

**SECTION VII**  
**ROADWAY AND SITE**  
**IMPROVEMENTS**

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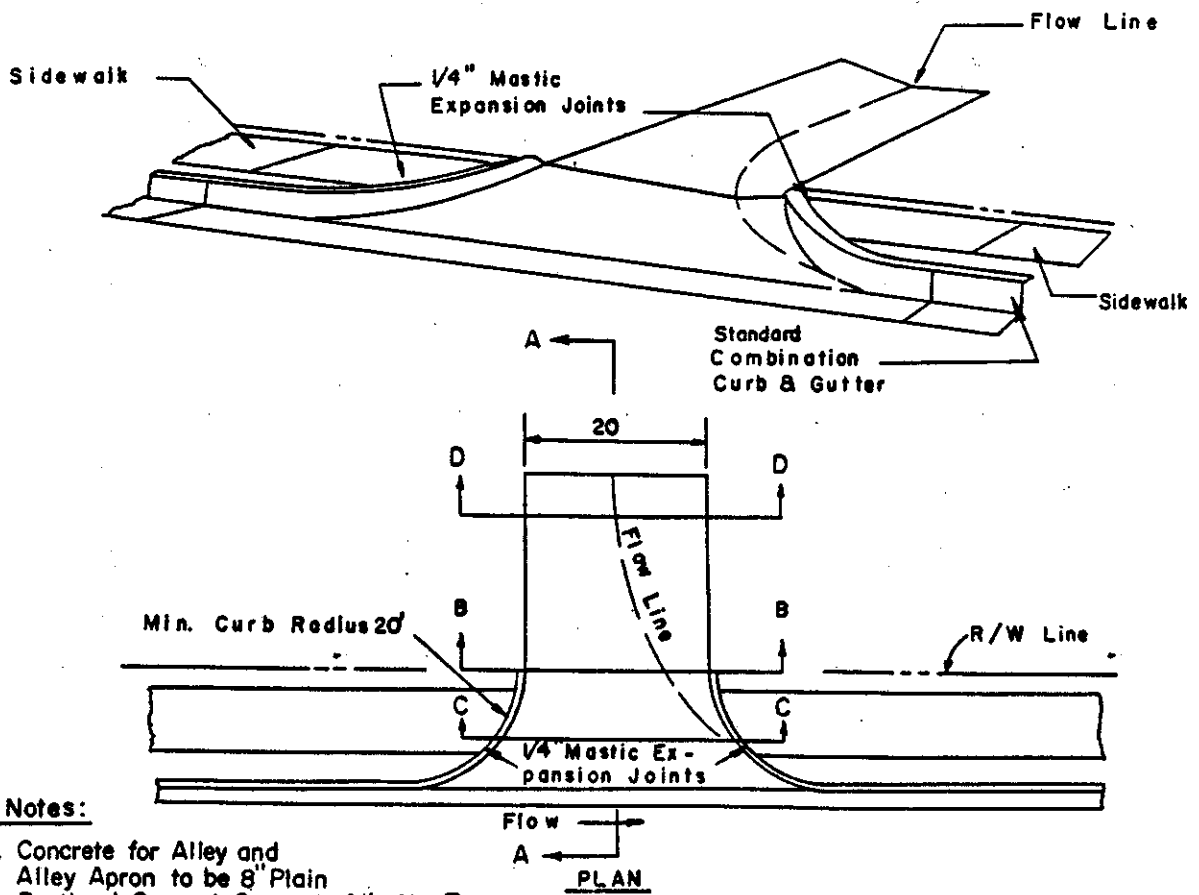
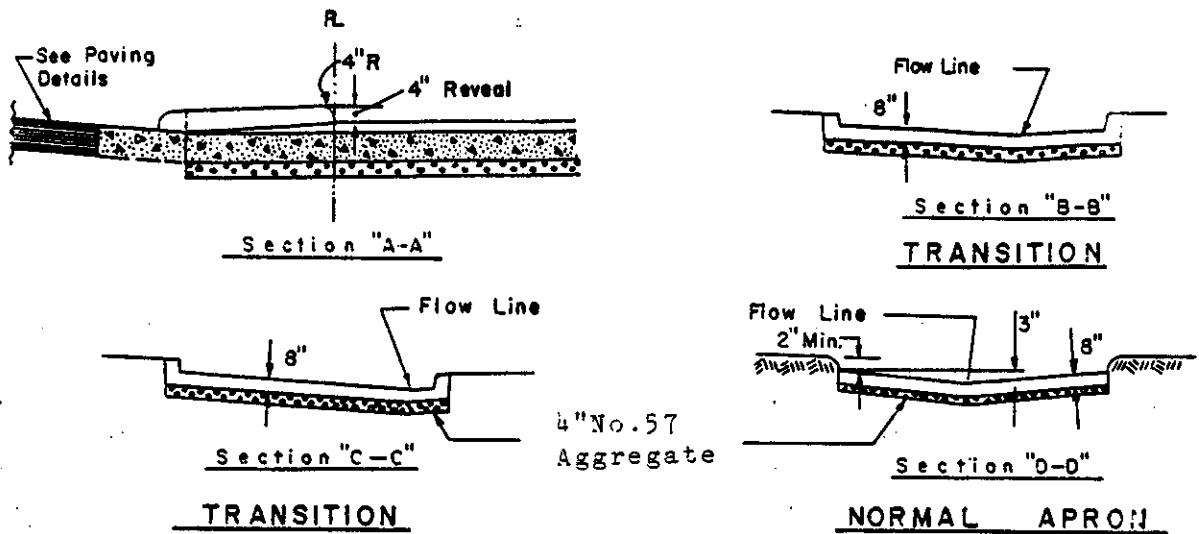
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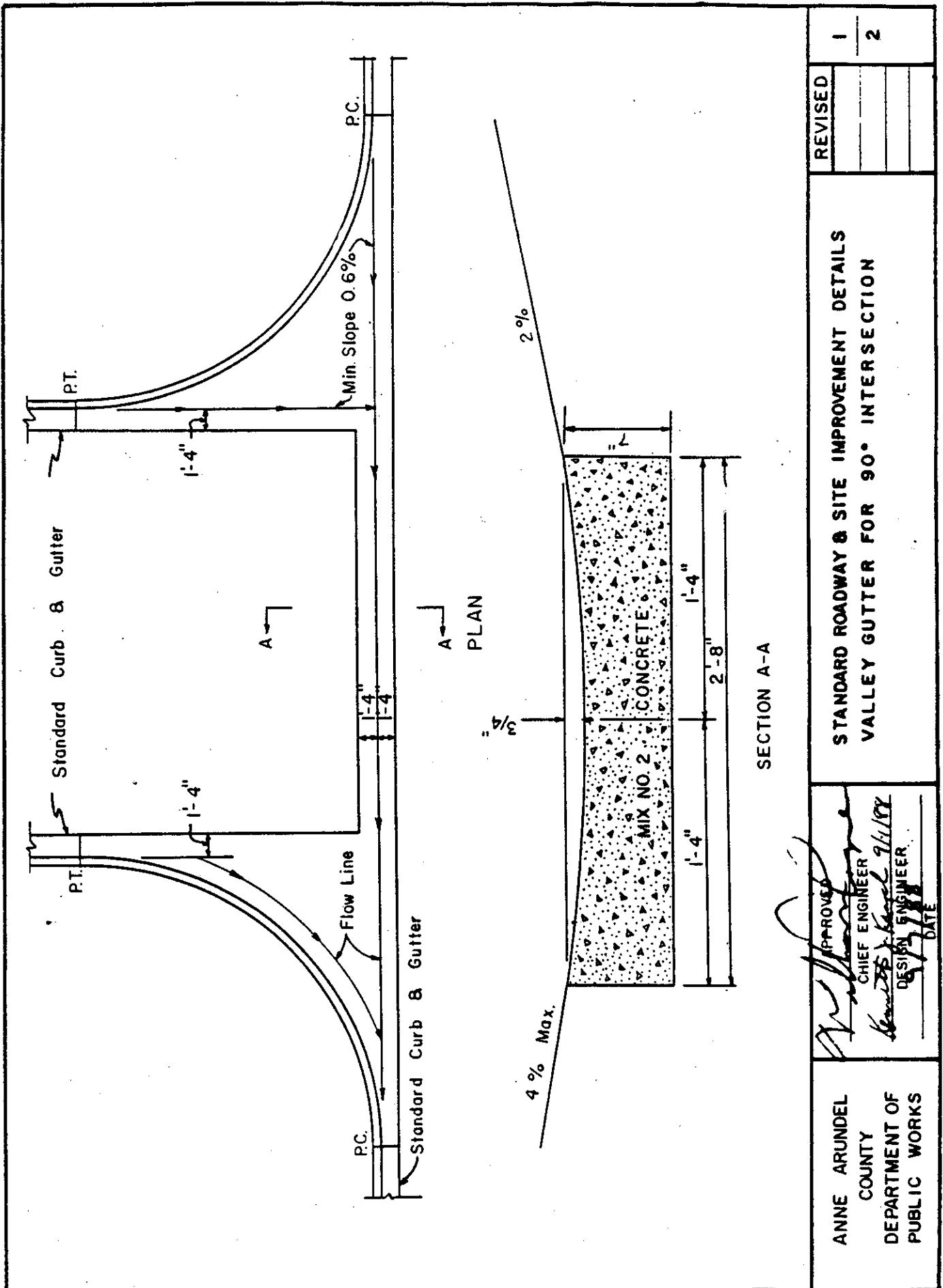


**Notes:**

1. Concrete for Alley and Alley Apron to be 8" Plain Portland Cement Concrete Mix No. 7
2. No Longitudinal Construction Joints will be permitted.

(NO SCALE)

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|--|---|---|---------|---|
| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER    | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS ALLEY INTERSECTION (COMMERCIAL AREAS) | REVISED | 1 |
|  | DESIGNED BY<br><i>[Signature]</i><br>DATE<br>9/7/88 |   |         | 1 |
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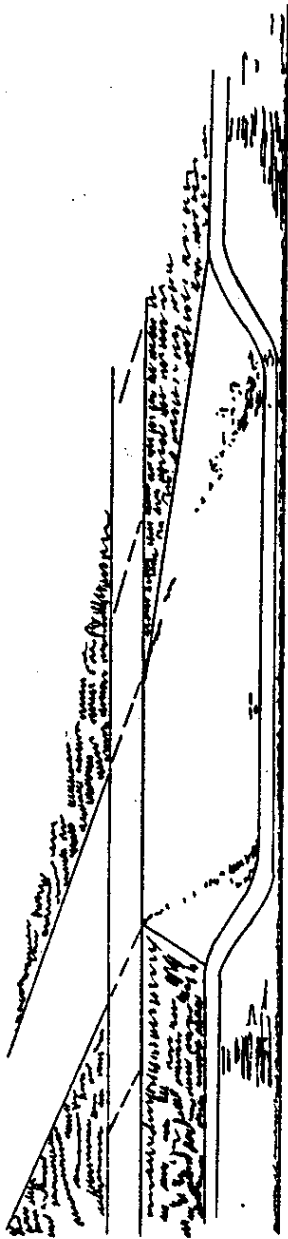
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STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 VALLEY GUTTER FOR 90° INTERSECTION

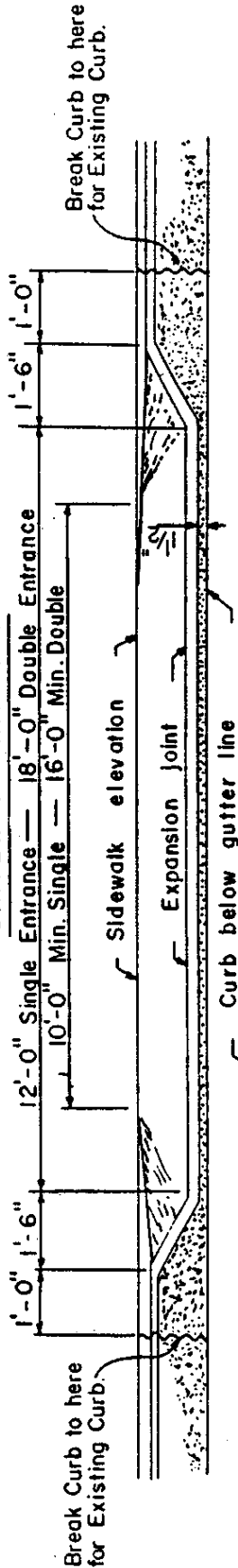
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 CHIEF ENGINEER  
 DESIGN ENGINEER  
 [Signature]  
 DATE

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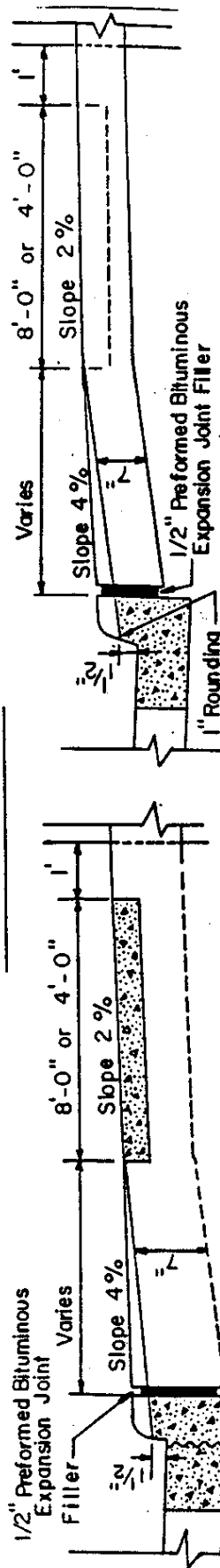
Note: This Standard Detail Applies for Driveways to Detached Houses.



