

# INDEX OF SHEETS

# COLORADO DEPARTMENT OF HIGHWAYS

## PLAN AND PROFILE OF PROPOSED STATE PROJECT F 006-1(II) UNIT 2 STATE HIGHWAY NO. 3 ADAMS COUNTY

| FEDERAL ROAD DISTRICT NO. | PROJECT NO.       | SHEET NO. | TOTAL SHEETS |
|---------------------------|-------------------|-----------|--------------|
| 4                         | F006-1(II) UNIT 2 | 1         | 1            |

Rev 7-8-54, Added Sheets 9a & 9b to Index, J.C.R.  
Rev. Conventional Signs, 8-19-59, D.C.W.

### CONVENTIONAL SIGNS

CENTER LINE  
RIGHT OF WAY LINE  
COUNTY LINE  
TOWNSHIP OR RANGE LINE  
LAND LINES  
RAILROAD  
BARBED WIRE FENCE  
COMBINATION WIRE FENCE  
SNOW FENCE  
TELEPHONE & TELEGRAPH LINES  
POWER LINE  
DETOUR  
PRESENT ROAD (Plan Sheets)  
CITY LIMITS  
ACCESS POINTS  
C of A (Control of Access)  
Access denied by Deed

STA. 944+54.2 END  
F006-1(II) UNIT 2 =  
Opposite (along County Line)  
Sta. 0+00 on FA# 148

STA. 840+82.8 BEG.  
F006-1(II) UNIT 2 =  
END 0+00 on FA# 148

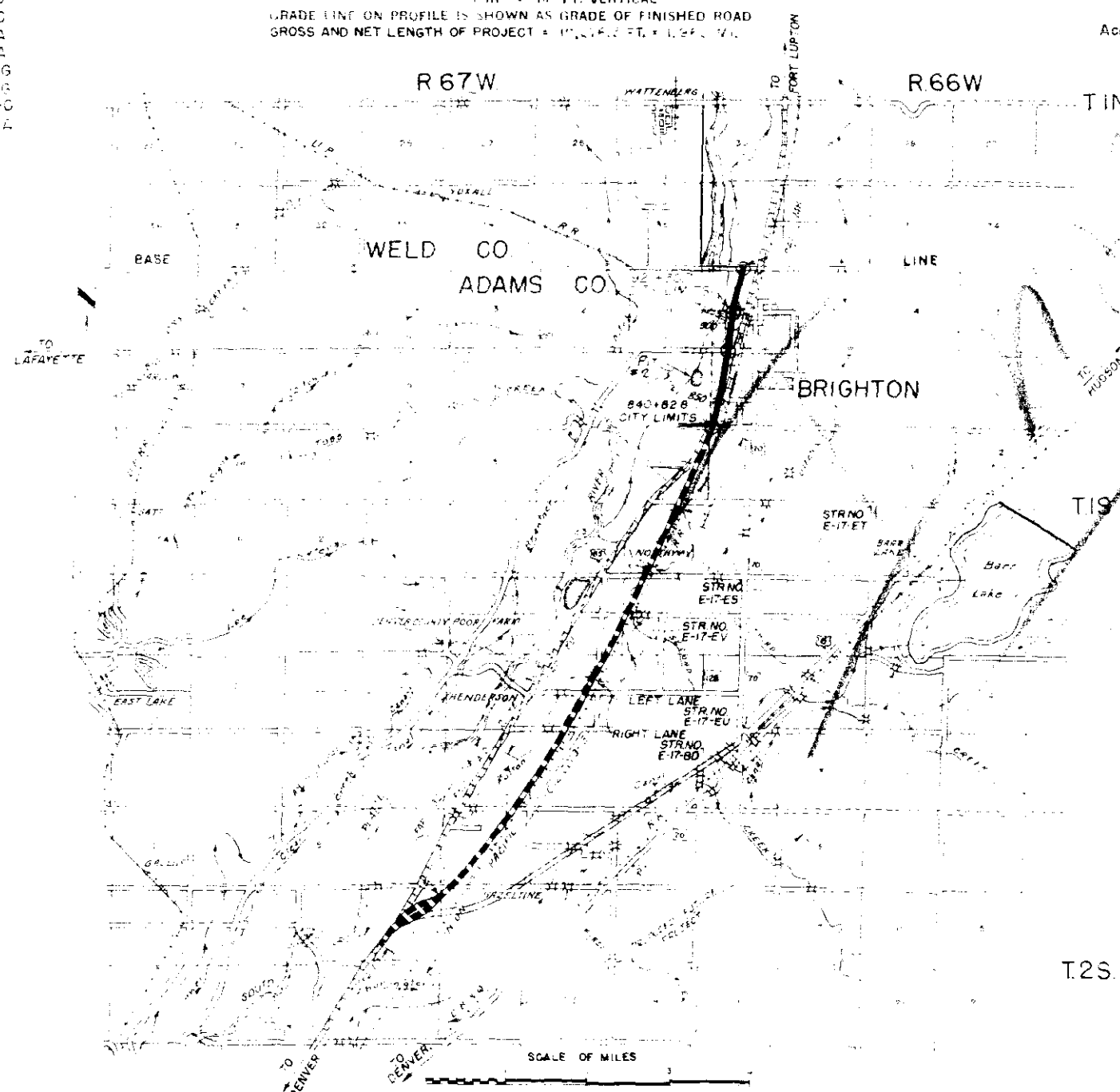
### SCALES OF ORIGINAL DRAWINGS

ON PLAN 1 IN. = 100 FT.  
ON PROFILE 1 IN. = 100 FT. HORIZONTAL  
1 IN. = 10 FT. VERTICAL

GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD  
GROSS AND NET LENGTH OF PROJECT = 12,376.3 FT. = 1.965 MI.

M-1-C 1  
M-2-EM  
M-7-C  
M-10-B  
M-12-D 2  
M-12-D 12  
M-18-B  
M-19-C  
M-27-C  
M-29-A  
M-46-A  
M-102-G  
M-104-B  
M-107-C  
M-124-A

M-1-C



### TABULATION OF LENGTH AND DESIGN DATA

| STATION                                                                              | ROADWAY   |          | LIN. FT. | MILES |
|--------------------------------------------------------------------------------------|-----------|----------|----------|-------|
|                                                                                      | BRIGHTON  | HEIGHTON |          |       |
| 840+82.8-Beg F006-1(II) Unit 2 =<br>END 0+00 on FA# 148                              | 1,372.4   |          |          |       |
| 854+55.2 Bk = } Equation<br>854+53.3 Ah.                                             | 6,680.4   |          |          |       |
| 921+30.7 (City Limits)                                                               |           | 2,323.5  |          |       |
| 944+54.2-End F006-1(II) Unit 2 =<br>Opp. (along County Line) Sta 24+10<br>on FA# 148 |           |          |          |       |
| TOTALS                                                                               | 8,052.8   | 2,323.5  |          |       |
| SUMMARY                                                                              |           |          |          |       |
| F006-1(II) Unit 2 Roadway<br>(Inside Brighton)                                       |           |          | 8,052.8  | 1.525 |
| F006-1(II) Unit 2 Roadway<br>(Outside Brighton)                                      |           |          | 2,323.5  | 0.440 |
| Total F006-1(II) Unit 2 - Gross & Net Length                                         |           |          | 12,376.3 | 1.965 |
| DESIGN DATA                                                                          |           |          |          |       |
| Maximum Degree of Curve                                                              | 2° 00'    |          |          |       |
| Maximum Grade                                                                        | 1.264%    |          |          |       |
| Minimum N.P.S.D. -horizontal                                                         | 713.77 ft |          |          |       |
| Minimum N.P.S.D. -vertical                                                           | 860 ft    |          |          |       |
| Maximum Design Speed                                                                 | 60 M.P.H. |          |          |       |

NOTED TO BIDDERS  
THE FOLLOWING INFORMATION IS FOR YOUR INFORMATION ONLY. IT IS NOT A PART OF THE CONTRACT.  
GLEN McLEOD, Construction Engineer,  
Denver, Colorado  
IVAN JOHNSON, Resident Engr., Brighton, Colo.  
PHONE: OFF 15-BRIGHTON 2241, HOME-62 F006

COLORADO  
DEPARTMENT OF HIGHWAYS  
5-14-54  
DATE

DEPARTMENT OF COMMERCE  
BUREAU OF PUBLIC ROADS  
APPROVED: \_\_\_\_\_  
DATE \_\_\_\_\_  
DISTRICT ENGINEER

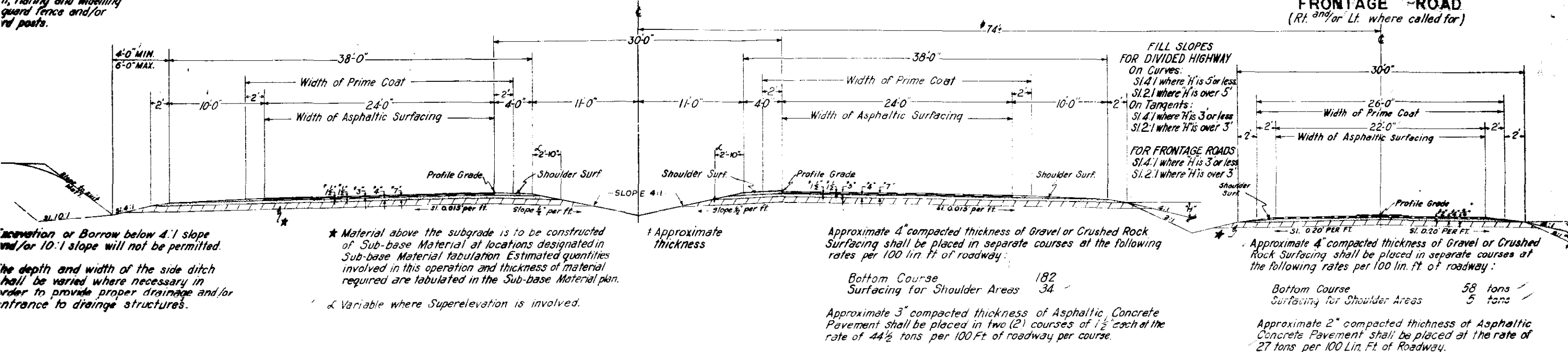
# TYPICAL CROSS SECTION OF IMPROVEMENT

| FEDERAL ROAD DIVISION NO. | DISTRICT | PROJ. NO.         | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|-------------------|-----------|--------------|
| 1                         | COLORADO | FOO6-1(II) UNIT 2 | 2         |              |

Rev. 6-8-54- Median Slope & Rate of Surf. J.R.M. ✓

TE: See Standard M-2-EM details of cut slope treatment, flaring and widening guard fence and/or rd posts.

## TYPICAL SECTION



## FRONTAGE ROAD

(Rt. and/or Lt. where called for)

## GENERAL NOTES

- ✓ This project is to be constructed in conformity with the Standard Specifications of the Colorado Department of Highways, adopted June 1, 1952.
- ✓ All quantities on preliminary plans are to be considered approximate only.
- ✓ All poles encroaching on construction are to be moved by the owners.
- ✓ All Corrugated Metal Pipe Cross Culverts, including Arch Culverts, shall be laid with Metal Aprons on each end unless otherwise noted on plans.
- ✓ All curves are to be superelevated and widened as provided by the Standard Superelevation sheets included with the plans.
- ✓ The force-account item, Clearing of Building Sites, including Removal of Foundation and Appurtenance, shall include removal of all foundations, wells, outhouses and other appurtenance not removed by the owner, and any necessary backfilling of cellars, cess pools, wells, etc. to provide neat roadside conditions. It is estimated that this item applies at the following locations: Sta. 841+, Sta. 857+, Sta. 907+, Sta. 911+, Sta. 916+ to 919+

For preliminary plan quantities of Asphaltic Road Materials the following rates of Application were used:

PRIME COAT MC @ 0.40 Gal. per sq. yd.  
Paving Asphalt @ 6.18 Lbs. per sq. yd. per inch

Rate of application and grade of Asphaltic Material shall be as determined by the Engineer at time of application.

All side approach roads to the project designated by the Engineer shall be primed to approximately 50 feet out from edge of the Asphaltic Surfacing or to the Right of Way Line, whichever is less. The following listed approaches shall be primed and Asphaltic Processed: Sta. 840+ Rt & Lt, Sta. 894+ Rt & Lt, Sta. 921+ Rt & Lt, and Sta. 944+ Rt & Lt.

• This distance shall be varied to conform to field conditions encountered in constructing Frontage Roads.

SUMMARY OF APPROXIMATE QUANTITIES

Rev. 6-8-54-Added  
Item 110 vx - J.R.W.

| FEDERAL ROAD<br>DIVISION NO. | DISTRICT | PROJ. NO.          | SHEET<br>NO. | TOTAL<br>SHEETS |
|------------------------------|----------|--------------------|--------------|-----------------|
| 1                            | COLORADO | F 006-1(11) UNIT 2 | 3            |                 |

| ITEM NO.      | ITEM                                                              | UNIT     | INSIDE BRIGHTON |  | OUTSIDE BRIGHTON |           | PROJECT TOTALS |
|---------------|-------------------------------------------------------------------|----------|-----------------|--|------------------|-----------|----------------|
|               |                                                                   |          | ROADWAY         |  | ROADWAY          |           |                |
|               |                                                                   |          |                 |  |                  |           |                |
| 10a           | Clearing & Grubbing Entire Project                                | Lump Sum | (Paved) •       |  | (Paved) •        | •         |                |
| 11a           | Removal of 5 Structures (Inside Brighton)                         | Lump Sum | •               |  | •                | •         |                |
| 11b           | Removal of 2 Structures (Outside Brighton)                        | Lump Sum | •               |  |                  | •         |                |
| 11c           | Disconnecting and Connecting Water Lines                          | Lump Sum | •               |  |                  | •         |                |
| 11d           | Removing & Resetting Mail Boxes                                   | Lump Sum | •               |  |                  | •         |                |
| 11e           | Adjust Manhole Ring and Cover                                     | Sq. Ft.  | 4               |  | 1                | 5         |                |
| 11f           | Remove Concrete Sidewalk                                          | Each     | 1000            |  |                  | 1000      |                |
| 11g           | Remove & Reset Guard Posts                                        | Each     | 6               |  |                  | 6         |                |
| 12a           | Removing Fence                                                    | Lin. Ft. | 4500            |  | 200              | 4700      |                |
| 12b           | Removing and Rebuilding Fence                                     | Lin. Ft. | 600             |  |                  | 600       |                |
| 12c           | Line Posts (Treated Wood)                                         | Each     | 10              |  |                  | 10        |                |
| 12x           | Removing and Resetting Gates                                      | Each     |                 |  | 1                | 1         |                |
| 13c           | Unclassified Excavation                                           | Cu. Yd.  | 147 550         |  | 41 450           | 189 000   |                |
| 13d           | Unclassified Ditch Excavation                                     | Cu. Yd.  | 125             |  | 75               | 200       |                |
| 13s           | Stripping                                                         | Cu. Yd.  | 5 600           |  | 1 000            | 6 600     |                |
| 14a           | Dry Rock Excavation (Str.)                                        | Cu. Yd.  | 80              |  | 30               | 110       |                |
| 14b           | Dry Common Excavation (Str.)                                      | Cu. Yd.  | 1 490           |  | 460              | 1950      |                |
| 14c           | Wet Rock Excavation (Str.)                                        | Cu. Yd.  | 23              |  | 7                | 30        |                |
| 14d           | Wet Common Excavation (Str.)                                      | Cu. Yd.  | 375             |  | 115              | 490       |                |
| 16a           | Structure Backfill (Class 1)                                      | Cu. Yd.  | 1170            |  | 500              | 1 670     |                |
| 16c           | Mechanical Tamping                                                | Hour     | 170             |  | 80               | 250       |                |
| 17a           | Rolling with Tamping Roller (Two (2) Unit)                        | Hour     | 475             |  | 155              | 630       |                |
| 17b           | Rolling with Tamping Roller (Four (4) Unit)                       | Hour     | 80              |  | 30               | 110       |                |
| 17c           | Rolling with Flat Wheeled Roller (Tandem)                         | Hour     | 225             |  | 55               | 280       |                |
| 17d           | Rolling with Flat Wheeled Roller (Three (3) Wheel)                | Hour     | 130             |  | 30               | 160       |                |
| 17e           | Rolling with Rubber Tired Roller                                  | Hour     | 42              |  | 8                | 50        |                |
| 17f           | Furnishing Tamping Roller (Two (2) Unit)                          | Each     | 0.8             |  | 0.2              | 1         |                |
| 17g           | Furnishing Tamping Roller (Four (4) Unit)                         | Each     | 0.8             |  | 0.2              | 1         |                |
| 17h           | Furnishing Flat Wheeled Roller (Tandem)                           | Each     | 1.6             |  | 0.4              | 2         |                |
| 17i           | Furnishing Flat Wheeled Roller (Three (3) Wheel)                  | Each     | 0.8             |  | 0.2              | 1         |                |
| 17j           | Furnishing Rubber Tired Roller                                    | Each     | 0.8             |  | 0.2              | 1         |                |
| 17k           | Wetting                                                           | M Gal.   | 4 560           |  | 1 410            | 5 970     |                |
| 18a           | Station Yard Overhaul                                             | Sta. Yd. | 1050 375        |  | 428 625          | 1 479 000 |                |
| 18b           | Yard Mile Overhaul                                                | Yd. Mi.  | 66 250          |  | 56 950           | 123 200   |                |
| 18c           | Ton Mile Overhaul                                                 | Ton Mile | 38 535          |  | 12 665           | 51 200    |                |
| 23c           | Sub-Base Material (Class 3)                                       | Ton      | 14 700          |  | 1 400            | 16 100    |                |
| 26c           | Gravel or Crushed Rock Surfacing (Grading C)                      | Ton      | 27 370          |  | 6 030            | 33 400    |                |
| 29b           | Asphalt (85-100 penetration)                                      | Ton      | 690             |  | 150              | 840       |                |
| 30x           | Asphaltic Road Material MC (Prime)                                | Gal.     | 35 550          |  | 6 850            | 42 400    |                |
| 34d           | Asphaltic Concrete Pavement (Surface Type B)                      | Ton      | 11 170          |  | 2 510            | 13 680    |                |
| 46a           | Class "A" Concrete                                                | Cu. Yd.  | 19              |  | 225              | 247       |                |
| 46b           | Class "B" Concrete                                                | Cu. Yd.  | 7               |  |                  | 7         |                |
| 47            | Reinforcing Steel                                                 | Lb.      | 1750            |  | 18 950           | 20 700    |                |
| 51v           | Relaying 10" Pipe                                                 | Lin. Ft. |                 |  | 22               | 22        |                |
| 53w           | 8" Corrugated Metal Culvert Pipe                                  | Lin. Ft. |                 |  | 340              | 340       |                |
| 53a           | 15" Corrugated Metal Culvert Pipe                                 | Lin. Ft. | 676             |  |                  | 676       |                |
| 53b           | 18" Corrugated Metal Culvert Pipe                                 | Lin. Ft. | 520             |  | 26               | 546       |                |
| 53c           | 24" Corrugated Metal Culvert Pipe                                 | Lin. Ft. | 1 302           |  | 266              | 1 568     |                |
| 55b           | 18" Corrugated Metal Siphon Pipe                                  | Lin. Ft. | 361             |  |                  | 361       |                |
| 55c           | 24" Corrugated Metal Siphon Pipe                                  | Lin. Ft. | 178             |  |                  | 178       |                |
| 76c           | Barbed Wire Fence with Metal Posts                                | Lin. Ft. | 9 425           |  | 4 575            | 14 000    |                |
| 76f           | Combination Wire Fence with Metal Posts                           | Lin. Ft. | 1 900           |  |                  | 1 900     |                |
| 76x           | Barrier Fence with Metal Posts                                    | Lin. Ft. | 10 100          |  |                  | 10 100    |                |
| 81b           | Right of Way Markers                                              | Each     | 6               |  | 2                | 8         |                |
| 84a           | Concrete Curb                                                     | Lin. Ft. | 1195            |  | 405              | 1 600     |                |
| 85b           | Trash Guards for 18" Siphons                                      | Each     | 4               |  |                  | 4         |                |
| 85c           | Trash Guards for 24" Siphons                                      | Each     | 2               |  |                  | 2         |                |
| 92            | Timber Guard Posts                                                | Each     | 47              |  | 22               | 69        |                |
| 95b           | Metal Aprons for 18" Corrugated Metal Pipe Culverts               | Each     | 4               |  |                  | 4         |                |
| 95by          | Metal Aprons for 18" Corrugated Metal Pipe Culverts (for Siphons) | Each     | 4               |  |                  | 4         |                |
| 95c           | Metal Aprons for 24" Corrugated Metal Pipe Culverts               | Each     | 11              |  | 3                | 14        |                |
| 95cy          | Metal Aprons for 24" Corrugated Metal Pipe Culverts (for Siphons) | Each     | 2               |  |                  | 2         |                |
| 95xc          | Metal Aprons for 29 x 18" Corrugated Metal Pipe Arch Culverts     | Each     | 3               |  | 4                | 7         |                |
| 110vx         | 4" Hub Gate Valve                                                 | Each     | 2               |  |                  | 2         |                |
| 110va         | 4" Cast Iron Valve and Valve Box                                  | Each     | 3               |  |                  | 3         |                |
| 110pa         | 4" Metal Drain Pipe                                               | Lin. Ft. | 940             |  |                  | 940       |                |
| 113xc         | 4" Cast Iron Water Pipe                                           | Lin. Ft. | 950             |  |                  | 950       |                |
| 113xe         | 6" Cast Iron Water Pipe                                           | Lin. Ft. | 1 300           |  |                  | 1 300     |                |
| 132ve         | 12" Vitrified Pipe Sewer                                          | Lin. Ft. | 108             |  |                  | 108       |                |
| 132vq         | 18" Vitrified Pipe Sewer                                          | Lin. Ft. | 102             |  |                  | 102       |                |
| 132w          | No. 13 Inlet Grating and Frame                                    | Each     | 1               |  | 1                | 2         |                |
| 132x          | Inlet Grating and Frame (Median)                                  | Each     | 14              |  | 2                | 16        |                |
| 132m          | Manholes                                                          | Each     | 1               |  |                  | 1         |                |
| 134c          | 29 x 18" Corrugated Metal Pipe Arch Culverts                      | Lin. Ft. | 298             |  | 220              | 518       |                |
| 134h          | 65 x 40" Corrugated Metal Pipe Arch Culverts                      | Lin. Ft. |                 |  | 110              | 110       |                |
| 134i          | 72 x 44" Corrugated Metal Pipe Arch Culverts                      | Lin. Ft. |                 |  | 102              | 102       |                |
| 81a           | Project Markers                                                   | Each     | 8               |  | 1                | 9         |                |
|               | Reflectorized R.R. Advance Warning Signs                          | Each     | 2               |  |                  | 2         |                |
|               | Reflectorized R.R. Crossbuck Signs                                | Each     | (Paved) •       |  | (Paved) •        | •         |                |
|               | Signing and Striping Entire Project                               | Lump Sum |                 |  |                  |           |                |
| STATE FORCES  |                                                                   |          |                 |  |                  |           |                |
| FORCE ACCOUNT |                                                                   |          |                 |  |                  |           |                |
|               | Reset all Fire and/or Water Hydrants                              | Lump Sum | •               |  |                  | •         |                |
|               | (Work by City of Brighton Forces)                                 |          |                 |  |                  |           |                |
|               | Clearing of Building Sites, including Removal of Foundations      | Lump Sum | •               |  |                  | •         |                |
|               | and Appurtenances                                                 |          |                 |  |                  |           |                |
|               | R.R. Grade Crossing and 4 Flashing Light Signs (work by UPRR)     | Lump Sum | •               |  |                  | •         |                |
|               | Relocate Power Poles (Work by S.W. Sugar Co. Forces)              | Lump Sum | •               |  |                  | •         |                |
|               | Rebate Public Service Power Line (Work by                         | Lump Sum | •               |  |                  | •         |                |
|               | Public Service Co. Forces)                                        |          |                 |  |                  |           |                |

# LIST OF STRUCTURES

| FED. ROAD<br>DIVISION NO. | DISTRICT | PROJECT NO.           | SHEET<br>NO. | TOTAL<br>SHEETS |
|---------------------------|----------|-----------------------|--------------|-----------------|
| 2.                        | COLO.    | FOOD-1(III)<br>UNIT 2 | 4            |                 |

Rev. 6-8-54 - Conc. & Steel L.R.W.

INSIDE BRIGHTON

| LOCATION                   | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                               | REMOVE STRUCTURE |      | EXCAVATION |             |             | STRUCTURAL EXCAVATION | STRUCTURE BACKFILL | MECH. TAMPING | GRAVEL OR CRUSHED ROCK SURFACING | INLET GRATING & FRAME (MEDIAN) | CONCRETE    |       | REINFORCING STEEL | 18" METAL TRASH GUARDS | CORRUGATED METAL CULVERT PIPE |             |    |    |     | 20"x18" CORR. MET. PIPE ARCH CULVERTS | 4" VALVE 8" VALVE BOX | METAL APRONS FOR C.M.P. CULVERTS |                 | MISCELLANEOUS |     |     |          |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------|------------|-------------|-------------|-----------------------|--------------------|---------------|----------------------------------|--------------------------------|-------------|-------|-------------------|------------------------|-------------------------------|-------------|----|----|-----|---------------------------------------|-----------------------|----------------------------------|-----------------|---------------|-----|-----|----------|
|                            |                                                                                                                                                                                                                                                                                                                                                                                           | NO.              | KIND | UNCL.      | CUBIC YARDS |             | CUBIC YARDS           | CUBIC YARDS        |               |                                  |                                | CUBIC YARDS |       |                   |                        |                               | LINEAR FEET |    |    |     |                                       |                       | EA                               | 18" 24" 28"x18" |               |     |     |          |
|                            |                                                                                                                                                                                                                                                                                                                                                                                           |                  |      |            | EMB.        | UNCL. DITCH |                       |                    |               |                                  |                                | CL. 1       | CL. A |                   |                        | CL. B                         | LBS.        | EA | 8" | 18" |                                       |                       |                                  |                 |               | 24" | 48" | LIN. FT. |
|                            |                                                                                                                                                                                                                                                                                                                                                                                           |                  |      |            |             |             |                       |                    |               |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 |               |     |     |          |
| 840+<br>840+ to 921+       | Intersection (including Appr. to Present Road, Rt.)<br>Frontage Road, Lt.                                                                                                                                                                                                                                                                                                                 |                  |      |            | 200         |             |                       |                    |               |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 |               |     |     |          |
| 848+ to 855+               | Adjust Borrow Ditch between Roadway & Front-<br>age Road, Lt. to drain ahead                                                                                                                                                                                                                                                                                                              |                  |      |            | 100         |             |                       |                    |               |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 |               |     |     |          |
| 849+00<br>850+60<br>851+00 | Cross Culvert under both lanes; C.M.P. under<br>Frontage Road, Lt. Mtl. Aprons @ Each End; Ditches<br>Approach to Frontage Road, Lt.<br>Cross Culvert under both lanes & Frontage<br>Road, Lt.; Ditches<br>Remove 1.5'x1'x16' W.B.C., Rt                                                                                                                                                  |                  |      |            | 50          | 10          | 45                    |                    | 75            |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  | 4               |               |     |     |          |
| 851+07<br>857+90           | Cross Culvert under both lanes & Frontage<br>Road, Lt.; Ditches<br>C.M.P. Incasement for future service lines<br>Plug both ends                                                                                                                                                                                                                                                           |                  |      |            |             | 5           | 30                    |                    | 45            |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  | 2               |               |     |     |          |
| 855+00                     | Cross Culvert under both lanes & Frontage<br>Road, Lt. Type 'A' Conc. Inlet in median<br>(H-6.5') and between Roadway & Frontage<br>Road, Lt. (H-4.0'). Type 'A' Headwall at<br>Outlet; Ditches                                                                                                                                                                                           |                  |      |            |             | 5           | 20                    |                    | 54            |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  | 2               |               |     |     |          |
| 859+59                     | 18'x178" Siphon under both lanes & Frontage<br>Road, Lt. (H-5.0 Lt. & 6.2 Rt.), Siphon Drain &<br>Trash Guards; Ditches                                                                                                                                                                                                                                                                   |                  |      |            |             | 5           | 140                   |                    | 110           |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 | 1             |     |     |          |
| 867+50<br>867+89           | Approach to Frontage Road, Lt.<br>24'x174" Siphon under both lanes & Frontage<br>Road, Lt. (H-2.0 Lt. & 4.3 Rt.), Siphon Drain &<br>Trash Guards; Ditches<br>Remove 3.5'x40' Conc. Drop, Lt.                                                                                                                                                                                              |                  |      |            | 50          |             |                       |                    |               |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 | 1             |     |     |          |
| 869+00<br>873+40<br>875+00 | 18'x175" Siphon under both lanes & Frontage<br>Road, Lt. (H-2.5 Lt. & 6.1 Rt.), Siphon Drain<br>& Trash Guards; Ditches<br>C.M.P. Incasement for future service line<br>Plug both ends<br>Cross Culvert under both lanes & Frontage<br>Road, Lt. Type 'A' Conc. Inlet in median<br>(H-5.5') and between Roadway & Frontage<br>Road, Lt. (H-4.0'). Type 'A' Headwall at<br>Outlet; Ditches |                  |      |            |             | 5           | 165                   |                    | 116           |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 | 1             |     |     |          |
| 888+00                     | Cross Culvert under both lanes & Frontage<br>Road, Lt. Type 'A' Conc. Inlet in median<br>(H-4.5') and between Roadway & Frontage<br>Road, Lt. (H-4.0'). Type 'A' Headwall at<br>Outlet; Ditches                                                                                                                                                                                           |                  |      |            |             | 5           | 15                    |                    | 55            |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 | 1             |     |     |          |
| 889+00<br>890+00           | C.M.P. Incasement for future service line<br>Plug both ends<br>Sewer Line for future sewer line<br>Plug both ends                                                                                                                                                                                                                                                                         |                  |      |            |             |             | 60                    |                    | 23            |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 |               |     |     |          |
| 893+00                     | C.M.P. under Frontage Road, Lt.; Ditches                                                                                                                                                                                                                                                                                                                                                  |                  |      |            |             | 5           | 4                     |                    | 13            |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 |               |     |     |          |
| 894+67.5                   | Side Drain, Rt. connected to Manhole, median<br>crossing & Intersection with Accel. & Decel. lanes                                                                                                                                                                                                                                                                                        |                  |      |            | 600         |             | 15                    |                    | 14            |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 |               |     |     |          |
| 894+ to 921+               | Frontage Road, Rt.                                                                                                                                                                                                                                                                                                                                                                        |                  |      |            |             |             |                       |                    |               |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 |               |     |     |          |
| 895+ to 915+               | Water Line with C.M.P. Incasement<br>Sta. 906+15 & 4" Hub Gate Valves, Sta. 899+80<br>& Sta. 905+90                                                                                                                                                                                                                                                                                       |                  |      |            |             |             | 660                   |                    | 38            |                                  |                                |             |       |                   |                        |                               |             |    |    |     |                                       |                       |                                  |                 |               |     |     |          |

(CONTINUED ON SHEET No. 5)

LIST OF STRUCTURES  
(CONTINUED FROM SHEET No. 4)

| FED. ROAD DIVISION NO. | DISTRICT | PROJECT NO.         | SHEET NO. | TOTAL SHEETS |
|------------------------|----------|---------------------|-----------|--------------|
| 9.                     | COLO.    | FOUR-1 (III) UNIT 2 | 5         |              |

Rev. 6-8-54 - Conc. & Steel Totals J.R.W.

| LOCATION        | DESCRIPTION                                                                                                                                                                                       | REMOVE    | EXCAVATION  |       |      | STRUCTURAL  | STRUCTURE   | MECH. | GRAVEL OR | INLET | CONCRETE | REINFORCING | 18"                  | CORRUGATED METAL CULVERT PIPE | 29"x18"           | 4" | METAL APRONS | MISCELLANEOUS |                                              |        |             |      |      |        |        |                                                                                                  |      |    |     |     |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|-------|------|-------------|-------------|-------|-----------|-------|----------|-------------|----------------------|-------------------------------|-------------------|----|--------------|---------------|----------------------------------------------|--------|-------------|------|------|--------|--------|--------------------------------------------------------------------------------------------------|------|----|-----|-----|
|                 |                                                                                                                                                                                                   | STRUCTURE | CUBIC YARDS |       |      | EXCAVATION  | BACKFILL    |       |           |       |          |             |                      |                               |                   |    |              |               | TRASH                                        | GUARDS | LINEAR FEET | FOR  |      |        |        |                                                                                                  |      |    |     |     |
|                 |                                                                                                                                                                                                   | NO.       | KIND        | UNCL. | EMB. | UNCL. DITCH | CUBIC YARDS |       |           |       |          |             |                      |                               |                   |    |              |               | CUBIC YARDS                                  | CL 1   | HOURS       | TONS | EACH | CL "A" | CL "B" | LBS.                                                                                             | EACH | 8" | 15" | 18" |
| 895 + 12        | Cross Culvert under both lanes & Frontage Road, Lt. with Manhole, Rt. C.M.P. to drain Borrow Ditch, Rt.; Outlet Ditch Remove Headwall, Rt.                                                        | 1         |             |       |      | 5           | 42          |       | 85        |       |          |             |                      |                               |                   |    |              |               | 18                                           | 2 1/2  |             |      |      | 1      |        | 1-Manhole (height - 5.5' ±)                                                                      |      |    |     |     |
| 899 + 50        | Cross Culvert under both lanes & Frontage Road, Rt. & Lt.; Ditches                                                                                                                                |           |             |       |      | 15          | 34          |       | 63        |       |          |             |                      |                               |                   |    |              |               | 190                                          |        |             |      |      | 2      |        |                                                                                                  |      |    |     |     |
| 904 + 00        | Cross Culvert under both lanes & Frontage Road, Rt. & Lt., Type 'A' Conc. Inlet in median, (H-5.5') and between Roadway & Frontage Road, Rt. & Lt. (H-5.5'), Type 'A' Headwall at Outlet; Ditches |           |             |       |      | 20          | 80          |       | 68        |       |          | 3           | 1.44<br>1.44<br>1.44 | 1.65                          | 132<br>132<br>132 |    |              |               | 56 Rt.<br>54 Lt.<br>40 Rt.O.H.<br>40 Lt.O.H. |        |             |      |      | 1      |        |                                                                                                  |      |    |     |     |
| 906 + 50        | Sewer Line for future sewer Plug both ends                                                                                                                                                        |           |             |       |      |             |             |       |           |       |          |             |                      |                               |                   |    |              |               |                                              |        |             |      |      |        |        | 108' of 12" Vitrified Pipe Sewer                                                                 |      |    |     |     |
| 906 + 25        | Approach to Frontage Road, Rt. & Lt.                                                                                                                                                              |           |             |       |      |             |             |       |           |       |          |             |                      |                               |                   |    |              |               |                                              |        |             |      |      |        |        |                                                                                                  |      |    |     |     |
| 906 + to 912 +  | Remove Unsuitable & Replace with suitable mtl.                                                                                                                                                    |           |             |       |      | 11,400      | 15          |       |           |       |          |             |                      |                               |                   |    |              |               |                                              |        |             |      |      |        |        |                                                                                                  |      |    |     |     |
| 913 + 00        | Cross Culvert under both lanes & Frontage Road, Rt., Type 'A' Conc. Inlet in median, (H-4.0') and between Roadway & Frontage Road, Rt. (H-4.0'); Ditches                                          |           |             |       |      | 15          | 50          |       | 48        |       |          | 2           | 1.06<br>1.06         |                               | 104<br>104        |    |              |               | 52 Rt.<br>54 Lt.<br>40 Rt.O.H.               |        |             |      |      | 2      |        |                                                                                                  |      |    |     |     |
| 914 + 27        | Adjust Manhole Ring & Cover, Lt. of Median                                                                                                                                                        |           |             |       |      |             |             |       |           |       |          |             |                      |                               |                   |    |              |               |                                              |        |             |      |      |        |        | Adjust Manhole Ring & Cover (1)                                                                  |      |    |     |     |
| 915 +           | R.R. Advance Warning Signs & Crossbuck Signs                                                                                                                                                      |           |             |       |      |             |             |       |           |       |          |             |                      |                               |                   |    |              |               |                                              |        |             |      |      |        |        | 8-Reflectorized R.R. Advance Wring Signs<br>2-Reflectorized R.R. Crossbuck Signs<br>State Forces |      |    |     |     |
| 915 + 86        | Adjust 2 Manhole Rings & Covers, Rt.                                                                                                                                                              |           |             |       |      |             |             |       |           |       |          |             |                      |                               |                   |    |              |               |                                              |        |             |      |      |        |        | Adjust Manhole Ring & Cover (2)                                                                  |      |    |     |     |
| 916 + 00        | Approach to Frontage Road, Rt.                                                                                                                                                                    |           |             |       |      | 50          |             |       |           |       |          |             |                      |                               |                   |    |              |               |                                              |        |             |      |      |        |        |                                                                                                  |      |    |     |     |
| 916 + 25        | No. 13 Conc. Inlet, Rt. (H-3.0') connected to present 8" C.M.P.; Adjust Manhole Ring & Cover, Rt. Remove Storm Sewer Grate, Box & Approximately 10' of 8" C.M.P.                                  | 2         |             |       |      |             | 4           |       | 2         |       |          |             | 0.85                 |                               | 84                |    |              |               |                                              |        |             |      |      |        |        | (1-No. 13 Inlet Grating & Frame<br>Adjust Manhole Ring & Cover (1)                               |      |    |     |     |
| 916 + 30        | Cross Culvert under both lanes & Frontage Road, Rt., Type 'A' Conc. Inlet in median (H-4.0') and between Roadway & Frontage Road, Rt. & Lt. (H-4.0' Rt. & Lt.); Outlet Ditch                      |           |             |       |      | 10          | 75          |       | 56        |       |          | 3           | 1.12<br>1.06<br>1.06 |                               | 104<br>104<br>104 |    |              |               | 54 Rt.<br>54 Lt.<br>44 Rt.O.H.               |        |             |      |      | 1      |        |                                                                                                  |      |    |     |     |
| 917 + 00        | Incase Water Line                                                                                                                                                                                 |           |             |       |      |             | 90          |       | 36        |       |          |             |                      |                               |                   |    |              |               | 160                                          |        |             |      |      |        |        | Disconnecting & Connecting Water Line                                                            |      |    |     |     |
| 917 + 20        | Approach to Frontage Road, Lt.                                                                                                                                                                    |           |             |       |      |             |             |       |           |       |          |             |                      |                               |                   |    |              |               |                                              |        |             |      |      |        |        |                                                                                                  |      |    |     |     |
| 921 + 10        | Remove Concrete Sidewalk, Rt. & Lt.                                                                                                                                                               |           |             |       |      |             |             |       |           |       |          |             |                      |                               |                   |    |              |               |                                              |        |             |      |      |        |        | Remove 1000 Sq. Ft. Conc. Sidewalk                                                               |      |    |     |     |
| 921 + 25        | Lower and Incase Water Line                                                                                                                                                                       |           |             |       |      |             |             |       |           |       |          |             |                      |                               |                   |    |              |               | 102                                          |        |             |      |      |        |        | Disconnecting & Connecting Water Line                                                            |      |    |     |     |
| 921 + 30.7      | Side Drain, Rt. Median Crossing & Intersection with Decel. Lane                                                                                                                                   |           |             |       |      | 300         | 25          |       | 17        |       |          |             |                      |                               |                   |    |              |               | 64                                           |        |             |      |      |        |        |                                                                                                  |      |    |     |     |
|                 | Mechanical Tamping for all structures                                                                                                                                                             |           |             |       |      |             |             |       |           | 165   |          |             |                      |                               |                   |    |              |               |                                              |        |             |      |      |        |        |                                                                                                  |      |    |     |     |
| INSIDE BRIGHTON |                                                                                                                                                                                                   | 5         |             |       |      | 11,700      | 1,065       | 120   | 1,949     |       |          |             | 1,163                |                               | 165               | 76 | 14           | 18.04         | 6.60                                         | 1,709  | 4           |      | 676  | 520    | 1,302  | 298                                                                                              | 3    | 4  | 11  | 3   |

