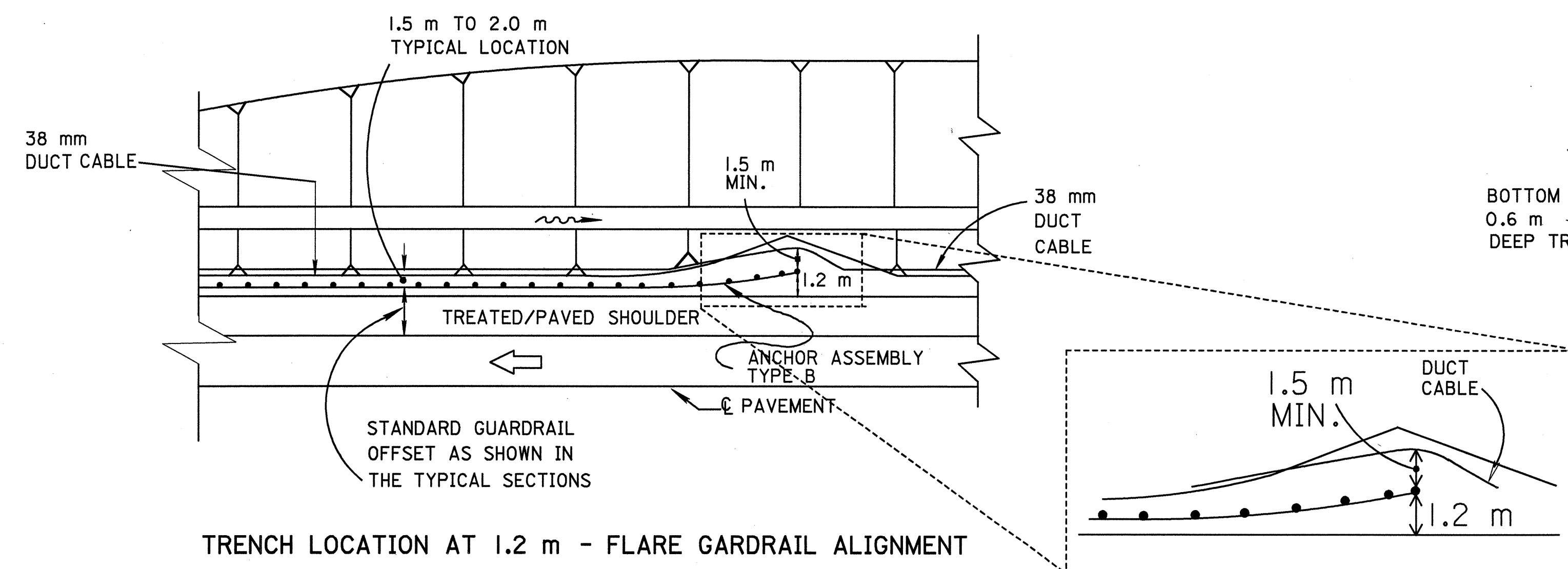


# NOTES

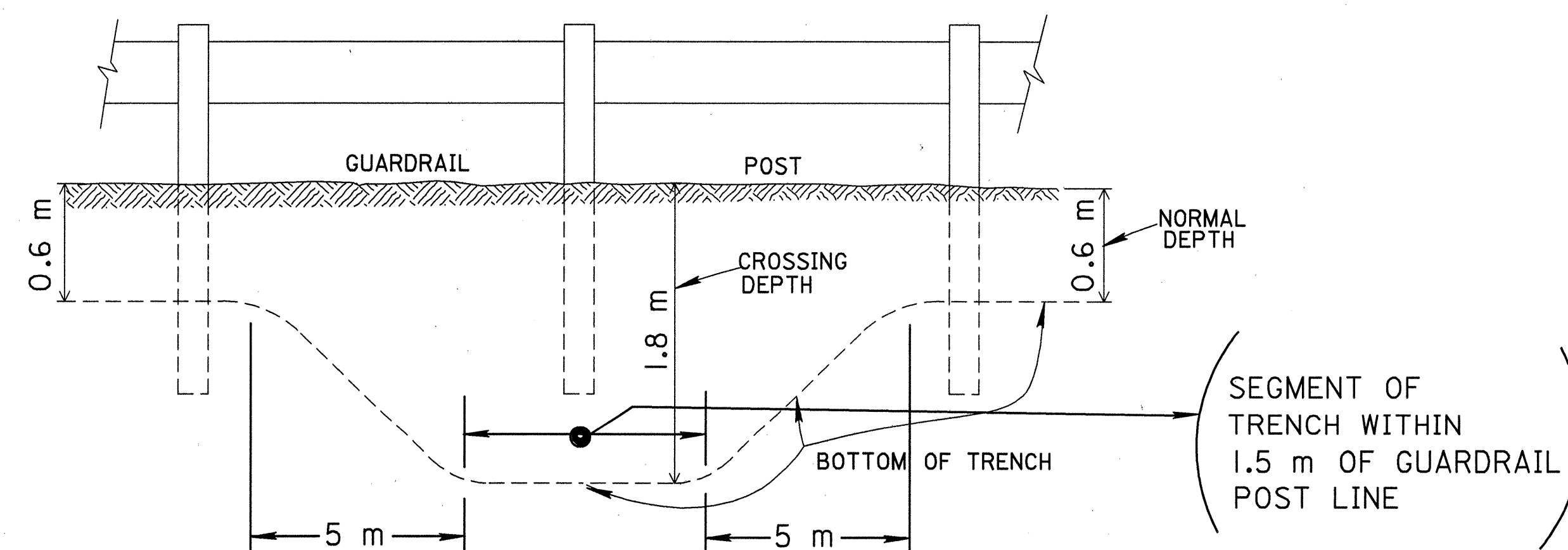
1. PAYMENT FOR PROTECTION OF DUCT-CABLE AND DISTRIBUTION CABLE UNDER GUARDRAIL, AS DETAILED IN METHODS 1 THRU 4, SHALL BE INCLUDED IN THE UNIT PRICES BID FOR THE AFFECTED CABLE AND TRENCH ITEMS.



## TRENCH LOCATION AT TAPERED OR WIDE FLARE GUARDRAIL ALIGNMENT



## TRENCH LOCATION AT 1.2 m - FLARE GARDRAIL ALIGNMENT

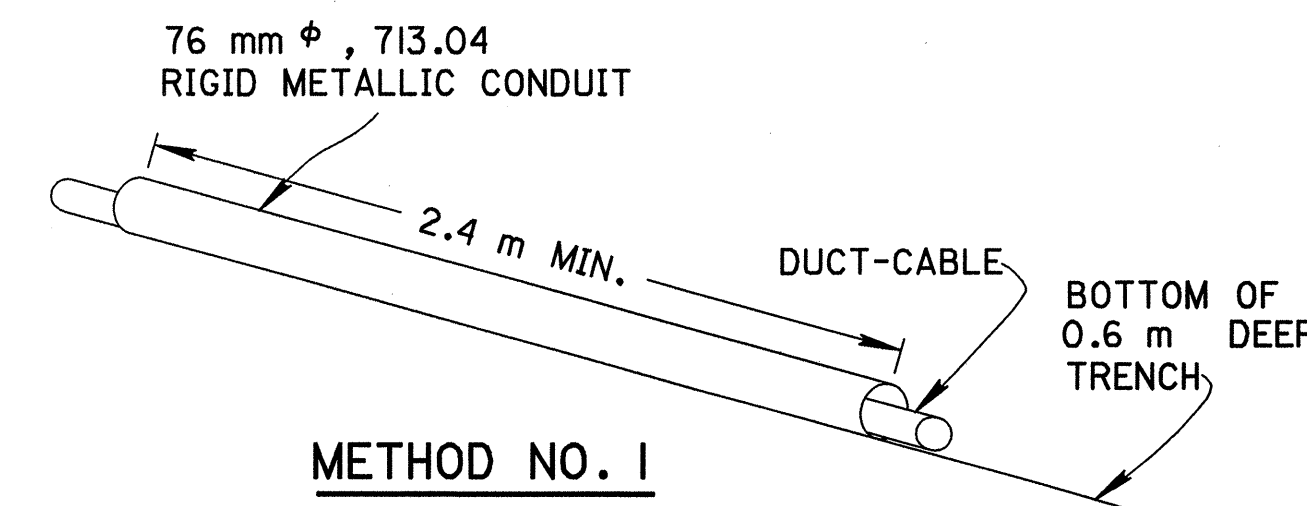
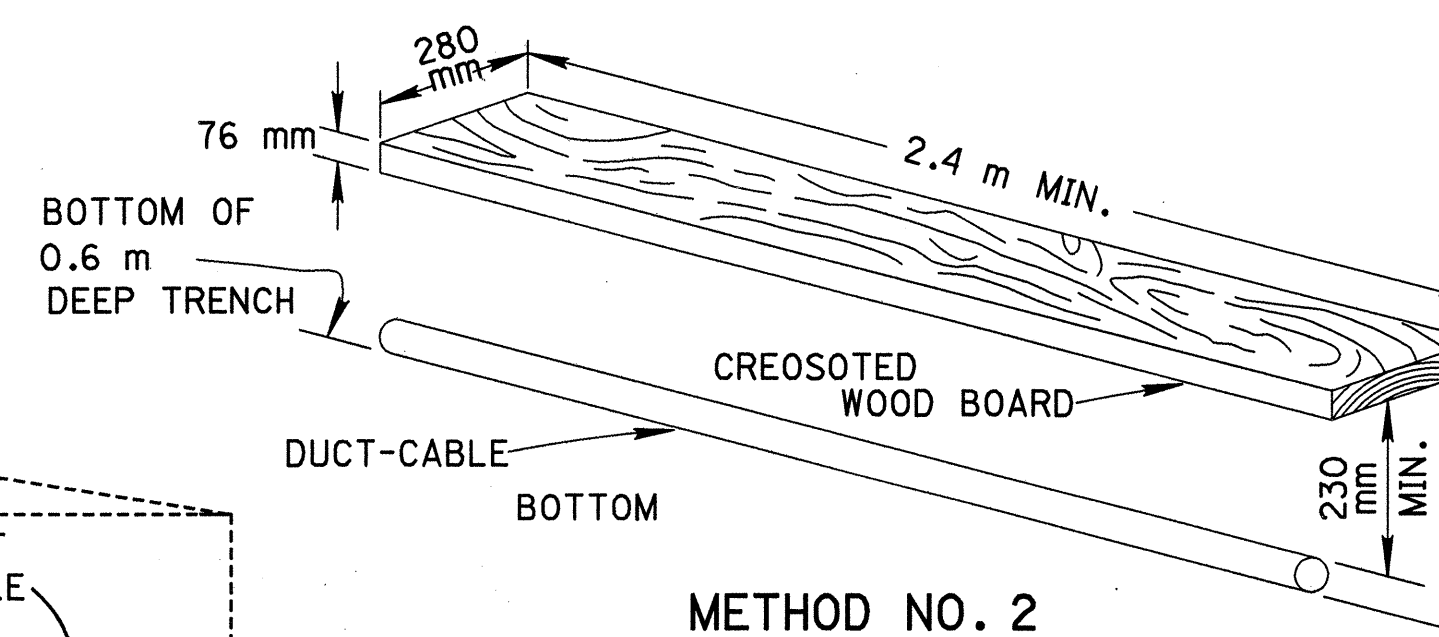
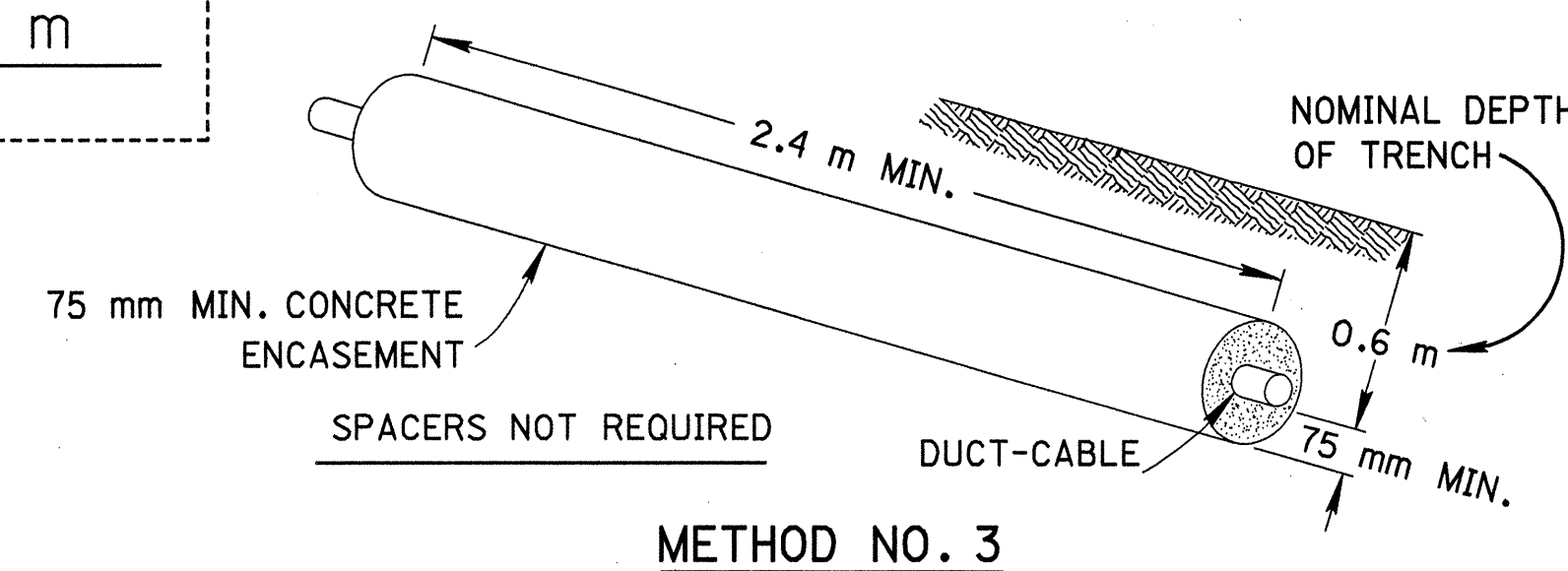
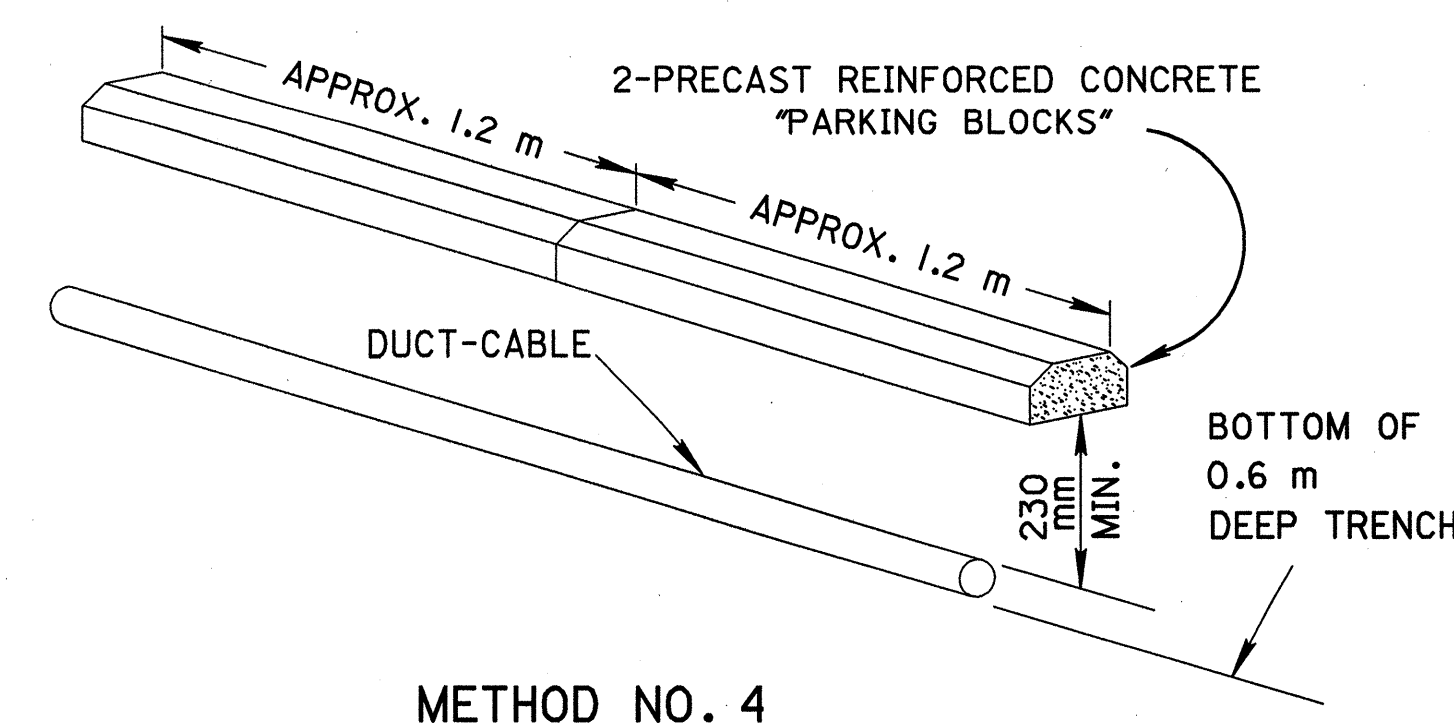


## METHOD FOR PROTECTING DUCT-CABLE UNDER GUARDRAIL

INCREASED DEPTH OF CABLE TRENCH AT POINT OF CROSSING TO BE USED WHEN CIRCUIT IS INSTALLED PRIOR TO GUARDRAIL INSTALLATION

## METHODS OF PROTECTING DUCT-CABLE

(SEE NOTE 1)



metric units

OFFICE OF TRAFFIC ENGINEERING  
DIVISION OF ENGINEERING POLICY  
OHIO DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING

DATE  
05/01/95

ROADWAY  
CONDUIT DETAILS I

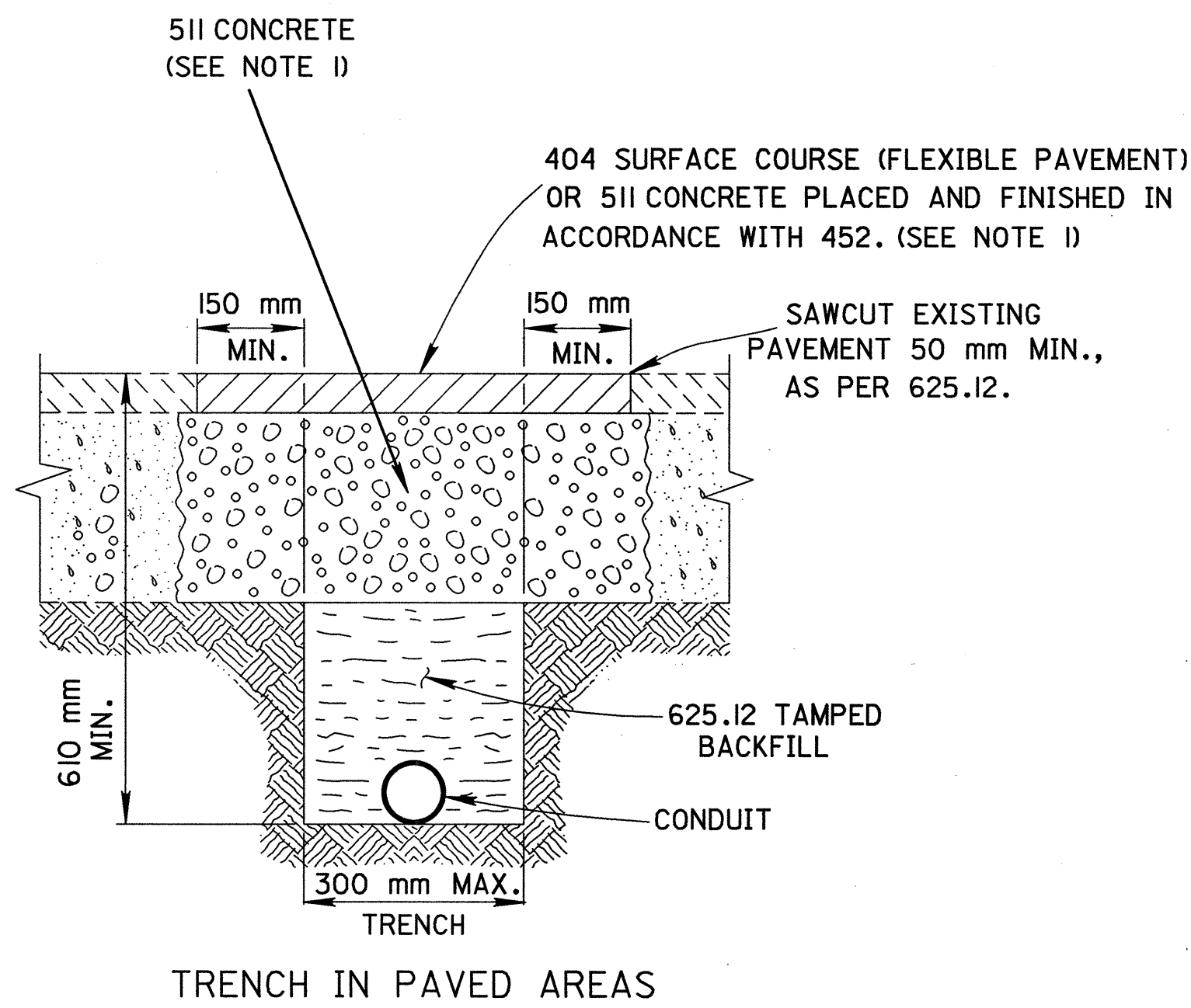
STANDARD  
CONSTRUCTION  
DRAWING

HL-30.2IM

APPROVED *[Signature]* ADMINISTRATOR

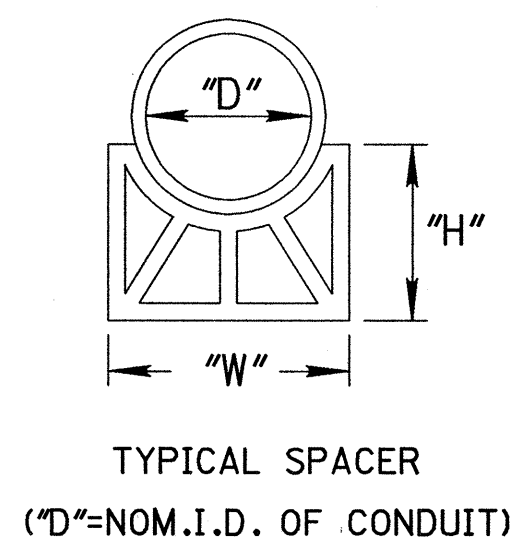
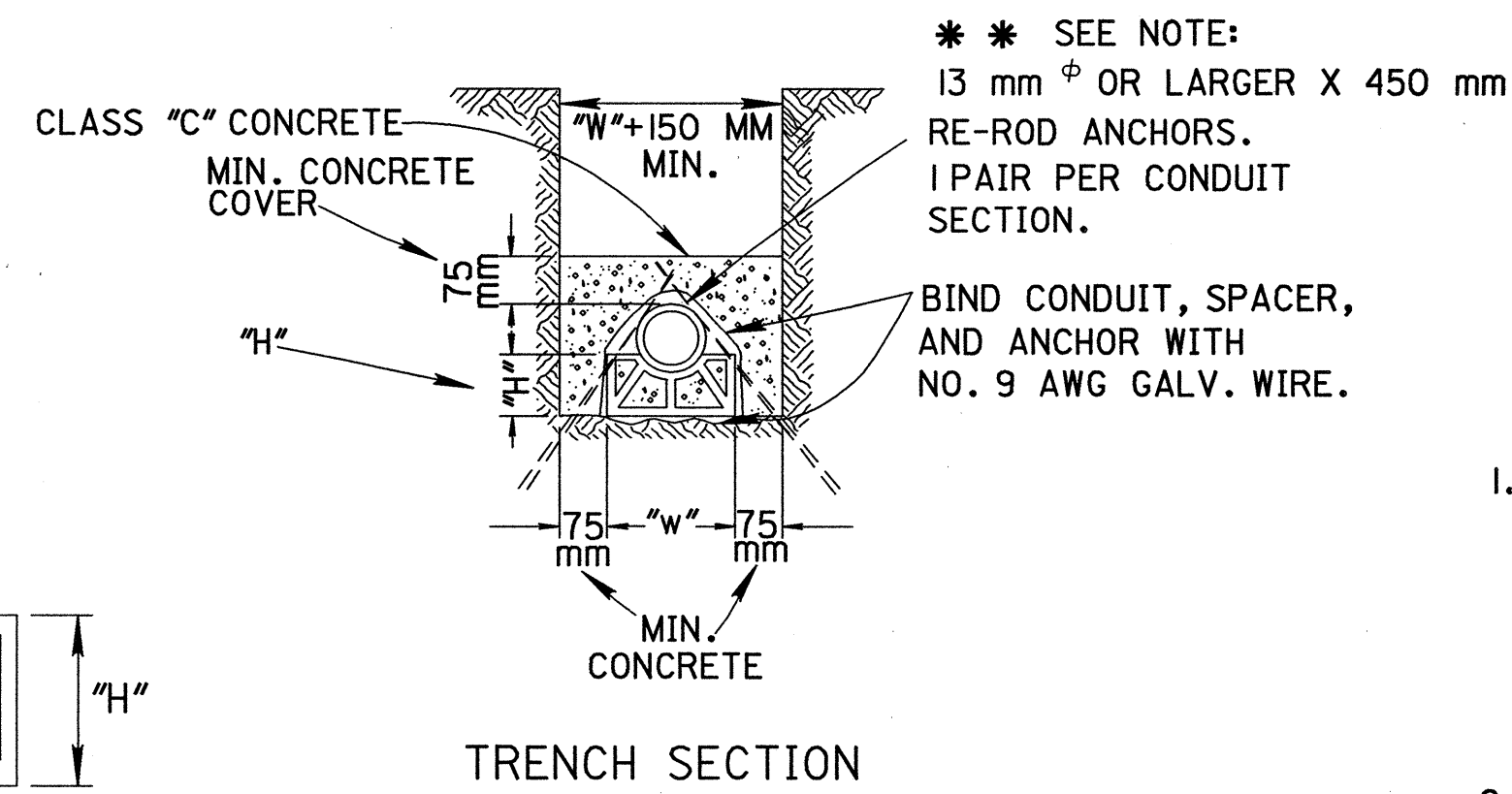


## CONCRETE ENCASED CONDUIT



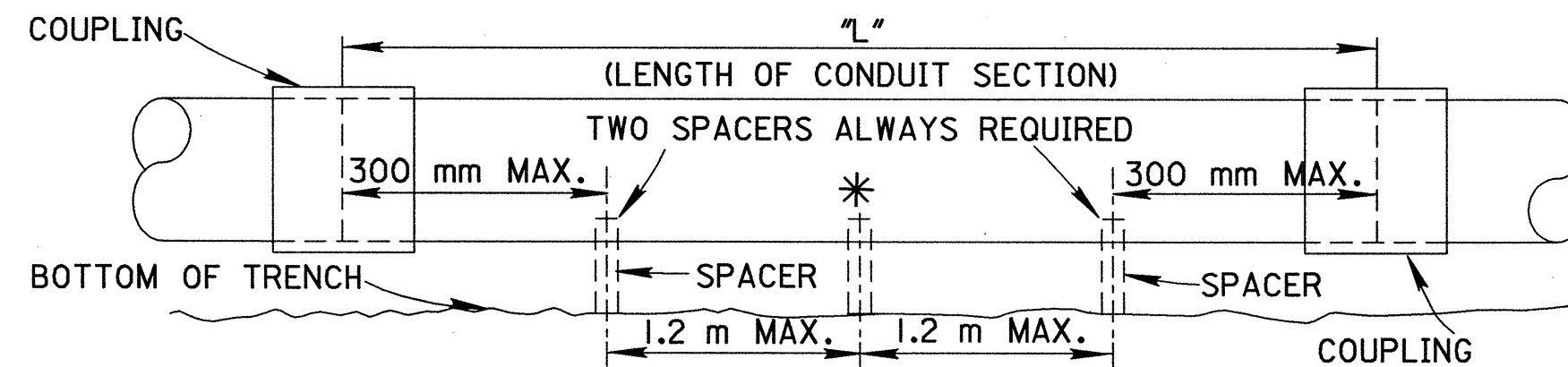
| "D"    | "H"    | "W"    |
|--------|--------|--------|
| 51 mm  | 90 mm  | 140 mm |
| 76 mm  | 100 mm | 165 mm |
| 102 mm | 105 mm | 195 mm |
| 127 mm | 115 mm | 225 mm |

### NORMAL SPACER DIMENSIONS



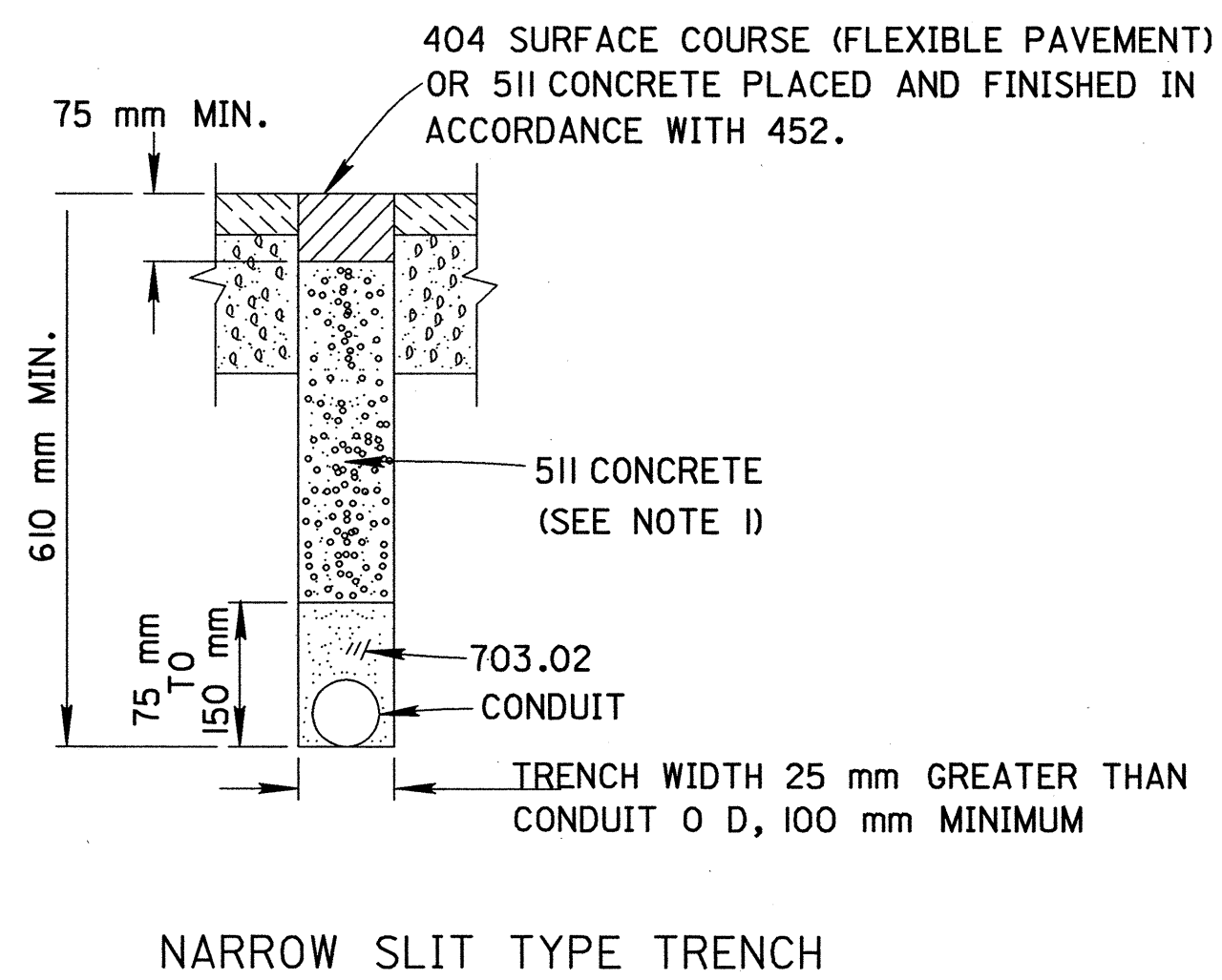
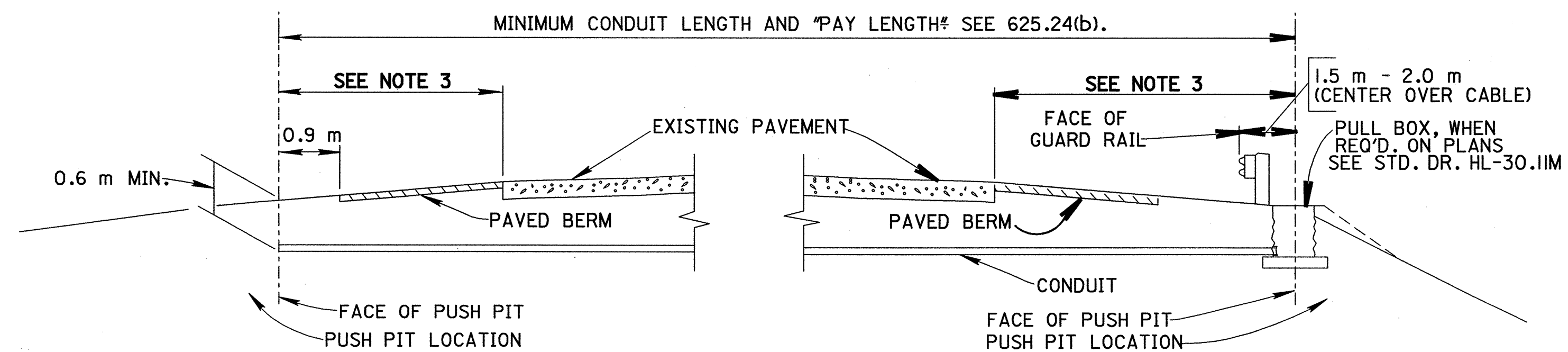
## NOTES

1. AT TRENCH LOCATIONS IN PAVED AREAS, REPLACEMENT OF DISTURBED FLEXIBLE PAVEMENT SHALL CONSIST OF 5" CONCRETE PLACED TO WITHIN 51 mm OF THE SURFACE AND A 404 SURFACE COURSE MATCHING THE EXISTING SURFACE. REPLACEMENT OF DISTURBED RIGID PAVEMENT SHALL CONSIST OF 5" CONCRETE WITH SURFACE PLACED AND FINISHED IN ACCORDANCE WITH 452.
2. SITE CLEARING AND RESTORATION SHALL BE IN ACCORDANCE WITH 603.09.
3. WHEN UNDERMINING SHOULDER AREAS THAT DO NOT HAVE PAVED BERMS, PROVIDE 19 mm THICK STEEL SURFACE PLATES. CORRUGATED PIPE SLEEVES, SHORING OR OTHER APPROVED MEANS TO PREVENT CAVE-IN.
4. WHEN CONDUIT IS JACKED OR DRILLED UNDER DIVIDED PAVEMENTS, CABLE MAY BE INSTALLED IN A TRENCH THROUGH THE MEDIAN AREA WHEN SPECIFIED IN THE PLANS.



\* INTERMEDIATE SPACER REQUIRED WHEN "L" EQUALS 3.1m  
ADDITIONAL SPACERS SHALL BE REQUIRED WHEN "L" EXCEEDS 3.1m  
\*\* NOTE: DELETE ANCHORS AND BINDING WIRE WHEN USING STEEL CONDUIT.

SIDE ELEVATION



## CONDUIT JACKED UNDER PAVEMENT



# metric units

OFFICE OF TRAFFIC ENGINEERING  
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OHIO DEPARTMENT OF TRANSPORTATION

## HIGHWAY LIGHTING

|          |
|----------|
| DATE     |
| 03/31/95 |

## ROADWAY CONDUIT DETAILS II

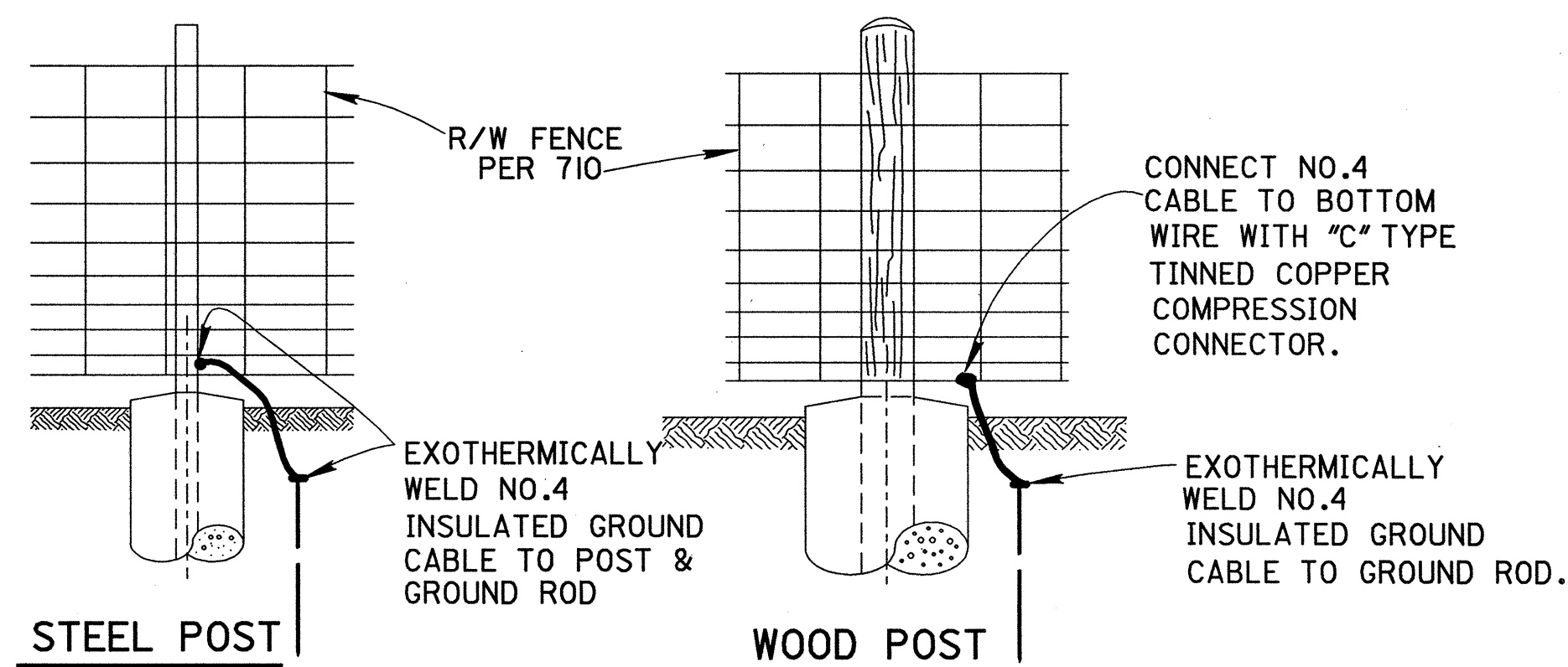
STANDARD  
CONSTRUCTION  
DRAWING

APPROVED *Adyanbach* ADMINISTRATOR



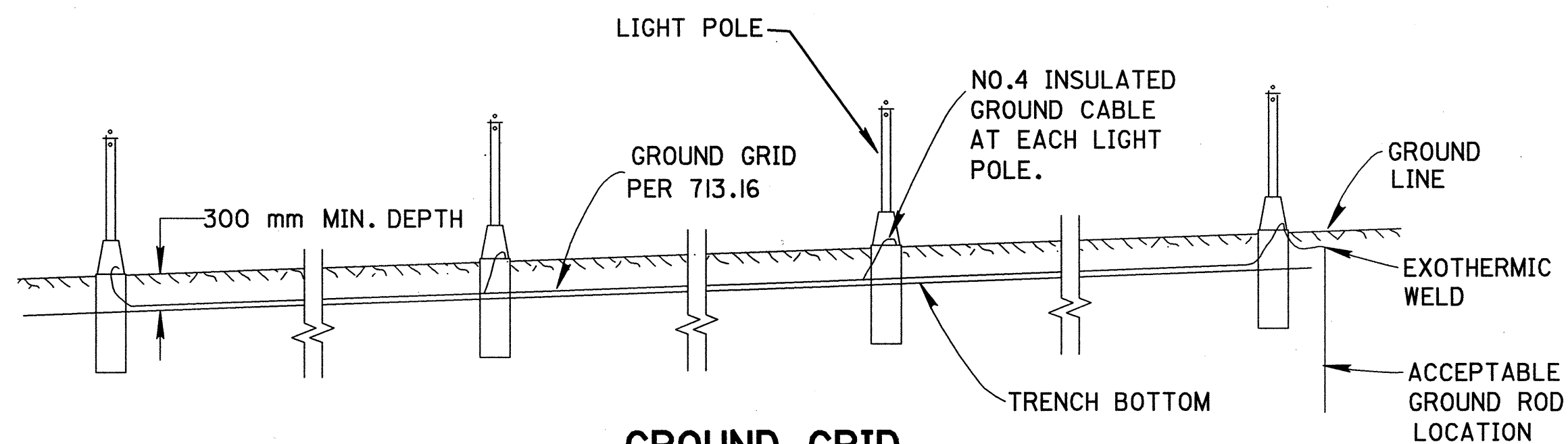
## NOTES

1. WHERE OVERHEAD TRANSMISSION LINE EASEMENTS 15 m OR MORE IN WIDTH CROSS A FENCED ROADWAY RIGHT-OF-WAY, EACH FENCE SHALL BE GROUNDED AS SHOWN HEREON.
2. WHERE OVERHEAD ELECTRIC POWER LINE EASEMENTS LESS THAN 15 m IN WIDTH CROSS A FENCED ROADWAY RIGHT-OF-WAY, EACH FENCE SHALL BE GROUNDED DIRECTLY BELOW THE CENTERLINE OF THE POWER LINE CROSSING.
3. WHERE OVERHEAD TRANSMISSION LINES RATED 110 KV OR HIGHER ARE PARALLEL TO ROADWAY FENCES AND THE TRANSMISSION LINE EASEMENT IS CONTIGUOUS TO THE ROADWAY RIGHT-OF-WAY THE ROADWAY FENCES SHALL BE GROUNDED AT LEAST EVERY 100 m.
4. FENCE GROUNDS WILL BE PAID FOR AT THE UNIT PRICE BID FOR 625 GROUND ROD.
5. APPLY TWO COATS OF INSULATING VARNISH OVER ALL EXOTHERMIC WELDS AND EXPOSED CABLE.

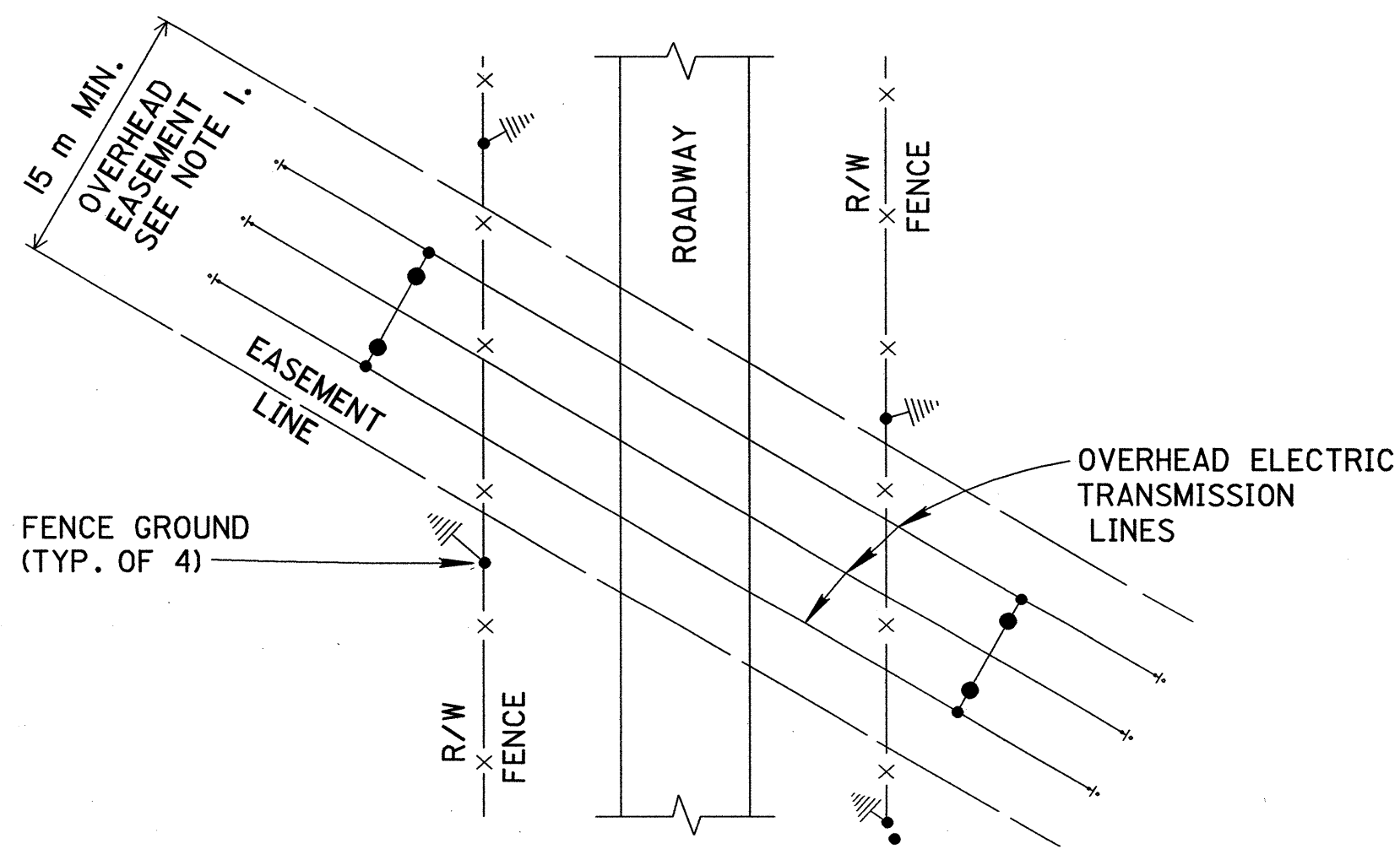


### R/W FENCE GROUND

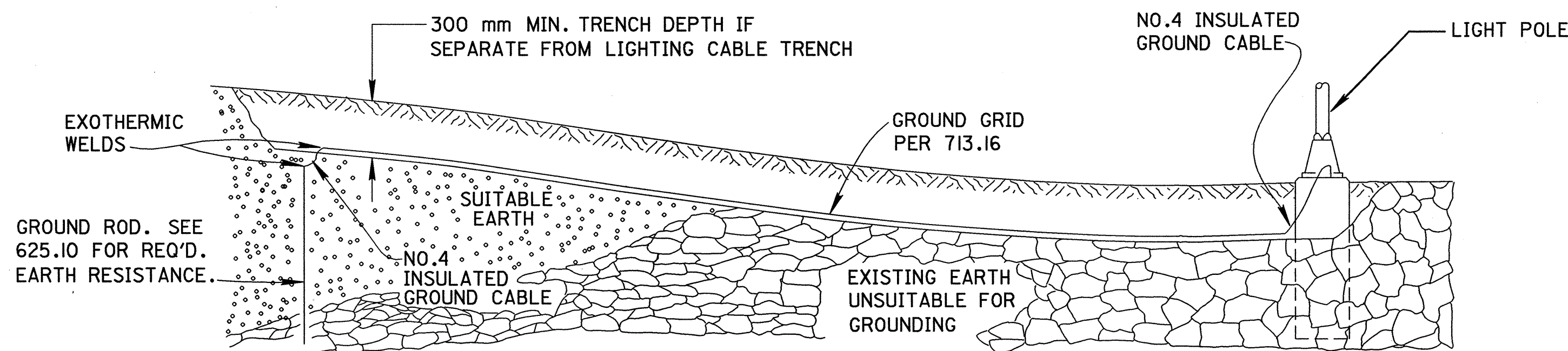
WHEN SPECIFICALLY NOTED ON THE PLANS, AND IN NOTES 1, 2, & 3, R/W FENCES SHALL BE GROUNDED AS SHOWN ABOVE. SEE ALSO NOTE 4.