**DRIVEWAY ENTRANCE**



**FRONT VIEW**



**SECTION - DRIVEWAY IN EXISTING CURB**

**SECTION DRIVEWAY IN NEW CURB**

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APPROVED: *[Signature]*  
 CHIEF ENGINEER  
 DESIGN ENGINEER: *[Signature]*  
 DATE: *[Date]*

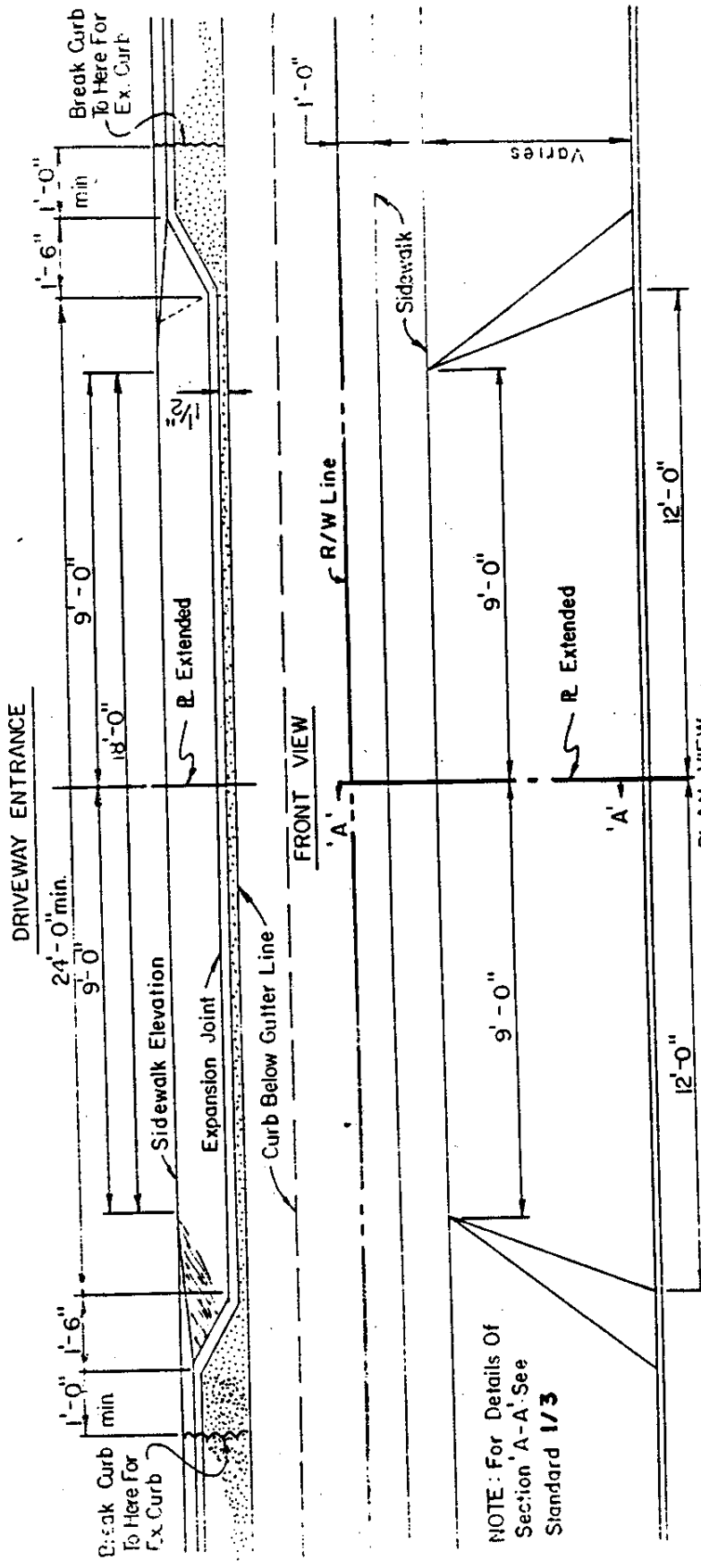
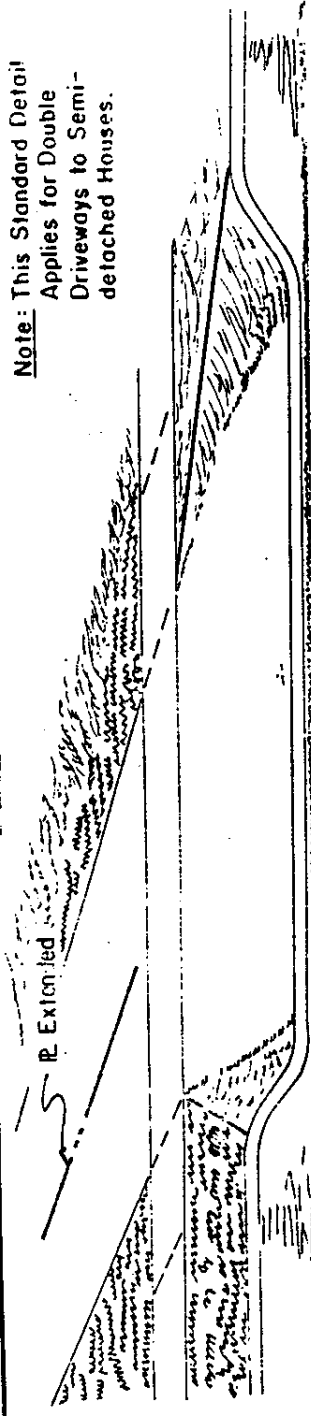
STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 TYPICAL DRIVEWAY ENTRANCE -- URBAN  
 (SPACE BETWEEN SIDEWALK AND CURB)

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3



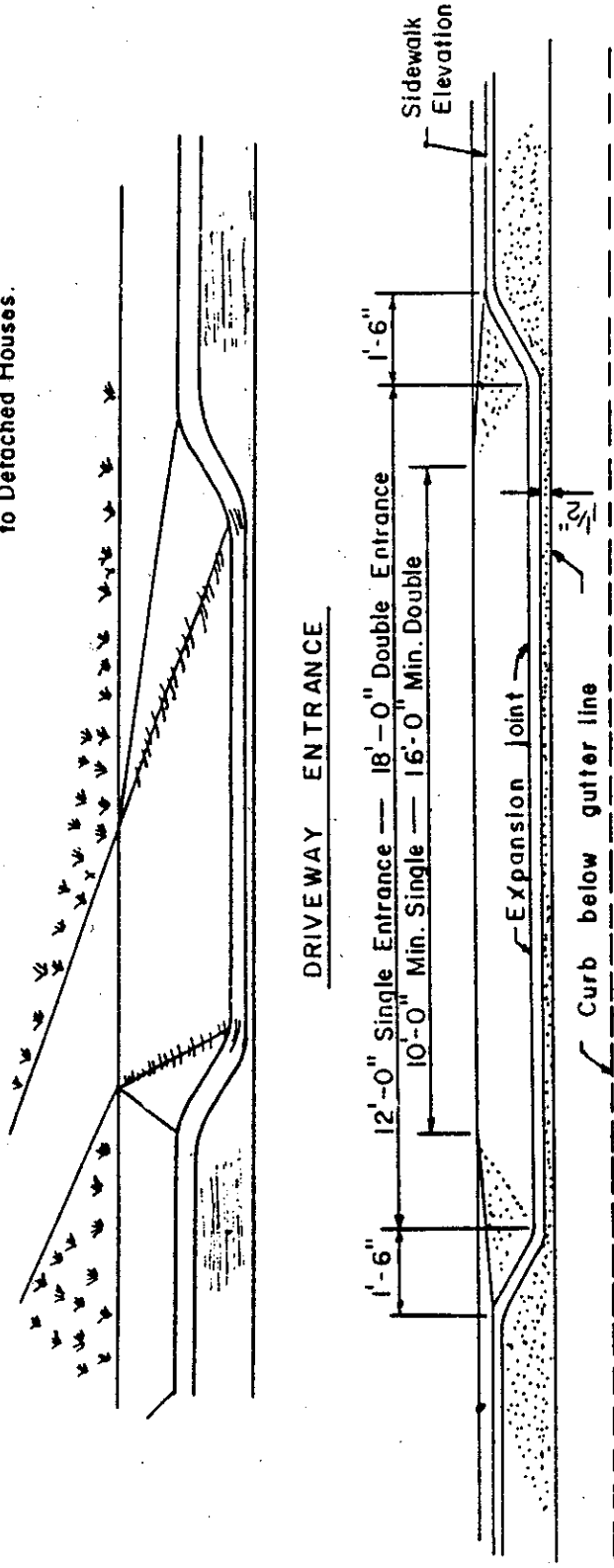
Note: This Standard Detail Applies for Double Driveways to Semi-detached Houses.



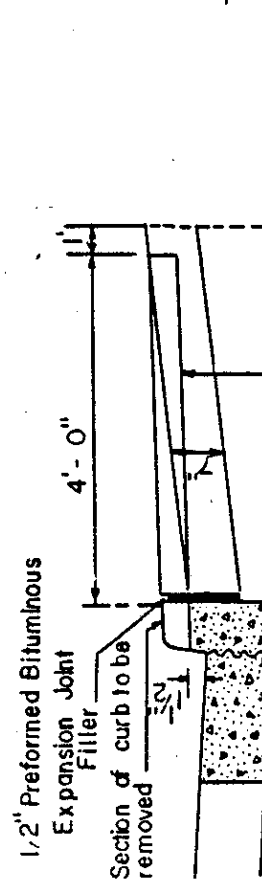
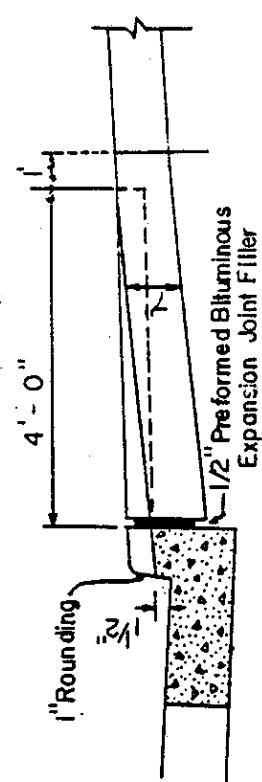
NOTE: For Details Of Section 'A-A' See Standard 1/3


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| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS   | APPROVED        | REVISION |
|  | CHIEF ENGINEER  | 1        |
|  | DESIGN ENGINEER | 4        |
|  | DATE            |          |
| STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>TYPICAL DOUBLE DRIVEWAY ENTRANCE - URBAN<br>(SPACE BETWEEN SIDEWALK AND CURB) |                 |          |

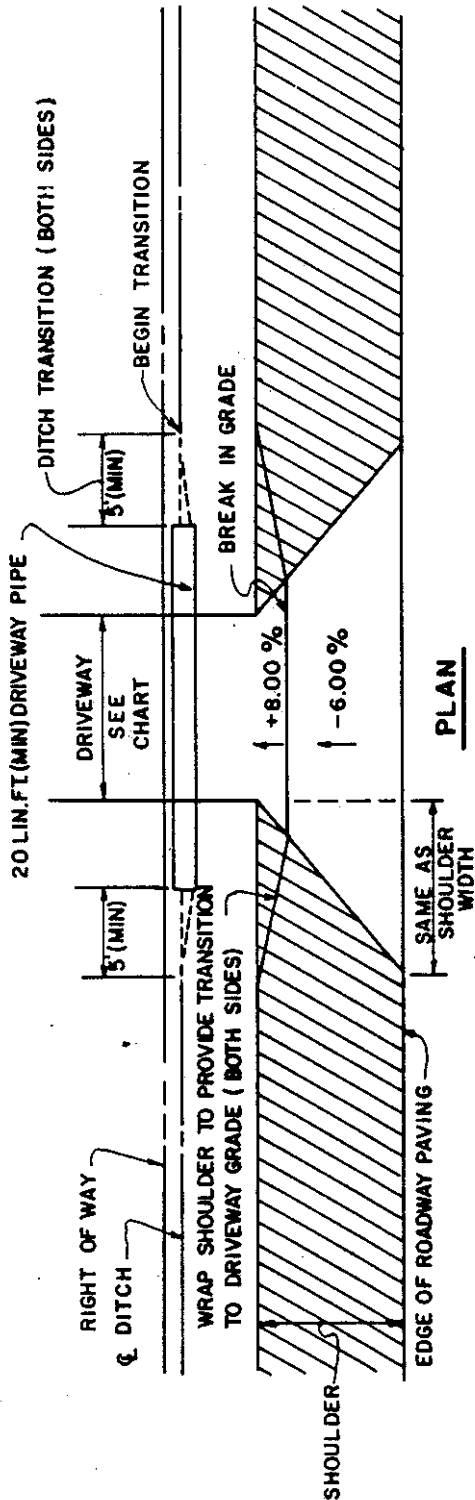
Note: This Standard Detail Applies for Driveways to Detached Houses.