(CONTINUED ON SHEET No. 6)

LIST OF STRUCTURES  
(CONTINUED FROM SHEET No. 5)

| FED. ROAD DIVISION NO. | DISTRICT | PROJECT NO.          | SHEET NO. | TOTAL SHEETS |
|------------------------|----------|----------------------|-----------|--------------|
| 9.                     | COLO.    | F006-1(11)<br>UNIT 2 | 6         |              |

OUTSIDE BRIGHTON

| (CONTINUED FROM SHEET NO. 5) |                                                                                          |                     |              |      |     |                          |                       |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     |                                 |     |         |     |     |
|------------------------------|------------------------------------------------------------------------------------------|---------------------|--------------|------|-----|--------------------------|-----------------------|------------------|----------------------------------------|-----------------------------------------|----------------|-------------|----------------------|----------------------------------|-----------------------------|-------|------|------|-------------|-------------------------------------------------|-----------------|----------------------------------------|-----|----|-----|---------------------------------|-----|---------|-----|-----|
| LOCATION                     | DESCRIPTION                                                                              | REMOVE<br>STRUCTURE | EXCAVATION   |      |     | STRUCTURAL<br>EXCAVATION | STRUCTURE<br>BACKFILL | MECH.<br>TAMPING | GRAVEL OR<br>CRUSHED ROCK<br>SURFACING | INLET<br>GRATING<br>& FRAME<br>(MEDIAN) | CONCRETE       |             | REINFORCING<br>STEEL | 18"<br>METAL<br>TRASH-<br>GUARDS | CORRUGATED METAL CHUTE PIPE |       |      |      |             | 29"x18"<br>CORR. MET.<br>PIPE ARCH.<br>CULVERTS | 4" VALVE<br>BOX | METAL APRONS<br>FOR<br>C.M.P. CULVERTS |     |    |     | MISCELLANEOUS                   |     |         |     |     |
|                              |                                                                                          |                     | CUBIC YARDS  |      |     |                          |                       |                  |                                        |                                         | CUBIC YARDS    | CUBIC YARDS |                      |                                  | CL. A                       | CL. B | LBS. | EACH | LINEAR FEET |                                                 |                 |                                        |     | EA | 18" |                                 | 24" | 29"x18" |     |     |
|                              |                                                                                          |                     | UNDL.        | EMB. | WET |                          |                       |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      | 8"          |                                                 |                 | 15"                                    | 18" |    |     |                                 |     |         | 24" | 48" |
| NO.                          | KIND                                                                                     |                     |              |      |     |                          |                       | HOURS            | TONS                                   | EACH                                    |                |             |                      | EACH                             |                             |       |      |      |             |                                                 |                 |                                        |     |    |     |                                 |     |         |     |     |
| 921+ to 924+                 | Adjust Borrow Ditch, Rt. to drain back                                                   |                     | 60           |      |     |                          |                       |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     |                                 |     |         |     |     |
| 922+50                       | Cross Culvert under both lanes, Type 'A'<br>Conc. Inlet in median, (H-40); Inlet Ditch   |                     |              | 10   | 60  | 37                       |                       |                  |                                        | 1                                       | 1.06           |             | 104                  |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    | 2   |                                 |     |         |     |     |
| 926+00                       | Cross Culvert under both lanes, Ditches &<br>Conc. Division Box, Rt.                     |                     |              | 15   | 5   | 10                       | 37                    |                  |                                        |                                         | 1.93           |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    | 2   |                                 |     |         |     |     |
| 933+00                       | C.M.P. encasement for future service lines<br>Plug both ends                             |                     |              |      |     | 227                      | 95                    |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     |                                 |     |         |     |     |
| 933+63                       | Adjust Manhole Ring & Cover, Lt. of Median                                               |                     |              |      |     |                          |                       |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     | 110' of 65" x 40" C.M.A.P.      |     |         |     |     |
| 934+00                       | C.M.P. encasement for future service lines<br>Plug both ends                             |                     |              |      |     | 213                      | 88                    |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     | Adjust Manhole Ring & Cover (1) |     |         |     |     |
|                              |                                                                                          |                     |              |      |     |                          |                       |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     | 102' of 72" x 44" C.M.A.P.      |     |         |     |     |
| 937+50                       | Underpass with 10'x10'x12' C.B.C. (Type 10T)<br>No. 13 Conc. Inlet, (H-30) & C.M.P., Lt. |                     | 1,750<br>600 |      | 50  | 144                      |                       | 30               | 100                                    |                                         | 222.34<br>0.85 |             | 18,615<br>84         |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     | No. 13 Inlet Grating & Frame    |     |         |     |     |
| 943+35                       | Cross Culvert under Lt. lane, Type 'A'<br>Conc. Inlet in median, (H-40); Outlet Ditch    |                     |              | 5    | 20  | 19                       |                       |                  |                                        | 1                                       | 1.12           |             | 104                  |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    | 1   |                                 |     |         |     |     |
| 944+19                       | Cross Culvert, under both lanes & Approach, Rt.                                          |                     |              |      | 10  | 67                       |                       |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    | 2   |                                 |     |         |     |     |
| 944+                         | C.M.P. under Irrigation Ditch, Lt.                                                       |                     |              |      | 8   | 7                        |                       |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     |                                 |     |         |     |     |
| 944+30                       | Relay Side Drain, Lt.; Adjust South borrow<br>ditch of Base Line Road to drain West      |                     |              | 50   | 2   | 2                        |                       |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     | Relay 22' of 10" Pipe           |     |         |     |     |
| 944+                         | Remove 8"x5' Tile in Concrete & 18" Tile Pipe<br>with Conc. Headwalls, Rt.               | 2                   |              |      |     |                          |                       |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     |                                 |     |         |     |     |
| 944+54.2                     | Median Crossing and Intersection with<br>Decel. Lanes                                    |                     |              | 100  |     |                          |                       |                  | 4                                      |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     |                                 |     |         |     |     |
| 944+                         | Project Marker, Lt.                                                                      |                     |              |      |     |                          |                       |                  |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     | Project Marker (State Forces)   |     |         |     |     |
|                              | Mechanical Tamping for all structures<br>except 10'x10' C.B.C.                           |                     |              |      |     |                          |                       | 50               |                                        |                                         |                |             |                      |                                  |                             |       |      |      |             |                                                 |                 |                                        |     |    |     |                                 |     |         |     |     |
| OUTSIDE BRIGHTON             |                                                                                          | 2                   | 660          | 115  | 70  | 600                      | 496                   | 80               | 100                                    | 2                                       | 227.30         | 18,907      |                      | 340                              | 26                          | 266   |      | 220  |             |                                                 | 3               | 4                                      |     |    |     |                                 |     |         |     |     |

\* Structural Excavation is estimated to be 95% Common & 5% Rock, each of which is estimated to be 80% Dry & 20% Wet.  
Δ Included in Surfacing Plan.      ⊗ See Mass Diagram & Earthwork Summary Sheet.      \* Included in Profile Quantities as Borrow.  
\* Included in Profile Quantities.      ⊞ To be disposed of as directed by the Engineer.

FENCING REQUIREMENTS

|                  | STATION                | SIDE | REMOVE FENCE | REMOVE & REBUILD FENCE | BUILD BARBED WIRE FENCE | BUILD COMB. WIRE FENCE | BARRIER FENCE & | REMOVE AND RESET GATES |
|------------------|------------------------|------|--------------|------------------------|-------------------------|------------------------|-----------------|------------------------|
|                  |                        |      | Lin. Ft.     | Lin. Ft.               | Lin. Ft.                | Lin. Ft.               | Lin. Ft.        | Each                   |
| INSIDE BRIGHTON  | 841+00 to 841+40       | Lt.  |              | 80                     |                         |                        |                 |                        |
|                  | 842+10                 | X    | 510          |                        |                         |                        |                 |                        |
|                  | 843+75                 | X    | 230          |                        |                         |                        |                 |                        |
|                  | 850+80                 | X    | 160          |                        |                         |                        |                 |                        |
|                  | 851+00                 | X    | 160          |                        |                         |                        |                 |                        |
|                  | 856+90                 | X    | 180          |                        |                         |                        |                 |                        |
|                  | 858+10                 | X    | 330          |                        |                         |                        |                 |                        |
|                  | 867+50                 | X    | 200          |                        |                         |                        |                 |                        |
|                  | 867+85                 | X    | 200          |                        |                         |                        |                 |                        |
|                  | 872+70                 | X    | 180          |                        |                         |                        |                 |                        |
|                  | 894+40                 | X    | 330          |                        |                         |                        |                 |                        |
|                  | 895+00                 | X    | 310          |                        |                         |                        |                 |                        |
|                  | 899+70                 | X    | 1090         |                        |                         |                        |                 |                        |
|                  | 901+00 to 902+95       | Rt.  |              | 120                    |                         |                        |                 |                        |
|                  | 906+35                 | X    | 180          |                        |                         |                        |                 |                        |
|                  | 911+20                 | X    | 150          |                        |                         |                        |                 |                        |
|                  | 911+20 to 911+70       | Rt.  | 230          |                        |                         |                        |                 |                        |
|                  | 917+80 to 921+30       | Lt.  |              | 360                    |                         |                        |                 |                        |
|                  | 840+10 to 843+00       | Rt.  |              |                        | 210                     |                        |                 |                        |
|                  | 843+70 to 858+25       | Rt.  |              |                        | 1450                    |                        |                 |                        |
|                  | 858+25 to 867+65       | Rt.  |              |                        |                         | 940                    |                 |                        |
|                  | 867+65 to 894+60       | Rt.  |              |                        | 2700                    |                        |                 |                        |
| OUTSIDE BRIGHTON | 846+00 to 857+85       | Lt.  |              |                        | 1190                    |                        |                 |                        |
|                  | 857+85 to 867+20       | Lt.  |              |                        |                         | 930                    |                 |                        |
|                  | 867+60 to 893+95       | Lt.  |              |                        | 2660                    |                        |                 |                        |
|                  | 894+60 to 906+20       | Lt.  |              |                        | 1170                    |                        |                 |                        |
|                  | 841+30 to 894+00       | Lt.  |              |                        |                         | 5290                   |                 |                        |
|                  | 895+00 to 915+80       | Lt.  |              |                        |                         | 2080                   |                 |                        |
|                  | 916+40 to 920+70       | Lt.  |              |                        |                         | 430                    |                 |                        |
|                  | 895+50 to 914+40       | Rt.  |              |                        |                         | 1890                   |                 |                        |
|                  | 915+00 to 919+00       | Rt.  |              |                        |                         | 400                    |                 |                        |
|                  | TOTAL-INSIDE BRIGHTON  |      | 4,440        | 560                    | 9,380                   | 1,870                  | 10,090          |                        |
|                  | 921+50                 | X    | 190          |                        |                         |                        |                 |                        |
|                  | 921+50 to 937+35       | Rt.  |              |                        | 1600                    |                        |                 |                        |
|                  | 937+65 to 944+55       | Rt.  |              |                        | 690                     |                        |                 |                        |
|                  | 921+50 to 937+35       | Lt.  |              |                        | 1600                    |                        |                 |                        |
|                  | 937+65 to 944+10       | Lt.  |              |                        | 660                     |                        |                 |                        |
|                  | 944+                   | Rt.  |              |                        |                         |                        |                 | 1                      |
|                  | TOTAL-OUTSIDE BRIGHTON |      | 190          |                        | 4,550                   |                        |                 | 1                      |

\* It is estimated that 5 Treated Wooden Line Posts will be req'd. for Remove & Rebuild Fence.  
q To be placed between Main Highway and Frontage Roads.

TIMBER GUARD POSTS

|                             | STATION                      | LEFT FRONTAGE ROAD |                    |                       | LEFT LANE                                                |                    |     | RIGHT LANE |                    |     | RIGHT FRONTAGE ROAD |              |     |
|-----------------------------|------------------------------|--------------------|--------------------|-----------------------|----------------------------------------------------------|--------------------|-----|------------|--------------------|-----|---------------------|--------------|-----|
|                             |                              | SIDE               | SPACING            | NO.                   | SIDE                                                     | SPACING            | NO. | SIDE       | SPACING            | NO. | SIDE                | SPACING      | NO. |
| INSIDE BRIGHTON             | 849+00                       |                    |                    |                       | Lt                                                       | Culvert            | 1   | Rt         | Culvert            | 1   |                     |              |     |
|                             | 855+00                       | Lt & Rt            | Culv. & Med. Drain | 2                     | Lt & Rt                                                  | Culv. & Med. Drain | 2   | Lt & Rt    | Culv. & Med. Drain | 2   |                     |              |     |
|                             | 875+00                       | Lt & Rt            | Culv. & Med. Drain | 2                     | Lt & Rt                                                  | Culv. & Med. Drain | 2   | Lt & Rt    | Culv. & Med. Drain | 2   |                     |              |     |
|                             | 888+00                       | Lt & Rt            | Culv. & Med. Drain | 2                     | Lt & Rt                                                  | Culv. & Med. Drain | 2   | Lt & Rt    | Culv. & Med. Drain | 2   |                     |              |     |
|                             | 904+00                       | Lt & Rt            | Culv. & Med. Drain | 2                     | Lt & Rt                                                  | Median Drains      | 2   | Lt & Rt    | Median Drains      | 2   | Lt                  | Median Drain | 1   |
|                             | 913+00                       |                    |                    |                       | Lt & Rt                                                  | Culv. & Med. Drain | 2   | Lt & Rt    | Median Drains      | 2   | Lt                  | Median Drain | 1   |
|                             | 916+30                       | Rt                 | Median Drain       | 1                     | Lt & Rt                                                  | Median Drains      | 2   | Lt & Rt    | Median Drains      | 2   | Lt                  | Median Drain | 1   |
|                             | SUB-TOTAL (INSIDE BRIGHTON)  |                    |                    |                       | 9                                                        |                    | 13  |            |                    | 13  |                     |              | 3   |
|                             | Estimated for Intersections  |                    |                    |                       | 10-of which 6 are to be Removed & Reset (from Sta. 840+) |                    |     |            |                    |     |                     |              |     |
|                             | TOTAL - INSIDE BRIGHTON      |                    |                    |                       | Timber Guard Posts 47 - Remove & Reset Guard Posts 6     |                    |     |            |                    |     |                     |              |     |
| OUTSIDE BRIGHTON            | 922+50                       |                    |                    |                       | Lt & Rt                                                  | Culv. & Med. Drain | 2   | Lt & Rt    | Culv. & Med. Drain | 2   |                     |              |     |
|                             | 926+00                       |                    |                    |                       | Lt                                                       | Culvert            | 1   | Rt         | Culvert            | 1   |                     |              |     |
|                             | 937+50                       |                    |                    |                       | Lt                                                       | C.B.C.             | 1   | Rt         | C.B.C.             | 1   |                     |              |     |
|                             | 943+35                       |                    |                    |                       | Lt & Rt                                                  | Culv. & Med. Drain | 2   | Lt         | Median Drain       | 1   |                     |              |     |
|                             | 944+19                       |                    |                    |                       | Lt                                                       | Culvert            | 1   | Rt         | Culvert            | 1   |                     |              |     |
|                             | SUB-TOTAL (OUTSIDE BRIGHTON) |                    |                    |                       | 9                                                        |                    | 7   |            |                    | 6   |                     |              |     |
| Estimated for Intersections |                              |                    |                    | 9                     |                                                          |                    |     |            |                    |     |                     |              |     |
| TOTAL - OUTSIDE BRIGHTON    |                              |                    |                    | Timber Guard Posts 22 |                                                          |                    |     |            |                    |     |                     |              |     |

RIGHT OF WAY MARKERS

| STATION                | INSIDE BRIGHTON |     | OUTSIDE BRIGHTON |     |
|------------------------|-----------------|-----|------------------|-----|
|                        | SIDE            | NO. | SIDE             | NO. |
| 850+00                 | Rt.             | 1   |                  |     |
| 863+50                 | Lt.             | 1   |                  |     |
| 867+50                 | Rt.             | 1   |                  |     |
| 890+00                 | Lt.             | 1   |                  |     |
| 901+00                 | Rt.             | 1   |                  |     |
| 917+70                 | Lt.             | 1   |                  |     |
| 929+50                 |                 |     | Rt.              | 1   |
| 942+50                 |                 |     | Lt.              | 1   |
| TOTAL-INSIDE BRIGHTON  |                 | 6   |                  |     |
| TOTAL-OUTSIDE BRIGHTON |                 |     | 2                |     |

SUB-BASE PLAN

SURFACING PLAN

It is estimated that material for Sub-Base and Surfacing for the project is available in the vicinity of the pit indicated in the following tabulation. Estimated quantities involved in these operations are shown below.

Alteration of the Sub-Base Plan or Surfacing Plan as here outlined will be allowed only on written permission from the Department.

|                                        | MATERIAL<br>TO BE<br>PLACED            | SOURCE                        | QUANTITY AND THICKNESS |                |        | OVERHAUL |
|----------------------------------------|----------------------------------------|-------------------------------|------------------------|----------------|--------|----------|
|                                        |                                        |                               | AVAILABLE              | CLASS 3        |        |          |
|                                        |                                        |                               |                        | *<br>THICKNESS | TONS   |          |
| INSIDE BRIGHTON                        | MAIN HIGHWAY                           |                               |                        |                |        |          |
|                                        | 840+82.8 - 843+00                      | Pit #2                        | 137,500                | 11"            | 1318   | 1304     |
|                                        | 856+00 - 867+70                        | Haul 0.5 Mi<br>to Sta. 867+70 | Cu Yds.                | 5"             | 3030   | 1851     |
|                                        | 867+70 - 875+00                        | "R" = 60                      |                        | 5"             | 1891   | 1076     |
|                                        | 890+00 - 892+50                        |                               |                        | 11"            | 1518   | 1436     |
|                                        | 911+00 - 914+00                        |                               |                        | 5"             | 777    | 1048     |
|                                        | 920+00 - 921+30.7                      |                               |                        | 7"             | 484    | 727      |
|                                        | Est. for Accel. & Decel. Lanes         |                               |                        |                | 399    | 391      |
|                                        | Est. for Intersections                 |                               |                        |                | 1084   | 1221     |
|                                        | Est. for Irregularities<br>in Subgrade |                               |                        |                | 1050   | 905      |
|                                        | Sub-Total                              |                               |                        |                | 11,551 | 9,959    |
|                                        | LEFT FRONTAGE ROAD                     |                               |                        |                |        |          |
|                                        | 840+82.8 - 848+50                      |                               |                        | 9"             | 1281   | 1201     |
|                                        | 854+00 - 854+55.2 Bk.                  |                               |                        | 4"             | 39     | 29       |
| 854+50.3 Ah - 867+70                   |                                        |                               | 4"                     | 924            | 578    |          |
| 867+70 - 874+00                        |                                        |                               | 4"                     | 441            | 247    |          |
| Est. for Irregularities<br>in Subgrade |                                        |                               |                        | 269            | 206    |          |
| RIGHT FRONTAGE ROAD                    |                                        |                               |                        |                |        |          |
| 904+50 - 906+50                        |                                        |                               | 4"                     | 140            | 170    |          |
| Est. for Irregularities<br>in Subgrade |                                        |                               |                        | 14             | 17     |          |
| Sub-Total                              |                                        |                               |                        | 3,108          | 2,448  |          |
| TOTAL - INSIDE BRIGHTON                |                                        |                               |                        | 14,659         | 12,407 |          |
| OUTSIDE BRIGHTON                       | MAIN HIGHWAY                           |                               |                        |                |        |          |
|                                        | 921+30.7 - 924+00                      |                               |                        | 7"             | 996    | 1535     |
|                                        | Est. for Intersections                 |                               |                        |                | 275    | 417      |
|                                        | Est. for Irregularities<br>in Subgrade |                               |                        |                | 127    | 195      |
|                                        | TOTAL - OUTSIDE BRIGHTON               |                               |                        |                | 1,398  | 2,147    |

\* Based on Curve "E" for Main Highway & Curve "C" for Frontage Roads

|                  | MATERIAL TO BE PLACED               | SOURCE                      | AVAILABLE | QUANTITY TONS USED          |                         |                            | OVERHAUL TON MILES |                 |
|------------------|-------------------------------------|-----------------------------|-----------|-----------------------------|-------------------------|----------------------------|--------------------|-----------------|
|                  |                                     |                             |           | ASPHALTIC CONCRETE PAVEMENT | BOTTOM COURSE GRADING C | *SHOULDER COURSE GRADING C | BOTTOM COURSE      | SHOULDER COURSE |
|                  |                                     |                             |           |                             |                         |                            |                    |                 |
| INSIDE BRIGHTON  | MAIN HIGHWAY                        |                             |           |                             |                         |                            |                    |                 |
|                  | 840+82.8 - 854+55.2 Bk.             | Pit #2                      | 137,500   | 1221                        | 2580                    | 467                        | 2270               | 411             |
|                  | 854+50.3 Ah - 867+70                | Haul 0.5 Mi. to Sta. 867+70 | Cu. Yds.  | 1175                        | 2481                    | 449                        | 1551               | 181             |
|                  | 867+70 - 921+30.7                   |                             |           | 4771                        | 10078                   | 1823                       | 10159              | 1838            |
|                  | Est. for Irregularities in Subgrade | "R" = 75                    |           |                             | 988                     |                            | 912                |                 |
|                  | Est. for Accel. & Decel. Lanes      |                             |           | 351                         | 429                     |                            | 453                |                 |
|                  | Est. for Intersections              |                             |           | 763                         | 784                     |                            | 862                |                 |
|                  | From List of Structures             |                             |           |                             | 76                      |                            | 52                 |                 |
|                  | Sub-Total                           |                             |           | 8,281                       | 17,416                  | 2,739                      | 6,292              | 2,530           |
|                  | LEFT FRONTAGE ROAD                  |                             |           |                             |                         |                            |                    |                 |
|                  | 840+82.8 - 854+55.2 Bk.             |                             |           | 371                         | 796                     | 69                         | 700                | 61              |
|                  | 854+50.3 Ah - 867+70                |                             |           | 356                         | 765                     | 66                         | 478                | 41              |
|                  | 867+70 - 921+30.7                   |                             |           | 1447                        | 3109                    | 268                        | 3134               | 270             |
|                  | RIGHT FRONTAGE ROAD                 |                             |           |                             |                         |                            |                    |                 |
| OUTSIDE BRIGHTON | 895+00 - 921+30.7                   |                             |           | 710                         | 1526                    | 132                        | 1932               | 167             |
|                  | Est. for Irregularities in Subgrade |                             |           |                             | 447                     |                            | 451                |                 |
|                  | Sub-Total                           |                             |           | 2,884                       | 6,643                   | 535                        | 6,695              | 539             |
|                  | TOTAL-INSIDE BRIGHTON               |                             |           | 11,165                      | 24,059                  | 3,274                      | 22,987             | 3,069           |
|                  | MAIN HIGHWAY                        |                             |           |                             |                         |                            |                    |                 |
|                  | 921+30.7 - 944+54.2                 |                             |           | 2068                        | 4368                    | 790                        | 7578               | 1371            |
|                  | Est. for Irregularities in Subgrade |                             |           |                             | 386                     |                            | 670                |                 |
|                  | Est. for Accel. & Decel. Lanes      |                             |           | 115                         | 139                     |                            | 264                |                 |
|                  | Est. for Intersections              |                             |           | 323                         | 243                     |                            | 433                |                 |
|                  | From List of Structures             |                             |           |                             | 100                     |                            | 178                |                 |
|                  | TOTAL-OUTSIDE BRIGHTON              |                             |           | 2,506                       | 5,236                   | 790                        | 9,123              | 1,371           |

\* Shoulder Surfacing is not to be placed across Road Approaches

PIT LOCATIONS

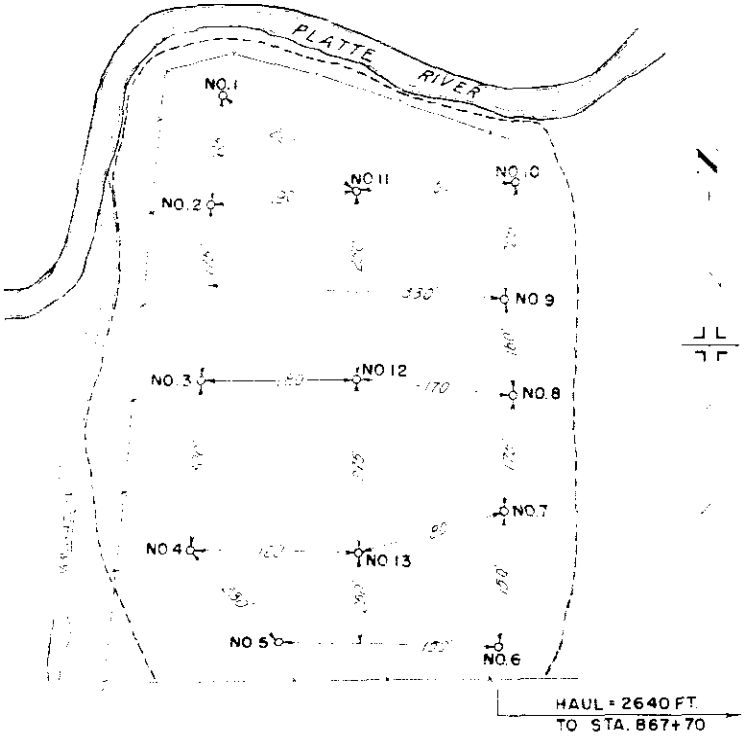
| FEDERAL ROAD<br>DIVISION NO. | DISTRICT | PROJ. NO.            | SHEET<br>NO. | TOTAL<br>SHEETS |
|------------------------------|----------|----------------------|--------------|-----------------|
| 9                            | COLORADO | FO06-1(11)<br>UNIT 2 | 9            |                 |

PIT NO. 2

Location : S.E. 1/4, N.E. 1/4 Sec. 12, T.1S., R. 67 W.  
Owner : John H. Delventhal, Jr. Brighton, Colo.  
Quantity Available : 137,500 Cu. Yds.  
Proposed Use : Borrow, Sub-Base Material, Surfacing &  
Asphaltic Concrete Pavement.  
Haul Distance : 2640 Ft. = 0.5 Mile to Sta. 867+70  
Sample No. : 1400

\*Estimated for Stripping Overburden 6,600 Cu.Yds.

Note: Overburden from this pit shall be used  
as Common Borrow, but shall be placed in bottom  
of fills not closer than 18" to top of the Subgrade.  
If more overburden is encountered than can be  
used in bottom of fills, or if it is found necessary to  
increase size of pit during Surfacing operations, the  
overburden shall be stripped and will be paid for  
as Stripping. Overburden - R= 20  
Mtl. below Overburden - R= 60



FIELD SAMPLE NO. 1400

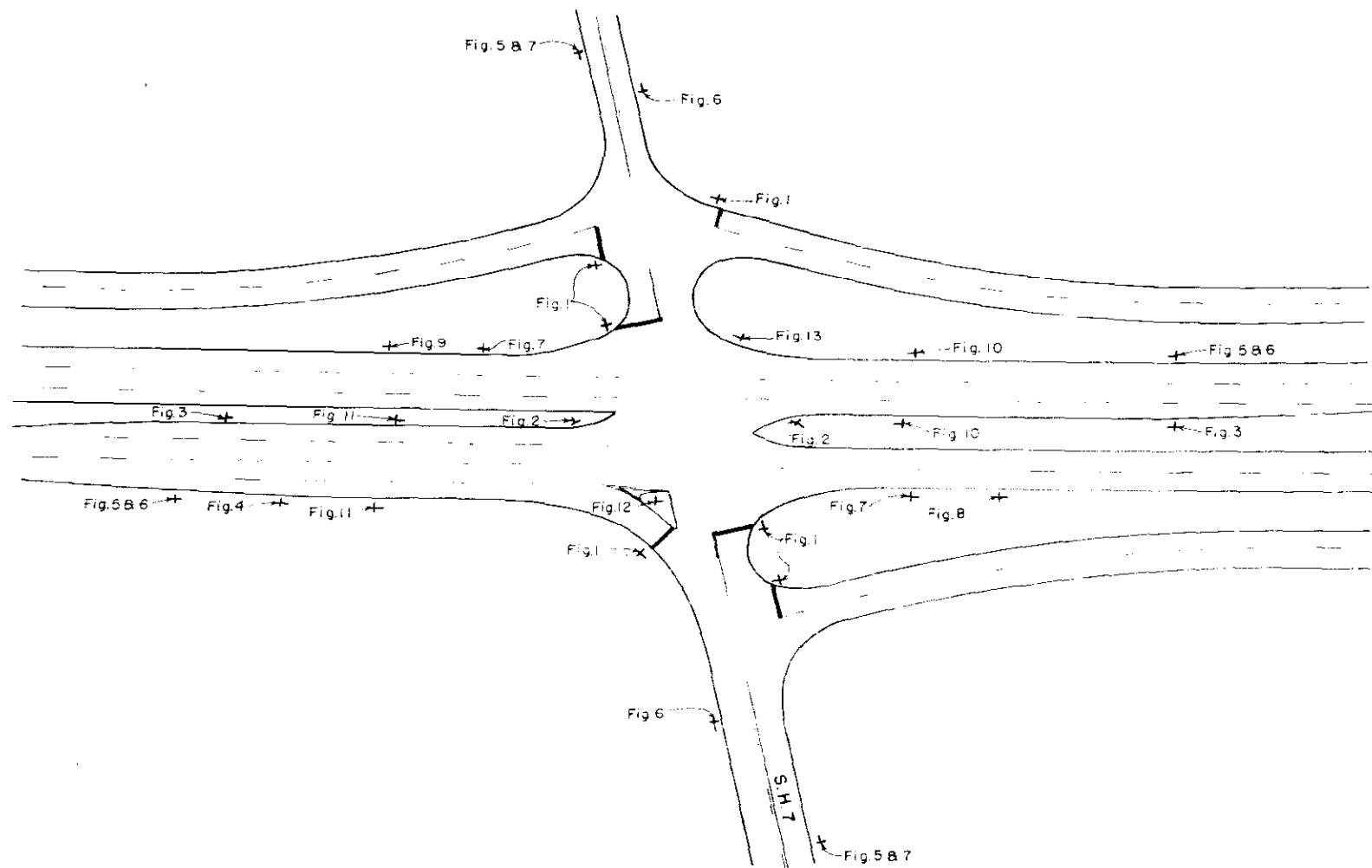
| TEST<br>NO | DEPTH        | DESCRIPTION                                                        |
|------------|--------------|--------------------------------------------------------------------|
| 1          | 0.0'-2.0'    | O.B.                                                               |
| 1-A        | 2.0'-12.0+   | Gravel Water at 6'                                                 |
| 2          | 0.0'-3.0'    | O.B.                                                               |
| 2-A        | 3.0'-7.0'    | Dirty sand & gravel                                                |
| 2-B        | 7.0'-12.0'   | Very clean sand & gravel-Water at 9'                               |
| 3          | 0.0'-3.0'    | Sample represents material from 3-12                               |
| 3-A        | 3.0'-13.0'   | O.B. Typical of O.B. on entire pit<br>Sand and Gravel-Water at 10' |
| 4          | 0.0'-0.5'    | O.B.                                                               |
| 4-A        | 0.5'-13.0+   | Sand & Gravel Water at 13'                                         |
| 5          | 0.0'-4.0'    | O.B.                                                               |
| 5-A        | 4.0'-12.0'   | Sand & Gravel                                                      |
| 5-B        | 12.0'-12.25' | Silt streak                                                        |
| 5-C        | 12.25'-14.0+ | Gravel - Similar 5-A Water at 13'                                  |
| 6          | 0.0'-2.0'    | O.B.                                                               |
| 6-A        | 2.0'-14.0+   | Sand & Gravel Water at 12'                                         |
| 7          | 0.0'-3.0'    | O.B.                                                               |
| 7-A        | 3.0'-12.0+   | Sand, Gravel & Rock - Water at 10'                                 |
| 8          | 0.0'-4.0'    | O.B.                                                               |
| 8-A        | 4.0'-13.0'   | Sand, Gravel & rock (3'-5") at 9'; Water 11'                       |
| 9          | 0.0'-1.0'    | O.B.                                                               |
| 9-A        | 1.0'-13.0+   | Sand & Gravel Water at 12'                                         |
| 10         | 0.0'-3.0'    | O.B.                                                               |
| 10-A       | 3.0'-14.0+   | Sand & Gravel Rock (3'-5") at 7'; Water at 10'                     |
| 11         | 0.0'-2.0'    | O.B.                                                               |
| 11-A       | 2.0'-11.0+   | Sand & Gravel Rock (3'-5") Water at 11'                            |
| 12         | 0.0'-6.0'    | O.B.                                                               |
| 12-A       | 6.0'-13.0'   | Sand, Gravel & Rock (3'-5") Water at 11'                           |
| 13         | 0.0'-3.9'    | O.B.                                                               |
| 13-A       | 3.0'-13.0'   | Sand, Gravel & Rock (1'-2") Water at 10'                           |

# SIGNING AND STRIPING INTERSECTION STA. 894+67.5

| FEDERAL ROAD<br>DIVISION NO. | DISTRICT | PROJ. NO.  | SHEET<br>NO. | TOTAL<br>SHEETS |
|------------------------------|----------|------------|--------------|-----------------|
| 9                            | COLORADO | F006-1(11) | 90           |                 |
| UNIT # 2                     |          |            |              |                 |

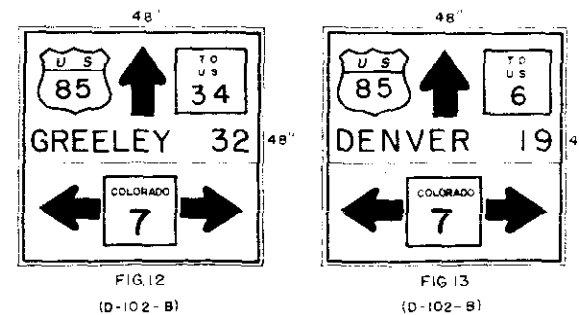
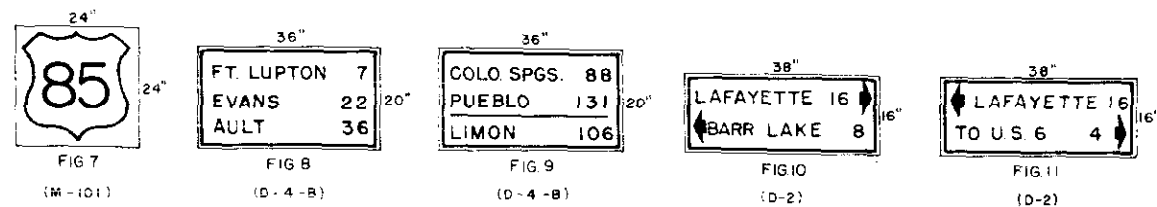
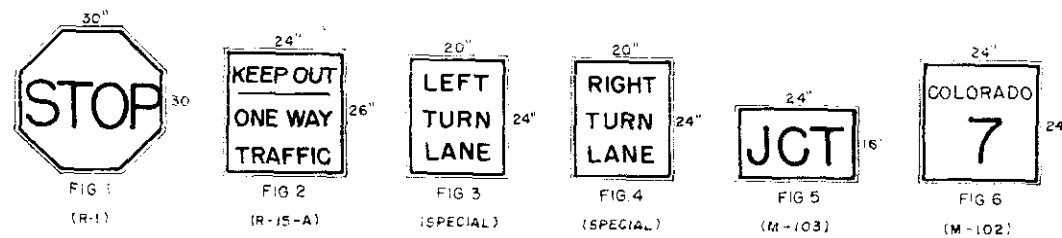
## LEGEND

|                            |                                   |
|----------------------------|-----------------------------------|
| Edge Of Pavement           | -----                             |
| Center Stripe (White)      | ----- 15' 25' 15' 25'             |
| Curb Lines (Yellow)        | ----- 5' 5' 5' 5'                 |
| Cross Hatch Lines (Yellow) | ----- 9' 9' 9' 9'                 |
| No Passing Barrier Lines   | -----                             |
| Sign And Post Installation | ----- FRONT                       |
| Stop Bar                   | ----- 24" RIGHT HAND EDGE OF ROAD |



| STRIPING SUMMARY |      |           |
|------------------|------|-----------|
| PAINT            | FEET | GALS REQ. |
| YELLOW           | 520  | 5         |
| WHITE            | 3800 | 15        |

| SIGN SUMMARY |          |          |
|--------------|----------|----------|
| CODE         | FIG. NO. | QUANTITY |
| R-1          |          | 6        |
| R-15-A       | 2        | 2        |
| SPECIAL      | 3        | 2        |
| SPECIAL      | 4        | 1        |
| V-103        | 5        | 4        |
| M-102        | 6        | 4        |
| M-101        | 7        | 4        |
| D-4-B        | 8        | 7        |
| D-4-B        | 9        | 1        |
| D-2          | 10       | 2        |
| D-2          | 11       | 2        |
| D-102-B      | 12       | 1        |
| D-102-B      | 13       | 1        |