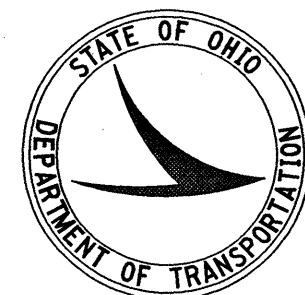
### GROUND GRID



### FENCE GROUNDS AT TRANSMISSION LINE CROSSING



### MODIFIED GROUND GRID - INDIVIDUAL POLE



metric  
units

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DIVISION OF ENGINEERING POLICY  
OHIO DEPARTMENT OF TRANSPORTATION

HIGHWAY LIGHTING

DATE  
03/31/95

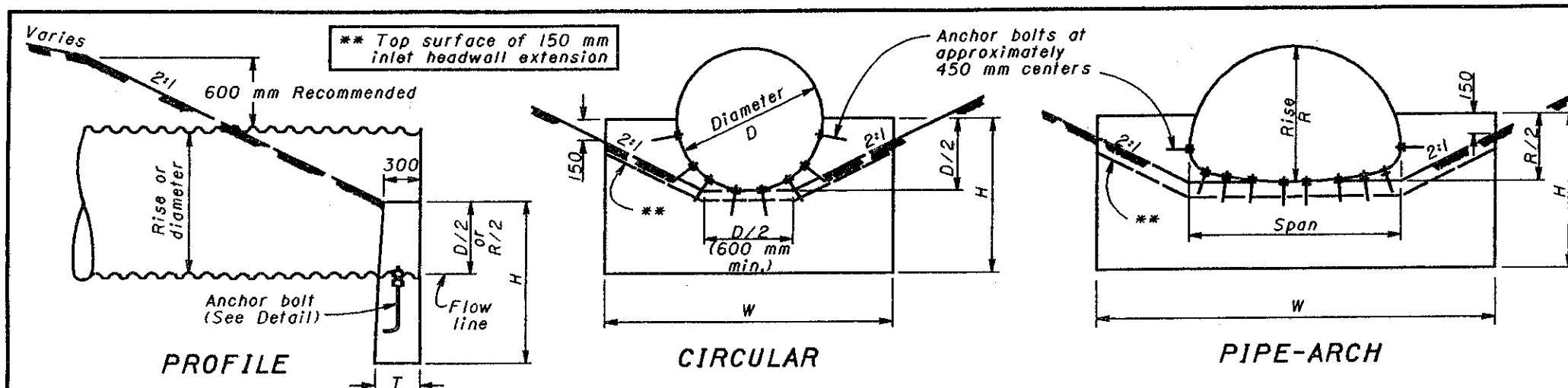
GROUNDING DETAILS

STANDARD  
CONSTRUCTION  
DRAWING

HL-50.11M

APPROVED *[Signature]* ADMINISTRATOR





END TREATMENT "A"

| HEADWALL FOR CORRUGATED METAL PIPE & PLASTIC PIPE |       |      |      |                            |                                                  |      |       |      |      |                            |                                                  |      |      |      |     |                            |
|---------------------------------------------------|-------|------|------|----------------------------|--------------------------------------------------|------|-------|------|------|----------------------------|--------------------------------------------------|------|------|------|-----|----------------------------|
| CIRCULAR                                          |       |      |      |                            | PIPE ARCH                                        |      |       |      |      |                            | PIPE ARCH                                        |      |      |      |     |                            |
| D                                                 | W     | H    | T    | CONC.<br>(m <sup>3</sup> ) | SPAN                                             | RISE | W     | H    | T    | CONC.<br>(m <sup>3</sup> ) | SPAN                                             | RISE | W    | H    | T   | CONC.<br>(m <sup>3</sup> ) |
| 300                                               | 600   | 925  | 300  | 0.17                       | 68x13 mm Corrugations                            |      |       |      |      |                            | *1825                                            | 1375 | 3550 | 1600 | 300 | 1.70                       |
| 375                                               | 750   | 975  | 300  | 0.22                       | 425                                              | 325  | 925   | 925  | 300  | 0.26                       | *2025                                            | 1475 | 3750 | 1650 | 375 | 2.09                       |
| 450                                               | 925   | 1000 | 300  | 0.28                       | 525                                              | 375  | 1075  | 925  | 300  | 0.30                       | 2175                                             | 1575 | 3950 | 1700 | 425 | 2.43                       |
| 525                                               | 1075  | 1025 | 300  | 0.33                       | 600                                              | 450  | 1225  | 975  | 300  | 0.36                       | 2450                                             | 1675 | 4275 | 1750 | 500 | 2.99                       |
| 600                                               | 1225  | 1075 | 300  | 0.39                       | 700                                              | 500  | 1375  | 1000 | 300  | 0.41                       | 2575                                             | 1775 | 4575 | 1800 | 550 | 3.50                       |
| 675                                               | 1375  | 1125 | 300  | 0.46                       | 875                                              | 600  | 1675  | 1050 | 300  | 0.53                       | 2800                                             | 1875 | 4875 | 1850 | 600 | 4.06                       |
| 750                                               | 1525  | 1150 | 300  | 0.53                       | 1050                                             | 725  | 1975  | 1100 | 300  | 0.65                       | 2925                                             | 1975 | 5400 | 1900 | 625 | 4.74                       |
| 825                                               | 1675  | 1175 | 300  | 0.59                       | 1225                                             | 825  | 2325  | 1150 | 300  | 0.80                       | 3200                                             | 2075 | 5475 | 1950 | 650 | 5.07                       |
| 900                                               | 1825  | 1225 | 300  | 0.67                       | 1425                                             | 950  | 2750  | 1225 | 300  | 1.01                       | 3425                                             | 2175 | 5800 | 2000 | 675 | 5.65                       |
| 975                                               | 1975  | 1275 | 300  | 0.76                       | 1600                                             | 1075 | 3050  | 1325 | 300  | 1.21                       | 3550                                             | 2275 | 6325 | 2050 | 675 | 6.32                       |
| 1050                                              | 2125  | 1300 | 300  | 0.83                       | 1775                                             | 1175 | 3350  | 1425 | 300  | 1.43                       | 150x50 mm Corrugations<br>(450 mm Corner Radius) |      |      |      |     |                            |
| 1200                                              | 2450  | 1375 | 300  | 1.01                       | *1925                                            | 1300 | 3550  | 1600 | 300  | 1.70                       |                                                  |      |      |      |     |                            |
| 1350                                              | 2825  | 1450 | 300  | 1.23                       | *2075                                            | 1425 | 3750  | 1650 | 375  | 2.09                       | *1825                                            | 1375 | 3550 | 1700 | 300 | 1.81                       |
| 1500                                              | 3200  | 1675 | 300  | 1.61                       | 150x50 mm Corrugations<br>(775 mm Corner Radius) |      |       |      |      |                            | *1900                                            | 1425 | 3650 | 1725 | 350 | 2.04                       |
| 1650                                              | 3575  | 1750 | 300  | 1.88                       |                                                  |      |       |      |      |                            | *2025                                            | 1475 | 3750 | 1750 | 375 | 2.21                       |
| 1800                                              | 3950  | 1825 | 300  | 2.16                       | 3975                                             | 2800 | 7300  | 2425 | 825  | 9.95                       | *2100                                            | 1525 | 3850 | 1775 | 400 | 2.39                       |
| 1950                                              | 4350  | 1900 | 350  | 2.68                       | 4050                                             | 2850 | 7550  | 2450 | 825  | 10.40                      | 2175                                             | 1575 | 3925 | 1800 | 425 | 2.56                       |
| 2100                                              | 4725  | 1975 | 350  | 3.03                       | 4200                                             | 2900 | 7575  | 2475 | 850  | 10.77                      | 2300                                             | 1625 | 4025 | 1825 | 450 | 2.75                       |
| 2250                                              | 5100  | 2050 | 400  | 3.66                       | 4250                                             | 2950 | 7850  | 2500 | 850  | 11.28                      | 2375                                             | 1675 | 4275 | 1850 | 500 | 3.16                       |
| 2400                                              | 5475  | 2125 | 400  | 4.07                       | 4325                                             | 3000 | 8100  | 2525 | 850  | 11.75                      | 2450                                             | 1725 | 4475 | 1875 | 525 | 3.46                       |
| 2550                                              | 5875  | 2200 | 450  | 4.84                       | 4475                                             | 3050 | 8150  | 2550 | 875  | 12.20                      | 2575                                             | 1775 | 4575 | 1900 | 550 | 3.69                       |
| 2700                                              | 6250  | 2275 | 500  | 5.68                       | 4600                                             | 3100 | 8200  | 2575 | 875  | 12.40                      | 2650                                             | 1825 | 4825 | 1925 | 575 | 4.06                       |
| 2850                                              | 6625  | 2350 | 550  | 6.61                       | 4675                                             | 3150 | 8450  | 2600 | 875  | 12.90                      | 2800                                             | 1875 | 4875 | 1950 | 600 | 4.28                       |
| 3000                                              | 7000  | 2450 | 600  | 7.71                       | 4750                                             | 3200 | 8700  | 2625 | 900  | 13.69                      | 2850                                             | 1925 | 5125 | 1975 | 650 | 4.81                       |
| *3150                                             | 7000  | 2525 | 650  | 8.39                       | 4875                                             | 3250 | 8750  | 2650 | 900  | 13.90                      | 2925                                             | 1975 | 5400 | 2000 | 675 | 5.26                       |
| 3300                                              | 7000  | 2600 | 700  | 9.10                       | 4950                                             | 3300 | 9025  | 2675 | 900  | 14.48                      | 3075                                             | 2025 | 5425 | 2025 | 675 | 5.35                       |
| 3450                                              | 7350  | 2675 | 750  | 10.32                      | 5100                                             | 3350 | 9050  | 2700 | 925  | 14.96                      | 3200                                             | 2075 | 5450 | 2050 | 675 | 5.44                       |
| 3600                                              | 7675  | 2750 | 825  | 11.87                      | 5150                                             | 3400 | 9325  | 2725 | 925  | 15.56                      | 3275                                             | 2125 | 5750 | 2075 | 700 | 5.96                       |
| 3750                                              | 8025  | 2825 | 875  | 13.31                      | 5225                                             | 3450 | 9575  | 2750 | 925  | 16.12                      | 3425                                             | 2175 | 5775 | 2100 | 700 | 6.06                       |
| 3900                                              | 8350  | 2900 | 925  | 14.83                      | 5375                                             | 3500 | 9625  | 2775 | 950  | 16.68                      | 3475                                             | 2225 | 6025 | 2125 | 700 | 6.40                       |
| 4050                                              | 8700  | 2975 | 975  | 16.49                      | 5425                                             | 3550 | 9875  | 2800 | 950  | 17.27                      | 3550                                             | 2275 | 6325 | 2150 | 725 | 6.97                       |
| 4200                                              | 9050  | 3050 | 1025 | 18.28                      | 5575                                             | 3600 | 9900  | 2825 | 950  | 17.47                      | 3700                                             | 2325 | 6350 | 2175 | 725 | 7.07                       |
| 4350                                              | 9375  | 3125 | 1075 | 20.13                      | 5625                                             | 3650 | 10150 | 2850 | 975  | 18.43                      | 3750                                             | 2375 | 6600 | 2200 | 725 | 7.44                       |
| 4500                                              | 9725  | 3200 | 1100 | 21.78                      | 5775                                             | 3700 | 10175 | 2875 | 975  | 18.64                      | 3800                                             | 2425 | 6875 | 2225 | 750 | 8.03                       |
| 4650                                              | 10050 | 3275 | 1125 | 23.44                      | 5850                                             | 3750 | 10500 | 2900 | 975  | 19.40                      | 3850                                             | 2500 | 7200 | 2250 | 750 | 8.50                       |
| 4800                                              | 10425 | 3350 | 1150 | 25.31                      | 5900                                             | 3800 | 10750 | 2925 | 1000 | 20.43                      | 4025                                             | 2525 | 7200 | 2275 | 750 | 8.59                       |
| 4950                                              | 10750 | 3425 | 1175 | 27.14                      | 5975                                             | 3850 | 11050 | 2950 | 1000 | 21.18                      | 4175                                             | 2575 | 7200 | 2300 | 775 | 8.90                       |
| 5100                                              | 11075 | 3500 | 1200 | 29.06                      | 6125                                             | 3900 | 11050 | 2975 | 1000 | 21.36                      | 4225                                             | 2625 | 7650 | 2325 | 775 | 9.55                       |
| 5250                                              | 11425 | 3575 | 1225 | 31.13                      | 6175                                             | 3950 | 11325 | 3000 | 1025 | 22.50                      | 4275                                             | 2675 | 7775 | 2350 | 775 | 9.82                       |
| 5400                                              | 11750 | 3650 | 1250 | 33.23                      | 75x25 mm Corrugations                            |      |       |      |      |                            | 4450                                             | 2725 | 7775 | 2400 | 825 | 10.49                      |
| 5550                                              | 12125 | 3725 | 1275 | 35.56                      | 1000                                             | 775  | 1975  | 1100 | 300  | 0.65                       | 4600                                             | 2775 | 7775 | 2425 | 825 | 10.60                      |
| 5700                                              | 12450 | 3800 | 1300 | 37.84                      | 1150                                             | 900  | 2325  | 1150 | 300  | 0.80                       | 4650                                             | 2825 | 8050 | 2450 | 825 | 11.09                      |
| 5850                                              | 12800 | 3875 | 1325 | 40.29                      | 1325                                             | 1025 | 2750  | 1225 | 300  | 1.01                       | 4700                                             | 2875 | 8350 | 2475 | 850 | 11.88                      |
| 6000                                              | 13125 | 3950 | 1350 | 42.76                      | 1500                                             | 1150 | 3050  | 1325 | 300  | 1.21                       | 4750                                             | 2950 | 8650 | 2500 | 850 | 12.43                      |
| 6150                                              | 13450 | 4050 | 1375 | 45.61                      | 1650                                             | 1275 | 3350  | 1425 | 300  | 1.43                       | 4925                                             | 2975 | 8650 | 2525 | 850 | 12.55                      |
| 6300                                              | 13825 | 4125 | 1400 | 48.46                      |                                                  |      |       |      |      |                            | 4975                                             | 3025 | 8950 | 2550 | 875 | 13.40                      |

## NOTES

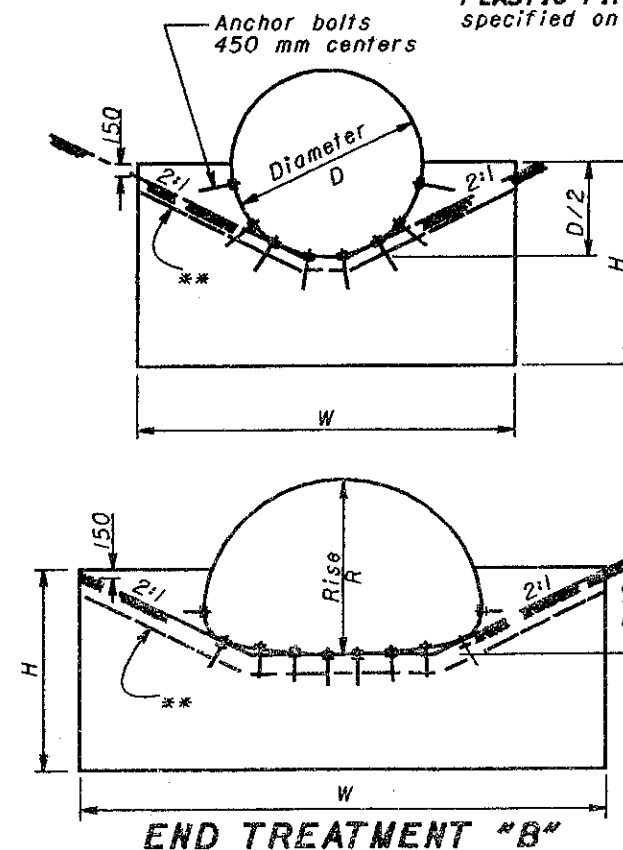
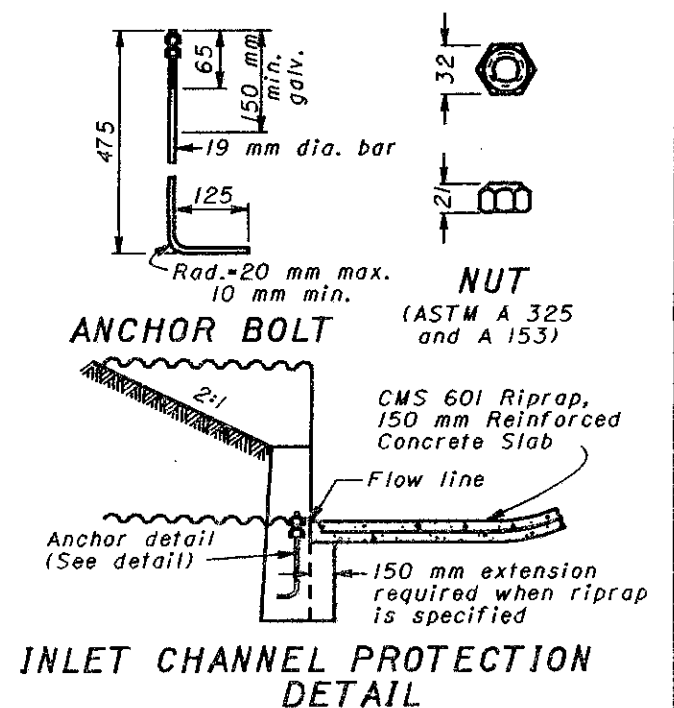
**CONCRETE:** Headwall concrete shall be Class C. Concrete quantities are based on headwalls without the 150 mm extension under the channel protection.

**ANCHOR BOLTS:** Bolts (as detailed) for anchoring both ends of metal pipe shall meet ASTM A 307. The top 150 mm min. of bolt shall be galvanized according to ASTM A 153. Cost of anchors shall be included in the unit price bid per meter of CMS 603.

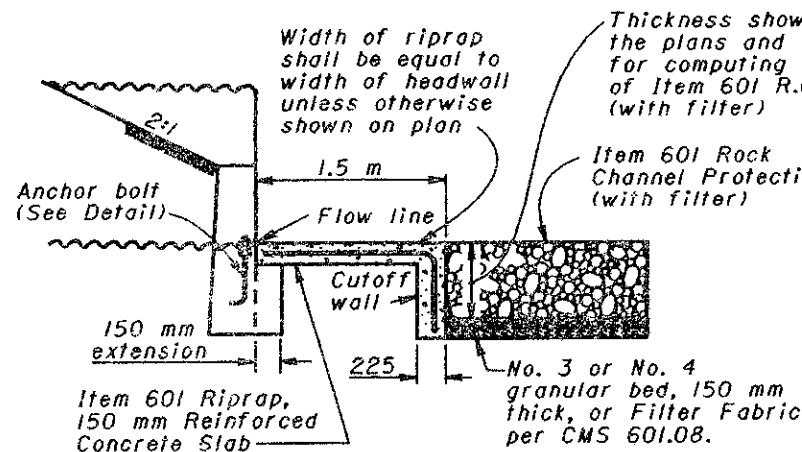
Headwall dimensions are based on end treatment "A" for pipe sizes up to and including 3000 mm, 1775 x 1175 mm, and 1650 x 1275 mm, and on end treatment "B" for sizes over and including 3300 mm, 3975 x 2800 mm, and 2175 x 1575 mm.

\* Channel configuration for pipe sizes between end treatment "A" and end treatment "B" is determined by 2:1 slopes passing through a point 150 mm below the top and at each side of the headwall. For end treatment "B", 2:1 slopes are tangent to pipe.

**PLASTIC PIPE:** Plastic pipe may not be available in all the sizes specified on this Standard Construction Drawing.



All dimensions are in millimeters unless otherwise noted.



This Drawing Replaces HW-4A.

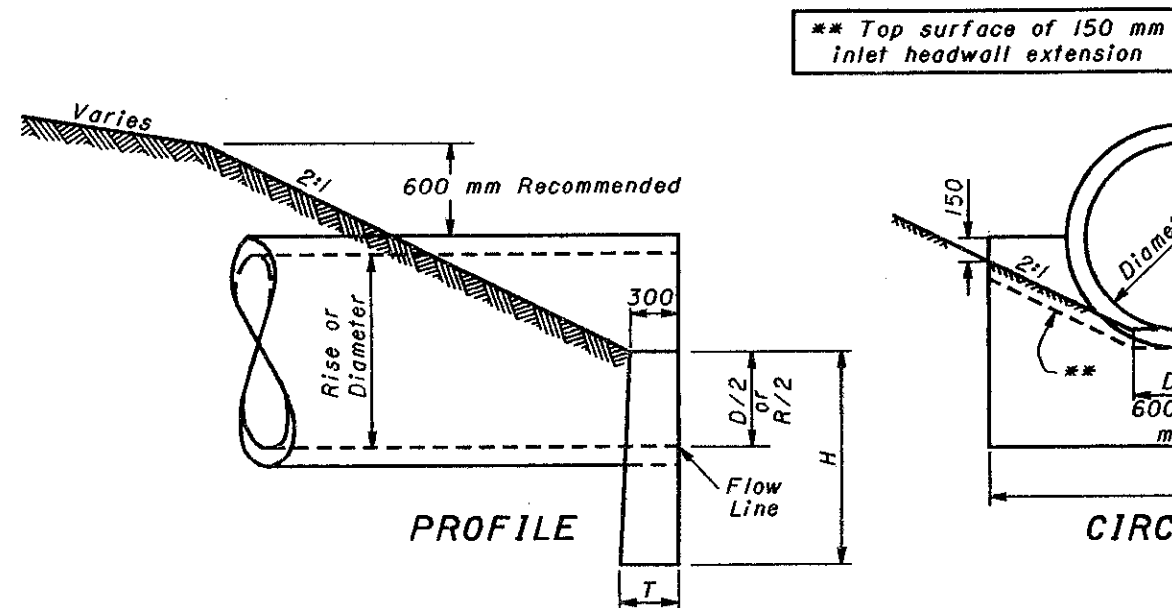
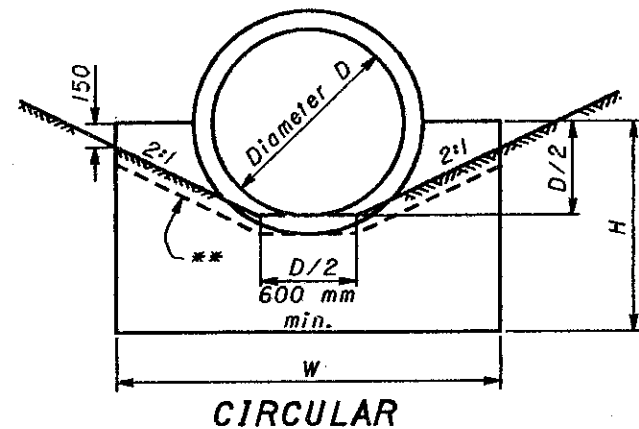
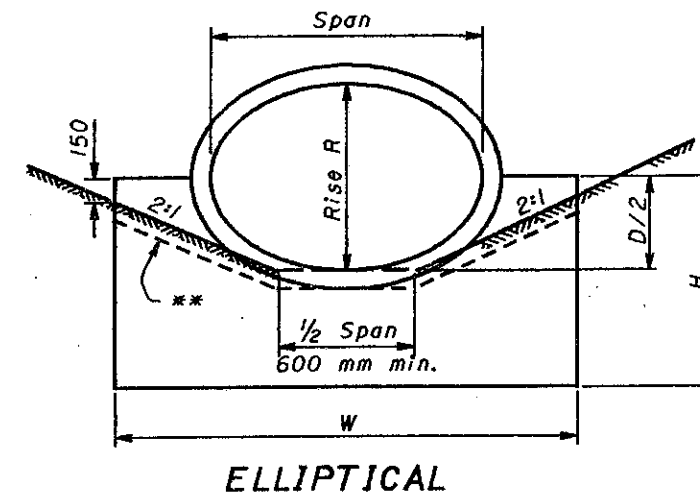
BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF TRANSPORTATION

HALF-HEIGHT  
HEADWALLS FOR  
CORRUGATED METAL  
PIPE & PLASTIC PIPE

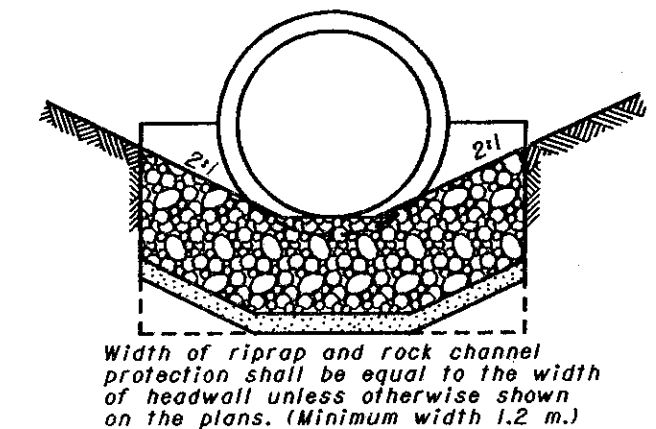
STANDARD  
CONSTRUCTION  
DRAWING

APPROVED *D.K. Hulman*  
ENGR., L & D

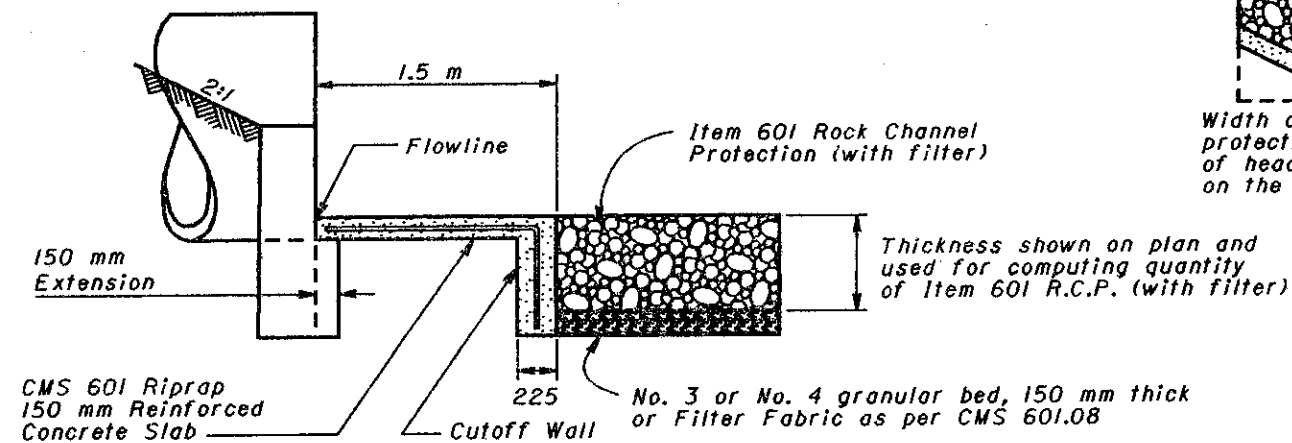
DATE  
7-12-95



CONCRETE PIPE

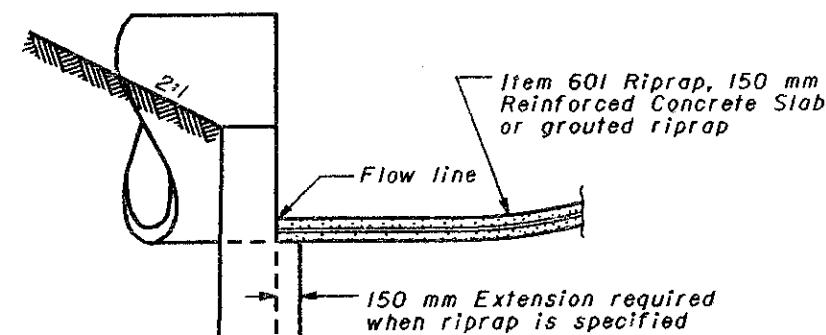


| HEADWALL FOR CONCRETE PIPE |      |      |     |                         |            |      |      |      |     |                         |
|----------------------------|------|------|-----|-------------------------|------------|------|------|------|-----|-------------------------|
| CIRCULAR                   |      |      |     |                         | ELLIPTICAL |      |      |      |     |                         |
| D                          | W    | H    | T   | Conc. (m <sup>3</sup> ) | Span       | Rise | W    | H    | T   | Conc. (m <sup>3</sup> ) |
| 300                        | 600  | 925  | 300 | 0.17                    | 575        | 350  | 925  | 975  | 300 | 0.27                    |
| 375                        | 750  | 975  | 300 | 0.22                    | 750        | 475  | 1100 | 1025 | 300 | 0.34                    |
| 450                        | 900  | 1000 | 300 | 0.27                    | 850        | 550  | 1200 | 1050 | 300 | 0.38                    |
| 525                        | 1050 | 1025 | 300 | 0.32                    | 950        | 600  | 1375 | 1075 | 300 | 0.44                    |
| 600                        | 1200 | 1075 | 300 | 0.39                    | 1050       | 675  | 1425 | 1100 | 300 | 0.47                    |
| 675                        | 1350 | 1125 | 300 | 0.46                    | 1125       | 725  | 1575 | 1125 | 300 | 0.53                    |
| 750                        | 1500 | 1150 | 300 | 0.52                    | 1225       | 800  | 1650 | 1175 | 300 | 0.58                    |
| 825                        | 1650 | 1175 | 300 | 0.58                    | 1325       | 850  | 1800 | 1225 | 375 | 0.74                    |
| 900                        | 1800 | 1225 | 300 | 0.66                    | 1500       | 950  | 2075 | 1275 | 375 | 0.89                    |
| 975                        | 1950 | 1275 | 300 | 0.75                    | 1700       | 1075 | 2450 | 1325 | 400 | 1.14                    |
| 1050                       | 2100 | 1300 | 300 | 0.82                    | 1900       | 1200 | 2800 | 1525 | 400 | 1.49                    |
| 1200                       | 2400 | 1375 | 350 | 1.07                    | 2075       | 1325 | 3150 | 1575 | 450 | 1.86                    |
| 1350                       | 2775 | 1450 | 350 | 1.31                    | 2275       | 1450 | 3500 | 1650 | 450 | 2.16                    |
| 1500                       | 3150 | 1675 | 400 | 1.85                    | 2450       | 1575 | 3825 | 1700 | 500 | 2.60                    |
| 1650                       | 3525 | 1750 | 450 | 2.31                    | 2650       | 1700 | 4200 | 1775 | 500 | 2.98                    |
| 1800                       | 3900 | 1825 | 450 | 2.67                    | 2825       | 1800 | 4500 | 1825 | 550 | 3.49                    |
| 1950                       | 4275 | 1900 | 500 | 3.25                    | 3025       | 1925 | 4850 | 1900 | 550 | 3.91                    |
| 2100                       | 4650 | 1975 | 550 | 3.90                    | 3200       | 2050 | 5175 | 1950 | 600 | 4.54                    |
| 2250                       | 5025 | 2050 | 550 | 4.38                    | 3400       | 2175 | 5525 | 2025 | 600 | 5.03                    |
| 2400                       | 5400 | 2125 | 600 | 5.16                    | 3575       | 2300 | 5900 | 2075 | 650 | 5.81                    |
| 2550                       | 5775 | 2200 | 650 | 6.03                    | 3775       | 2425 | 6250 | 2150 | 650 | 6.38                    |
| 2700                       | 6150 | 2275 | 650 | 6.64                    | 4150       | 2650 | 6875 | 2250 | 700 | 7.73                    |
| 2850                       | 6525 | 2350 | 700 | 7.66                    | 4500       | 2900 | 7575 | 2400 | 750 | 9.54                    |
| 3000                       | 6900 | 2450 | 750 | 8.87                    |            |      |      |      |     |                         |
| 3150                       | 7275 | 2525 | 750 | 9.64                    |            |      |      |      |     |                         |
| 3300                       | 7650 | 2600 | 825 | 11.18                   |            |      |      |      |     |                         |
| 3600                       | 8400 | 2750 | 875 | 13.57                   |            |      |      |      |     |                         |



OUTLET CHANNEL PROTECTION DETAIL

The depth of the riprap cutoff wall (750 mm min.) shall match the thickness of the rock channel protection shown on the plan plus 150 mm.



INLET CHANNEL PROTECTION DETAIL

## NOTE

**CONCRETE:** Concrete for headwalls shall be Class C. Concrete quantities are based on headwalls without the 150 mm extension under the channel protection.

All dimensions are in millimeters unless otherwise noted.



This Drawing Replaces HW-4B.

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF TRANSPORTATION

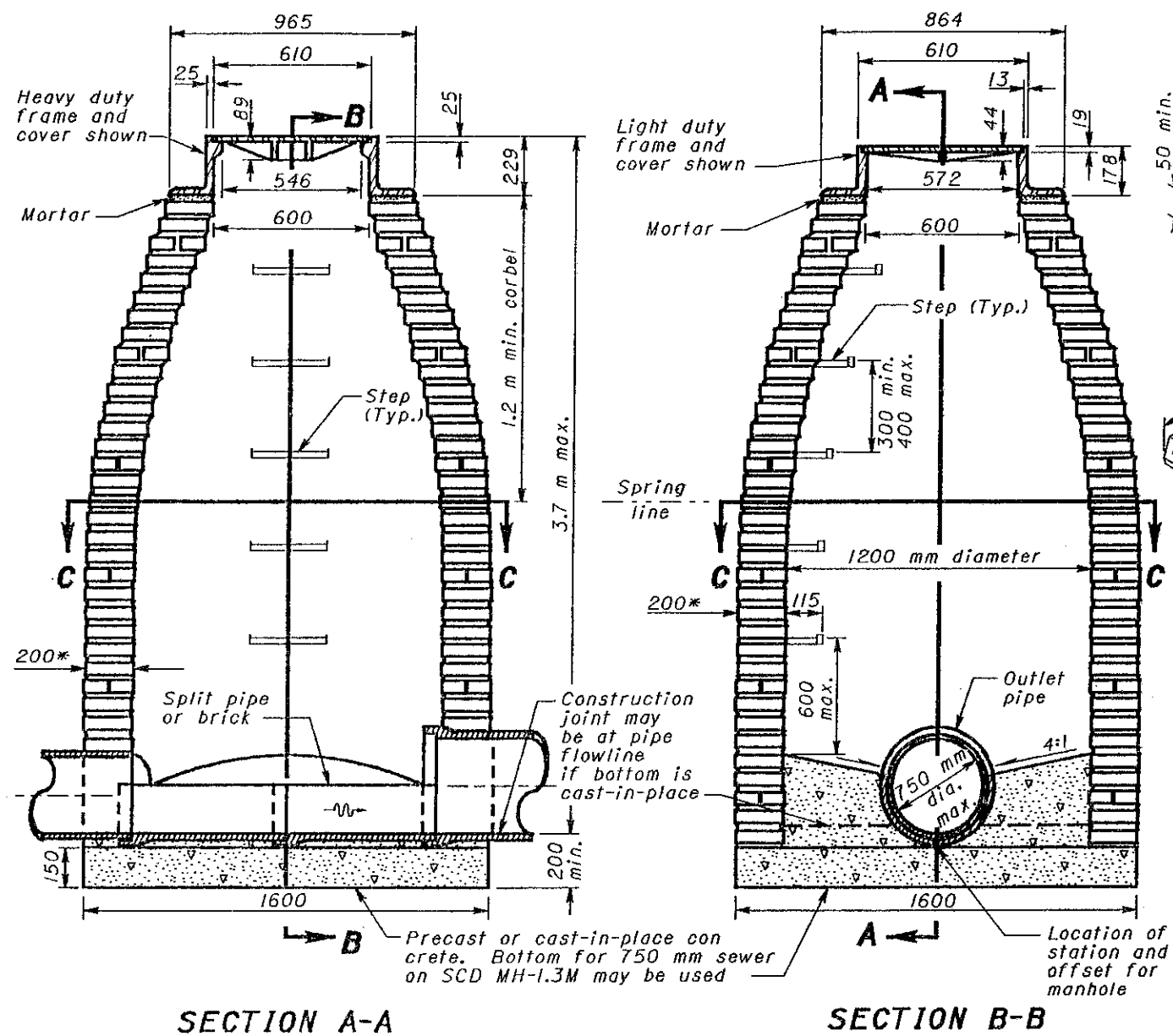
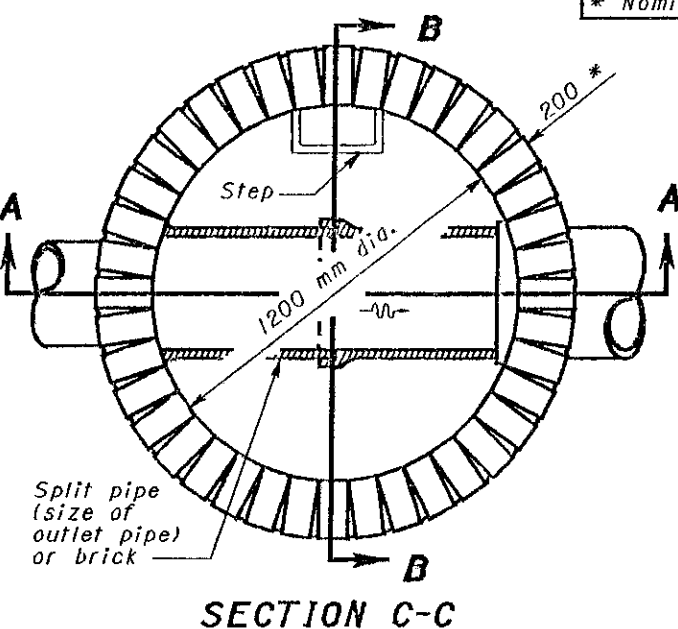
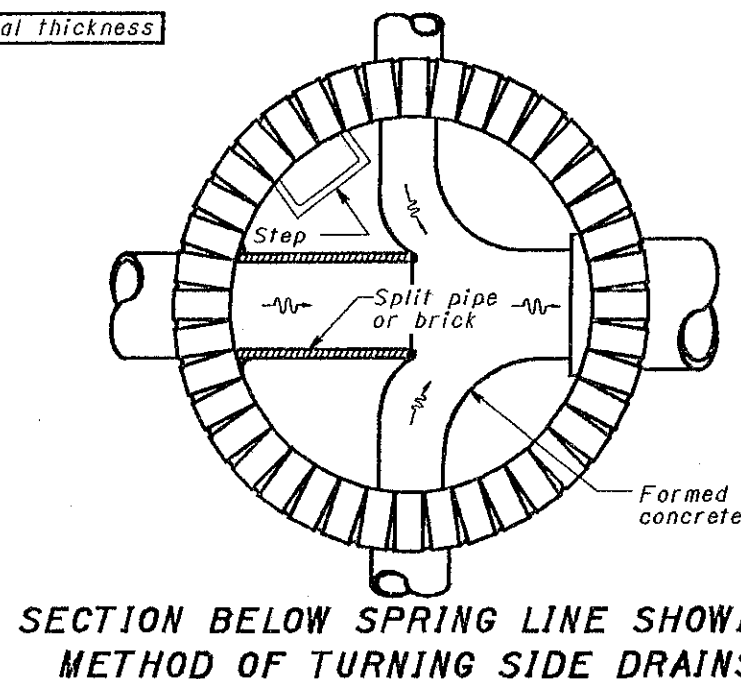
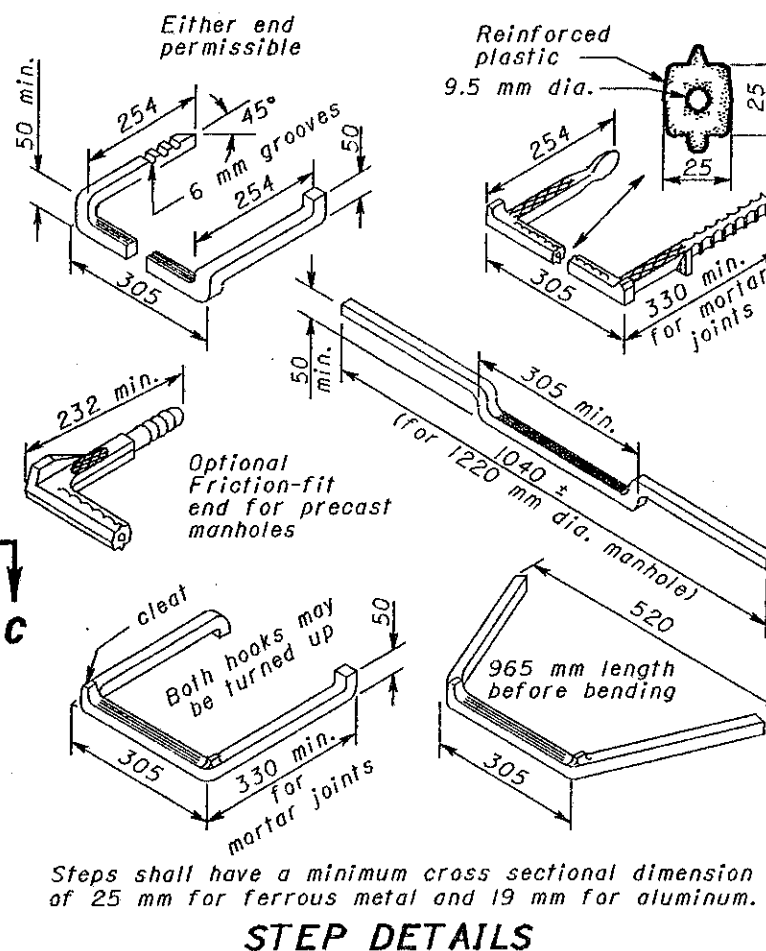
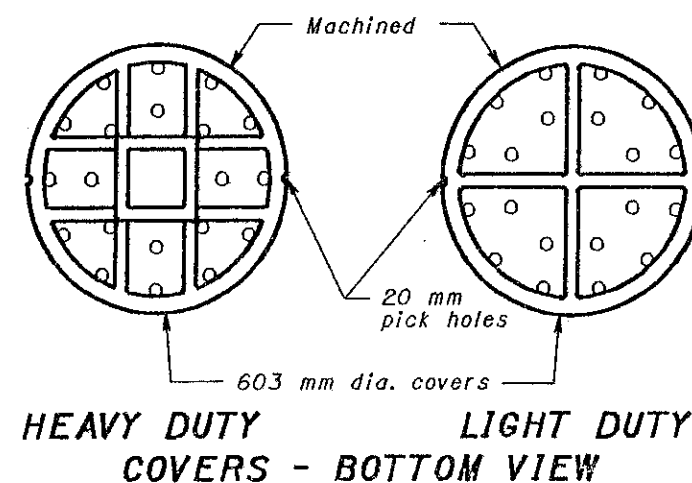
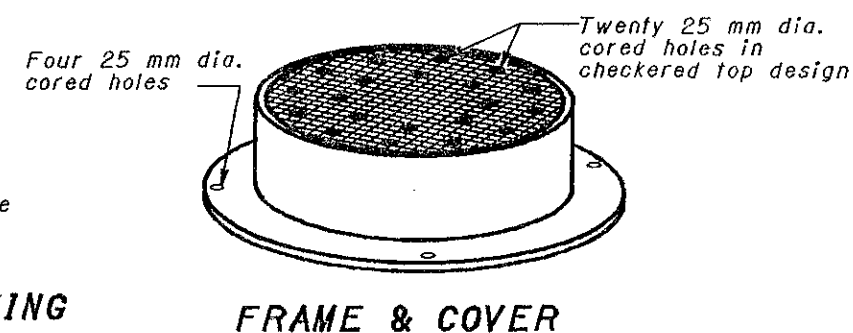
HALF-HEIGHT  
HEADWALLS FOR  
CONCRETE PIPE

DATE  
7-12-95

STANDARD  
CONSTRUCTION  
DRAWING

APPROVED *D.K. Hulman*  
ENGR., L & D

ENGR., L & D



## NOTES

**CONSTRUCTION:** Manhole No. 1 is for sewers 750 mm diameter or less. The design shown is for brick construction with every sixth course a stretcher course. The 150 mm bottom may be precast or cast-in-place concrete. The bottom channel section shall be built with concrete and lined with split pipe or brick except curved channels may be formed in the concrete.

Precast solid concrete radial blocks or cast-in-place concrete reinforced with #16 bars on 300 mm centers both vertically and horizontally, may be used with a wall thickness of 150 mm or greater. Precast manholes detailed on SCD's MH-1.2M or MH-1.3M may be used in lieu of the design shown hereon unless otherwise specified by the plans.

**FRAME AND COVER:** The frame and cover shall be of heavy design (215 kg min. total mass) when the manhole is placed within the limits of the pavement or shoulder. Otherwise, the light design (124 kg min.) may be used. Bearing areas shall be finished smooth and fitted so as to provide a firm and even seat for all portions of the cover in the frame. Each cover shall seat in its frame without rocking and shall be marked as a matched frame and cover before delivery to the project. The base of the frame shall be set in a full bed of Portland cement mortar and adjusted to conform to the finished pavement or shoulder elevation and slope. Castings meeting CMS 604 requirements and designed essentially the same and equally as strong as those shown hereon shall be provided.

**STEPS:** Steps shall conform to the material requirements of CMS 604. All steps shall have a depressed tread or a 13 mm minimum cleat height at the ends.

Friction-fit steps meeting the requirements of CMS 711.31 with a rebar may be used in precast manholes. The receiving holes for friction-fit steps shall not penetrate the manhole wall.

The Engineer may require the contractor to test load a maximum of one step per manhole to a proof load of 1780 N in direct pull. The equipment and method used shall meet the approval of the Engineer. If the selected step fails the pullout test, the remaining steps in that manhole shall also be tested. All steps not passing the pullout test shall be removed and a new step installed and tested to the satisfaction of the Engineer. Cost of testing shall be incidental to the unit price bid for the manhole.

**DROP PIPE:** When specified on the plans, the drop pipe shall be constructed as shown on SCD MH-3.1M.



***This Drawing Replaces MH-1.***

# OHIO DEPARTMENT OF TRANSPORTATION

**MANHOLE**  
**No. 1**

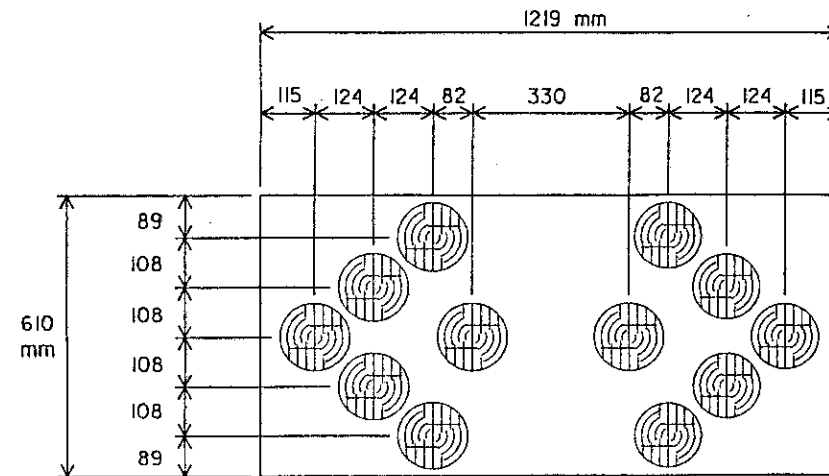
|             |
|-------------|
| <b>DATE</b> |
| 9-6-95      |
| 10-21-97    |

STANDARD  
CONSTRUCTION  
DRAWING

MH-1.1M

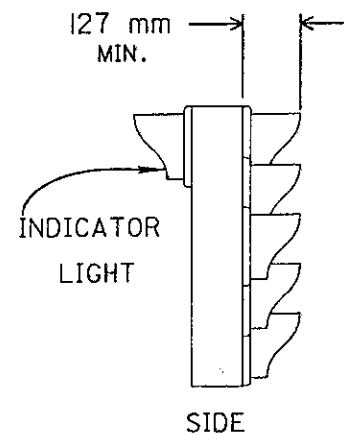
APPROVED: *Paul F. Suckland*

ALL MEASUREMENTS ARE IN MILLIMETERS



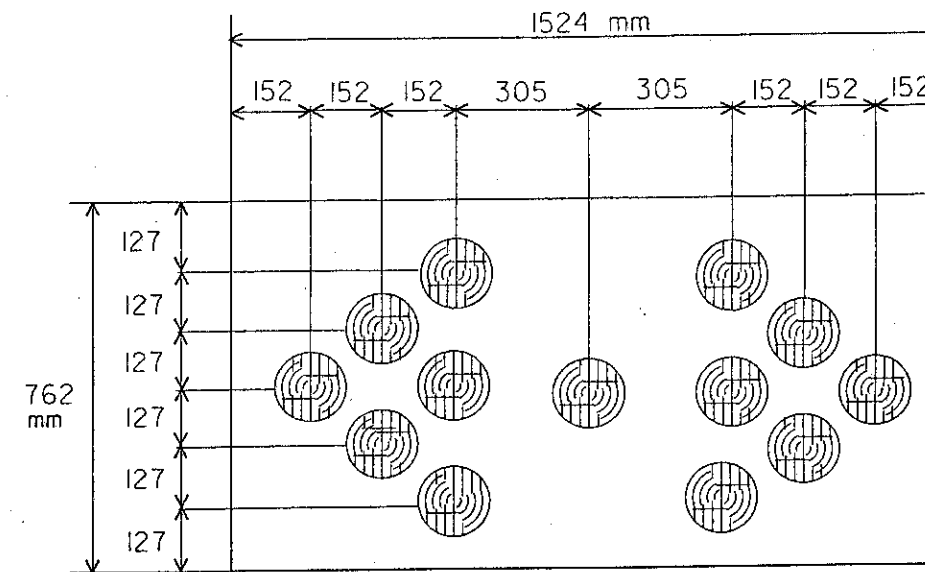
FRONT

TYPE A PANEL



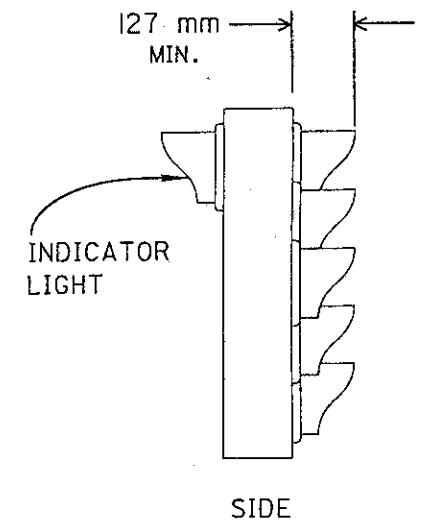
SIDE

ALL MEASUREMENTS ARE IN MILLIMETERS



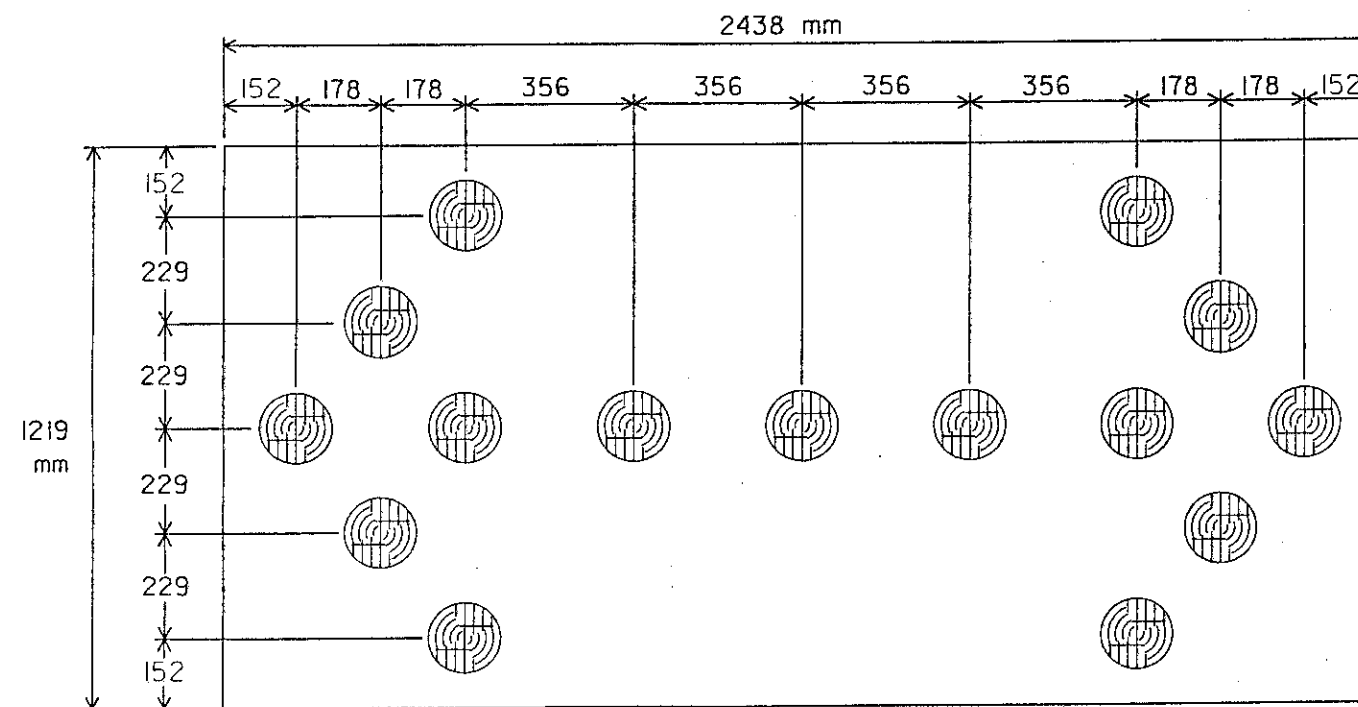
FRONT

TYPE B PANEL



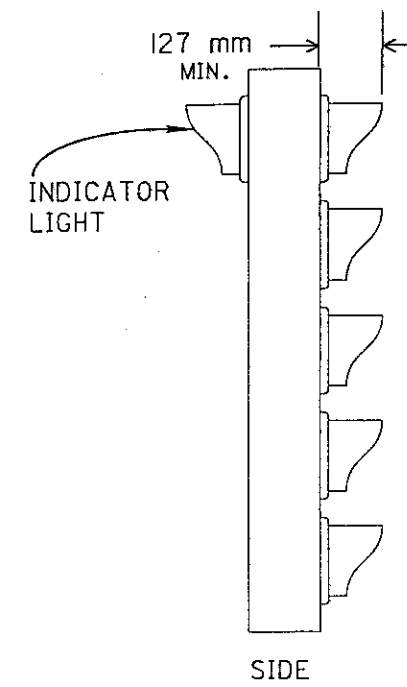
SIDE

ALL MEASUREMENTS ARE IN MILLIMETERS



FRONT

TYPE C PANEL



SIDE

M E T R I C

(SEE MT-35.11M FOR NOTES)

BUREAU OF DESIGN SERVICES  
DIVISION OF HIGHWAYS  
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

DATE  
01/30/95

FLASHING ARROW PANEL

STANDARD  
CONSTRUCTION  
DRAWING

MT-35.10M

APPROVED *[Signature]* ENGR. OF DESIGN SERVICES



## FLASHING ARROW PANEL

THE FLASHING ARROW PANEL SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- FLASHER PANEL
- LAMPS
- CONTROLS
- POWER SUPPLY
- MOUNTING

### A. FLASHER PANEL

THE FLASHER PANEL SHALL BE OF EXTERIOR TYPE PLYWOOD BY CORROSION RESISTANT METAL CONSTRUCTION OF ADEQUATE DESIGN AND STRENGTH. THE PANEL FINISH SHALL BE FLAT BLACK.