FRONT VIEW

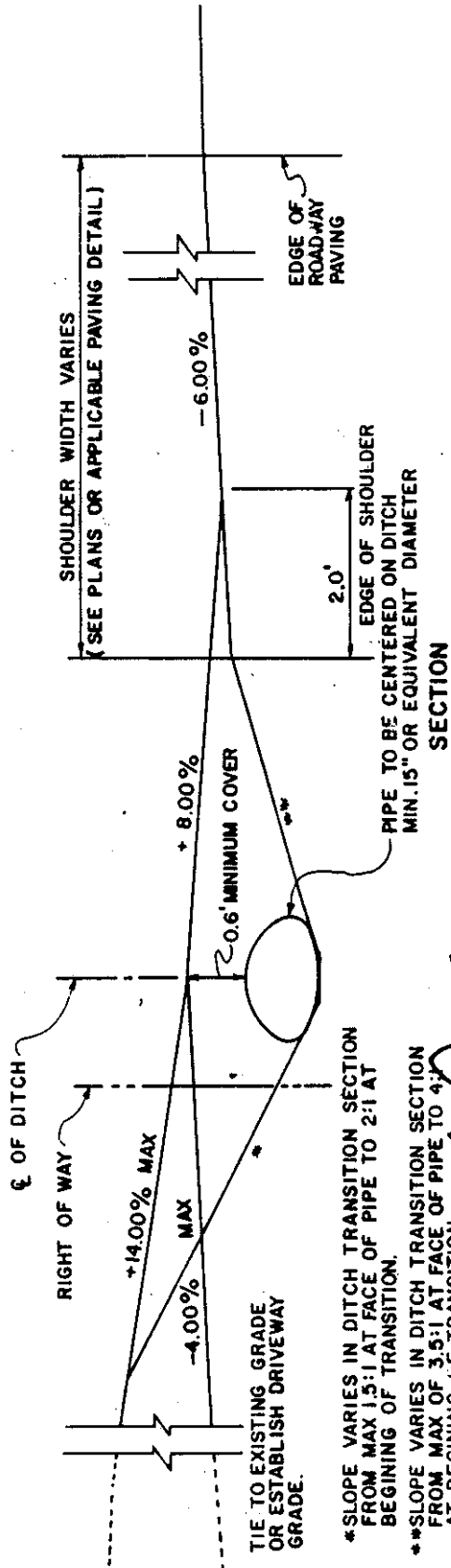


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| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS   | APPROVED   | REVISION |
|  | <br>CHIEF ENGINEER<br>DESIGN ENGINEER<br>DATE 9/15/88 | 1<br>5   |
| STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>TYPICAL DRIVEWAY ENTRANCE - URBAN<br>(SIDEWALK ABUTTING CURB) |  |          |



|        |                       |
|--------|-----------------------|
| SINGLE | 10' (MIN) / 12' (MAX) |
| DOUBLE | 18' (MIN) / 20' (MAX) |

- NOTES:**
1. FOR THE MINIMUM PAVING FOR DRIVEWAYS IN THE COUNTY RIGHT OF WAY, SEE LOCAL ROAD PAVING SECTIONS, DETAIL P/8.
  2. A MINIMUM OF 20 LIN. FT. OF METAL PIPE (16 GAUGE MINIMUM) TO BE INSTALLED.
  3. DITCH LINING AND VELOCITY DISSIPATORS TO BE PROVIDED AS REQUIRED.



TIE TO EXISTING GRADE OR ESTABLISH DRIVEWAY GRADE.

\*SLOPE VARIES IN DITCH TRANSITION SECTION FROM MAX 1.5:1 AT FACE OF PIPE TO 2:1 AT BEGINNING OF TRANSITION.

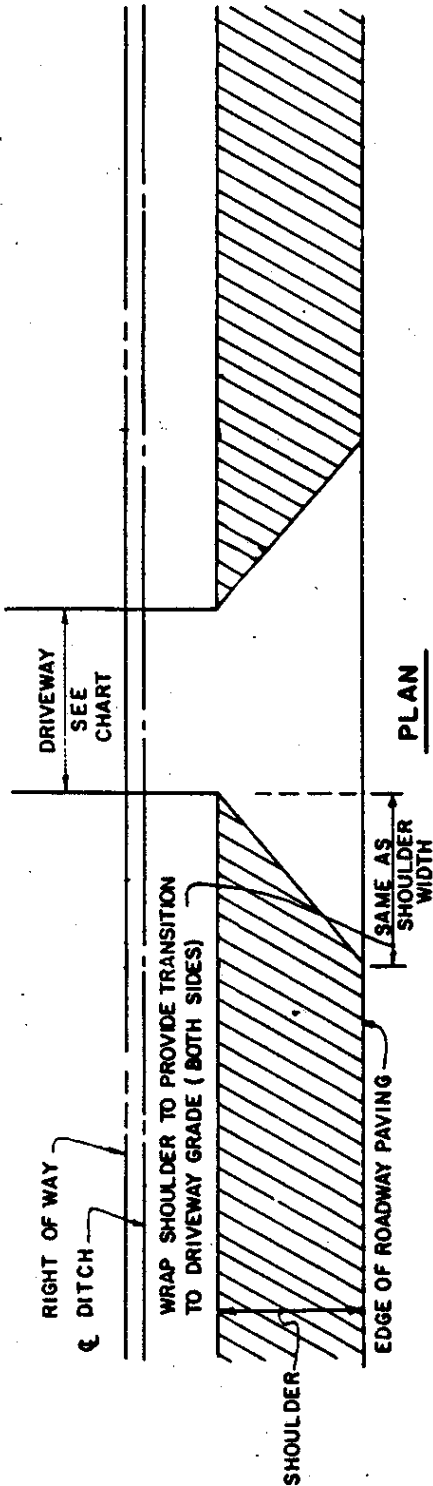
\*\*SLOPE VARIES IN DITCH TRANSITION SECTION FROM MAX OF 3.5:1 AT FACE OF PIPE TO 4:1 AT BEGINNING OF TRANSITION.

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 CHIEF ENGINEER  
 DESIGN ENGINEER: *[Signature]*  
 DATE: 9/7/88

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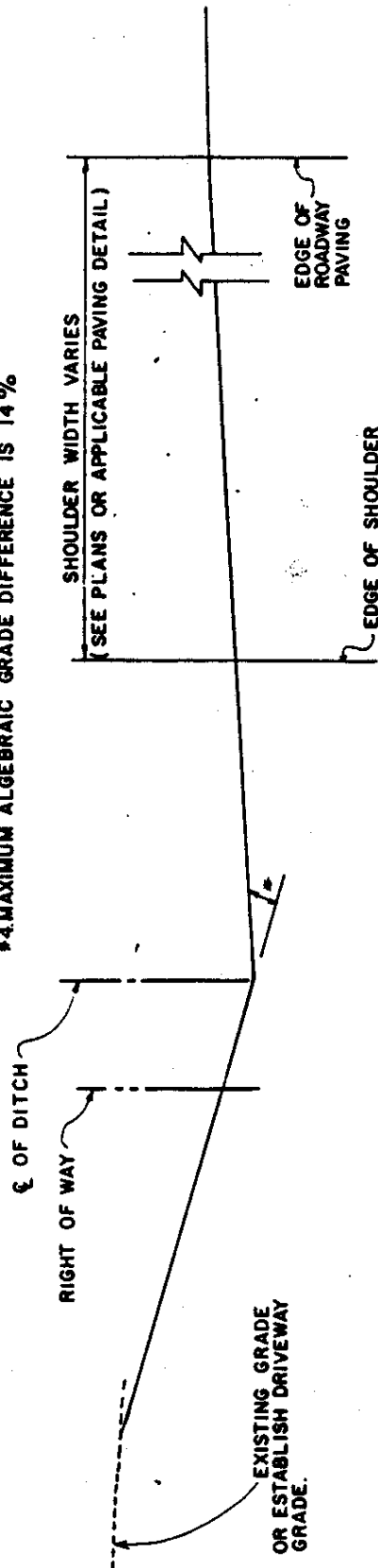
STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 TYPICAL DRIVEWAY ENTRANCE — RURAL  
 ( WITH DRAINAGE PIPE )

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- NOTES:**
1. FOR THE MINIMUM PAVING FOR DRIVEWAYS IN THE COUNTY RIGHT OF WAY, SEE LOCAL ROAD PAVING SECTIONS, DETAIL P/8.
  2. DITCH LINING AND VELOCITY DISSIPATORS TO BE PROVIDED AS REQUIRED.
  3. ALLOWING SURFACE DRAINAGE TO CROSS A PAVED DRIVEWAY ON THE SURFACE IS SUBJECT TO THE APPROVAL OF THE DEPARTMENT OF PUBLIC WORKS.
  - \*4. MAXIMUM ALGEBRAIC GRADE DIFFERENCE IS 14%.

|        |                       |
|--------|-----------------------|
| SINGLE | 10' (MIN) / 12' (MAX) |
| DOUBLE | 18' (MIN) / 20' (MAX) |





SECTION

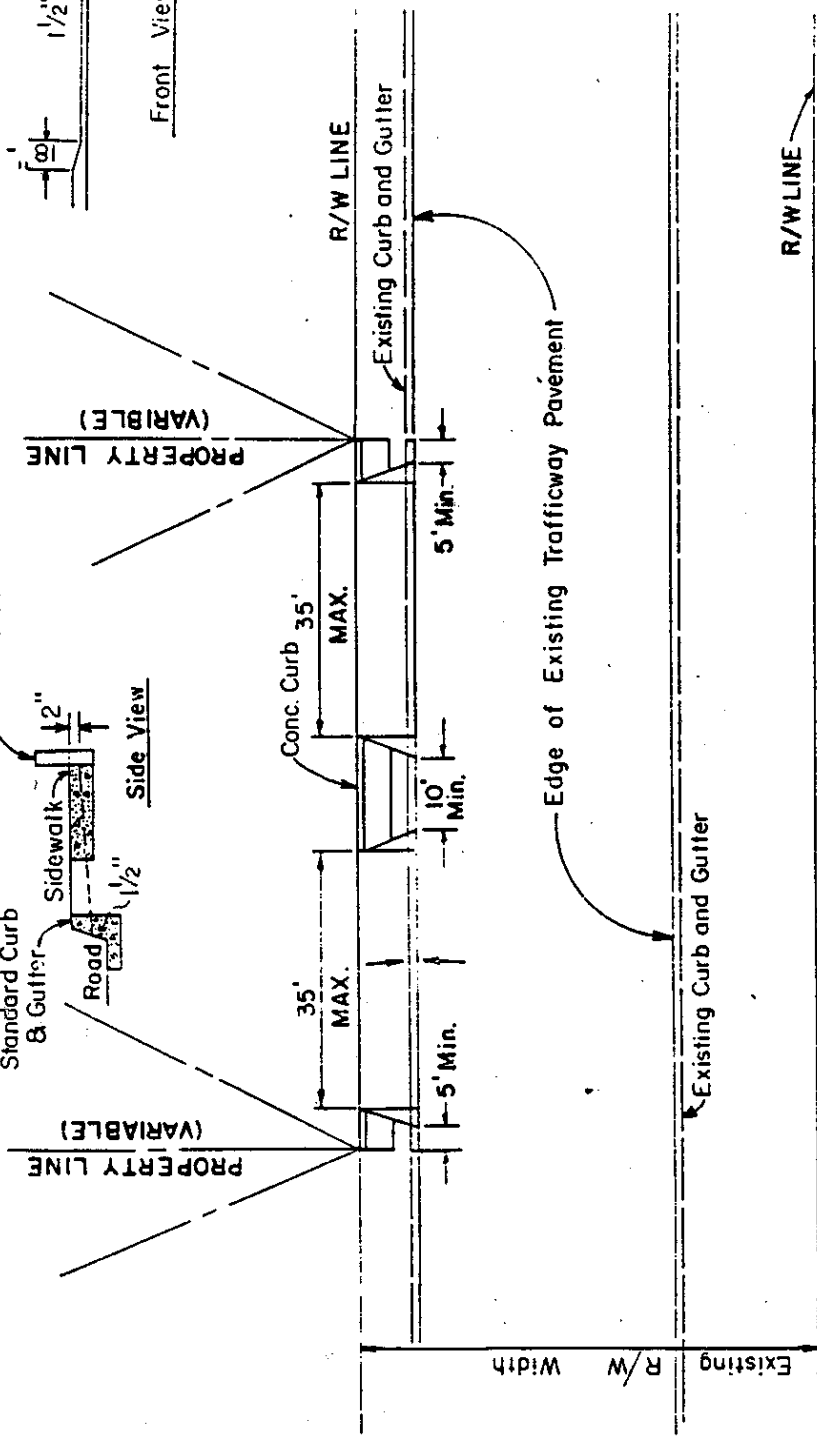
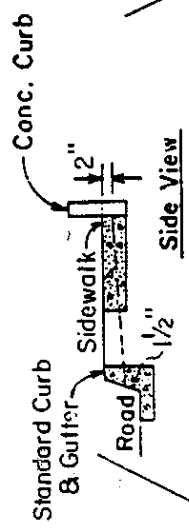
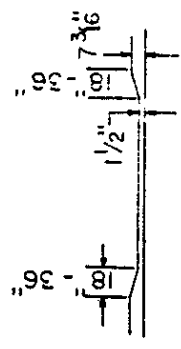
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STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 TYPICAL DRIVEWAY ENTRANCE — RURAL  
 (WITHOUT DRAINAGE PIPE)