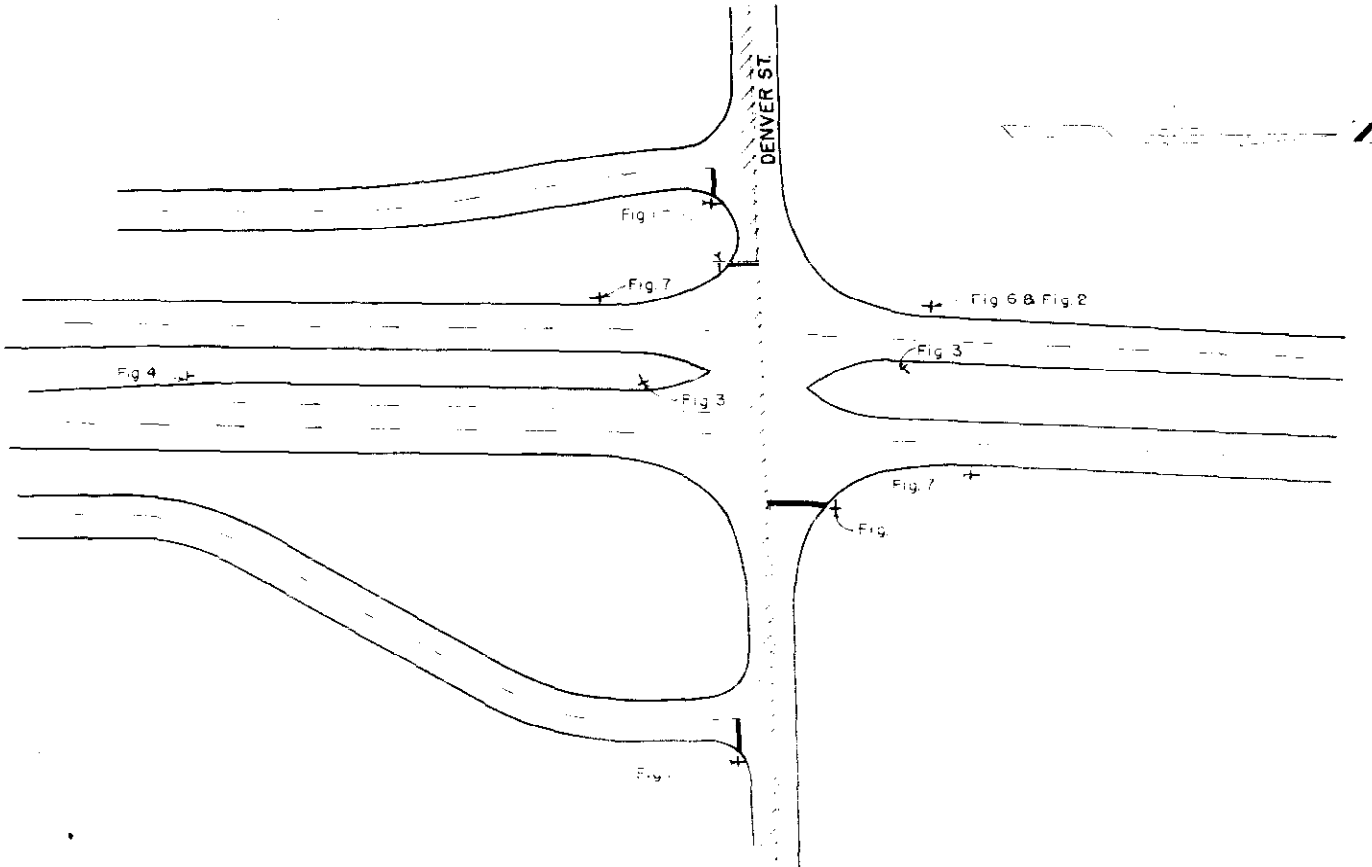


# SIGNING AND STRIPING

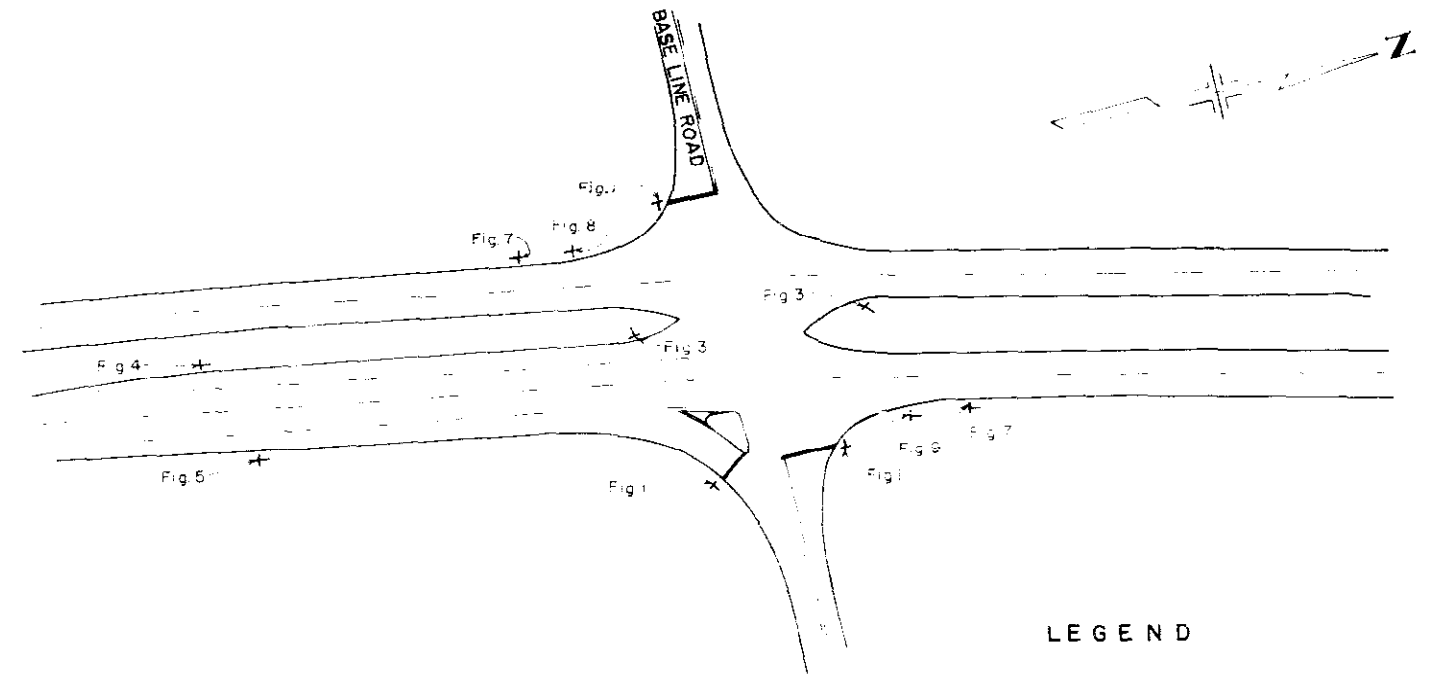
| FEDERAL ROAD DIVISION NO. | DISTRICT | PROJ. NO.    | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|--------------|-----------|--------------|
| 9                         | COLORADO | F 006-1 (11) | 9b        |              |

UNIT #2

## INTERSECTION STA. 921+27.7



## INTERSECTION STA. 944+54.2



| STRIPING SUMMARY |      |             |
|------------------|------|-------------|
| PAINT            | FEET | GALS. REQD. |
| YELLOW           | 1100 | 10          |
| WHITE            | 4800 | 30          |

| SIGN SUMMARY |          |          |
|--------------|----------|----------|
| CODE         | FIG. NO. | QUANTITY |
| R-1          | 1        | 7        |
| R-102-CG     | 2        | 1        |
| P-15-A       | 3        | 4        |
| SPECIAL      | 4        | 2        |
| SPECIAL      | 5        | 1        |
| D-6-B        | 6        | 1        |
| M-101        | 7        | 4        |
| D-6-A        | 8        | 1        |
| D-6-A        | 9        | 1        |

### LEGEND

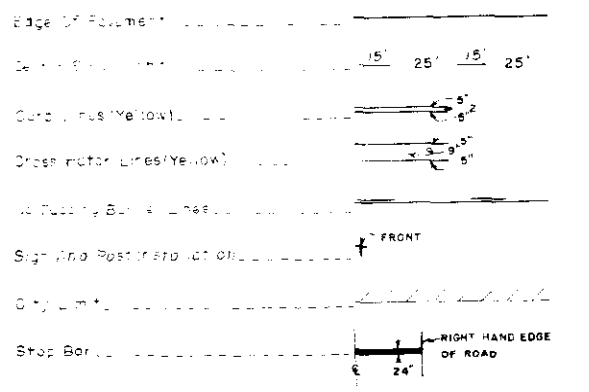


FIG. 1

(R-1)

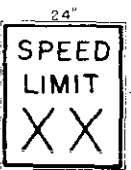


FIG. 2

(R-102-CG)



FIG. 3

(R-15-A)

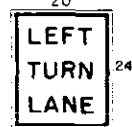


FIG. 4

(SPECIAL)

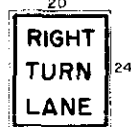


FIG. 5

(SPECIAL)



FIG. 6

(D-6-B)



FIG. 7

(M-101)

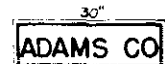


FIG. 8

(D-6-A)

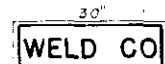


FIG. 9

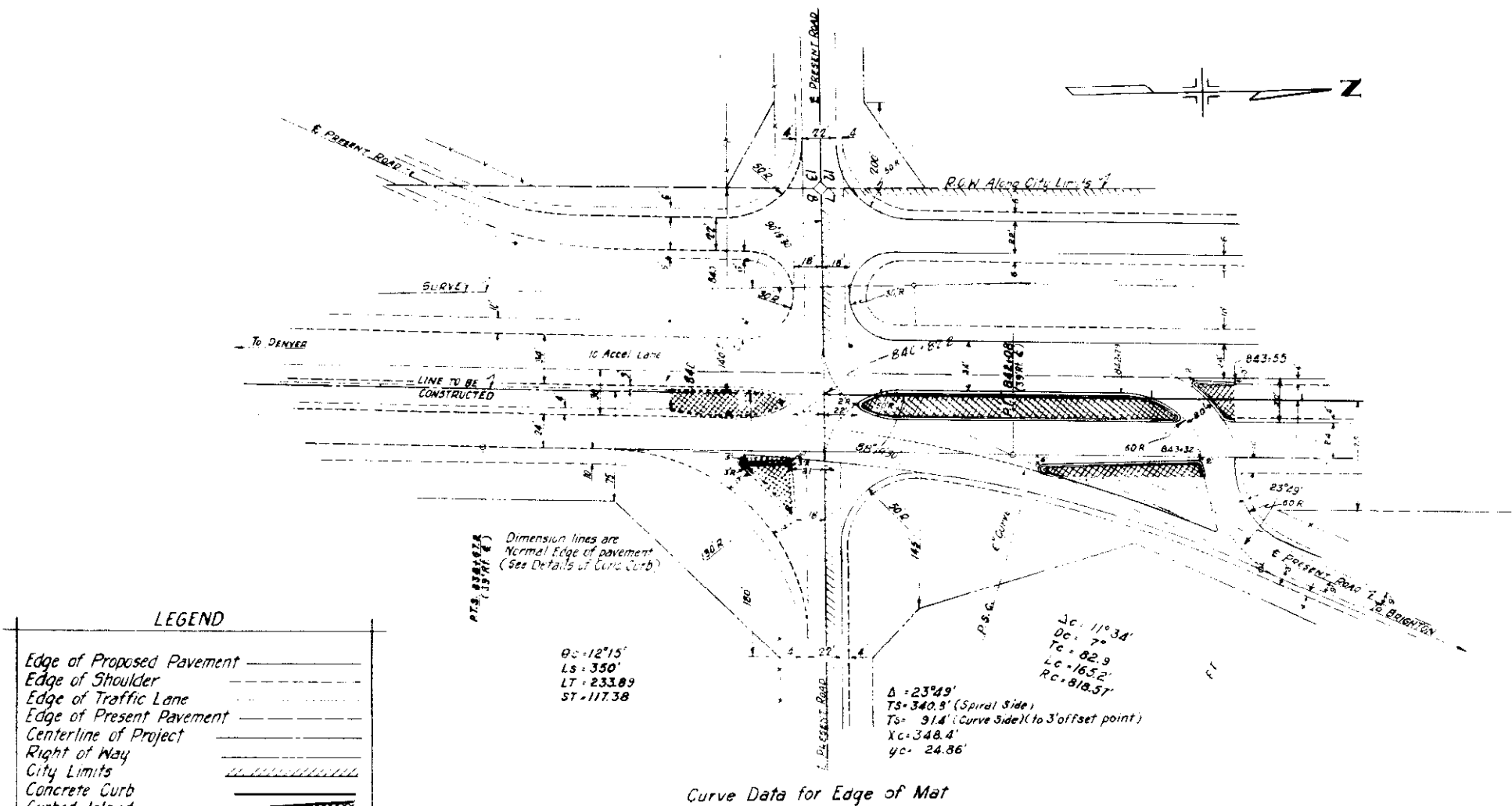
(D-6-A)



DETAILS OF INTERSECTION  
STA. 840+

| FEDERAL ROAD<br>DIVISION NO. | DISTRICT | PROJ. NO.         | SHEET<br>NO. | TOTAL<br>SHEETS |
|------------------------------|----------|-------------------|--------------|-----------------|
| 8                            | COLORADO | F006-1(11) UNIT 2 | 10           |                 |

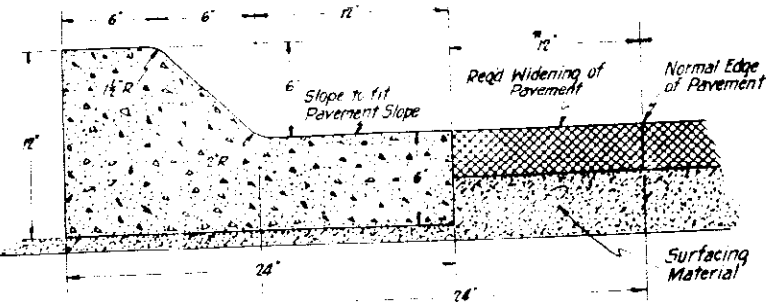
Rev. Intersection 6-28-55 CJW



| LEGEND                    |           |
|---------------------------|-----------|
| Edge of Proposed Pavement | —————     |
| Edge of Shoulder          | - - - - - |
| Edge of Traffic Lane      | —————     |
| Edge of Present Pavement  | —————     |
| Centerline of Project     | —————     |
| Right of Way              | —————     |
| City Limits               | —————     |
| Concrete Curb             | —————     |
| Curbed Island             | —————     |
| Present Fence             | —————     |
| Denied to Traffic         | —————     |
| Uncurbed Island           | —————     |
| Guard Posts               | —————     |

STA. 840+82.8 BEGIN F006-1(11) UNIT 2  
(South 1/2 Intersection Constructed under  
Projects F006-1(11) Unit 1 & C12-0003-13)

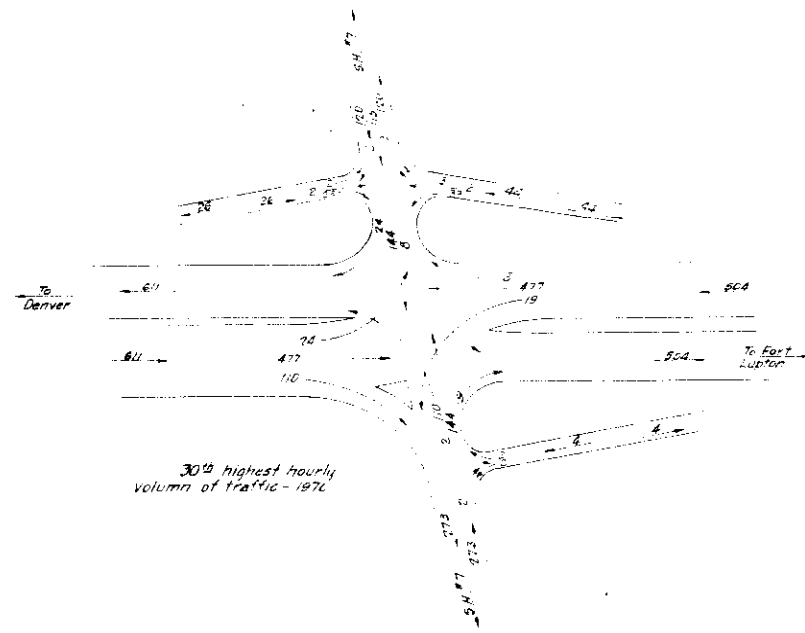
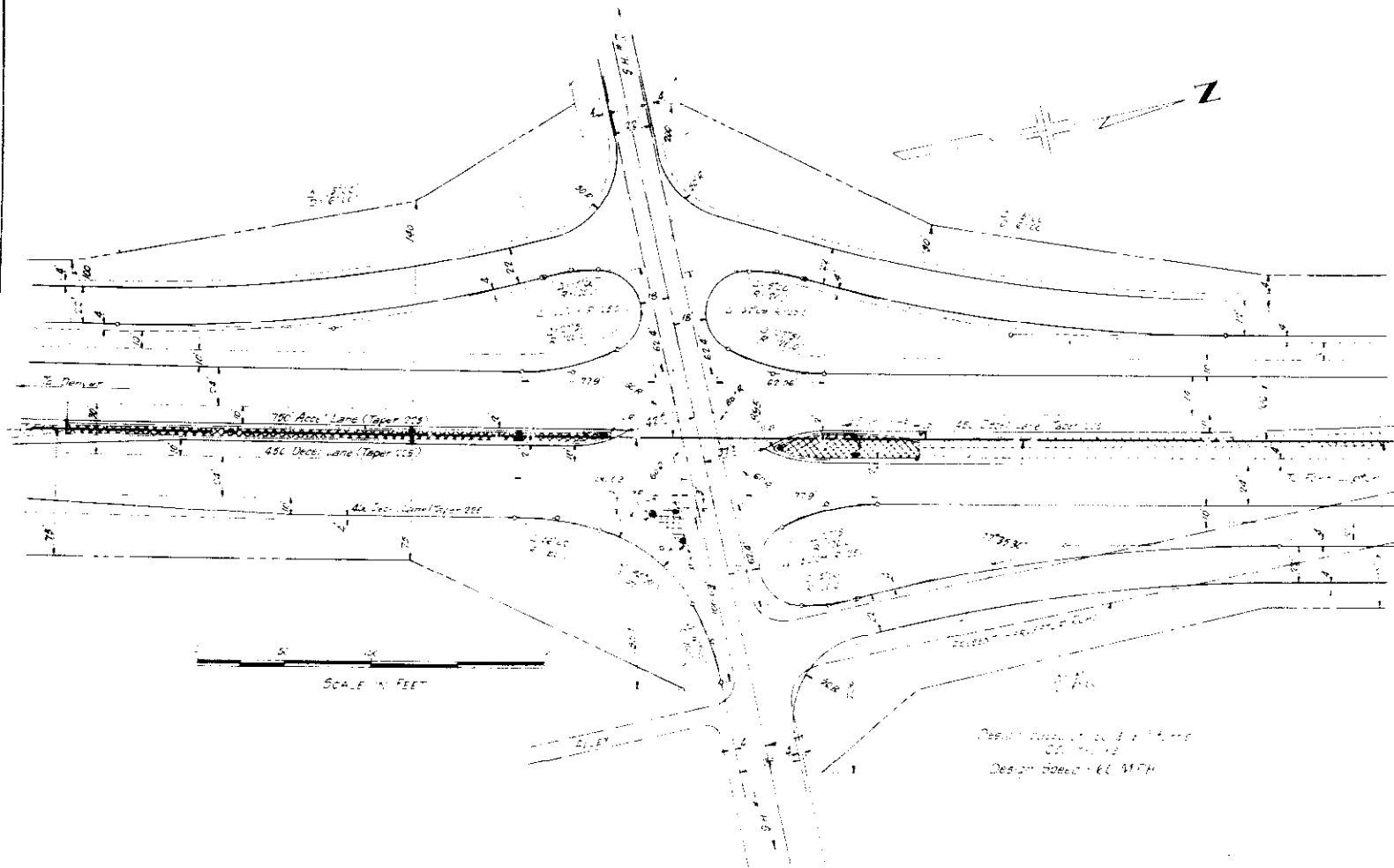
DETAILS OF CONCRETE CURB



\* Variable in areas marked Flare

| FEDERAL ROAD DIVISION NO. | DISTRICT | PROJ. NO.         | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|-------------------|-----------|--------------|
| 9                         | COLORADO | FO06-1(II) UNIT 2 | 11        |              |

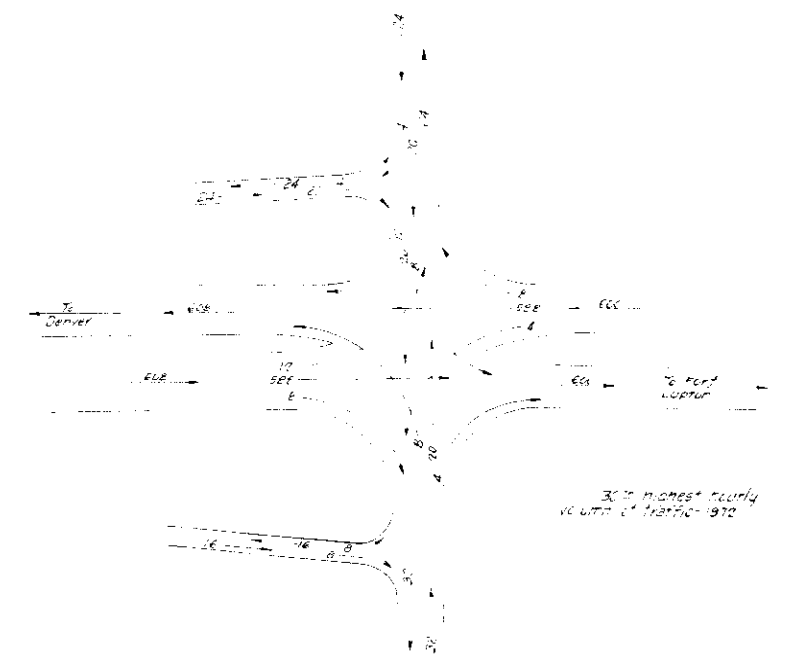
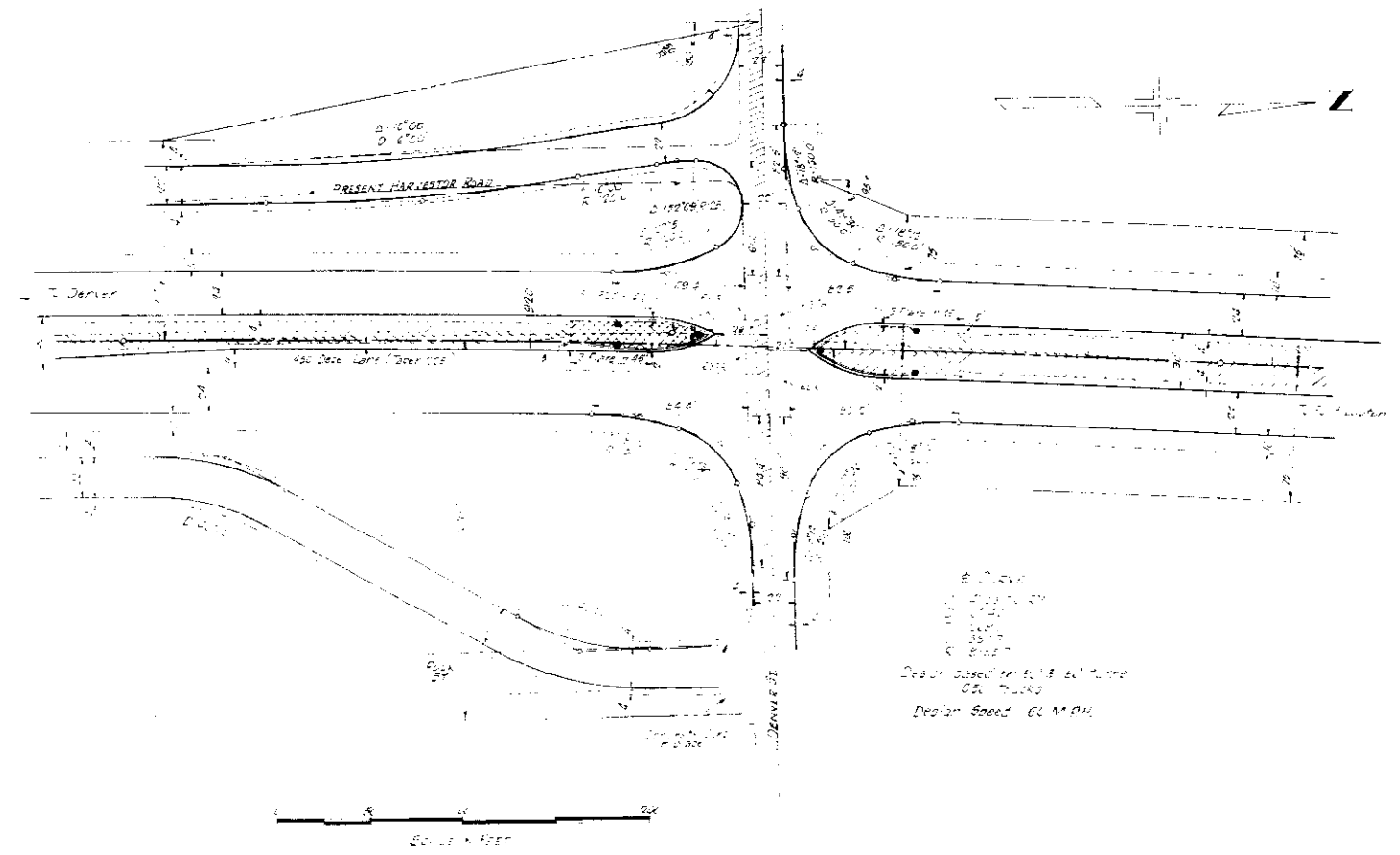
# INTERSECTION, STA. 894+67.5



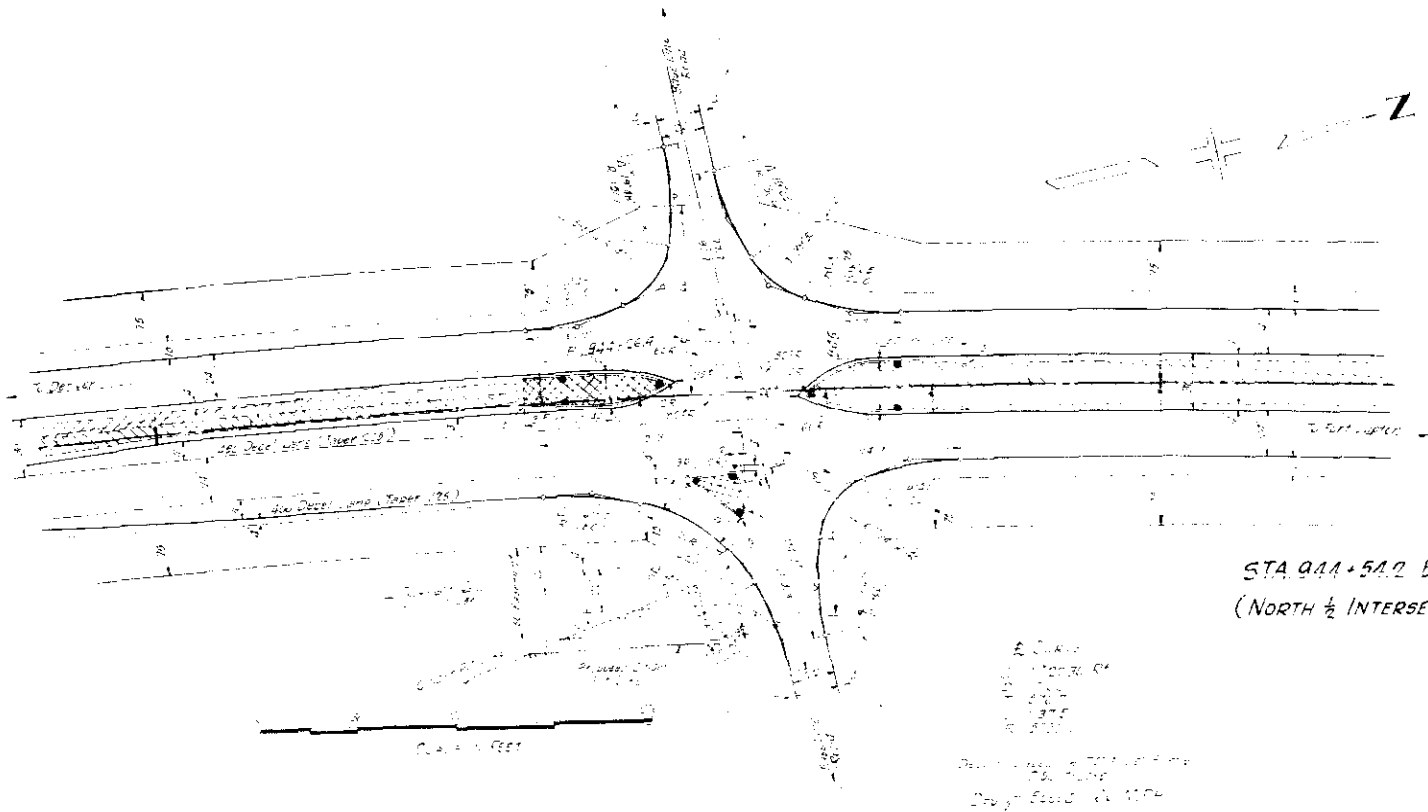
## LEGEND FOR BOTH INTERSECTIONS

|                         |       |
|-------------------------|-------|
| Normal Edge of Pavement | —     |
| Shoulder Edge           | - - - |
| Raised Curbed Island    | ▨     |
| Depressed Curbed Island | ▧     |
| Depressed Median        | ▩     |
| City Limits             | ▬     |
| Present Fence           | —     |
| Right of Way            | —     |
| Guard Posts             | •     |

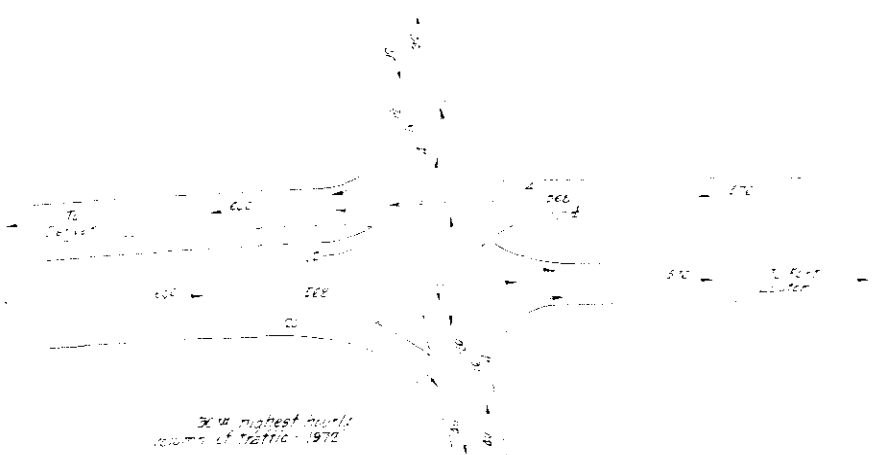
# INTERSECTION, STA. 921+30.7



INTERSECTION, STA. 944+54.2



STA. 944+54.2 END F006-1(II) UNIT 2  
(NORTH 1/2 INTERSECTION FUTURE CONSTRUCTION)

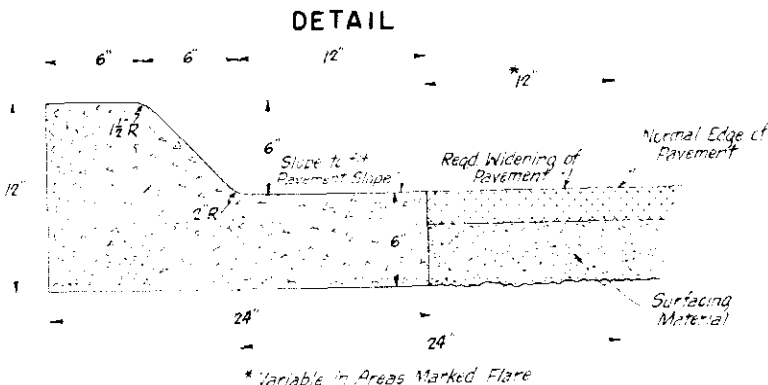


| LEGEND                  |       |
|-------------------------|-------|
| Normal Edge of Pavement | ————— |
| Shoulder Edge           | ----- |
| Raised Curbed Island    |       |
| Depressed Curbed Island |       |
| Depressed Median        |       |
| Present Fence           | ..... |
| Right of Way            | ————— |
| Guard Posts             | • • • |

| 45' FLARE               |      |
|-------------------------|------|
| X                       | Y    |
| 10                      | 0.15 |
| 20                      | 0.59 |
| 30                      | 1.33 |
| 40                      | 2.37 |
| 45                      | 3.00 |
| $Y = \frac{3X^2}{45^2}$ |      |



REQUIREMENTS FOR CONCRETE CURB

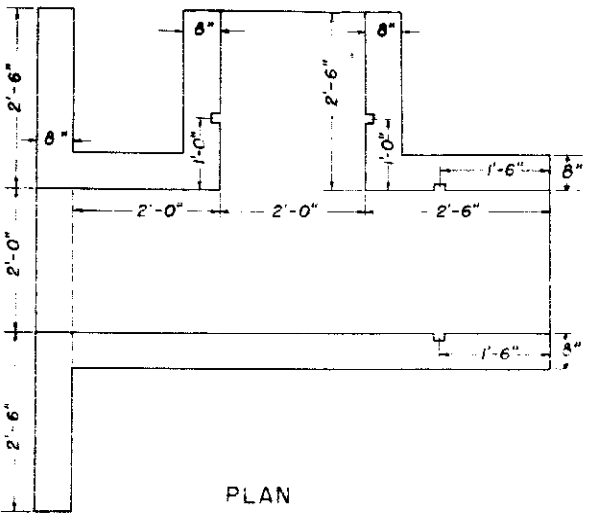


TABULATION OF CONCRETE CURB

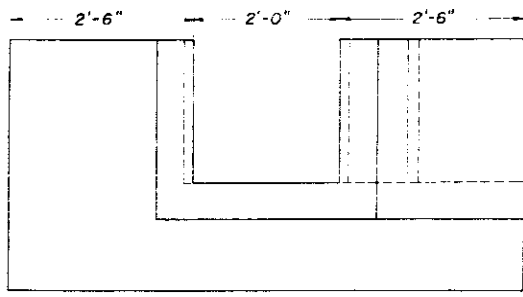
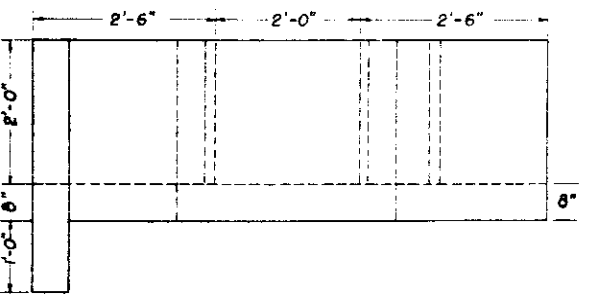
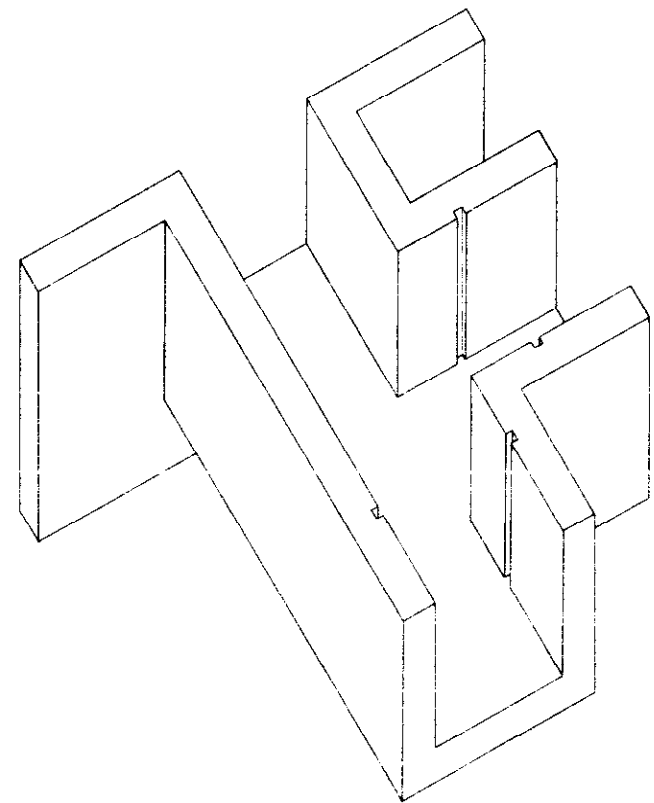
| STATION                     | INSIDE BRIGHTON |               | OUTSIDE BRIGHTON |               |
|-----------------------------|-----------------|---------------|------------------|---------------|
|                             | CONC CURB       | UNCLASS EXCAV | CONC CURB        | UNCLASS EXCAV |
| 841+05 - 841+85<br>(Median) | 160             | 6             |                  |               |
| 891+00 - 894+15<br>(Median) | 630             | 24            |                  |               |
| 894+35 - 894+60<br>(Island) | 70              | 3             |                  |               |
| 895+10 - 895+96<br>(Median) | 175             |               |                  |               |
| 920+22 - 920+25<br>(Median) | 160             | 6             |                  |               |
| 921+53 - 922+32<br>(Median) |                 |               | 165              | 6             |
| 943+40 - 944+14<br>(Median) |                 |               | 35               | 6             |
| 944+25 - 944+50<br>(Island) |                 |               | 85               | 3             |
| TOTAL-INSIDE BRIGHTON       | 1195            | 46            |                  |               |
| TOTAL-OUTSIDE BRIGHTON      |                 |               | 405              | 15            |

# CONCRETE DIVISION BOX STA. 926+00

NOTE:  
Slots to be constructed in walls of structure to accommodate flash boards, shall be 2" inches in width and shall be recessed into walls 1 3/4 inches.  
Timber flash boards to fit shall be furnished by the Contractor and shall be included in the price of Concrete.



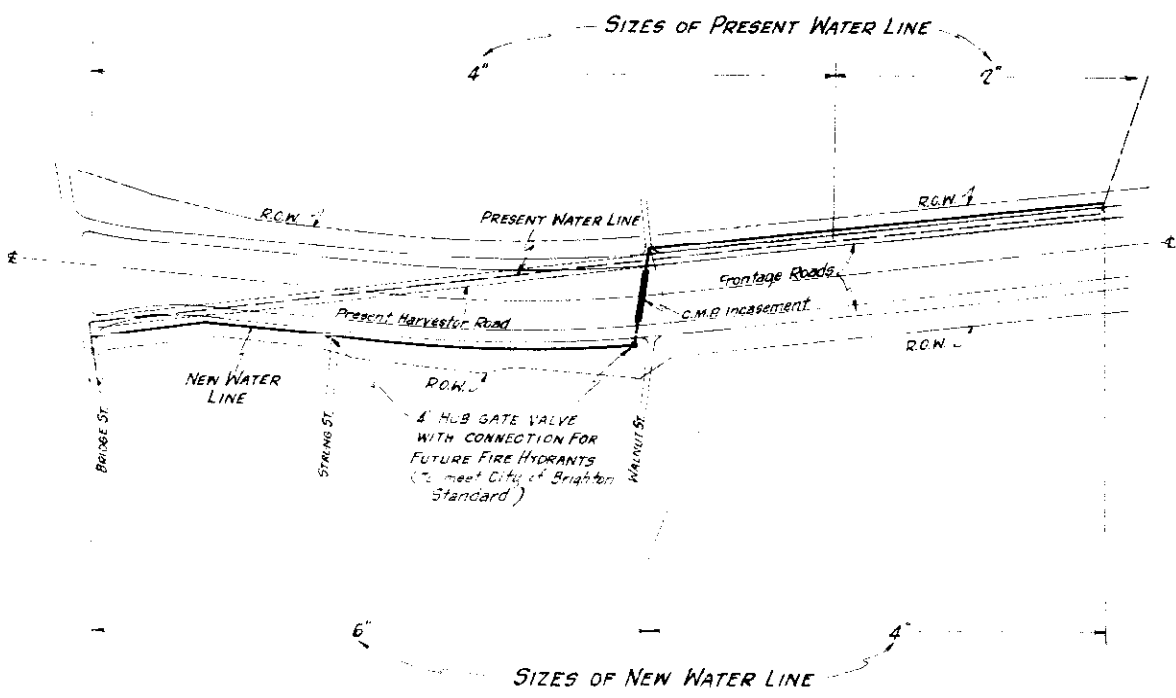
Concrete 1.93 Cu. Yds.

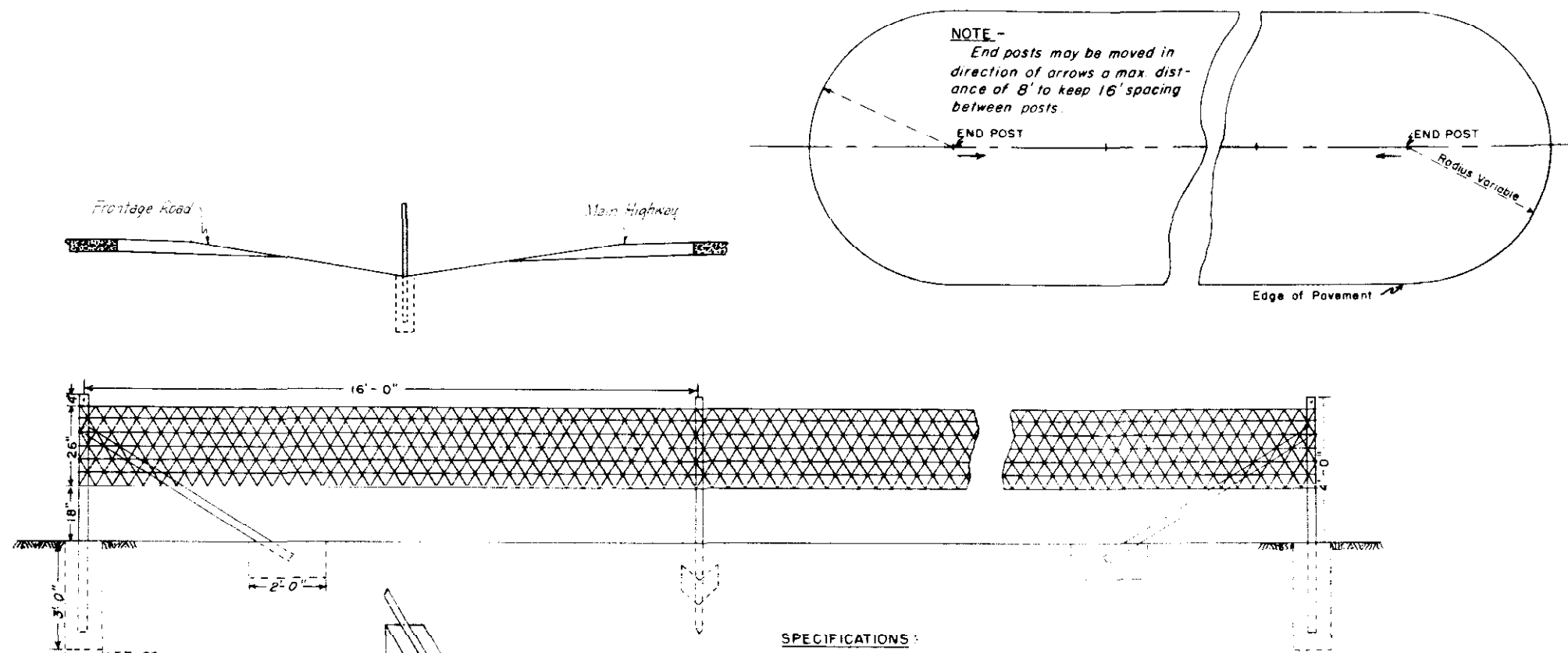


| FEDERAL ROAD DIVISION NO. | DISTRICT | PROJ. NO.         | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|-------------------|-----------|--------------|
| 8                         | COLORADO | FO06-1(II) UNIT 2 | 13        |              |

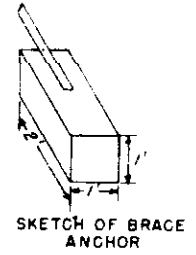
Rev. 6-8-54 - Note on Valves J.R.W.