A FLASHER PANEL SHALL BE ONE OF THREE SIZES. THE TYPE A PANEL SHALL BE A NOMINAL 610 MILLIMETERS HIGH BY 1219 MILLIMETERS WIDE. TYPE B SHALL BE A NOMINAL 762 MILLIMETERS HIGH BY 1524 MILLIMETERS WIDE. TYPE C SHALL BE A NOMINAL 1219 MILLIMETERS HIGH BY 2438 MILLIMETERS WIDE.

FLASHING ARROW PANELS, SHALL NORMALLY UTILIZE HIGH OUTPUT (4412A AND 4415A) LAMPS POWERED BY AN ENGINE DRIVEN GENERATOR WHEN PERMITTED BY THE PLANS. THE CONTRACTOR MAY ALSO FURNISH UNITS POWERED BY A SOLAR ARRAY AND BATTERIES OR ONLY BATTERIES; HOWEVER THESE UNITS SHALL NOT BE USED WHERE THE APPROACHING TRAFFIC WOULD BE ON A HORIZONTAL CURVE IN EXCESS OF 3 DEGREES. THESE UNITS SHALL NOT BE USED IF THE APPROACHING TRAFFIC, CLOSER THAN 1.6 km (.8 km WHERE SPEED LIMITS ARE LESS THAN 64 km/h), IS MORE THAN 5 1/2 DEGREES HORIZONTALLY OR 2 DEGREES VERTICALLY FROM THE CENTRAL AXIS OF THE LENSE UNITS.

### B. LAMPS

FOR ENGINE POWERED GENERATOR UNITS, LAMPS SHALL BE ANSI NUMBER 4412A (PAR 46) FOR TYPE B AND C AND 4415A (PAR 36) FOR TYPE A. THE LAMP SHALL BE FITTED WITH AN UPPER HOOD OF NOT LESS THAN 180° AT LEAST 127 MILLIMETERS LONG. ARROW PANELS MAY USE A LOWER POWER (WATTAGE) LAMP THAN THE STANDARD ARROW PANELS. THE LAMPS SHALL BE APPROXIMATELY 127 MILLIMETER DIAMETER WITH A PARABOLIC REFLECTOR. THE LAMP SHALL PROVIDE IMPROVED LIGHT DISTRIBUTION CONTROL BY MEANS OF HIGH QUALITY REFLECTORS AND REFRACTORS. THE LIGHT OUTPUT FROM EACH LAMP OF THE ARROW SHALL NOT BE LESS THAN SHOWN IN FIGURE I WHEN OPERATING AT FULL DAYTIME BRIGHTNESS:

THE LAMPS SHALL BE SECURELY MOUNTED AND POSITIONED IN THE PANEL PERPENDICULAR TO THE PANEL FACE AND ORIENTED SO THAT THE LAMP LOCATION LUG (ON BACK OF THE LAMP) IS ON THE HORIZONTAL CENTER LINE THROUGH THE LENS. THE LUG WILL BE ON THE RIGHT SIDE OF THE LAMP AS VIEWED FROM THE FRONT.

THE LAMPS SHALL BE WIRED IN CIRCUITS THAT CAN BE SWITCHED TO DISPLAY ANY ONE OF THE FOLLOWING MESSAGES: LEFT ARROW, RIGHT ARROW, LEFT AND RIGHT, AND CAUTION BAR. A MINIMUM OF THREE INDICATOR LIGHTS SHALL BE PLACED ON THE BACK OF THE PANEL TO INDICATE WHICH MESSAGE MODE IS IN OPERATION.

EACH PANEL SHALL CONTAIN THE FOLLOWING NUMBER OF LAMPS AS A MINIMUM: TYPE A-12 LAMPS, TYPE B-13 LAMPS, TYPE C-15 LAMPS.

LUX POWER CHART

|      |      |        |      |      |      |       |               |
|------|------|--------|------|------|------|-------|---------------|
|      |      | 215    | 215  | 215  |      |       | 4°            |
| 108  | 1076 | 1614   | 2152 | 1614 | 1076 | 108   | 2°            |
| 215  | 2152 | 4304   | 5380 | 4304 | 2152 | 215   | 0° HORIZONTAL |
| 108  | 1076 | 1614   | 2152 | 1614 | 1076 | 108   | - 2°          |
|      |      | 215    | 215  | 215  |      |       | - 4°          |
| 7.5° | 5°   | 2.5°   | 0°   | 2.5° | 5°   | 7.5°  |               |
| LEFT |      | CENTER |      |      |      | RIGHT |               |

FIGURE I

- MEASUREMENTS EXPRESSED IN LUX.
- COLOR OF OUTPUT LIGHT SHALL BE YELLOW TO LIGHT YELLOW.

### C. CONTROLS

EACH FLASHING ARROW PANEL SHALL CONTAIN A FLASHER CONTROL AND A DIMMER CONTROL UNIT HOUSED IN A CABINET WHICH CAN BE LOCKED.

#### 1. FLASHER CONTROL

THE FLASH RATE FOR THE SIGN PANEL SHALL BE 25 TO 40 FLASHES PER MINUTE. THE FLASHER SHALL NOT CAUSE ELECTROMAGNETIC INTERFERENCE. THE LAMPS SHALL HAVE A MINIMUM "ON TIME" OF 50% AND A MAXIMUM OF 66%.

#### 2. DIMMER CONTROL

LAMP INTENSITY SHALL BE VARIABLE BY MEANS OF A PHOTOELECTRICALLY CONTROLLED CIRCUIT WHICH SHALL REDUCE LAMP OUTPUT DURING LOW AMBIENT LIGHT CONDITIONS. THE PHOTOELECTRIC CONTROL SHALL BE CALIBRATED TO ACTUATE A LAMP DIMMING CIRCUIT AT 22 TO 54 AMBIENT LUX AND TO RESTORE THE LIGHTS TO NORMAL AT 54 TO 108 AMBIENT LUX. A TIME DELAY SHALL BE BUILT INTO THE CONTROL TO PREVENT FALSE OPERATION DUE TO LIGHT FLASHES. THE PHOTOELECTRIC CONTROL SHALL CONTAIN A SWITCH WHICH SHALL OVERRIDE THE PHOTOELECTRIC CONTROL. THE DIMMING CIRCUIT SHALL BE EXTERNALLY ADJUSTABLE SUCH THAT THE LIGHT OUTPUT MAY BE ADJUSTED WITHIN THE RANGE OF 50% TO 100% OF THE NORMAL LAMP OUTPUT. IT SHALL NORMALLY BE SET AT 50% UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

### D. POWER SUPPLY

THE FLASHING ARROW PANEL SHALL OPERATE FROM POWER SOURCES CAPABLE OF CONTINUOUSLY FURNISHING THE PROPER VOLTAGE TO THE LAMPS A MINIMUM OF 24 HOURS WITHOUT ATTENDANCE.

### D. CONT.

MOTOR GENERATORS, IF USED SHALL BE OF MODERN DESIGN TO PROVIDE LOW EMISSION OF POLLUTANTS AND SHALL BE PROPERLY MUFFLED. THE MOTOR GENERATOR SHALL BE ENCLOSED IN A MESH ENCLOSURE WHICH CAN BE LOCKED. THE FUEL TANK SHALL HAVE A CAP WHICH CAN BE LOCKED. MOTOR GENERATORS SUPPLYING POWER TO A FLASHING ARROW SIGN SHALL NOT BE USED TO SUPPLY POWER TO OTHER EQUIPMENT. GASOLINE FUELED ENGINES SHALL NOT BE USED.

BATTERY AND SOLAR/BATTERY UNITS SHALL HAVE A NO-CHARGE-LIFE OF NOT LESS THAN 15 DAYS. NO-CHARGE-LIFE IS THE NUMBER OF CONSECUTIVE DAYS THAT THE SYSTEM CAN CONTINUE TO FUNCTION (DOUBLE ARROW MODE, NORMAL DIMMING DURING 12 HOUR NIGHT, FULL OUTPUT DURING 12 HOUR DAY) STARTING WITH A FULL BATTERY CHARGE AND WITH NO ADDITIONAL CHARGE BEING PROVIDED BY THE SOLAR CELLS. THE NO-CHARGE-LIFE MAY BE BASED UPON CALCULATIONS PROVIDING THAT MANUFACTURER'S RATINGS AND EFFICIENCY CALCULATIONS ARE FURNISHED FOR EACH MAJOR COMPONENT.

### E. MOUNTING

THE FLASHING ARROW PANEL MAY BE TRAILER OR VEHICLE MOUNTED OR MOUNTED ON A RIGID SUPPORTING DEVICE SUITABLE FOR MAINTAINING IT IN THE DESIGNATED POSITION. EACH OF THE MOUNTING METHODS SHALL BE SUITABLY STABLE SUCH AS TO PREVENT MOVEMENT DUE TO HIGH WINDS OR PASSAGE OF LARGE VEHICLES.

WHEN A TRAILER IS USED, CONSTRUCTION SHALL BE SUCH AS TO TRANSPORT THE FLASHING ARROW PANEL AND APPURTANCES ADEQUATELY AND LEGALLY AS WELL AS SUPPORT THEM PROPERLY DURING OPERATION. THE TRAILER SHALL BE EQUIPPED WITH DEVICES WHICH SHALL PROVIDE LEVELING AND STABILITY DURING OPERATION.

MINIMUM ARROW PANEL MOUNTING HEIGHT SHALL BE 2.1m ABOVE THE PAVEMENT SURFACE (MEASURED TO THE BOTTOM OF THE PANEL).

### USE AND OPERATION

THE FLASHING ARROW PANEL SHALL BE LOCATED AS SHOWN IN THE MAINTENANCE OF TRAFFIC DRAWINGS OR AS DIRECTED BY THE ENGINEER AND OPERATED CONTINUOUSLY DURING TRAFFIC MAINTAINED PERIODS. THE CONTRACTOR SHALL SUPPLY ALL FUEL, LUBRICANTS AND PARTS NECESSARY TO OBTAIN CONTINUOUS OPERATION AND SHALL PROVIDE ALL SERVICE. THE CONTRACTOR SHALL INSPECT THE OPERATION OF THE UNIT DAILY, INCLUDING WEEKENDS AND HOLIDAYS. THE CONTRACTOR SHALL ARRANGE WITH THE ENGINEER, AN ACCEPTABLE METHOD OF OBTAINING SERVICE FOR A MALFUNCTIONING PANEL WITHIN 30 MINUTES OF A REPORTED MALFUNCTION. LAMP INTENSITY SHALL BE ADJUSTED TO PROVIDE MINIMUM LEGIBILITY DISTANCES OF .8 km (TYPE A), 1.21 km (TYPE B) AND 1.6 km (TYPE C).

TYPE C PANELS SHALL BE USED FOR STATIONARY OPERATIONS ON HIGH SPEED (88 km/h OR GREATER), HIGH VOLUME ROADWAYS. TYPE B SHALL BE USED FOR STATIONARY OPERATIONS ON INTERMEDIATE SPEED (64-80 km/h) FACILITIES, AND TYPE A ON LOW SPEED (32-56 km/h) FACILITIES.

IN ADDITION, TYPE B PANELS SHALL BE USED FOR MOVING OPERATIONS ON FREEWAYS AND EXPRESSWAYS AND TYPE A FOR MOVING OPERATIONS ON OTHER FACILITIES.

BATTERY AND SOLAR/BATTERY UNITS SHALL BE FULLY CHARGED WHEN FIRST SET UP. THEY SHALL HAVE GAUGES TO INDICATE APPROXIMATE BATTERY CHARGE REMAINING. THE CONTRACTOR SHALL VERIFY DAILY THAT THE UNIT IS OPERATING SATISFACTORILY AND THE REMAINING BATTERY CHARGE IS SUFFICIENT FOR AT LEAST 2 MORE DAYS.

FLASHING ARROW PANELS ARE NOT TO BE USED ON TWO LANE-TWO WAY ROADWAYS.

WHEN LEFT UNATTENDED THE CONTROL CABINET, MOTOR GENERATOR ENCLOSURE AND FUEL TANK SHALL BE LOCKED.

TYPE A AND TYPE B PANELS USED IN MOVING OPERATIONS MAY BE POWERED BY THE VEHICLE'S ELECTRICAL SYSTEM BUT SHALL NOT BE LEFT UNATTENDED WHEN SO POWERED.

WHEN NOT IN USE, THE FLASHING ARROW PANEL SHALL BE STORED AT A LOCATION WHICH WILL NOT BE HAZARDOUS TO TRAFFIC OR PEDESTRIANS.

THE PANELS SHALL BE DESIGNED FOR OPERATION IN 100% HUMIDITY AND TEMPERATURES FROM -29 TO + 54 DEGREES CELSIUS.

M E T R I C

BUREAU OF DESIGN SERVICES  
DIVISION OF HIGHWAYS  
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

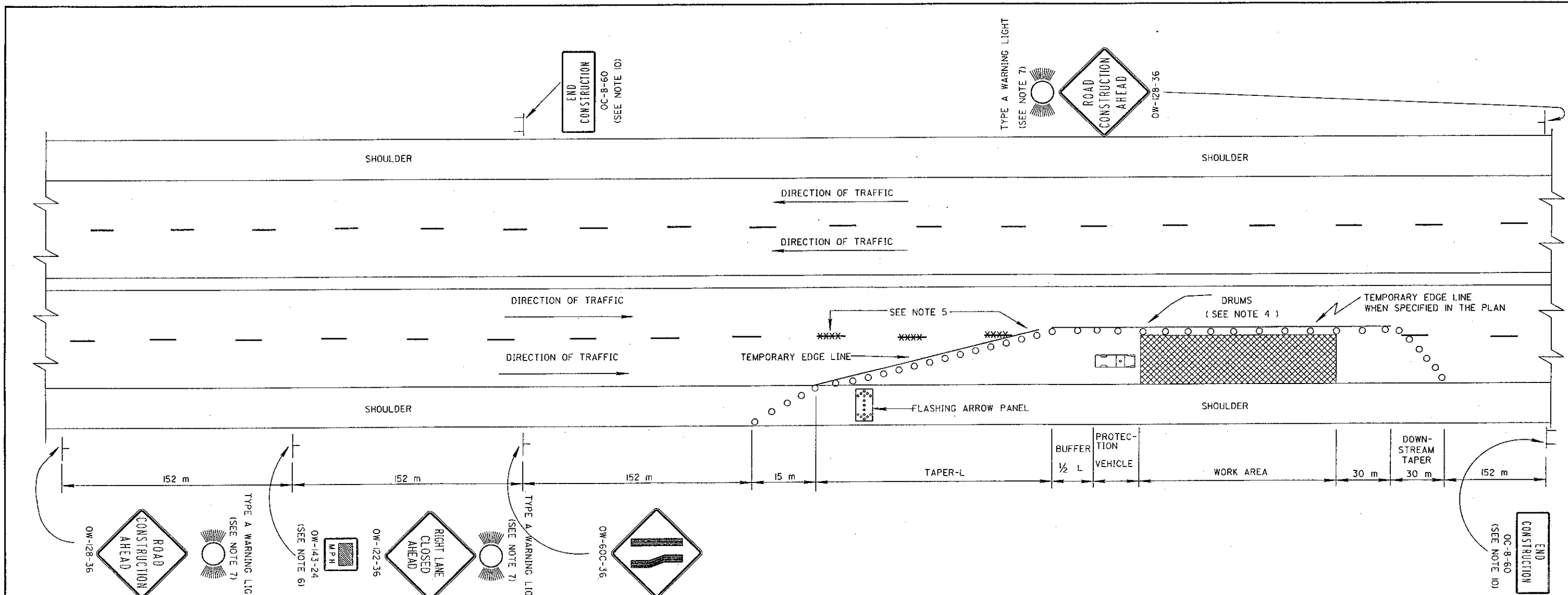
DATE  
01/30/95

FLASHING ARROW PANEL  
NOTES

STANDARD  
CONSTRUCTION  
DRAWING

MT-35.IIM

APPROVED: *[Signature]* ENGR. OF DESIGN SERVICES



GENERAL NOTES:

1. THE LOCATION OF THE MERGING TAPER AND THE ADVANCE WARNING SIGNS SHOULD BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTICAL AND HORIZONTAL ROADWAY ALIGNMENT.
2. THE SPACING BETWEEN PROPOSED SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 61m CLEARANCE TO EXISTING SIGNS.
3. THIS TAPER LENGTH (L) AND SPACING (S) OF DRUMS SHALL CONFORM TO TABLE I. DRUM SPACING (S) SHALL BE USED FOR THE MERGING TAPER, THE BUFFER AREA AND FOR THE FIRST 305 m OF THE WORK AREA AND AT OTHER HAZARDOUS LOCATIONS AS DIRECTED BY THE ENGINEER. THE MAXIMUM DRUM SPACING FOR THE BALANCE OF THE WORK AREA IS TO BE TWO TIMES THE SPACING (S) IN TABLE I. A MINIMUM OF 5 DRUMS SHALL BE USED TO CLOSE THE SHOULDER AND THE DOWNSTREAM TAPER.
4. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.
5. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMs) SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED ALONG THE TAPER. TEMPORARY EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE
5. CONT. AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.
6. THE ADVISORY SPEED SIGN OW-143 SHALL BE USED WHEN SPECIFIED IN THE PLAN.
7. TYPE A FLASHING WARNING LIGHTS SHOWN ON THE OW-128 AND OW-122 SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
8. THE FLASHING ARROW PANEL SHALL MEET REQUIREMENTS OF STANDARD CONSTRUCTION DRAWING TC-35.10M.
9. THE PROTECTION VEHICLE SHOWN AT THE BEGINNING OF THE WORK AREA SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.
10. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

11. OW-128 SIGNS SHALL BE PROVIDED ON ENTRANCE RAMP AND/OR SIDE ROADS LOCATED WITHIN THE WORK LIMITS OR THE ADVANCE WARNING SIGN GROUP. WITHIN THE LENGTH OF CLOSURE, PROVISION SHALL BE MADE TO CONTROL TRAFFIC ENTERING FROM INTERSECTING STREETS AND DRIVEWAYS. THREE DRUMS SHALL BE PLACED ON EACH SIDE ACROSS THE CLOSED LANE AT EACH INTERSECTION AND DRIVEWAY.
12. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

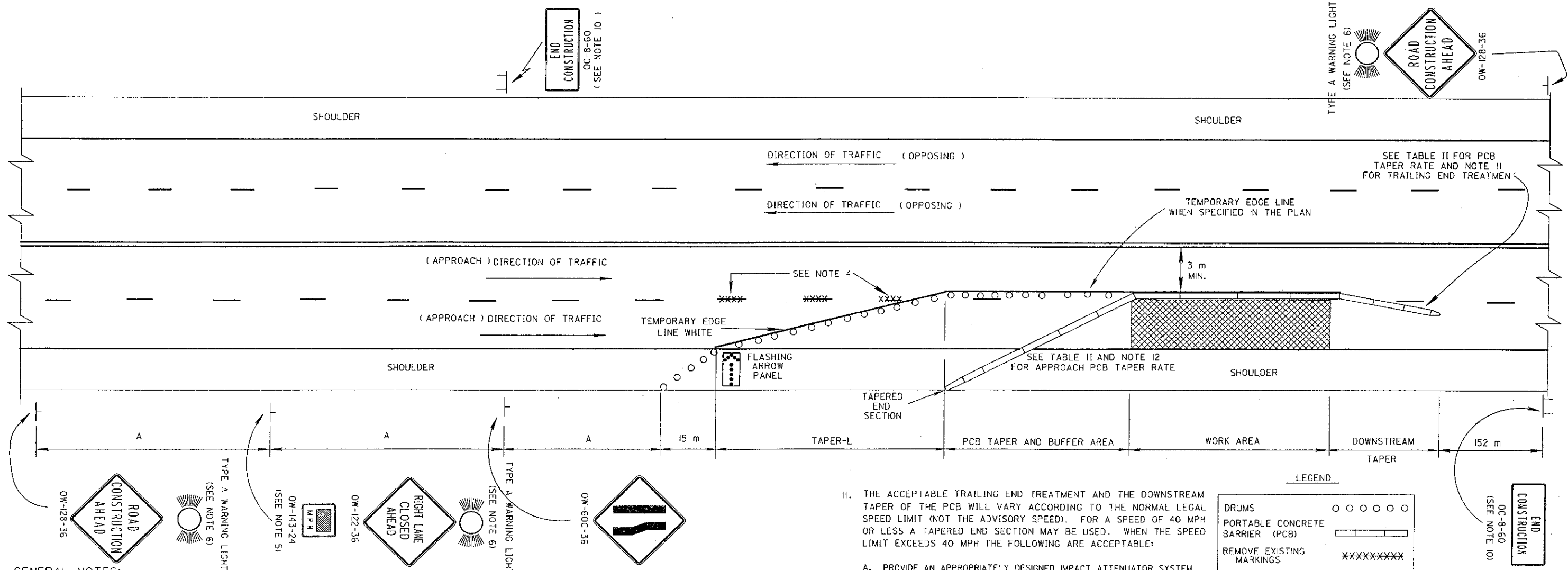
TABLE I

| SPEED LIMIT (MPH) | MINIMUM TAPER (L) (METERS) | MAXIMUM SPACING (S) OF DRUMS |
|-------------------|----------------------------|------------------------------|
| 20-25             | 38                         | 6                            |
| 30-40             | 98                         | 12                           |
| 45-55             | 201                        | 12                           |

METRIC

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

|                                                                                                 |                  |
|-------------------------------------------------------------------------------------------------|------------------|
| BUREAU OF DESIGN SERVICES<br>DIVISION OF HIGHWAYS<br>OHIO DEPARTMENT OF TRANSPORTATION          |                  |
| MAINTENANCE OF TRAFFIC<br>CLOSING RIGHT LANE OF A<br>MULTI-LANE UNDIVIDED HIGHWAY<br>WITH DRUMS | DATE<br>04/25/94 |
| STANDARD<br>CONSTRUCTION<br>DRAWING<br>APPROVED <i>[Signature]</i> ENGR. OF DESIGN SERVICES     | MT-95.31M        |



#### GENERAL NOTES:

1. THE LOCATION OF THE MERGING TAPER AND THE ADVANCE WARNING SIGNS SHOULD BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTICAL AND HORIZONTAL ROADWAY ALIGNMENT.
2. THE SPACING BETWEEN PROPOSED SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 61 m CLEARANCE TO EXISTING SIGNS.
3. THE TAPER LENGTH (L) AND SPACING (S) OF DRUMS SHALL CONFORM TO TABLE II. DRUM SPACING (S) SHALL BE USED FOR THE MERGING TAPER AND THE BUFFER AREA. A MINIMUM OF 5 DRUMS SHALL BE USED TO CLOSE THE SHOULDER.
4. THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMs) SHALL BE REMOVED AT NO ADDITIONAL COST. THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED ALONG THE TAPER. TEMPORARY PAVEMENT MARKINGS WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE-C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, TEMPORARY PAVEMENT MARKINGS SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND RAISED PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.
5. THE ADVISORY SPEED SIGN OW-143 SHALL BE USED WHEN SPECIFIED IN THE PLAN.
6. TYPE A FLASHING WARNING LIGHTS SHOWN ON THE OW-128 AND OW-122 SIGNS ARE REQUIRED.

7. THE FLASHING ARROW PANEL SHALL MEET REQUIREMENTS OF STANDARD CONSTRUCTION DRAWING TC-35.10M.
8. PCB SHALL BE DELINEATED AS FOLLOWS:

#### PCB TYPE

#### DELINEATION

|                                     |                                                                                                            |
|-------------------------------------|------------------------------------------------------------------------------------------------------------|
| 813 mm HIGH WITHOUT GLARE SCREEN    | BARRIER REFLECTORS @ 7.6 m C-C (MAX.)<br>TOP MOUNTED OBJECT MARKERS<br>(229 mm X 381 mm) @ 7.6 m C-C MAX.) |
| 813 mm HIGH WITH GLARE SCREEN       | BARRIER REFLECTORS @ 7.6 m C-C (MAX.)<br>VERTICAL STRIPES ON PADDLES<br>(51 mm X 305 mm) @ 3.8 m C-C MAX.) |
| 1270 mm HIGH                        | BARRIER REFLECTORS @ 7.6 m C-C (MAX.)                                                                      |
| TAPERED END SECTION AND EXPOSED END | OBJECT MARKERS (229 mm X 381 mm)<br>TOP MOUNTED @ EACH END                                                 |

9. OW-128 SIGNS SHALL BE PROVIDED ON SIDE ROADS LOCATED WITHIN THE WORK LIMITS OR THE ADVANCE WARNING SIGN GROUP. WITHIN THE LENGTH OF CLOSURE, PROVISION SHALL BE MADE TO CONTROL TRAFFIC ENTERING FROM INTERSECTING STREETS AND DRIVEWAYS. THREE DRUMS SHALL BE PLACED ACROSS THE CLOSED LANE AT EACH INTERSECTION AND DRIVEWAY.
10. THE OC-8 SIGNS MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

11. THE ACCEPTABLE TRAILING END TREATMENT AND THE DOWNSTREAM TAPER OF THE PCB WILL VARY ACCORDING TO THE NORMAL LEGAL SPEED LIMIT (NOT THE ADVISORY SPEED). FOR A SPEED OF 40 MPH OR LESS A TAPERED END SECTION MAY BE USED. WHEN THE SPEED LIMIT EXCEEDS 40 MPH THE FOLLOWING ARE ACCEPTABLE:
  - A. PROVIDE AN APPROPRIATELY DESIGNED IMPACT ATTENUATOR SYSTEM.
  - B. ON OUTSIDE EDGE OF ROAD: EXTEND PCB AT APPROPRIATE TAPER TO 9.1 m FROM EDGE OF NEAREST OPPOSING TRAFFIC LANE.
12. THE SPEED LIMIT CHOSEN FOR DESIGN OF APPROACH TAPERS SHALL BE THE NORMAL LEGAL SPEED EXCEPT WHERE THE LEGAL SPEED LIMIT IS REDUCED DUE TO THE CONSTRUCTION AND THE SUBJECT LANE CLOSURE IS NOT THE FIRST ACTIVE CONSTRUCTION AREA ENCOUNTERED BY TRAFFIC WITHIN THE PROJECT.
13. NO EQUIPMENT OR MATERIAL SHALL BE LOCATED OTHER THAN BEHIND THE PCB.

TABLE I

| MINIMUM DISTANCE (METERS) | A   |
|---------------------------|-----|
| URBAN                     | 61  |
| MAJOR STANDARD            | 152 |

TABLE II

| SPEED LIMIT (MPH) * | MINIMUM DRUM TAPER (L) (METERS) | MAXIMUM SPACING (S) OF DRUMS (METERS) | PCB TAPER RATE | DOWN-STREAM TAPER LENGTH (METERS) |
|---------------------|---------------------------------|---------------------------------------|----------------|-----------------------------------|
| 20 - 25             | 38                              | 6                                     | 7:1            | 17                                |
| 30 - 40             | 98                              | 12                                    | 11:1           | 20                                |
| 45 - 55             | 201                             | 12                                    | 16:1           | 21                                |

\* SEE NOTE 12

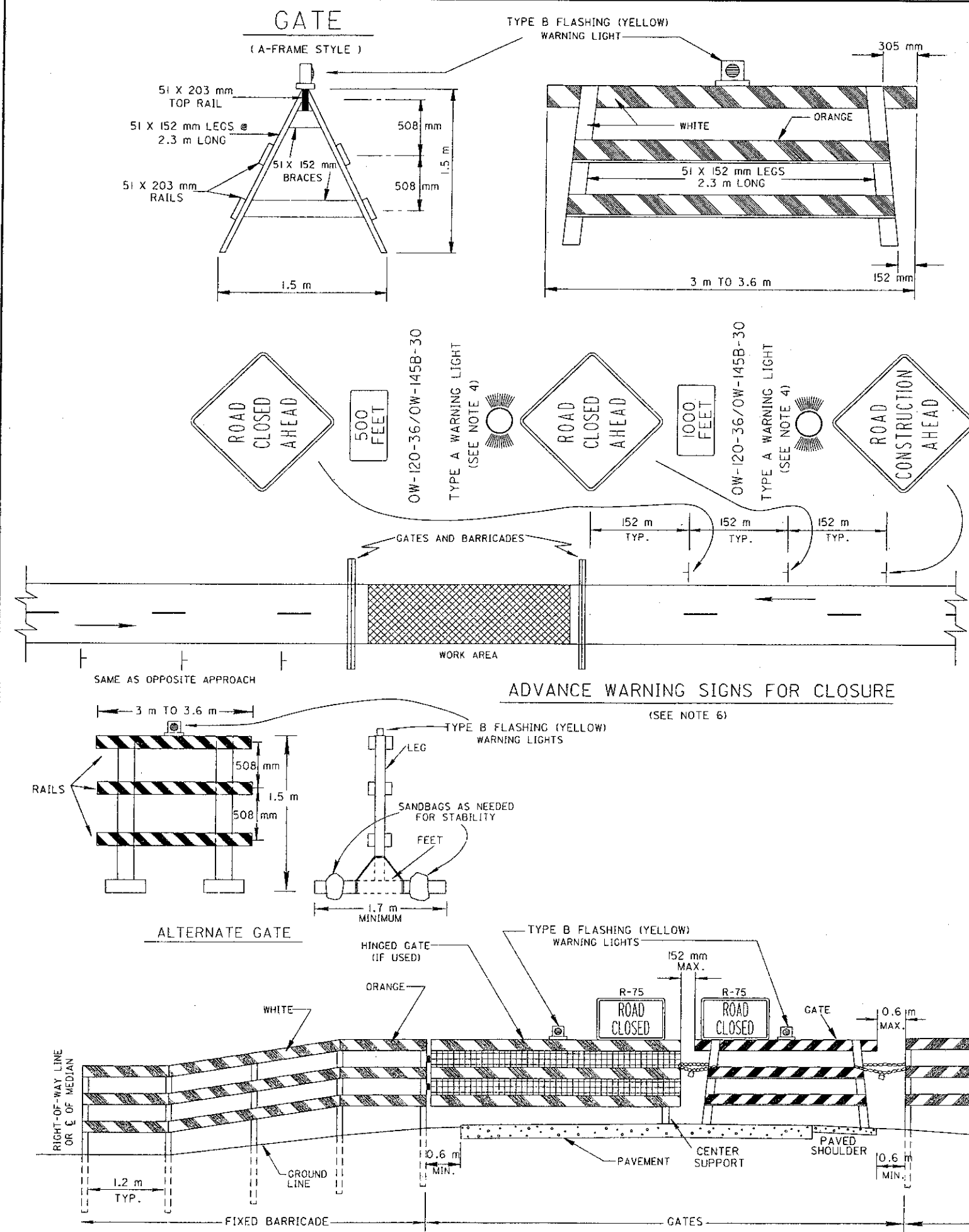
#### LEGEND

|                                 |           |
|---------------------------------|-----------|
| DRUMS                           | ○ ○ ○ ○ ○ |
| PORTABLE CONCRETE BARRIER (PCB) | ▬         |
| REMOVE EXISTING MARKINGS        | *****     |

## METRIC

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF THE OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

|                                                                                           |                  |
|-------------------------------------------------------------------------------------------|------------------|
| BUREAU OF DESIGN SERVICES<br>DIVISION OF HIGHWAYS<br>OHIO DEPARTMENT OF TRANSPORTATION    |                  |
| MAINTENANCE OF TRAFFIC                                                                    | DATE<br>04/25/94 |
| CLOSING RIGHT LANE OF A<br>MULTI-LANE UNDIVIDED HIGHWAY<br>WITH PORTABLE CONCRETE BARRIER |                  |
| STANDARD<br>CONSTRUCTION<br>DRAWING                                                       | MT-95.4IM        |
| APPROVED <i>[Signature]</i> ENGR. OF DESIGN SERVICES                                      |                  |



# GENERAL NOTES

- BARRICADES:** BARRICADES SHALL BE CONSTRUCTED ACCORDING TO DETAILS SHOWN. 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 IMPRACTICAL TO EXTEND THE BARRICADE TO THE RIGHT-OF-WAY LINE BECAUSE OF A SIDEWALK WHICH IS TO REMAIN OPEN 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:** IN CONSTRUCTION OR MAINTENANCE AREAS ALL RAILS OF THE BARRICADES AND GATES SHALL BE REFLECTORIZED WITH ORANGE AND WHITE REFLECTORIZED TYPE G SHEETING IN 152 mm WIDE ALTERNATE STRIPES WHICH SLOPE DOWNWARD TOWARD THE CENTER LINE OF THE ROAD AT AN ANGLE OF 45°. THE TOP RAIL OF THE A-FRAME AND ALL THREE RAILS OF THE HINGED GATE SHALL BE STRIPED ON BOTH SIDES. ALL POST, BRACES, GATE LEGS, AND ANY UNSTRIPED RAILS SHALL BE PAINTED WHITE. (GATES AND BARRICADES USED IN PERMANENT OR SEMIPERMANENT APPLICATION SHALL DIFFER ONLY IN THAT THEY SHALL USE RED AND WHITE STRIPES).
- GATES:** ONE GATE SHALL BE ERECTED FOR EACH TRAFFIC LANE. GATES SHALL BE CHAINED AND PADLOCKED TO ONE ANOTHER AND TO ADJACENT POST OF THE BARRICADES. CHAINS SHALL BE 6.4 mm STOCK OR LARGER WITH WELDED LINKS. A HINGED GATE MAY BE USED AND SHALL BE SUPPORTED AT THE CENTER IN AN APPROVED MANNER.
- TYPE A FLASHING WARNING LIGHTS:** TYPE A FLASHING WARNING LIGHTS ARE REQUIRED ON THE OW-128 AND THE FIRST OW-120 SIGNS.
- TYPE B FLASHING WARNING LIGHTS:** EACH GATE SHALL BE EQUIPPED WITH A TYPE B FLASHING WARNING LIGHT, CONSPICUOUSLY VISIBLE AT ALL DISTANCES UP TO 305 m UNDER NORMAL ATMOSPHERIC CONDITIONS. THE LIGHT SHALL BE IN OPERATION AT ALL TIMES DURING THE PERIOD THE HIGHWAY IS CLOSED.
- SIGNS:** WHERE THE ROAD IS CLOSED TO TRAFFIC BY THE ERECTION OF GATES AND BARRICADES, R-75 SIGNS SHALL BE MOUNTED ON THE GATES AS SHOWN. THE ADVANCE WARNING SIGNS SHOWN ON THIS DRAWING WILL NOT BE REQUIRED WHEN ALL TRAFFIC HAS BEEN DIRECTED FROM THE ROADWAY AT OR JUST IN ADVANCE OF THE GATES AND BARRICADES SUCH AS ON A LIMITED ACCESS HIGHWAY OR WHEN A TEMPORARY RUNAROUND SIMILAR TO FIGURE C-24 OF THE OHIO MANUAL IS USED. ADVANCE WARNING SIGNS SHALL BE REQUIRED IN ALL OTHER SITUATIONS AND WHEN REQUIRED IN THE PLANS. ADVANCE WARNING SIGNS ON AN APPROACH SHALL CONSIST OF TWO OW-120 SIGNS WITH DISTANCE PLAQUES PLACED ABOUT 152 m AND 305 m FROM THE CLOSURE AND A OW-128 PLACED ABOUT 457 m FROM CLOSURE. THE SIGNS SHALL BE PLACED ON BOTH SIDES OF THE ROAD (DUALLED) FOR 4-LANE DIVIDED HIGHWAYS OR WHEN REQUIRED BY THE PLANS.

**7. OPERATION:** ON A 2-LANE 2-WAY ROADWAY THE CONTRACTOR WILL NORMALLY OPEN ONLY THE LEFT HAND GATE AS NECESSARY TO ALLOW VEHICLES TO ENTER AND IMMEDIATELY CLOSE IT. BOTH GATES WILL NOT NORMALLY BE OPENED AT THE SAME TIME. THE CONTRACTOR SHALL ASSIGN AN EMPLOYEE TO ASSURE THAT GATES ARE CLOSED AND CHAINED SHUT AT THE END OF EACH WORKDAY.

**8. MATERIALS:** GATES OR BARRICADES SHALL BE FABRICATED OF THE FOLLOWING MATERIALS:

**FIXED BARRICADE:**

**POST:** - 102 X 102 mm SQUARE OR 127 mm DIA. (MAXIMUM) WOOD (MAY BE TREATED)

- NO. 3, DRIVE POST (712.20)
- UP TO 51 mm SQUARE, 14 GAUGE PUNCHED STEEL TUBING

**RAILS:** - 25 X 203 mm OR 51 X 203 mm COMMON LUMBER

- 203 X (16 TO 25 mm) THICK EXTERIOR PLYWOOD
- EXTRUDED PLASTIC OR FORMED SHEET METAL WITH A 203 mm WIDE SURFACE AND OF SUFFICIENT STIFFNESS TO RESIST TYPICAL WIND LOADS OF UP TO 1436 pascals, BUT HAVING A WEIGHT OF NOT MORE THAN 7.5 kg/m.

**FASTENERS:** - SPIKES (OF SUFFICIENT LENGTH TO CLINCH)

- SCREWS/BOLTS (8 mm MIN. DIA.) METAL GUSSET PLATES AND FORMED OR WELDED METAL JOINTS OF SUFFICIENT SIZE AND QUANTITY TO RESIST THE WIND LOAD SPECIFIED ABOVE. ALL SLIPFIT CONNECTIONS SHALL ALSO BE BOLTED TO PREVENT UNAUTHORIZED DISASSEMBLY

**GATES:**

**LEGS:** - 51 X 152 mm COMMON LUMBER ("A FRAME" ONLY)

- 102 X 102 mm WOOD
- UP TO 51 mm SQUARE, 14 GAUGE PUNCHED STEEL TUBING
- NO. 3 DRIVE POST (712.20)

**RAILS:** - 51 X 203 mm COMMON LUMBER

**FASTENERS:** (SAME AS BARRICADES ABOVE)

**FEET:** - 152 X 152 mm WOOD

- NO. 3 DRIVE POST (712.20)
- UP TO 57 mm SQUARE, 12 GAUGE PUNCHED STEEL TUBING

**BRACES:** - 51 X 152 mm (MAXIMUM) COMMON LUMBER

- 102 mm WIDE X 19 mm THICK PLYWOOD STRIPS
- NO. 2 DRIVE POST (712.20)

**HINGED GATE:**

**GATE:** - 3.6 m X 1.2 m STEEL FRAME, FARM GATE

**RAILS:** (SAME AS FIXED BARRICADES ABOVE)

**HARDWARE:** - HINGED SCREWHOOKS FOR HANGING GATE TO POST

**9. LUMBER:** LUMBER USED IN THE CONSTRUCTION OF GATES AND BARRICADES SHALL BE COMMON YELLOW PINE OR COMMON DOUGLAS FIR, SURFACED ON FOUR SIDES STANDARD, ALL SIZES ARE NOMINAL.

## METRIC

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

|                                                                                        |                          |
|----------------------------------------------------------------------------------------|--------------------------|
| BUREAU OF DESIGN SERVICES<br>DIVISION OF HIGHWAYS<br>OHIO DEPARTMENT OF TRANSPORTATION |                          |
| MAINTENANCE OF TRAFFIC                                                                 | DATE<br>04/25/94         |
| GATES AND BARRICADES<br>IN POSITION                                                    |                          |
| STANDARD<br>CONSTRUCTION<br>DRAWING MT-101.60M                                         |                          |
| APPROVED <i>[Signature]</i>                                                            | ENGR. OF DESIGN SERVICES |



# TEMPORARY SIGN SUPPORT REQUIREMENTS

## A. PLACEMENT OF SIGNS WHICH WILL REMAIN MORE THAN ONE DAY:

- 1) LATERAL PLACEMENT TO NEAREST EDGE OF SIGNS SHALL BE AS FOLLOWS:
  - a) ON THE RIGHT SIDE OF THE ROAD FOR APPROACHING TRAFFIC (EXCEPT FOR DUAL MOUNTED SIGNS AND SIGNS DESIGNATED IN THE PLANS FOR LEFT SIDE MOUNTING).
  - b) CURBED ROADWAY - MINIMUM 0.6 m BEHIND FACE OF CURB.
  - c) UNCURBED ROADWAY- 3.7 m FROM EDGE OF TRAFFIC LANE OR 1.8 m FROM EDGE OF PAVED OR USEABLE SHOULDER, WHICHEVER IS GREATER.
  - d) BEHIND GUARDRAIL OR BARRIER - PREFERABLY 0.6 m BEHIND FACE OF GUARDRAIL (MINIMUM 0.3 m) FOR SIGNS ON CLASS A SUPPORTS; 1.2 m FOR CLASS B OR C SUPPORTS; 0.3 m BEHIND FACE OF CONCRETE BARRIER UNLESS BARRIER TOP MOUNTING IS REQUIRED BY THE PLAN.
- 2) VERTICAL CLEARANCE OF SIGNS, MEASURED ABOVE ROADWAY ELEVATION, SHALL BE AS FOLLOWS:
  - a) RURAL - 1.5 m WHEN PARKED CARS, CONSTRUCTION EQUIPMENT, ETC WILL NOT OBSCURE SIGN VISIBILITY.
  - b) RURAL AREAS WITH PARKED CARS OR CONSTRUCTION EQUIPMENT - 2.1 m
  - c) URBAN - 2.1 m
  - d) CARE SHALL BE TAKEN TO ASSURE THAT SIGNS WILL NOT BE OBSCURED BY CONSTRUCTION EQUIPMENT, TREES, WEEDS OR OTHER OBSTACLES. BRUSH, WEEDS OR GRASS WITHIN THE RIGHT OF WAY SHALL BE TRIMMED AS NECESSARY. SIGNS SHALL NORMALLY BE VISIBLE TO TRAFFIC 122 m TO 183 m IN ADVANCE OF THE SIGN.
- 3) SUPPORTS FOR SIGNS WHICH WILL REMAIN IN PLACE MORE THAN ONE DAY SHALL BE FIXED RATHER THAN PORTABLE EXCEPT IN SITUATIONS WHERE THE SIGN MUST REST ON PERMANENT PAVEMENT OR OTHER SURFACE WHICH WOULD BE DAMAGED BY INSERTION OF POST TYPE SUPPORTS.

## B. PLACEMENT OF SIGNS WHICH WILL REMAIN FOR ONE DAY OR LESS:

- 1) SAME AS A-1 ABOVE EXCEPT THAT SIGNS MAY BE PLACED ON THE ROADWAY ONLY IF THEY DO NOT INTRUDE INTO A TRAFFIC LANE IN USE.
- 2) MINIMUM OF 0.3 m ABOVE ROADWAY

## C. CLASSES OF SUPPORTS:

ALL TEMPORARY SIGN SUPPORTS SHALL BE OF THE FOLLOWING TYPES:

### 1) CLASS A:

SUPPORTS SHALL BE USED FOR EXPOSED LOCATIONS ON HIGHWAYS WHERE TRAFFIC APPROACH SPEEDS OF 40 MPH AND HIGHER ARE ENCOUNTERED. THEY ARE ALSO SUITABLE FOR USE IN ALL OTHER LOCATIONS.

### 2) CLASS B:

SUPPORTS SHALL BE USED FOR EXPOSED LOCATIONS ON HIGHWAYS WHERE TRAFFIC APPROACH SPEEDS OF LESS THAN 40 MPH ARE ENCOUNTERED. THEY ARE ALSO SUITABLE FOR USE IN ALL APPLICATIONS DEFINED FOR CLASS C SUPPORTS.

### 3) CLASS C:

SUPPORTS MAY ONLY BE USED WHERE FULLY PROTECTED BY GUARDRAIL, CONCRETE BARRIER AND IN LOCATIONS POSITIVELY PROTECTED FROM TRAFFIC SUCH AS ON RETAINING WALLS OR WHERE TRAFFIC APPROACH SPEEDS ARE LESS THAN 25 MPH.

## D. TRAFFIC APPROACH SPEEDS:

TRAFFIC APPROACH SPEEDS SHALL BE THE LOCALLY POSTED SPEED (NOT ADVISORY SPEED SIGNS) OR THE MEASURED ACTUAL (85TH PERCENTILE) SPEED (IF AVAILABLE) OF APPROACHING TRAFFIC, WHICHEVER IS HIGHER, ADJACENT TO THE SIGN LOCATION.

## TABLE

| APPROACH SPEED (MPH) | COMPLETELY PROTECTED BY GUARDRAIL OR BARRIER | PARTLY PROTECTED BY GUARDRAIL OR BARRIER * | GREATER THAN 9 m FROM EDGE OF PAVEMENT | WITHIN 9 m FROM EDGE OF PAVEMENT |
|----------------------|----------------------------------------------|--------------------------------------------|----------------------------------------|----------------------------------|
| 40 AND HIGHER        | A, B OR C                                    | A OR B                                     | A OR B **                              | A ONLY                           |
| 26 TO 39             | A, B OR C                                    | A OR B                                     | A OR B                                 | A OR B                           |
| 0 TO 25              | A, B OR C                                    | A, B OR C                                  | A, B OR C                              | A, B OR C                        |

\* IF SUPPORTS ARE BEHIND GUARDRAIL BUT NOT FULLY 1.7 m BEHIND FACE OF RAIL OR IF SIGN IS NOT 0.3 m BEHIND FACE OF CONCRETE BARRIER.

\*\* 9 m CRITERION IS BASED UPON STRAIGHT ROADWAY AND A SLOPE OF 6 TO 1 OR FLATTER. SUPPORTS ON THE OUTSIDE OF CURVES OR LOCATED DOWN A SLOPE (STEEPER THAN 6 : 1) WILL REQUIRE USE OF CLASS A SUPPORTS.

## E. BALLASTING

BALLASTING OF PORTABLE SUPPORTS SHALL BE WITH SANDBAGS PLACED WITHIN 0.3 m OF THE GROUND. IN NO CASE SHALL HARD OBJECTS BE USED FOR BALLAST.

## F. STRENGTH OF SIGN SUPPORTS

THE CONTRACTOR SHALL CHOOSE SIGN SUPPORTS OF ADEQUATE STRENGTH AND WITH ADEQUATE FOUNDATIONS AND ANCHORAGE TO SUPPORT THE SIGN SIZES ERRECTED. PROPRIETARY DEVICES SHALL NOT BE LOADED BEYOND THE LIMITS RECOMMENDED BY THE MANUFACTURER. SLIP BASE TYPE BREAKAWAY BEAM CONNECTIONS SHALL BE AT LEAST PARTIALLY EMBEDDED IN CONCRETE CONSISTING OF A 0.3 m DEEP BY 0.3 m DIAMETER COLLAR. SIGN SUPPORTS WHICH FAIL UNDER TYPICAL WIND LOAD CONDITIONS SHALL BE IMMEDIATELY MODIFIED OR REPLACED WITH A SUPPORT OF ADEQUATE STRENGTH.

## G. PROHIBITED SUPPORTS

THE FOLLOWING SUPPORT TYPES SHALL NOT BE PERMITTED ON PROJECTS:

- 1) SUPPORTS FABRICATED FROM AUTOMOTIVE AXLE DIFFERENTIAL ASSEMBLIES AND SIMILARLY HEAVY ASSEMBLIES WHICH CANNOT BE CONSIDERED BREAKAWAY TYPE.
- 2) SUPPORTS CONSISTING OF VERTICAL POSTS WITH ANGLED BRACES MADE FROM DRIVEPOST OR OTHER RIGID ELEMENTS.