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*[Signature]*  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE

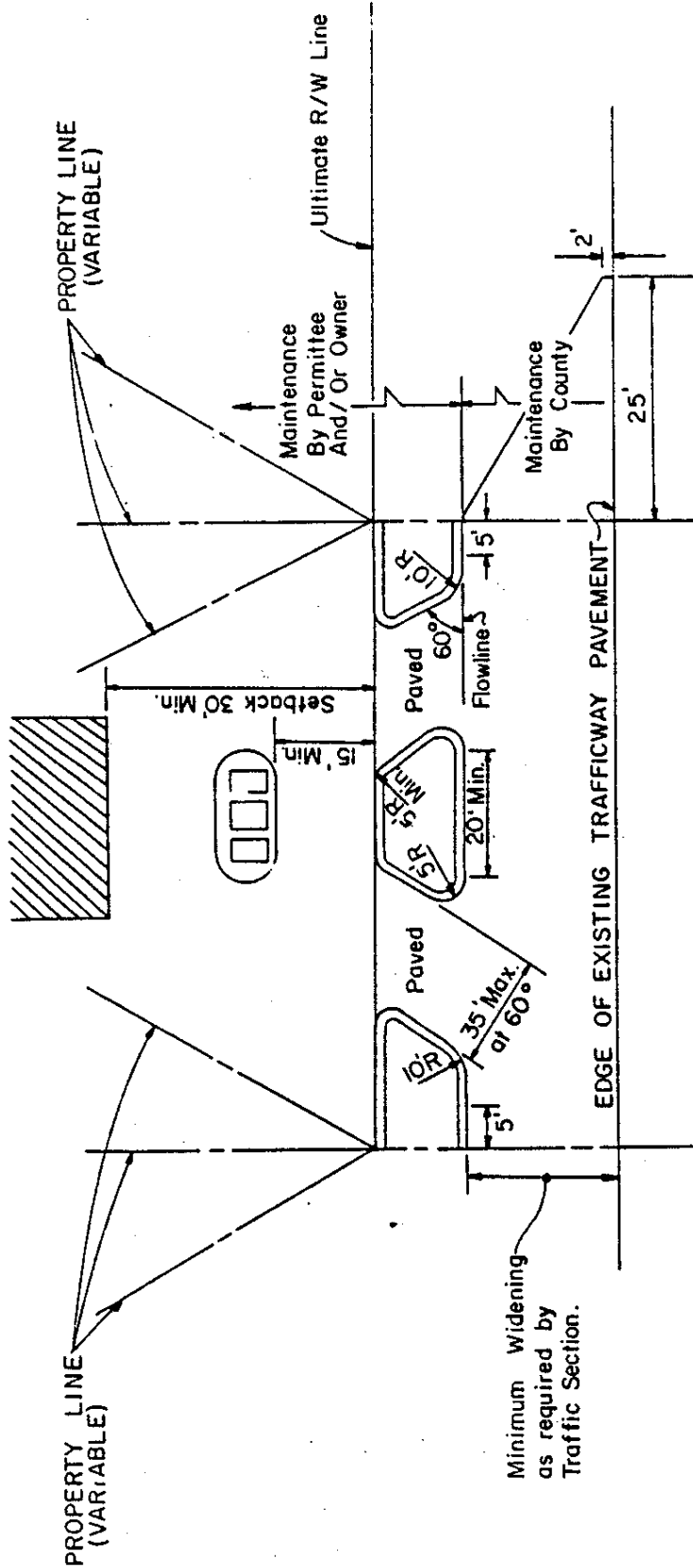
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| ANNE ARUNDEL<br>COUNTY<br>DEPARTMENT OF<br>PUBLIC WORKS | APPROVED<br><br>CHIEF ENGINEER<br>DESIGN ENGINEER<br><br>DATE: 1/1/88 | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>CHANNELIZATION OF COMMERCIAL ENTRANCES<br>(URBAN) |   | REVISED |
|   |   | 1  | 7 | (Empty) |



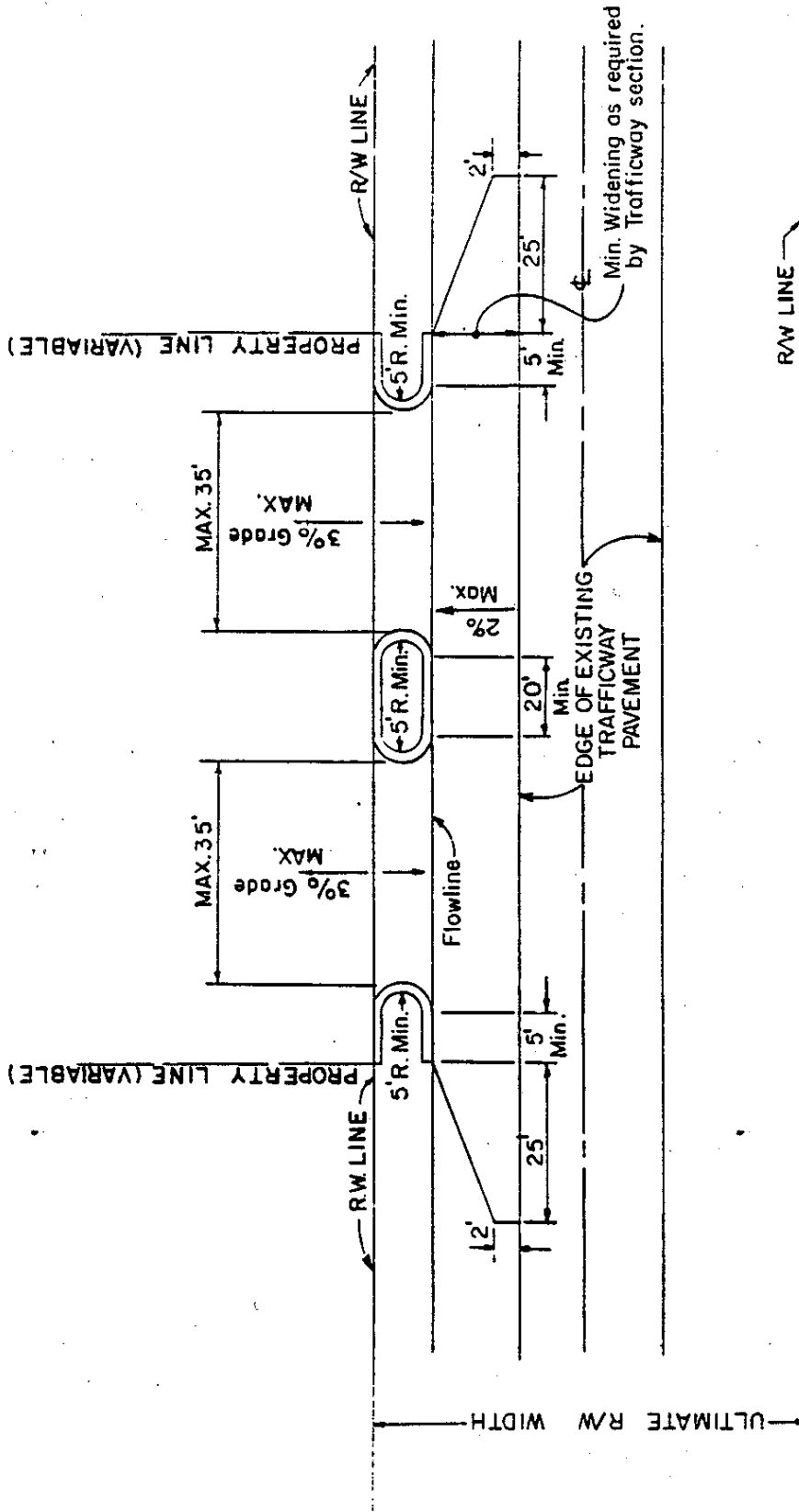



NOTE FINAL PLANS SHALL INDICATE STRUCTURES  
TRAFFIC PATTERN, TOPO (EX. & PROP) DIMENSIONS  
STORM DRAIN (EX. & PROP) AND ETC.



Note 20' Minimum at Existing or  
Proposed Signalized Intersections.

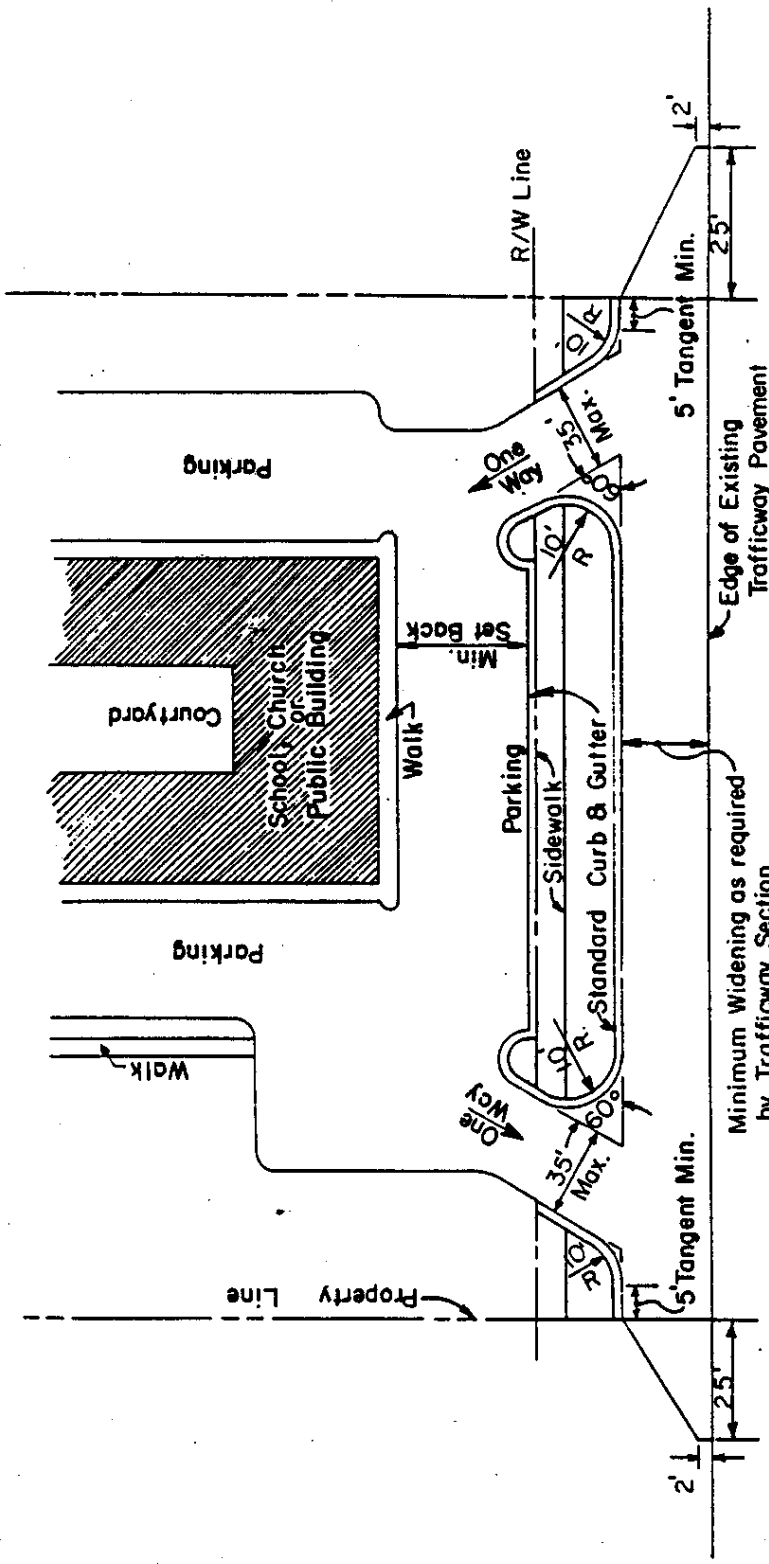
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|   |  | REVISED   | 1<br>9 |