# LAYOUT OF NEW WATER LINE STA. 895+ TO STA. 915+

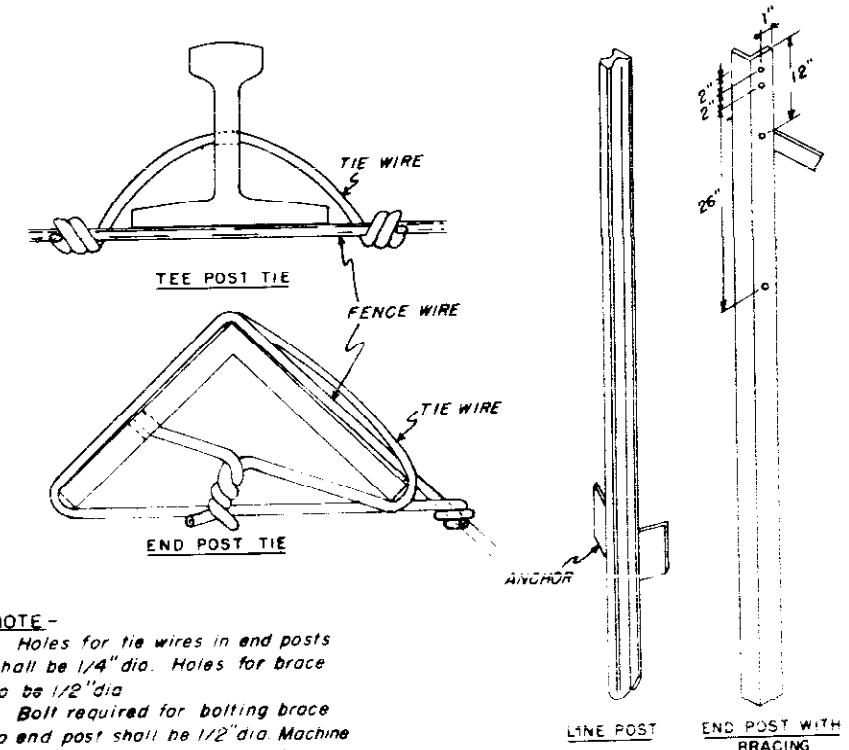




**NOTE -**  
All footings for end posts shall be of Class "A" Concrete and shall have crowned tops. The cost involved shall be included in the bid price for the fence.



- SPECIFICATIONS:**
- END POSTS -**  
 TYPE - 2-1/2"x 2-1/2"x 1/4" Structural Steel Angles  
 WGT - 4.1 lbs per lin. ft.  
 LENGTH - 6'-6" Min.  
 NO. OF BRACES - 1
- LINE POSTS -**  
 TYPE - Structural Steel "Tees"  
 WGT - 1.4 lbs. per lin. ft., Min.  
 LENGTH - 6'-6" Min.  
 ANCHOR - Securely fastened, with bearing surface sufficient to resist movement of post.
- BRACES -**  
 TYPE - 2"x 2"x 1/4" Structural Steel Angles  
 WGT - 3.19 lbs. per lin. ft.  
 LENGTH - Same as end post used
- 4"x 4" WIRE MESH FENCE -**  
 WIDTH - 26 inches  
 WGT - 0.58 lbs per lin. ft. minimum  
 HORIZONTAL WIRES - 2 strands No. 12-1/2 Ga.  
 CROSS WIRES - 1 strand No. 14 Ga.  
 CONSTRUCTION - Cross wires to be woven with horizontal wires making a one piece fabric.
- BARBED WIRE -**  
 Wire shall be of Standard Make, No. 12-1/2 Ga. Galvanized, having two (2) point barb spaced not more than five (5) inches apart.
- TIES -**  
 Min. No. 12-1/2 Ga. Galvanized Wire or acceptable equivalent  
 END POSTS - Each horizontal wire of mesh to be wrapped around post and fastened in addition to two (2) tie wires.  
 LINE POSTS - Min. four (4) ties per post for mesh and one (1) per post for barbed wire.



**NOTE -**  
 Holes for tie wires in end posts shall be 1/4" dia. Holes for brace to be 1/2" dia.  
 Bolt required for bolting brace to end post shall be 1/2" dia. Machine Bolt and shall be galvanized.

**General Notes**

All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the project.  
 All posts and braces shall be of the types and weights as shown on this sheet or acceptable equivalents. Posts and braces to be of structural steel hot dip galvanized or painted with an approved waterproof asphalt or mineral paint. Holes to be provided in end posts as detailed hereon.  
 Wire mesh used as shown shall be galvanized.  
 On curves, fence wire shall be placed on side of post which would prevent tension on fence ties.

COLORADO

DEPARTMENT OF HIGHWAYS

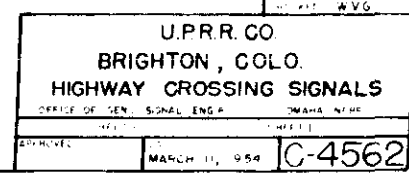
Barrier Fence

Designed by E.E.O

Made by E.E.O

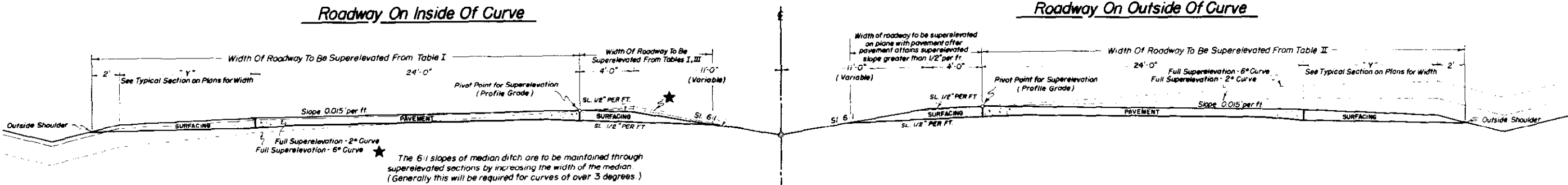
Checked by

Date



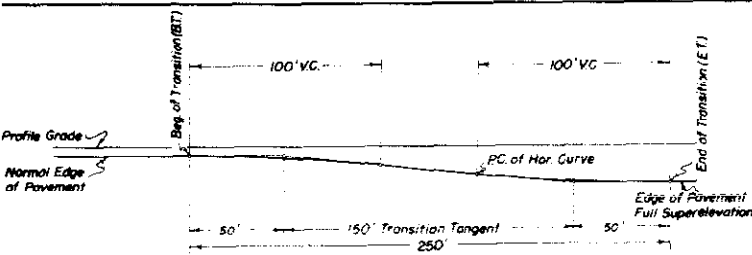


Standard Methods for Superelevating Curves on Divided Highways



Superelevation Tables

PROFILE VIEW SHOWING TRANSITION TO FULL SUPERELEVATION ON ROADWAY INSIDE OF CURVE



**Circular Curve with Unlimited Tangent Approach**

The transition shown above illustrates the effect of Superelevation on the outside edge of the pavement by gradually lowering the outside shoulder over a distance of 250 ft. The beginning of this transition takes place at a point 150 feet back of the end of the curve and acquires full Superelevation at a point 100 feet inside of the curve.

The transition for Superelevating the inside shoulder on roadway inside of curve shall start at a point 50 feet back of the BT as described above, and by using rates in Table III, shall reach a Superelevation equal to the normal crown slope of 0.015 ft. per foot at the BT. From this point the shoulder shall be raised on a plane with the roadway pavement.

TABLE I - FOR ROADWAY ON INSIDE OF CURVE  
(Figures in columns are Rates of Superelevation per Foot of Roadway Width)

| Percent Of Transition Distance | Distance From BT In Feet | DEGREE OF CURVE |          |          |          |          |
|--------------------------------|--------------------------|-----------------|----------|----------|----------|----------|
|                                |                          | 2° 30' ±        | 3° 30' ± | 4° 30' ± | 5° 30' ± | 6° 30' ± |
| 2                              | 5                        | .0000           | .0000    | .0000    | .0000    | .0000    |
| 4                              | 10                       | .0000           | .0001    | .0001    | .0001    | .0002    |
| 6                              | 15                       | .0000           | .0001    | .0002    | .0003    | .0004    |
| 8                              | 20                       | .0001           | .0002    | .0004    | .0005    | .0006    |
| 10                             | 25                       | .0001           | .0003    | .0006    | .0008    | .0010    |
| 12                             | 30                       | .0002           | .0005    | .0008    | .0011    | .0014    |
| 14                             | 35                       | .0002           | .0007    | .0011    | .0015    | .0020    |
| 16                             | 40                       | .0003           | .0009    | .0014    | .0020    | .0026    |
| 18                             | 45                       | .0004           | .0011    | .0018    | .0025    | .0032    |
| 20                             | 50                       | .0005           | .0014    | .0023    | .0031    | .0040    |
| 22                             | 55                       | .0006           | .0017    | .0027    | .0038    | .0048    |
| 24                             | 60                       | .0007           | .0020    | .0032    | .0045    | .0058    |
| 26                             | 65                       | .0008           | .0024    | .0038    | .0053    | .0068    |
| 28                             | 70                       | .0010           | .0027    | .0044    | .0061    | .0078    |
| 30                             | 75                       | .0011           | .0031    | .0051    | .0071    | .0090    |
| 32                             | 80                       | .0013           | .0035    | .0058    | .0080    | .0102    |
| 34                             | 85                       | .0014           | .0040    | .0065    | .0091    | .0116    |
| 36                             | 90                       | .0016           | .0045    | .0073    | .0101    | .0130    |
| 38                             | 95                       | .0018           | .0050    | .0081    | .0113    | .0144    |
| 40                             | 100                      | .0020           | .0055    | .0090    | .0125    | .0160    |
| 42                             | 105                      | .0022           | .0061    | .0099    | .0138    | .0176    |
| 44                             | 110                      | .0024           | .0066    | .0108    | .0150    | .0192    |
| 46                             | 115                      | .0026           | .0072    | .0117    | .0163    | .0208    |
| 48                             | 120                      | .0028           | .0077    | .0126    | .0175    | .0224    |
| 50                             | 125                      | .0030           | .0083    | .0135    | .0188    | .0240    |
| 52                             | 130                      | .0032           | .0088    | .0144    | .0200    | .0256    |
| 54                             | 135                      | .0034           | .0094    | .0153    | .0213    | .0272    |
| 56                             | 140                      | .0036           | .0099    | .0162    | .0225    | .0288    |
| 58                             | 145                      | .0038           | .0105    | .0171    | .0238    | .0304    |
| 60                             | 150                      | .0040           | .0110    | .0180    | .0250    | .0320    |
| 62                             | 155                      | .0042           | .0116    | .0189    | .0263    | .0336    |
| 64                             | 160                      | .0044           | .0120    | .0197    | .0274    | .0350    |
| 66                             | 165                      | .0046           | .0126    | .0205    | .0285    | .0364    |
| 68                             | 170                      | .0047           | .0130    | .0212    | .0295    | .0378    |
| 70                             | 175                      | .0049           | .0135    | .0219    | .0305    | .0390    |
| 72                             | 180                      | .0050           | .0138    | .0226    | .0314    | .0402    |
| 74                             | 185                      | .0052           | .0142    | .0232    | .0323    | .0412    |
| 76                             | 190                      | .0053           | .0145    | .0238    | .0330    | .0422    |
| 78                             | 195                      | .0054           | .0149    | .0243    | .0338    | .0432    |
| 80                             | 200                      | .0055           | .0151    | .0247    | .0344    | .0440    |
| 82                             | 205                      | .0056           | .0154    | .0252    | .0350    | .0448    |
| 84                             | 210                      | .0057           | .0156    | .0256    | .0355    | .0454    |
| 86                             | 215                      | .0058           | .0158    | .0259    | .0360    | .0460    |
| 88                             | 220                      | .0058           | .0160    | .0262    | .0364    | .0466    |
| 90                             | 225                      | .0059           | .0162    | .0264    | .0367    | .0470    |
| 92                             | 230                      | .0059           | .0163    | .0266    | .0370    | .0474    |
| 94                             | 235                      | .0060           | .0164    | .0268    | .0372    | .0476    |
| 96                             | 240                      | .0060           | .0164    | .0269    | .0374    | .0478    |
| 98                             | 245                      | .0060           | .0165    | .0270    | .0375    | .0480    |
| Full Super                     | 250                      | .0060           | .0165    | .0270    | .0375    | .0480    |

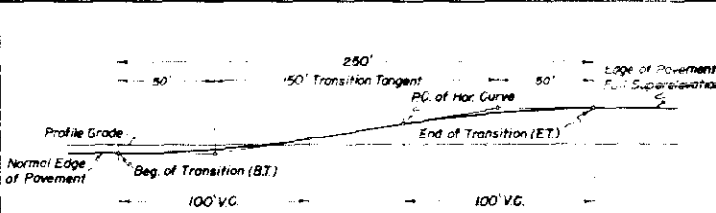
TABLE III - FOR INSIDE SHOULDER OF ROADWAY INSIDE OF CURVE

| Percent Of Transition Distance | Distance Back Of BT | Rate Of Superelevation Per Foot Of Shoulder Width |
|--------------------------------|---------------------|---------------------------------------------------|
| 100                            | BT                  | .05666                                            |
| 80                             | 10                  | .04533                                            |
| 60                             | 20                  | .03400                                            |
| 40                             | 30                  | .02266                                            |
| 20                             | 40                  | .01133                                            |
| 0                              | 50                  | .00000                                            |

TABLE II - FOR ROADWAY ON OUTSIDE OF CURVE  
(Figures in columns are Rates of Superelevation per Foot of Roadway Width)

| Percent Of Transition Distance | Distance From RT In Feet | DEGREE OF CURVE |          |          |          |          |
|--------------------------------|--------------------------|-----------------|----------|----------|----------|----------|
|                                |                          | 2° 30' ±        | 3° 30' ± | 4° 30' ± | 5° 30' ± | 6° 30' ± |
| 2                              | 5                        | .0000           | .0000    | .0000    | .0001    | .0001    |
| 4                              | 10                       | .0001           | .0002    | .0002    | .0002    | .0003    |
| 6                              | 15                       | .0003           | .0004    | .0004    | .0005    | .0006    |
| 8                              | 20                       | .0005           | .0006    | .0008    | .0009    | .0010    |
| 10                             | 25                       | .0008           | .0010    | .0012    | .0014    | .0016    |
| 12                             | 30                       | .0011           | .0014    | .0017    | .0020    | .0023    |
| 14                             | 35                       | .0015           | .0019    | .0023    | .0028    | .0032    |
| 16                             | 40                       | .0019           | .0025    | .0030    | .0036    | .0042    |
| 18                             | 45                       | .0024           | .0031    | .0038    | .0046    | .0053    |
| 20                             | 50                       | .0030           | .0039    | .0048    | .0056    | .0065    |
| 22                             | 55                       | .0036           | .0047    | .0057    | .0069    | .0079    |
| 24                             | 60                       | .0043           | .0056    | .0068    | .0081    | .0094    |
| 26                             | 65                       | .0051           | .0066    | .0080    | .0096    | .0110    |
| 28                             | 70                       | .0059           | .0076    | .0093    | .0110    | .0127    |
| 30                             | 75                       | .0068           | .0088    | .0107    | .0127    | .0146    |
| 32                             | 80                       | .0077           | .0099    | .0122    | .0144    | .0166    |
| 34                             | 85                       | .0087           | .0113    | .0137    | .0163    | .0188    |
| 36                             | 90                       | .0097           | .0126    | .0154    | .0182    | .0211    |
| 38                             | 95                       | .0108           | .0140    | .0171    | .0204    | .0235    |
| 40                             | 100                      | .0120           | .0155    | .0190    | .0225    | .0260    |
| 42                             | 105                      | .0132           | .0171    | .0209    | .0248    | .0286    |
| 44                             | 110                      | .0144           | .0186    | .0228    | .0270    | .0312    |
| 46                             | 115                      | .0156           | .0202    | .0247    | .0293    | .0338    |
| 48                             | 120                      | .0168           | .0217    | .0266    | .0315    | .0364    |
| 50                             | 125                      | .0180           | .0233    | .0285    | .0338    | .0390    |
| 52                             | 130                      | .0192           | .0248    | .0304    | .0360    | .0416    |
| 54                             | 135                      | .0204           | .0264    | .0323    | .0383    | .0442    |
| 56                             | 140                      | .0216           | .0279    | .0342    | .0405    | .0468    |
| 58                             | 145                      | .0228           | .0295    | .0361    | .0428    | .0494    |
| 60                             | 150                      | .0240           | .0310    | .0380    | .0450    | .0520    |
| 62                             | 155                      | .0252           | .0326    | .0399    | .0472    | .0545    |
| 64                             | 160                      | .0263           | .0339    | .0416    | .0493    | .0569    |
| 66                             | 165                      | .0273           | .0353    | .0433    | .0513    | .0592    |
| 68                             | 170                      | .0283           | .0366    | .0448    | .0531    | .0614    |
| 70                             | 175                      | .0292           | .0378    | .0463    | .0549    | .0634    |
| 72                             | 180                      | .0301           | .0389    | .0477    | .0565    | .0653    |
| 74                             | 185                      | .0309           | .0400    | .0490    | .0580    | .0670    |
| 76                             | 190                      | .0317           | .0409    | .0502    | .0594    | .0686    |
| 78                             | 195                      | .0324           | .0419    | .0513    | .0607    | .0701    |
| 80                             | 200                      | .0330           | .0426    | .0522    | .0619    | .0715    |
| 82                             | 205                      | .0336           | .0434    | .0532    | .0629    | .0727    |
| 84                             | 210                      | .0341           | .0440    | .0540    | .0639    | .0738    |
| 86                             | 215                      | .0345           | .0446    | .0547    | .0647    | .0748    |
| 88                             | 220                      | .0349           | .0451    | .0553    | .0655    | .0757    |
| 90                             | 225                      | .0352           | .0455    | .0558    | .0661    | .0764    |
| 92                             | 230                      | .0355           | .0459    | .0562    | .0666    | .0770    |
| 94                             | 235                      | .0357           | .0461    | .0566    | .0670    | .0774    |
| 96                             | 240                      | .0359           | .0463    | .0568    | .0673    | .0777    |
| 98                             | 245                      | .0360           | .0465    | .0570    | .0674    | .0779    |
| Full Super                     | 250                      | .0360           | .0465    | .0570    | .0675    | .0780    |

PROFILE VIEW SHOWING TRANSITION TO FULL SUPERELEVATION ON ROADWAY OUTSIDE OF CURVE



**Circular Curve with Unlimited Tangent Approach**

The transition shown above illustrates the effect of Superelevation on the outside edge of the pavement by gradually raising the outside shoulder over a distance of 250 feet. The beginning of this transition takes place at a point 150 feet back of the end of the curve and acquires full Superelevation at a point 100 feet inside of the curve.

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department applicable to the Project.

Special transition problems not covered by this Standard Sheet shall be covered by appropriate notes included with curve data on plans.

In cases where spiral curves are used, the transition from normal crowned section to full superelevation shall take place over the full length of spiral curve.

The use of this Standard Sheet is restricted to Divided Highways having a normal crown slope of 0.015 ft. per foot on pavements and a normal crown slope of 1/2" per foot on the inside shoulders.

COLORADO  
STATE HIGHWAY DEPARTMENT

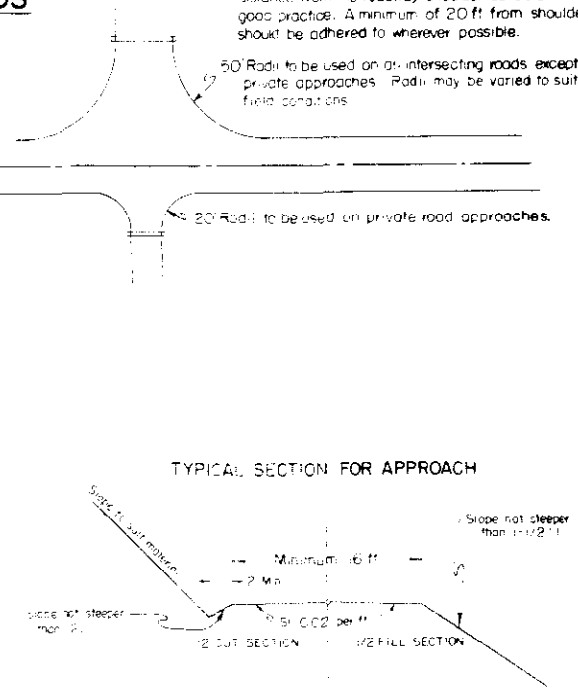
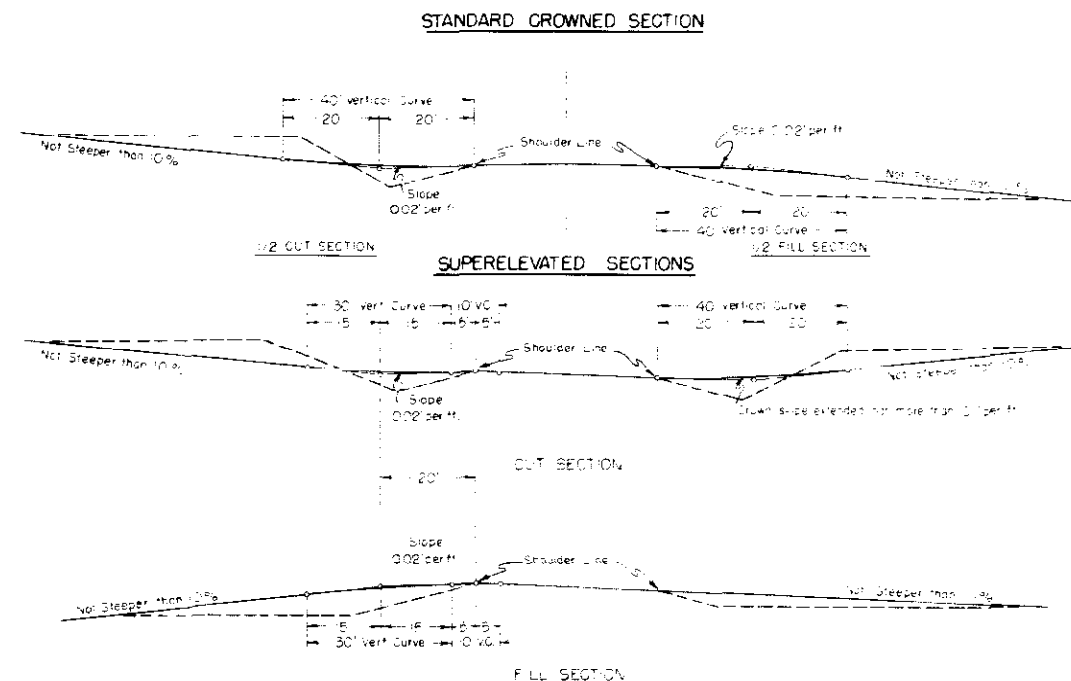
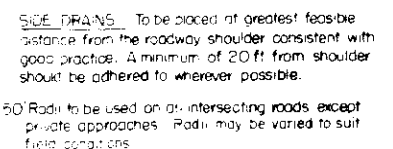
Standard Methods  
For Superelevating Curves  
On Divided Highways

Designed by G.M. Approved by G.M.  
Made by G.M. Engineer, Surveys & Plans  
Checked by M.R.H. Date: Feb 8 1950

| FED. ROAD<br>DIV NO | DISTRICT | F000-1(11) | SHEET<br>NO | TOTAL<br>SHEETS |
|---------------------|----------|------------|-------------|-----------------|
| 9                   | COLO.    | JNIT 2     | 16          |                 |

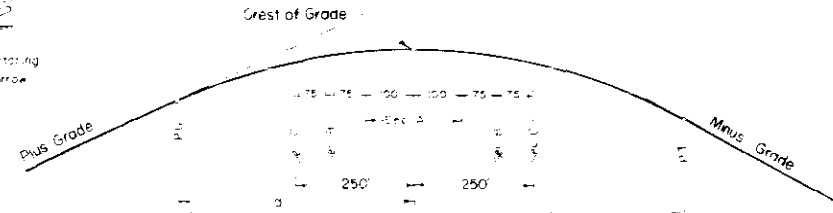
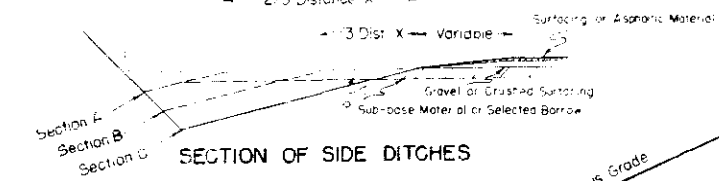
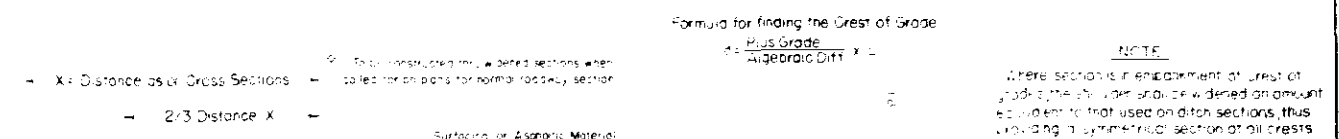
Rev. 12-9-53, Details of Road Approaches, J.C.R.

### TYPICAL PLANS FOR SIDE APPROACH ROADS



**NOTE:**  
ROAD WARE SHOULD BE APPLIED TO THE ROAD BED UNLESS OTHERWISE  
SPECIFIED BY CITY ENGINEER. THERE IS NO WORK IN THE EXISTING SECTION AND  
ANYTHING MORE THAN THE EXISTING IMPROVED SECTION IN THE EXISTING APPROACH  
ROAD SHOULD BE DONE. THE NEW CONSTRUCTION BE LESS THAN SIXTEEN (16) FEET IN  
WIDTH.

DETAILS FOR DITCH & WIDENED SHOULDERS AT CREST OF GRADES  
(TO BE USED ONLY WHERE SIGHT DISTANCE AT CREST OF GRADE IS 600 FT OR LESS)



GENERAL NOTES

All work shall be done in accordance with the **Standard Specifications of the Colorado Department of Highways** applicable to the **Project**.

All side approach roads to the **Project** shall be Gravel Surfaced with a four (4) inch thickness of "Gravel or Crushed Rock Surfacing" extending approximately to the Right of Way Line. Estimated tonnage & type of material required for this operation are shown in the Surfacing Plan.

The maximum grades shown are to be the limiting grades for all road approaches. Modifications of grades will be permitted where adherence to the grades as shown would cause damage to property or create other unsatisfactory conditions. Grades less than the maximum shown are to be used wherever feasible.

**COLORADO**  
**DEPARTMENT OF HIGHWAYS**  
**STANDARD**  
**SIDE APPROACH ROADS,**  
**FLARING, CUT SLOPE TREATMENT,**  
**AND WIDENING AT BRIDGES AND**  
**AT CREST OF GRADES**

|                   |                              |
|-------------------|------------------------------|
| Designed by A. Z. | Approved by <i>A. Zulian</i> |
| Made by SJM & ABH |                              |
| Checked by CRS    | Date: November 1, 1953       |

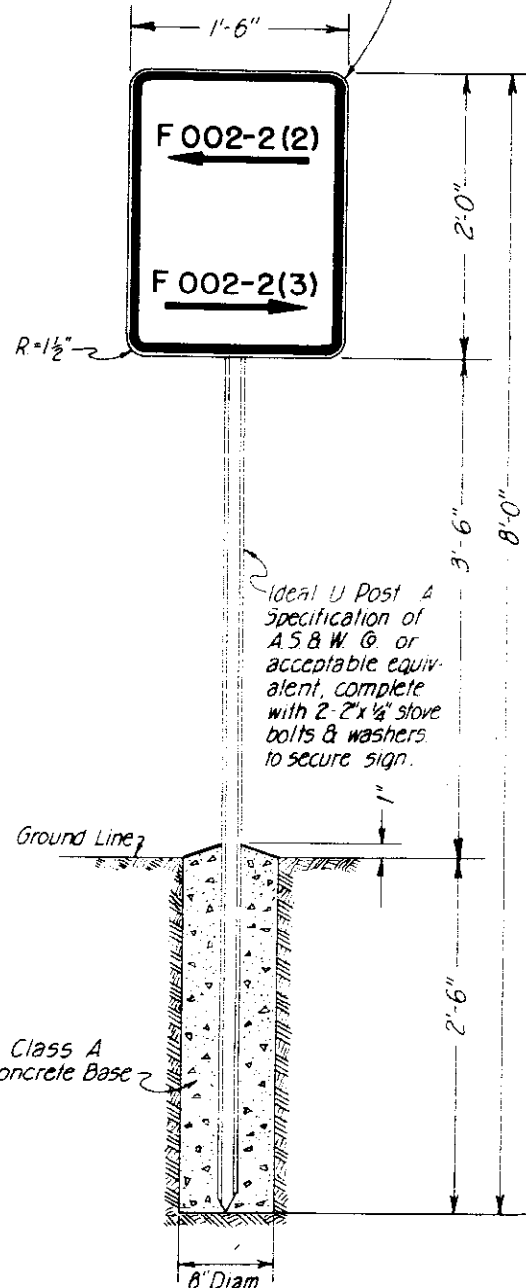
# PROJECT MARKER POST

# RIGHT OF WAY MARKER POST

# STANDARD M-7-C

| FEDERAL ROAD DIVISION NO. | DISTRICT | PROJ. NO.         | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|-------------------|-----------|--------------|
| 9                         | COLORADO | F000-1(1), UNIT 2 | 11        |              |

Metal Sign Conforming to A.A.S.H.O. Manual on Uniform Traffic Control Devices. White Background, Black Letters & Symbols.



## NOTES FOR PROJECT MARKER POSTS

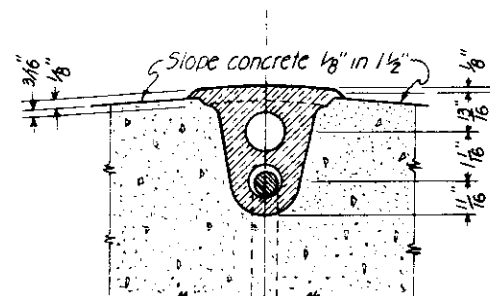
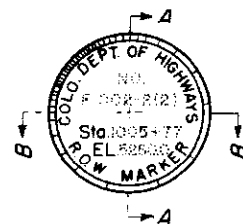
All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to this project.

Numbers and arrows shall show the proper numbers and directions of the projects each way from where the post is placed. Post is to be set with sign facing the road at the end of the project, two feet inside the R.O.W. line or at a point amply protected from traffic in such a position that the sign will indicate properly the projects to which it refers.

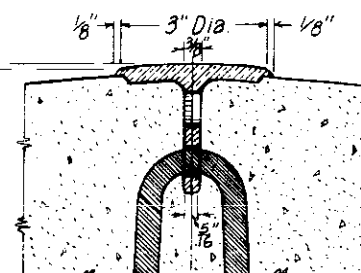
## NOTES FOR R.O.W. MARKER POSTS

All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the project. Posts shall be made of Class A Concrete. The upper 12 inches of marker posts shall be rubbed free of form marks, and the top surface of the post must be constructed to drain thoroughly.

All exposed surfaces of the bronze tablet are to be ground to a smooth surface. All letters are to be depressed a minimum of 1/16 inch. Information on the bronze tablet indicated by pin lines is to be stamped in field by the engineering party after post is placed. 3/16 inch letters and figures to be used. Project designations on tablets shall be properly shown (i.e., I for Fed Aid Interstate, F for Fed Aid Primary, S for Fed Aid Secondary, etc. & C for State Projects, see detail below.)

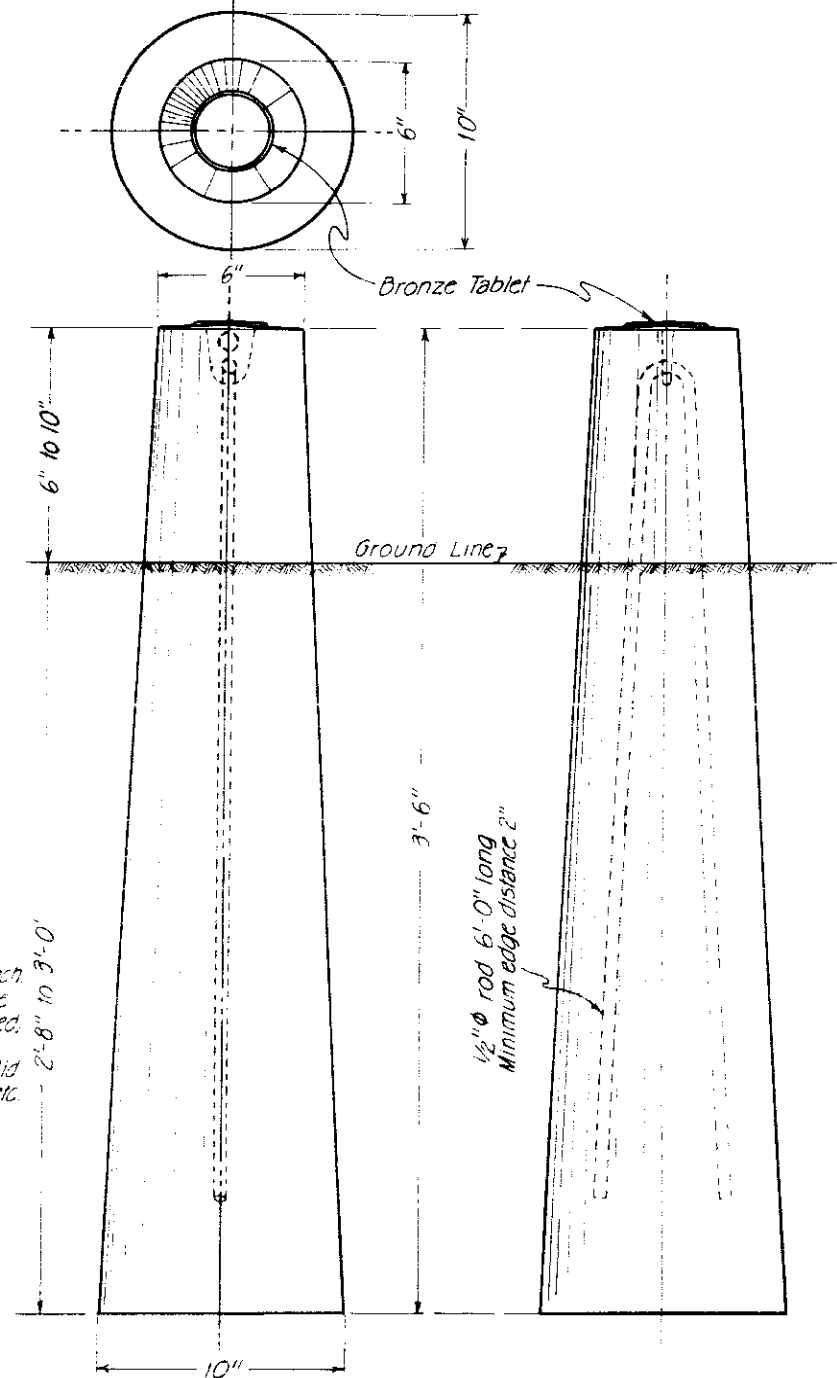


SECTION B-B



SECTION A-A

DETAIL OF BRONZE TABLET FOR RIGHT OF WAY MARKER POST



COLORADO  
DEPARTMENT OF HIGHWAYS  
STANDARD  
MARKER POSTS

Designed by R.E.L. Approved by J. Julian  
Made by E.E.O. Date: Nov. 12, 1953  
Checked by R.E.L.

REVISIONS  
Rev 12-13-47 J.P.R.  
Rev 7-1-49 J.E.R.  
Rev 9-14-50 J.E.R.  
Rev 7-10-52 T.M.C.

STANDARD M-10-B.

| FEET IN A<br>FOOT | STATE | FOOD-1 (11) | SHEET<br>NO. | TOTAL<br>SHEETS |
|-------------------|-------|-------------|--------------|-----------------|
| 3                 | COLO. | UNIT 2      | 19           |                 |

1 2 3 4 5 6 7 8 9 0.

A B C D E F G H I J K L

M N O P Q R S T U V W

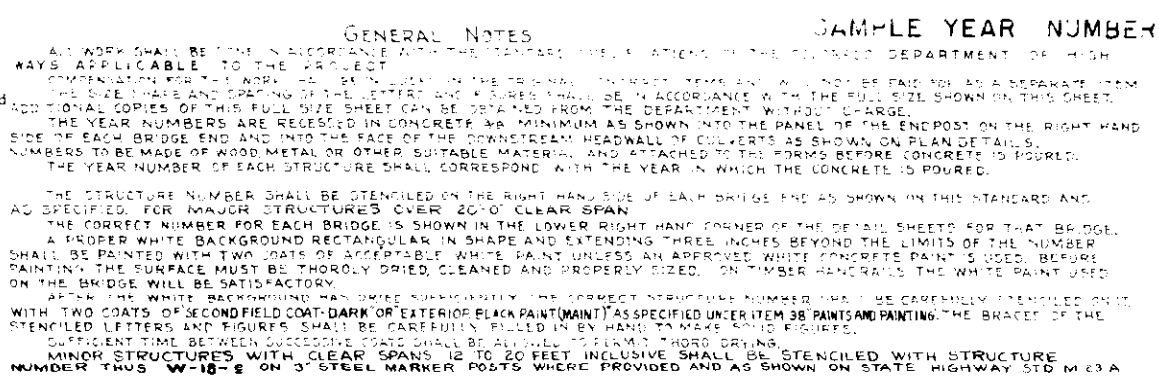
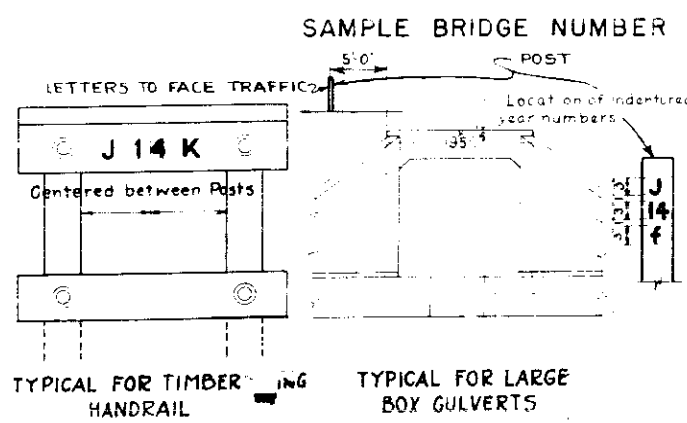
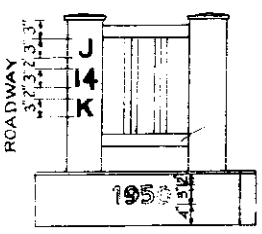
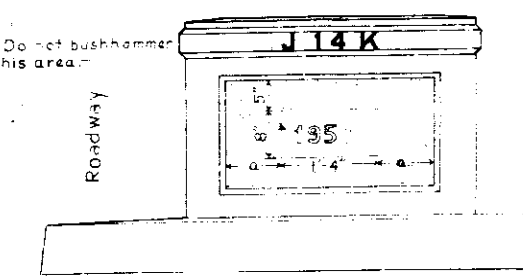
a b c d e f g h i j k l m n o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0

Scale in inches

SECTION

White Background



GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS APPLICABLE TO THE PROJECT.