# CLASS A SUPPORTS

## FIXED SUPPORTS

- 1) ALL #2 AND #3 POST WHEN INSTALLED SINGLY OR IN PAIRS (SIDE BY SIDE) ACCORDING TO THE DETAILS OF TC-41.20M. THE NUMBER OF SUPPORTS SHALL BE AS SHOWN ON TC-52.10M AND TC-52.20M.
- 2) THE FOLLOWING POST TYPES, WHEN INSTALLED SINGLY, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 1.1 m.
  - a) - UP TO 102 X 102 mm WOOD.
  - b) - UP TO 51 mm DIAMETER SCHEDULE 40 STEEL PIPE.
  - c) - UP TO 76 mm DIAMETER SCHEDULE 40 ALUMINUM PIPE.
  - d) - UP TO 56.4 mm SQUARE, 12 GAUGE WALL, PUNCHED STEEL POST.
  - e) - UP TO 152 X 203 mm WOOD WITH BREAKAWAY HOLES SHOWN BELOW.
- 3) THE FOLLOWING POST TYPES WHEN INSTALLED IN PAIRS (SIDE BY SIDE) WITH LESS THAN 2 m BETWEEN POSTS, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 1.1 m:
  - a) - UP TO 102 X 102 mm WOOD.
  - b) - UP TO 51 mm DIAMETER SCHEDULE 40 STEEL PIPE.
  - c) - UP TO 76 mm DIAMETER SCHEDULE 40 ALUMINUM PIPE.
  - d) - UP TO 51 mm SQUARE, 14 GAUGE WALL, PUNCHED STEEL POST.
- 4) FIXED TYPE III BARRICADES:
- 5) ALL BREAKAWAY CONNECTION BEAM SUPPORTS, WHEN INSTALLED ACCORDING TO THE PROPER DETAILS SHOWN ON TC-41.10M WITH A MINIMUM CLEAR DISTANCE BETWEEN SUPPORTS OF 2.1 m FOR SUPPORTS LARGER THAN W6 X 9.
- 6) ANY BREAKAWAY POST OR POST AND CONNECTION WHICH HAS BEEN CRASH TESTED AND APPROVED BY THE FHWA AS SATISFYING THE BREAKAWAY CRITERIA DESCRIBED IN 630.06.

( CONTINUED ON MT-105.11M )

# M E T R I C

BUREAU OF DESIGN SERVICES  
DIVISION OF HIGHWAYS  
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

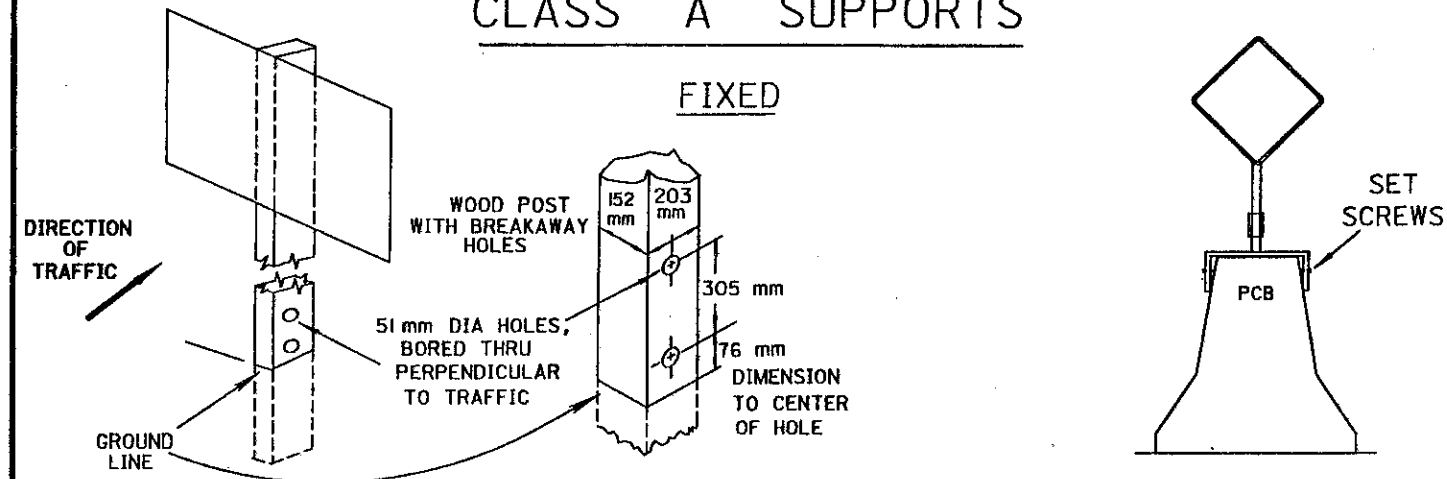
DATE  
04/25/94

TEMPORARY SIGN SUPPORT

STANDARD  
CONSTRUCTION  
DRAWING  
APPROVED *[Signature]* ENGR. OF DESIGN SERVICES

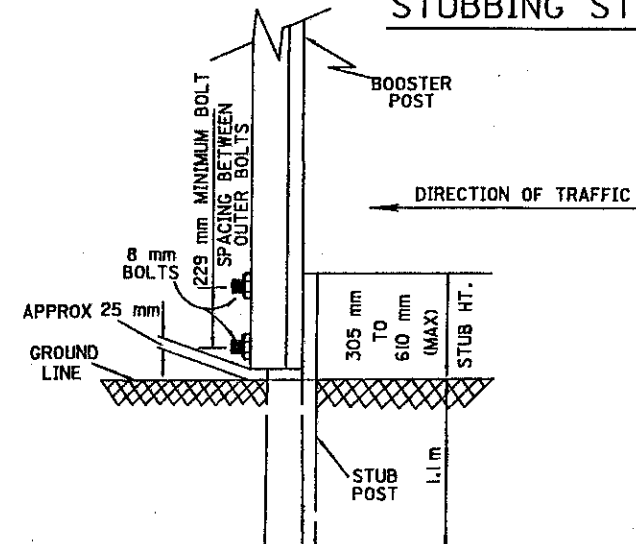
MT-105.10M

## CLASS A SUPPORTS



## CLASS A SUPPORTS

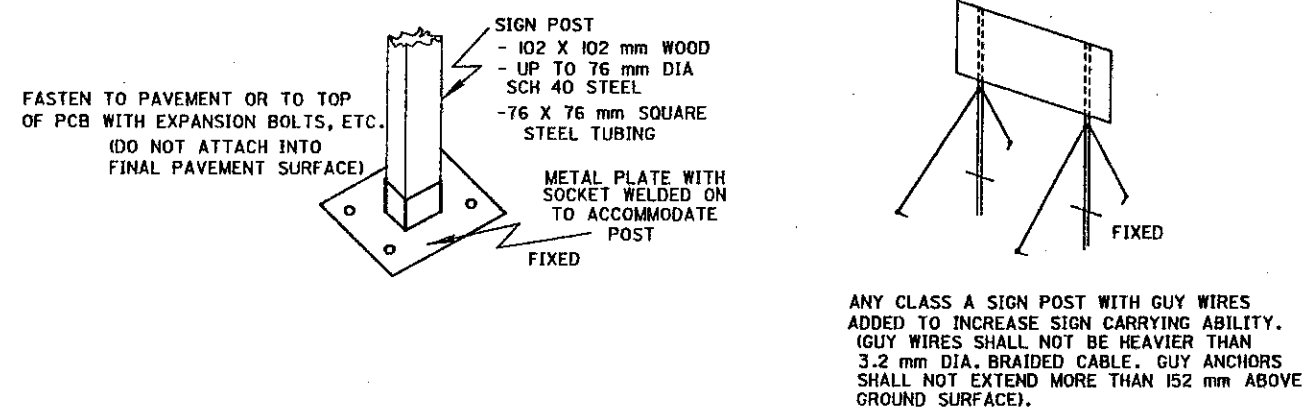
### STUBBING STANDARD



### NOTES

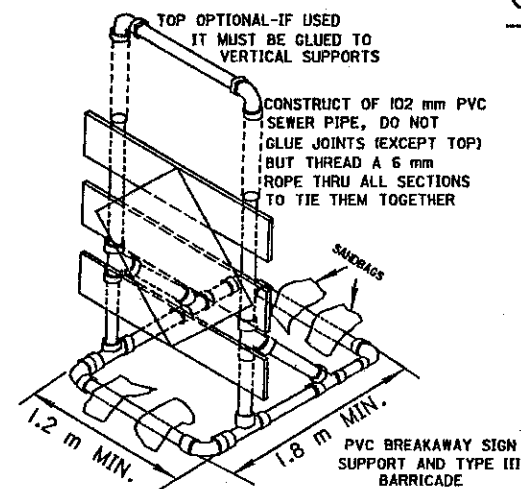
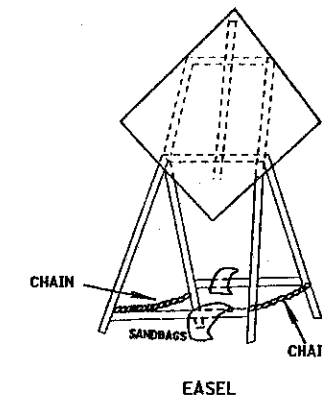
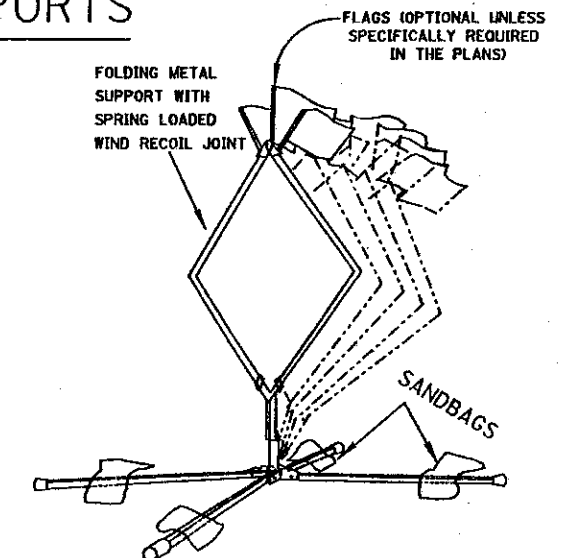
1. FOR USE WITH #3 POST OR SMALLER ONLY
2. BOLTS SHALL BE STEEL OR ALUMINUM
3. A MINIMUM OF TWO FASTENERS SHALL BE USED PER ASSEMBLY
4. BOOSTER POST SHALL BE MOUNTED BEHIND STUB POST
5. BOOSTER POST SHALL BE THE SAME OR 1.5 kg/m LESS THAN STUB POST

## CLASS B SUPPORTS



## CLASS A SUPPORTS

### PORTABLE

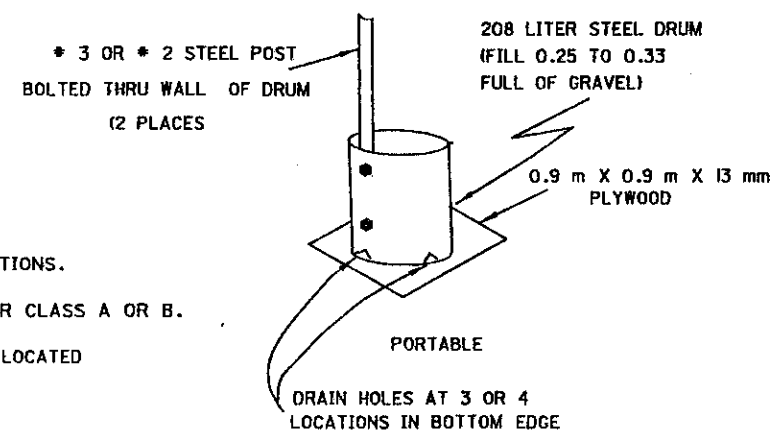


### NOTES

#### RAIL MATERIALS:

25 X 203 mm OR 51 X 203 mm COMMON LUMBER  
 203 mm X (16 mm TO 25 mm) THICK EXTERIOR PLYWOOD  
 EXTRUDED PLASTIC OR FORMED SHEET METAL WITH A 203 mm WIDE SURFACE AND OF SUFFICIENT STIFFNESS TO RESIST TYPICAL WIND LOADS OF UP TO 147 kg/m<sup>2</sup>, BUT HAVING A WEIGHT OF NOT MORE THAN 7.5 kg/m.

## CLASS C SUPPORTS



1. ALL BEAM TYPE SUPPORTS WITHOUT BREAKAWAY CONNECTIONS.
2. SUPPORTS SIMILAR TO BUT LARGER THAN PERMITTED FOR CLASS A OR B.
3. THE STEEL DRUM(S) SHOWN BELOW MAY BE USED ONLY WHEN LOCATED BEHIND GUARDRAIL OR BARRIER.

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF THE OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES  
 DIVISION OF HIGHWAYS  
 OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

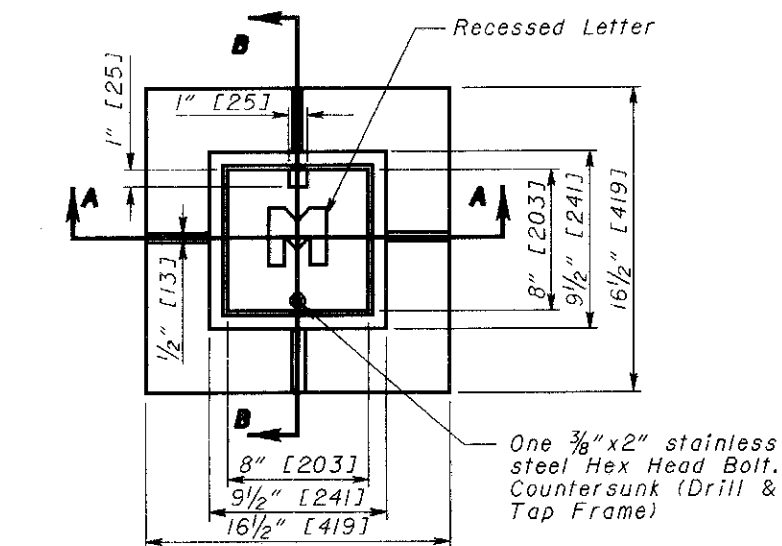
DATE  
 04/25/94

TEMPORARY SIGN SUPPORT

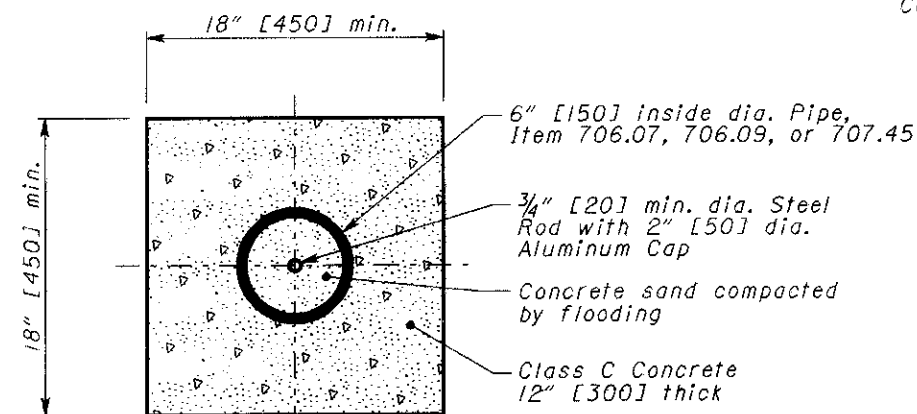
STANDARD  
 CONSTRUCTION  
 DRAWING  
 APPROVED *Day J. C.* ENGR. OF DESIGN SERVICES

MT-105.IIM

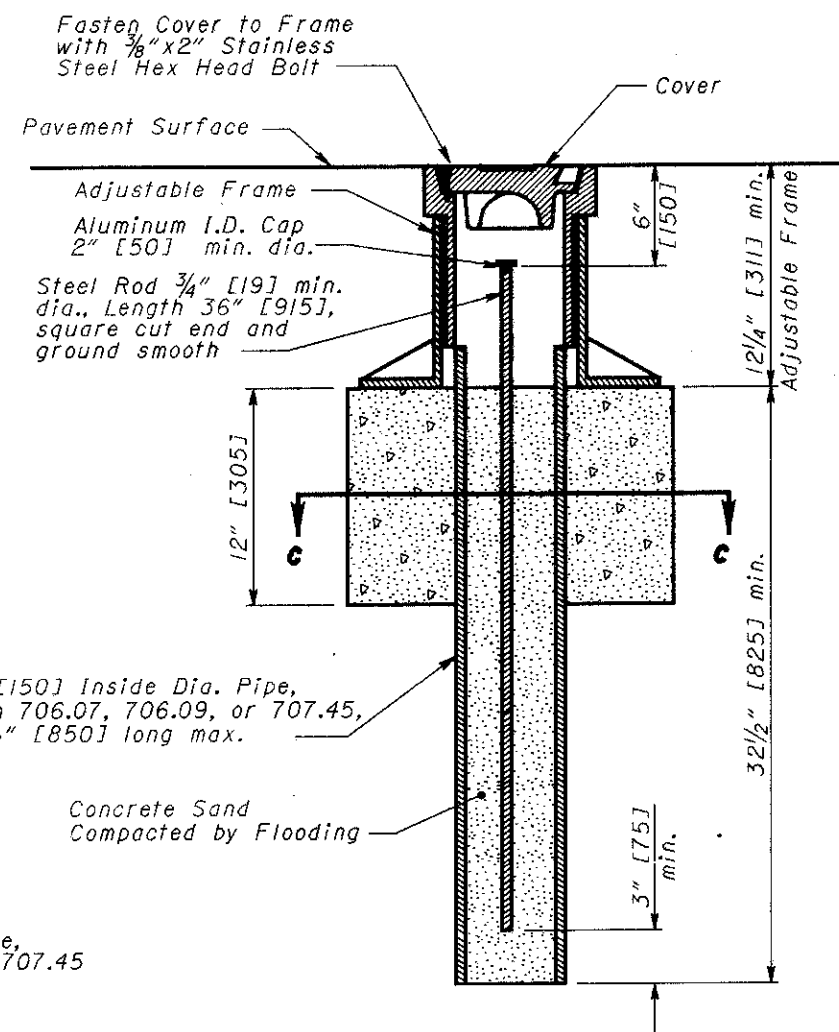
METRIC



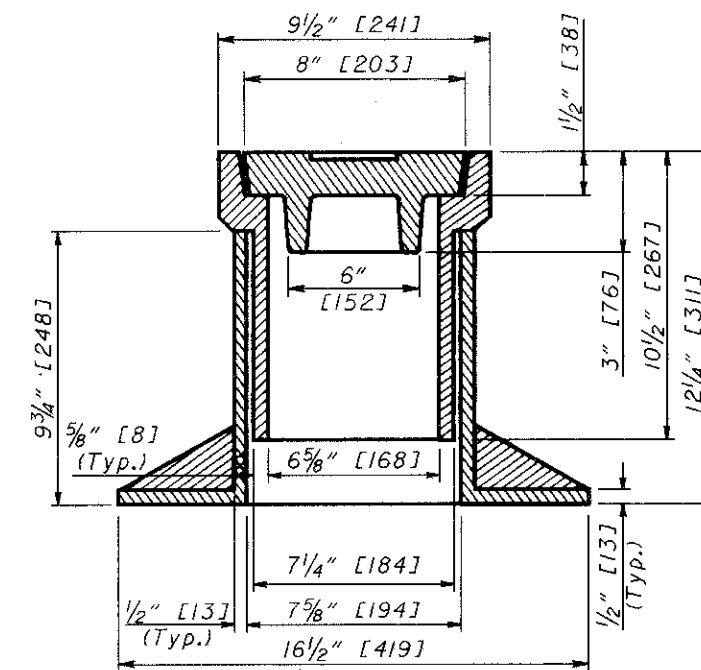
TOP VIEW



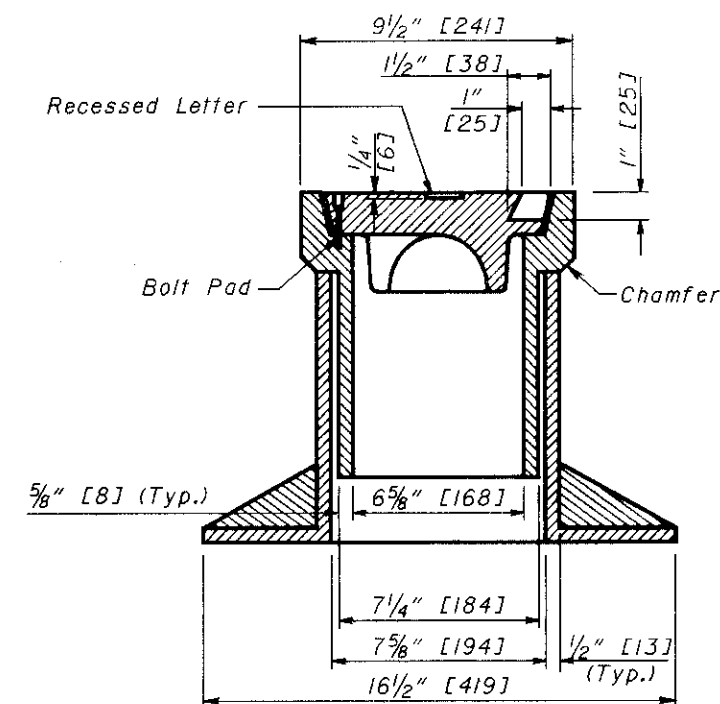
SECTION C-C



SIDE VIEW



SECTION A-A



SECTION B-B

# ADJUSTABLE CENTERLINE MONUMENT DETAILS

THIS DRAWING REPLACES RM-1.1M DATED 4-8-97.

NUMBER  
RM-1.1

STANDARD ROADWAY CONSTRUCTION DRAWING  
ROADWAY MONUMENTS

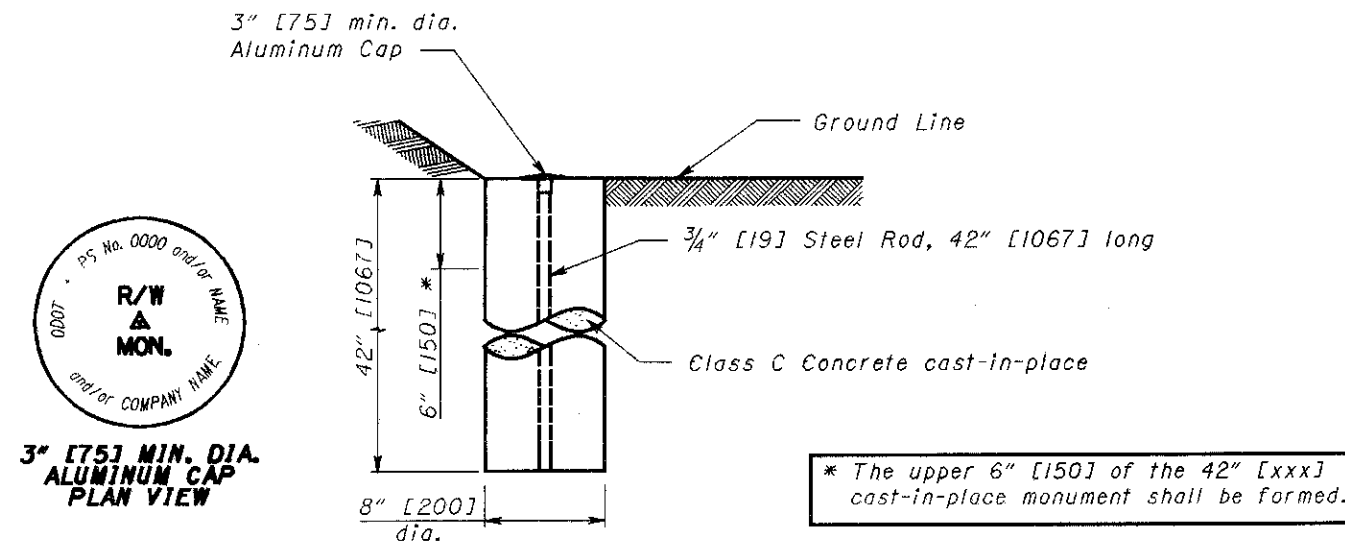
DESIGN AGENCY  
OFFICE OF PLANNING

All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

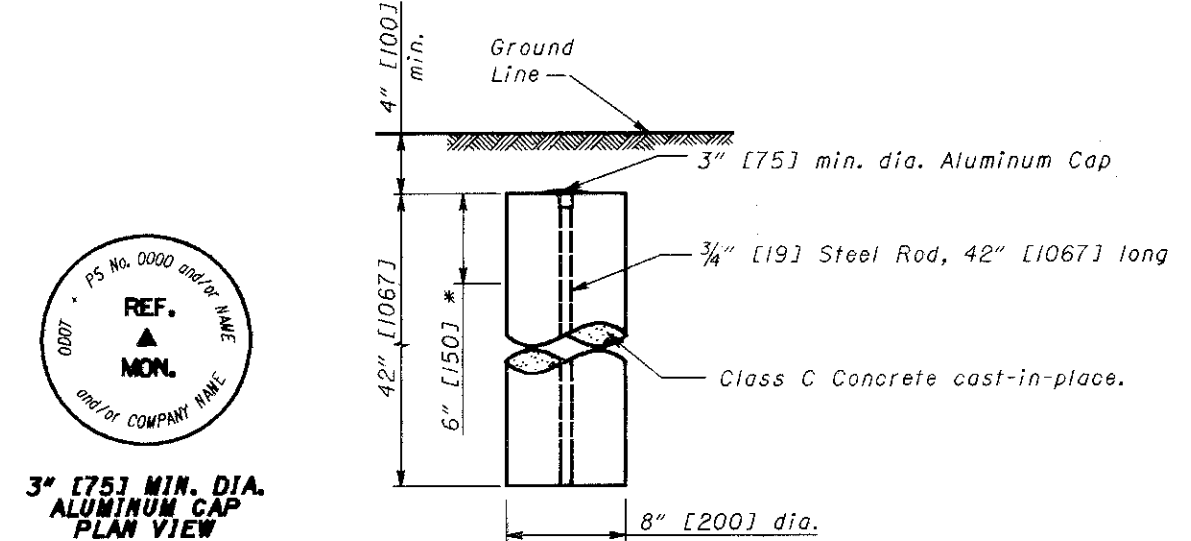
STATUS: EMM  
M. EVANS  
D. FOCKE

REVISES

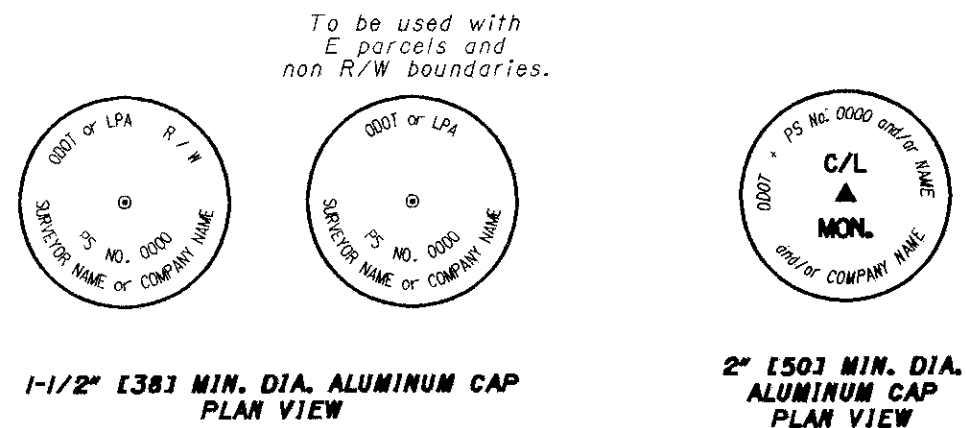
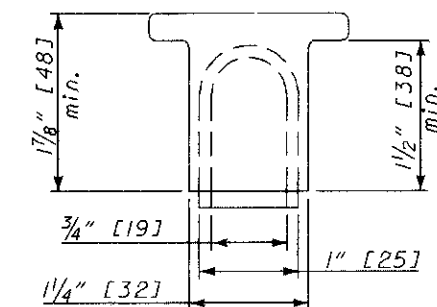
OHIO DEPARTMENT OF TRANSPORTATION  
LAURENCE B. BETHLAND  
ROADWAY DESIGN ENGINEER  
4-29-99  
DATE



RIGHT OF WAY MONUMENT DETAILS



REFERENCE MONUMENT DETAILS



## NOTES

Monuments shall be placed under the direction of a Surveyor, registered in the State of Ohio, in accordance with Chapter 4733-37 of the Ohio Administrative Code and ODOT's Survey Manual. Monuments are to be set, as shown, by the highway contractor at the time of construction. If deviations cannot be avoided, the Surveyor shall obtain pre-approval for the new monument locations from the Ohio Department of Transportation and shall notify ODOT of the new monument locations as set.

All aluminum caps used shall have an insulator to eliminate dissimilar metal corrosion.



The diagram illustrates the cross-section of concrete steps. Key dimensions and components include:

- Handrail**: Located at the top of the steps.
- Integral Wall**: The vertical structure on the right side of the steps.
- Dimensions**:
  - Top step height: 75
  - Horizontal distance from the left wall to the start of the steps: 600
  - Typical riser height:  $T$  (Typ.)
  - Horizontal distance from the end of the steps to the right wall: 250
  - Right wall thickness: 150
  - Stair width: 900 mm
  - Pay width per tread: 150
- Section Line**: Indicated by 'A' at both ends of the diagram.

**GENERAL:** Top of integral wall shall be located 25 to 75 mm above ground line.

**TYPE A:** Hand railing and stairposts shall be fabricated from nominal size 38 mm diameter, 3.7 mm wall thickness steel pipe meeting the requirements of the Specification for Welded and Seamless Steel Pipe ASTM A 53 Standard Weight, Schedule Number 40, or aluminum pipe meeting the requirements of the Specification for Aluminum-Alloy Pipe ASTM B 241, 6063 T6 ASA, Schedule Number 40.

Steel handrails and stairposts shall be galvanized after fabrication in accordance with ASTM A 123. Splices for steel railing shall be field-welded. Areas on which the speller coating has been damaged shall be re-galvanized in accordance with AASHTO M 36 Section 24, Metalizing Process or they shall be repaired under the direction of the Engineer with stick-form galvanizing repair compound meeting the requirements of Federal Specification 0-G-93.

*A single handrail shall be installed to the right side of the stairs, facing up, unless shown otherwise on the plans.*

For stair widths greater than 1100 mm, a handrail is required on both sides of the stairs. Hand railings shall also be installed on both sides of the steps with widths less than 1100 mm, if required by the plans.

*Splices for aluminum railing shall be provided with internal sleeves and shall be smooth and water tight after welding.*

*Stairposts shall be cast-in-place or set in sockets filled with "1:3" cement mortar. That portion of aluminum stairposts set into concrete or mortar shall be given a heavy coating of asphalt varnish or coal-tar pitch paint, both inside and outside.*

*The installed stairposts and handrails shall be free of burrs or sharp projections.*

*H ~ 865 mm min., 965 mm max.*  
*R ~ 100 mm min., 175 mm max.*  
*T ~ 275 mm min., 375 mm max.*

*All risers shall be of equal height and all treads shall be of equal depth on any set of steps.*

*L ~ Interior panel lengths shall be equal. The upper and lower panel lengths may vary. Panel lengths shall not exceed 1.0 m.*

\* Unless shown otherwise on plan.  
▲ Measurable tread per CMS 608.08

*All dimensions are in millimeters  
unless otherwise noted.*



***This Drawing Replaces MC-2.***

## BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION

## CONCRETE STEPS

DATE  
-12-95

**STANDARD  
CONSTRUCTION  
DRAWING** **RM-2.1M**

APPROVED D. R. Adelman  
ENGR. I & D

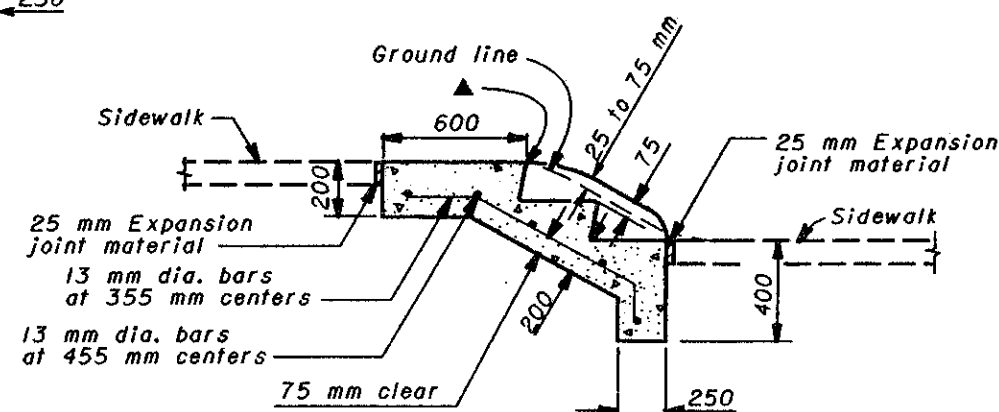
[illegible]

TYPE A  
(For 3 Risers or more)

### NOSING DETAIL

**TYPE B**

See Nosing Detail  
**SECTION B-B**



## NOTES

**PORTABLE CONCRETE BARRIER (PCB)** PCB, as shown, shall not be used on bridge deck edges. PCB, Bridge Mounted, shall be used at such locations in accordance with the Office of Structural Engineering's Standard Drawing PCB-91M.

**WIRE FABRIC:** Shall meet the requirements of CMS 709.10.

**CONNECTING HARDWARE:** Bolts, washers and hex nuts shall be galvanized after fabrication as per CMS 711.02 and shall meet the requirements of CMS 711.09 except that the Rotational Capacity test specified in ASTM A 325M shall be waived.

In lieu of the pin and loop connections detailed on this Standard Construction Drawing, barrier sections with "J-J Hooks" end connections may be utilized.

Transition barrier sections with pin and loop connections on one end and "J-J Hooks" on the other shall be used to connect runs of "J-J Hooks" barrier to other permitted barrier types. The heights of the transition sections shall be the same as the barrier runs being connected. "J-J Hooks" is a trademark of East-Sei Industries, P.O. Box 300, Midland, VA 22728, (540) 439-8911 or (800) 547-4045.

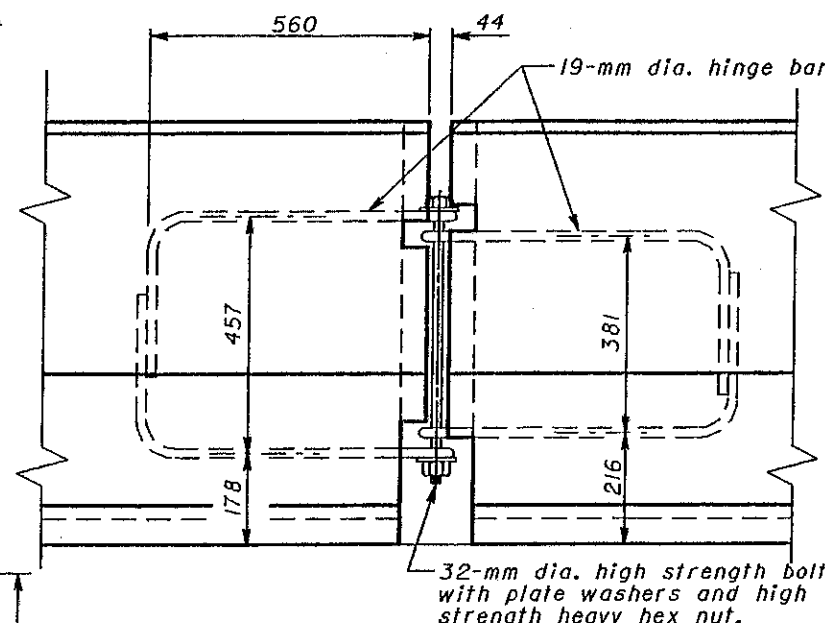
**HINGE AND REINFORCING BARS:** The 19-mm hinge bars and #16M reinforcing bars shall meet the requirements of CMS 509.

**HANDLING DEVICES:** Such devices may be used in lieu of the lifting slot for moving the barrier. They may be of any design sufficient to handle the weight of the section being lifted. No handling devices shall protrude from the surface of the barrier when in place.

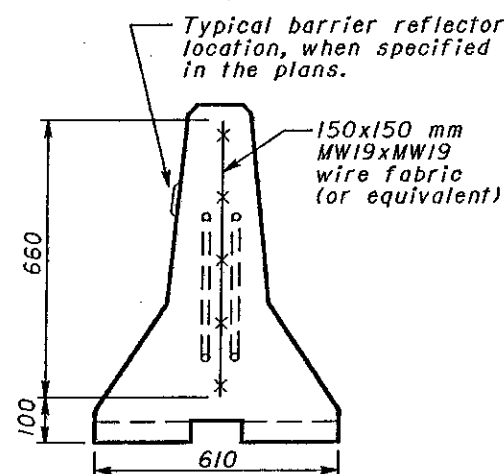
**MARKING:** All barrier segments shall be marked as shown, where XX indicates the year cast. These markings shall be permanently impressed in the barrier using a minimum of 50-mm high lettering.

Each segment shall have, on its top, a unique identification as to its manufacturer and, somewhere on the barrier, the day and month that the barrier was manufactured.

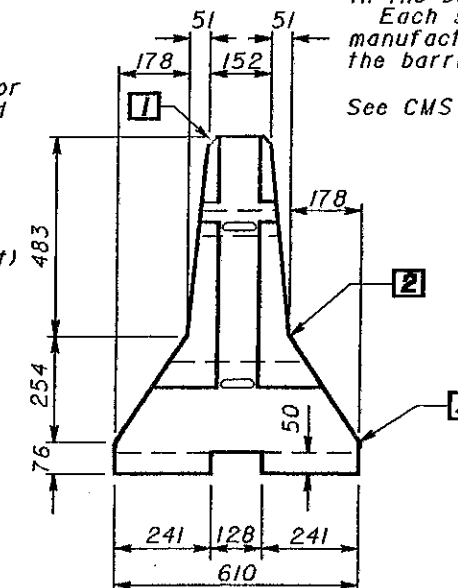
See CMS 622 for additional information.



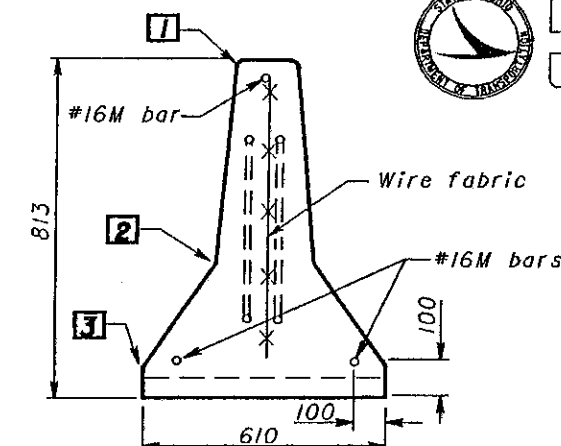
**DETAIL AT HINGED CONNECTION**



**SECTION A-A**



**VIEW B-B**



**SECTION C-C**

*All dimensions are in millimeters  
unless otherwise noted.*

***This Drawing Replaces MC-9.2.***

**OHIO DEPARTMENT OF TRANSPORTATION**

**813-mm PORTABLE  
CONCRETE BARRIER**

DATE \_\_\_\_\_

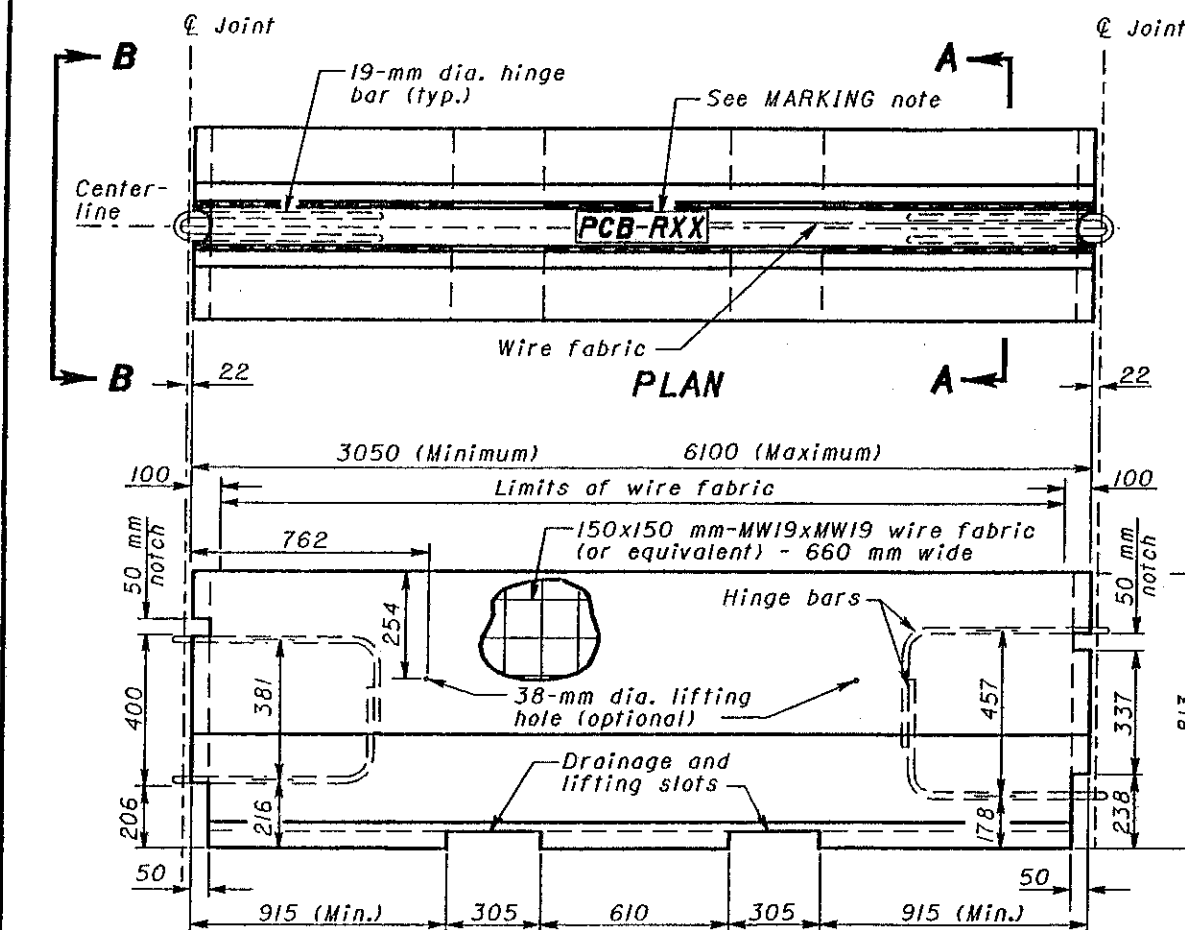
6-30-95  
10-21-97

STANDARD  
CONSTRUCTION  
DRAWING **RM-4.2M**

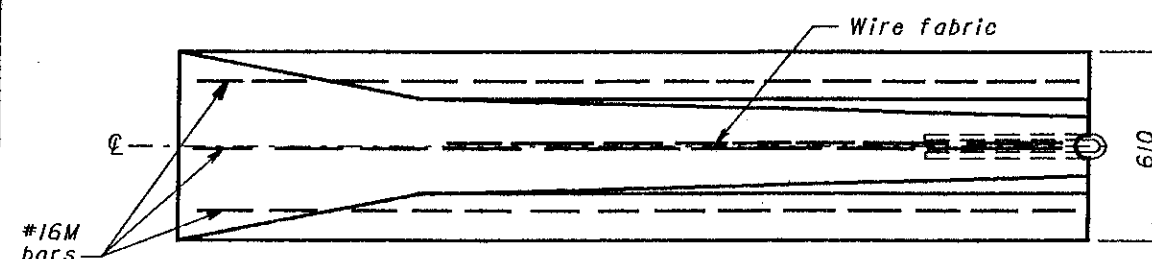
APPROVED Paul T. Sullivan

### LEGEND

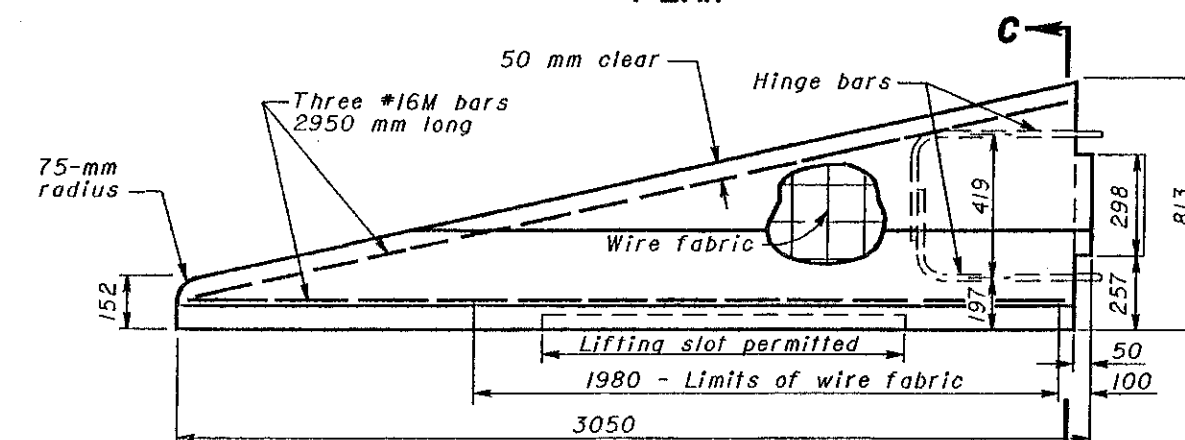
- 1** 25-mm radius or 19-mm chamfer, all top and end corners.
- 2** Permissible 250-mm radius.
- 3** Permissible 25-mm radius.



**ELEVATION**  
**BARRIER DETAILS**

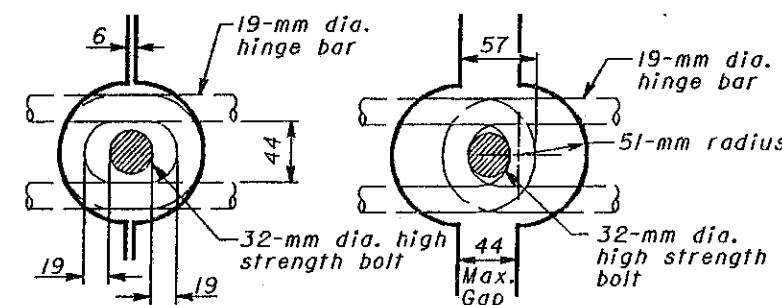


**PLAN**



**ELEVATION**

**TAPERED END SECTION DETAILS**



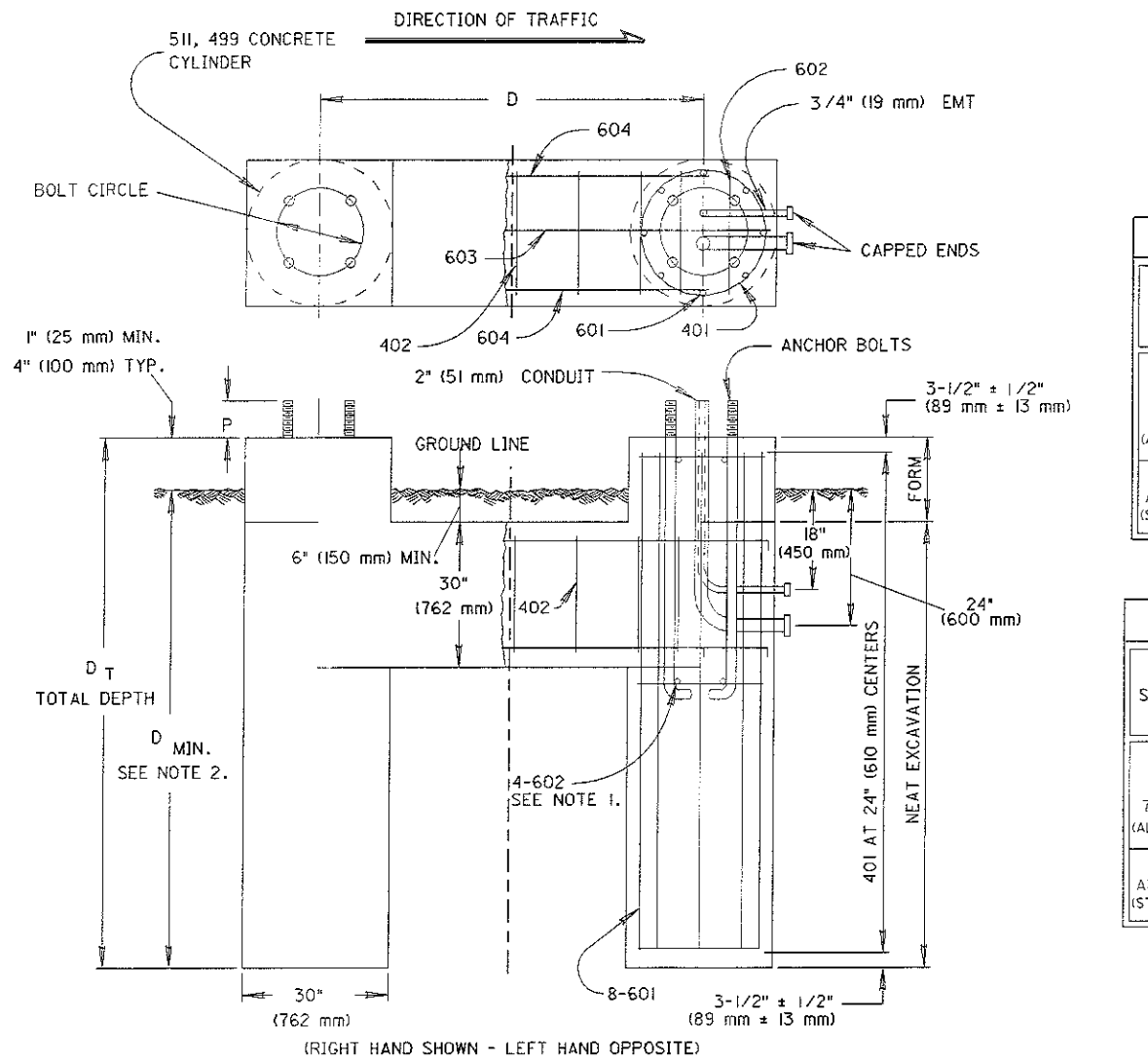
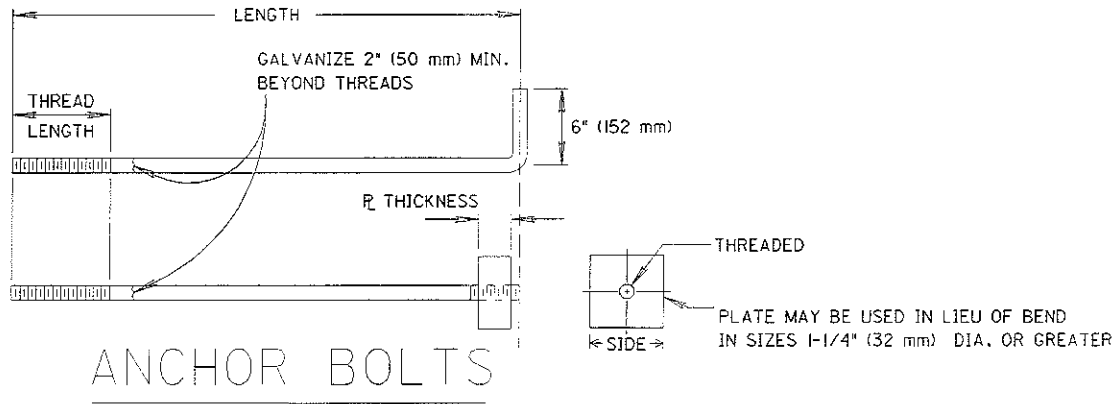
**CLOSED JOINT**

Barriers shall initially be placed close together so that bolts can be easily inserted through hinge bar loop.