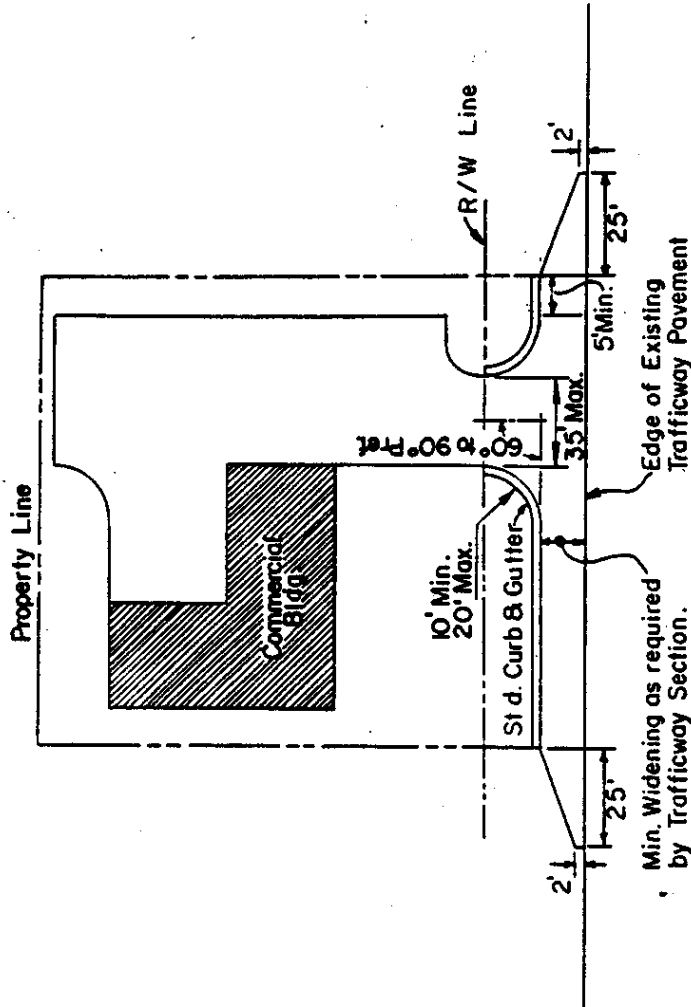
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|   |   | CHANNELIZATION OF COMMERCIAL ENTRANCES<br>(RURAL UNDIVIDED HIGHWAY) |         |
|   |   | REVISED   | 1<br>10 |



NOTE:  
 Minimum Radius = 10'  
 Maximum Radius = 20'



|   |  |   |  |           |
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| ANNE ARUNDEL<br>COUNTY<br>DEPARTMENT OF<br>PUBLIC WORKS | APPROVED<br><br>CHIEF ENGINEER<br>DESIGN ENGINEER<br>DATE 9/1/88 | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS |  | REVISIONS |
|   |  | DRIVEWAYS TO A PUBLIC BUILDING - RURAL      |  | I<br>II   |

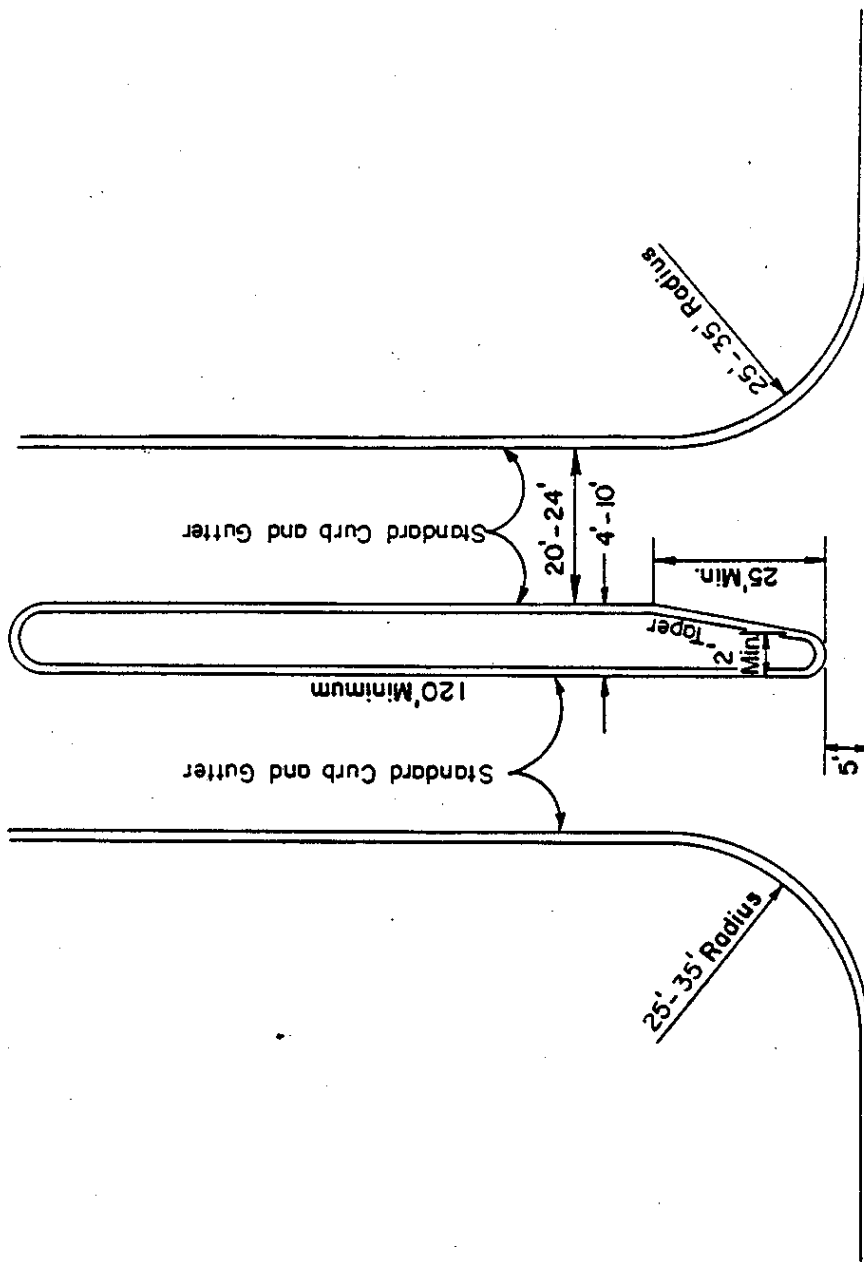


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**STANDARD ROADWAY & SITE IMPROVEMENT DETAILS**  
**SINGLE DRIVEWAY COMMERCIAL ESTABLISHMENT**  
**(RURAL)**

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 DATE

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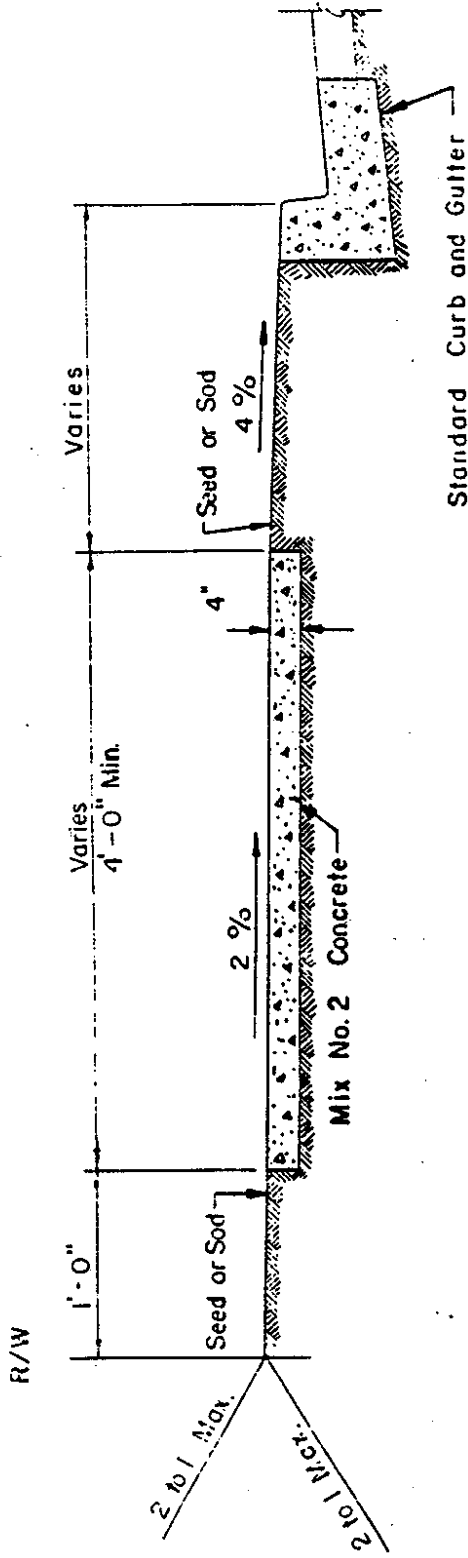


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STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
SIMPLE MONUMENTAL ENTRANCE

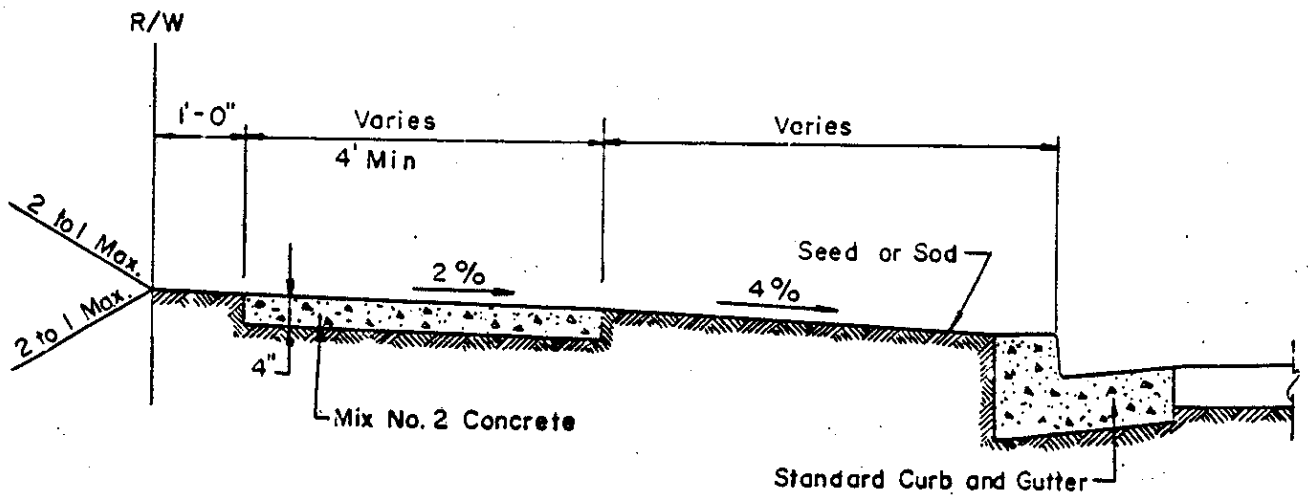
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*[Signature]*  
CHIEF ENGINEER  
DESIGN ENGINEER  
DATE 9/1/88