COMPENSATION FOR THE WORK HEREIN SHOWN IN THE STANDARD SPECIFICATIONS SHALL NOT BE PAID FOR AS A SEPARATE ITEM.

THE SIZE, SHAPE AND SPACING OF THE LETTERS AND FIGURES SHALL BE IN ACCORDANCE WITH THE FULL SIZE SHOWN ON THIS SHEET.

ADDITIONAL COPIES OF THIS FULL SIZE SHEET CAN BE OBTAINED FROM THE DEPARTMENT WITHOUT CHARGE.

THE YEAR NUMBERS ARE RECESSED IN CONCRETE OR MINIMUM AS SHOWN INTO THE PANEL OF THE ENDPOST ON THE RIGHT HAND SIDE OF EACH BRIDGE END AND INTO THE FACE OF THE DOWNSTREAM HEADWALL OF CULVERTS AS SHOWN ON PLAN DETAILS.

NUMBERS TO BE MADE OF WOOD, METAL OR OTHER SUITABLE MATERIAL, AND ATTACHED TO THE FORMS BEFORE CONCRETE IS POURED.

THE YEAR NUMBER OF EACH STRUCTURE SHALL CORRESPOND WITH THE YEAR IN WHICH THE CONCRETE IS POURED.

THE STRUCTURE NUMBER SHALL BE STENCILED ON THE RIGHT HAND SIDE OF EACH BRIDGE END AS SHOWN ON THIS STANDARD AND AS SPECIFIED FOR MAJOR STRUCTURES OVER 20'-0" CLEAR SPAN.

THE CORRECT NUMBER FOR EACH BRIDGE IS SHOWN IN THE LOWER RIGHT HAND CORNER OF THE DETAIL SHEETS FOR THAT BRIDGE.

A PROPER WHITE BACKGROUND RECTANGULAR IN SHAPE AND EXTENDING THREE INCHES BEYOND THE LIMITS OF THE NUMBER SHALL BE PAINTED WITH TWO COATS OF ACCEPTABLE WHITE PAINT UNLESS AN APPROVED WHITE CONCRETE PAINT IS USED. BEFORE PAINTING THE SURFACE MUST BE THOROUGHLY DRIED, CLEANED AND PROPERLY SIZED. ON TIMBER HANDRAILS THE WHITE PAINT USED ON THE BRIDGE WILL BE SATISFACTORY.

AFTER THE WHITE BACKGROUND HAS DRIED SUFFICIENTLY THE CORRECT STRUCTURE NUMBER SHALL BE CAREFULLY STENCILED ONCE WITH TWO COATS OF SECOND FIELD COAT DARK OR EXTERIOR BLACK PAINT (MAINT) AS SPECIFIED UNDER ITEM 38 PAINTS AND PAINTING. THE BRACKET OF THE STENCILED LETTERS AND FIGURES SHALL BE CAREFULLY FILLED IN BY HAND TO MAKE SOLID FIGURES.

SUFFICIENT TIME BETWEEN SUCCESSIVE COATS SHALL BE ALLOWED TO PERMIT THOROUGH DRYING.

MINOR STRUCTURES WITH CLEAR SPANS 12 TO 20 FEET INCLUSIVE SHALL BE STENCILED WITH STRUCTURE NUMBER THUS W-18-2 ON 3" STEEL MARKER POSTS WHERE PROVIDED AND AS SHOWN ON STATE HIGHWAY STD M-23-A.

**COLORADO**  
DEPARTMENT OF HIGHWAYS  
STANDARD  
LETTERS AND FIGURES  
FOR  
YEAR NUMBERS AND  
STRUCTURE NUMBERS

Designed by G.H.C. Approved by *P. Bailey*  
Made by WPM Bridge Engineer  
Checked by Date: June 1, 1946

# DETAILS OF MANHOLE

## STANDARD M-12-D-8 NO. 8 CONCRETE INLET

| FEDERAL ROAD DIVISION NO. | DISTRICT | FOOD-1(11) | SHEET NO. | TOTAL SHEETS |
|---------------------------|----------|------------|-----------|--------------|
| 9                         | COLO.    | JNIT 2     | 17        |              |

REV. FOR SPECS. - 9/26/52-E.E.O.

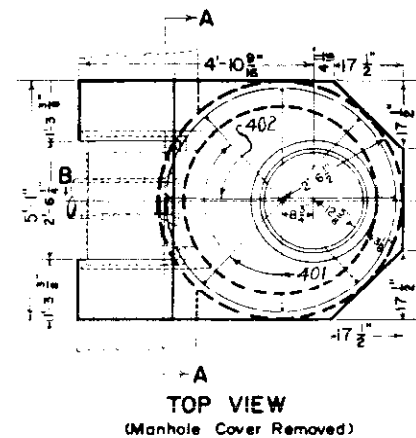
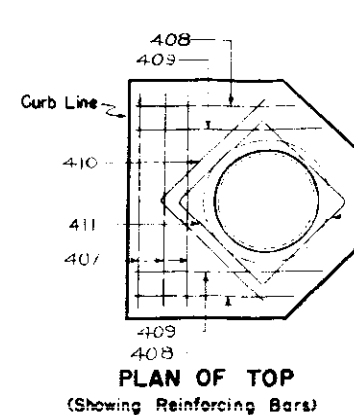
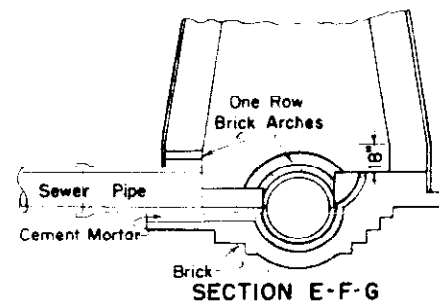
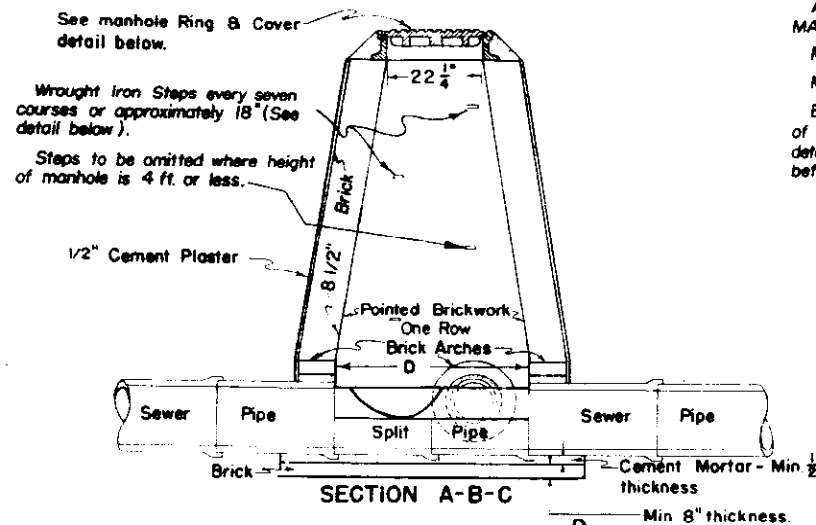
### NOTE:

All brick in manholes to conform to requirements of Grade MA of A.A.S.H.O. Designation M-91-42.

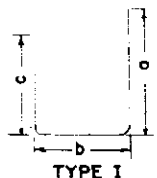
Manhole bottoms may be either brick or concrete.

Manhole benches shall be of brick as specified.

Equivalent reinforced concrete manholes may be used in lieu of standard masonry manholes. However all departures from details shown hereon must be approved by the Department before being used.



### BAR LIST FOR H=6'-6"

| MARK | SIZE   | NO<br>REQD | LENGTH  | TYPE | DIMENSIONS |       |        | TOTAL<br>LENGTH | BENDING DIAGRAM<br>ALL DIMENSIONS ARE<br>OUT TO OUT OF BAR                                        |
|------|--------|------------|---------|------|------------|-------|--------|-----------------|---------------------------------------------------------------------------------------------------|
|      |        |            |         |      | a          | b     | c      |                 |                                                                                                   |
| 401  | 1/2" φ | 3          | 16'-10" | I    | 6'-2"      | 4'-7" | 6'-2"  | 50'-6"          |  <p>TYPE I</p> |
| 402  | 1/2" φ | 1          | 14'-4"  | I    | 6'-2"      | 4'-7" | 6'-3"  | 14'-4"          |                                                                                                   |
| 403  | 1/2" φ | 6          | 16'-9"  | II   | 4'-8"      | -     | -      | 100'-6"         |                                                                                                   |
| 404  | 1/2" φ | 4          | 10'-11" | III  | 4'-8"      | -     | -      | 43'-8"          |                                                                                                   |
| 601  | 3/4" φ | 3          | 2'-6"   | I    | 0'-10"     | 1'-0" | 0'-10" | 7'-6"           |                                                                                                   |
| 405  | 1/2" φ | 2          | 3'-6"   | IV   | 2'-0"      | 1'-6" | -      | 7'-0"           |                                                                                                   |
| 406  | 1/2" φ | 3          | 2'-4"   | Str. | -          | -     | -      | 7'-0"           |                                                                                                   |
| 407  | 1/2" φ | 3          | 4'-7"   | Str. | -          | -     | -      | 13'-9"          |                                                                                                   |
| 408  | 1/2" φ | 2          | 3'-4"   | Str. | -          | -     | -      | 6'-8"           |                                                                                                   |
| 409  | 1/2" φ | 2          | 3'-10"  | Str. | -          | -     | -      | 7'-8"           |                                                                                                   |
| 410  | 1/2" φ | 1          | 6'-6"   | V    | 3'-3"      | 3'-3" | -      | 6'-6"           |                                                                                                   |
| 411  | 1/2" φ | 2          | 5'-0"   | V    | 2'-6"      | 2'-6" | -      | 10'-0"          |                                                                                                   |

These dimensions to be increased in increments of 6" for H above 6'-6".  
Add 403 for each 6" additional height above 6'-6".  
Additional 601 required as follows:  
H = 7'-6" to 8'-6" 1 bar;  
H = 9'-0" to 10'-0" 2 bars;  
Cut or bend bars around pipes as required.

### STORM SEWER RING AND COVER

Ref. H & B. Cat. 150, P. 371, Fig. 371-C&D, or equal. Approx. weight with Hood and Hinge Plate 285 lbs.

Hood to be used only when specified.

### NO. 12 INLET GRATING & FRAME

Approx. Weight 340 lbs.

601 - Steps to be omitted when H is 4 feet or less.

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NOTE: ALL REINFORCING STEEL BARS SHALL CONFORM TO A S.T.M. SPECIFICATION AND BE 60,000 PSI OR LATEST REVISION THEREOF.

### QUANTITIES

| H      | CLASS "A" CONCRETE *CU YDS | REINFORCING *STEEL |
|--------|----------------------------|--------------------|
| 6'-6"  | 2.4                        | 192 lbs.           |
| 7'-0"  | 2.5                        | 206 "              |
| 7'-6"  | 2.7                        | 224 "              |
| 8'-0"  | 2.8                        | 238 "              |
| 8'-6"  | 2.9                        | 252 "              |
| 9'-0"  | 3.0                        | 270 "              |
| 9'-6"  | 3.2                        | 284 "              |
| 10'-0" | 3.3                        | 298 "              |

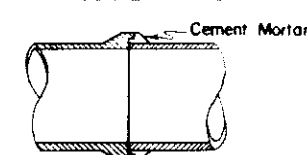
\*Includes 1% allowance for overrun.

\*Volume for inlet - volume occupied by pipes to be deducted for pay quantity of concrete.

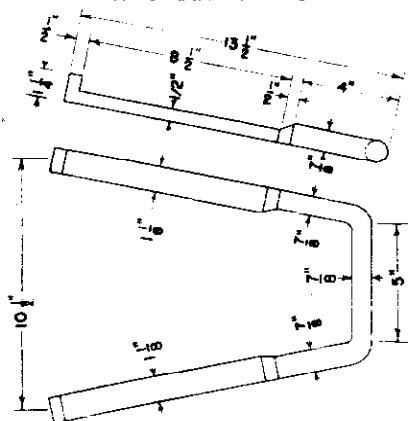
Curved inverts to be formed of vitrified brick or split tile

NOTE: inside diameter of bottom of manhole to be 4'-0" for pipe sewers 18" and under, and 5'-0" for pipe sewers 21" to 48" inc.

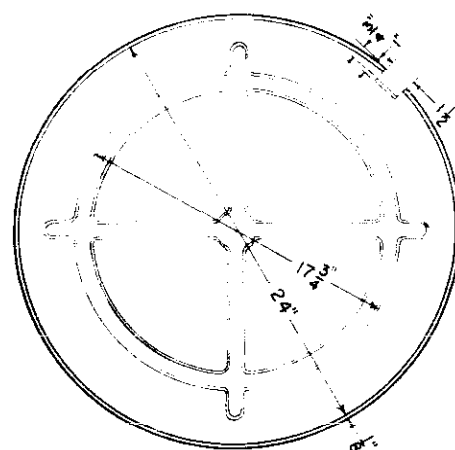
### DETAIL OF JOINTS FOR SEWER PIPE



### WROUGHT IRON OR MILD STEEL STEPS

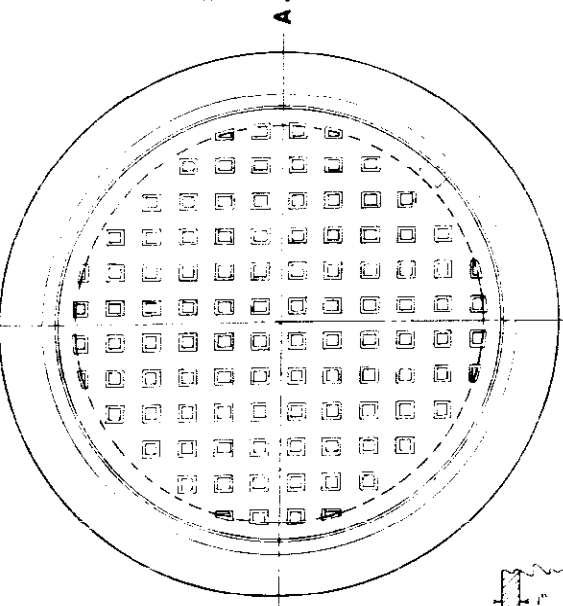


### BOTTOM VIEW OF COVER

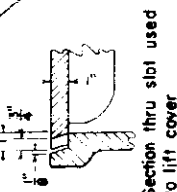


### DENVER PATTERN MANHOLE RING & COVER OR EQUIVALENT

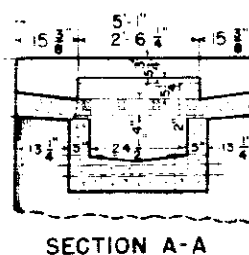
Approx. Weight 400 lbs.



### TOP VIEW OF FRAME & COVER

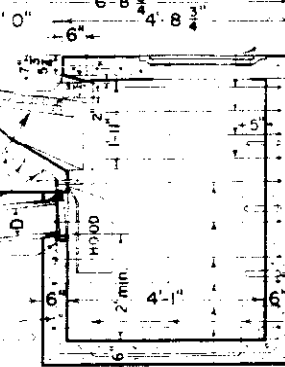


Section thru slot used to lift cover



### SECTION A-A

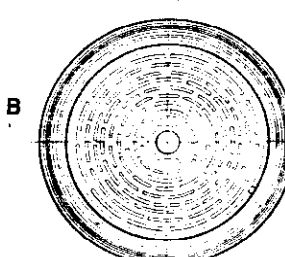
No. 12 Inlet Grating and Frame with back side of frame cut out.



### SECTION B-B

### STORM SEWER RING & COVER

Ref. H & B. Cat. 150, P. 371, Fig. 371-C, or Equiv. Approx. Weight 220 lbs.



### SECTION B-B

### GENERAL NOTES - SEE ADDITIONAL GRATING NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the Project.  
All reinforced concrete shall be class "A", AND AIR-ENTRAINED AS SPECIFIED.  
All concrete walls shall be formed on both sides.  
All exposed concrete corners shall be beveled to a 1" face.  
All reinforcing bars shall be deformed, of intermediate grade, and shall be tagged with BAR designation and station number.  
All castings shall be painted with two coats of asphalt or coal tar and oil.  
All surfaces exposed to view on the box shall receive class 1 surface finish.

### SECTION E-E

### SECTION F-F

### SECTION G-G

### SECTION H-H

### SECTION I-I

### SECTION J-J

### SECTION K-K

### SECTION L-L

### SECTION M-M

### SECTION N-N

### SECTION O-O

**COLORADO DEPARTMENT OF HIGHWAYS STANDARD NO. 8 CONCRETE INLET, MANHOLE & PIPE JOINTS ON SEWERS**

Designed by A.P.G.  
Made by A.P.G.  
Check design A.Z.  
Check detail C.R.S.

Approved by P.D. Bailey  
Bridge Engineer  
Date JUL 10, 1951

NO. 12 CONCRETE INLET

STANDARD M-12-D-13

NO. 13 CONCRETE INLET

| FED. ROAD DIVN. NO. | DISTRICT | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
|---------------------|----------|-------------|-----------|--------------|
| 9                   | COLO.    | UNIT 2      | 20        |              |

Rev 7-7-52 S.J.M. 1952 Specifications

BAR LIST FOR H = 3' 0"

| MARK | SIZE | NO. REQD. | LENGTH  | TYPE | DIMENSIONS   | BENDING DIAGRAM |
|------|------|-----------|---------|------|--------------|-----------------|
| 601  | 3/4" | Note      | 2' 6"   | I    | 1'-0" 0'-10" |                 |
| 401  | 1/2" | 3         | 11'-10" | II   | 2'-6" 2'-6"  |                 |
| 402  | 1/2" | 5         | 5'-6"   | I    | 2'-5" 1'-7"  |                 |
| 403  | 1/2" | 5         | 7'-1"   | I    | 2'-7" 1'-8"  |                 |
| 404  | 1/2" | 2         | 2'-7"   | STR. | -            |                 |

Omit 601 when H is 4'-0" or less.

These dimensions to be increased in increments of 6" for H above 3'-0".

Add 1-401 for each 6" additional height above 3'-0".

601 required as follows:

H = 4'-6" to 5'-6" - 1 bar; H = 9'-0" to 10'-0" - 4 bars

H = 6'-0" to 7'-0" - 2 bars;

H = 7'-6" to 8'-6" - 3 bars;

Cut or bend bars around pipes as required.

See Plans for size and locations of outlets.

BAR LIST FOR H = 3' 0"

| MARK | SIZE | NO. REQD. | LENGTH  | TYPE | DIMENSIONS   | BENDING DIAGRAM |
|------|------|-----------|---------|------|--------------|-----------------|
| 601  | 3/4" | Note      | 2' 6"   | I    | 1'-0" 0'-10" |                 |
| 401  | 1/2" | 4         | 11'-10" | II   | 3'-5" 2'-1"  |                 |
| 402  | 1/2" | 7         | 6'-1"   | I    | 2'-0" 2'-1"  |                 |
| 403  | 1/2" | 4         | 7'-5"   | I    | 3'-4" 2'-1"  |                 |

Omit 601 when H is 4'-0" or less.

These dimensions to be increased in increments of 6" for H above 3'-0".

Add 1-401 for each 6" additional height above 3'-0".

601 required as follows:

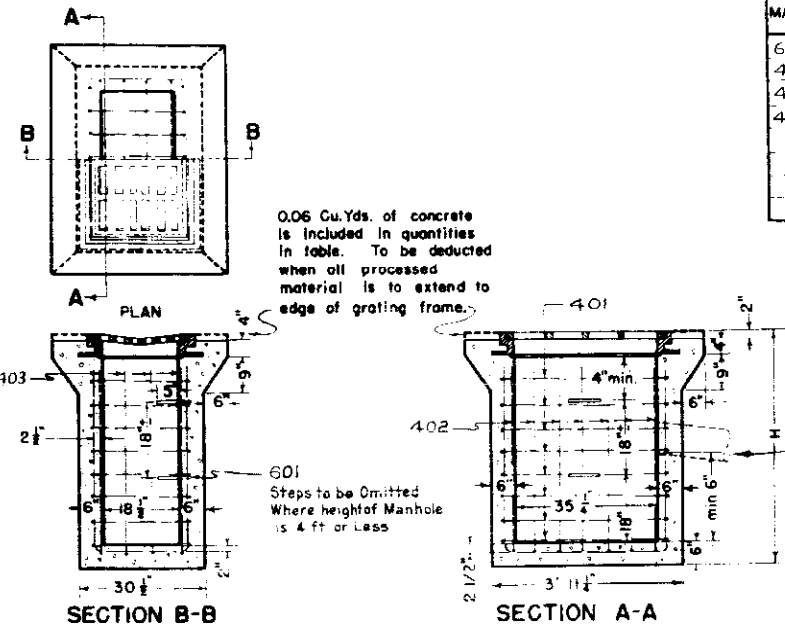
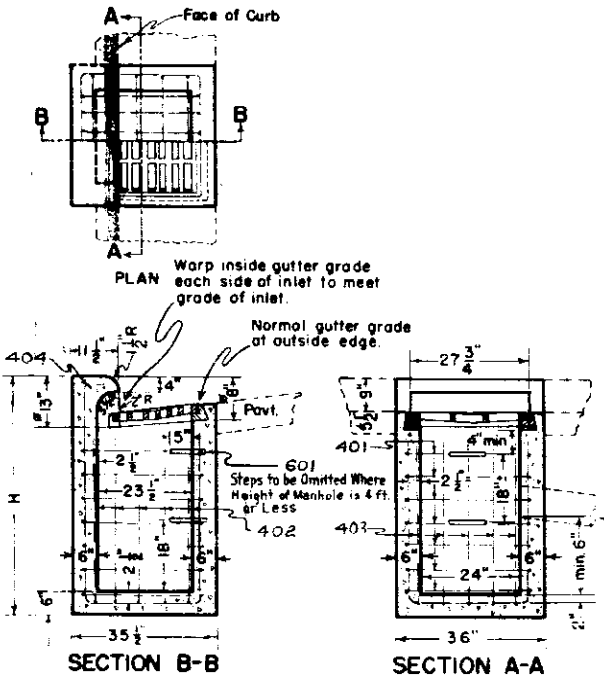
H = 4'-6" to 5'-6" - 1 bar; 9'-0" to 10'-0" - 4 bars

H = 6'-0" to 7'-0" - 2 bars;

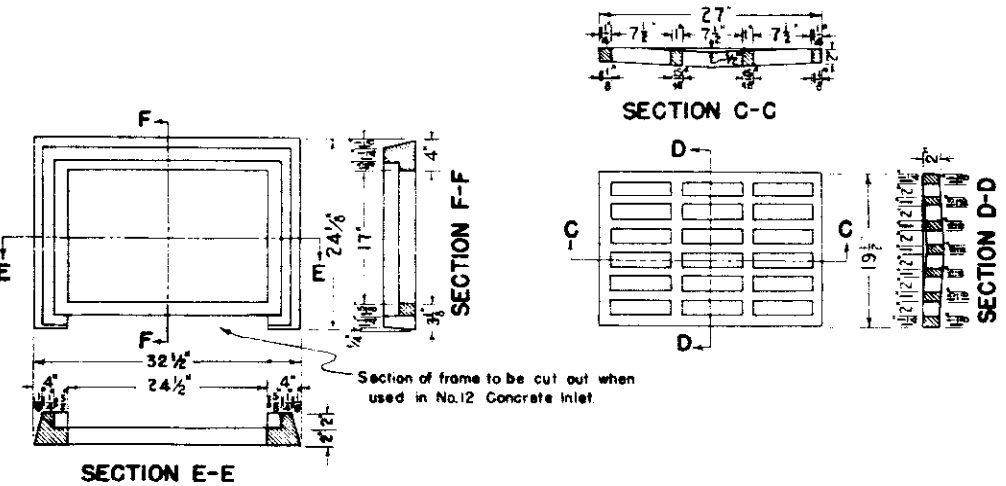
H = 7'-6" to 8'-6" - 3 bars;

Cut or bend bars around pipes as required.

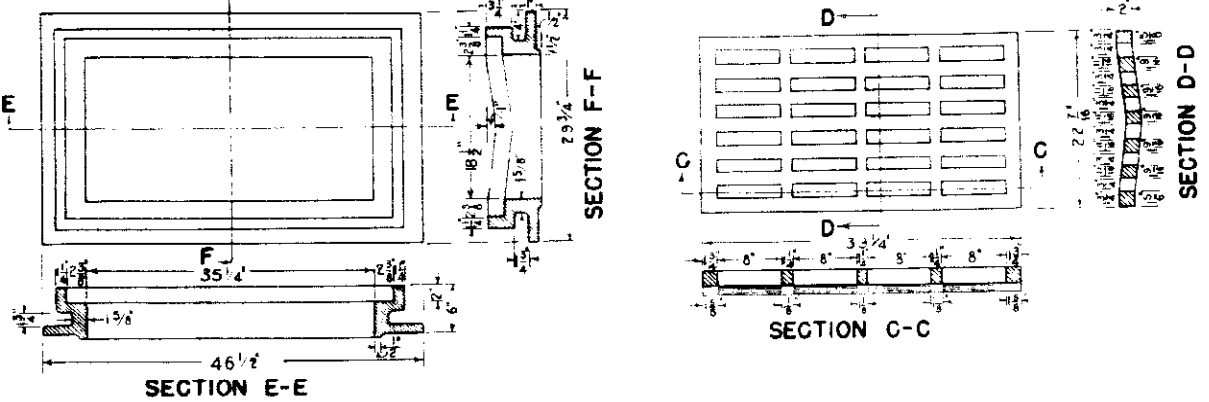
See Plans for size and locations of outlets.



NO. 12 INLET GRATING & FRAME



NO. 13 INLET GRATING & FRAME



| H      | CLASS "A" CONCRETE CU. YDS. | REINFORCING STEEL |
|--------|-----------------------------|-------------------|
| 3' 0"  | 0.54                        | 70 lbs            |
| 3' 6"  | 0.63                        | 85 "              |
| 4' 0"  | 0.72                        | 100 "             |
| 4' 6"  | 0.81                        | 119 "             |
| 5' 0"  | 0.90                        | 137 "             |
| 5' 6"  | 0.99                        | 152 "             |
| 6' 0"  | 1.08                        | 166 "             |
| 6' 6"  | 1.17                        | 185 "             |
| 7' 0"  | 1.27                        | 200 "             |
| 7' 6"  | 1.36                        | 215 "             |
| 8' 0"  | 1.45                        | 233 "             |
| 8' 6"  | 1.54                        | 248 "             |
| 9' 0"  | 1.63                        | 263 "             |
| 9' 6"  | 1.73                        | 282 "             |
| 10' 0" | 1.82                        | 297 "             |

| H      | CLASS "A" CONCRETE CU. YDS. | REINFORCING STEEL |
|--------|-----------------------------|-------------------|
| 3' 0"  | 0.54                        | 84 lbs            |
| 3' 6"  | 0.63                        | 100 "             |
| 4' 0"  | 0.72                        | 116 "             |
| 4' 6"  | 0.81                        | 136 "             |
| 5' 0"  | 0.90                        | 156 "             |
| 5' 6"  | 0.99                        | 172 "             |
| 6' 0"  | 1.08                        | 192 "             |
| 6' 6"  | 1.17                        | 208 "             |
| 7' 0"  | 1.27                        | 225 "             |
| 7' 6"  | 1.36                        | 245 "             |
| 8' 0"  | 1.45                        | 261 "             |
| 8' 6"  | 1.54                        | 277 "             |
| 9' 0"  | 1.63                        | 297 "             |
| 9' 6"  | 1.73                        | 313 "             |
| 10' 0" | 1.82                        | 329 "             |

VOLUME TO BE DEDUCTED FOR EACH OPENING

|     | C.M.P. | R.C.P. |
|-----|--------|--------|
| 18" | 0.03   | 0.05   |
| 24" | 0.06   | 0.09   |
| 30" | 0.09   | 0.14   |
| 36" | 0.13   |        |

\*Volume for inlet - volume occupied by pipes to be deducted for pay quantity of concrete.

\* Includes 1% allowance for overrun.

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the project.

All reinforced concrete shall be class "A", AND AIR ENTRAINMENT AS SPECIFIED.

All concrete walls shall be formed on both sides.

All exposed concrete corners shall be beveled to a 1" face.

All reinforcing bars shall be deformed, of intermediate grade, and shall be tagged with BAR designation and station number.

All castings shall be painted with two coats of asphalt or coal tar and oil.

All surfaces exposed to view on the box shall receive class 1 surface finish.

ALL DIMENSIONS NOT SHOWN AS CLEAR ARE TO C OF BAR.

ALL REINFORCING STEEL BARS SHALL CONFORM TO A.S.T.M. SPECIFICATION A-305-50T OR LATEST REVISION THEREOF.

COLORADO DEPARTMENT OF HIGHWAYS STANDARD NO. 12 AND NO. 13 CONCRETE INLETS

Designed by A.P.G. Made by A.P.G. Check Design A.Z. Check Detail C.R.G. Date JUL 10 1951

Approved by P.J. Bailey Bridge Engineer

# Standard Types of Railroad Warning Signs

STANDARD M-18-B

|                        |          |           |           |              |
|------------------------|----------|-----------|-----------|--------------|
| FED. ROAD DIVISION NO. | DISTRICT | FDDG-1111 | SHEET NO. | TOTAL SHEETS |
| 9                      | COLO.    | UNIT 3    | 21        |              |

## RAILROAD ADVANCE WARNING SIGNS

### SPECIFICATIONS

**POSTS:** 4"x4" Untreated Wood conforming to Item 42 of the Specifications. Length of posts to be determined from typical section on plans and local conditions.

**SIGN:** 16 ga. steel plate or acceptable equivalent. Type - A.A.S.H.O. designation W-32.

**PAINTING & MARKING:** Wood posts shall be painted in accordance with Item 38 of the specifications using one (1) coat of primer and two (2) coats of outside white.

Metal sign to have a black crossbuck and letters on a "Highway Yellow" background. Sign shall be reflectorized with reflective sheeting, reflector buttons or other reflective materials of approved types acceptable to the Department.

### INSTALLATION - URBAN

Signs shall be placed on right side of road or street facing approaching traffic. In resident or business districts where low speeds are prevalent, signs are to be placed a minimum distance of 100 feet from the crossing. In all cases signs shall be placed at a distance from the crossing great enough to provide adequate stopping distance for the prevailing speed of traffic thru that area.

Consideration shall be given to intersecting roads or streets and local conditions whereby additional signs may be required.

Signs shall be placed in advance of every railroad crossing regardless of other controls present except for the following conditions:

- At a minor siding or spur which is infrequently used and which is guarded by a member of the train crew when in use.
- In business districts of large cities where crossings are fully protected and the physical conditions are such that even a partial display of the sign is impossible.

### NOTE

On sign installations where roadway grades are not level it may be desirable to place signs out of plumb either forward or rearward depending on the grade, so as to keep the angle of view close to 90°.

### URBAN INSTALLATION

### INSTALLATION - RURAL

Signs shall be placed on right side of road facing approaching traffic. Sign to be placed normally 500 feet in advance of crossing although local conditions such as grades, curves and limited sight distance might make some intermediate distance between 300 and 500 feet more satisfactory.

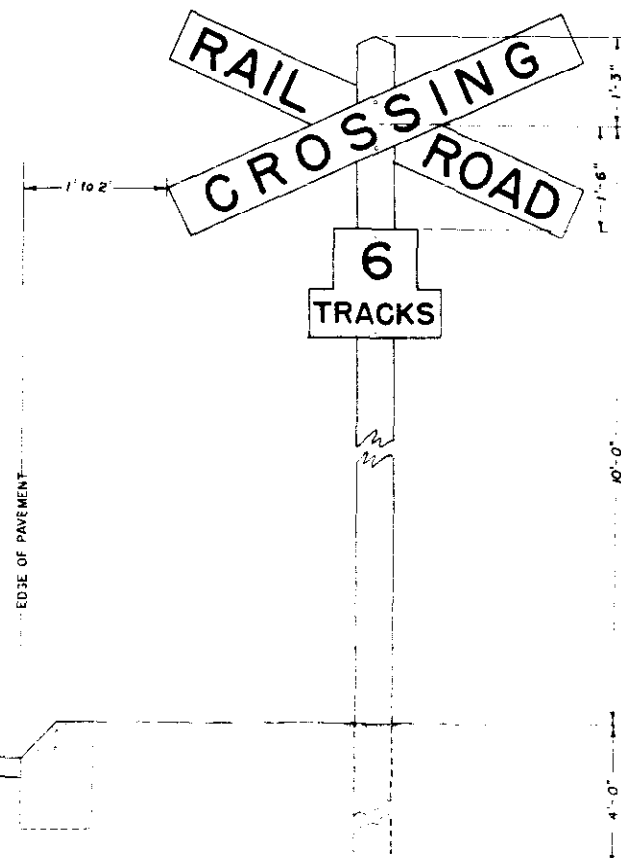
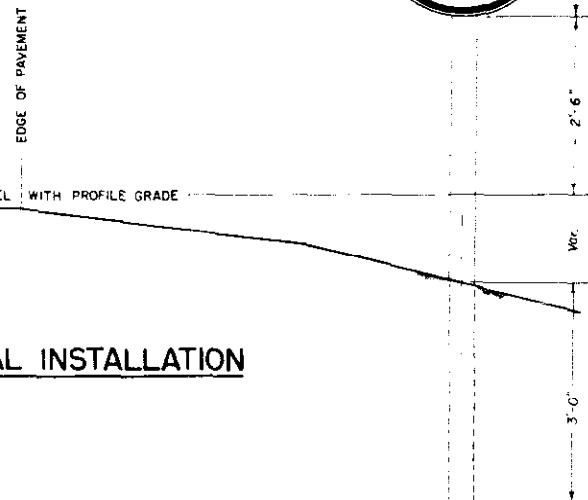
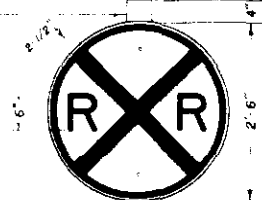
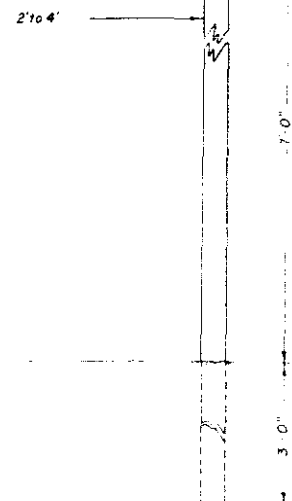
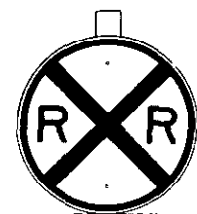
In all cases the distance shall be great enough to permit traffic to be brought to a complete halt before the crossing is reached.

Roadway intersections within minimum placement distance should be considered for additional signs.

Signs shall be placed in advance of every railroad crossing regardless of other controls present except for the following condition:

- At a minor siding or spur which is infrequently used or when used is guarded by a member of the train's crew.

### RURAL INSTALLATION



### URBAN INSTALLATION

### INSTALLATION - RURAL & URBAN

Crossbuck Signs shall be erected on the right side of roadway on each approach to the crossing, not less than fifteen (15) feet from the centerline of the nearest track.

The distance that should be assumed to separate tracks before an additional crossing sign is considered necessary is 100 ft., unless local conditions require otherwise.

SIDE VIEW

## GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department applicable to the Project.

All Crossbuck and Advance Warning Signs shall be constructed, painted, marked and erected in accordance with details shown on this sheet and in conformity with data set forth under the following publications:

"Manual on Uniform Traffic Control Devices for Streets and Highways" dated August 1948, published by Public Roads Administration.

Section 88 - Page 51, Section 89 - Page 52.

"Bulletin No. 4, Railroad-Highway Grade Crossing Protection" dated 1949, published by Association of American Railroads.

Details shown on this sheet take precedence over conflicting details shown in Bulletin No. 4 referred to above.

Wood posts as detailed above shall not be placed in the ground set in concrete.

### RURAL INSTALLATION

## RAILROAD CROSSBUCK SIGNS

### SPECIFICATIONS

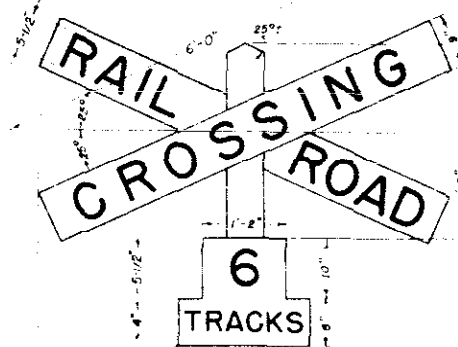
**POSTS:** 6"x6" Untreated Wood conforming to Item 42 of the Specifications. Length of posts to be determined from typical section on plans and local conditions.

**CROSSBUCKS:** 1/4" Boiler Plate or acceptable equivalent. Type - A.A.S.H.O. designation W-33.

**TRACK SIGN:** 14 ga. flat steel or acceptable equivalent.

**PAINTING & MARKING:** Wood posts shall be painted in accordance with Item 38 of the specifications using one (1) coat of primer and two (2) coats of outside white.

Crossbuck and track signs shall be white with all lettering and numerals black. All signs are to be reflectorized with reflective sheeting, reflector buttons or reflective materials of approved types.



TRACK SIGN REQUIRED FOR CROSSINGS WITH TWO OR MORE TRACKS

SIDE VIEW

COLORADO  
STATE HIGHWAY DEPARTMENT  
Standard Types  
Of  
Railroad Warning Signs

Designed by  
Made by C.G.M.  
Checked by  
Approved by J. Sullivan  
Engineer, Surveys & Plans  
Date: July 20 1951

# STANDARD TIMBER GUARD POSTS

## STANDARD M-19-D SPECIFICATIONS

|                        |          |             |           |              |
|------------------------|----------|-------------|-----------|--------------|
| FED. ROAD DIVISION NO. | DISTRICT | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| 9                      | C.O.G.   | 1000-1(11)  | 22        |              |

Rev. 5-13-53, Specifications, J.C.R.  
Rev. 12-4-53, Date Nails Deleted, D.L.V.  
Rev. 2-1-54, Delineation by State Forces, J.C.R.

**POSTS** - Lodgepole Pine, Southern Yellow Pine or West Coast Douglas Fir, not less than six (6) inches in diameter. All posts shall be pressure treated with Pentachlorophenol as provided under paragraph 42.2.20 of the specifications, after being peeled and shaved in accordance with specifications.

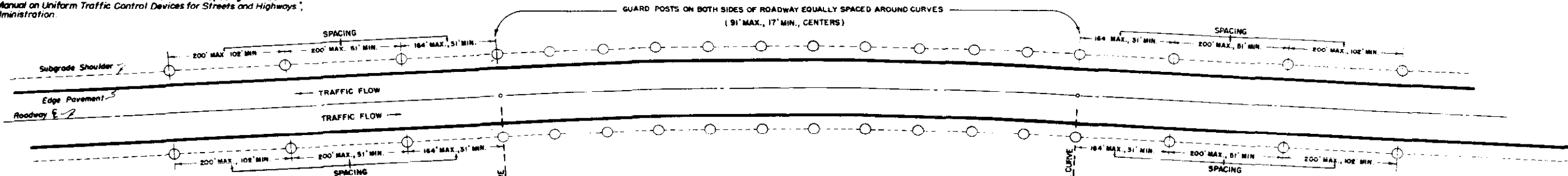
**PAINTING** - Posts shall be painted with aluminum paint and a black band placed around each post as per details on this sheet. Number of coats and type of paint applied shall be in accordance with specifications.