OPEN JOINT

Barrier joints shall be fully open before the nut is tightened onto bolt.

## JOINT CONNECTION DETAILS



| ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED |                |       |        |              |       |        |               |   |         |        |                  |
|-------------------------------------------------|----------------|-------|--------|--------------|-------|--------|---------------|---|---------|--------|------------------|
| SUPPORT TYPE                                    | TRUSS BOX SIZE | D     | D MIN. | ANCHOR BOLTS |       |        |               |   |         |        |                  |
|                                                 |                |       |        | CIRCLE       | DIA.  | LENGTH | THREAD LENGTH | P | R THICK | R SIDE | THREADS PER INCH |
| 7.65 AND 7.2-7.6 (AL. TRUSS)                    | 3'-0"          | 4'-5" | 11'-0" | 11           | 1-1/4 | 42     | 8             | 5 | 1-1/2   | 4      | 7                |
|                                                 | 4'-0"          | 5'-7" |        |              |       |        |               |   |         |        |                  |
|                                                 | 5'-0"          | 6'-7" |        |              |       |        |               |   |         |        |                  |
| 15.115 AND 15.8 (ST. TRUSS)                     | 3'-4" ±        | 5'-3" | 12'-0" | 12-1/2       | 1-1/2 | 54     | 9             | 6 | 1-1/2   | 4      | 6                |
|                                                 | 5'-0"          | 6'-7" |        |              |       |        |               |   |         |        |                  |

| ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED |                |        |        |              |      |        |               |     |         |        |               |
|------------------------------------------------------|----------------|--------|--------|--------------|------|--------|---------------|-----|---------|--------|---------------|
| SUPPORT TYPE                                         | TRUSS BOX SIZE | D      | D MIN. | ANCHOR BOLTS |      |        |               |     |         |        |               |
|                                                      |                |        |        | CIRCLE       | DIA. | LENGTH | THREAD LENGTH | P   | R THICK | R SIDE | mm PER THREAD |
| 7.65 AND 7.2-7.6 (AL. TRUSS)                         | 0.91 m         | 1.35 m | 3.35 m | 279          | 32   | 1067   | 203           | 127 | 38      | 102    | 3.6           |
|                                                      | 1.22 m         | 1.70 m |        |              |      |        |               |     |         |        |               |
|                                                      | 1.52 m         | 2.01 m |        |              |      |        |               |     |         |        |               |
| 15.115 AND 15.8 (ST. TRUSS)                          | 1.02 m ±       | 1.60 m | 3.66 m | 318          | 38   | 1372   | 229           | 152 | 38      | 102    | 4.2           |
|                                                      | 1.52 m         | 2.01 m |        |              |      |        |               |     |         |        |               |

| REINFORCEMENT SCHEDULE (FOR EACH FOUNDATION) |         |                     |      |  |
|----------------------------------------------|---------|---------------------|------|--|
| MARK                                         | NO.     | LENGTH              | TYPE |  |
| 401                                          | 24" C/C | 7'-6"               | 401  |  |
| 402                                          | 12" C/C | 8'-6"               | 402  |  |
| 601                                          | 16      | D <sub>T</sub> - 6" | STR. |  |
| 602                                          | 8       | 2'-0"               | STR. |  |
| 603                                          | 2       | D + 4'-0"           | 603  |  |
| 604                                          | 4       | D + 2'-0"           | 604  |  |

| REINFORCEMENT SCHEDULE (METRIC) (FOR EACH FOUNDATION) |            |                         |      |  |
|-------------------------------------------------------|------------|-------------------------|------|--|
| MARK                                                  | NO.        | LENGTH                  | TYPE |  |
| 401                                                   | 610 mm C/C | 2.29 m                  | 401  |  |
| 402                                                   | 305 mm C/C | 2.59 m                  | 402  |  |
| 601                                                   | 50M        | D <sub>T</sub> - 152 mm | STR. |  |
| 602                                                   | 25M        | 0.6 m                   | STR. |  |
| 603                                                   | 5M         | D + 1.2 m               | 603  |  |
| 604                                                   | 10M        | D + 0.6 m               | 604  |  |

NOTES

1. Tie anchor bolts to rebar cage near the top and bottom of the anchor bolts.
2. D MIN. may be deeper as required in the plans.
3. When required by local conditions and approved by the Engineer, alternate foundation designs are acceptable.
4. Provide all anchor bolts with standard steel hex nuts, leveling nuts, plain and lockwashers. The nuts shall be capable of developing the full strength of the anchor bolts.
5. At locations where the existing slope is 6:1 or greater, the buried depth of foundation shall apply to the low side of the slope. Set the top of the foundation 2" (50 mm) above the existing surface on the high side of the slope. The additional depth of foundation necessary to meet these requirements shall be added to the formed top.

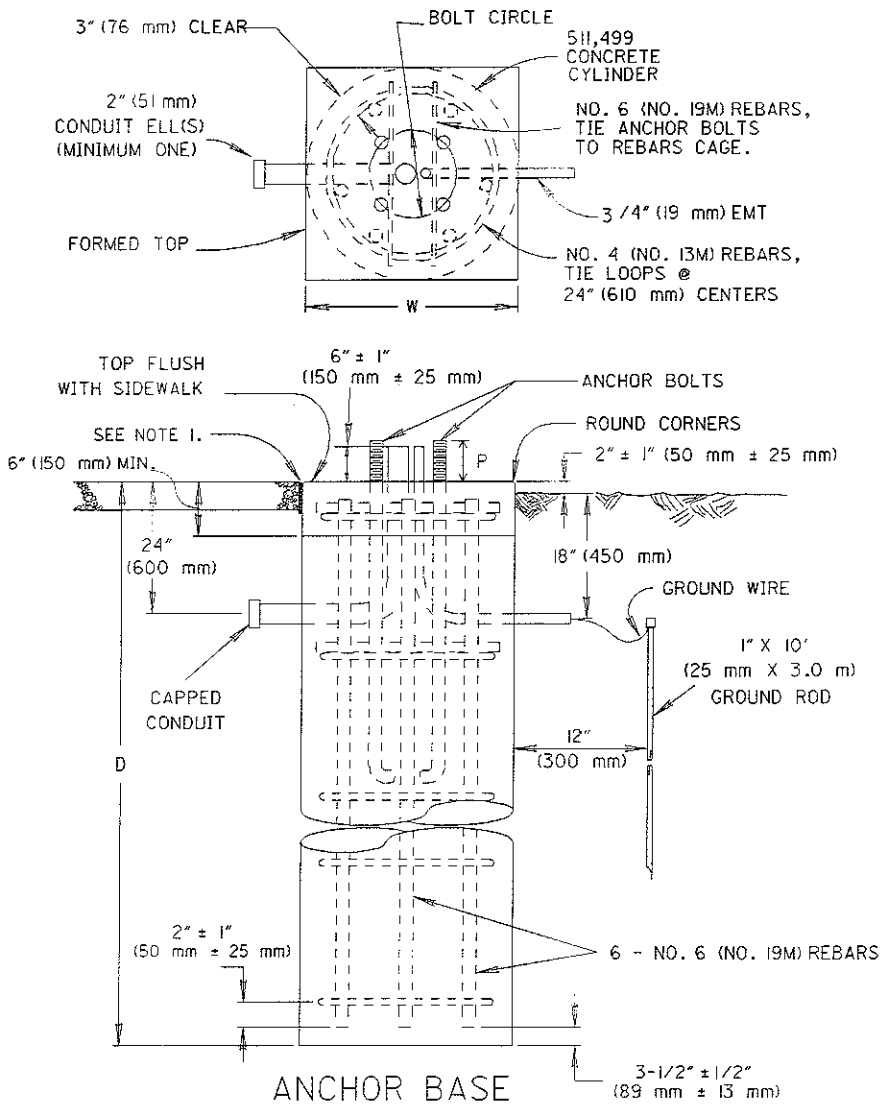
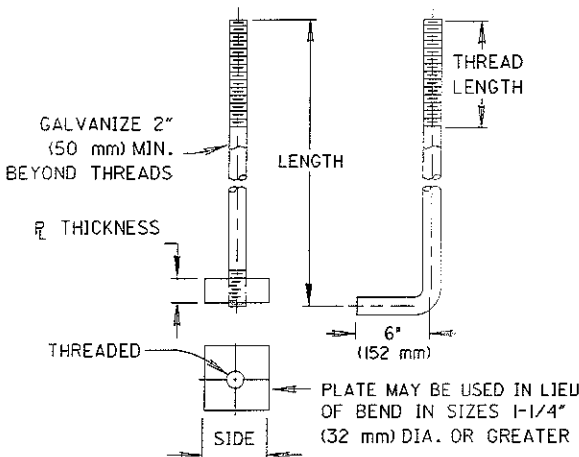
NOTES

- 1. Use 1/2" (13 mm) preformed joint filler as per 705.03 between foundations and adjacent paved areas.
- 2. A special foundation design will be required when soil with load bearing capacity of less than 2000 LB/FT<sup>2</sup> (9700 KG/M<sup>2</sup>) is encountered.
- 3. In lieu of providing reinforcing steel in the embedded pole foundation, the pole butt may be extended to within 3" (76 mm) of the foundation bottom. The pole base diameter as specified in the plans is the diameter of the pole at the groundline.
- 4. Provide all anchor bolts with standard steel hex nuts, leveling nuts, plain and lockwashers. The nuts shall be capable of developing the full strength of the anchor bolts.
- 5. At locations where the existing slope is 6:1 or greater, the buried depth of foundation shall apply to the low side of the slope. Set the top of the foundation 2" (50 mm) above the existing surface on the high side of the slope. The additional depth of foundation necessary to meet these requirements shall be added to the formed top.

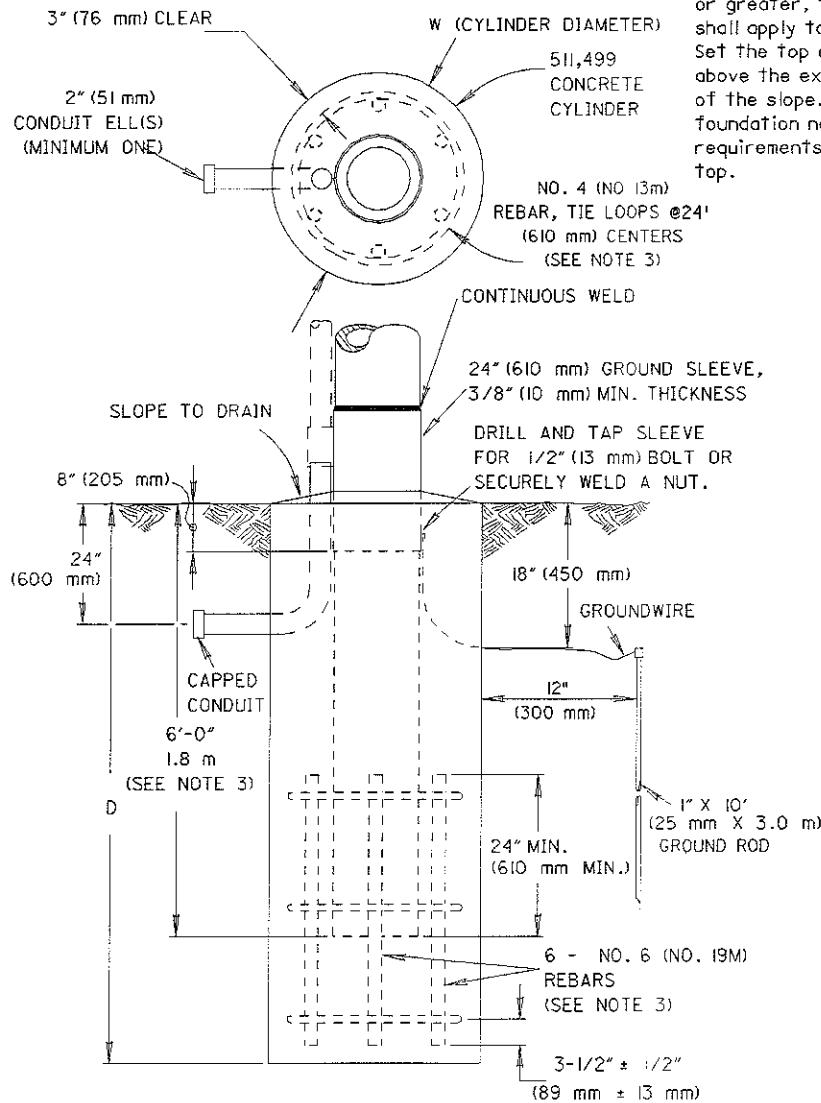
| ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED |        |               |         |        |                  |
|-------------------------------------------------|--------|---------------|---------|--------|------------------|
| DIA.                                            | LENGTH | THREAD LENGTH | R THICK | R SIDE | THREADS PER INCH |
| 1 1/4                                           | 42     | 8             | 1 1/2   | 4      | 7                |
| 1 1/2                                           | 54     | 9             | 1 1/2   | 4      | 6                |
| 1 3/4                                           | 64     | 9             | 2       | 5      | 5                |
| 2                                               | 90     | 9             | 2       | 5      | 4 1/2            |
| 2 1/4                                           | 90     | 10            | 2 1/2   | 6      | 4 1/2            |
| 2 1/2                                           | 114    | 10            | 2 1/2   | 6      | 4                |
| 3                                               | 138    | 12            | 3       | 7      | 4                |

| ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED |                 |               |         |        |               |
|------------------------------------------------------|-----------------|---------------|---------|--------|---------------|
| DIA.                                                 | LENGTH (meters) | THREAD LENGTH | R THICK | R SIDE | mm PER THREAD |
| 32                                                   | 1.1             | 203           | 38      | 102    | 3.6           |
| 38                                                   | 1.4             | 229           | 38      | 102    | 4.2           |
| 45                                                   | 2.1             | 229           | 51      | 127    | 5.1           |
| 51                                                   | 2.3             | 229           | 51      | 127    | 5.6           |
| 57                                                   | 2.3             | 254           | 64      | 152    | 5.6           |
| 64                                                   | 2.9             | 254           | 64      | 152    | 6.4           |
| 76                                                   | 3.5             | 305           | 76      | 178    | 6.4           |

ANCHOR BOLTS



ANCHOR BOLTS



EMBEDDED POLE  
(STRAIN POLE ONLY)

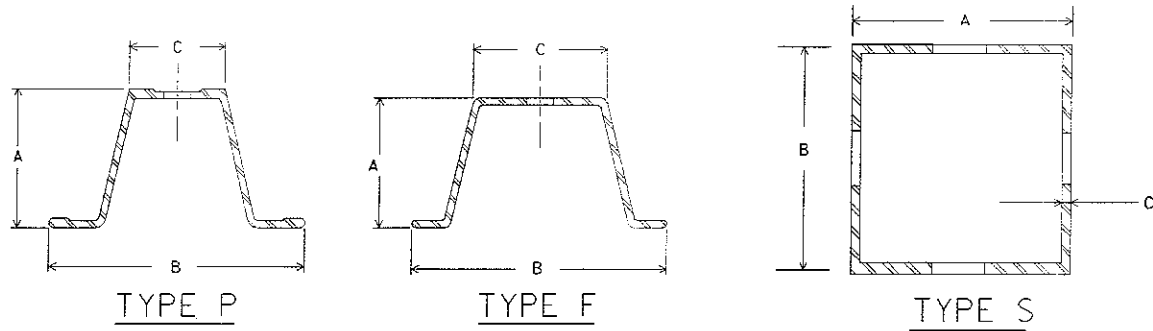


ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED

| TC-9.10 TYPE SUPPORTS |          |    |              |        |    | TC-16.20 & TC-81.20 TYPE SUPPORTS |          |    |              |        |    | TC-17.10 & 81.10 TYPE SUPPORTS |          |    |              |        |    | TC-12.30 TYPE SUPPORTS |          |    |              |        |     |
|-----------------------|----------|----|--------------|--------|----|-----------------------------------|----------|----|--------------|--------|----|--------------------------------|----------|----|--------------|--------|----|------------------------|----------|----|--------------|--------|-----|
| DESIGN NO.            | D (feet) | W  | ANCHOR BOLTS |        |    | DESIGN NO.                        | D (feet) | W  | ANCHOR BOLTS |        |    | DESIGN NO.                     | D (feet) | W  | ANCHOR BOLTS |        |    | DESIGN NO.             | D (feet) | W  | ANCHOR BOLTS |        |     |
|                       |          |    | SIZE         | CIRCLE | P  |                                   |          |    | SIZE         | CIRCLE | P  |                                |          |    | SIZE         | CIRCLE | P  |                        |          |    | SIZE         | CIRCLE | P   |
| 1                     | 8        | 30 | 1½ X 54      | 13½    | 6¾ | 1                                 | 8        | 30 | 1½ X 54      | 13½    | 6¾ | 1                              | 7        | 30 | 1¼ X 42      | 10     | 5¾ | 1                      | 9        | 36 | 1¾ X 84      | 15     | 7¾  |
| 2                     | 8        | 30 | 1½ X 54      | 13½    | 6¾ | 2                                 | 8        | 30 | 1½ X 54      | 15     | 6¾ | 2                              | 7        | 30 | 1½ X 54      | 12½    | 6¾ | 2                      | 9        | 36 | 1¾ X 84      | 15     | 7¾  |
| 3                     | 9        | 36 | 1¾ X 84      | 16     | 7¾ | 3                                 | 9        | 30 | 1½ X 54      | 16     | 6¾ | 3                              | 8        | 30 | 1½ X 54      | 13½    | 6¾ | 3                      | 11       | 36 | 2 X 90       | 18     | 8½  |
|                       |          |    |              |        |    | 4                                 | 10       | 36 | 1¾ X 84      | 18     | 7¾ | 4                              | 8        | 36 | 1¾ X 84      | 15     | 7¾ | 4                      | 11       | 36 | 2 X 90       | 18     | 8½  |
|                       |          |    |              |        |    | 5                                 | 9        | 36 | 1¾ X 84      | 15     | 7¾ | 5                              | 9        | 36 | 1¾ X 84      | 16     | 7¾ | 5                      | 11       | 36 | 2 X 90       | 22     | 8½  |
| TC-9.30 TYPE SUPPORTS |          |    |              |        |    | 6                                 | 9        | 36 | 1¾ X 84      | 15     | 7¾ | 6                              | 9        | 36 | 1¾ X 84      | 16     | 7¾ | 6                      | 11       | 36 | 2 X 90       | 22     | 8½  |
| 1                     | 8        | 30 | 1½ X 54      | 13½    | 6¾ | 7                                 | 9        | 36 | 1¾ X 84      | 15     | 7¾ | 7                              | 10       | 36 | 2 X 90       | 18     | 8½ | 7                      | 15       | 36 | 2½ X 114     | 23½    | 9¾  |
| 2                     | 9        | 36 | 1¾ X 84      | 15     | 7¾ | 8                                 | 9        | 36 | 1¾ X 84      | 16     | 7¾ | 8                              | 10       | 36 | 2 X 90       | 20     | 8½ | 8                      | 15       | 36 | 2½ X 114     | 23½    | 9¾  |
| 3                     | 10       | 36 | 2 X 90       | 20     | 8½ | 9                                 | 10       | 36 | 1¾ X 84      | 18     | 7¾ | 9                              | 10       | 36 | 2 X 90       | 22     | 8½ | 9                      | 15       | 36 | 2½ X 114     | 23½    | 9¾  |
| 4                     | 11       | 36 | 2¼ X 90      | 22     | 9  | 10                                | 10       | 36 | 1¾ X 84      | 20     | 7¾ | 10                             | 11       | 36 | 2¼ X 90      | 22     | 9  | 10                     | 17       | 36 | 2½ X 114     | 25½    | 9¾  |
| 5                     | 11       | 36 | 2¼ X 90      | 22     | 9  | 11                                | 10       | 36 | 1¾ X 84      | 20     | 7¾ | 11                             | 11       | 36 | 2¼ X 90      | 22     | 9  | 11                     | 17       | 36 | 2½ X 114     | 25½    | 9¾  |
|                       |          |    |              |        |    | 12                                | 11       | 36 | 2 X 90       | 20     | 8½ | 12                             | 12       | 36 | 2½ X 114     | 23½    | 9¾ | 12                     | 18       | 36 | 3 X 138      | 25½    | 11¼ |

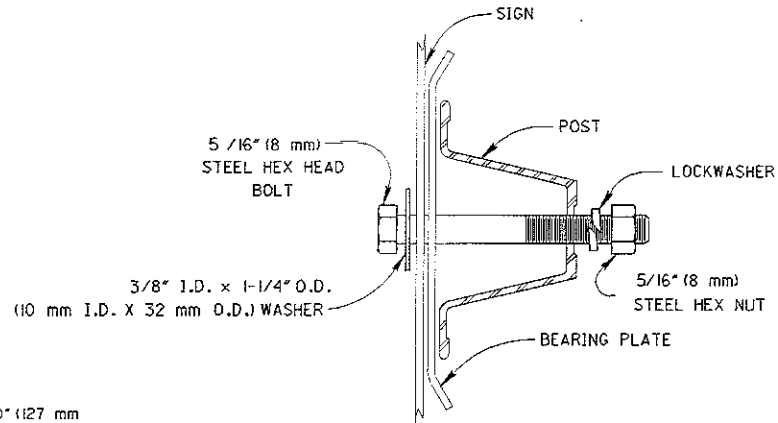
ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

| TC-9.10 TYPE SUPPORTS |            |     |              |        |     | TC-16.20 & TC-81.20 TYPE SUPPORTS |            |     |              |        |     | TC-17.10 & 81.10 TYPE SUPPORTS |            |     |              |        |     | TC-12.30 TYPE SUPPORTS |            |     |              |        |     |
|-----------------------|------------|-----|--------------|--------|-----|-----------------------------------|------------|-----|--------------|--------|-----|--------------------------------|------------|-----|--------------|--------|-----|------------------------|------------|-----|--------------|--------|-----|
| DESIGN NO.            | D (meters) | W   | ANCHOR BOLTS |        |     | DESIGN NO.                        | D (meters) | W   | ANCHOR BOLTS |        |     | DESIGN NO.                     | D (meters) | W   | ANCHOR BOLTS |        |     | DESIGN NO.             | D (meters) | W   | ANCHOR BOLTS |        |     |
|                       |            |     | SIZE         | CIRCLE | P   |                                   |            |     | SIZE         | CIRCLE | P   |                                |            |     | SIZE         | CIRCLE | P   |                        |            |     | SIZE         | CIRCLE | P   |
| 1                     | 2.4        | 762 | 38 X 1.4 m   | 343    | 171 | 1                                 | 2.4        | 762 | 38 X 1.4 m   | 343    | 171 | 1                              | 2.1        | 762 | 32 X 1.1 m   | 254    | 146 | 1                      | 2.7        | 914 | 45 X 2.1 m   | 381    | 197 |
| 2                     | 2.4        | 762 | 38 X 1.4 m   | 343    | 171 | 2                                 | 2.4        | 762 | 38 X 1.4 m   | 381    | 171 | 2                              | 2.1        | 762 | 38 X 1.4 m   | 318    | 171 | 2                      | 2.7        | 914 | 45 X 2.1 m   | 381    | 197 |
| 3                     | 2.7        | 914 | 45 X 2.1 m   | 406    | 197 | 3                                 | 2.7        | 762 | 38 X 1.4 m   | 406    | 171 | 3                              | 2.4        | 762 | 38 X 1.4 m   | 343    | 171 | 3                      | 3.4        | 914 | 51 X 2.3 m   | 457    | 216 |
|                       |            |     |              |        |     | 4                                 | 3.1        | 914 | 45 X 2.1 m   | 457    | 197 | 4                              | 2.4        | 914 | 45 X 2.1 m   | 381    | 197 | 4                      | 3.4        | 914 | 51 X 2.3 m   | 457    | 216 |
|                       |            |     |              |        |     | 5                                 | 2.7        | 914 | 45 X 2.1 m   | 381    | 197 | 5                              | 2.7        | 914 | 45 X 2.1 m   | 406    | 197 | 5                      | 3.4        | 914 | 51 X 2.3 m   | 559    | 216 |
| TC-9.30 TYPE SUPPORTS |            |     |              |        |     | 6                                 | 2.7        | 914 | 45 X 2.1 m   | 381    | 197 | 6                              | 2.7        | 914 | 45 X 2.1 m   | 406    | 197 | 6                      | 3.4        | 914 | 51 X 2.3 m   | 559    | 216 |
| 1                     | 2.4        | 762 | 38 X 1.4 m   | 343    | 171 | 7                                 | 2.7        | 914 | 45 X 2.1 m   | 381    | 197 | 7                              | 3.1        | 914 | 51 X 2.3 m   | 457    | 216 | 7                      | 4.6        | 914 | 64 X 2.9 m   | 597    | 248 |
| 2                     | 2.7        | 914 | 45 X 2.1 m   | 381    | 197 | 8                                 | 2.7        | 914 | 45 X 2.1 m   | 406    | 197 | 8                              | 3.1        | 914 | 51 X 2.3 m   | 508    | 216 | 8                      | 4.6        | 914 | 64 X 2.9 m   | 597    | 248 |
| 3                     | 3.1        | 914 | 51 X 2.3 m   | 508    | 216 | 9                                 | 3.1        | 914 | 45 X 2.1 m   | 457    | 197 | 9                              | 3.1        | 914 | 51 X 2.3 m   | 559    | 216 | 9                      | 4.6        | 914 | 64 X 2.9 m   | 597    | 248 |
| 4                     | 3.4        | 914 | 57 X 2.3 m   | 559    | 229 | 10                                | 3.1        | 914 | 45 X 2.1 m   | 508    | 197 | 10                             | 3.4        | 914 | 57 X 2.3 m   | 559    | 229 | 10                     | 5.2        | 914 | 64 X 2.9 m   | 648    | 248 |
| 5                     | 3.4        | 914 | 57 X 2.3 m   | 559    | 229 | 11                                | 3.1        | 914 | 45 X 2.1 m   | 508    | 197 | 11                             | 3.4        | 914 | 57 X 2.3 m   | 559    | 229 | 11                     | 5.2        | 914 | 64 X 2.9 m   | 648    | 248 |
|                       |            |     |              |        |     | 12                                | 3.4        | 914 | 51 X 2.3m    | 508    | 216 | 12                             | 3.7        | 914 | 64 X 2.9 m   | 597    | 248 | 12                     | 5.5        | 914 | 76 X 3.5 m   | 648    | 286 |

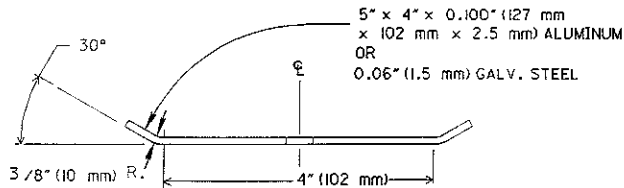
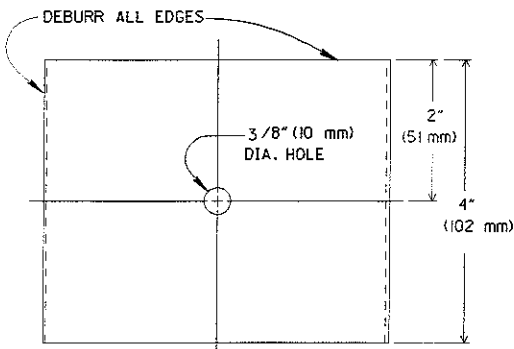


| POST NO. | TYPE | LB/FT | POST DIMENSIONS (INCHES) |       |       | ANCHOR DIMENSIONS |       |       | NUMBER OF POSTS PERMITTED IN SEVEN FOOT PATH IN EXPOSED LOCATIONS |
|----------|------|-------|--------------------------|-------|-------|-------------------|-------|-------|-------------------------------------------------------------------|
|          |      |       | A                        | B     | C     | A                 | B     | C     |                                                                   |
| 1        | F    | 1.12  | 0.875                    | 2.063 | 0.813 |                   |       |       |                                                                   |
|          | P    | 2.00  | 1.469                    | 3.063 | 1.281 |                   |       |       | 2                                                                 |
|          | F    | 2.00  | 1.516                    | 3.125 | 1.250 |                   |       |       | 2                                                                 |
| 2        | S    |       | 1.750                    | 1.750 | 0.083 | 2.000             | 2.000 | 0.105 | 2                                                                 |
|          | P    | 3.00  | 1.875                    | 3.500 | 1.313 |                   |       |       | 2                                                                 |
|          | F    | 3.00  | 1.750                    | 3.500 | 1.625 |                   |       |       | 2                                                                 |
| 3        | S    |       | 2.00                     | 2.00  | 0.083 | 2.250             | 2.250 | 0.105 | 2                                                                 |
|          | P    | 4.00  | TWO NO.2 POST            |       |       |                   |       |       | 0                                                                 |
|          | F    | 4.00  | TWO NO.2 POST            |       |       |                   |       |       | 0                                                                 |
| 4        | S    |       | 2.500                    | 2.500 | 0.105 | 3.000             | 3.000 | 0.188 | 1                                                                 |
|          | P    | 6.00  | TWO NO.3 POST            |       |       |                   |       |       | 0                                                                 |
|          | F    | 6.00  | TWO NO.3 POST            |       |       |                   |       |       | 0                                                                 |

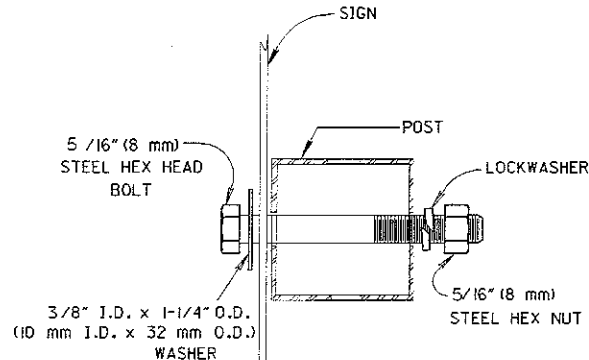
| POST NO. | TYPE | Kg/m | POST DIMENSIONS (mm) |    |     | ANCHOR DIMENSIONS |    |     | NUMBER OF POSTS PERMITTED IN 2.1m PATH IN EXPOSED LOCATIONS |
|----------|------|------|----------------------|----|-----|-------------------|----|-----|-------------------------------------------------------------|
|          |      |      | A                    | B  | C   | A                 | B  | C   |                                                             |
| 1        | F    | 1.7  | 22                   | 52 | 21  |                   |    |     |                                                             |
|          | P    | 3.0  | 37                   | 78 | 33  |                   |    |     | 2                                                           |
|          | F    | 3.0  | 39                   | 79 | 32  |                   |    |     | 2                                                           |
| 2        | S    |      | 44                   | 44 | 2.1 | 51                | 51 | 2.7 | 2                                                           |
|          | P    | 4.5  | 48                   | 89 | 33  |                   |    |     | 2                                                           |
|          | F    | 4.5  | 44                   | 89 | 41  |                   |    |     | 2                                                           |
| 3        | S    |      | 51                   | 51 | 2.1 | 57                | 57 | 2.7 | 2                                                           |
|          | P    | 6.0  | TWO NO.2 POST        |    |     |                   |    |     | 0                                                           |
|          | F    | 6.0  | TWO NO.2 POST        |    |     |                   |    |     | 0                                                           |
| 4        | S    |      | 63                   | 63 | 2.7 | 76                | 76 | 4.8 | 1                                                           |
|          | P    | 9.0  | TWO NO.3 POST        |    |     |                   |    |     | 0                                                           |
|          | F    | 9.0  | TWO NO.3 POST        |    |     |                   |    |     | 0                                                           |



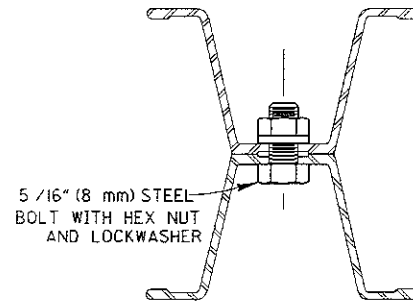
U - CHANNEL  
SIGN ATTACHMENT DETAIL



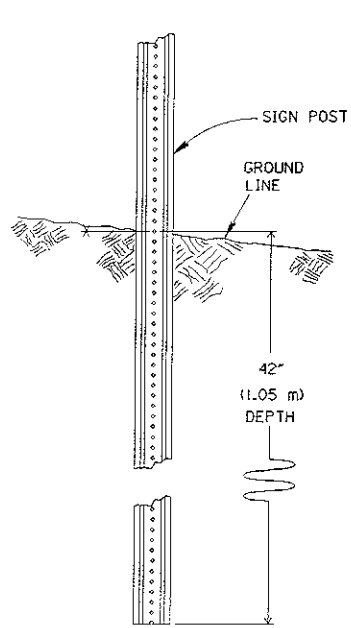
BEARING PLATE



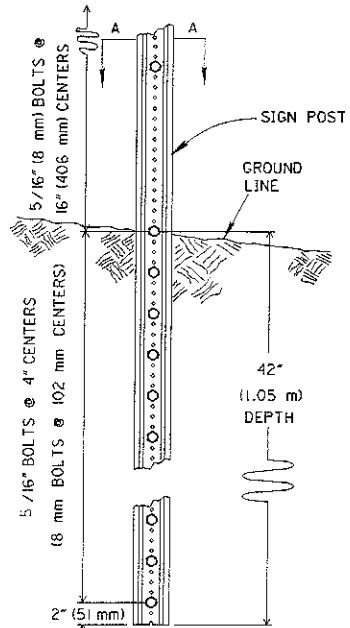
SQUARE POST  
SIGN ATTACHMENT DETAIL



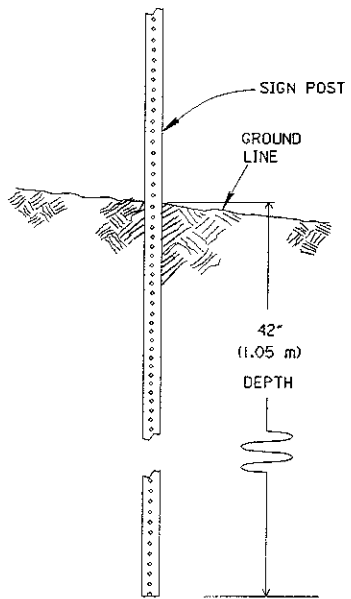
SECTION A - A



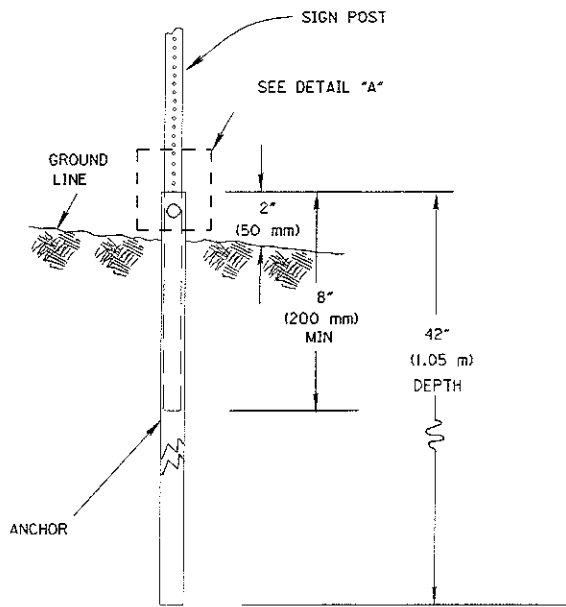
TYPICAL NO. 1, NO. 2  
AND NO. 3 U - CHANNEL  
DRIVEN INSTALLATION



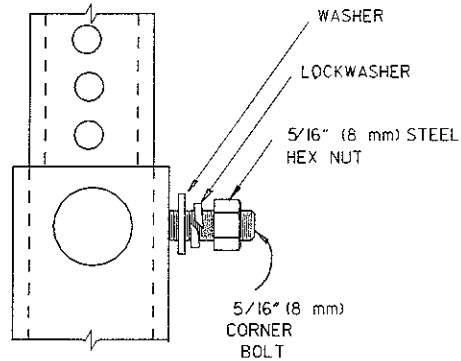
TYPICAL NO. 4 AND  
NO. 6 U - CHANNEL  
DRIVEN INSTALLATION



TYPICAL SQUARE POST  
DRIVEN INSTALLATION



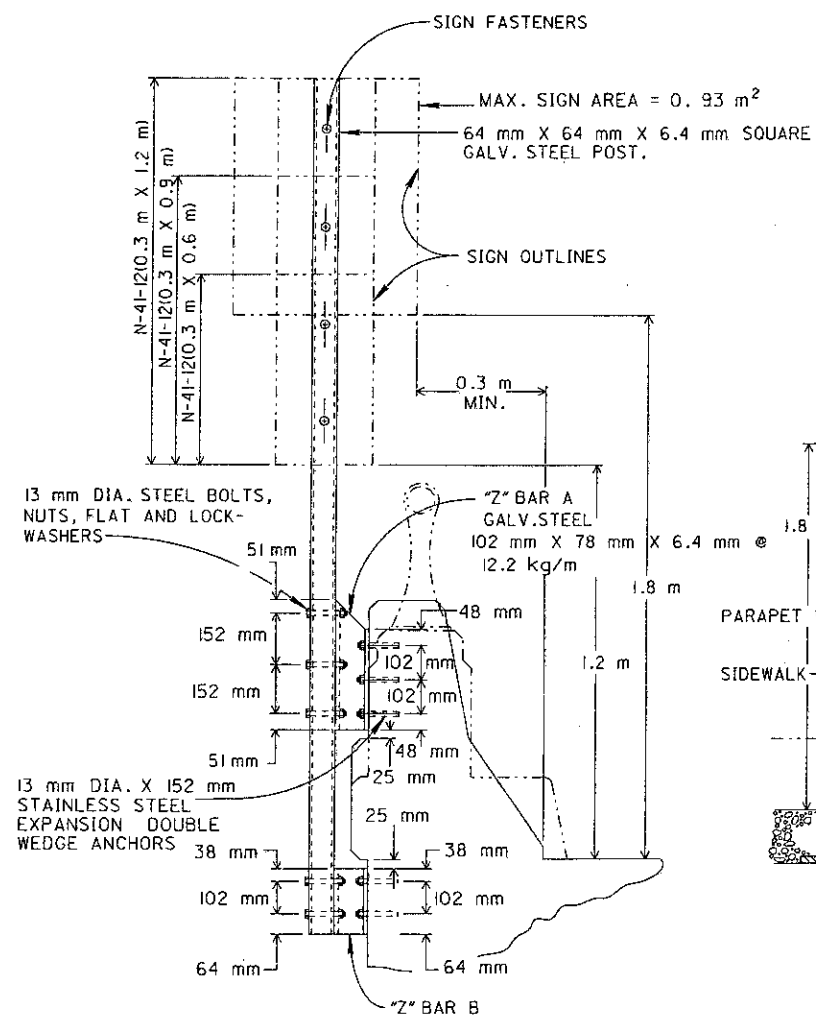
TYPICAL SQUARE POST ANCHOR  
BASE INSTALLATION



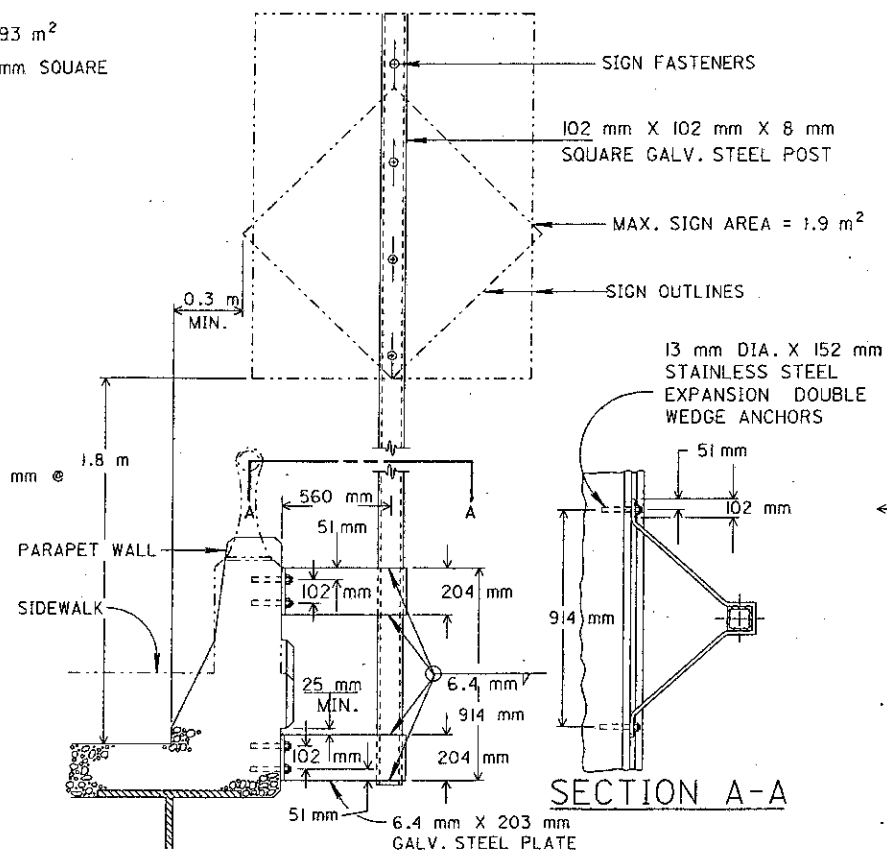
DETAIL "A"

NOTES

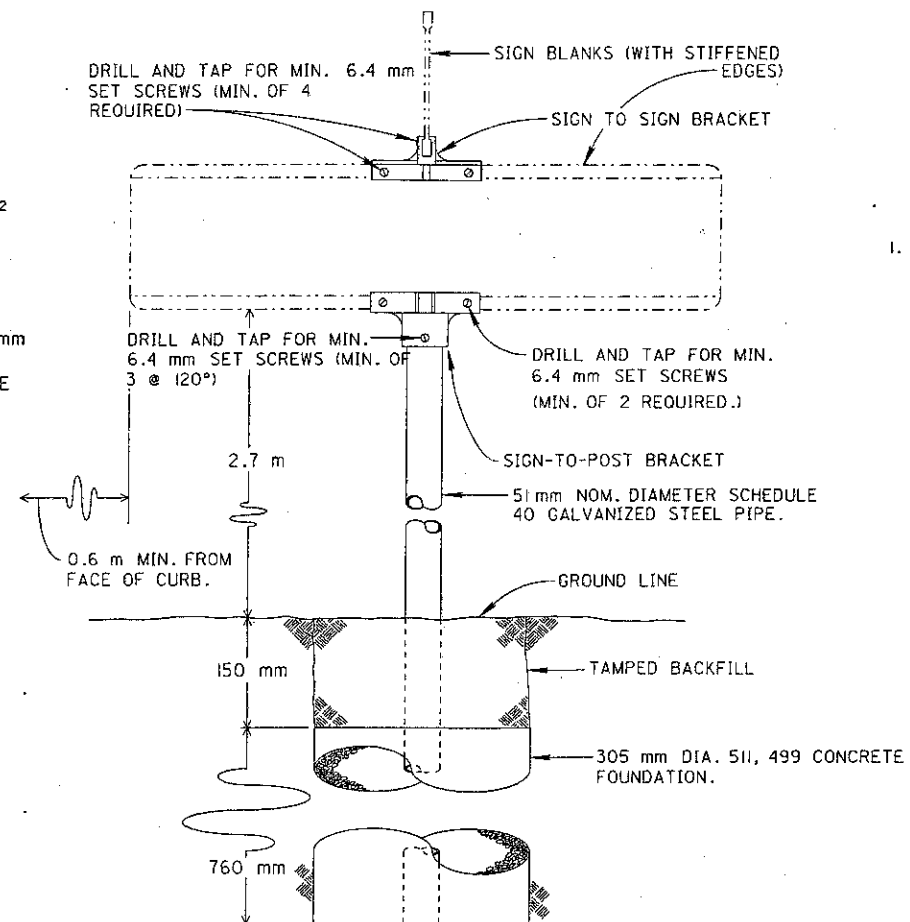
1. Install number 4 type P and F posts, and number 6 type P and F posts, only in protected locations (e.g. behind guardrail). Install two post installations of number 4 type S posts within 7 foot (2.1m) path only in protected locations.
2. Use of anchor base with No. 2 and No. 3 square post is optional. Use of anchor base with No. 4 square post is required.
3. Square post may have die-cut knockouts or open holes.



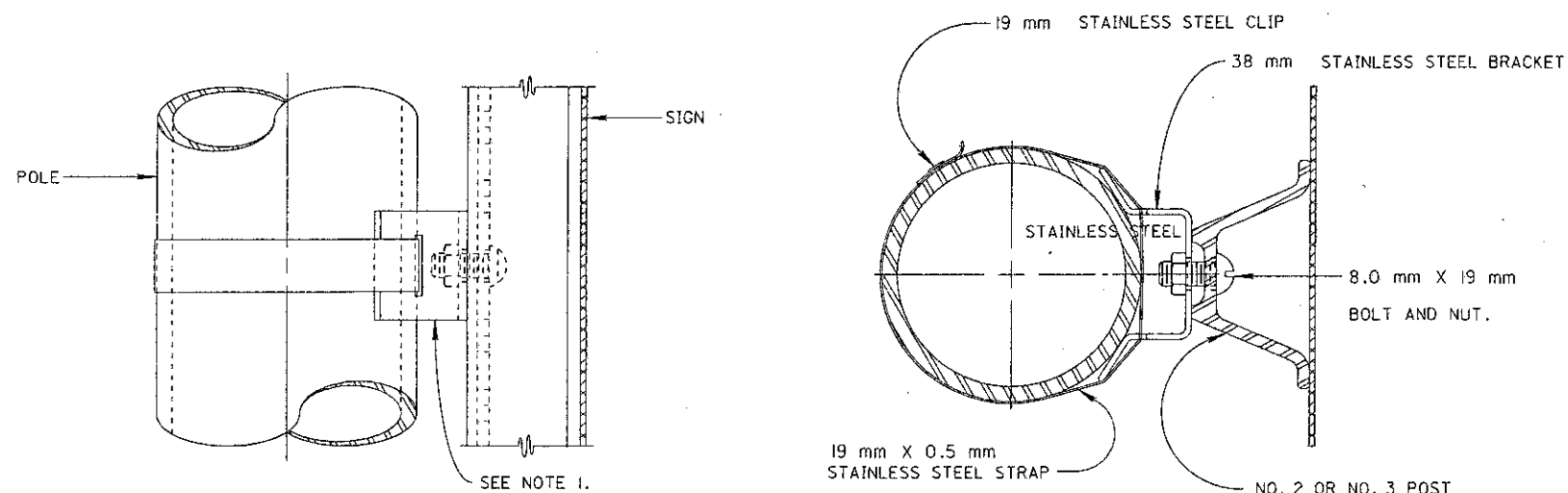
SIGN SUPPORT ASSEMBLY, BRIDGE MOUNTED, TYPE 1.



SIGN SUPPORT ASSEMBLY, BRIDGE MOUNTED, TYPE 2.



STREET NAME SIGN SUPPORT



SIGN SUPPORT ASSEMBLY, POLE MOUNTED

## NOTES

- USE MINIMUM OF 2 BRACKETS (LOCATED 150 mm FROM TOP AND BOTTOM OF SIGN) PER INSTALLATION WITH MAXIMUM SPACING OF 0.9 m.