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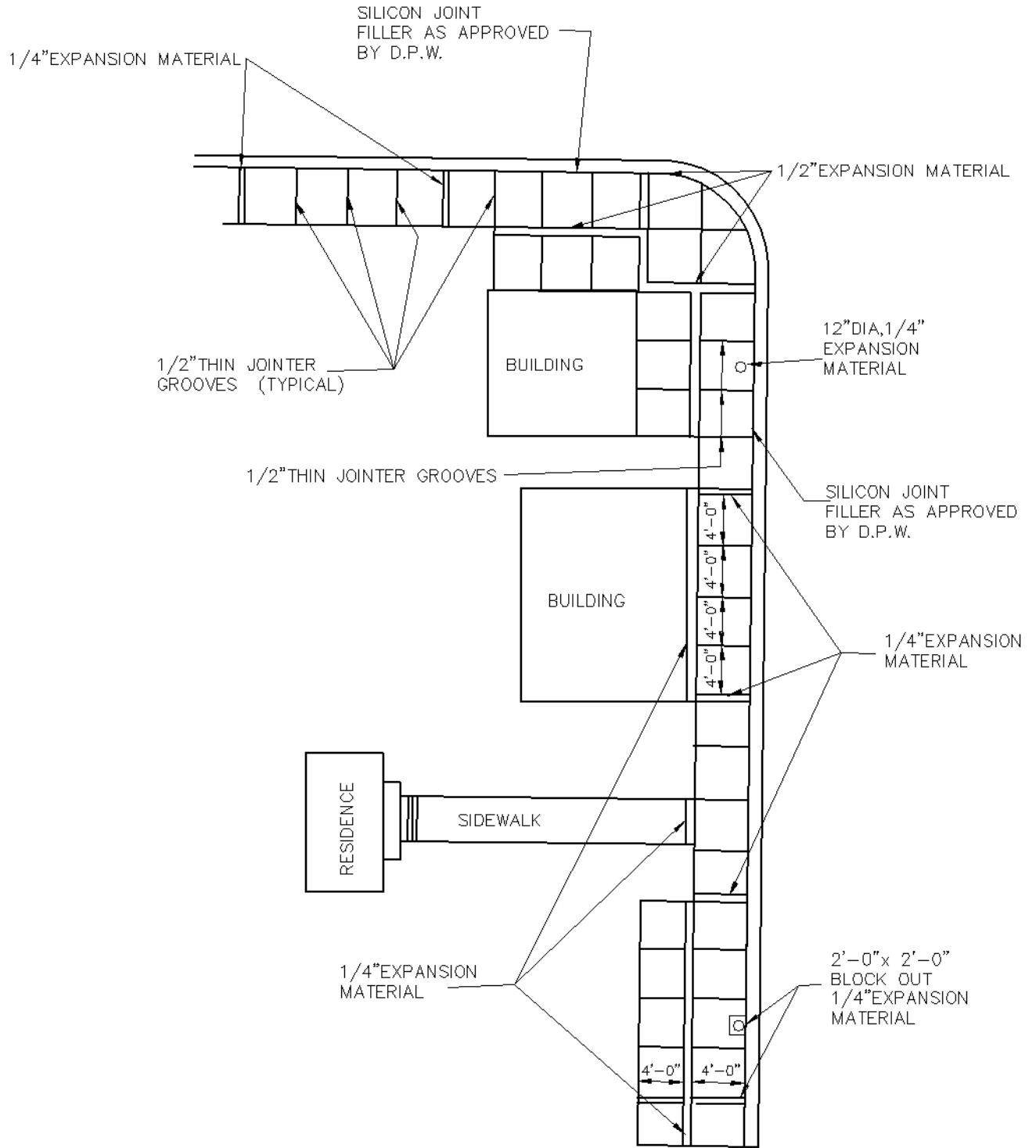
- Note 1. Mark in 4' Squares , Use Pre-moulded Expansion Joints at Intervals Not Greater Than 16', See Detail I/16
- Note 2. All Unpaved Areas Within R/W to be Seeded And Mulched With 4" of Top Soil, or Sodded to Obtain A Thick Stand of Grass.

|                      |  |   |  |
|----------------------|--|---|--|
| REVISIONS<br>1<br>14 | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>COMMERCIAL SIDEWALK | APPROVED<br>[Signature]<br>CHIEF ENGINEER<br>[Signature]<br>DESIGN ENGINEER<br>DATE | ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS |
|----------------------|--|---|--|



- Note 1. Mark Sidewalk in 4'± Squares, With Weakened Plane Traverse Joints. See Detail 1/16
- Note 2. Use Pre-moulded Expansion Joints at Intervals Not Greater Than 16'. See Detail 1/16
- Note 3. All Unpaved Areas Within R/W to be Seeded And Mulched With 4" of Top Soil or Sodded to Obtain a Thick Stand of Grass

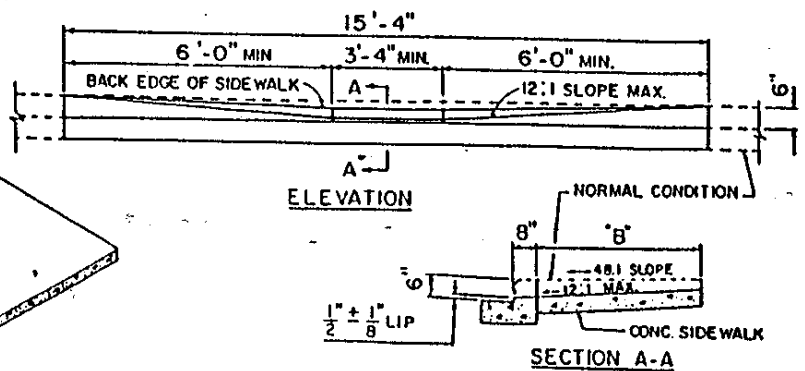
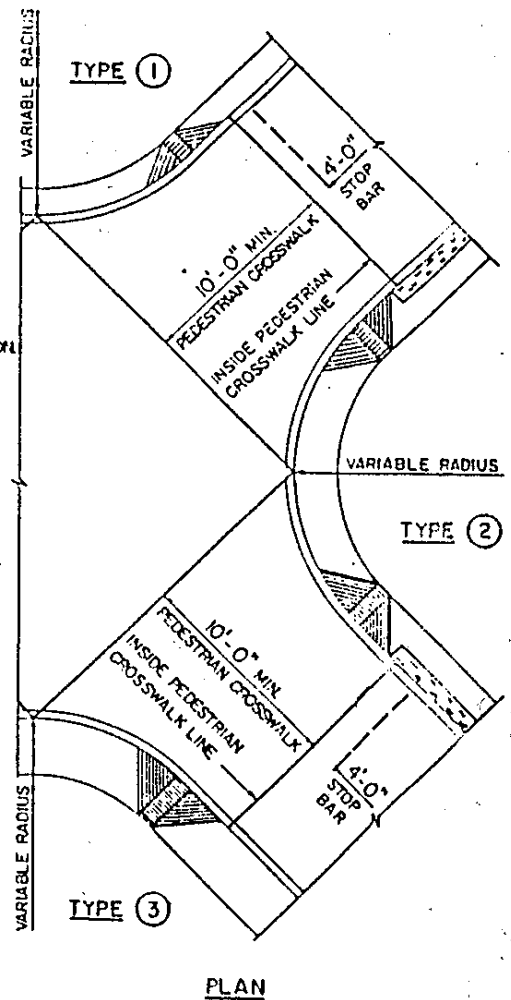
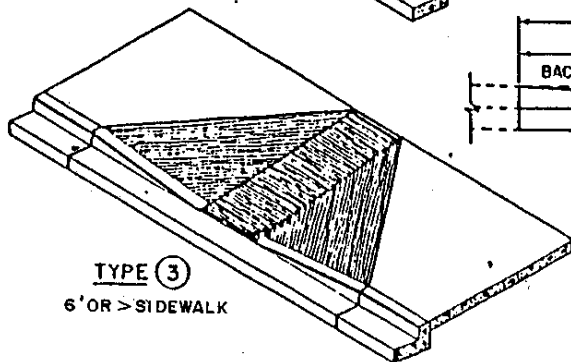
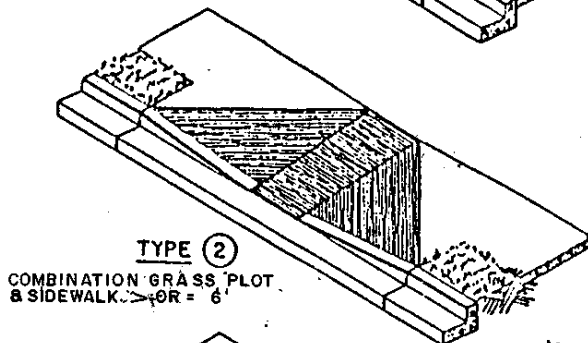
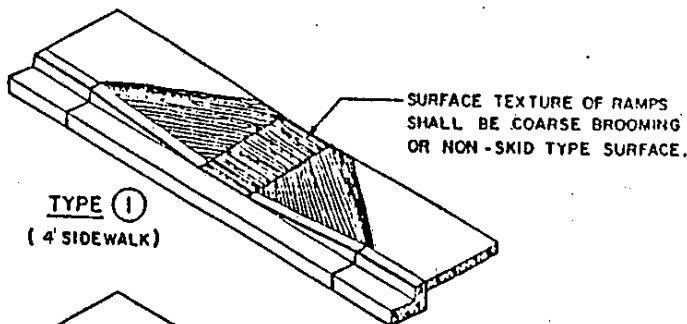
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| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>RESIDENTIAL SIDEWALK | REVISED | - 1 |
|   | DESIGN ENGINEER<br>9/15/88<br>DATE               |  |         | 15  |
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| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br>_____<br>CHIEF ENGINEER | <b>STANDARD ROADWAY AND SITE IMPROVEMENT DETAILS</b><br><br><b>SIDEWALK EXPANSION JOINTS</b> | REVISED<br>_____ | 1<br><hr style="width: 100%;"/> 16 |
|   | _____<br>DESIGN ENGINEER            |  | _____            |                                    |
|   | DATE: _____                         |  | _____            |                                    |
|   | _____                               |  | _____            |                                    |
|   | _____                               |  | _____            |                                    |

1. SIDEWALK RAMPS SHOULD BE LOCATED AS INDICATED ON DRAWINGS, HOWEVER EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. MAY AFFECT PLACEMENT.
2. NO SLOPE SHALL EXCEED 12:1 ON THE RAMP OR SIDEWALK.
3. IN NO CASE SHALL THE WIDTH OF RAMPS BE LESS THAN 3'-4" WIDTHS MAY EXCEED 3'-4" IF NECESSARY.
4. A 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE CONCRETE RAMP JOINS ANY RIGID PAVEMENT OR STRUCTURE.
5. THE PEDESTRIAN CROSSWALK LINES SHALL BE ESTABLISHED BY BISECTING THE INTERSECTION RADII.
6. RAMPS SHALL BE LOCATED SO THAT THE BEGINNING WILL BE TWO FEET FROM THE INSIDE PEDESTRIAN CROSSWALK LINE. (GENERALLY)
7. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM CONTROL DEVICES PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.

8. SIDEWALK RAMPS TO BE INCLUDED IN COST BID FOR CONCRETE SIDEWALK AND CURB OR CURB & GUTTER.
9. THIS STANDARD MAY BE MODIFIED TO SUIT A PARTICULAR LOCATION.
10. SIDEWALK RAMPS TO BE SHOWN ON PLANS (BY SYMBOL III) AND REFERENCED WITH THE CENTER OF THE RAMP ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE.