(Work By State Forces)

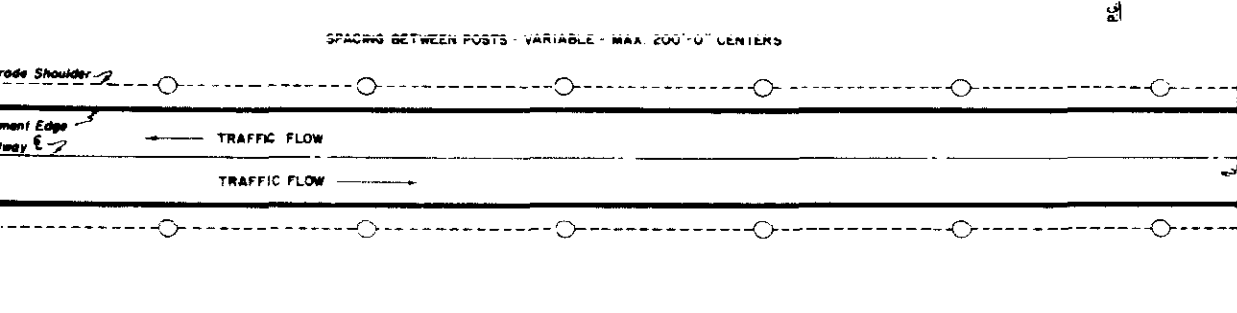
**REFLECTIVE SHEETING** - In accordance with the details hereon, State Forces will furnish and place the required 2" x 6" smooth surfaced reflective delineators fabricated from 3s M14 aluminum alloy, minimum thickness 0.025", reflectorized by means of wide-angle flattop silver "Scotchlite". Strips shall be suitable for placement around a curved surface.

### Typical Installation on Curves

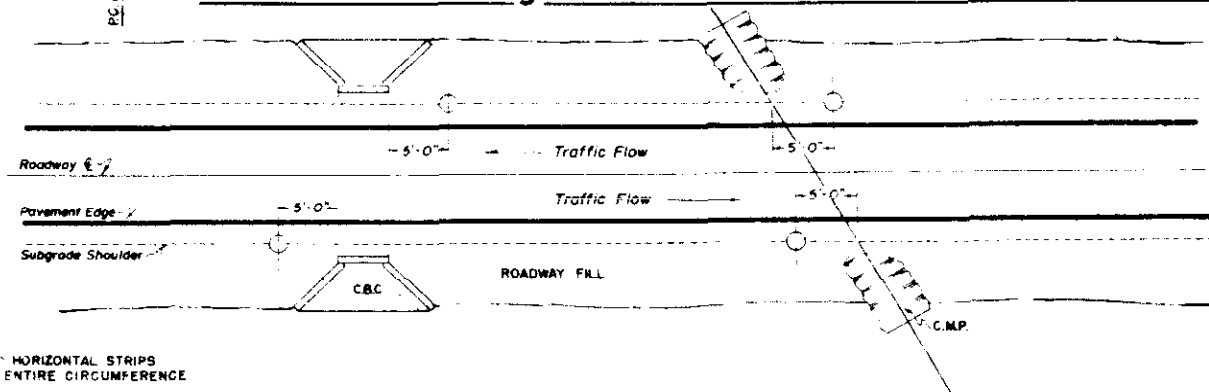
Installation of guard posts on curves shall be in accordance with details shown below. Spacing shall be in accordance with Section 157, Table 1 of Manual on Uniform Traffic Control Devices for Streets and Highways, August 1948 by the Public Roads Administration.



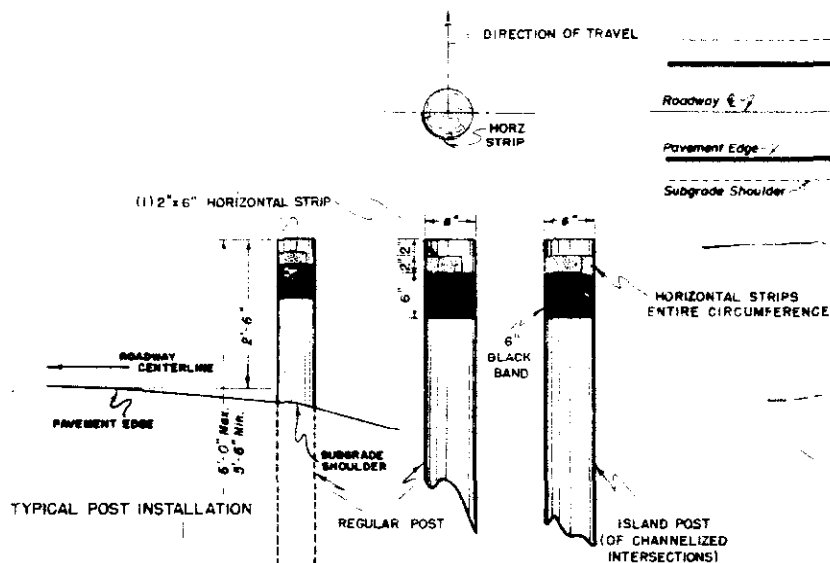
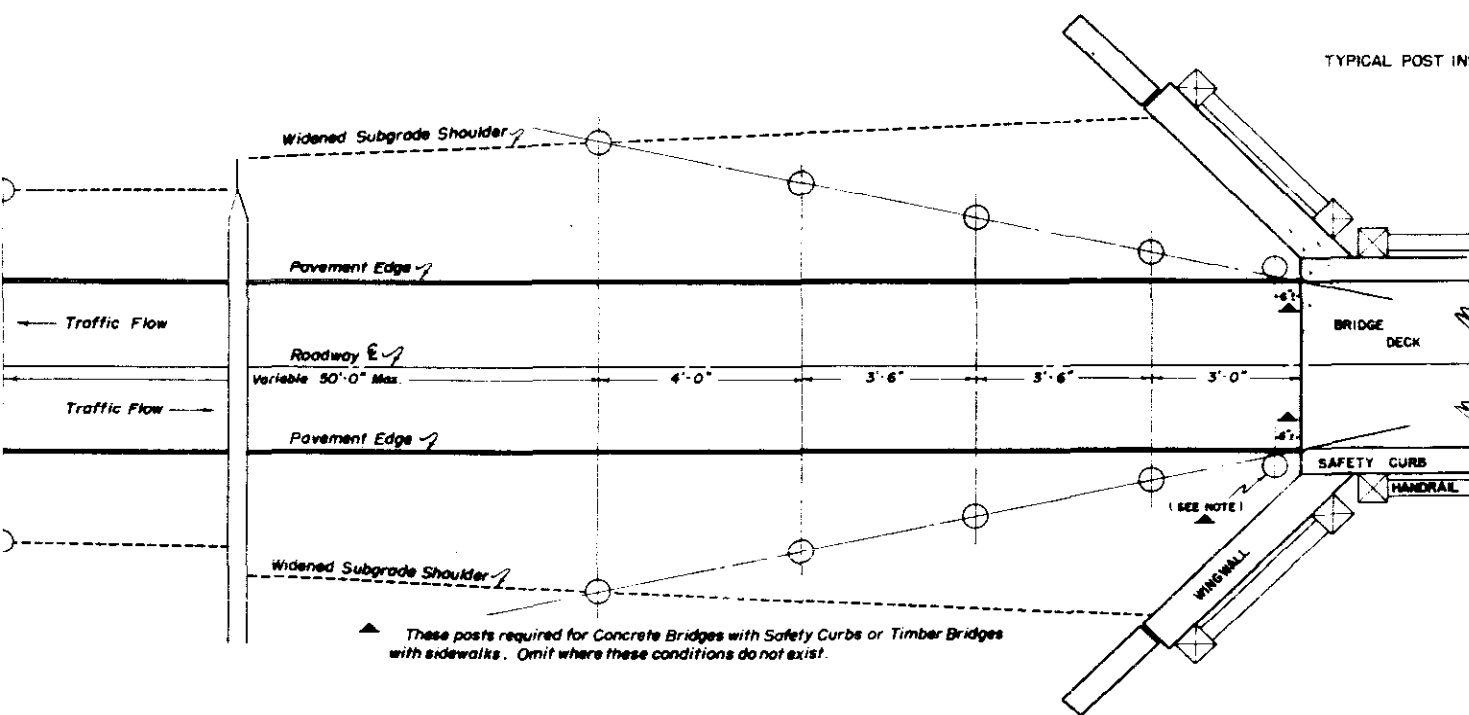
### Method of Placement on Tangents



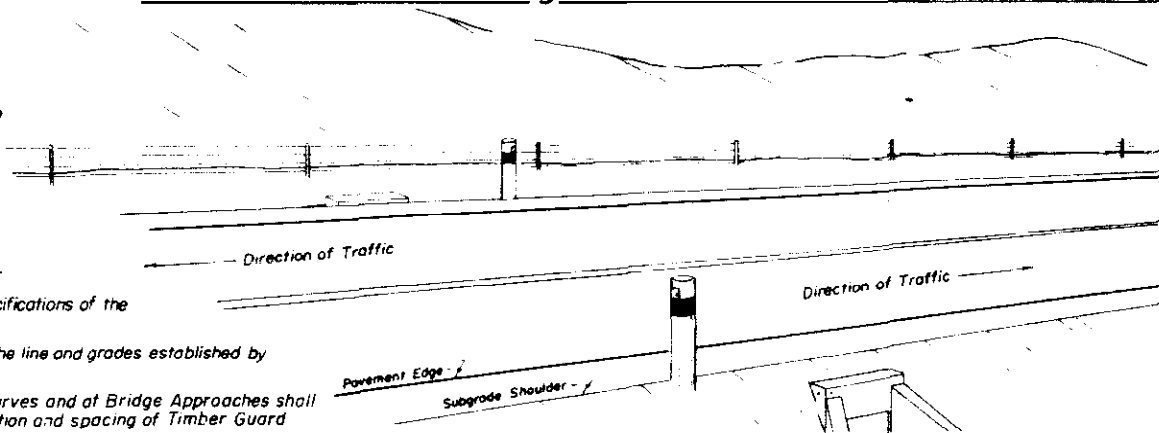
### Plan View Showing Placement at Isolated Minor Structures



### Typical Installation at Bridge Approaches



### Pictorial View Showing Location at Isolated Minor Structures



(Work By State Forces)  
INSTALLATION DETAILS OF REFLECTORIZED STRIPS

### GENERAL NOTES

(Work By Contractor)

All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the project.

All posts shall be set and tamped in, plumb and firm, to the line and grades established by the Engineer.

INSTALLATION of Timber Guard Posts on Tangents, Curves and at Bridge Approaches shall be in conformity with details on this sheet. The number, location and spacing of Timber Guard Posts is shown on plans.

(Work By State Forces)

Reflective delineators shall be furnished and installed by State Forces after the Contractor has finished his operations.

Installation of reflective delineators shall be in accordance with the following: Wrap Around Reflective Sheeting Strips shall be installed horizontally one (1) sheet on all posts. Island posts shall have Wrap Around Reflective Sheeting Strips placed horizontally to cover entire circumference of Post.

On Divided Highways and Islands, Reflective Sheeting Strips shall be placed in a manner to obtain maximum visibility for the primary direction of travel. In all instances tests shall be made to insure the maximum effectiveness of reflective delineators.

All Traffic Islands shall be marked with Island Posts as indicated hereon.

COLORADO  
DEPARTMENT OF HIGHWAYS

STANDARD  
TIMBER GUARD POSTS

Designed by  
Made by  
Checked by

Approved by  
Engineer, Survey & Plans  
Date: March 25, 1953

# Standard Wire Fence With Metal Posts

## STANDARD M-27-C

Rev. 7-3-51, C.G.M., Alternate Gate Note  
Rev. 4-30-53, Deleted Rod Brace from Driveway Gate, J.C.R.  
Rev. 6-30-53, Added acceptable equivalent for End, Corner & Gate Posts, J.C.R.  
Rev. 8-14-53, Added Carriage Bolt to Tubular Posts, J.C.R.

| DIVISION NO. | DISTRICT | UNIT   | SHEET NO. | TOTAL SHEETS |
|--------------|----------|--------|-----------|--------------|
| 9            | COLO.    | UNIT 2 | 23        |              |

Rev. 5-9-50, C.G.M., Specs. for Driveway Gates & Posts and Walk Gates.  
Rev. 6-7-50, C.G.M., Rev. detail & specs for Tee & Angle Post Clips.  
Rev. 6-21-50, J.L.C., Ties, Holes for Fastening Fence Wire.

### Typical Metal Posts & Fence Clamps

### SPECIFICATIONS

**CORNER POSTS -**  
TYPE - 2-1/2" x 2-1/2" x 1/4" Structural Steel Angles  
WGT. - 4.1 lbs./lin. ft., Min.  
LENGTH - 6'-6" Min.  
NO. BRACES - 2

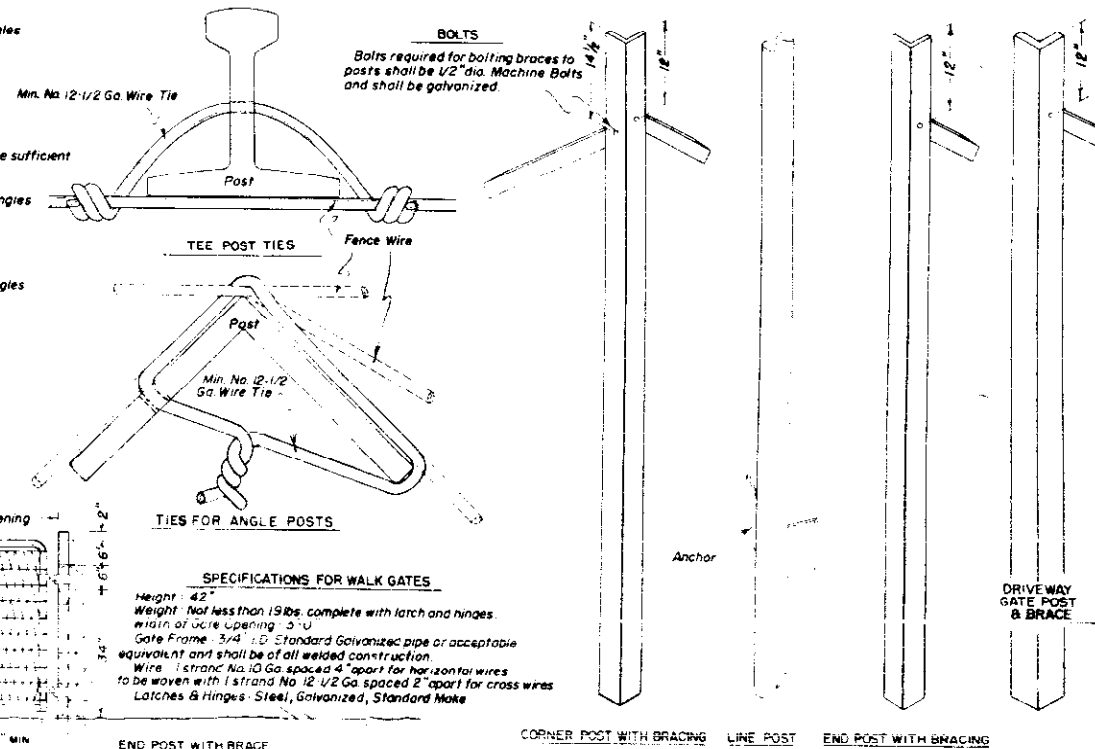
**LINE POSTS -**  
TYPE - Structural Steel "Tees"  
WGT. - 1.4 lbs./lin. ft., Min.  
LENGTH - 6'-6" Min.  
ANCHOR - Securely fastened, with bearing surface sufficient to resist movement of post.

**END POSTS -**  
TYPE - 2-1/2" x 2-1/2" x 1/4" Structural Steel Angles  
WGT. - 4.1 lbs./lin. ft., Min.  
LENGTH - 6'-6" Min.  
NO. BRACES - 1

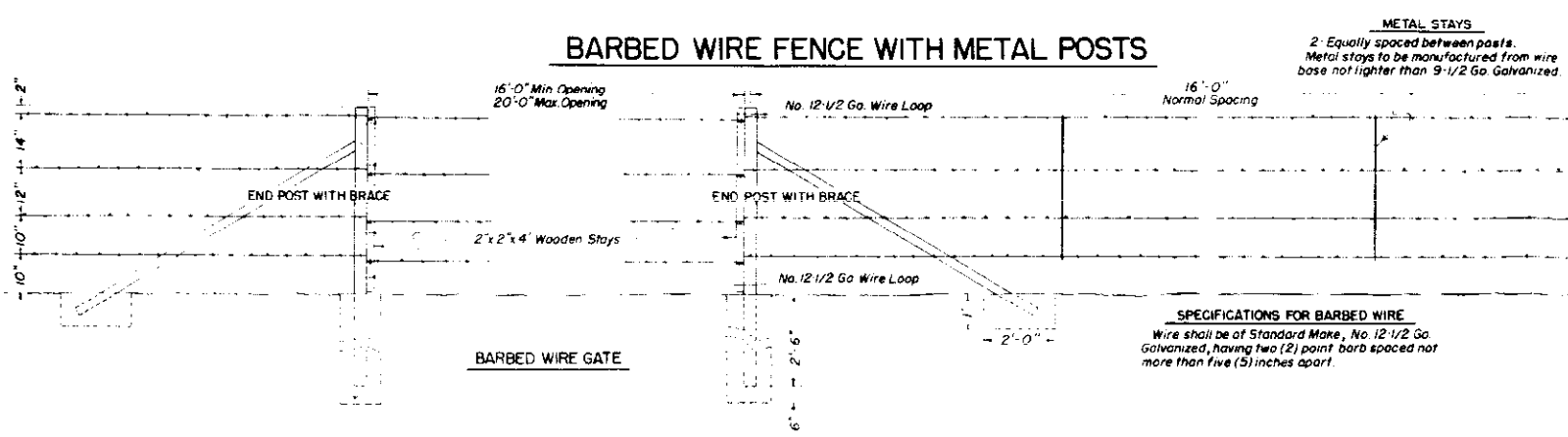
**DRIVEWAY GATE POSTS -**  
TYPE - 2-1/2" x 2-1/2" x 3/8" Structural Steel Angles  
WGT. - 5.9 lbs./lin. ft.  
LENGTH - 6'-6" Min.  
NO. BRACES - 1

**BRACES -**  
TYPE - 2" x 2" x 1/4" Structural Steel Angles  
WGT. - 3.19 lbs./lin. ft.  
LENGTH - Same as corner and end posts used

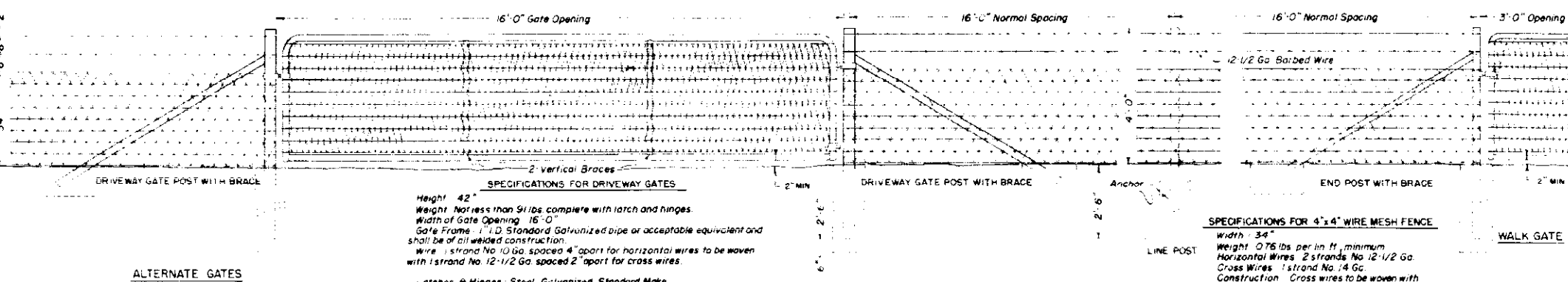
**TEE & ANGLE POST TIES**  
Min. No. 12-1/2 Ga. Galvanized wire or acceptable equivalent.  
Min. 4 lbs. per post for Comb. Wire.  
Min. 1 tie per Barbed Wire per post.



### BARBED WIRE FENCE WITH METAL POSTS



### COMBINATION WIRE FENCE WITH METAL POSTS



**SPECIFICATIONS FOR DRIVEWAY GATES**  
Height - 42"  
Weight - Not less than 9 lbs. complete with latch and hinges.  
Width of Gate Opening - 16'-0"  
Gate Frame - 1" I.D. Standard Galvanized pipe or acceptable equivalent and shall be of all welded construction.  
Wire - 1 strand No. 10 Ga. spaced 4" apart for horizontal wires to be woven with 1 strand No. 12-1/2 Ga. spaced 2" apart for cross wires.  
Latches & Hinges - Steel, Galvanized, Standard Make

**SPECIFICATIONS FOR 4' x 4' WIRE MESH FENCE**  
Width - 34"  
Weight - 0.76 lbs. per lin. ft. minimum  
Horizontal Wires - 2 strands No. 12-1/2 Ga.  
Cross Wires - 1 strand No. 14 Ga.  
Construction - Cross wires to be woven with horizontal wires making a one piece fabric

### General Notes

All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the Project.  
All posts and braces shall be of the types and weights as shown on this sheet or acceptable equivalents. Posts and braces to be of structural steel but dip galvanized or painted with an approved waterproof asphalt or mineral paint. Holes to be provided in end, corner and gate posts as detailed herein.  
Wire mesh used in Combination Wire Fence as shown above shall be galvanized. Wire mesh used in walk & and driveway gates shall be galvanized or painted with an approved waterproof asphalt or mineral paint.  
Fence wire to be placed on either road or field side of posts depending on local conditions. In curves the wire should be placed on side of post which would prevent tension on fence ties. This will also apply where wind drift, tumble weeds or other conditions would exert unusual pressure against the wire.  
In lieu of Galvanized Finish on Gate Frames, Cadmium Plated Pipe or Aluminum Painting with zinc chromate Primer as per specifications will be considered to be equivalent.

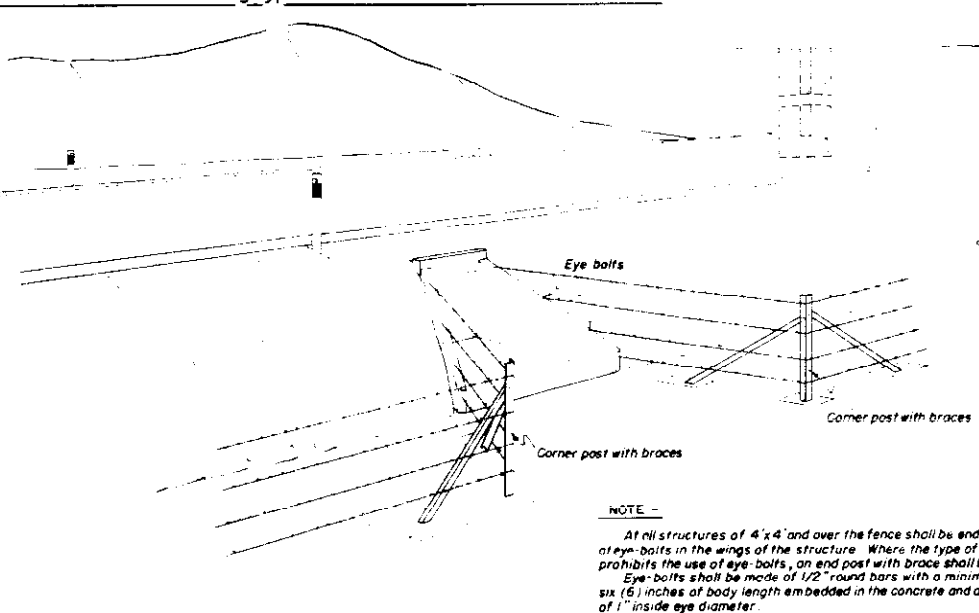
### Typical Installation At Fence Intersections

**NOTE -**  
All footings or bases for corner, end and driveway gate posts shall be of Class "A" Concrete and shall have crowned tops.  
The cost involved shall be included in the bid price for the fence.

### Typical Corner Post Installation

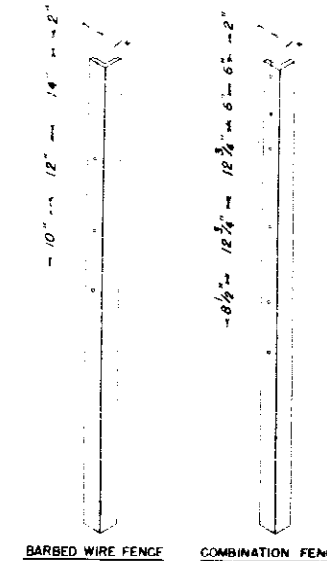
**END, CORNER & GATE POSTS -**  
TYPE - 2-1/2" O.D. Galvanized Tubular Steel  
WGT - 3.65 lbs./lin. ft., Min.  
**BRACES -**  
TYPE - 1-3/8" O.D. Tubular Steel with 2-1/2" Brace Band, Hinge Bolt and 1-3/8" I.D. Rail End, all Galvanized.  
WGT - 1.68 lbs./lin. ft., Min.  
LENGTH - Refer to various lengths indicated on this sheet for End, Corner and Gate Posts, and Braces. Holes for fastening wire to be drilled as indicated elsewhere on this sheet for End, Corner and Gate Posts.

### Pictorial Sketch Showing Typical Fence Installation At Structures



**NOTE -**  
At all structures of 4' x 4' and over the fence shall be ended at eye-bolts in the wings of the structure. Where the type of structure prohibits the use of eye-bolts, an end post with brace shall be used.  
Eye-bolts shall be made of 1/2" round bars with a minimum of six (6) inches of body length embedded in the concrete and a minimum of 1" inside eye diameter.

### Spacing of Holes for Fastening Fence Wire to End, Corner, & Gate Posts



**NOTE -**  
All holes to be 1/4" Diameter. Fence wire to be securely fastened with No. 12-1/2 ga. (Min.) Galvanized Wire bound around fence wire and passed through hole in post.  
Holes may be in either leg of angle post. For convenience, the department will approve the use of angle posts with holes spaced for barbed wire fence on one leg and combination wire fence on the other leg.

**COLORADO**  
DEPARTMENT OF HIGHWAYS  
Standard Wire Fence  
With  
Metal Posts

|                    |                                   |
|--------------------|-----------------------------------|
| Designed by C.G.M. | Approved by <i>W. H. Marshall</i> |
| Made by C.G.M.     | Engineer, Surveys & Plans         |
| Checked by         | Date: Mar 1, 1950                 |

# STANDARD ROADWAY CONSTRUCTION TRAFFIC SIGNS

STANDARD M-29-A

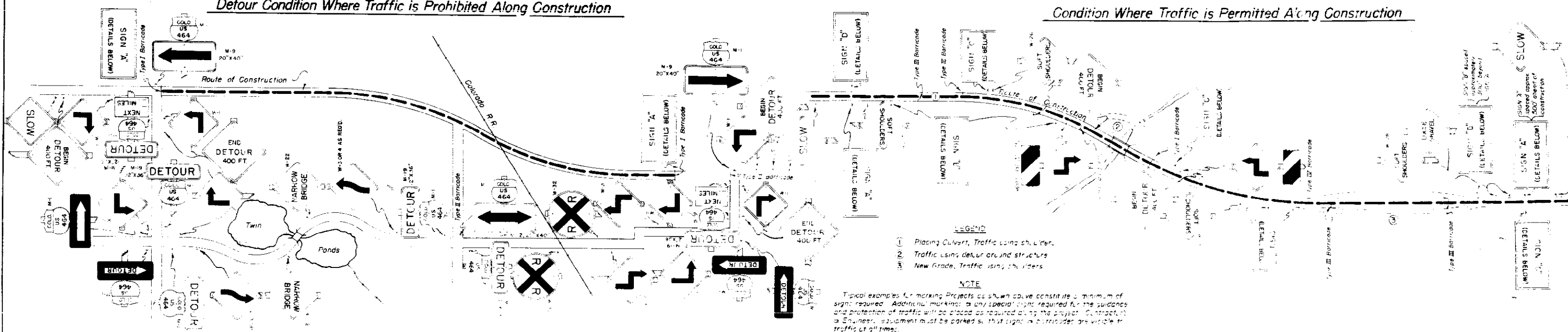
| FED. ROAD DIST. NO. | DISTRICT | PROJECT NO. | SHEET NO. | TOTAL SHEETS |
|---------------------|----------|-------------|-----------|--------------|
| 9                   | COLO.    | 4604/114    | 25        |              |

Rev 11-28-52, J.C.R.  
Rev 4-22-54, Scotchite Specs, J.C.R.

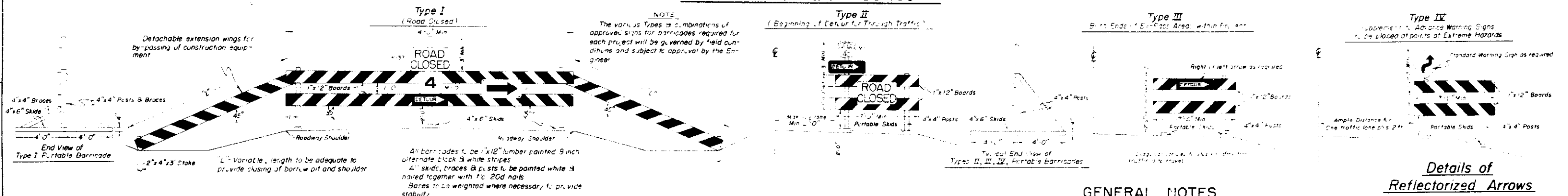
## Typical Methods of Marking Highways & Detours

### Detour Condition Where Traffic is Prohibited Along Construction

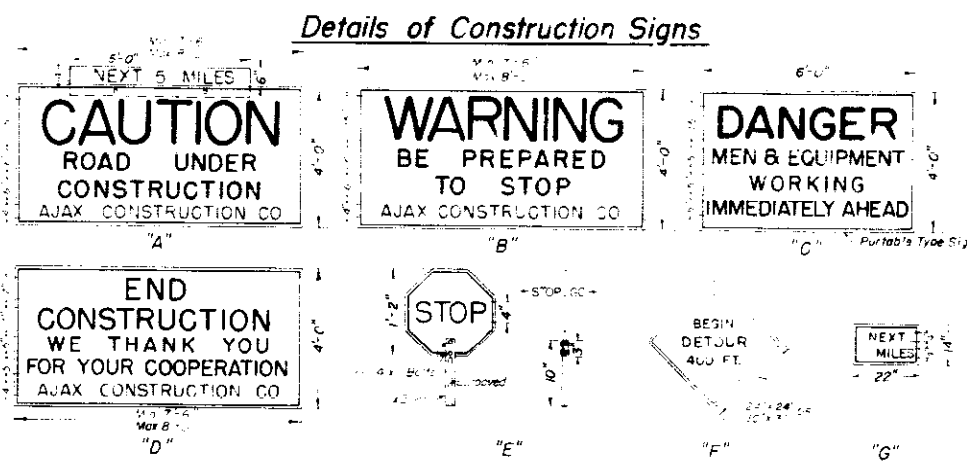
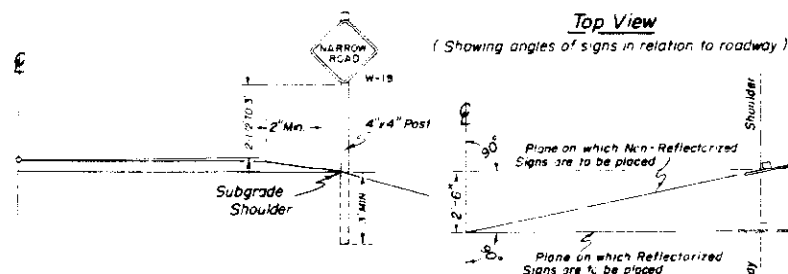
### Condition Where Traffic is Permitted Along Construction



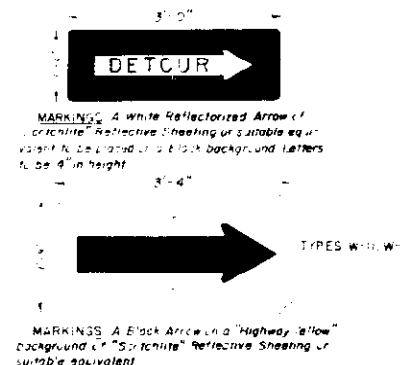
## Details of Barricades



## Position of Signs Relative to Roadbed & Hazards



## Details of Reflectorized Arrows



**COLORADO DEPARTMENT OF HIGHWAYS**

**Standard Roadway Construction Traffic Signs**

Designed by J.C.R.  
Made by J.C.R.  
Checked by

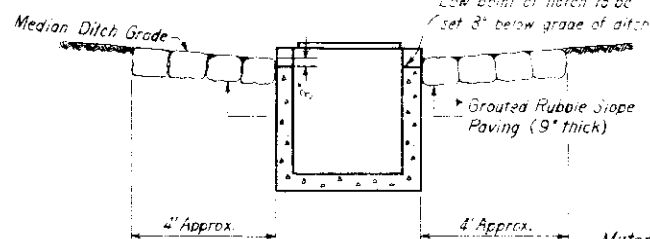
Approved by J.C.R.  
Engineer, Survey & Plans  
Date: October 10, 1952

# STANDARD M-46-A

Rev. P.C. 9-18-52 Added 18" pipe.  
Rev. C.W. 12-5-52 Added Grating Note

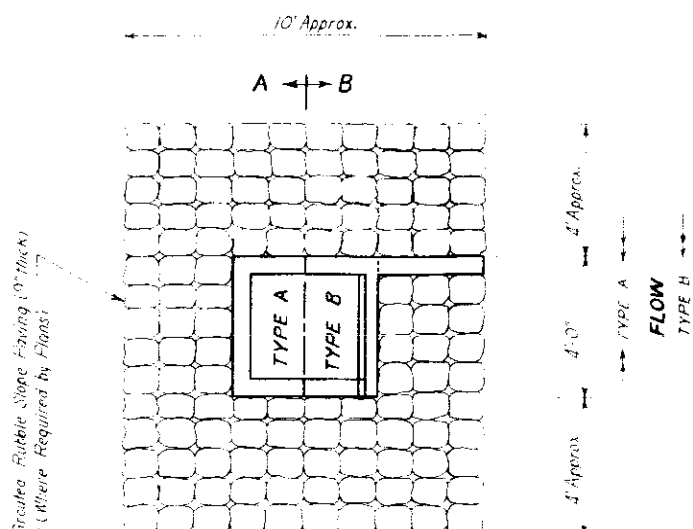
| FED. ROAD DIVISION NO. | DISTRICT | SHEET NO. | TOTAL SHEETS |
|------------------------|----------|-----------|--------------|
| 9                      | COLO.    | INIT 2    | 25           |

## TYPE A FOR USE AT BOTTOM OF VERTICAL CURVE



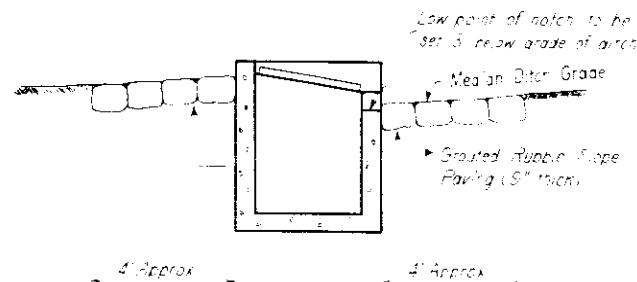
SECT. "A-A"

Materials used in the construction of inlet gratings shall meet with the requirements of Item 48, Structural Steel in the Standard Specifications.



## TYPE B

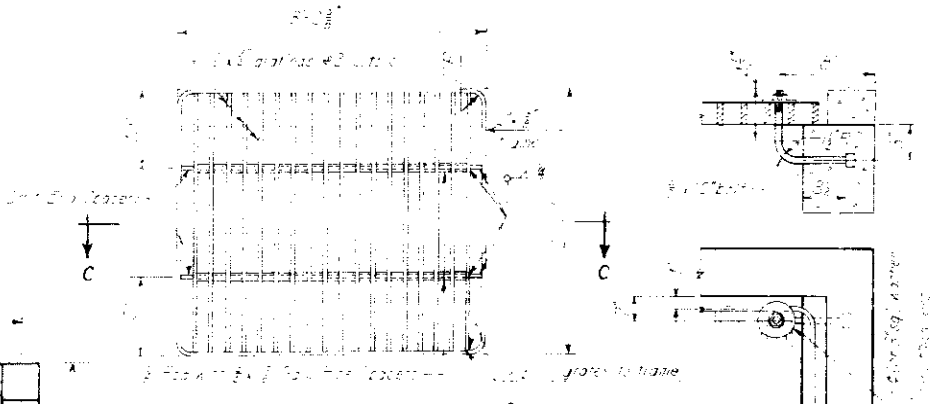
FLOW FROM ONE DIRECTION



SECT. "B-B"

Grating same as for Type A

## LAYOUT OF INLET IN MEDIAN DITCH



DETAIL OF FASTENER  
4 REQ'D FOR EACH INLET

SECT. "C-C"

## DETAIL OF GRATING

### MATERIAL LIST FOR GRATING AND FASTENERS

|                         |         |                |                               |
|-------------------------|---------|----------------|-------------------------------|
| Strap Iron Frame        | 1 pc.   | 4' x 8' x 1/2" | @ 1.55 lb. per ft. = 32.0 lb. |
| Strap Iron Gratings     | 18 pcs. | 2' x 3' x 1/2" | @ 1.55 lb. per ft. = 27.9 lb. |
| Galvanized Pipe Spacers | 54 pcs. | 3/4" x 3/4"    | @ 1.13 lb. per ft. = 61.2 lb. |
| Tie Rods                | 2 pcs.  | 3/4" x 1-1/2"  | @ 1.13 lb. per ft. = 2.3 lb.  |
| Bars                    | 4 pcs.  | 3/4" x 3'      | @ 1.13 lb. per ft. = 4.1 lb.  |
| Washers                 | 4 pcs.  | 3/4" x 3'      | @ 1.25 lb. per ft. = 3.9 lb.  |

Note: Acceptable equivalent Gratings may be substituted after approval by the Engineer.

SECT. "D-D"

## FRONT ELEV.

\*Note for Longitudinal Pipe: 6" minimum between bottom of Inlet Opening and top of Longitudinal Pipe.

## BAR LIST FOR H=4'-0"

| MARK | NO.<br>REQ'D | KIND | TYPE A     |       |       |        | TYPE B     |        |        |        |
|------|--------------|------|------------|-------|-------|--------|------------|--------|--------|--------|
|      |              |      | DIMENSIONS |       |       | LENGTH | DIMENSIONS |        |        | LENGTH |
|      |              |      | M          | N     | O     |        | M          | N      | O      |        |
| 401  | 2            | I    | 3'-5"      | 3'-3" | 3'-3" | 9'-10" | 3'-5"      | 3'-3"  | 4'-5"  | 11'-0" |
| 402  | 2            | I    | 3'-5"      | 3'-6" | 3'-6" | 10'-4" | 3'-5"      | 3'-6"  | 4'-5"  | 11'-3" |
| 403  | 5            | I    | 3'-5"      | 3'-7" | 3'-7" | 10'-7" | 3'-7"      | 3'-5"  | 4'-5"  | 12'-4" |
| 404  | 4            | II   | 3'-7"      | 3'-7" |       | 15'-4" | 3'-8"      | 3'-6"  |        | 15'-4" |
| 405  | 1            | I    |            |       |       |        | 3'-8"      | 3'-7"  | 3'-7"  | 10'-9" |
| 406  | 2            | I    |            |       |       |        | 6'-8"      | 2'-10" | 2'-10" | 6'-3"  |
| 407  | 2            | Str. |            |       |       |        |            |        |        | 1'-7"  |
| 408  | 2            | Str. |            |       |       |        |            |        |        | 1'-5"  |

All reinforcing bars to be 1/2" #.