M E T R I C

BUREAU OF DESIGN SERVICES  
DIVISION OF HIGHWAYS  
OHIO DEPARTMENT OF TRANSPORTATION

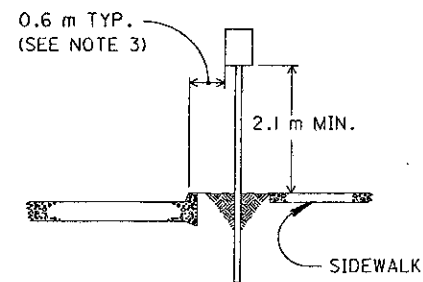
TRAFFIC CONTROL

DATE  
03/31/94

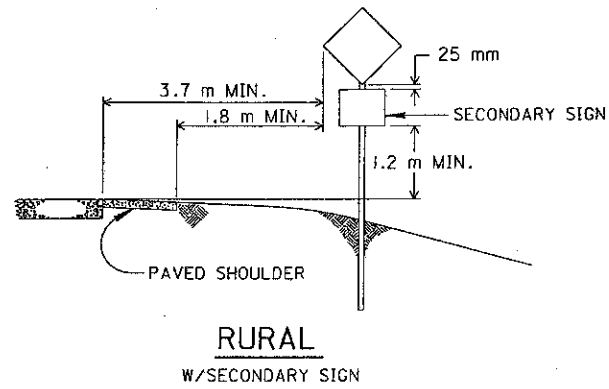
SPECIAL SIGN  
ATTACHMENTS AND SUPPORTS

STANDARD  
CONSTRUCTION  
DRAWING  
APPROVED: *[Signature]* ENGR. OF DESIGN SERVICES

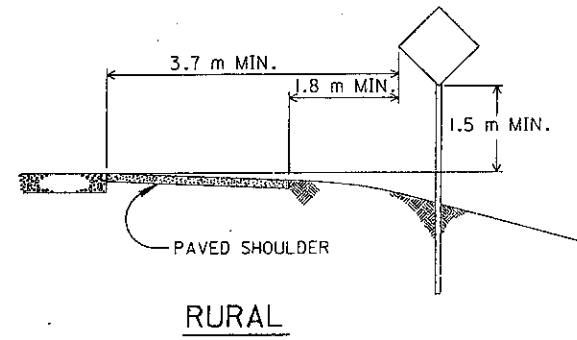
TC-41.40M



URBAN-RESIDENTIAL AND BUSINESS



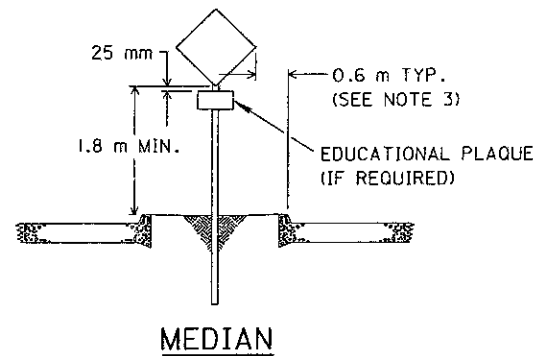
RURAL  
W/SECONDARY SIGN



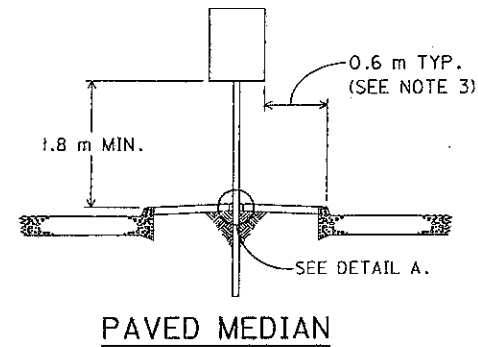
RURAL

## NOTES

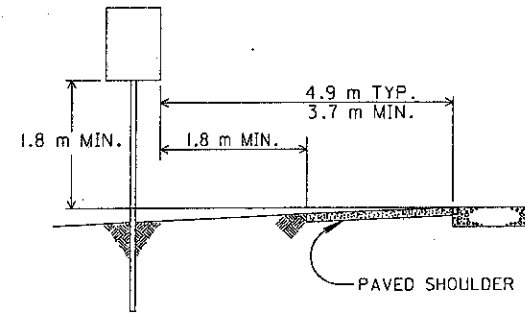
1. SEE DRAWING TC-41.20M FOR DETAILS ON YIELDING SUPPORTS.
2. ALL SIGNS SHALL BE PLACED 90° TO THE ROADWAY, EXCEPT PARKING SIGNS WITH ARROW SHALL BE SET AT AN ANGLE OF NOT LESS THAN 30° NOR MORE THAN 45° WITH A LINE PARALLEL TO THE FLOW OF TRAFFIC.
3. A CLEARANCE OF 0.3 m IS PERMISSIBLE WHERE SIDEWALK WIDTH IS LIMITED OR WHERE EXISTING POLES ARE CLOSE TO THE CURB.
4. SEE DRAWINGS TC-52.10M AND TC-52.20M FOR DIMENSIONS BETWEEN SUPPORTS.



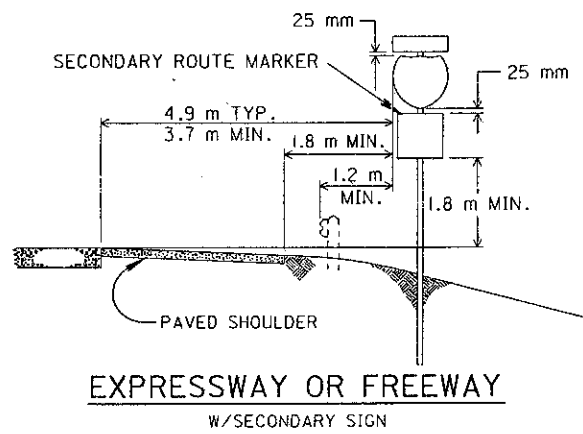
MEDIAN



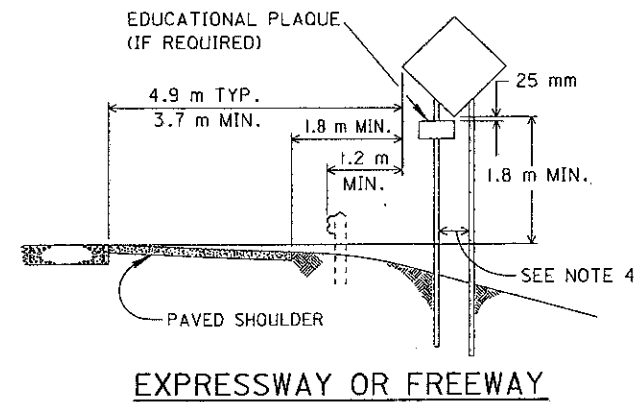
PAVED MEDIAN



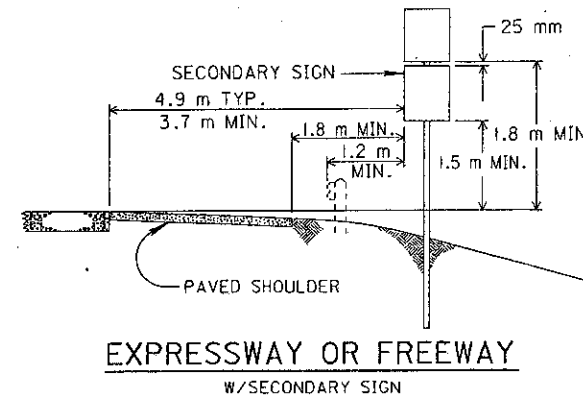
MEDIAN-EXPRESSWAY OR FREEWAY



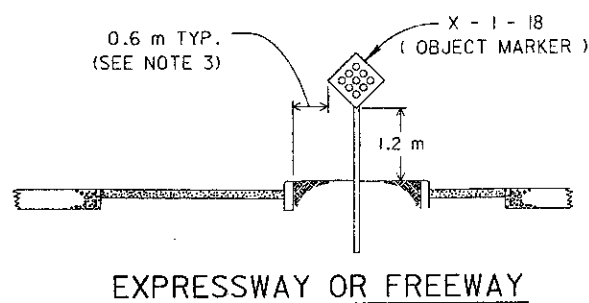
EXPRESSWAY OR FREEWAY  
W/SECONDARY SIGN



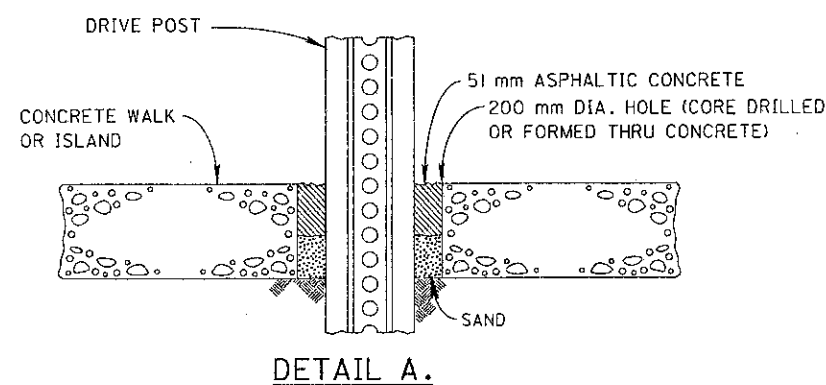
EXPRESSWAY OR FREEWAY



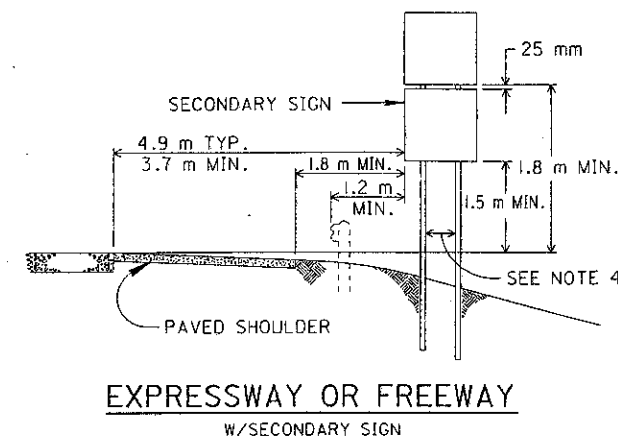
EXPRESSWAY OR FREEWAY  
W/SECONDARY SIGN



EXPRESSWAY OR FREEWAY



DETAIL A.



EXPRESSWAY OR FREEWAY  
W/SECONDARY SIGN

METRIC

BUREAU OF DESIGN SERVICES  
DIVISION OF HIGHWAYS  
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

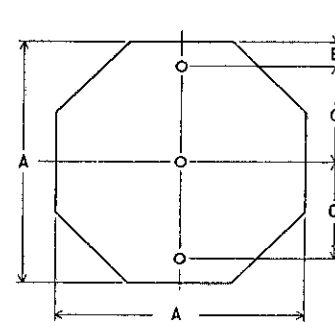
DATE  
03/31/94

TYPICAL SIGN PLACEMENT  
REGULATORY, WARNING  
AND ROUTE MARKER SIGNS

STANDARD  
CONSTRUCTION  
DRAWING  
APPROVED *John W. Wagoner* ENGR. OF DESIGN SERVICES

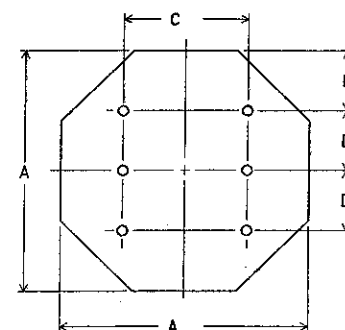
TC-42.20M





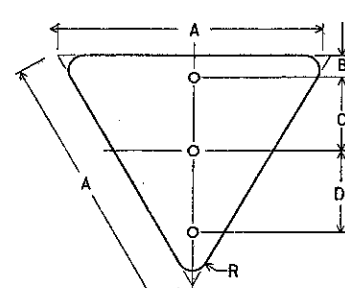
OCTA-1-3

| A   | B   | C   | THICKNESS | m <sup>2</sup> |
|-----|-----|-----|-----------|----------------|
| 750 | 75  | 300 | 2.0       | 0.56           |
| 900 | 150 | 300 | 2.0       | 0.81           |



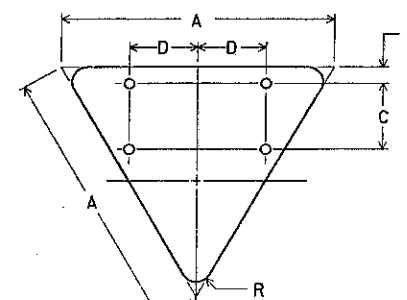
OCTA-2-6

| A    | B   | C   | D   | THICKNESS | m <sup>2</sup> |
|------|-----|-----|-----|-----------|----------------|
| 1200 | 300 | 600 | 300 | 2.5       | 1.44           |



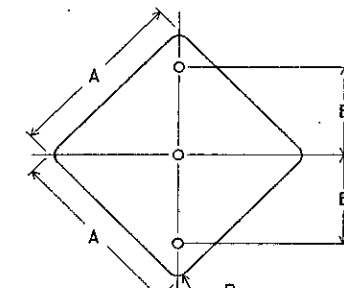
TRI-1-3

| A   | B  | C   | D   | R  | THICKNESS | m <sup>2</sup> |
|-----|----|-----|-----|----|-----------|----------------|
| 900 | 75 | 250 | 275 | 50 | 2.5       | 0.35           |



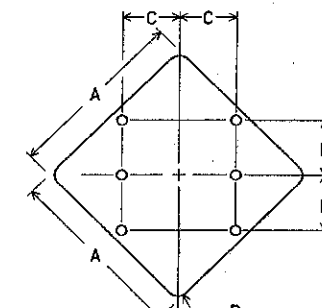
TRI-2-4

| A    | B  | C   | D   | R   | THICKNESS | m <sup>2</sup> |
|------|----|-----|-----|-----|-----------|----------------|
| 1200 | 75 | 300 | 300 | 75  | 2.5       | 0.62           |
| 1500 | 75 | 450 | 375 | 100 | 2.5       | 0.97           |



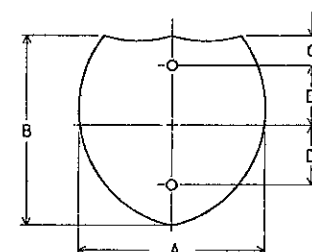
DIA-1-3

| A   | B   | R  | THICKNESS | m <sup>2</sup> |
|-----|-----|----|-----------|----------------|
| 600 | 300 | 38 | 1.6       | 0.36           |
| 750 | 375 | 48 | 2.0       | 0.56           |
| 900 | 450 | 57 | 2.0       | 0.81           |



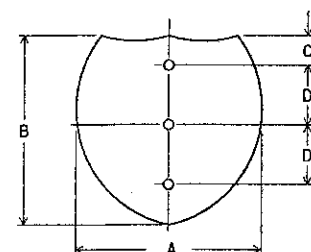
DIA-2-6

| A    | B   | C   | R  | THICKNESS | m <sup>2</sup> |
|------|-----|-----|----|-----------|----------------|
| 1200 | 375 | 375 | 75 | 2.5       | 1.44           |
| 1500 | 450 | 450 | 95 | 2.5       | 2.25           |



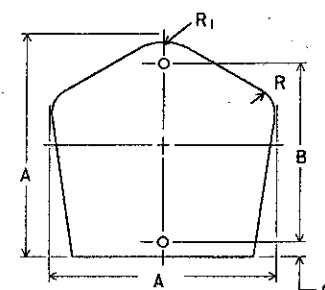
I.S.-1-2

| A    | B   | C  | D   | THICKNESS | m <sup>2</sup> |
|------|-----|----|-----|-----------|----------------|
| 600  | 600 | 75 | 225 | 1.6       | 0.36           |
| 750  | 600 | 75 | 225 | 2.0       | 0.45           |
| 750  | 750 | 75 | 300 | 2.0       | 0.56           |
| 1000 | 750 | 75 | 300 | 2.0       | 0.75           |



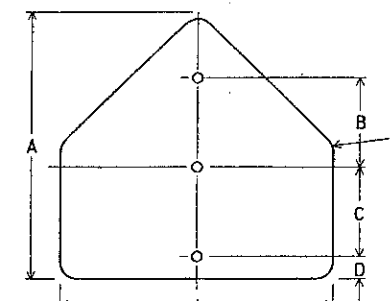
I.S.-1-3

| A    | B   | C   | D   | THICKNESS | m <sup>2</sup> |
|------|-----|-----|-----|-----------|----------------|
| 900  | 900 | 150 | 300 | 2.0       | 0.81           |
| 1200 | 900 | 150 | 300 | 2.5       | 1.08           |



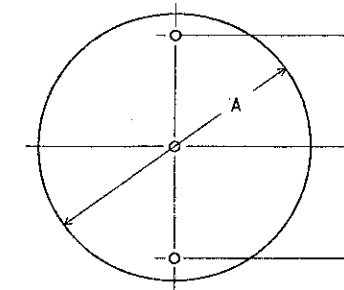
CO-1-2

| A   | B   | C  | R1  | R  | THICKNESS | m <sup>2</sup> |
|-----|-----|----|-----|----|-----------|----------------|
| 450 | 375 | 25 | 125 | 50 | 1.6       | 0.20           |
| 600 | 450 | 50 | 135 | 68 | 1.6       | 0.36           |
| 750 | 600 | 50 | 168 | 86 | 2.0       | 0.56           |



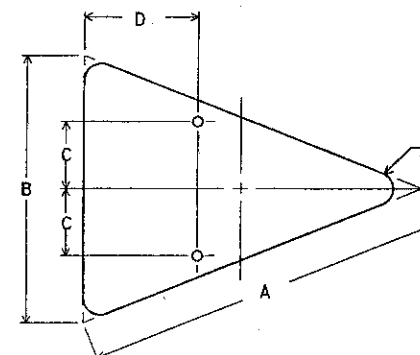
PENT-1-3

| A    | B   | C   | D   | R  | THICKNESS | m <sup>2</sup> |
|------|-----|-----|-----|----|-----------|----------------|
| 750  | 250 | 275 | 75  | 48 | 2.0       | 0.56           |
| 900  | 300 | 300 | 75  | 57 | 2.0       | 0.81           |
| 1050 | 350 | 325 | 100 | 64 | 2.5       | 1.10           |



CIR-1-3

| A   | B   | THICKNESS | m <sup>2</sup> |
|-----|-----|-----------|----------------|
| 750 | 300 | 1.6       | 0.56           |
| 900 | 375 | 2.0       | 0.81           |

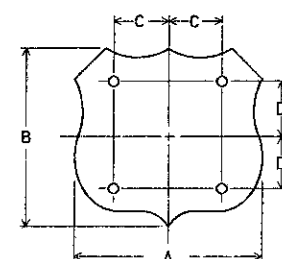


ISOS-1-2

| A    | B   | C   | D   | R  | THICKNESS | m <sup>2</sup> |
|------|-----|-----|-----|----|-----------|----------------|
| 1000 | 750 | 187 | 300 | 48 | 2.0       | 0.35           |
| 1200 | 900 | 225 | 375 | 57 | 2.5       | 0.50           |

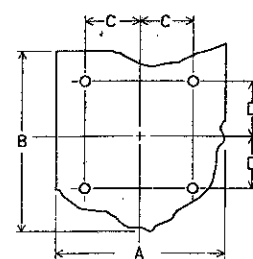
## ROUTE SHIELDS

(FOR GUIDE SIGNS ONLY)



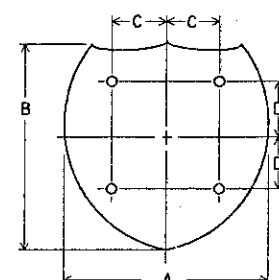
M-1C-

| A    | B   | C   | D   |
|------|-----|-----|-----|
| 610  | 600 | 175 | 175 |
| 750  | 600 | 200 | 200 |
| 750  | 750 | 225 | 225 |
| 937  | 750 | 225 | 225 |
| 900  | 900 | 250 | 250 |
| 1125 | 900 | 375 | 250 |



M-2C-

| A    | B   | C   | D   |
|------|-----|-----|-----|
| 600  | 600 | 175 | 175 |
| 750  | 600 | 200 | 200 |
| 750  | 750 | 225 | 225 |
| 937  | 750 | 225 | 225 |
| 900  | 900 | 250 | 250 |
| 1125 | 900 | 375 | 250 |



M-5C-

| A    | B   | C   | D   |
|------|-----|-----|-----|
| 600  | 600 | 175 | 175 |
| 750  | 600 | 200 | 200 |
| 750  | 750 | 225 | 225 |
| 1000 | 750 | 225 | 225 |
| 900  | 900 | 250 | 250 |
| 1200 | 900 | 375 | 250 |

ALL SHIELDS SHALL BE 1.6 mm THICK

SHAPE OCTA-2-6 NO. BOLTS REQUIRED

NO. SUPPORTS REQUIRED 1

## NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
- ALL BOLT HOLES SHALL BE 10 MILLIMETERS IN DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
- DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF  $\pm 0.8$  MILLIMETER.
- FOR ADDITIONAL BLANK DETAILS, SEE SIGN LAYOUT DRAWING.

# METRIC

BUREAU OF DESIGN SERVICES  
DIVISION OF HIGHWAYS  
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

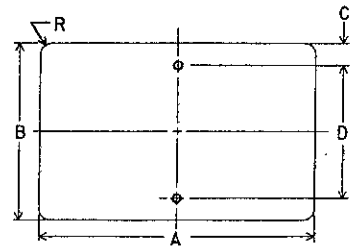
SIGN BLANK DETAILS I

STANDARD  
CONSTRUCTION  
DRAWING

TC-52.10M

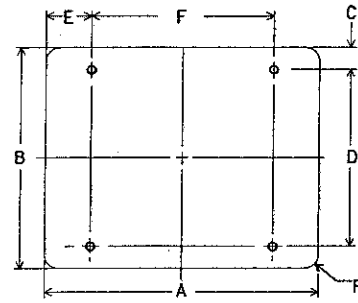
APPROVED *[Signature]* ENGR. OF DESIGN SERVICES

DATE  
07/29/94



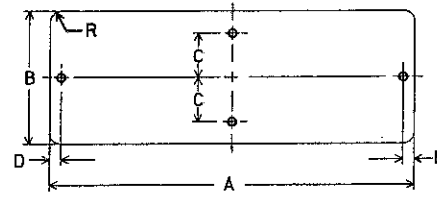
H-REC-1-2

| A    | B   | C    | D   | R  | THICKNESS | m <sup>2</sup> |
|------|-----|------|-----|----|-----------|----------------|
| 300  | 150 | 37.5 | 75  | 38 | 1.6       | 0.05           |
| 450  | 150 | 37.5 | 75  | 38 | 1.6       | 0.07           |
| 450  | 300 | 37.5 | 225 | 38 | 1.6       | 0.14           |
| 525  | 375 | 37.5 | 300 | 38 | 1.6       | 0.20           |
| 525  | 450 | 75   | 300 | 38 | 1.6       | 0.24           |
| 600  | 150 | 37.5 | 75  | 38 | 1.6       | 0.09           |
| 600  | 200 | 37.5 | 125 | 38 | 1.6       | 0.12           |
| 600  | 250 | 37.5 | 175 | 38 | 1.6       | 0.15           |
| 600  | 300 | 37.5 | 225 | 38 | 1.6       | 0.18           |
| 600  | 450 | 75   | 300 | 38 | 1.6       | 0.27           |
| 750  | 200 | 37.5 | 125 | 38 | 1.6       | 0.15           |
| 750  | 250 | 37.5 | 175 | 38 | 1.6       | 0.19           |
| 750  | 300 | 37.5 | 225 | 38 | 2.0       | 0.23           |
| 750  | 375 | 37.5 | 300 | 38 | 2.0       | 0.28           |
| 750  | 400 | 37.5 | 325 | 38 | 2.0       | 0.30           |
| 750  | 450 | 75   | 300 | 38 | 2.0       | 0.34           |
| 750  | 600 | 75   | 450 | 38 | 2.0       | 0.45           |
| 900  | 150 | 37.5 | 75  | 38 | 2.0       | 0.14           |
| 900  | 300 | 37.5 | 225 | 38 | 2.0       | 0.27           |
| 900  | 375 | 37.5 | 300 | 38 | 2.0       | 0.34           |
| 900  | 450 | 75   | 300 | 38 | 2.0       | 0.41           |
| 900  | 600 | 75   | 450 | 38 | 2.0       | 0.54           |
| 937  | 750 | 75   | 600 | 38 | 2.0       | 0.70           |
| 1050 | 375 | 37.5 | 300 | 38 | 2.0       | 0.39           |
| 1200 | 500 | 75   | 350 | 38 | 2.0       | 0.60           |



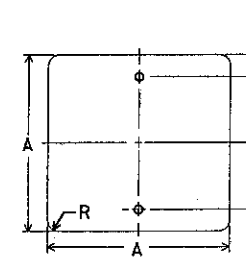
H-REC-2-4

| A    | B    | C    | D   | E   | F    | R  | THICKNESS | m <sup>2</sup> |
|------|------|------|-----|-----|------|----|-----------|----------------|
| 900  | 600  | 75   | 450 | 150 | 600  | 38 | 2.0       | 0.54           |
| 900  | 750  | 75   | 600 | 150 | 600  | 48 | 2.0       | 0.68           |
| 1000 | 500  | 75   | 350 | 150 | 700  | 38 | 2.0       | 0.50           |
| 1050 | 900  | 150  | 600 | 225 | 600  | 57 | 2.5       | 0.95           |
| 1125 | 900  | 150  | 600 | 225 | 675  | 57 | 2.5       | 1.01           |
| 1200 | 200  | 37.5 | 125 | 225 | 750  | 38 | 2.0       | 0.24           |
| 1200 | 212  | 37.5 | 137 | 225 | 750  | 38 | 2.0       | 0.25           |
| 1200 | 350  | 37.5 | 275 | 225 | 750  | 38 | 2.0       | 0.42           |
| 1200 | 400  | 37.5 | 325 | 225 | 750  | 38 | 2.0       | 0.48           |
| 1200 | 450  | 75   | 300 | 225 | 750  | 38 | 2.0       | 0.54           |
| 1200 | 600  | 75   | 450 | 225 | 750  | 48 | 2.5       | 0.72           |
| 1200 | 750  | 75   | 600 | 225 | 750  | 48 | 2.5       | 0.90           |
| 1200 | 900  | 150  | 600 | 225 | 750  | 57 | 2.5       | 1.08           |
| 1200 | 1050 | 150  | 750 | 225 | 750  | 57 | 2.5       | 1.26           |
| 1400 | 200  | 37.5 | 125 | 300 | 800  | 38 | 2.5       | 0.28           |
| 1500 | 300  | 37.5 | 225 | 300 | 900  | 38 | 2.0       | 0.45           |
| 1500 | 600  | 75   | 450 | 300 | 900  | 38 | 2.5       | 0.90           |
| 1500 | 750  | 75   | 600 | 300 | 900  | 48 | 2.5       | 1.13           |
| 1500 | 900  | 150  | 600 | 300 | 900  | 57 | 2.5       | 1.35           |
| 1500 | 1000 | 150  | 700 | 300 | 900  | 57 | 2.5       | 1.50           |
| 1600 | 200  | 37.5 | 125 | 300 | 1000 | 38 | 2.5       | 0.32           |
| 1650 | 600  | 75   | 450 | 300 | 1050 | 38 | 2.5       | 0.99           |
| 1650 | 900  | 150  | 600 | 300 | 1050 | 57 | 2.5       | 1.49           |
| 1800 | 300  | 37.5 | 225 | 300 | 1200 | 38 | 2.5       | 0.54           |
| 1800 | 450  | 75   | 300 | 300 | 1200 | 38 | 2.5       | 0.81           |
| 1800 | 600  | 75   | 450 | 300 | 1200 | 38 | 2.5       | 1.08           |
| 1800 | 900  | 75   | 600 | 300 | 1200 | 38 | 2.5       | 1.62           |



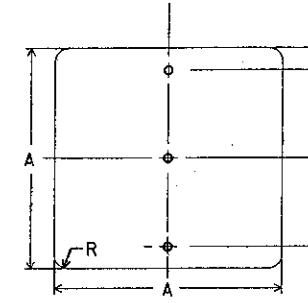
H-REC-1-4 (ONE WAY)

| A    | B   | C   | D  | R  | THICKNESS | m <sup>2</sup> |
|------|-----|-----|----|----|-----------|----------------|
| 900  | 300 | 100 | 25 | 38 | 2.0       | 0.27           |
| 1200 | 450 | 150 | 38 | 38 | 2.5       | 0.54           |



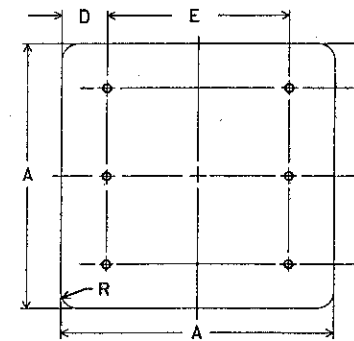
SQ-1-2

| A   | B  | C     | R  | THICKNESS | m <sup>2</sup> |
|-----|----|-------|----|-----------|----------------|
| 375 | 75 | 112.5 | 38 | 1.6       | 0.14           |
| 450 | 75 | 150   | 38 | 1.6       | 0.20           |
| 600 | 75 | 225   | 38 | 1.6       | 0.36           |



SQ-1-3

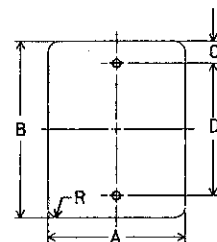
| A   | B   | C   | R  | THICKNESS | m <sup>2</sup> |
|-----|-----|-----|----|-----------|----------------|
| 750 | 75  | 300 | 48 | 2.0       | 0.56           |
| 900 | 150 | 300 | 57 | 2.0       | 0.81           |



SQ-2-6

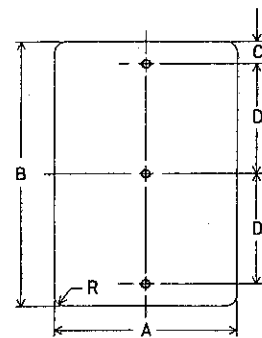
| A      | B   | C   | D   | E   | R  | THICKNESS | m <sup>2</sup> |
|--------|-----|-----|-----|-----|----|-----------|----------------|
| * 900  | 150 | 300 | 150 | 600 | 57 | 2.0       | 0.81           |
| * 1200 | 150 | 450 | 225 | 750 | 75 | 2.5       | 1.44           |

\* "DO NOT ENTER" SIGN.



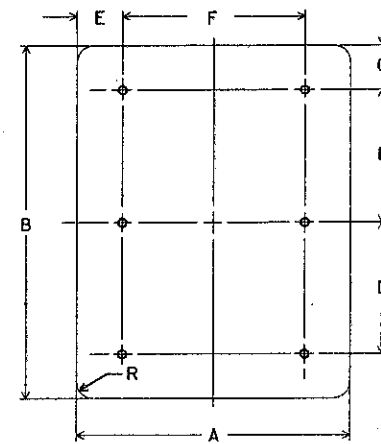
V-REC-1-2

| A   | B   | C    | D   | R  | THICKNESS | m <sup>2</sup> |
|-----|-----|------|-----|----|-----------|----------------|
| 200 | 650 | 125  | 400 | 38 | 1.6       | 0.13           |
| 225 | 300 | 37.5 | 225 | 38 | 1.6       | 0.07           |
| 300 | 450 | 37.5 | 375 | 38 | 1.6       | 0.14           |
| 300 | 600 | 75   | 450 | 38 | 1.6       | 0.18           |
| 450 | 600 | 75   | 450 | 38 | 1.6       | 0.27           |



V-REC-1-3

| A   | B    | C   | D   | R  | THICKNESS | m <sup>2</sup> |
|-----|------|-----|-----|----|-----------|----------------|
| 150 | 1350 | 225 | 450 | 38 | 2.0       | 0.20           |
| 300 | 900  | 75  | 375 | 38 | 1.6       | 0.27           |
| 300 | 1200 | 150 | 450 | 38 | 2.0       | 0.36           |
| 600 | 750  | 75  | 300 | 38 | 2.0       | 0.45           |
| 600 | 900  | 75  | 375 | 38 | 2.0       | 0.54           |
| 600 | 1200 | 225 | 375 | 38 | 2.5       | 0.72           |
| 750 | 900  | 75  | 375 | 48 | 2.0       | 0.68           |
| 750 | 950  | 75  | 400 | 38 | 2.0       | 0.68           |
| 750 | 1050 | 225 | 300 | 38 | 2.0       | 0.79           |
| 900 | 1050 | 225 | 300 | 57 | 2.5       | 0.95           |



V-REC-2-6

| A    | B    | C   | D   | E   | F   | R  | THICKNESS | m <sup>2</sup> |
|------|------|-----|-----|-----|-----|----|-----------|----------------|
| 900  | 1200 | 150 | 450 | 150 | 600 | 57 | 2.0       | 1.08           |
| 900  | 1350 | 150 | 525 | 150 | 600 | 57 | 2.5       | 1.22           |
| 900  | 1500 | 150 | 600 | 150 | 600 | 57 | 2.5       | 1.35           |
| 900  | 1800 | 225 | 675 | 150 | 600 | 57 | 2.5       | 1.62           |
| 1200 | 1350 | 150 | 525 | 225 | 750 | 75 | 2.5       | 1.62           |
| 1200 | 1500 | 150 | 600 | 225 | 750 | 75 | 2.5       | 1.80           |
| 1200 | 2400 | 300 | 900 | 225 | 750 | 75 | 2.5       | 2.88           |

SHAPE H-REC-2-4 NO. BOLTS REQUIRED  
NO. SUPPORTS REQUIRED

## NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
2. ALL BOLT HOLES SHALL BE 10 MILLIMETERS IN DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
3. DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF  $\pm 0.8$  MILLIMETER.
4. FOR ADDITIONAL BLANK DETAILS SEE SIGN LAYOUT DRAWINGS.

M E T R I C

BUREAU OF DESIGN SERVICES  
DIVISION OF HIGHWAYS  
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

DATE  
07/29/94

SIGN BLANK DETAILS II

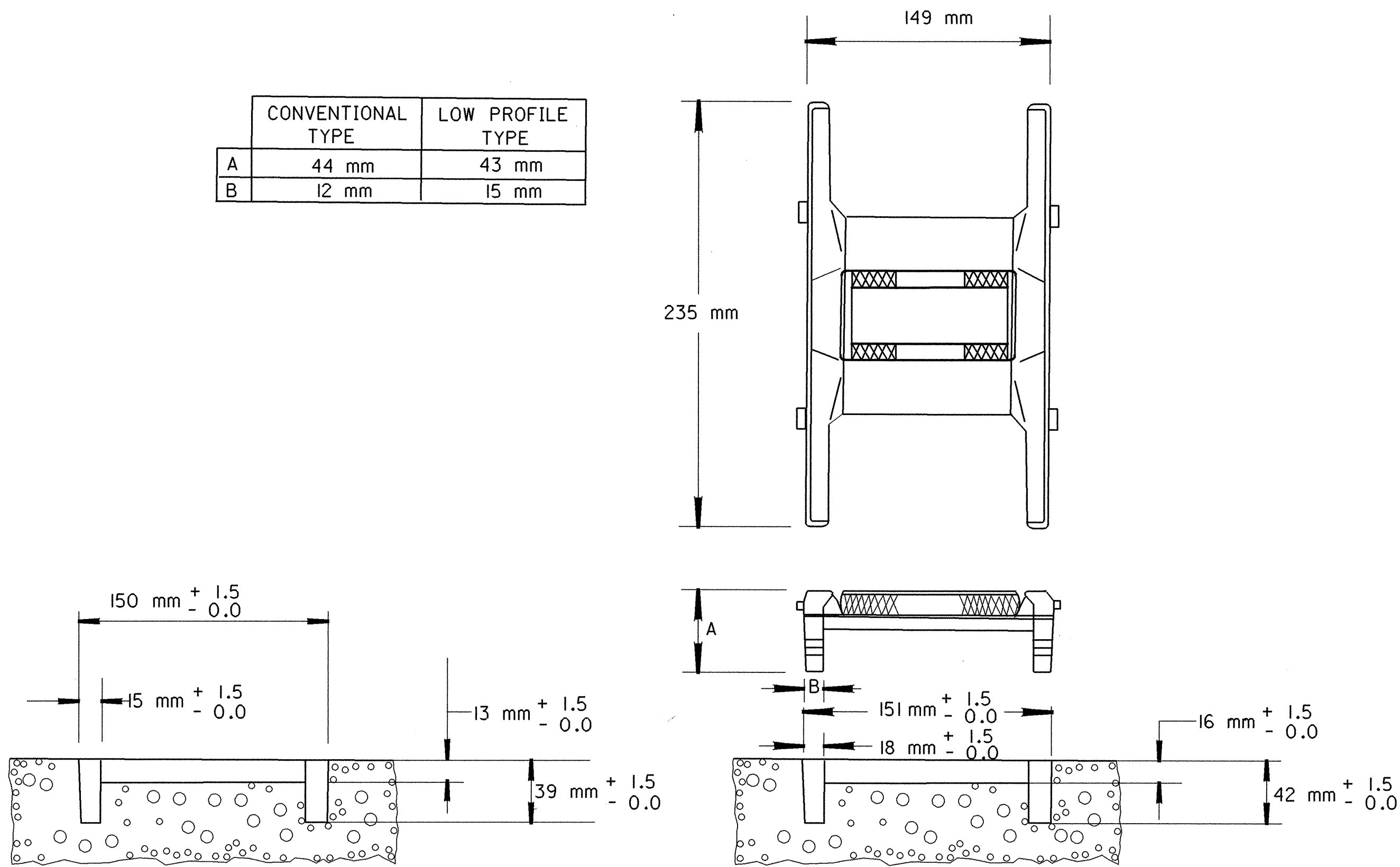
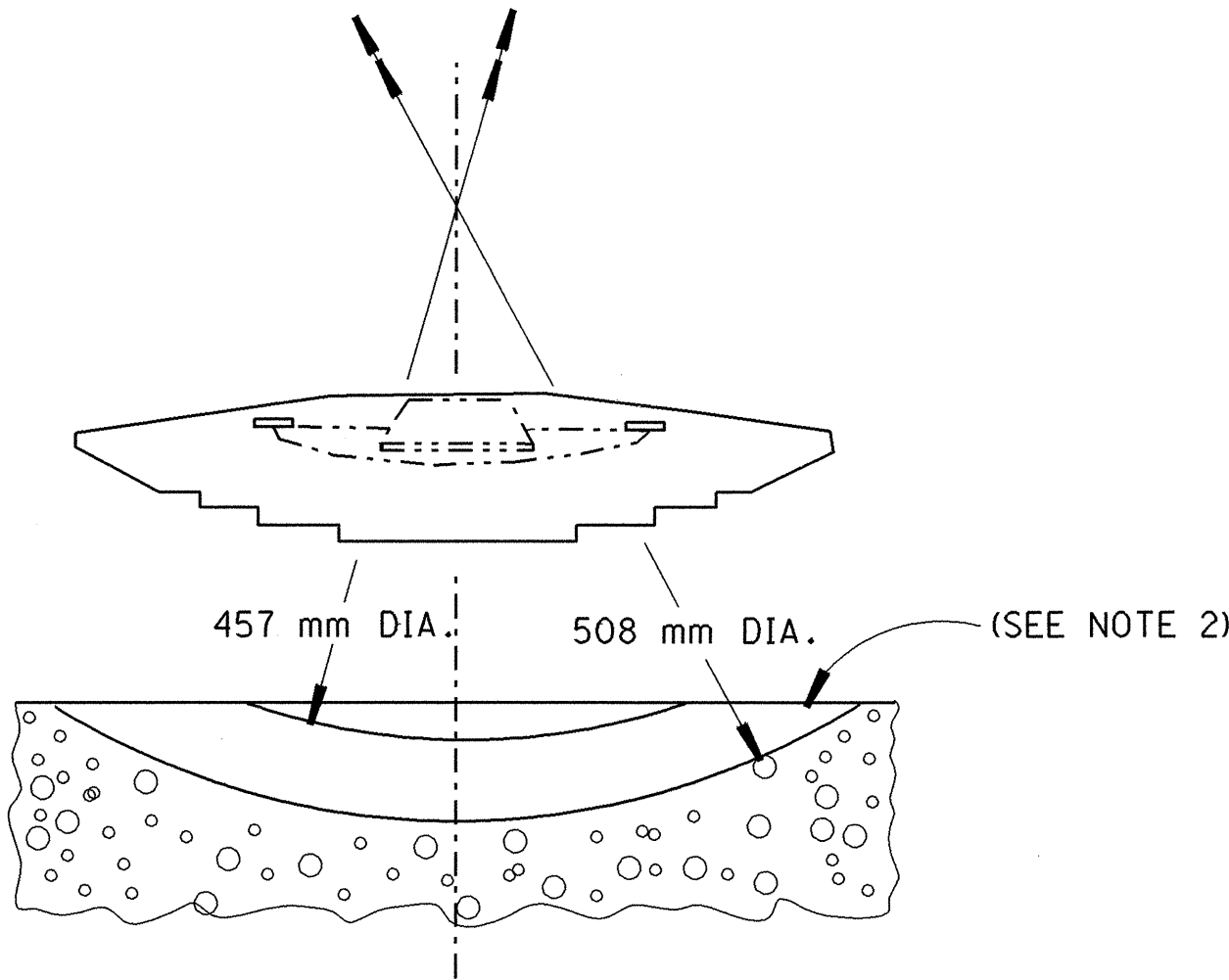
STANDARD  
CONSTRUCTION  
DRAWING  
APPROVED *Don A. Crisp* ENGR. OF DESIGN SERVICES

TC-52.20M

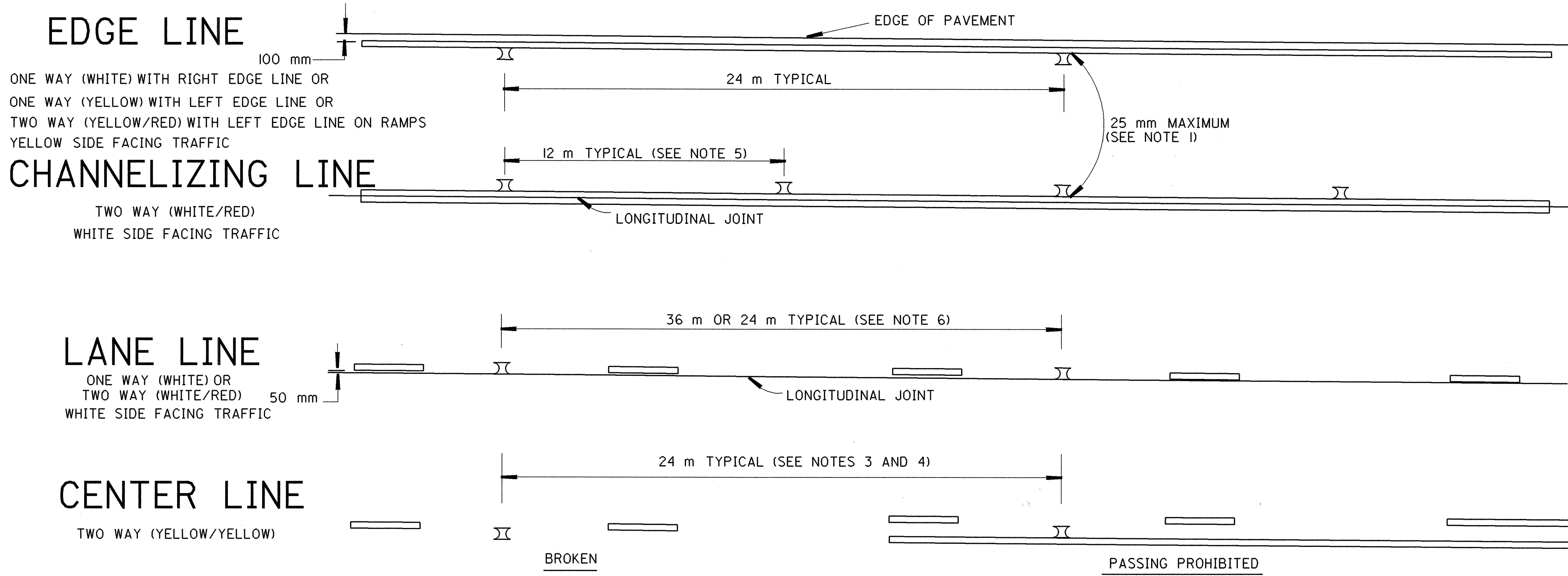
NOTES

- 1. CENTER LINE MARKERS SHALL BE PLACED BETWEEN THE TWO LINES. MARKERS INSTALLED ALONG AN EDGE LINE OR CHANNELIZING LINE SHALL BE PLACED SO THAT THE CASTING IS NO MORE THAN 25 mm FROM THE NEAR EDGE OF THE LINE. MARKERS INSTALLED ALONG A LANE LINE OR DASHED YELLOW CENTER LINE SHALL BE PLACED BETWEEN AND IN LINE WITH THE DASHES. MARKERS SHALL NOT BE PLACED OVER THE LINES EXCEPT WHERE THE LINES DEVIATE VISIBLY FROM THEIR CORRECT ALIGNMENT, AND THEN ONLY WITH THE APPROVAL OF THE ENGINEER.
- 2. TO FACILITATE THE CUTTING OF THE TWO PARALLEL SLOTS AND INTERVENING CONCAVED SURFACE SIMULTANEOUSLY, IT IS RECOMMENDED THAT AN ARBOR AND SAW BLADES ASSEMBLY BE USED. FOR ADDITIONAL DETAILS AND TOLERANCES OF THE CASTING AND ARBOR-SAW ASSEMBLY CONTACT THE CASTING MANUFACTURE.
- 3. FOR HORIZONTAL CURVE RADIUS OF 380 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS SHALL BE REDUCED TO 12 m BETWEEN P.C. OR T.S. AND P.T. OR S.T.
- 4. FOR HORIZONTAL CURVE RADIUS OF 250 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS MAY BE REDUCED TO 6 m BETWEEN P.C. OR T.S. AND P.T. OR S.T. WHEN USING 6m SPACING, 12 RAISED PAVEMENT MARKERS AT 12 m SPACING SHALL BE INSTALLED ON EACH END OF THE 6 m SPACING.
- 5. WHEN A CHANNELIZING LINE IS LESS THAN 24 m IN LENGTH, ONE RAISED PAVEMENT MARKER SHALL BE PLACED AT EACH END OF THE LINE AND ONE SHALL BE PLACED IN THE CENTER OF THE LINE.
- 6. RAISED PAVEMENT MARKERS ON LANE LINES ON FREEWAYS SHALL BE ONE WAY WHITE SPACED AT 36 METERS. ALL OTHER RAISED PAVEMENT MARKERS ON LANE LINES ON MULTILANE OR DIVIDED ROADWAYS SHALL BE TWO WAY RED/WHITE SPACED AT 24 METERS.

|   | CONVENTIONAL TYPE | LOW PROFILE TYPE |
|---|-------------------|------------------|
| A | 44 mm             | 43 mm            |
| B | 12 mm             | 15 mm            |



CASTING AND SAW CUT DETAILS



metric  
units

OFFICE OF TRAFFIC ENGINEERING  
DIVISION OF ENGINEERING POLICY  
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

RAISED PAVEMENT MARKER  
INSTALLATION DETAILS

STANDARD  
CONSTRUCTION  
DRAWING

TC-65.10M

APPROVED *[Signature]* ADMINISTRATOR

DATE  
11/03/93  
11/01/95

TYPICAL RAISED PAVEMENT MARKER PLACEMENT WITH LONGITUDINAL PAVEMENT MARKINGS

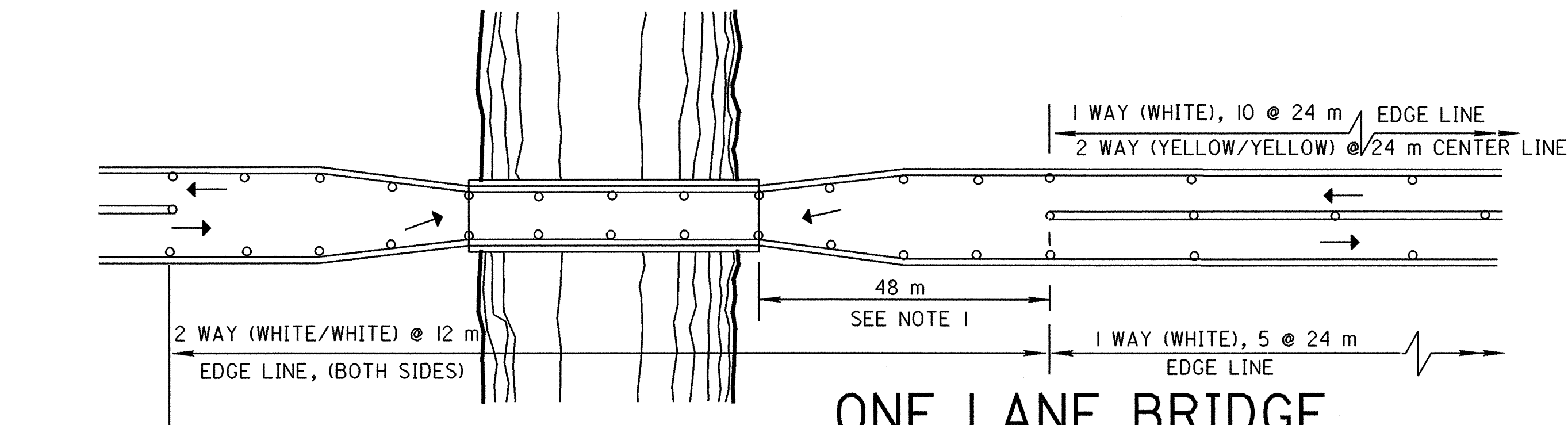


NOTES

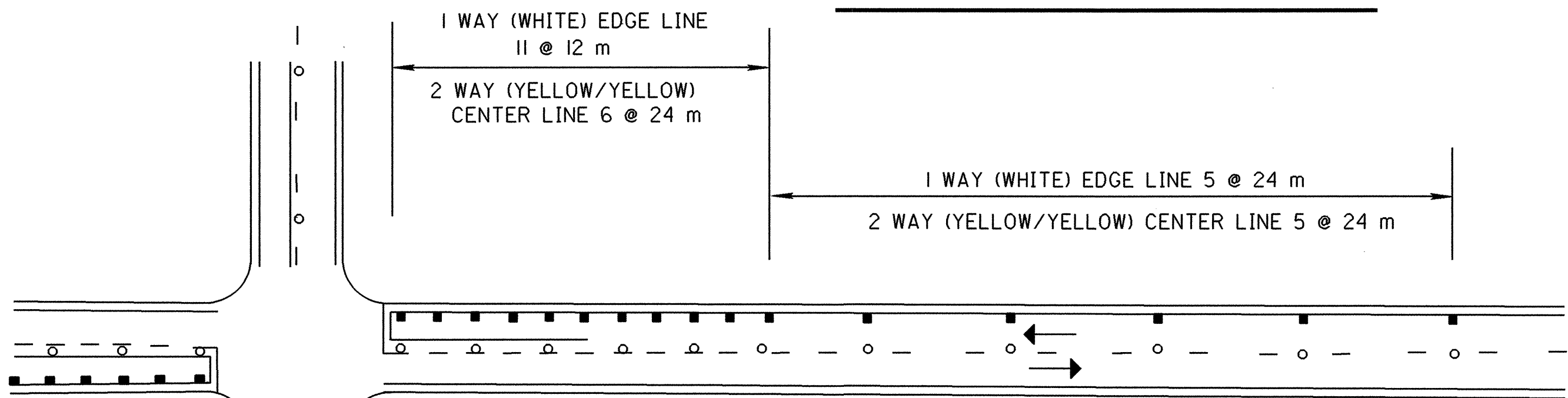
- 1. FOR ONE LANE BRIDGES, PAINTED CENTER LINE AND CENTER LINE MARKERS SHALL BE OMITTED 48 METERS ON EACH SIDE AND ACROSS THE BRIDGE.
- 2. FOR HORIZONTAL CURVE RADIUS OF 380 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS SHALL BE REDUCED TO 12 m BETWEEN P.C. OR T.S. AND P.T. OR S.T.
- 3. FOR HORIZONTAL CURVE RADIUS OF 250 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS MAY BE REDUCED TO 6 m BETWEEN P.C. OR T.S. AND P.T. OR S.T. WHEN USING 6 m SPACING, 12 RAISED PAVEMENT MARKERS AT 12 m SPACING SHALL BE INSTALLED ON EACH END OF THE 6 m SPACING.
- 4. A MINIMUM OF 3 EQUALLY SPACED RAISED PAVEMENT MARKERS SHALL BE INSTALLED ON THE BACK TAPER.
- 5. WHEN A CHANNELIZING LINE IS LESS THAN 24 m LONG, ONE RAISED PAVEMENT MARKER SHALL BE PLACED AT EACH END OF THE LINE AND ONE SHALL BE PLACED IN THE CENTER OF THE LINE.
- 6. RAISED PAVEMENT MARKERS SHALL NOT BE PLACED ON EDGE LINES ON A THROUGH APPROACH.
- 7. ALL APPROACHES AT A SIGNALIZED INTERSECTION SHALL BE TREATED AS SHOWN IN THE STOP APPROACH DETAIL.