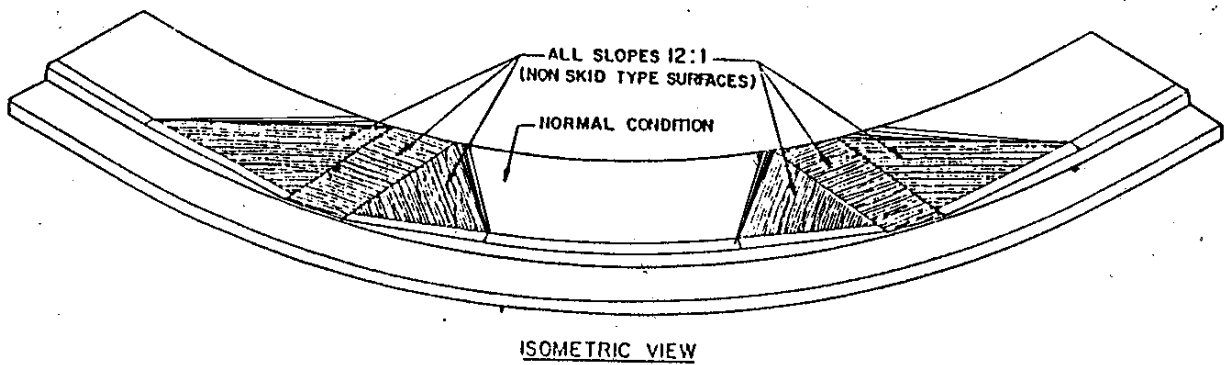
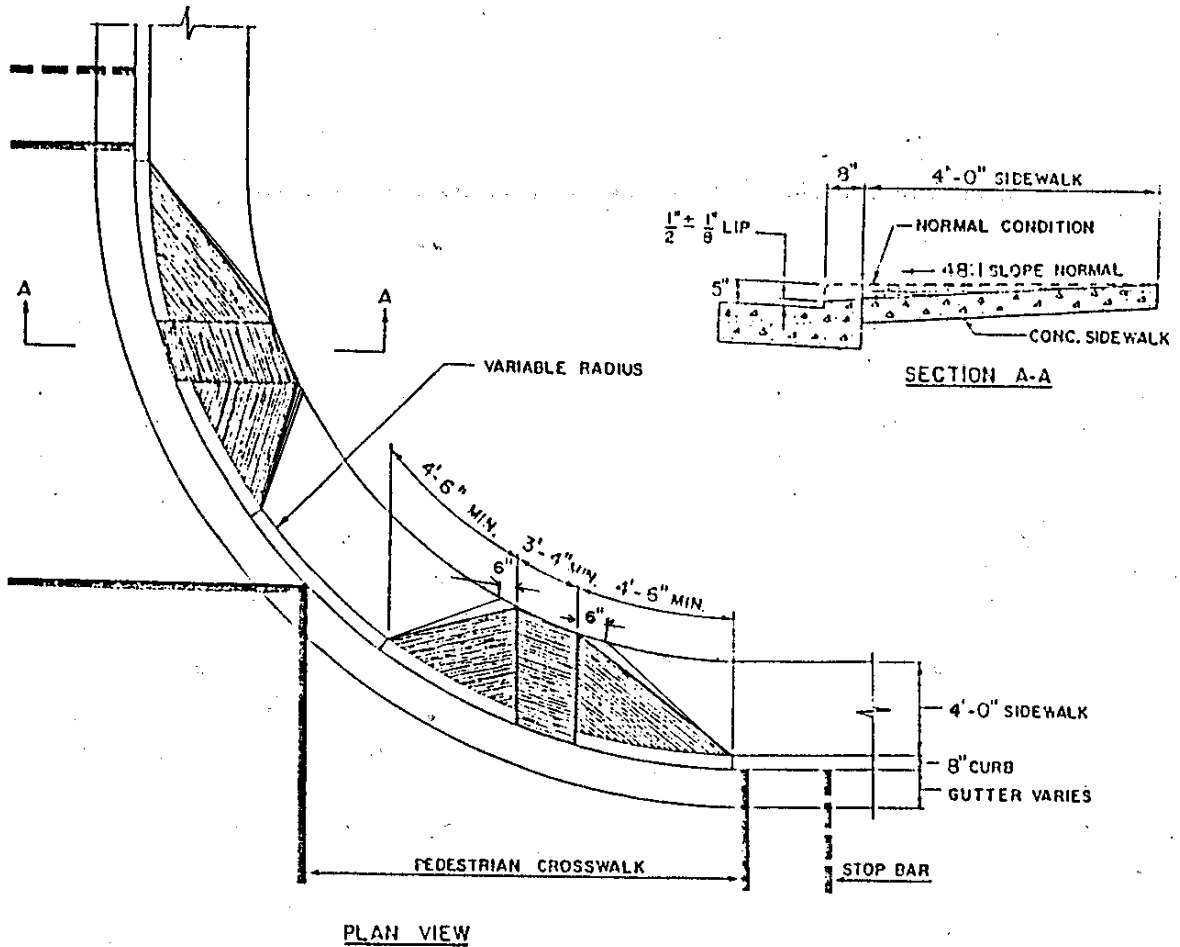


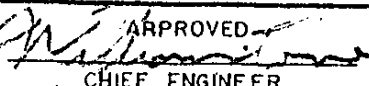
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*William*  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE

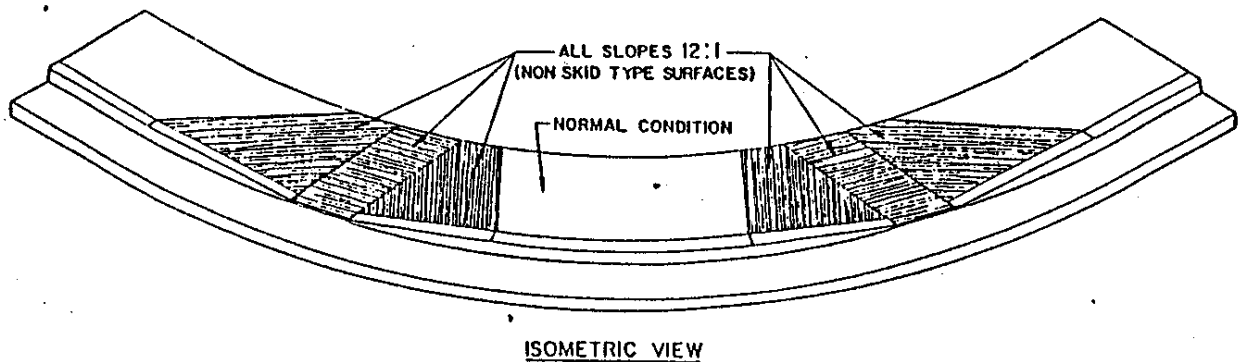
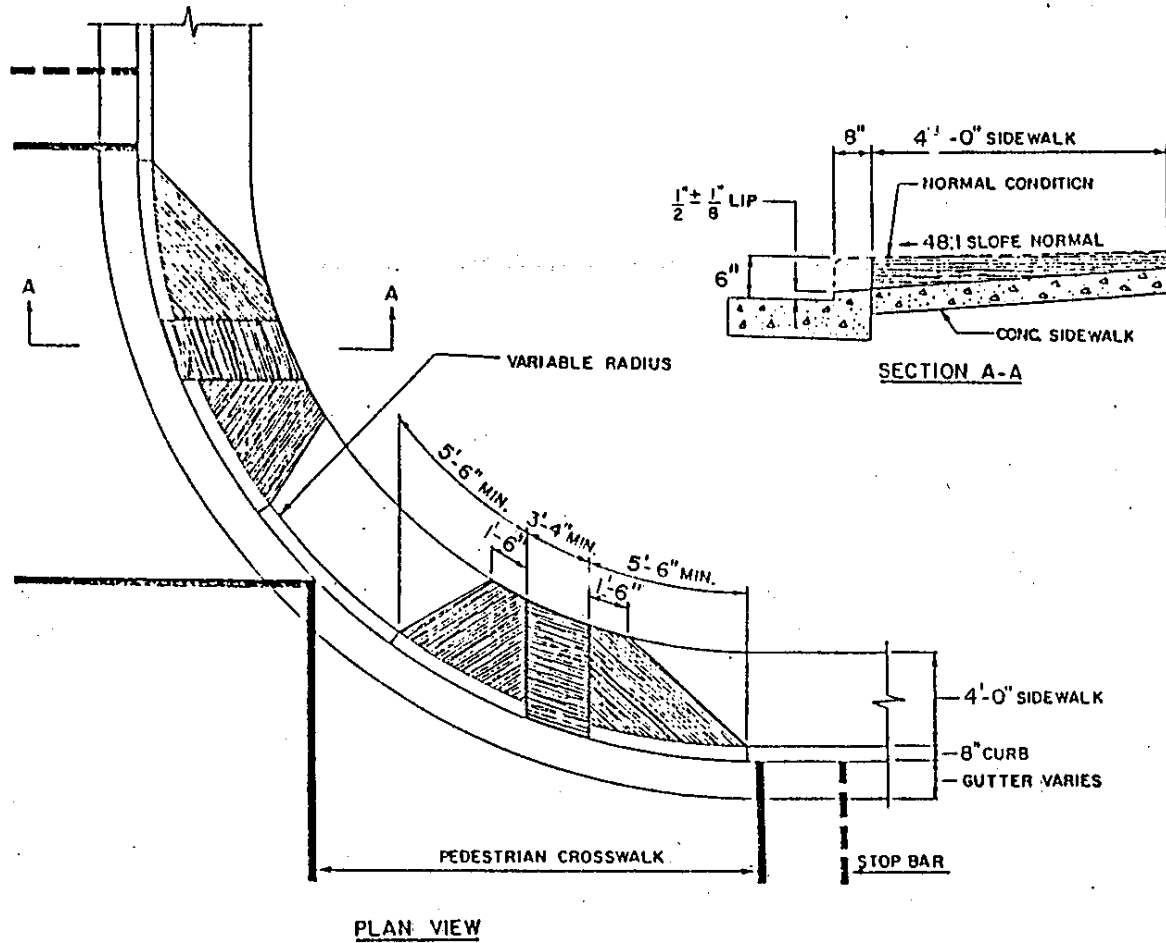
STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 SIDEWALK RAMPS GENERAL

REVISED  
 10/19/77  
 17

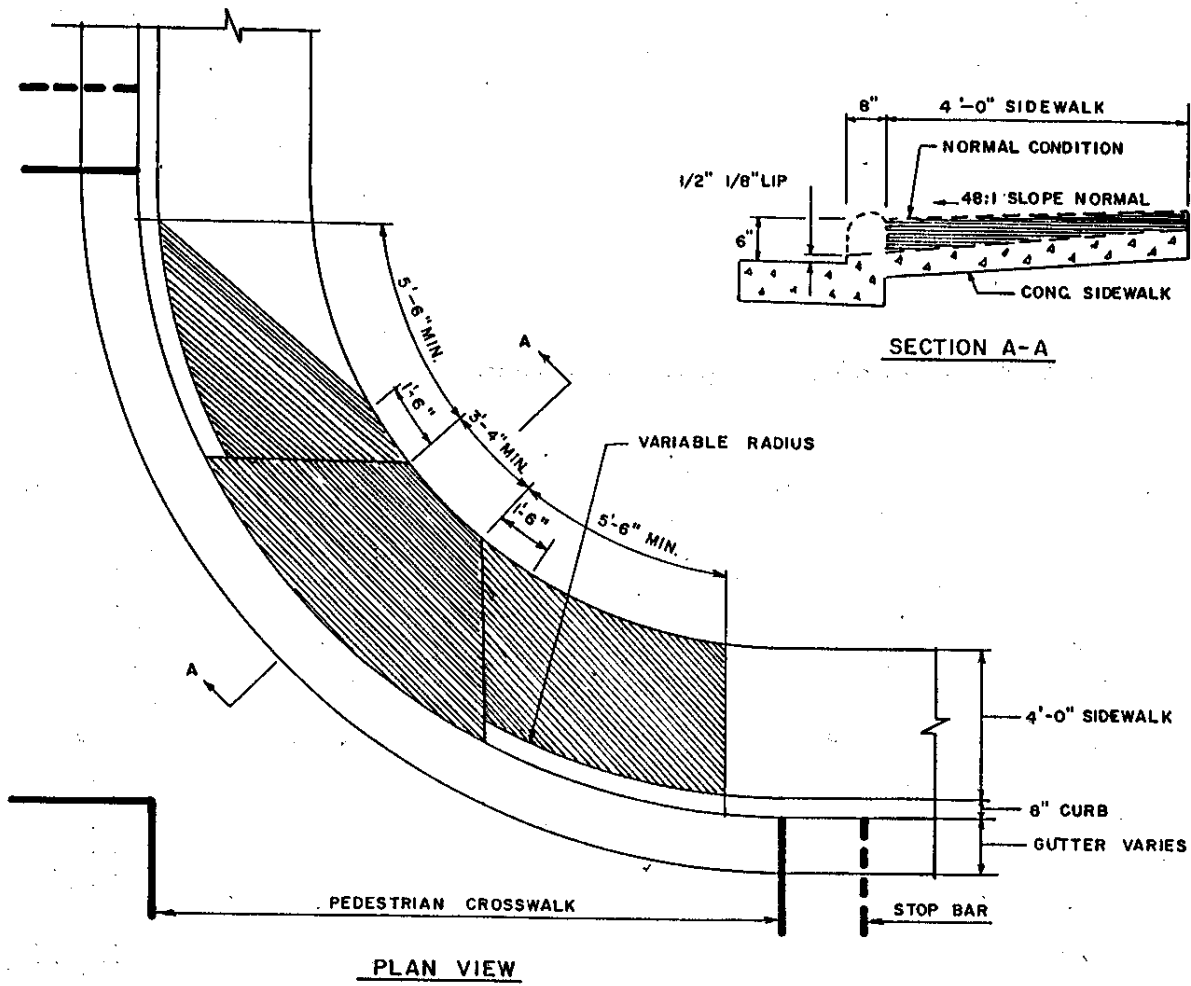


|   |  |   |                             |
|---|--|---|-----------------------------|
| ANNE ARUNDEL<br>COUNTY<br>DEPARTMENT OF<br>PUBLIC WORKS | APPROVED<br><br>CHIEF ENGINEER<br>Kenneth J. G... 9/1/89<br>DESIGN ENGINEER<br>9/1/89<br>DATE | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>SIDEWALK RAMPS METHOD A | REVISED<br>10/95<br>1<br>18 |
|---|--|---|-----------------------------|