## QUANTITIES FOR ONE INLET

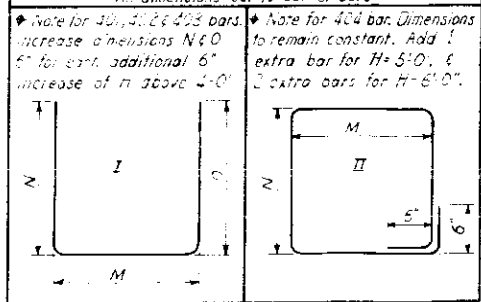
| H     | CLASS A CONCRETE |        | REINFORCING STEEL |        |
|-------|------------------|--------|-------------------|--------|
|       | CU. YDS.         | TYPE A | TYPE B            | TYPE B |
| 4'-0" | 1.18             | 1.49   | 104               | 133    |
| 4'-6" | 1.31             | 1.62   | 110               | 139    |
| 5'-0" | 1.44             | 1.75   | 126               | 155    |
| 5'-6" | 1.56             | 1.88   | 132               | 161    |
| 6'-0" | 1.69             | 2.01   | 149               | 178    |
| 6'-6" | 1.82             | 2.13   | 155               | 194    |

\*includes 1 1/2% for overrun.

\*Volume occupied by pipes to be deducted for pay quantity of concrete.

| SIZE | C.M.P.            | CONC. PIPE        |
|------|-------------------|-------------------|
| 18"  | 0.03 cu. yd. pipe | 0.05 cu. yd. pipe |
| 24"  | 0.06 " " "        | 0.09 " " "        |
| 30"  | 0.09 " " "        | 0.14 " " "        |
| 36"  | 0.13 " " "        | 0.20 " " "        |

## BENDING DIAGRAMS (SAME FOR TYPE A & B)



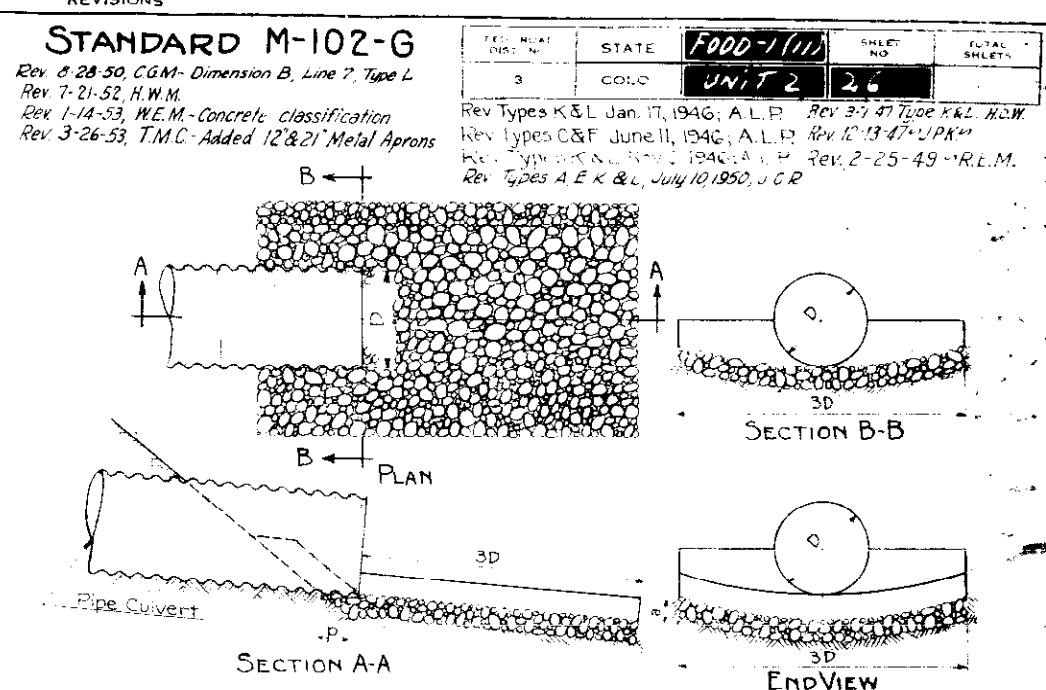
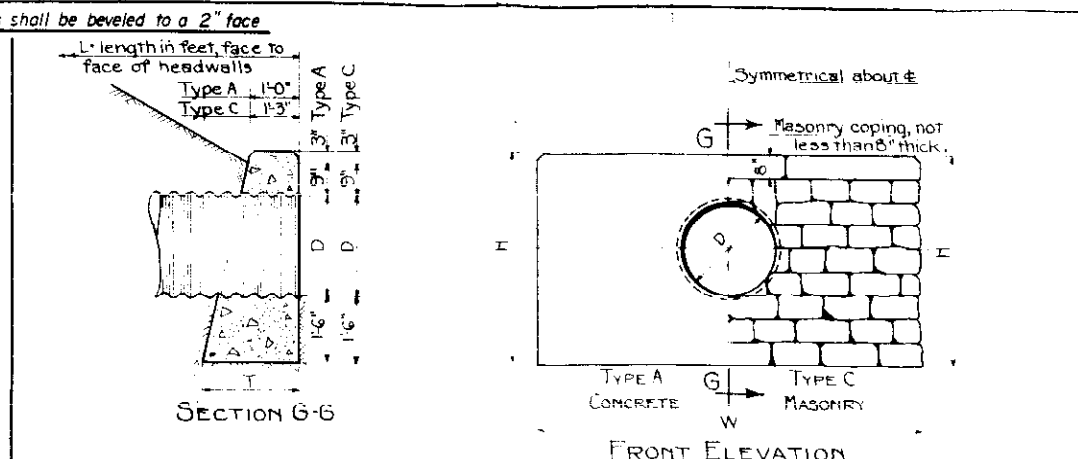
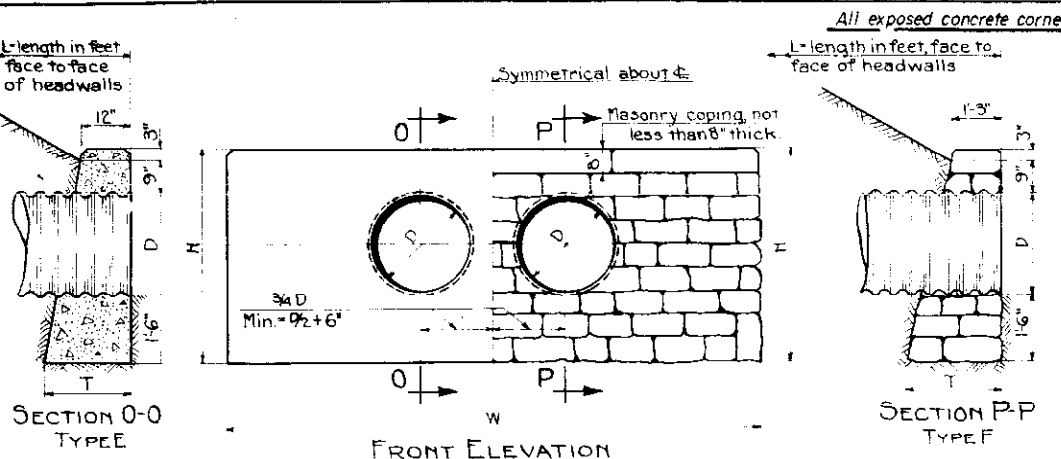
Note: Cut or bend bars to fit around pipes as required

## GENERAL NOTES

All work shall be done according to the Standard Specifications of the Colorado Department of Highways applicable to the project.  
All concrete shall be Class A and air entrained as specified.  
All walls shall have forms on both sides. Reveal on exposed corners to a 1" face.  
All reinforcing bars shall be deformed. If intermediate grades are used, they shall be tagged with the station number and bar designation.  
All reinforcing steel bars shall conform to ASTM specification A305-50T or latest revision thereof.  
All edge distances not marked clear are to the E of the bar.  
Inlet grating to be painted as per specifications for structural steel.

## COLORADO DEPARTMENT OF HIGHWAYS TYPES A & B CONCRETE INLETS FOR MEDIAN DITCH

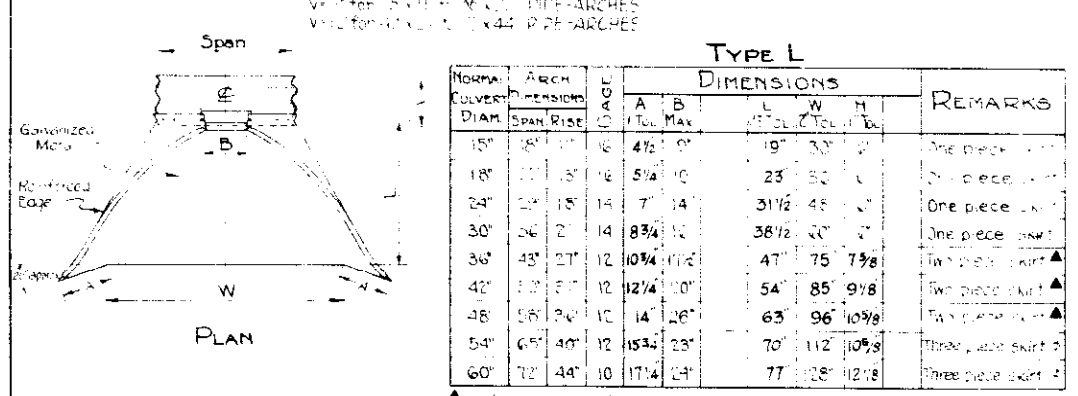
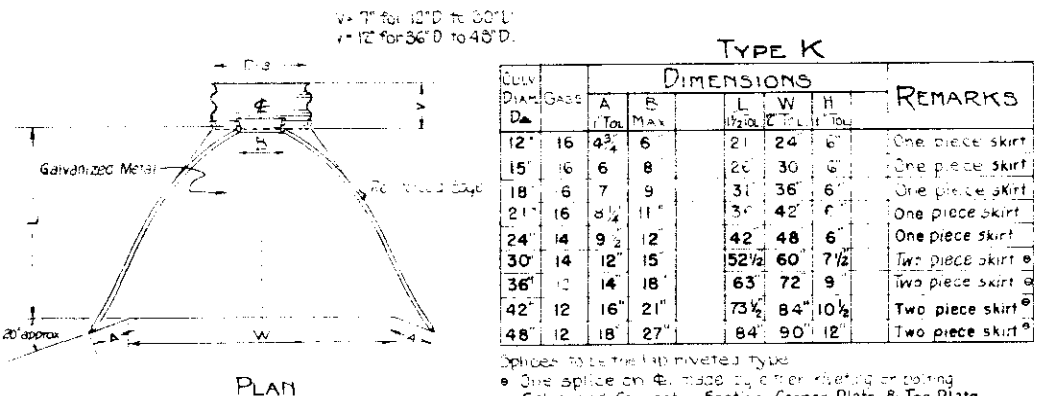
18", 24", 30" and 36" CULVERTS  
Designed by W.M.L. Approved by R. Bailey  
Made by P.C. Bridge Engineer  
Checked by T.C.R. Date: March 1, 1952



# STANDARD HEADWALLS FOR DOUBLE CORRUG. METAL PIPE CULVERTS

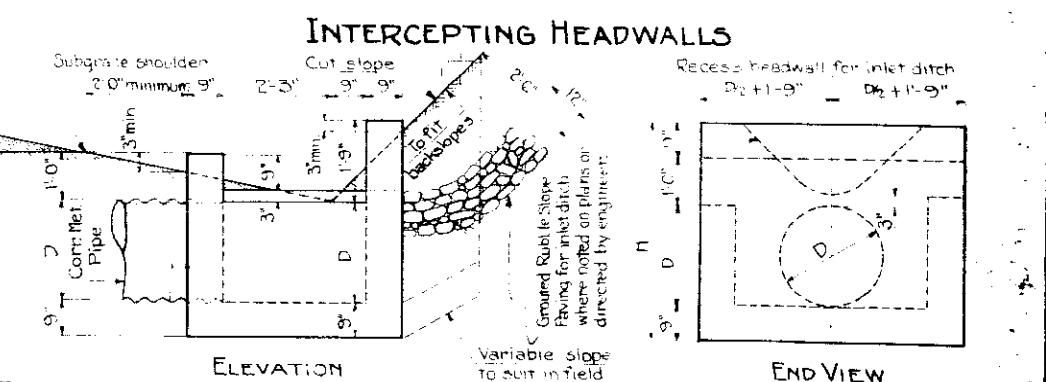
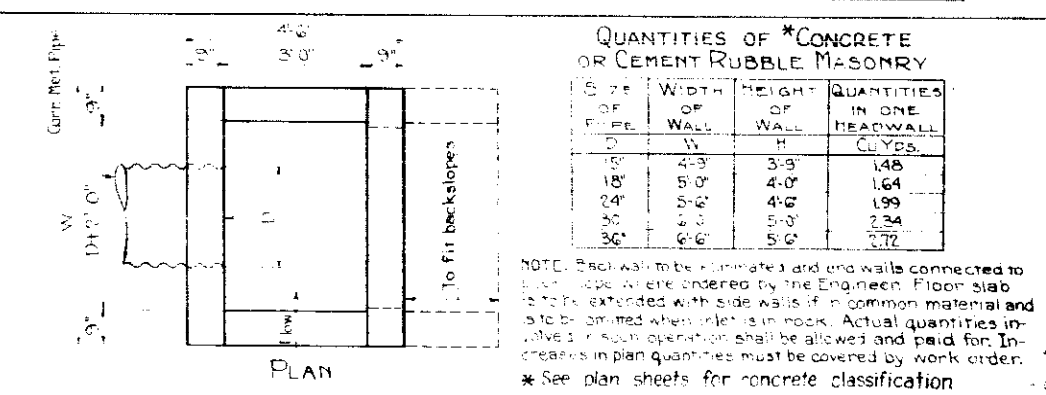
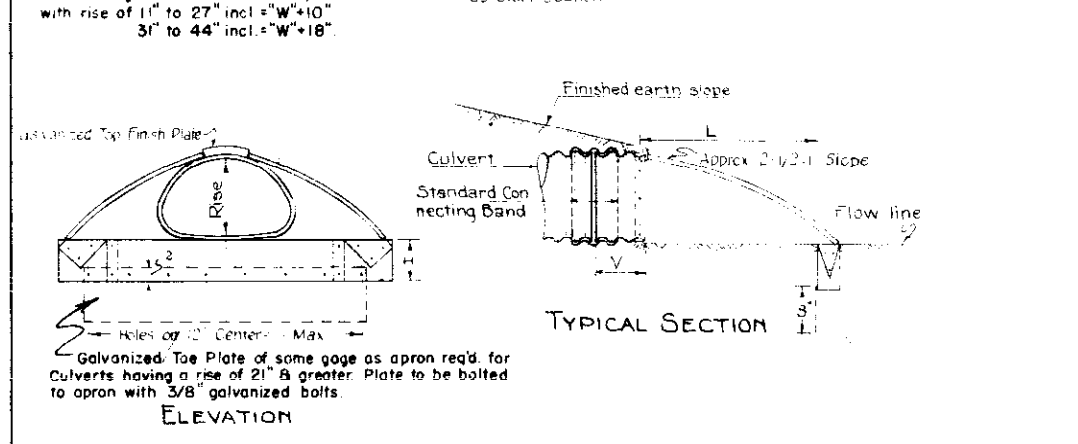
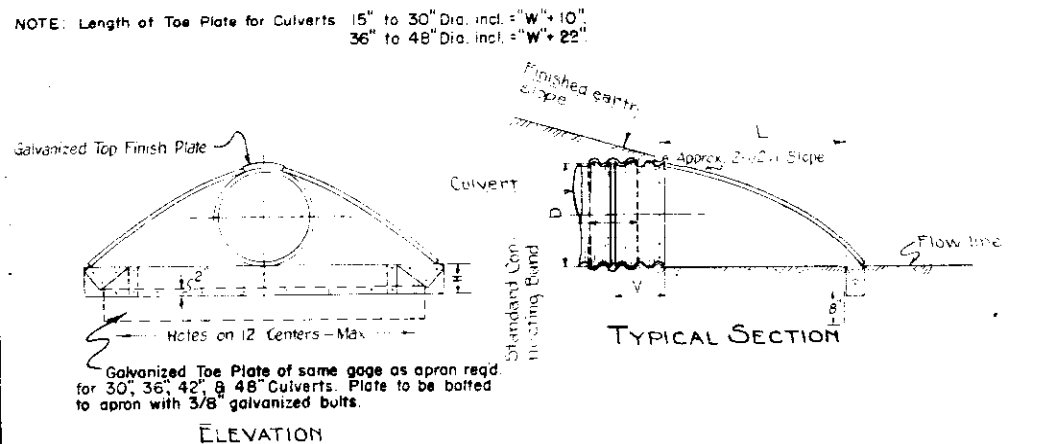
# STANDARD HEADWALLS FOR SINGLE CORRUG. METAL PIPE CULVERTS

# STANDARD GROUTED RUBBLE APRON FOR PIPE CULVERTS



SQUARE YARDS GROUTED RUBBLE SLOPE AND DITCH PAVING 1 FOOT THICK

| SLOPE | 15" | 18" | 24"  | 30"  | 36"  | 42"  | 48"  | 54"  | 60"  | 66"  | 72"  | 78"  | 84"  |
|-------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| 1:1   | 2.0 | 2.4 | 3.0  | 3.6  | 4.2  | 4.8  | 5.4  | 6.0  | 6.6  | 7.2  | 7.8  | 8.4  | 9.0  |
| 2:1   | 4.0 | 4.8 | 6.0  | 7.2  | 8.4  | 9.6  | 10.8 | 12.0 | 13.2 | 14.4 | 15.6 | 16.8 | 18.0 |
| 3:1   | 6.0 | 7.2 | 9.0  | 10.8 | 12.6 | 14.4 | 16.2 | 18.0 | 19.8 | 21.6 | 23.4 | 25.2 | 27.0 |
| 4:1   | 8.0 | 9.6 | 12.0 | 14.4 | 16.8 | 19.2 | 21.6 | 24.0 | 26.4 | 28.8 | 31.2 | 33.6 | 36.0 |



**COLORADO**

DEPARTMENT OF HIGHWAYS

STANDARD HEADWALLS

INTERCEPTING HEADWALLS

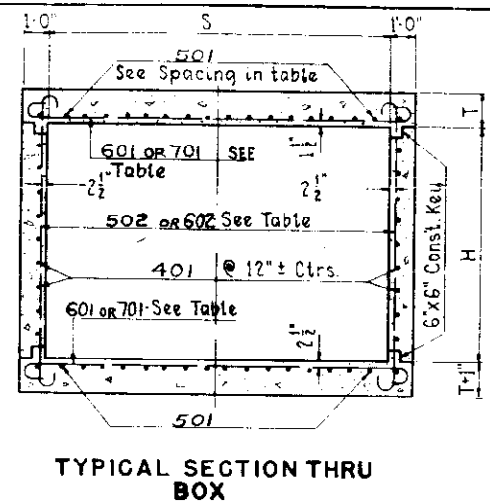
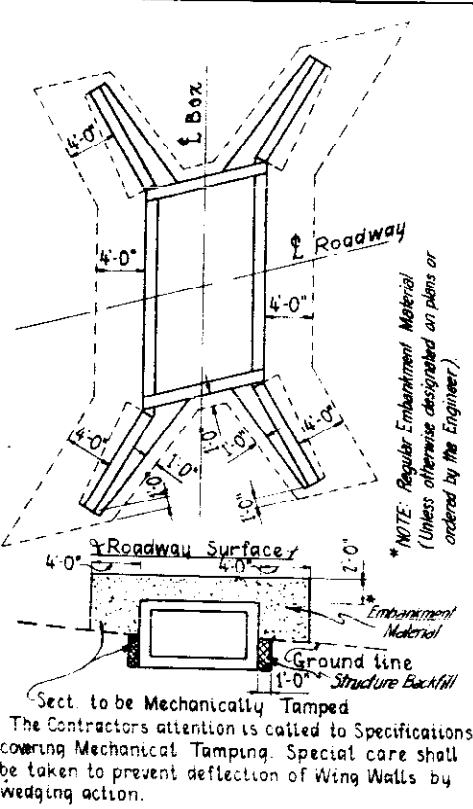
GALVANIZED METAL APRONS

GROUTED RUBBLE APRONS

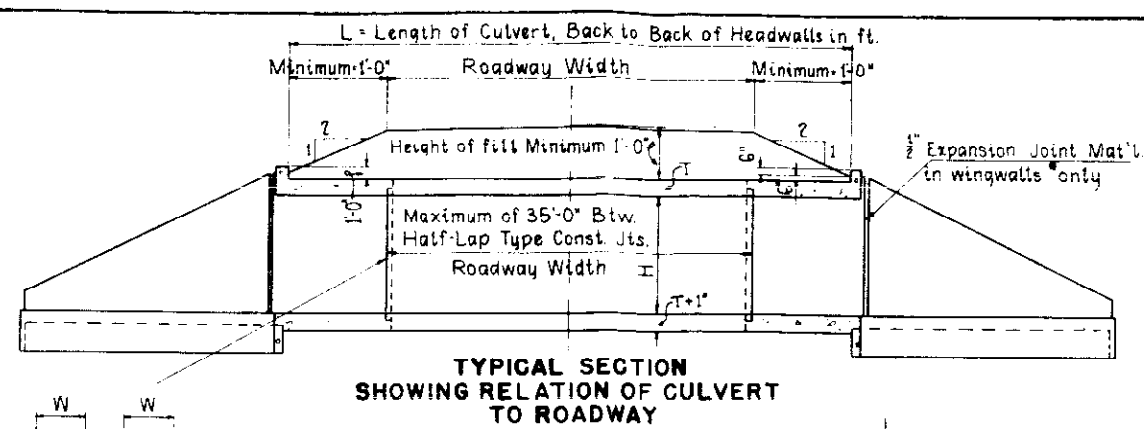
FOR CORR. MET. PIPE CULVERTS

Designed by P.B.G. Approved by C.W. B. Bridge Engineer

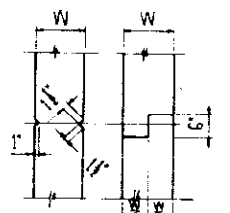
Made by A.L.P. Checked by H.W.P. Date December 15, 1945



TYPICAL SECTION THRU BOX

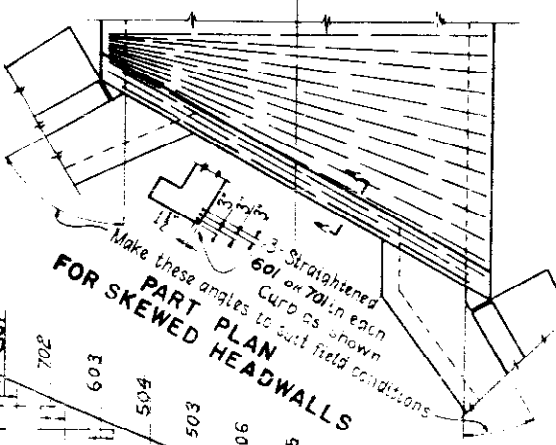


TYPICAL SECTION SHOWING RELATION OF CULVERT TO ROADWAY

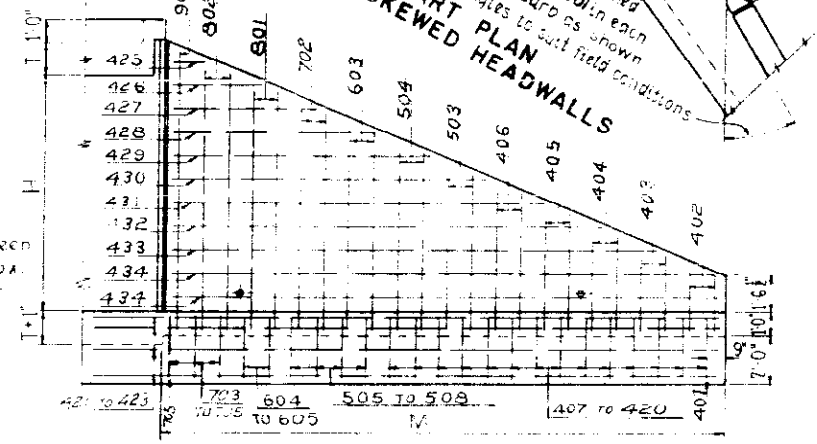


HALF-LAP TYPE CONSTRUCTION JOINT & ALTERNATE JOINT

At the ends of skewed boxes, the field shall fan 601 or 701 shown with alternate bars bearing on walls.

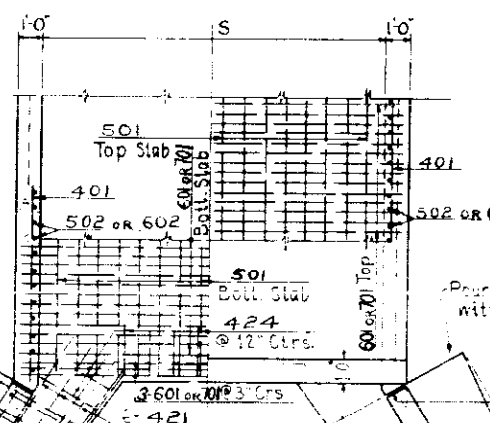


PART PLAN FOR SKEWED HEADWALLS

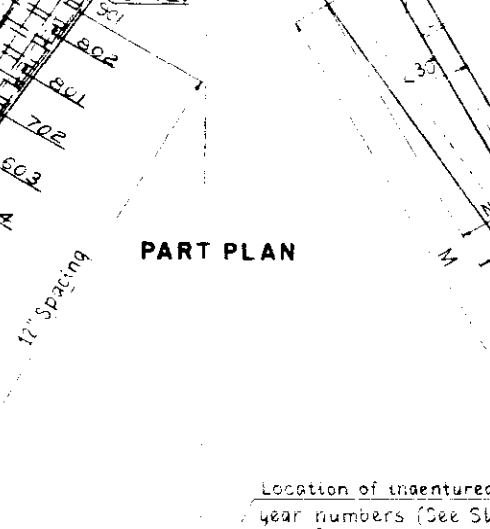


TRUE ELEVATION OF WINGWALL

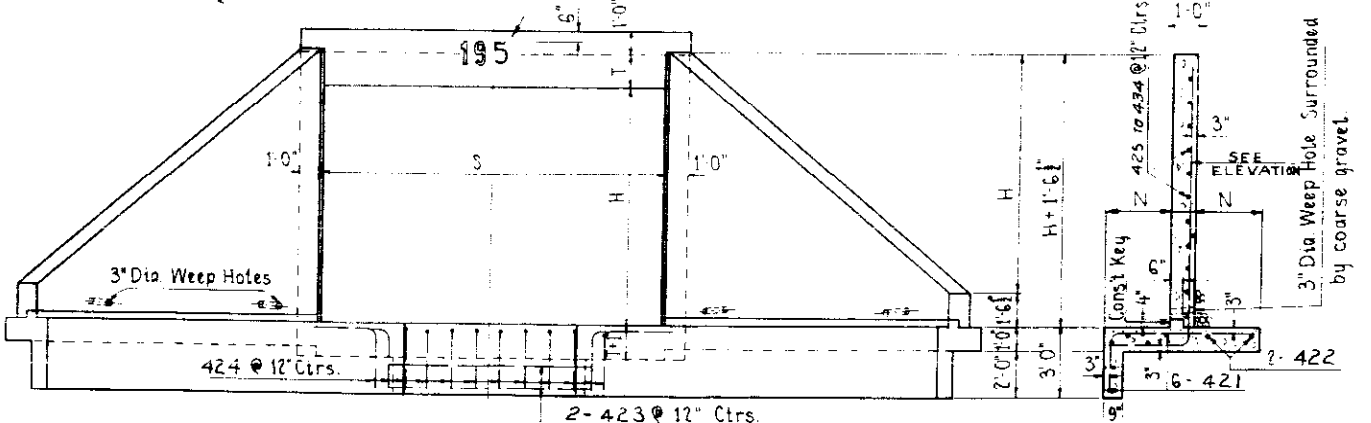
MECHANICALLY TAMPED BACKFILL



PART PLAN



END ELEVATION



TYPICAL SECTION THRU WINGWALL

REINFORCEMENT BAR LIST

| Use Bars For          | Mark | Size | No. Req'd   | Dimensions | Total Length | Type |
|-----------------------|------|------|-------------|------------|--------------|------|
| All Sizes             | 501  | 3/4" | See Table   | B          | L + 1'-7"    | I    |
| See table             | 601  | 3/4" | 24 (1) + 12 | 8'-1'-7"   | 8'-1'-7"     | II   |
| do                    | 701  | 3/4" | Spacing     | 5'-1'-7"   | 5'-1'-8"     | II   |
| do                    | 502  | 3/4" | 24 (1) + 12 | H + 2'-4"  | H + 1'-2"    | II   |
| do                    | 602  | 3/4" | Spacing     | H + 2'-4"  | H + 1'-2"    | II   |
| All Sizes             | 401  | 1/2" | 2 (H + 1)   |            | L + 1'-8"    | I    |
| do                    | 402  | 1/2" | 8           | 1'-8"      | 3'-0"        | I    |
| do                    | 403  | 1/2" | 8           | 2'-6"      | 4'-0"        | II   |
| do                    | 404  | 1/2" | 8           | 3'-4"      | 5'-0"        | II   |
| do                    | 405  | 1/2" | 8           | 4'-3"      | 6'-2"        | II   |
| do                    | 406  | 1/2" | 8           | 5'-2"      | 7'-3"        | II   |
| H + 8'-0" over        | 503  | 3/4" | 8           | 6'-1"      | 8'-4"        | II   |
| do                    | 504  | 3/4" | 8           | 7'-0"      | 9'-6"        | II   |
| H + 8'-0" over        | 603  | 3/4" | 8           | 7'-10"     | 10'-6"       | II   |
| do                    | 702  | 3/4" | 8           | 8'-8"      | 11'-6"       | II   |
| H + 10'-0" over       | 501  | 3/4" | 8           | 9'-7"      | 12'-7"       | II   |
| do                    | 602  | 3/4" | 8           | 10'-6"     | 13'-9"       | II   |
| do                    | 701  | 3/4" | 4           | 11'-4"     | 14'-9"       | II   |
| All Sizes             | 407  | 1/2" | 4           | 1'-7"      | 3'-11"       | II   |
| do                    | 408  | 1/2" | 4           | 1'-4"      | 2'-0"        | II   |
| do                    | 409  | 1/2" | 4           | 1'-6"      | 2'-0"        | II   |
| do                    | 410  | 1/2" | 4           | 1'-9"      | 2'-0"        | II   |
| do                    | 411  | 1/2" | 4           | 1'-11"     | 2'-0"        | II   |
| do                    | 412  | 1/2" | 4           | 2'-1"      | 2'-0"        | II   |
| do                    | 413  | 1/2" | 4           | 2'-3"      | 2'-0"        | II   |
| do                    | 414  | 1/2" | 4           | 2'-5"      | 2'-0"        | II   |
| do                    | 415  | 1/2" | 4           | 2'-8"      | 2'-0"        | II   |
| H + 6'-0" over        | 416  | 1/2" | 4           | 2'-10"     | 2'-0"        | II   |
| do                    | 417  | 1/2" | 4           | 3'-0"      | 2'-0"        | II   |
| do                    | 418  | 1/2" | 4           | 3'-3"      | 2'-0"        | II   |
| do                    | 419  | 1/2" | 4           | 3'-5"      | 2'-0"        | II   |
| do                    | 420  | 1/2" | 4           | 3'-7"      | 2'-0"        | II   |
| H + 8'-0" over        | 505  | 3/4" | 4           | 3'-9"      | 2'-0"        | II   |
| do                    | 506  | 3/4" | 4           | 4'-0"      | 2'-0"        | II   |
| do                    | 507  | 3/4" | 4           | 4'-2"      | 2'-0"        | II   |
| do                    | 508  | 3/4" | 4           | 4'-4"      | 2'-0"        | II   |
| H + 10'-0"            | 604  | 3/4" | 4           | 4'-6"      | 2'-0"        | II   |
| do                    | 605  | 3/4" | 4           | 4'-9"      | 2'-0"        | II   |
| do                    | 703  | 3/4" | 4           | 4'-11"     | 2'-0"        | II   |
| do                    | 704  | 3/4" | 4           | 5'-1"      | 2'-0"        | II   |
| do                    | 705  | 3/4" | 4           | 5'-3"      | 2'-0"        | II   |
| All Sizes             | 421  | 1/2" | 24          |            | M + 3'-0"    | I    |
| do                    | 422  | 1/2" | 8           |            | M - 6"       | I    |
| do                    | 423  | 1/2" | 4           |            | S - 2'-0"    | I    |
| do                    | 424  | 1/2" | 4 + 10      | 2'-1"      | 2'-0"        | II   |
| do                    | 425  | 1/2" | 4           |            | 1'-8"        | I    |
| do                    | 426  | 1/2" | 4           |            | 3'-11"       | I    |
| do                    | 427  | 1/2" | 4           |            | 6'-3"        | I    |
| H + 4'-0" (See Note)  | 428  | 1/2" | 4           | 2'-428     | 8'-7"        | I    |
| H + 6'-0" over        | 429  | 1/2" | 4           |            | 10'-10"      | I    |
| H + 8'-0" (See Note)  | 430  | 1/2" | 4           | 8'-430     | 13'-2"       | I    |
| H + 10'-0" over       | 431  | 1/2" | 4           |            | 15'-6"       | I    |
| H + 12'-0" (See Note) | 432  | 1/2" | 4           | 8'-432     | 17'-9"       | I    |
| H + 14'-0" over       | 433  | 1/2" | 4           |            | 20'-0"       | I    |
| do                    | 434  | 1/2" | 4           |            | 22'-6"       | I    |

Bending Diagrams  
Dimensions are out to out of bar

TYPE I

Straight  
Length

TYPE II

B

B  
Rad. 6"

TYPE III

LOADING DATA

LIVE LOAD = AASHO. HS20-44  
DEAD LOAD = Concrete 150#/cu.ft.  
Earth 70% of 120#/cu.ft. Vertical

DESIGNING DATA

5. 20,000 Lbs Per Sq. In.  
6. 1,000 Lbs Per Sq. In.  
7. 10

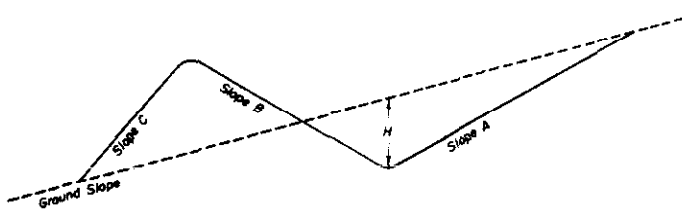
STANDARD TYPES of DITCHES and CONSTRUCTION METHODS

STANDARD M-107-C

|                        |          |            |           |              |
|------------------------|----------|------------|-----------|--------------|
| 1411 ROAD DIVISION NO. | DISTRICT | F000-1(11) | SHEET NO. | TOTAL SHEETS |
| 9.                     | COLO.    | UNIT 2     | 29        |              |

DETAILS for CONTOUR INTERCEPTING DITCHES

Typical Section for Contour Intercepting Ditches



PURPOSE & USE OF THE TABLE

The primary purpose of the information for Contour and Intercepting Ditches shown on this sheet is to serve as a guide in construction and to readily arrive at yardages of excavation involved. Foremost consideration in constructing these ditches is given first to the natural ground line slope confronted in construction, thence to the other values shown on the Typical Section. By properly arriving at the combination of values shown on the Typical Section and in the Table for a specified condition, the number of cubic yards of excavation per 100 lin. ft. of ditch may be read under the appropriate column for this item.