LEGEND

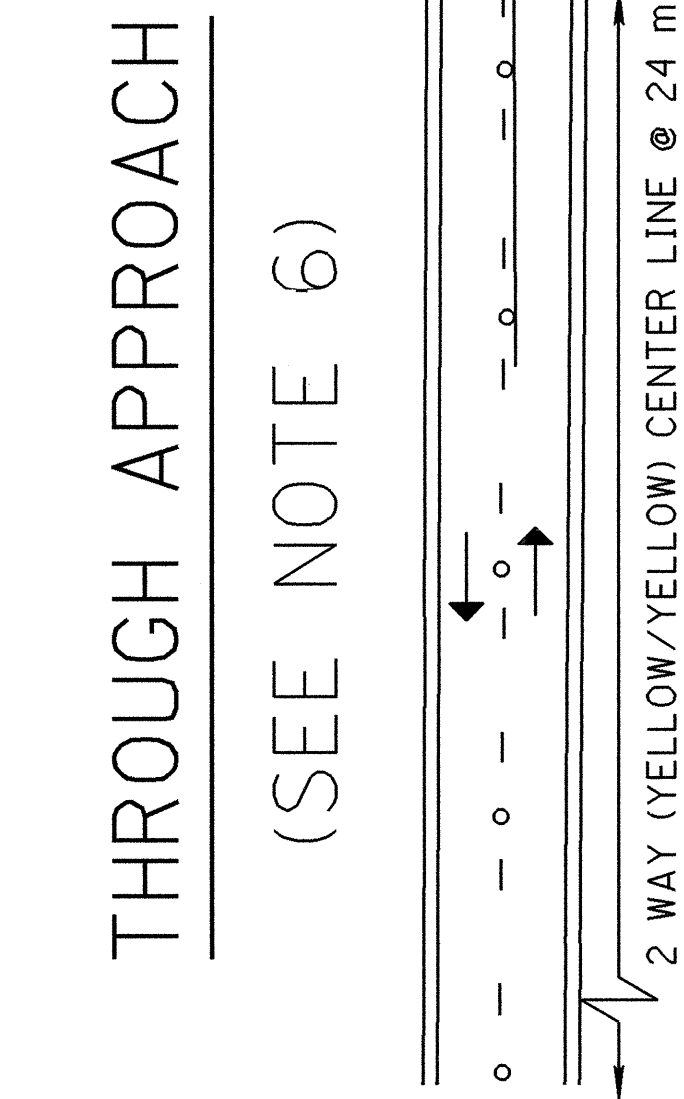
- 1 WAY REFLECTORS
- 2 WAY REFLECTORS



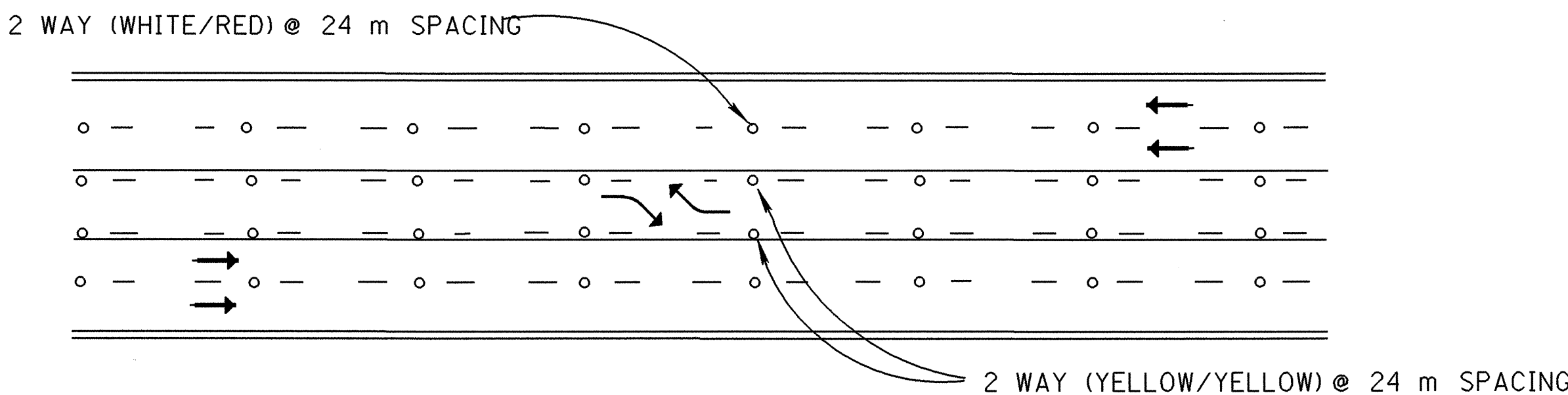
ONE LANE BRIDGE



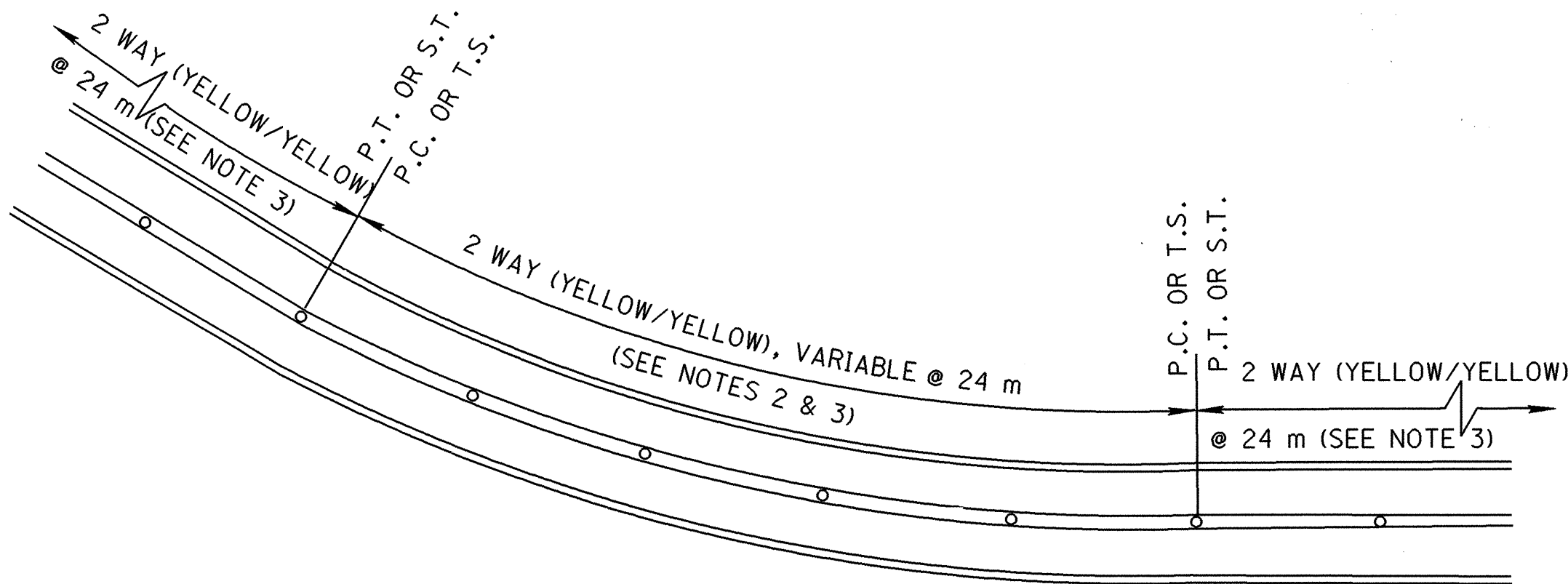
STOP APPROACH  
(SEE NOTE 7)



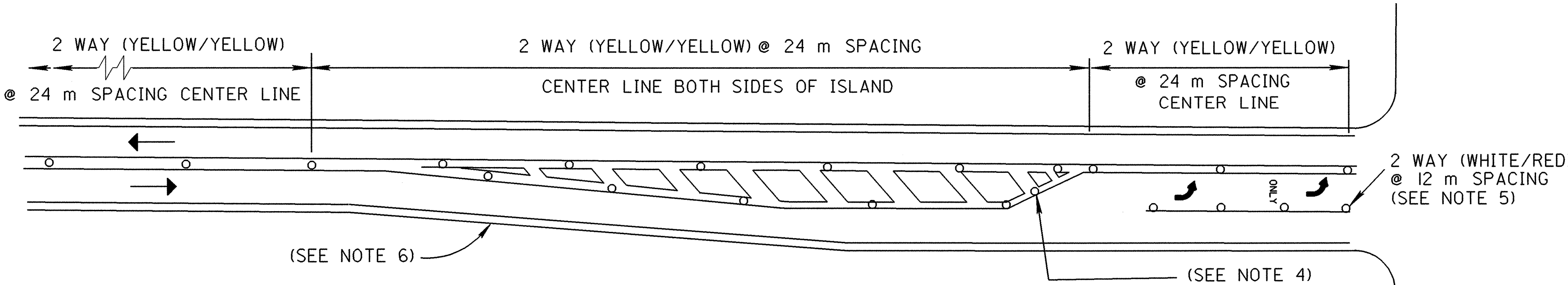
THROUGH APPROACH  
(SEE NOTE 6)



TWO WAY LEFT TURN LANE



HORIZONTAL CURVE



APPROACH W/LEFT TURN LANE



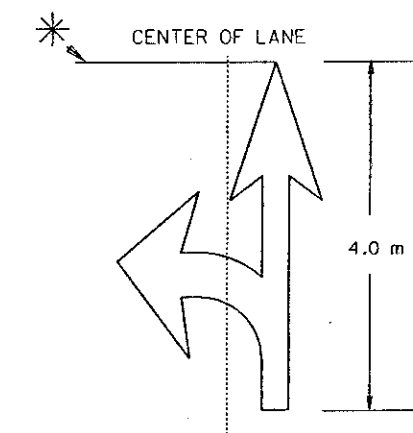
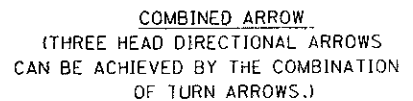
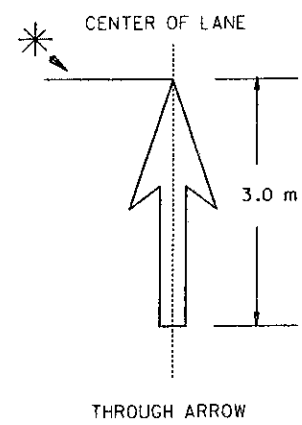
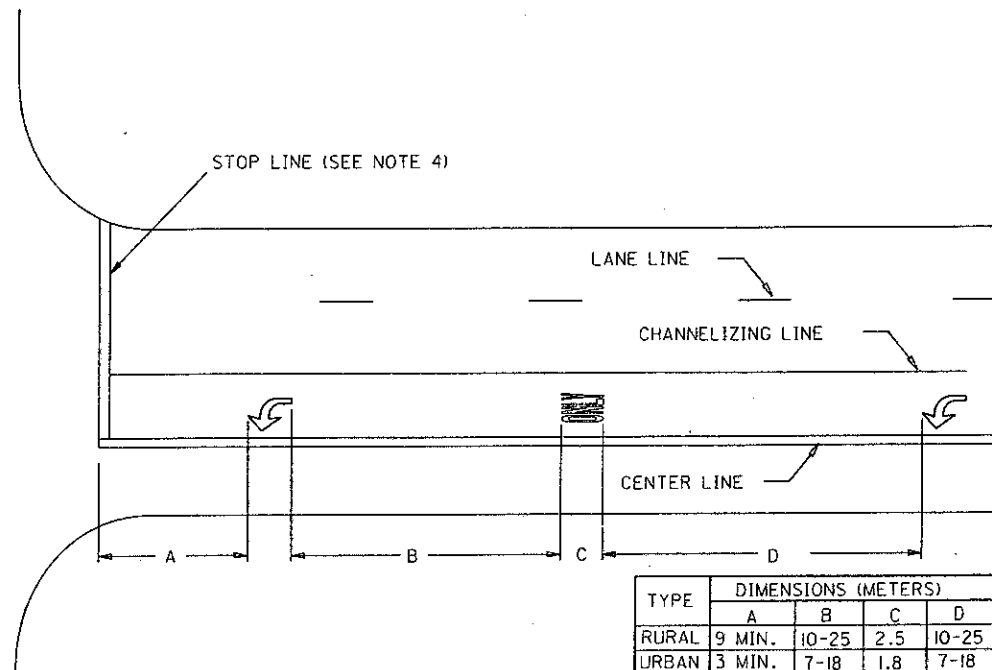
metric  
units

|                                                                                                      |                              |
|------------------------------------------------------------------------------------------------------|------------------------------|
| OFFICE OF TRAFFIC ENGINEERING<br>DIVISION OF ENGINEERING POLICY<br>OHIO DEPARTMENT OF TRANSPORTATION |                              |
| TRAFFIC CONTROL                                                                                      | DATE<br>11/03/93<br>11/01/95 |
| RAISED PAVEMENT MARKER<br>DETAILS II                                                                 |                              |
| STANDARD<br>CONSTRUCTION<br>DRAWING                                                                  | TC-65.12M                    |
| APPROVED                                                                                             | ADMINISTRATOR                |

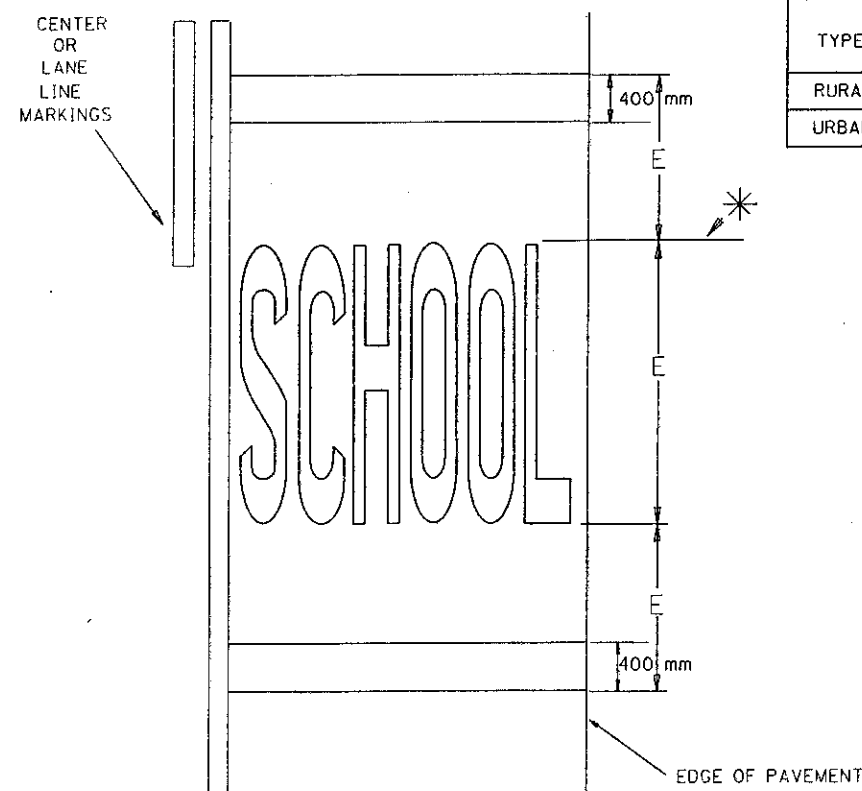


## NOTES

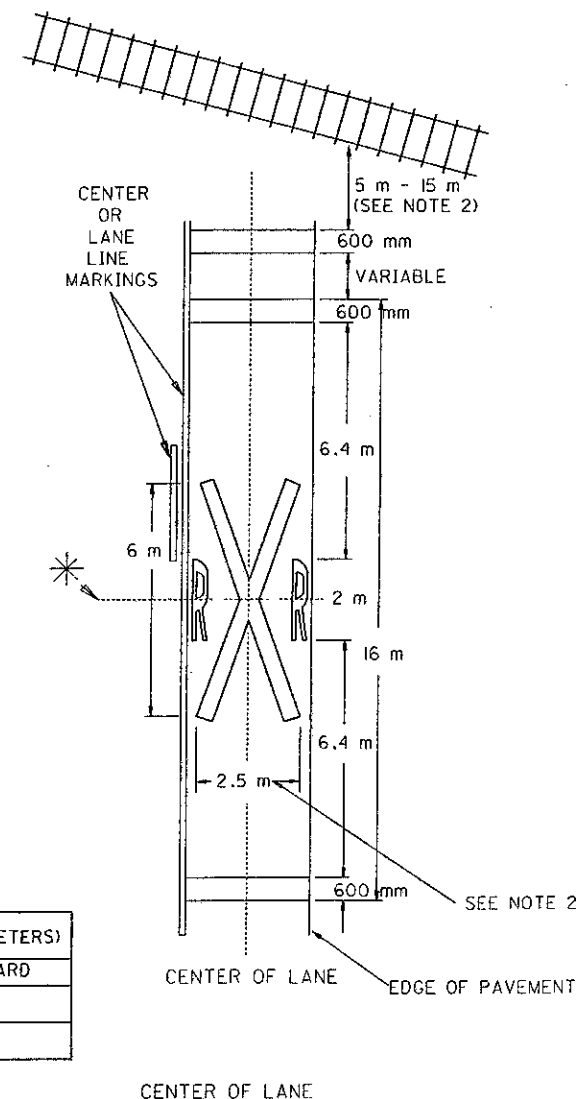
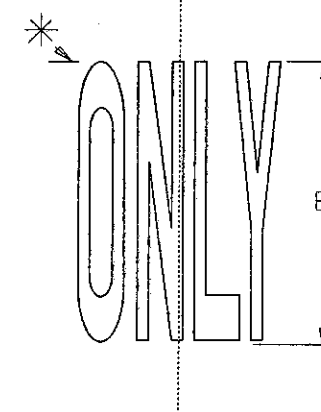
1. ON MULTI-LANE APPROACHES, THE TRANSVERSE LINES USED WITH THE RAILROAD SYMBOLS SHALL EXTEND ACROSS ALL APPROACH LANES AND SYMBOLS SHALL BE PLACED IN EACH APPROACH LANE.
  2. THE RAILROAD SYMBOL SHALL BE LOCATED SO THAT THE W-94, "RAILROAD ADVANCE WARNING SIGN", IS WITHIN THE TWO TRANSVERSE BOUNDARY LINES OF THE RAILROAD SYMBOL. THE STOP LINE SHALL BE LOCATED FOR BEST SIGHT DISTANCE WITHIN 5 METERS TO 15 METERS OF THE NEAR EDGE OF THE TRACKS. WIDTH OF "X" MAY VARY ACCORDING TO LANE WIDTH. STOP LINES SHALL BE APPROXIMATELY 2.4 METERS FROM A GATE (IF PRESENT).
  3. PREFERABLY, THE WORD "SCHOOL" SHOULD BE CONTAINED IN A SINGLE LANE. ON ONE LANE APPLICATIONS, THE TRANSVERSE LINES SHALL EXTEND ACROSS THE LANE WHICH APPROACHES THE ZONE WITH THE WORD "SCHOOL" CENTERED ACROSS THAT LANE. FOR TWO APPROACH LANES, EACH LANE SHOULD HAVE A SEPARATE WORD "SCHOOL" CENTERED ACROSS IT. ON TWO LANE, TWO WAY ROADWAYS WITH INSUFFICIENT PAVEMENT WIDTH, THE WORD AND TRANSVERSE LINES SHALL EXTEND ACROSS BOTH LANES OF TRAFFIC. ON FOUR LANE, TWO WAY ROADWAYS WITH INSUFFICIENT PAVEMENT WIDTH, THE WORD AND TRANSVERSE LINES SHALL EXTEND ACROSS BOTH LANES ENTERING THE SCHOOL ZONE. CENTER OR LANE LINES SHALL NOT PASS THROUGH THE "SCHOOL" MARKING.
  4. THE STOP LINE SHOULD BE PLACED WHERE CROSS-CORNER VISION IS MAXIMUM, IN NO CASE MORE THAN 9.1 METERS OR LESS THAN 1.2 METERS FROM THE NEAREST EDGE OF THE INTERSECTING ROADWAY. FOR NORMAL INTERSECTIONS A MAXIMUM DISTANCE OF 3 METERS IS RECOMMENDED.
- IF A MARKED CROSSWALK IS PRESENT, THE STOP LINE SHOULD BE PLACED 1.2 METERS IN ADVANCE OF AND PARALLEL TO THE NEAREST CROSSWALK LINE.
5. FOR TRAFFIC PAINT AND POLYESTER APPLICATION, TEMPLATE GAPS SHALL BE FILLED WITH MARKING MATERIAL IN ACCORDANCE WITH 641.03. FOR EXTRUDED THERMOPLASTIC MATERIAL, THESE GAPS MAY REMAIN UNFILLED IN ACCORDANCE WITH 644.03.
  6. USE STANDARD DIMENSIONS CONFORMING TO REQUIREMENTS OF OMUTCD SECTIONS 3B-40, 3B-41 AND 3B-43 WHICH CONFORMS TO THE 1977 METRIC EDITION STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKING WITH ERRATA.
- \* - INDICATES STATION REFERENCE POINT



| TYPE  | DIMENSIONS (METERS) |       |     |       |
|-------|---------------------|-------|-----|-------|
|       | A                   | B     | C   | D     |
| RURAL | 9 MIN.              | 10-25 | 2.5 | 10-25 |
| URBAN | 3 MIN.              | 7-18  | 1.8 | 7-18  |



| TYPE  | E (MILLIMETERS) |
|-------|-----------------|
|       | STANDARD        |
| RURAL | 2500            |
| URBAN | 1800            |



# M E T R I C

BUREAU OF DESIGN SERVICES  
DIVISION OF HIGHWAYS  
OHIO DEPARTMENT OF TRANSPORTATION

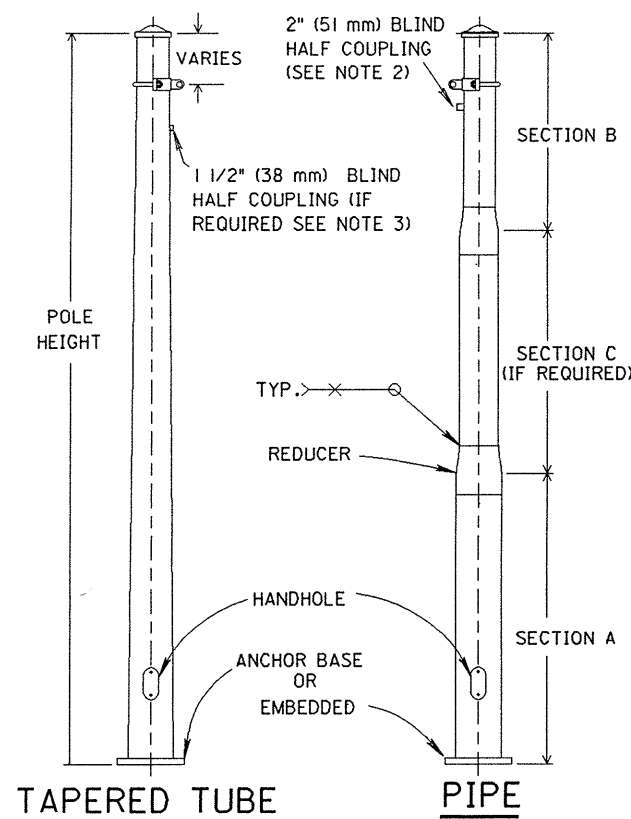
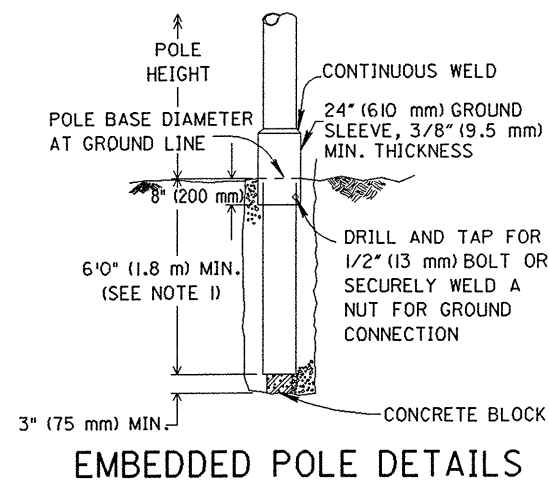
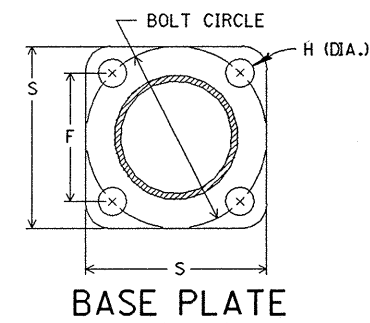
TRAFFIC CONTROL

DATE  
9/01/93

WORDS , SYMBOLS  
AND ARROWS

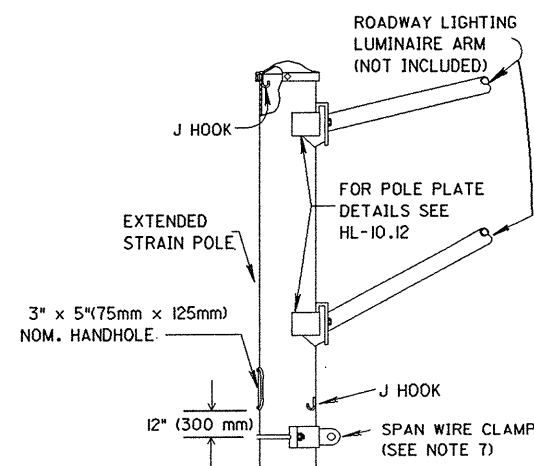
STANDARD  
CONSTRUCTION  
DRAWING

APPROVED My Design ENGR. OF DESIGN SERVICES

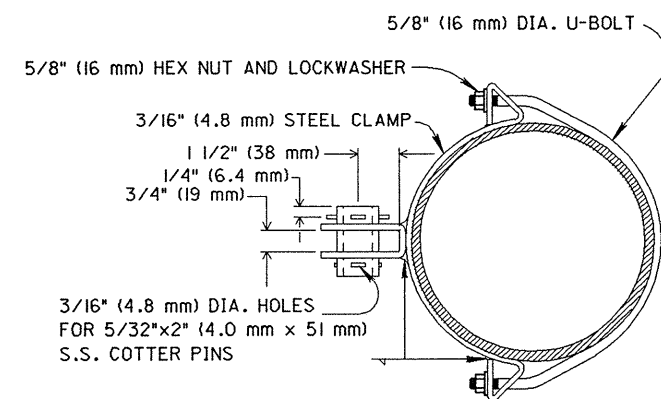
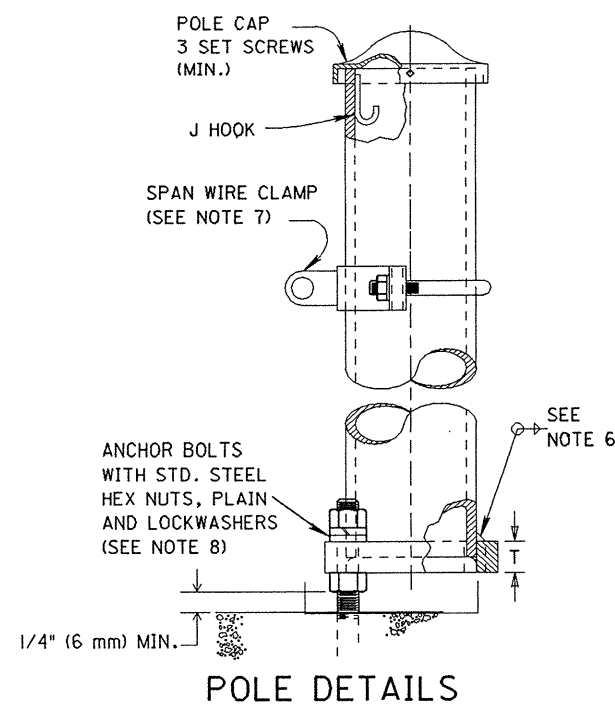
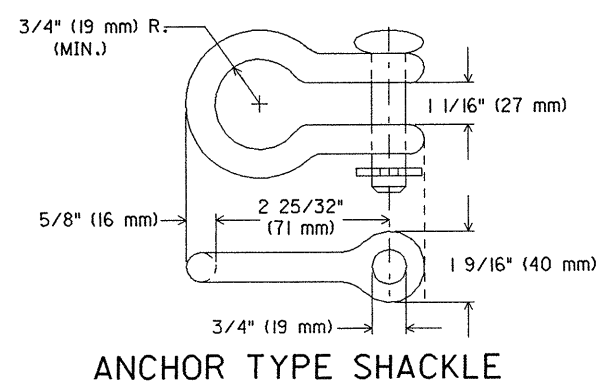
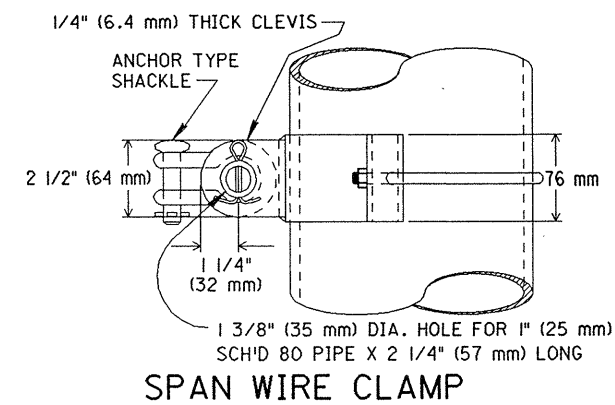


## NOTES

1. The embedded portion of the pole may be extended to within 3" (75 mm) of the foundation bottom in lieu of providing reinforcing steel as shown on TC-21.20. the base diameter is the pole at the ground line.
2. Signal cable entrance shall be a 2" (51 mm) blind half coupling provided in each pole.
3. Service wire entrance shall be a 1-1/2" (38 mm) blind half coupling, when required by the plans. Orientation and height shall be as required by the plans.
4. Span wire clamp shall be galvanized steel, capable of resisting a load of 12,500 pounds (5670 Kilograms) minimum without permanent distortion.
5. For foundation details, see drawing TC-21.20.
6. The base plate shall be welded to two ply poles with AWS prequalified welds in conformance with 730.04.
7. Alternate messenger wire assembly (wrapping) as shown on TC-17.10 or TC-84.20 may be used in lieu of the span wire clamp.
8. A minimum of one full bolt thread shall remain above the anchor nut.
9. All unused couplings shall be provided with a removable galvanized cast iron plug.
10. For construction details and location of handholes, see drawing TC-22.10.
11. For pole and base plate dimensions, see sheet 2.



## COMBINATION POLE



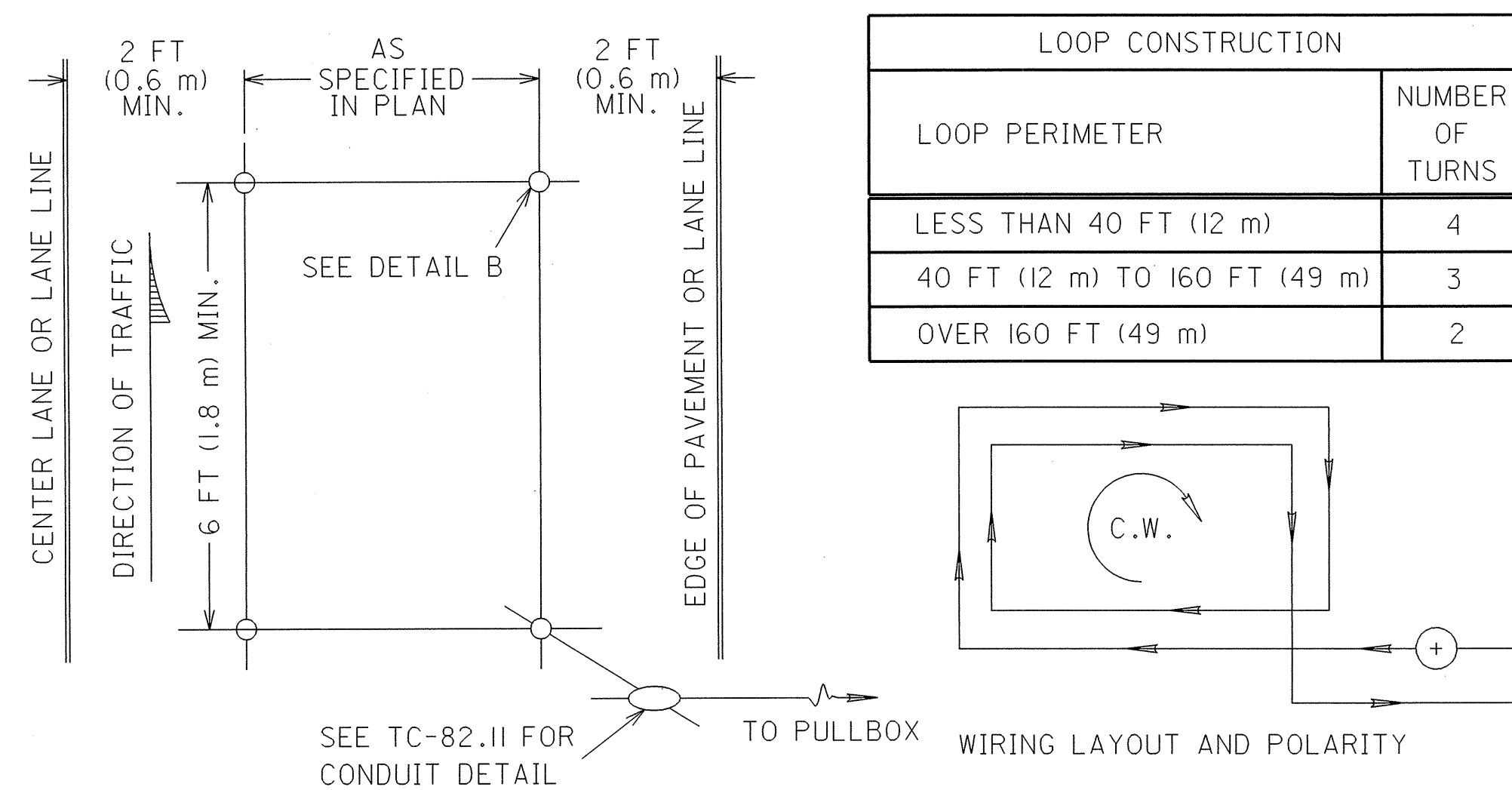
ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

| DESIGN NO. | POLE HEIGHT (feet) | BASE MOMENT AT YIELD (ft. kips) | TAPERED (NOTE 1) |                     | TAPERED (NOTE 2) |                     | NO. OF SIDES | A 36 PIPE (NOTE 3) |      |               |                |                | API GRADE X52 PIPE (NOTE 4) |      |               |                |                | ANCHOR BASE                    |                                 |                                 |                                |                               | ANCHOR BOLT                   |                               |     |  |  |  |
|------------|--------------------|---------------------------------|------------------|---------------------|------------------|---------------------|--------------|--------------------|------|---------------|----------------|----------------|-----------------------------|------|---------------|----------------|----------------|--------------------------------|---------------------------------|---------------------------------|--------------------------------|-------------------------------|-------------------------------|-------------------------------|-----|--|--|--|
|            |                    |                                 | BASE DIA.        | MIN. WALL THICKNESS | BASE DIA.        | MIN. WALL THICKNESS |              | SECTION            | DIA. | LENGTH (feet) | WALL THICKNESS | REDUCER TYPE * | SECTION                     | DIA. | LENGTH (feet) | WALL THICKNESS | REDUCER TYPE * | BOLT CIRCLE                    | F                               | S                               | T                              | H                             | DIA.                          | LENGTH                        |     |  |  |  |
| 1          | 20                 | 39.5                            | 7                | .239                | 7                | .239                | NA           | B                  | 5    | 10            | 0.312          | SCH.80         | B                           | 5    | 10            | 0.219          | SCH.80         | 10                             | 7 <sup>1</sup> / <sub>16</sub>  | 10 <sup>1</sup> / <sub>2</sub>  | 1 <sup>1</sup> / <sub>4</sub>  | 1 <sup>5</sup> / <sub>8</sub> | 1 <sup>1</sup> / <sub>4</sub> | 42                            |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     | A            | 6                  | 10   | 0.500         |                |                | A                           | 6    | 10            | 0.312          |                |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
| 2          | 24                 | 67.0                            | 9                | .239                | 9                | .239                | NA           | B                  | 6    | 12            | 0.375          | SCH.80         | B                           | 6    | 12            | 0.250          | SCH.40         | 12 <sup>1</sup> / <sub>2</sub> | 8 <sup>7</sup> / <sub>8</sub>   | 12 <sup>3</sup> / <sub>4</sub>  | 1 <sup>1</sup> / <sub>2</sub>  | 1 <sup>7</sup> / <sub>8</sub> | 1 <sup>1</sup> / <sub>2</sub> | 54                            |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     | A            | 8                  | 12   | 0.500         |                |                | A                           | 8    | 12            | 0.322          |                |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
| 3          | 26                 | 83.4                            | 10               | .239                | 10               | .239                | NA           | B                  | 8    | 13            | 0.277          | SCH.30         | B                           | 8    | 13            | 1.88           | SCH.40         | 13 <sup>1</sup> / <sub>2</sub> | 9 <sup>9</sup> / <sub>16</sub>  | 14 <sup>1</sup> / <sub>8</sub>  | 1 <sup>1</sup> / <sub>2</sub>  | 1 <sup>7</sup> / <sub>8</sub> | 1 <sup>1</sup> / <sub>2</sub> | 54                            |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     | A            | 10                 | 13   | 0.365         |                |                | A                           | 10   | 13            | 0.250          |                |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
| 4          | 26                 | 101.0                           | 11               | .239                | 11               | .239                | NA           | B                  | 8    | 13            | 0.312          | SCH.40         | B                           | 8    | 13            | 0.203          | SCH.40         | 15                             | 10 <sup>5</sup> / <sub>8</sub>  | 15 <sup>5</sup> / <sub>8</sub>  | 2                              | 2 <sup>1</sup> / <sub>8</sub> | 1 <sup>3</sup> / <sub>4</sub> | 84                            |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     | A            | 10                 | 13   | 0.483         |                |                | A                           | 10   | 13            | 0.279          |                |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
| 5          | 30                 | 121.0                           | 12               | .239                | 12               | .239                | NA           | B                  | 8    | 9             | 0.203          | SCH.20         | B                           | 8    | 9             | 0.188          | SCH.40         |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | C                  | 10   | 10            | 0.307          |                | C                           | 10   | 10            | 0.203          |                |                                | 16                              | 11 <sup>5</sup> / <sub>16</sub> | 17                             | 2                             | 2 <sup>1</sup> / <sub>8</sub> | 1 <sup>3</sup> / <sub>4</sub> | 84  |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | A                  | 12   | 11            | 0.375          | SCH.30         | A                           | 12   | 11            | 0.250          | SCH.40         |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | B                  | 8    | 8             | 0.219          |                | B                           | 8    | 10            | 0.188          |                |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
| 6          | 30                 | 149.0                           | 12               | .299                | 12               | .250                | 10           | C                  | 10   | 10            | 0.365          | SCH.20         | C                           | 10   | 10            | 0.279          | SCH.40         | 16                             | 11 <sup>5</sup> / <sub>16</sub> | 17                              | 2                              | 2 <sup>1</sup> / <sub>8</sub> | 1 <sup>3</sup> / <sub>4</sub> | 84                            |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     | A            | 12                 | 12   | 0.500         |                |                | A                           | 12   | 10            | 0.312          |                |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
| 7          | 30                 | 176.0                           | 13               | .299                | 13               | .250                | 12           | B                  | 8    | 10            | 0.375          | SCH.60         | B                           | 8    | 10            | 0.250          | SCH.40         |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | C                  | 10   | 10            | 0.500          |                | C                           | 10   | 10            | 0.344          |                |                                | 18                              | 12 <sup>3</sup> / <sub>4</sub>  | 18 <sup>1</sup> / <sub>2</sub> | 2                             | 2 <sup>3</sup> / <sub>8</sub> | 2                             | 90  |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | A                  | 12   | 10            | 0.562          | SCH.60         | A                           | 12   | 10            | 0.375          | SCH.40         |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | B                  | 8    | 9             | 0.375          |                | B                           | 8    | 10            | 0.277          |                |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
| 8          | 30                 | 206.0                           | 14               | .299                | 15               | .219                | 14           | C                  | 10   | 10            | 0.562          | SCH.80         | C                           | 10   | 10            | 0.438          | SCH.80         | 20                             | 14 <sup>1</sup> / <sub>8</sub>  | 20 <sup>1</sup> / <sub>2</sub>  | 2                              | 2 <sup>3</sup> / <sub>8</sub> | 2                             | 90                            |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | A                  | 12   | 11            | 0.688          |                | A                           | 12   | 10            | 0.438          |                |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | B                  | 8    | 8             | 0.406          | SCH.60         | B                           | 8    | 10            | 0.312          | SCH.80         |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | C                  | 10   | 10            | 0.594          |                | C                           | 10   | 10            | 0.438          |                |                                | 22                              | 15 <sup>1</sup> / <sub>2</sub>  | 23                             | 2 <sup>1</sup> / <sub>2</sub> | 2 <sup>3</sup> / <sub>8</sub> | 2                             | 90  |  |  |  |
| 9          | 30                 | 228.0                           | 12               | .478 (2 PLY)        | 14.75            | .250                | 14           | A                  | 12   | 12            | 0.750          | SCH.80         | A                           | 12   | 10            | 0.500          | SCH.80         |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | B                  | 8    | 8             | 0.406          |                | B                           | 8    | 8             | 0.250          |                |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | C                  | 10   | 11            | 0.719          | SCH.100        | C                           | 10   | 12            | 0.500          | SCH.80         | 22                             | 15 <sup>1</sup> / <sub>2</sub>  | 23                              | 2 <sup>1</sup> / <sub>2</sub>  | 2 <sup>5</sup> / <sub>8</sub> | 2 <sup>1</sup> / <sub>4</sub> | 90                            |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | A                  | 12   | 13            | 1.000          |                | A                           | 12   | 12            | 0.562          |                |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
| 10         | 32                 | 270.0                           | 13               | .478 (2 PLY)        | 16               | .250                | 16           | B                  | 8    | 9             | 0.562          | SCH.100        | B                           | 8    | 8             | 0.312          | SCH.80         |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | C                  | 10   | 11            | 1.000          |                | C                           | 10   | 12            | 0.594          |                |                                | 22                              | 15 <sup>1</sup> / <sub>2</sub>  | 23                             | 2 <sup>1</sup> / <sub>2</sub> | 2 <sup>5</sup> / <sub>8</sub> | 2 <sup>1</sup> / <sub>4</sub> | 90  |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | A                  | 12   | 12            | 1.125          | SCH.40         | A                           | 12   | 12            | 0.688          | SCH.80         |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | B                  | 10   | 9             | 0.438          |                | B                           | 10   | 8             | 0.250          |                |                                | 22                              | 15 <sup>1</sup> / <sub>2</sub>  | 23                             | 2 <sup>1</sup> / <sub>2</sub> | 2 <sup>5</sup> / <sub>8</sub> | 2 <sup>1</sup> / <sub>4</sub> | 90  |  |  |  |
| 11         | 32                 | 316.0                           | 14               | .478 (2 PLY)        | 15.50            | .313                | 14           | C                  | 12   | 11            | 0.750          | SCH.60         | C                           | 12   | 12            | 0.500          | SCH.80         |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | A                  | 12   | 11            | 0.750          |                | A                           | 12   | 12            | 0.500          |                |                                | 23 <sup>1</sup> / <sub>2</sub>  | 16 <sup>5</sup> / <sub>8</sub>  | 24 <sup>1</sup> / <sub>2</sub> | 2 <sup>1</sup> / <sub>2</sub> | 2 <sup>7</sup> / <sub>8</sub> | 2 <sup>1</sup> / <sub>2</sub> | 114 |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | B                  | 10   | 9             | 0.438          | SCH.100        | B                           | 10   | 8             | 0.250          | SCH.80         |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |
|            |                    |                                 |                  |                     |                  |                     |              | A                  | 14   | 12            | 1.094          |                | A                           | 14   | 12            | 0.688          |                |                                |                                 |                                 |                                |                               |                               |                               |     |  |  |  |

ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.