Typical Construction Layouts

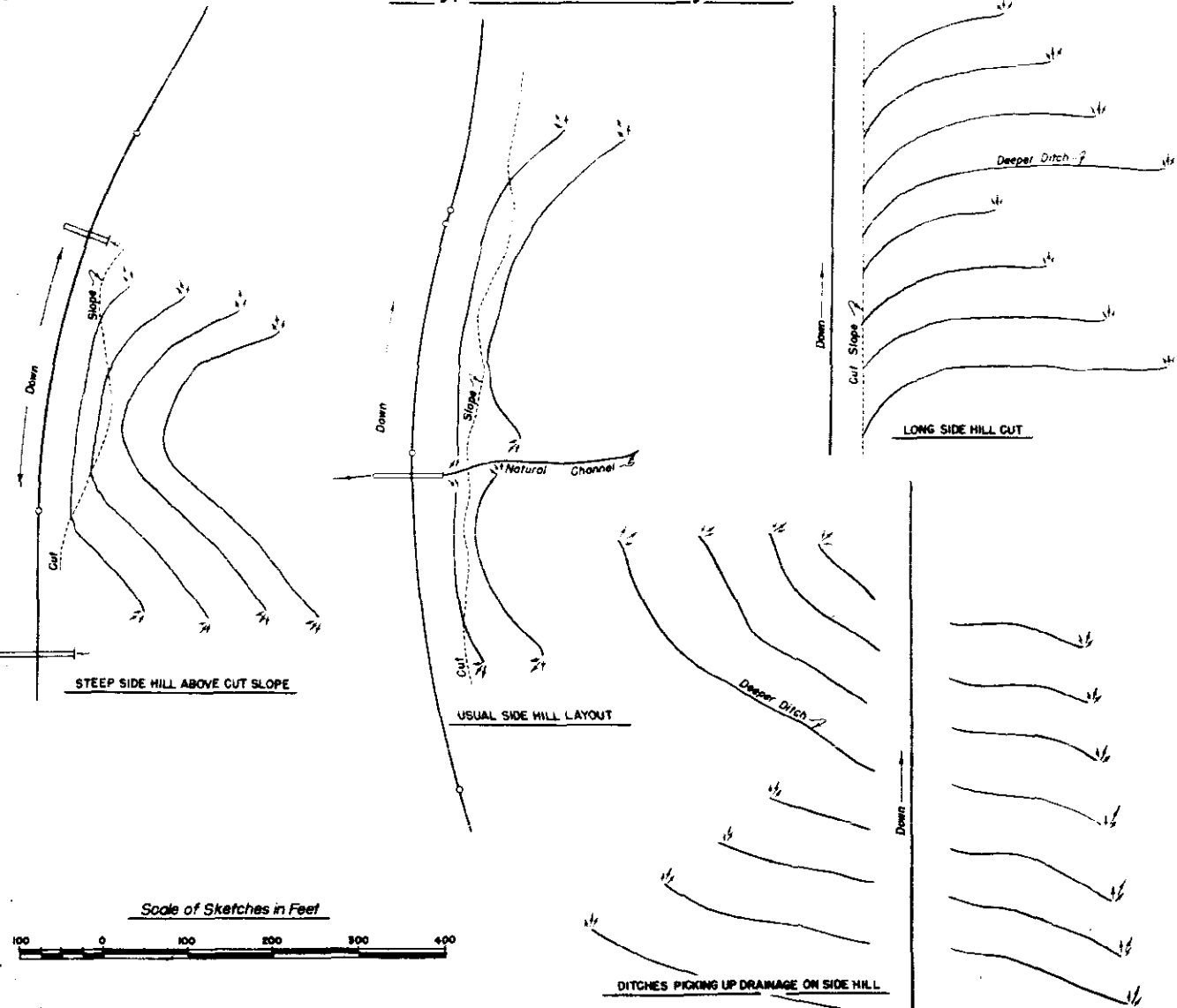
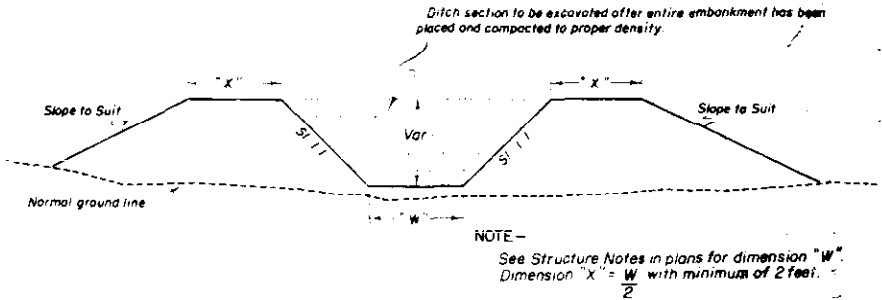


Table of Slopes and Yardages

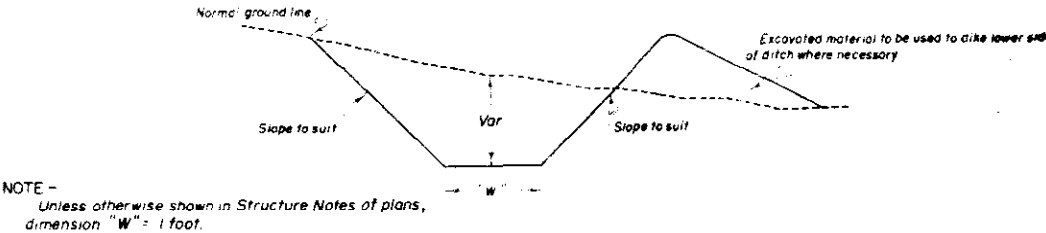
| SLOPES            |         |         |         | H   | Cubic Yards per 100 lin. ft. of Ditch |
|-------------------|---------|---------|---------|-----|---------------------------------------|
| Ground            | A       | B       | C       |     |                                       |
| 5:1<br>Or Flatter | 2:1     | 4:1     | 2:1     | 15" | 16                                    |
|                   |         |         |         | 18" | 23                                    |
|                   |         |         |         | 21" | 32                                    |
|                   |         | 3:1     | 2:1     | 15" | 15                                    |
|                   |         |         |         | 18" | 22                                    |
|                   |         |         |         | 21" | 30                                    |
|                   | 1-1/2:1 | 2:1     | 2:1     | 15" | 14                                    |
|                   |         |         |         | 18" | 20                                    |
|                   |         |         |         | 21" | 27                                    |
|                   |         | 1-1/2:1 | 1-1/2:1 | 15" | 13                                    |
|                   |         |         |         | 18" | 19                                    |
|                   |         |         |         | 21" | 25                                    |
| 4:1               | 2:1     | 4:1     | 2:1     | 15" | 12                                    |
|                   |         |         |         | 18" | 18                                    |
|                   |         |         |         | 21" | 25                                    |
|                   |         | 3:1     | 2:1     | 15" | 12                                    |
|                   |         |         |         | 18" | 17                                    |
|                   |         |         |         | 21" | 23                                    |
|                   | 1-1/2:1 | 2:1     | 2:1     | 15" | 10                                    |
|                   |         |         |         | 18" | 15                                    |
|                   |         |         |         | 21" | 20                                    |
|                   |         | 1-1/2:1 | 1-1/2:1 | 15" | 10                                    |
|                   |         |         |         | 18" | 14                                    |
|                   |         |         |         | 21" | 19                                    |
| 3:1               | 2:1     | 4:1     | 2:1     | 15" | 17                                    |
|                   |         |         |         | 18" | 25                                    |
|                   |         |         |         | 21" | 34                                    |
|                   |         | 3:1     | 2:1     | 15" | 17                                    |
|                   |         |         |         | 18" | 24                                    |
|                   |         |         |         | 21" | 32                                    |
|                   | 1-1/2:1 | 2:1     | 2:1     | 15" | 15                                    |
|                   |         |         |         | 18" | 22                                    |
|                   |         |         |         | 21" | 30                                    |
|                   |         | 1-1/2:1 | 1-1/2:1 | 15" | 15                                    |
|                   |         |         |         | 18" | 21                                    |
|                   |         |         |         | 21" | 29                                    |
| 2:1               | 1-1/2:1 | 4:1     | 1-1/2:1 | 15" | 13                                    |
|                   |         |         |         | 18" | 18                                    |
|                   |         |         |         | 21" | 25                                    |
|                   |         | 3:1     | 1-1/2:1 | 15" | 12                                    |
|                   |         |         |         | 18" | 17                                    |
|                   |         |         |         | 21" | 23                                    |
|                   | 1-1/2:1 | 2:1     | 1-1/2:1 | 15" | 11                                    |
|                   |         |         |         | 18" | 16                                    |
|                   |         |         |         | 21" | 21                                    |
|                   |         | 1-1/2:1 | 1-1/2:1 | 15" | 10                                    |
|                   |         |         |         | 18" | 14                                    |
|                   |         |         |         | 21" | 20                                    |
| 1-1/2:1           | 1:1     | 2:1     | 1:1     | 15" | 22                                    |
|                   |         |         |         | 18" | 31                                    |
|                   |         |         |         | 21" | 43                                    |
|                   |         | 1-1/2:1 | 1:1     | 15" | 21                                    |
|                   |         |         |         | 18" | 30                                    |
|                   |         |         |         | 21" | 41                                    |
|                   | 1-1/2:1 | 1:1     | 1:1     | 15" | 20                                    |
|                   |         |         |         | 18" | 29                                    |
|                   |         |         |         | 21" | 40                                    |
|                   |         | 1-1/2:1 | 1:1     | 15" | 13                                    |
|                   |         |         |         | 18" | 19                                    |
|                   |         |         |         | 21" | 26                                    |
| 1:1               | 1:1     | 1:1     | 1:1     | 15" | 12                                    |
|                   |         |         |         | 18" | 17                                    |
|                   |         |         |         | 21" | 24                                    |
|                   |         | 1:1     | 1:1     | 15" | 12                                    |
|                   |         |         |         | 18" | 17                                    |
|                   |         |         |         | 21" | 24                                    |
|                   | 1:1     | 1:1     | 1:1     | 15" | 9                                     |
|                   |         |         |         | 18" | 13                                    |
|                   |         |         |         | 21" | 17                                    |
|                   |         | 1:1     | 1:1     | 15" | 8                                     |
|                   |         |         |         | 18" | 12                                    |
|                   |         |         |         | 21" | 16                                    |
| 1:1               | 1:1     | 1:1     | 1:1     | 15" | 11                                    |
|                   |         |         |         | 18" | 16                                    |
|                   |         |         |         | 21" | 21                                    |

Slopes are approximate and may be varied to suit conditions encountered during construction.

TYPICAL SECTIONS for DRAINAGE, IRRIGATION DITCHES and CHANNEL CHANGES



For Embankment Sections  
(Generally for use in Irrigation Ditches & Channel Changes)



For Cut Sections

GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado State Highway Department applicable to the Project.

All ditches are to be constructed to lines and grades as staked by the Engineer using the ditch section shown on plans or as ordered by the Engineer.

CONTOUR INTERCEPTING DITCHES: Ditches are to be laid out along the ground contour on a grade of not over 1% (Type of soil shall govern the grade.)

Ends of ditches are to be lined up so that concentration of flow from a higher contour ditch into one of lower contour is, as far as possible avoided. The use of a deeper ditch is recommended where this condition is encountered.

The following horizontal spacing of ditches is recommended:

|                      |                           |
|----------------------|---------------------------|
| 4% to 6%             | Approximately 70' Centers |
| 8% to 10%            | Approximately 60' Centers |
| 20% to 4:1 Slope     | Approximately 55' Centers |
| 30% to 1-1/2:1 Slope | Approximately 50' Centers |

Where ditch checks are required the intervening ditch between one set of ditch checks shall not exceed a grade of 1.0%. Details of checks will be shown on plans when required.

**COLORADO**  
STATE HIGHWAY DEPARTMENT

Standard Types of Ditches  
and  
Construction Methods

Designed by C.G.M.  
Made by C.G.M.  
Checked by

Approved by *[Signature]*  
Engineer, Surveys & Plans  
Date: Aug. 18, 1950

# STANDARD C.M.P. SIPHON with METAL APRONS for INLETS & OUTLETS

STANDARD M-124-A

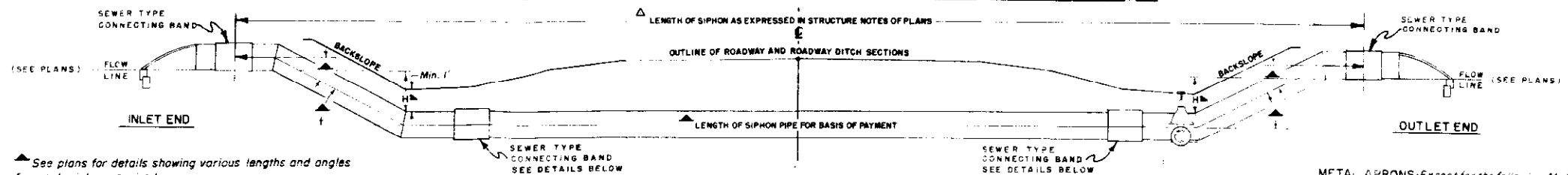
| FAIR ROAD DIVISION NO. | DISTRICT | UNIT   | SHEET NO. | TOTAL SHEETS |
|------------------------|----------|--------|-----------|--------------|
| 9                      | COLO     | UNIT 2 | 29        |              |

Rev. 8-10-51, C.G.M., Added "H" Dimension, Note, and Flow Line to Cross Sectional View.  
Rev. 9-5-52 J.C.R., Revised Connecting Bands  
Rev. 3-9-53, T.M., Revised Quantities and Table of Dimensions

## BOLTING

Trash guard to be shop fitted to apron after guard and apron are fabricated.

## Cross Sectional View Showing Typical Relationship of Siphon to Roadway



- See plans for details showing various lengths and angles for each siphon required.
- A tolerance of 2"± will be permitted in angles of sections of pipe to be fabricated.
- See plans for "H" value at inlet and outlet for each siphon.

## CONNECTING BAND NOTES:

- Rivet siphon pipe complete, standard practice, then flatten outside rivet heads to 1/8"± (See detail this sheet)
- Roll band sheet to one inch larger diameter than siphon pipe. Deform to fit struted pipe shape.
- Before installing band, paint inside of asphalt coated band and outside of asphalt coated siphon pipe with kerosene or distillate as this makes them slippery and allows the band to be pulled up tight.
- Use sewer type connecting bands, corrugations of connecting bands must mesh with corrugations of metal siphon pipe.

A maximum tolerance of 4 inches will be allowed in total length of siphon.

## QUANTITIES FOR CONNECTING BANDS

| PIPE DIA. | 1-PIECE BAND SHEET LENGTH | 1-PIECE BAND NOMINAL LAP | 1-PIECE ROD LENGTH |
|-----------|---------------------------|--------------------------|--------------------|
| 8"        | 31"                       | 3"                       | 3'-3"              |
| 10"       | 38"                       | 3"                       | 3'-10"             |
| 12"       | 44"                       | 3"                       | 4'-4"              |
| 15"       | 56"                       | 5/2"                     | 5'-1"              |
| 18"       | 66"                       | 6"                       | 5'-11"             |
| 21"       | 76"                       | 6"                       | 6'-8"              |
| 24"       | 86"                       | 6"                       | 7'-6"              |
| 30"       | 104"                      | 6"                       | 9'-0"              |
| 36"       | 123"                      | 6"                       | 10'-8"             |
| 42"       | 143"                      | 6"                       | 12'-3"             |

\* Rod length computed for Std. 3" Lug

## PLAN QUANTITIES FOR ONE SIPHON

| DIAMETER OF SIPHON | Item 55 CORR METAL SIPHON PIPE LIN. FT. | Item 85 TRASH GUARD EACH | Item 95 METAL APRONS FOR C.M.P. CULVITS EACH | Item 110P METAL DRAIN PIPE LIN. FT. | Item 110V CAST IRON VALVE & VALVE BOX EACH |
|--------------------|-----------------------------------------|--------------------------|----------------------------------------------|-------------------------------------|--------------------------------------------|
| 12"                | 16 Ga. as req'd                         | 2-32 lbs. Each           | 2-12"                                        | 2" dia as req'd                     | 1-2"                                       |
| 15"                | 16 Ga. as req'd                         | 2-46 lbs. Each           | 2-15"                                        | 2" dia as req'd                     | 1-2"                                       |
| 18"                | 16 Ga. as req'd                         | 2-62 lbs. Each           | 2-18"                                        | 4" dia as req'd                     | 1-4"                                       |
| 21"                | 16 Ga. as req'd                         | 2-74 lbs. Each           | 2-21"                                        | 4" dia as req'd                     | 1-4"                                       |
| 24"                | 14 Ga. as req'd                         | 2-98 lbs. Each           | 2-24"                                        | 4" dia as req'd                     | 1-4"                                       |
| 30"                | 14 Ga. as req'd                         | 2-130 lbs. Each          | 2-30"                                        | 6" dia as req'd                     | 1-6"                                       |
| 36"                | 12 Ga. as req'd                         | 2-187 lbs. Each          | 2-36"                                        | 6" dia as req'd                     | 1-6"                                       |
| 42"                | 12 Ga. as req'd                         | 2-229 lbs. Each          | 2-42"                                        | 6" dia as req'd                     | 1-6"                                       |

METAL APRONS-Except for the following, Metal Aprons used on C.M.P. Siphons shall be of the same specifications as those shown on the Standard Sheet included in plans for Metal Aprons.

1. Dimension Van Standard M-102G shall be 24" for all sizes for Siphons.

2. Circular Section to be close riveted and soldered to Apron to prevent leakage, also the Circular Section is to be Asphalt Coated.

3. Galvanized Toe Plates will be required on all sizes.

4. The galvanized Top Finish Plate normally required on all Metal Aprons will not be required. This unit is eliminated to facilitate installation of the Trash Guard Hinge. Use only when Trash Guard is not required.

TRASH GUARDS-Structural Steel Trash Guards conforming to details shown on this sheet shall be painted as per specifications for Structural Steel. These specifications may be found under the item "Paints and Painting".

CAST IRON VALVE & VALVE BOX- Cast Iron Extension Valve Box, Size B, with No. 6 Base as shown in Hendrie & Balhoff Catalog No. 150 (Pg. 387), or an acceptable equivalent will be used.

Valves used shall be Crane No. 461 Standard Body Wedge Gate Valve with brass seats and stem or an acceptable equivalent.

METAL DRAIN PIPE- Metal Drain Pipe conforming to specifications shall be used in the following sizes:

18" & 24" Dia. Siphon - 4" Dia. Drain Pipe with 4" Valve & Drain

30" & 36" Dia. Siphon - 6" Dia. Drain Pipe with 6" Valve & Drain

CORRUGATED METAL SIPHON PIPE- Siphon Pipe conforming to specifications shall be double riveted along the longitudinal seams and riveted at three (3) inch centers along circumferential seams.

Items shown include all items required to install one complete siphon, except for Structural Excavation, Structure Backfill, Mechanical Tamping and Unclassified Ditch Excavation when required.

## Illustrative Sketch of Metal Apron with Trash Guard Installed

NOTE: Sections shown below to be furnished and installed as part of Trash Guard Unit. The cost of all assemblies, installing, drilling, bolts, washers, rivets, painting, labor and equipment necessary shall be included for payment in bid price for item 85, Trash Guards.

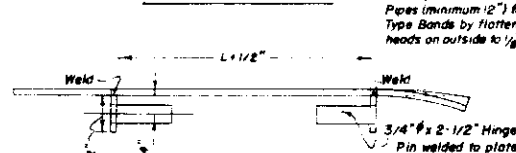
## TABLE OF DIMENSIONS

| DIAM. OF SIPHON | A   | B       | C      | D   | E      | F       | G   | H   | J   | K  | L   | P   | R      | S      |
|-----------------|-----|---------|--------|-----|--------|---------|-----|-----|-----|----|-----|-----|--------|--------|
| 12"             | 2"  | 14"     | 1"     | 4"  | 2-1/2" | 15"     | 1"  | 5"  | 10" | 2" | 5"  | 14" | 4"     | 7"     |
| 15"             | 4"  | 19"     | 1-1/2" | 6"  | 2-3/4" | 22-1/2" | 14" | 7"  | 11" | 3" | 7"  | 22" | 4"     | 1"     |
| 18"             | 6"  | 25"     | 1"     | 10" | 2-1/2" | 30"     | 15" | 11" | 12" | 3" | 9"  | 26" | 6-1/2" | 1"     |
| 21"             | 7"  | 30"     | 3/4"   | 13" | 2-1/2" | 37"     | 21" | 10" | 14" | 7" | 10" | 33" | 5"     | 1-1/2" |
| 24"             | 8"  | 34-1/2" | 1/2"   | 14" | 2-1/2" | 39"     | 23" | 12" | 17" | 6" | 10" | 37" | 5"     | 1"     |
| 30"             | 12" | 41"     | 1-1/4" | 15" | 2-1/2" | 43"     | 27" | 19" | 20" | 7" | 18" | 39" | 6-1/2" | 1"     |
| 36"             | 14" | 51"     | 1-1/4" | 21" | 2-1/2" | 58"     | 32" | 23" | 24" | 8" | 20" | 54" | 6"     | 1"     |
| 42"             | 19" | 59"     | 1-1/4" | 25" | 2-1/2" | 68"     | 37" | 27" | 28" | 9" | 23" | 64" | 5-1/2" | 1-1/4" |

NOTE: All dimensions shown above to have 1/2"± tolerance except dimensions A & L.

## Details of Parts for Trash Guard Assembly

### TRASH GUARD HINGE

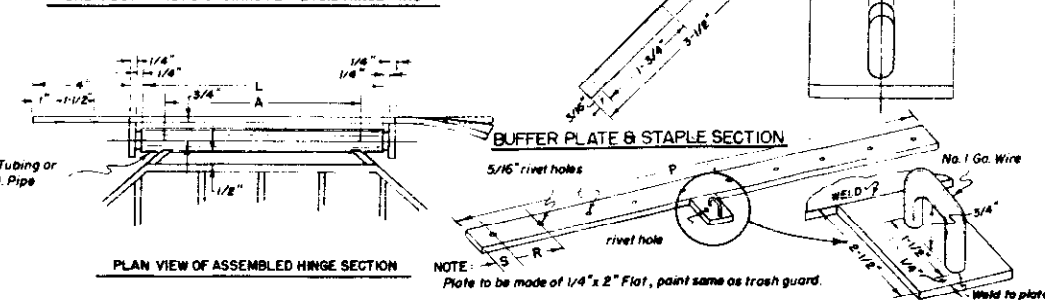


NOTE: Trash Guard to be of all welded construction with hinge section and hasp attached, making one integral unit.  
4 - 3/8" dia. x 1" galvanized machine bolts with flat and lock washers, to be provided for mounting Trash Guard to Apron.

Plate section, made from 2-1/2" x 1/4" Flat

Ends bent to contour of sides of Metal Apron

## BREAKDOWN VIEWS SHOWING PLATE AND HINGE PINS



## Details for Installing Valve, Valve Box, Metal Drain Pipe & Metal Apron at Outlets

## ELEVATION

Additional Structure Backfill required when Cast Iron Valve & Valve Box is called for on plans. See plans for quantities and Class.

## GENERAL NOTES

All work shall be done in accordance with the Standard Specifications of the Colorado Department of Highways applicable to the Project.

Trash Guards, Metal Drain Pipe and Cast Iron Valve and Valve Boxes will be furnished when called for on plans.

Alternate equivalent hardware and fittings will be accepted subject to the Engineers approval.

COLORADO  
DEPARTMENT OF HIGHWAYS

Standard C.M.P. Siphon  
with  
Metal Aprons for Inlets & Outlets

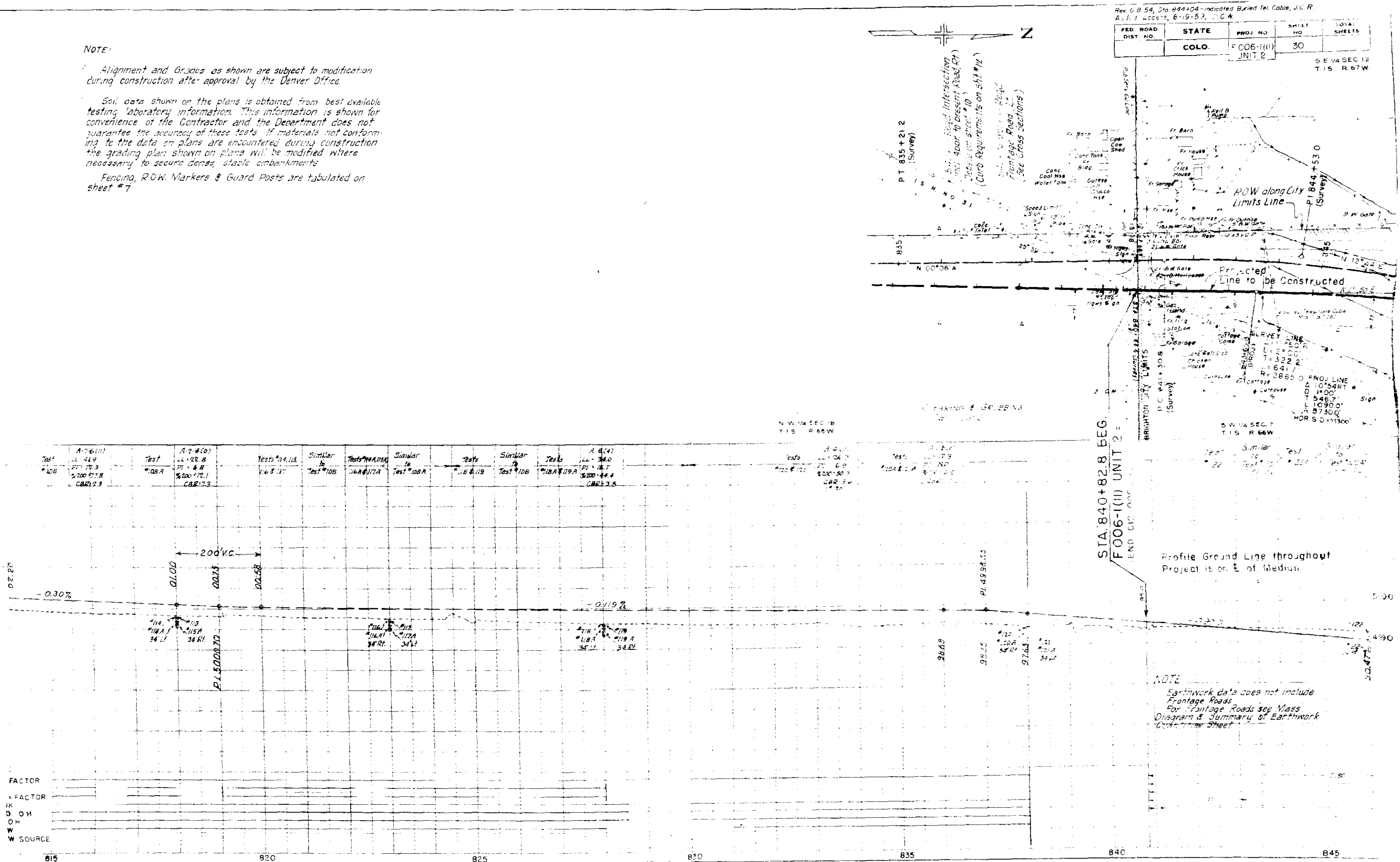
Designed by T.C.V.  
Made by C.G.M.  
Checked by M.R.H.

Approved by J.M. L.  
Engineer, Surveys & Plans  
Date: OCT 18, 1950

Alignment and Grades as shown are subject to modification during construction after approval by the Denver Office.

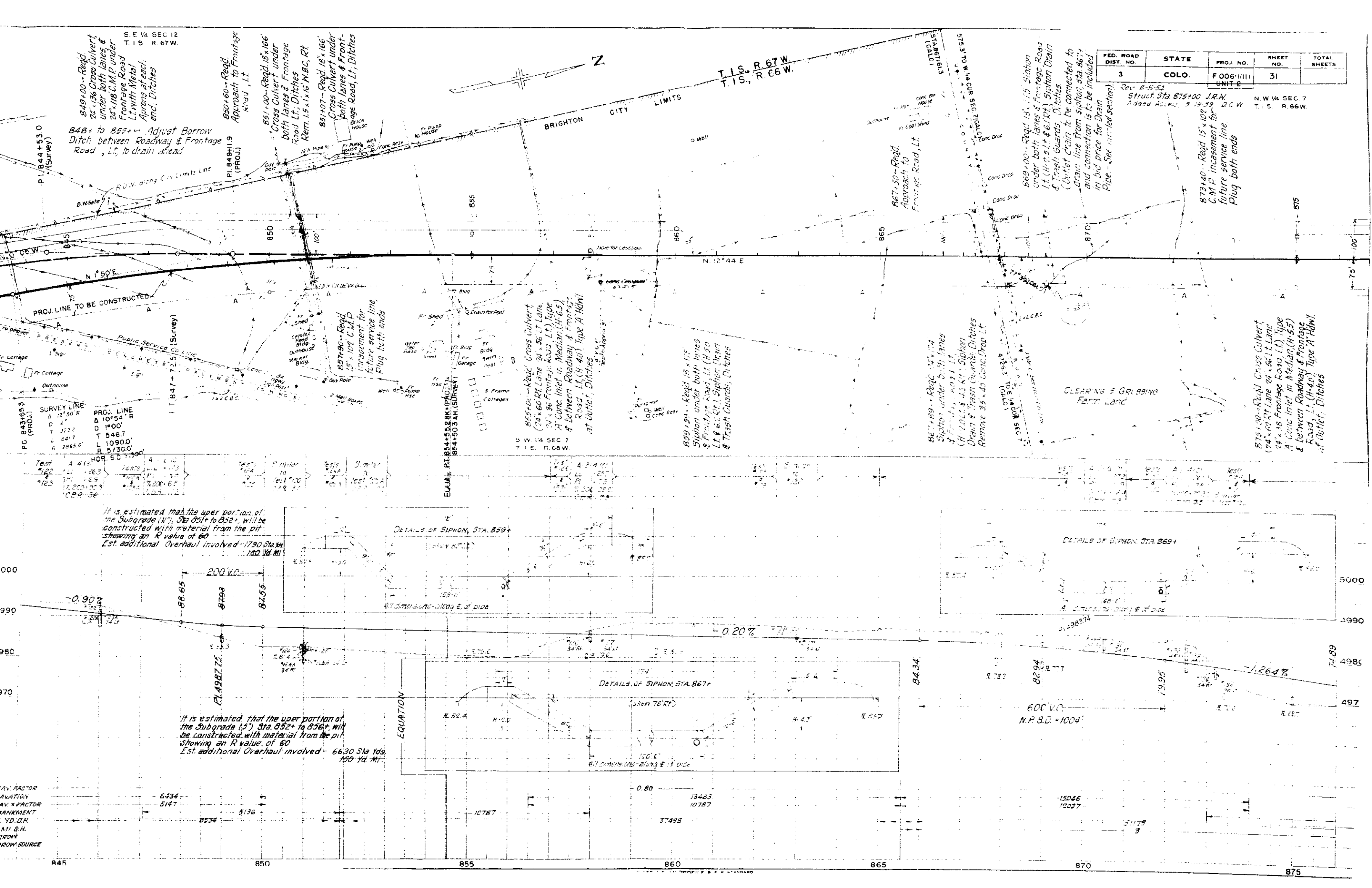
Soil data shown on the plans is obtained from best available testing laboratory information. This information is shown for convenience of the Contractor and the Department does not guarantee the accuracy of these tests. If materials not conforming to the data on plans are encountered during construction the grading plan shown on plans will be modified where necessary to secure dense stable embankments.

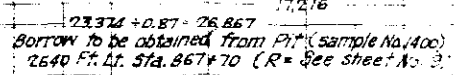
Fencing, ROW, Markers & Guard Posts are tabulated on sheet #7

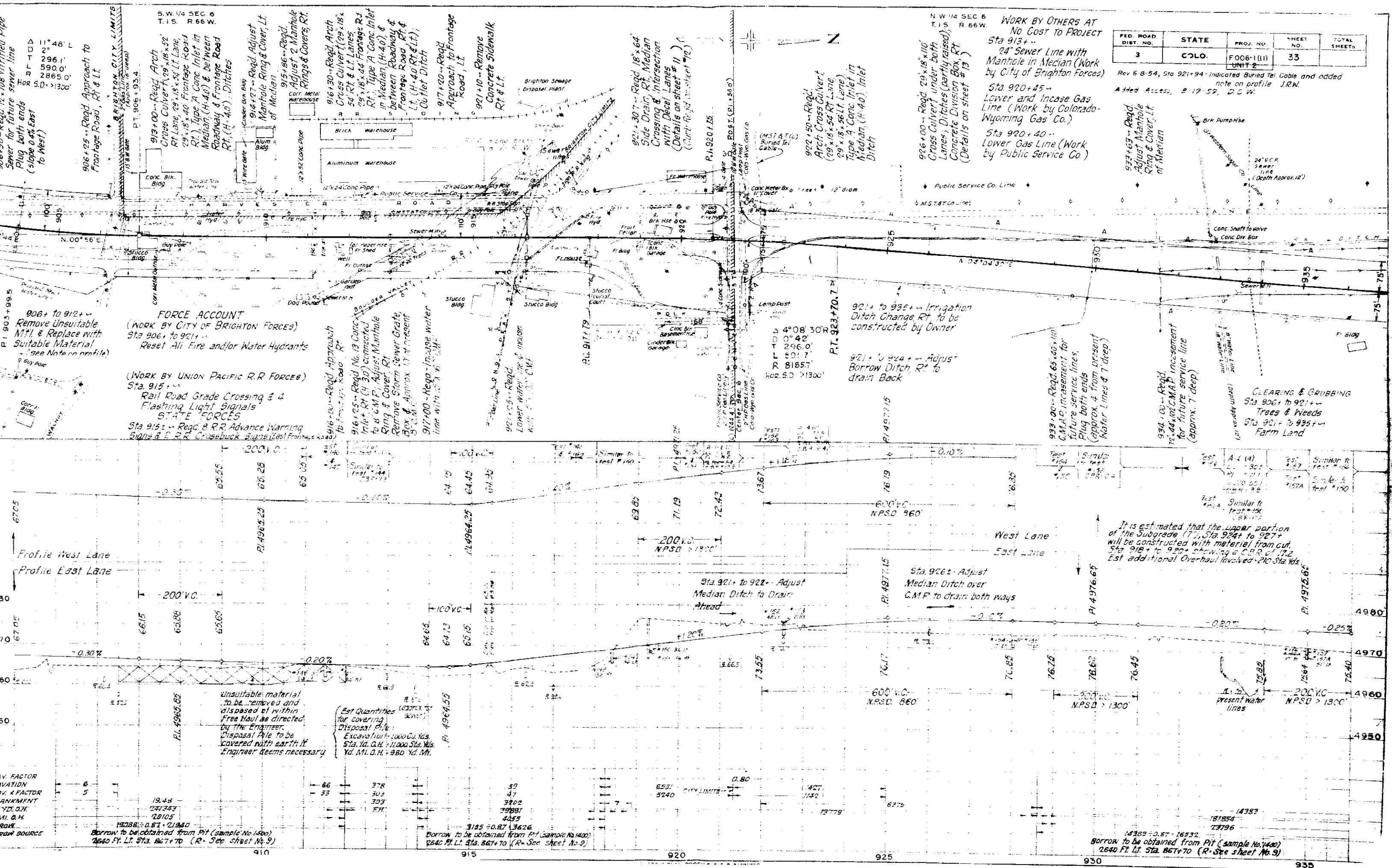


NOTE  
Earthwork data does not include  
Frontage Roads  
For Frontage Roads see Mass  
Diagram & Summary of Earthwork  
Cross-section Sheet

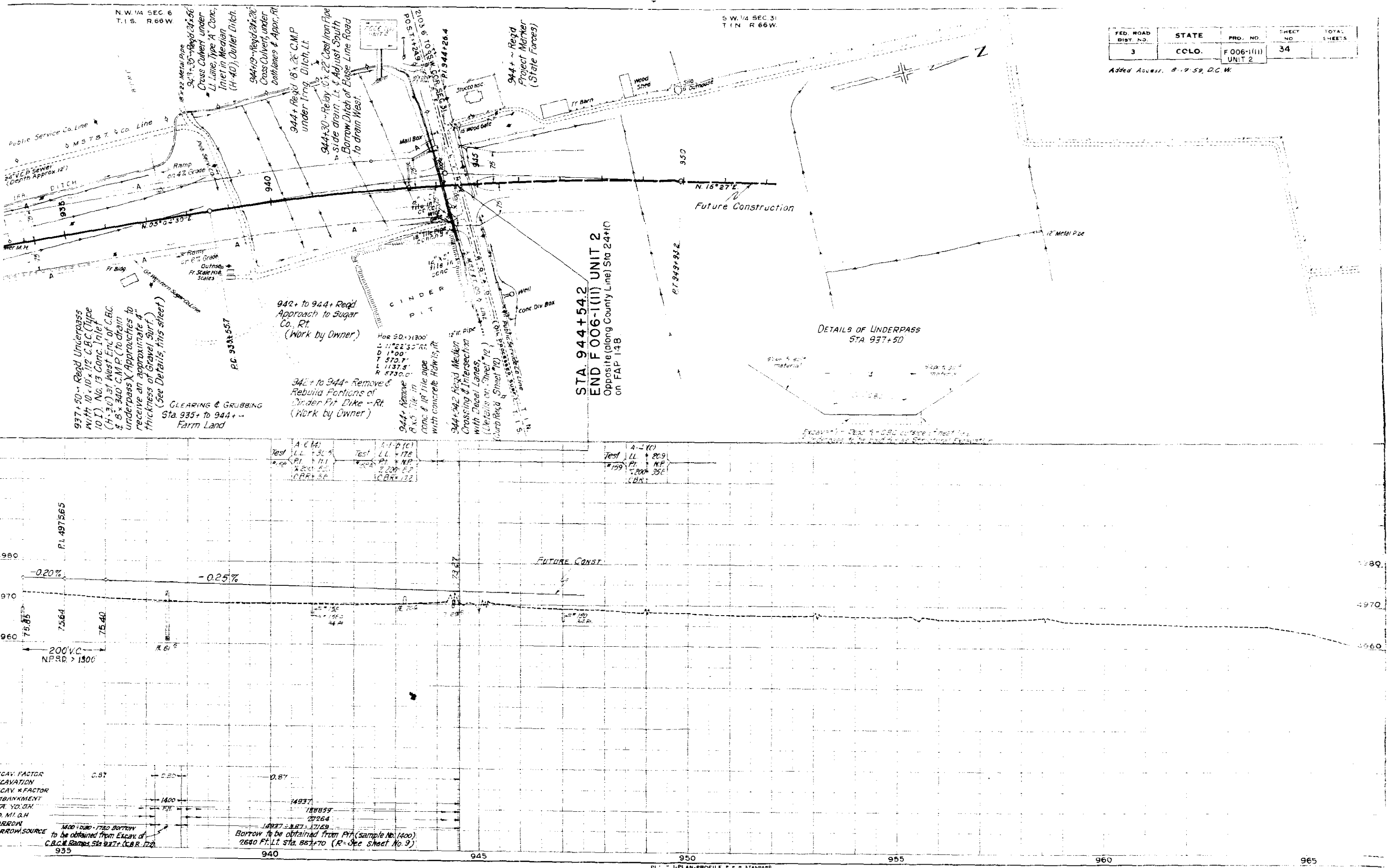
PLATE 1 PLAN-PROFILE OF SECTION AND







Added Access, 8-17-59, D.C.W.



Excavation  
Cu. Yds. AreaEmbankment  
Area Cu. Yds.Excavation  
Cu. Yds. AreaEmbankment  
Area Cu. Yds.

| FED. ROAD<br>DIVISION NO. | DISTRICT | PROJ. NO.    | SHEET<br>NO. | TOTAL<br>SHEETS |
|---------------------------|----------|--------------|--------------|-----------------|
| 9                         | COLO.    | F006-1(11)-2 | 6            |                 |

## SUMMARY OF EARTHWORK QUANTITIES F006-1(11) UNIT 2

## EXCAVATION

FROM CROSS SECTIONS - MAIN ROADWAY  
FROM CROSS SECTIONS - FRONTAGE ROADS  
BORROW - MAIN ROADWAY  
BORROW - FRONTAGE ROADS  
FROM CURB TABULATION  
LIST OF STRUCTURES AS EXCAVATION  
LIST OF STRUCTURES AS EMBANKMENT  
ESTIMATED FOR CUT SLOPE TREATMENT  
ESTIMATED FOR OVERBREAK AND SUBSIDENCE  
ESTIMATED FOR COVERING ENDS OF CULVERTS  
ESTIMATED FOR COVERING DISPOSAL PILE

## EXCAVATION \* FACTOR

MAIN ROADWAY  
FRONTAGE ROADS

## BORROW \* FACTOR

MAIN ROADWAY  
FRONTAGE ROADS

## EMBANKMENT

FROM CROSS SECTIONS - MAIN ROADWAY  
FROM CROSS SECTIONS - FRONTAGE ROADS

## STATION YARD OVERHAUL

FROM MASS DIAGRAM - MAIN ROADWAY  
FROM MASS DIAGRAM - FRONTAGE ROADS  
ESTIMATED FOR OVERBREAK AND SUBSIDENCE  
ESTIMATED FOR STRUCTURE BACKFILL  
ESTIMATED FOR COVERING DISPOSAL PILE  
ESTIMATED FOR CROSS HAUL

## YARD MILE OVERHAUL

FROM MASS DIAGRAM - MAIN ROADWAY  
FROM MASS DIAGRAM - FRONTAGE ROADS  
ESTIMATED FOR OVERBREAK AND SUBSIDENCE  
ESTIMATED FOR STRUCTURE BACKFILL  
ESTIMATED FOR COVERING DISPOSAL PILE  
ESTIMATED FOR CROSS HAUL

| INSIDE<br>BRIGHTON | OUTSIDE<br>BRIGHTON | PROJECT<br>TOTALS |
|--------------------|---------------------|-------------------|
| 42,546             | 1,427               | 43,973            |
| 4,192              | 0                   | 4,192             |
| 52,433             | 35,451              | 87,884            |
| 22,114             | 0                   | 22,114            |
| 46                 | 15                  | 61                |
| 11,700             | 660                 | 12,360            |
| 1,065              | 115                 | 1,180             |
| 143                | 31                  | 174               |
| 12,129             | 3,688               | 15,817            |
| 10                 | 5                   | 15                |
| 1,000              | 0                   | 1,000             |
| 147,370            | 41,392              | 188,762           |
| 34,038             | 1,142               | 35,180            |
| 3,354              | 0                   | 3,354             |
| 45,617             | 30,720              | 76,337            |
| 19,233             | 0                   | 19,233            |
| 102,248            | 31,862              | 134,110           |
| 74,422             | 27,095              | 101,517           |
| 22,593             | 0                   | 22,593            |
| 97,015             | 27,095              | 124,110           |
| 673,974            | 384,492             | 1,058,466         |
| 24,432             | 0                   | 24,432            |
| 91,341             | 38,449              | 129,790           |
| 12,793             | 5,456               | 18,249            |
| 11,000             | 0                   | 11,000            |
| 15,180             | 210                 | 15,390            |
| 1,050,320          | 428,607             | 1,478,927         |
| 41,439             | 51,060              | 92,499            |
| 16,749             | 0                   | 16,749            |
| 5,819              | 5,106               | 10,925            |
| 919                | 751                 | 1,670             |
| 980                | 0                   | 980               |
| 330                | 0                   | 330               |
| 66,236             | 56,917              | 123,153           |

## UNCLASSIFIED DITCH EXCAVATION

NO INTERCEPTING DITCHES ESTIMATED

FROM LIST OF STRUCTURES

INSIDE BRIGHTON - 120 Cu. Yds.

OUTSIDE BRIGHTON - 70 Cu. Yds.

TOTALS 190 Cu. Yds.

|                 |   |            |          |
|-----------------|---|------------|----------|
| SHEET<br>TOTALS | { | EXCAVATION | CU. YDS. |
|                 |   | EXCAVATION | CU. YDS. |
|                 |   | EMBANKMENT | CU. YDS. |