| DESIGN NO. | POLE HEIGHT (meters) | BASE MOMENT AT YIELD (kN-m) | TAPERED (NOTE 1) |                     | TAPERED (NOTE 2) |                     |              | A 36 PIPE (NOTE 3) |      |                 |                |                | API GRADE X52 PIPE (NOTE 4) |      |                 |                |                | ANCHOR BASE |     |     |    |    | ANCHOR BOLT |                 |
|------------|----------------------|-----------------------------|------------------|---------------------|------------------|---------------------|--------------|--------------------|------|-----------------|----------------|----------------|-----------------------------|------|-----------------|----------------|----------------|-------------|-----|-----|----|----|-------------|-----------------|
|            |                      |                             | BASE DIA.        | MIN. WALL THICKNESS | BASE DIA.        | MIN. WALL THICKNESS | NO. OF SIDES | SECTION            | DIA. | LENGTH (meters) | WALL THICKNESS | REDUCER TYPE * | SECTION                     | DIA. | LENGTH (meters) | WALL THICKNESS | REDUCER TYPE * | BOLT CIRCLE | F   | S   | T  | H  | DIA.        | LENGTH (meters) |
| 1          | 6.1                  | 53.6                        | 178              | 6.07                | 178              | 6.07                | NA           | B                  | 127  | 3.0             | 7.92           | SCH.80         | B                           | 127  | 3.0             | 5.56           | SCH.80         | 254         | 179 | 267 | 32 | 41 | 32          | 1.1             |
|            |                      |                             |                  |                     |                  |                     | A            | 152                | 3.0  | 12.70           |                |                | A                           | 152  | 3.0             | 7.92           |                |             |     |     |    |    |             |                 |
| 2          | 7.3                  | 90.9                        | 229              | 6.07                | 229              | 6.07                | NA           | B                  | 152  | 3.7             | 9.53           | SCH.80         | B                           | 152  | 3.7             | 6.35           | SCH.40         | 318         | 225 | 324 | 38 | 48 | 38          | 1.4             |
|            |                      |                             |                  |                     |                  |                     | A            | 203                | 3.7  | 12.70           |                |                | A                           | 203  | 3.7             | 8.18           |                |             |     |     |    |    |             |                 |
| 3          | 7.9                  | 113.1                       | 254              | 6.07                | 254              | 6.07                | NA           | B                  | 203  | 4.0             | 7.04           | SCH.30         | B                           | 203  | 4.0             | 4.78           | SCH.40         | 343         | 243 | 359 | 38 | 48 | 38          | 1.4             |
|            |                      |                             |                  |                     |                  |                     | A            | 254                | 4.0  | 9.27            |                |                | A                           | 254  | 4.0             | 6.35           |                |             |     |     |    |    |             |                 |
| 4          | 7.9                  | 137.0                       | 279              | 6.07                | 279              | 6.07                | NA           | B                  | 203  | 4.0             | 7.92           | SCH.40         | B                           | 203  | 4.0             | 5.16           | SCH.40         | 381         | 270 | 397 | 51 | 54 | 44          | 2.1             |
|            |                      |                             |                  |                     |                  |                     | A            | 254                | 4.0  | 12.27           |                |                | A                           | 254  | 4.0             | 7.09           |                |             |     |     |    |    |             |                 |
| 5          | 9.1                  | 164.1                       | 305              | 6.07                | 305              | 6.07                | NA           | B                  | 203  | 2.7             | 5.16           | SCH.20         | B                           | 203  | 2.7             | 4.78           | SCH.40         |             |     |     |    |    |             |                 |
|            |                      |                             |                  |                     |                  |                     | C            | 254                | 3.0  | 7.80            | SCH.30         | C              | 254                         | 3.0  | 5.16            | SCH.40         | 406            | 287         | 432 | 51  | 54 | 44 | 2.1         |                 |
|            |                      |                             |                  |                     |                  |                     | A            | 305                | 3.4  | 9.53            |                |                | A                           | 305  | 3.4             |                | 6.35           |             |     |     |    |    |             |                 |
| 6          | 9.1                  | 202.0                       | 305              | 7.59                | 305              | 6.35                | 10           | B                  | 203  | 2.4             | 5.56           | SCH.20         | B                           | 203  | 3.0             | 4.78           | SCH.40         |             |     |     |    |    |             |                 |
|            |                      |                             |                  |                     |                  |                     | C            | 254                | 3.0  | 9.27            | SCH.40         | C              | 254                         | 3.0  | 7.09            | SCH.40         | 406            | 287         | 432 | 51  | 54 | 44 | 2.1         |                 |
|            |                      |                             |                  |                     |                  |                     | A            | 305                | 3.7  | 12.70           |                |                | A                           | 305  | 3.0             |                | 7.92           |             |     |     |    |    |             |                 |
| 7          | 9.1                  | 238.7                       | 330              | 7.59                | 330              | 6.35                | 12           | B                  | 203  | 3.0             | 9.53           | SCH.60         | B                           | 203  | 3.0             | 6.35           | SCH.40         |             |     |     |    |    |             |                 |
|            |                      |                             |                  |                     |                  |                     | C            | 254                | 3.0  | 12.70           | SCH.60         | C              | 254                         | 3.0  | 8.74            | SCH.40         | 457            | 324         | 470 | 51  | 60 | 51 | 2.3         |                 |
|            |                      |                             |                  |                     |                  |                     | A            | 305                | 3.0  | 14.27           |                |                | A                           | 305  | 3.0             |                | 9.53           |             |     |     |    |    |             |                 |
| 8          | 9.1                  | 279.3                       | 356              | 7.59                | 381              | 5.56                | 14           | B                  | 203  | 2.7             | 9.53           | SCH.60         | B                           | 203  | 3.0             | 7.04           | SCH.80         |             |     |     |    |    |             |                 |
|            |                      |                             |                  |                     |                  |                     | C            | 254                | 3.0  | 14.27           | SCH.80         | C              | 254                         | 3.0  | 11.13           | SCH.80         | 508            | 359         | 521 | 51  | 60 | 51 | 2.3         |                 |
|            |                      |                             |                  |                     |                  |                     | A            | 305                | 3.4  | 17.48           |                |                | A                           | 305  | 3.0             |                | 11.13          |             |     |     |    |    |             |                 |
| 9          | 9.1                  | 309.2                       | 305              | 12.14 (2 PLY)       | 375              | 6.35                | 14           | B                  | 203  | 2.4             | 10.31          | SCH.60         | B                           | 203  | 3.0             | 7.92           | SCH.80         |             |     |     |    |    |             |                 |
|            |                      |                             |                  |                     |                  |                     | C            | 254                | 3.0  | 15.09           | SCH.80         | C              | 254                         | 3.0  | 11.13           | SCH.80         | 559            | 394         | 584 | 64  | 60 | 51 | 2.3         |                 |
|            |                      |                             |                  |                     |                  |                     | A            | 305                | 3.7  | 19.05           |                |                | A                           | 305  | 3.0             |                | 12.70          |             |     |     |    |    |             |                 |
| 10         | 9.8                  | 366.1                       | 330              | 12.14 (2 PLY)       | 406              | 6.35                | 16           | B                  | 203  | 2.4             | 10.31          | SCH.60         | B                           | 203  | 2.4             | 6.35           | SCH.80         |             |     |     |    |    |             |                 |
|            |                      |                             |                  |                     |                  |                     | C            | 254                | 3.4  | 18.26           | SCH.100        | C              | 254                         | 3.7  | 12.70           | SCH.80         | 559            | 394         | 584 | 64  | 67 | 57 | 2.3         |                 |
|            |                      |                             |                  |                     |                  |                     | A            | 305                | 4.0  | 25.40           |                |                | A                           | 305  | 3.7             |                | 14.27          |             |     |     |    |    |             |                 |
| 11         | 9.8                  | 428.5                       | 356              | 12.14 (2 PLY)       | 394              | 7.95                | 14           | B                  | 203  | 2.7             | 14.27          | SCH.100        | B                           | 203  | 2.4             | 7.92           | SCH.80         |             |     |     |    |    |             |                 |
|            |                      |                             |                  |                     |                  |                     | C            | 254                | 3.4  | 25.40           | SCH.40         | C              | 254                         | 3.7  | 15.09           | SCH.80         | 559            | 394         | 584 | 64  | 67 | 57 | 2.3         |                 |
|            |                      |                             |                  |                     |                  |                     | A            | 305                | 3.7  | 28.58           |                |                | A                           | 305  | 3.7             |                | 17.48          |             |     |     |    |    |             |                 |
| 12         | 9.8                  | 522.1                       | 356              | 15.19 (2 PLY)       | 438              | 7.95                | 16           | B                  | 254  | 2.7             | 11.13          | SCH.60         | B                           | 254  | 2.4             | 6.35           | SCH.80         |             |     |     |    |    |             |                 |
|            |                      |                             |                  |                     |                  |                     | C            | 305                | 3.4  | 19.05           | SCH.100        | C              | 305                         | 3.7  | 12.70           | SCH.80         | 597            | 422         | 622 | 64  | 73 | 64 | 2.9         |                 |
|            |                      |                             |                  |                     |                  |                     | A            | 356                | 3.7  | 27.79           |                |                | A                           | 356  | 3.7             |                | 17.48          |             |     |     |    |    |             |                 |





**TYPICAL DETECTOR LOOP DETAILS**

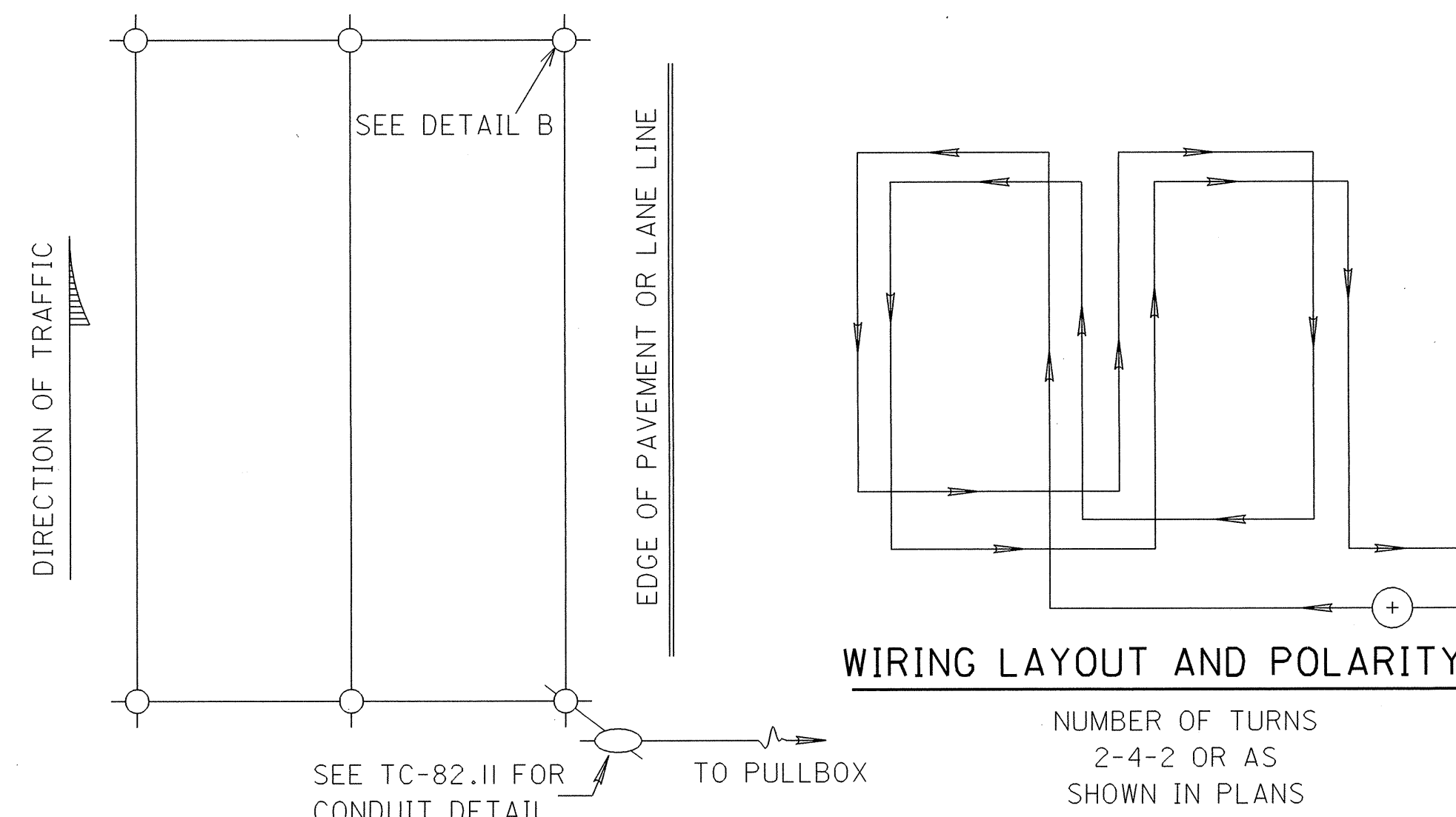
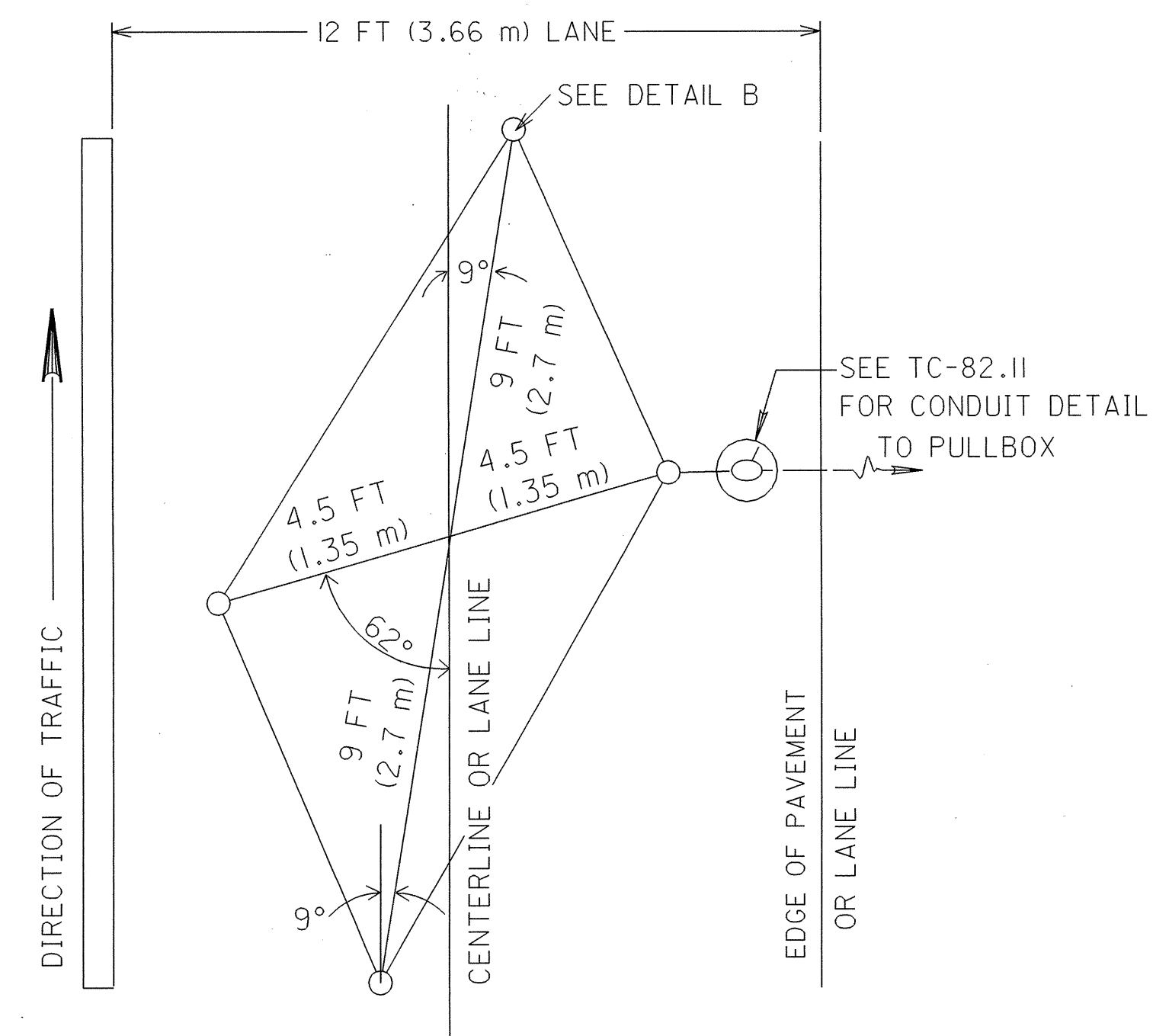
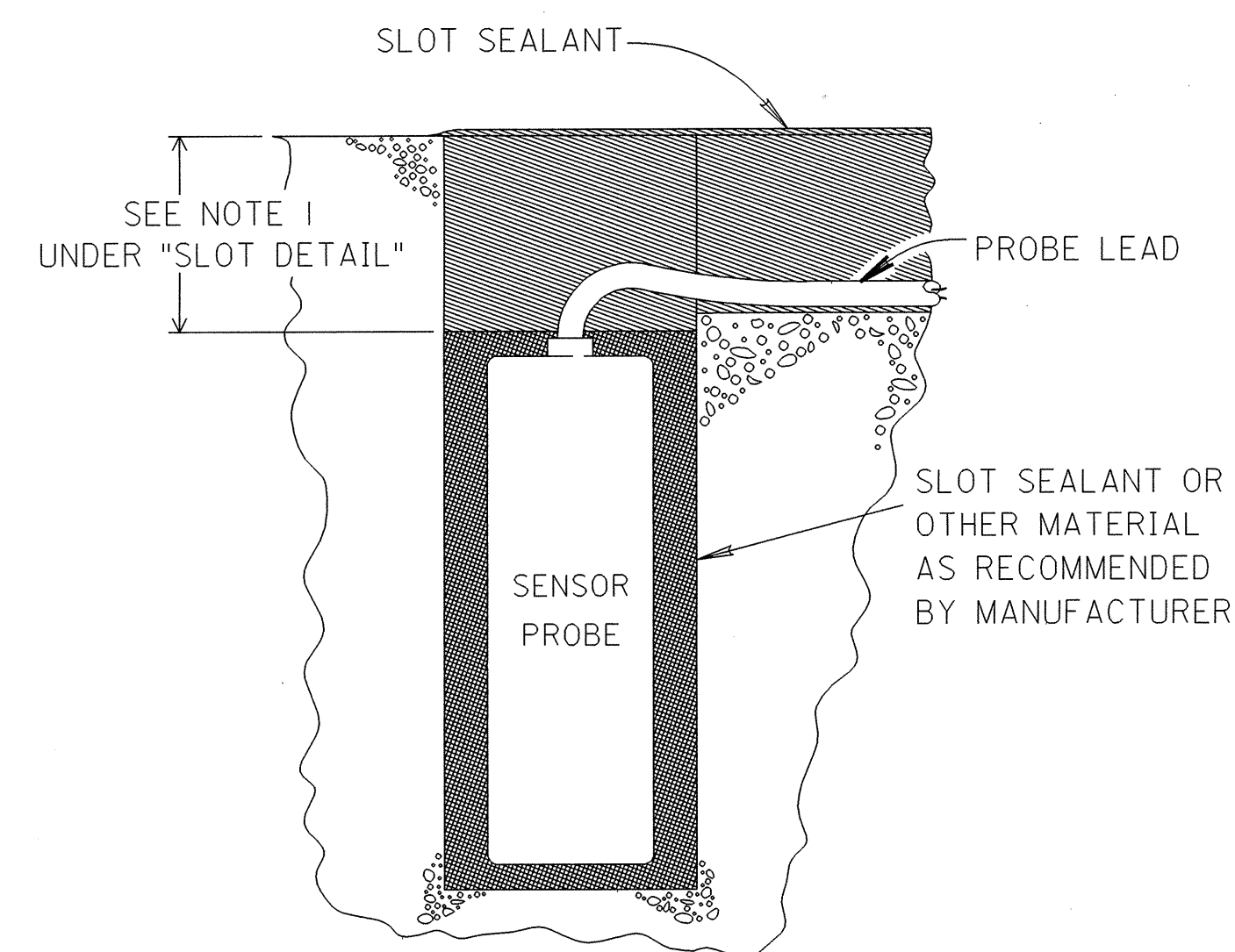


**FIGURE 8 (QUADRUPOLE) LOOP DETAILS**



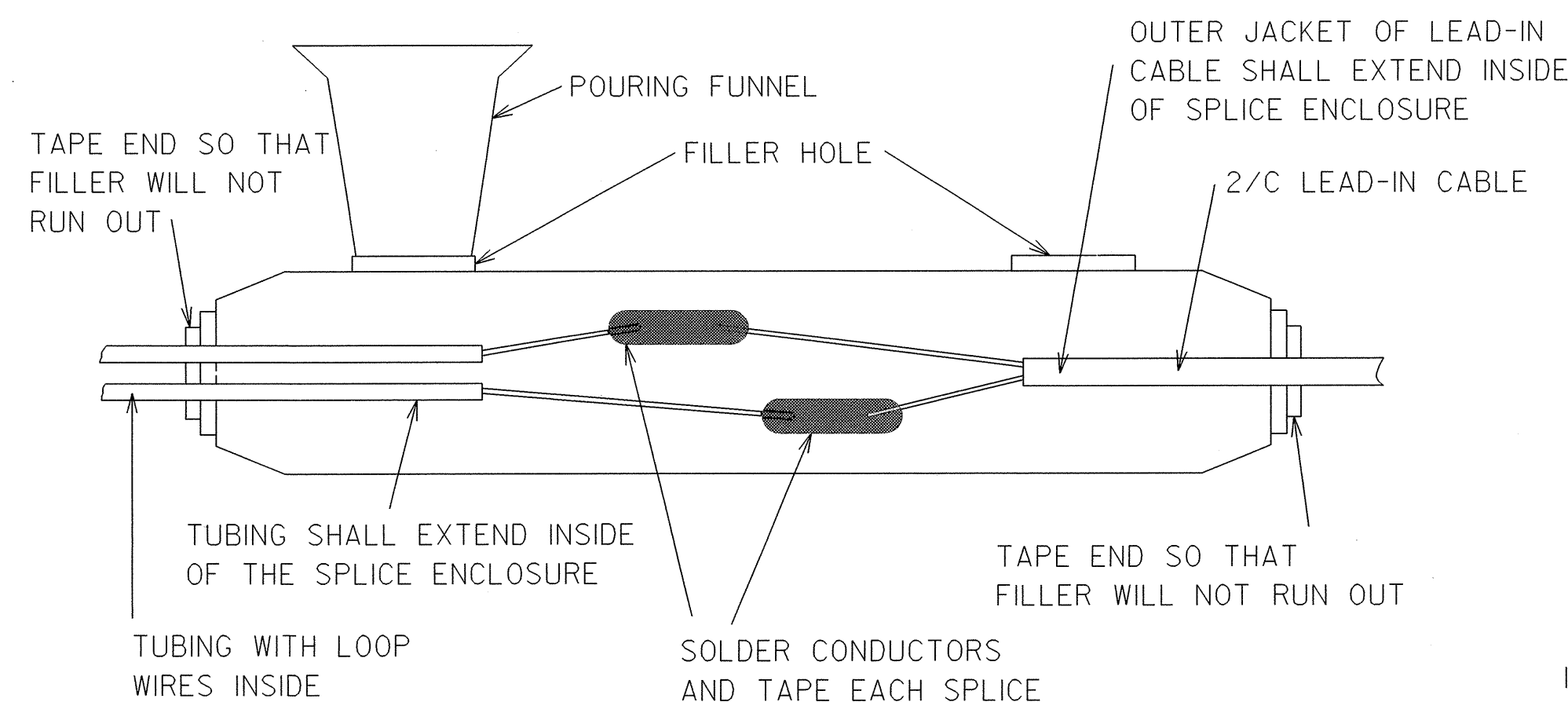
OTHER SIZES CAN BE DESIGNATED AS LONG AS THE ANGLES REMAIN THE SAME AS SHOWN AND THE DIMENSION RATIO REMAINS 2:1.

**ANGULAR DESIGN DETECTION LOOP DETAIL**



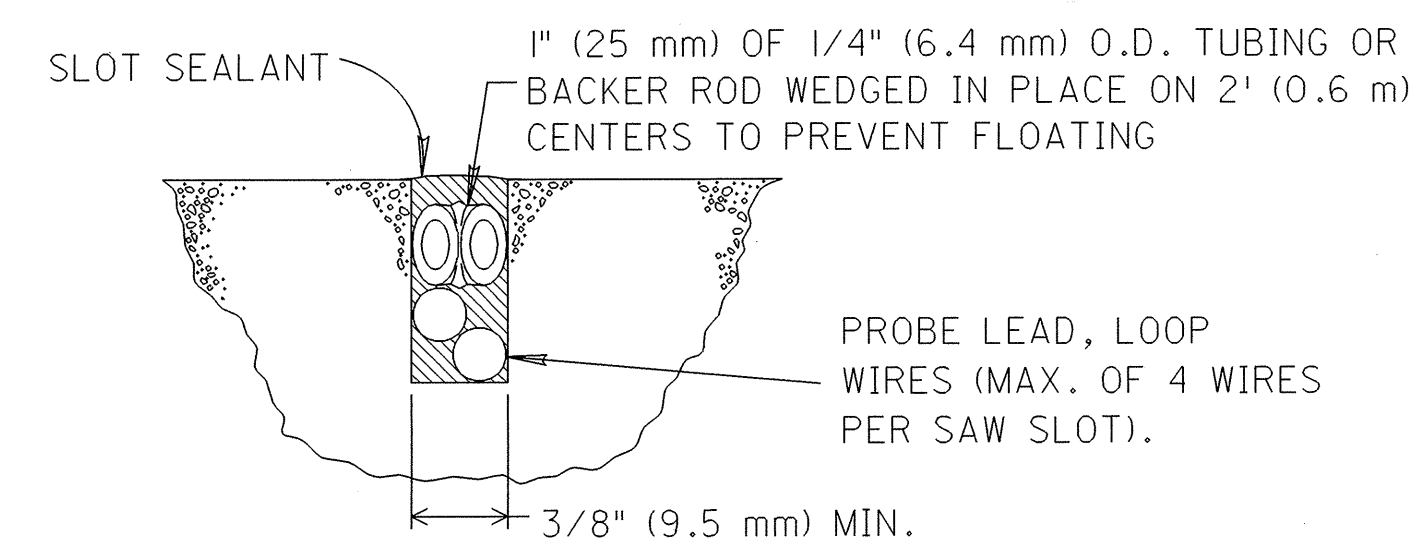
THE MAGNETOMETER HOLE SIZE SHALL BE APPROXIMATELY 3/4" (19 mm) LARGER THAN THE DETECTOR PROBE DIAMETER AND A DEPTH AS RECOMMENDED BY THE MANUFACTURER OR AS DIRECTED BY THE ENGINEER.

**MAGNETOMETER SENSOR PROBE DETAIL**



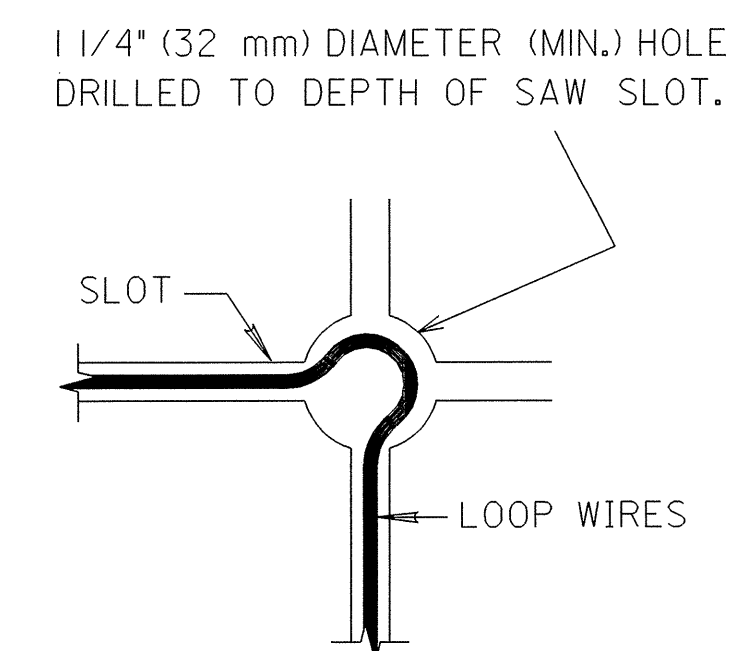
1. LOOP DETECTOR WIRE TO LEAD-IN CABLE SPLICES WITHIN THE ENCAPSULATED SPLICE ENCLOSURE SHALL BE SOLDERED.
2. IF A PULLBOX IS NOT SPECIFIED IN THE PLANS, THE WATERPROOF SPLICE ENCLOSURE SHALL BE LOCATED IN THE FIRST ENTERED POLE OR PEDESTAL, EXCEPT IF THE CONTROLLER CABINET IS MOUNTED ON THAT POLE OR PEDESTAL, IN WHICH CASE THE LOOP WIRES SHALL BE ROUTED DIRECTLY INTO THE CABINET WITHOUT SPLICING.
3. VISIBLE AIR BUBBLES (VOIDS) OF 1/4" (6 mm) OR GREATER MAY BE CAUSE FOR REJECTION OF THE SPLICE.

**SPLICE ENCLOSURE DETAIL**



1. MINIMUM SAW SLOT DEPTH: ASPHALT 4" (100 mm), CONCRETE 2" (50 mm)
2. LOOP DETECTOR WIRE IN TUBING SHALL BE AS SPECIFIED IN CMS TABLE 732.19.
3. LOOP DETECTOR SEALANT SHALL BE A PREQUALIFIED PRODUCT IN ACCORDANCE WITH SUPPLEMENT 1048.
4. SAW SLOTS AND PROBE HOLES SHALL BE THOROUGHLY CLEANED AND DRIED PRIOR TO INSTALLATION OF SEALANT.
5. WIRE INSTALLATIONS IN NEW ASPHALT MAY BE SAWED AND EMBEDDED WITH SEALANT IN A SUB-SURFACE COURSE WITH SUBSEQUENT COVERING BY THE SURFACE COURSE, IF SPECIFIED IN PLAN.

**SLOT DETAIL**



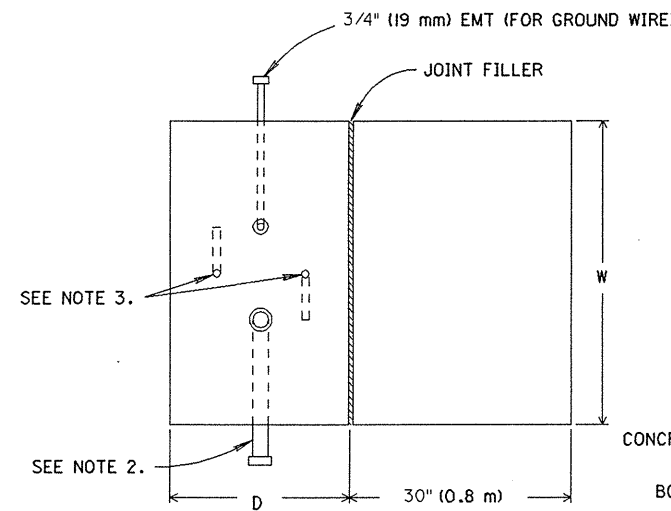
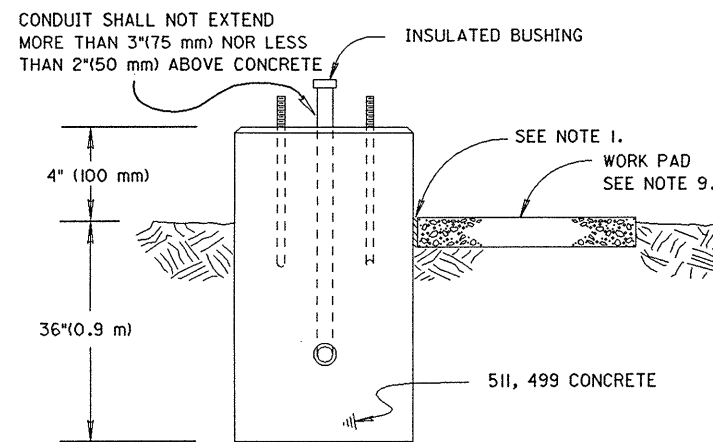
**DETAIL B**

|                                                                                                      |                  |
|------------------------------------------------------------------------------------------------------|------------------|
| OFFICE OF TRAFFIC ENGINEERING<br>DIVISION OF ENGINEERING POLICY<br>OHIO DEPARTMENT OF TRANSPORTATION |                  |
| TRAFFIC CONTROL                                                                                      | DATE<br>01/19/99 |
| VEHICLE DETECTOR<br>INSTALLATION DETAILS I                                                           |                  |
| STANDARD<br>CONSTRUCTION<br>DRAWING                                                                  | TC-82.10         |
| APPROVED <i>[Signature]</i>                                                                          | ADMINISTRATOR    |



## NOTES

- 1/2" (13 mm) preformed joint filler as per 705.03 shall be used between foundations and adjacent paved areas.
- The size, number and orientation of conduit ells shall be as shown in the plan, except that on 3/4" (19 mm) EMT shall be installed in each foundation.
- The size, number and location of anchor bolts shall be in accordance with the manufacturer's recommendations.
- All pedestals shall be provided with a method of securely attaching a No. 4 AWG insulated copper grounding cable to the pedestal or anchor bolt. No cables or connections shall be external to the pedestal.
- The pedestal shaft length as shown in the plans includes the pedestal base height for either base design.
- The pedestal base shall set on the foundation top without grouting, preformed fillers or leveling nuts under the base. Steel shims may be used under the base for leveling the installation.
- The foundation area of contact with the pedestal base shall be level. If adjacent paved areas slope, the remainder of the foundation top shall be beveled to meet the adjacent elevations.
- A cast steel anchor base of equivalent strength may be used in lieu of the plate base.
- A 40" x 30" x 4" (1.0 m x 0.8 m x 100 mm) work pad shall be located in front of each pedestal mounted controller cabinet unless in an otherwise paved area. The work pad for the ground mounted controller shall be sized as shown in the table. When required, this item shall be paid for under Item 633 Controller Work Pad. In level areas the top of the pad shall be 1" (25 mm) above the ground line. In steeply sloped areas the pad's location shall be adjusted to provide access and drainage.
- Ground mounted controller cabinets shall be sealed to the foundation with a flexible weatherproof caulking compound.



| TYPE | W              | D              | FOUNDATION<br>CONCRETE              | WORK<br>PAD                         |
|------|----------------|----------------|-------------------------------------|-------------------------------------|
| 1    | 40"<br>(1.0 m) | 24"<br>(0.6 m) | .99 C.Y.<br>(0.72 m <sup>3</sup> )  | 0.96 S.Y.<br>(0.80 m <sup>2</sup> ) |
| 2    | 50"<br>(1.3 m) | 36"<br>(0.9 m) | 1.85 C.Y.<br>(1.40 m <sup>3</sup> ) | 1.24 S.Y.<br>(1.04 m <sup>2</sup> ) |

**GROUND MOUNTED  
CONTROLLER FOUNDATION**

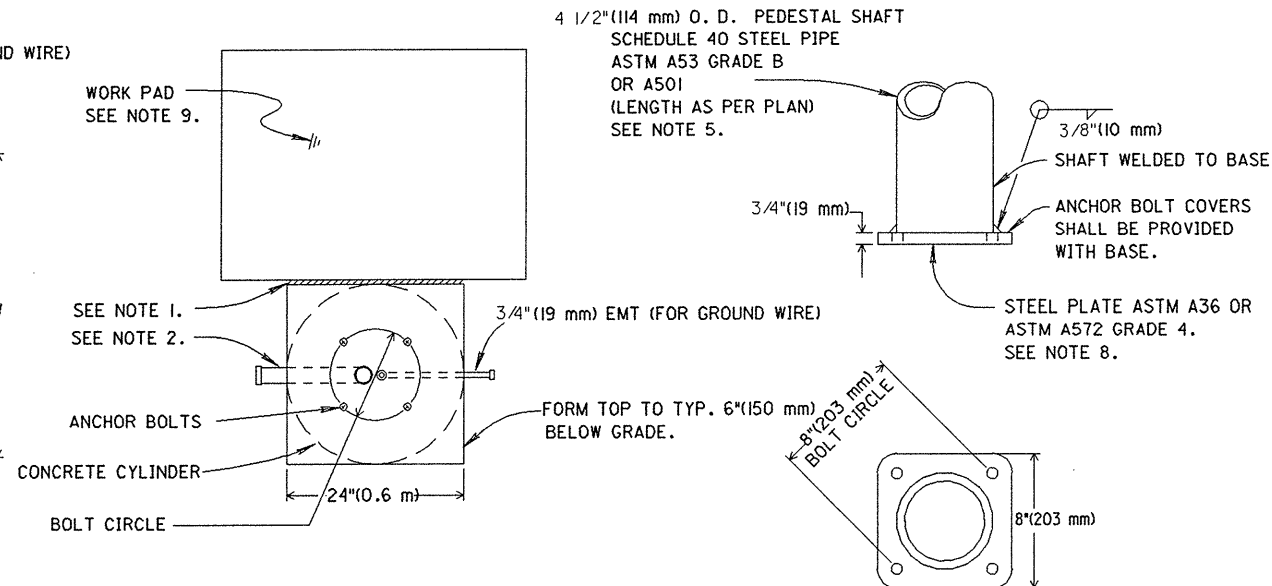
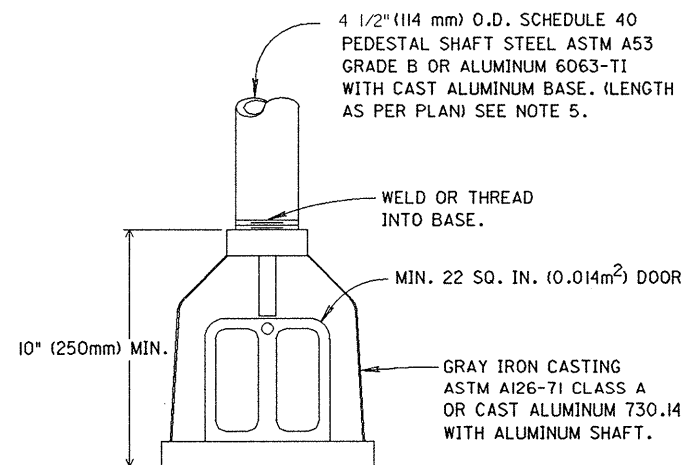
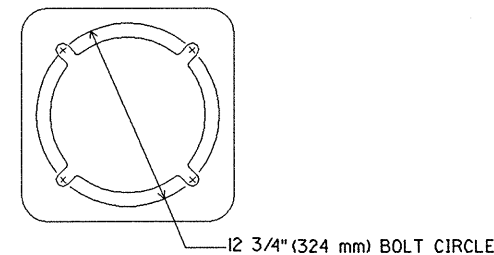
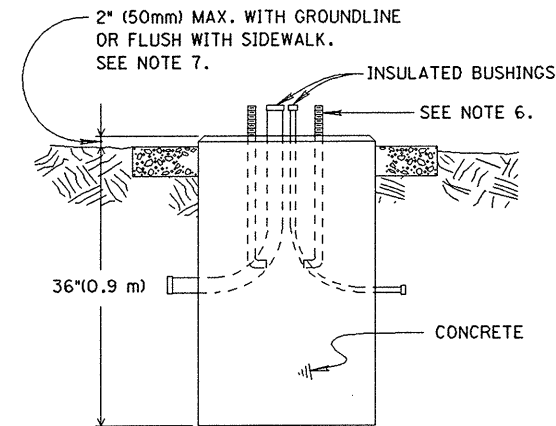


**PLATE PEDESTAL BASE**

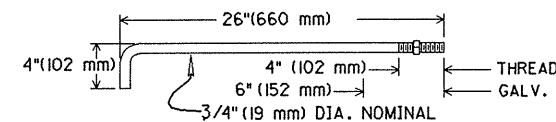


**TRANSFORMER TYPE  
PEDESTAL BASE**

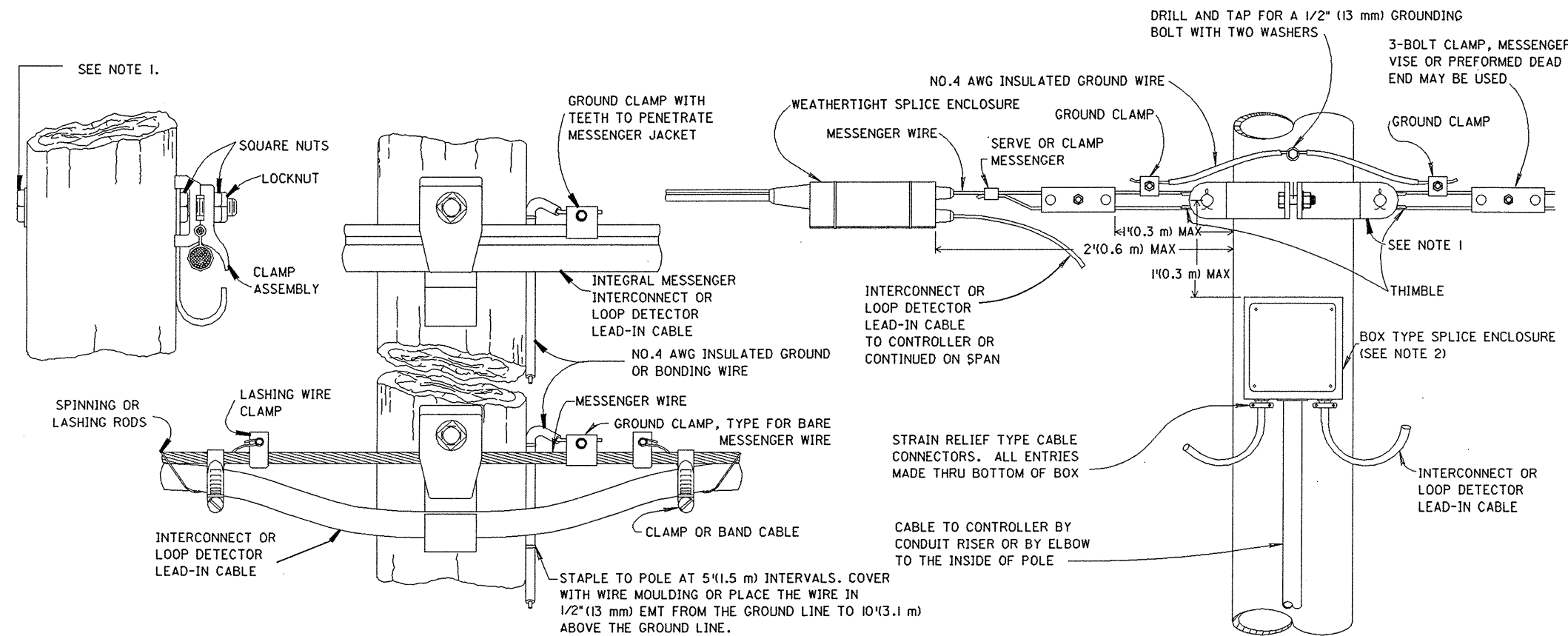


**PEDESTAL FOUNDATION**

| FOUNDATION<br>CONCRETE              | WORK<br>PAD                         |
|-------------------------------------|-------------------------------------|
| 0.42 C.Y.<br>(0.32 m <sup>3</sup> ) | 0.96 C.Y.<br>(0.80 m <sup>2</sup> ) |

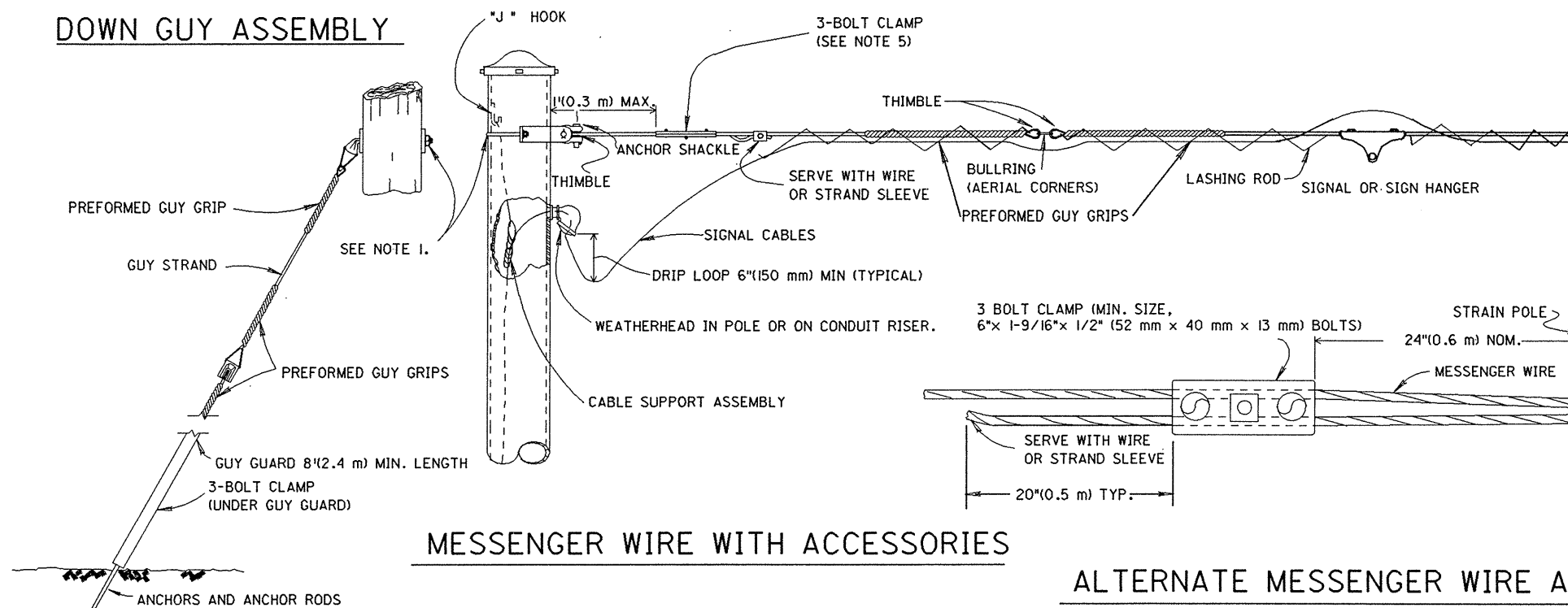


**PEDESTAL ANCHOR BOLT**  
ASTM A307 STEEL



### INTERCONNECT AND LOOP DETECTOR LEAD-IN ATTACHMENT DETAIL

### DOWN GUY ASSEMBLY

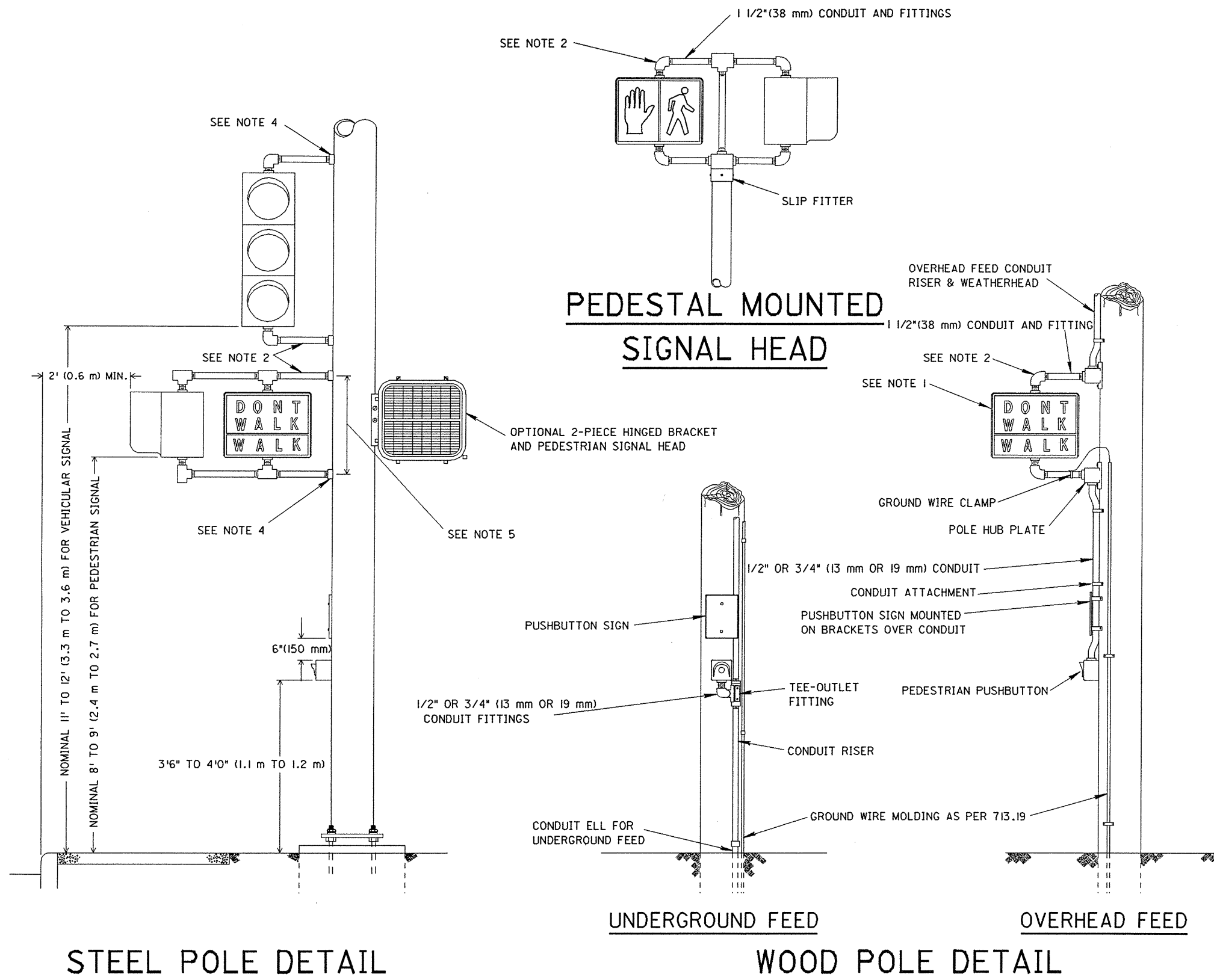


### MESSENGER WIRE WITH ACCESSORIES

### ALTERNATE MESSENGER WIRE ASSEMBLY

### NOTES

1. Messenger wire pole attachment shall be by a pole clamp on steel poles and be a 5/8" (16 mm) Thru-bolt (or thimble-eye bolt) with washers on wood poles.
2. The pole mounted type splice enclosure may be used as an alternative splice method unless otherwise specified in the plans. Pole attachment shall be by means of passivated stainless steel banding or tapped screws on steel poles and lag screws on wood poles. The box shall be gasketed and weathertight, and hot dipped galvanized if constructed of steel. Minimum box requirements shall be 8" x 8" x 4" (200 mm x 200 mm x 100 mm) with 12 terminal connections (20 amp).
3. The interconnect or loop detector lead-in cable shall have a sag between 3% and 5% or match existing utility lines.
4. The interconnect or loop detector lead-in messenger wire shall be grounded at the first and last poles in a cable run and at intervals not to exceed 1200 feet (366 m). When attached to wood poles, the messenger wire shall be grounded by bonding to an existing ground rod. The messenger wire shall be bonded to grounded steel poles by use of a 1/2" bolt, drilled and tapped into the pole.
5. The minimum 3-bolt size clamp shall be 6" (152 mm) long with 1/2" (13 mm) diameter bolts. Preformed guy grips shall not be used to attach the messenger wire to the signal poles. Their use is limited to bullring attachments.
6. The alternate messenger wire attachment shall only be allowed on round, tapered steel strain poles.



## NOTES

1. Vehicular signal heads shall utilize mounting brackets similar to those shown for pedestrian signal heads.
2. Signalhead conduit brackets and conduit fittings shall be galvanized and painted (except pole clamps or bands) to match the body of the signal head.
3. For embedded steel poles, external conduit shall be similar to that shown in wood pole detail. External grounding will not be required unless specifically noted on the plans.
4. The signal head bracket arms shall be attached to steel poles by one of the following methods:
  - a. 1-1/2" (38 mm) blind half coupling welded into the pole prior to galvanizing.
  - b. Bracket arm hub plates attached to the pole as per note 7.
  - c. Pole clamp with threaded hub.

Field installation of the wiring holes for signal heads and pushbuttons will be permitted provided that the holes are drilled or hole sawn. No torch cutting or field welding will be permitted. Cut surfaces shall be filed smooth and covered with two coats of zinc rich paint. Grommets or wiring guides shall be installed in the holes.
5. Vertical spacing between bracket fittings shall be determined by the Contractor, and shall be the dimension from centerline to centerline of the bracket arms necessary to accommodate the vertical height of the signalhead plus not more than 10" (250 mm).
6. The following minimum size fasteners shall be used for the attachment of the indicated hardware to wood poles:
  - a. CONDUIT BRACKET ARM HUB PLATES: 1/2" (13 mm) dia. x 3" (127 mm) long lag screws (two screws per hub plate).
  - b. CONDUIT STRAPS (Two hole): 1/4" x 3" (6.4 mm x 76 mm) long lag screws, #14 x 3" (76 mm) long round head wood screws, or 20d spikes.
  - c. PUSHBUTTON SIGN: with brackets - 3/8" x 3" (10 mm x 76 mm) long lag screws (two per bracket); without brackets - 3/8" x 3" (10 mm x 76 mm) long lag screws with 7/16" (11 mm) I.D. x 1" (25 mm) O.D. flat washer between the sign and pole (two per sign).
  - d. PUSHBUTTON: #14 x 3" (76 mm) long round head wood screws or 1/4" x 3" (6.4 mm x 76 mm) long lag screws (two per pushbutton).
7. The following minimum size fasteners shall be used for the attachment of the indicated hardware to steel poles:
  - a. CONDUIT BRACKET ARM HUB PLATES: 1/2" (13 mm) dia. screw or 3/4" (19 mm) wide passivated stainless steelband (two fasteners or bands per hub plate).
  - b. CONDUIT: two hole conduit straps with 1/4" (6.4 mm) dia. screws or 3/4" (19 mm) wide passivated stainless steelbands.
  - c. PUSHBUTTON SIGN: 3/8" (10 mm) dia. screws (two per sign).
  - d. PUSHBUTTON: 1/4" (6.4 mm) dia. screws (two per pushbutton).

The screws shall utilize a drilled and tapped hole or be the self-tapping type.