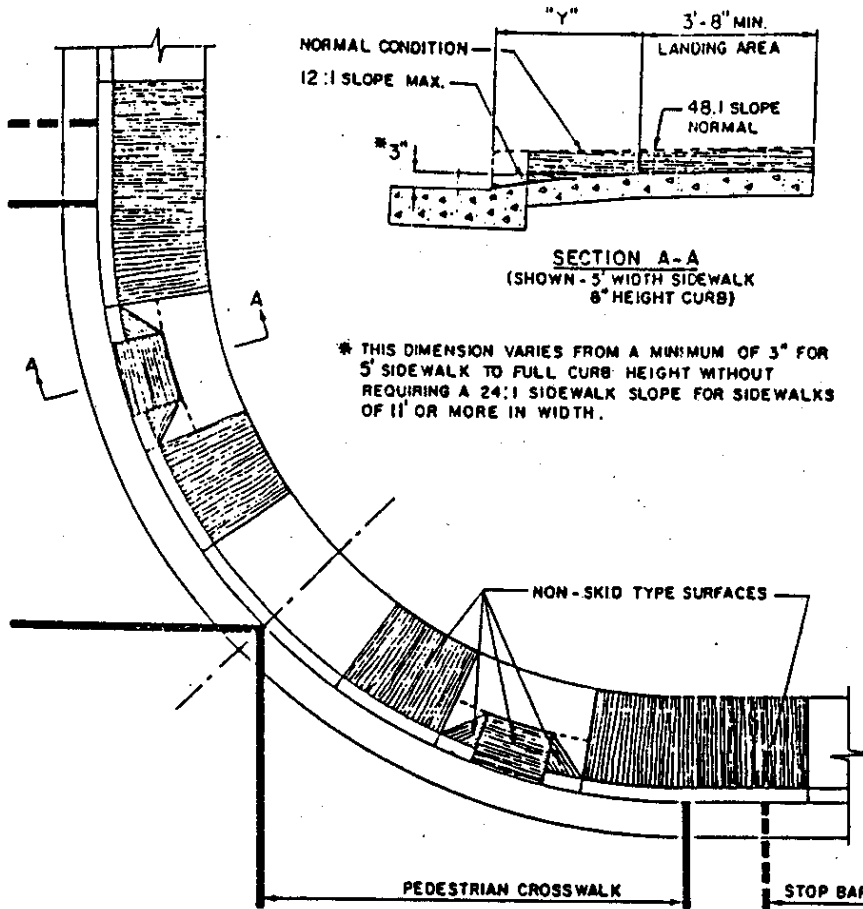




|  |  |  |                        |
|--|--|--|------------------------|
| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER<br>Kenneth J. Krall 9/11/88<br>DESIGN ENGINEER<br>9/13/88 | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>SIDEWALK RAMPS METHOD B | REVISED<br>10/95<br>19 |
|--|--|--|------------------------|

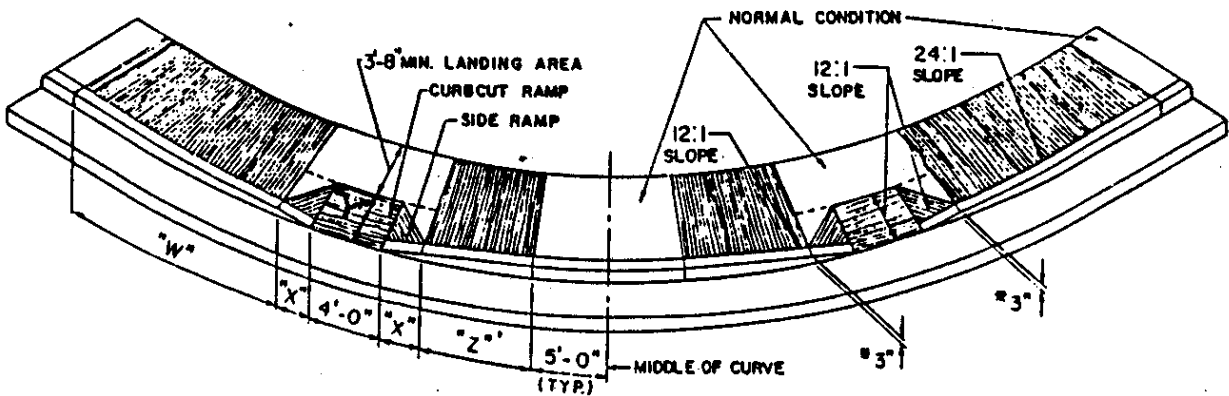


|  |   |  |         |    |
|--|---|--|---------|----|
| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>William T. ...</i><br>CHIEF ENGINEER           | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>SIDEWALK RAMPS METHOD C | REVISED | 20 |
|  | <i>Kenneth J. ...</i><br>DESIGN ENGINEER<br>9/1/88<br>975/188 |  | 10/95   |    |

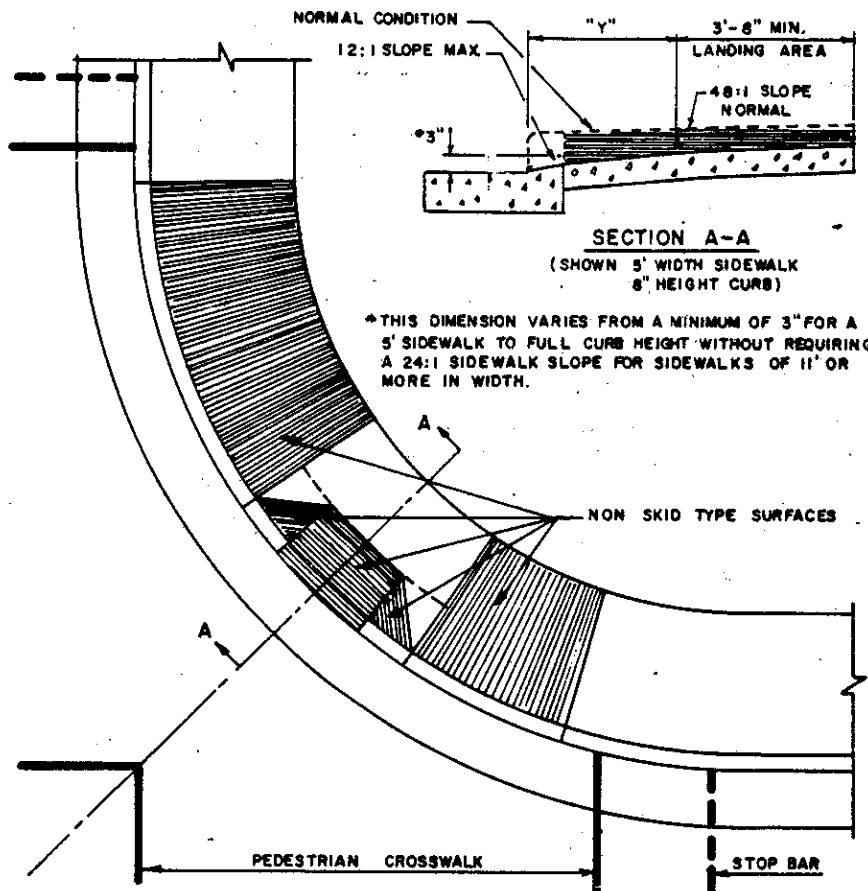


| CURB HEIGHT | SIDE WALK WIDTH | "W" | "X" | "Y" | "Z"  |
|-------------|-----------------|-----|-----|-----|------|
| 5"          | 4'              | 7'  | 1'  | 1'  | 3.5' |
|             | 5'              | 5'  | 2'  | 2'  | 2.5' |
|             | 6'              | 3'  | 3'  | 3'  | 1.5' |
|             | 7'              | 1'  | 4'  | 4'  | 0.5' |
| 6"          | 8'              | 0'  | 5'  | 5'  | 0'   |
|             | 4'              | 9'  | 1'  | 1'  | 4.5' |
|             | 5'              | 7'  | 2'  | 2'  | 3.5' |
|             | 6'              | 5'  | 3'  | 3'  | 2.5' |
| 7"          | 7'              | 3'  | 4'  | 4'  | 1.5' |
|             | 8'              | 1'  | 5'  | 5'  | 0.5' |
|             | 9'              | 0'  | 6'  | 6'  | 0'   |
|             | 4'              | 11' | 1'  | 1'  | 5.5' |
| 8"          | 5'              | 9'  | 2'  | 2'  | 4.5' |
|             | 6'              | 7'  | 3'  | 3'  | 3.5' |
|             | 7'              | 5'  | 4'  | 4'  | 2.5' |
|             | 8'              | 3'  | 5'  | 5'  | 1.5' |
| 9"          | 9'              | 1'  | 6'  | 6'  | 0.5' |
|             | 10'             | 0'  | 7'  | 7'  | 0'   |
|             | 4'              | 13' | 1'  | 1'  | 6.5' |
|             | 5'              | 11' | 2'  | 2'  | 5.5' |
| 9"          | 6'              | 9'  | 3'  | 3'  | 4.5' |
|             | 7'              | 7'  | 4'  | 4'  | 3.5' |
|             | 8'              | 5'  | 5'  | 5'  | 2.5' |
|             | 9'              | 3'  | 6'  | 6'  | 1.5' |
| 9"          | 10'             | 1'  | 7'  | 7'  | 0.5' |
|             | 11'             | 0'  | 8'  | 8'  | 0'   |
|             | 4'              | 15' | 1'  | 1'  | 7.5' |
|             | 5'              | 13' | 2'  | 2'  | 6.5' |
| 9"          | 6'              | 11' | 3'  | 3'  | 5.5' |
|             | 7'              | 9'  | 4'  | 4'  | 4.5' |
|             | 8'              | 7'  | 5'  | 5'  | 3.5' |
|             | 9'              | 5'  | 6'  | 6'  | 2.5' |
| 9"          | 10'             | 3'  | 7'  | 7'  | 1.5' |
|             | 11'             | 1'  | 8'  | 8'  | 0.5' |
|             | 12'             | 0'  | 9'  | 9'  | 0'   |

ALL ABOVE DIMENSIONS BASED ON  
CURB LIP OF 1 1/2" ± 0"

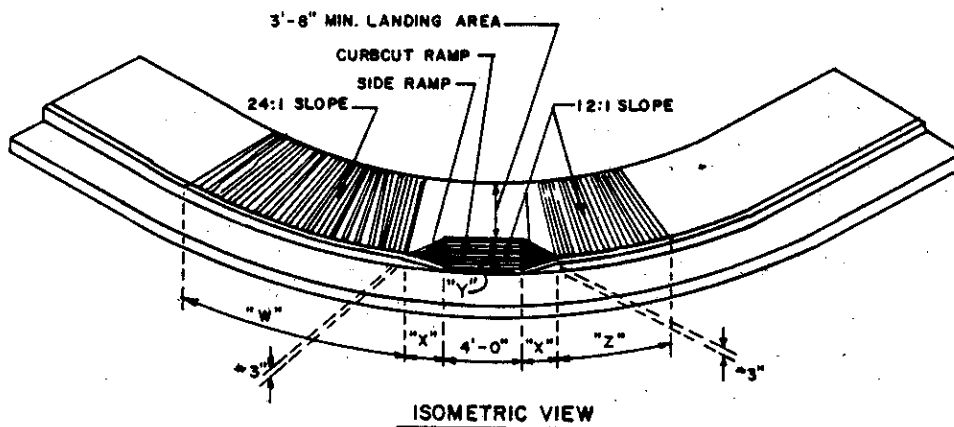


|  |   |  |         |    |
|--|---|--|---------|----|
| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER      | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>SIDEWALK RAMPS METHOD D | REVISED | 1  |
|  | DESIGN ENGINEER<br><i>[Signature]</i><br>DATE 9/25/92 |  | 9/25/92 | 21 |



| CURB HEIGHT | SIDE WALK WIDTH | "w" | "x" | "y" | "z"   |
|-------------|-----------------|-----|-----|-----|-------|
| 5"          | 1'              | 7'  | 1'  | 1'  | 3.5'  |
|             | 5'              | 5'  | 2'  | 2'  | 2.5'  |
|             | 6'              | 3'  | 3'  | 3'  | 1.5'  |
|             | 7'              | 1'  | 4'  | 4'  | 0.5'  |
|             | 8'              | 0'  | 5'  | 5'  | 0'    |
| 6"          | 1'              | 9'  | 1'  | 1'  | 4.5'  |
|             | 5'              | 7'  | 2'  | 2'  | 3.5'  |
|             | 6'              | 5'  | 3'  | 3'  | 2.5'  |
|             | 7'              | 3'  | 4'  | 4'  | 1.5'  |
|             | 8'              | 1'  | 5'  | 5'  | 0.5'  |
| 7"          | 1'              | 11' | 1'  | 1'  | 5.5'  |
|             | 5'              | 9'  | 2'  | 2'  | 4.5'  |
|             | 6'              | 7'  | 3'  | 3'  | 3.5'  |
|             | 7'              | 5'  | 4'  | 4'  | 2.5'  |
|             | 8'              | 3'  | 5'  | 5'  | 1.5'  |
| 8"          | 1'              | 13' | 1'  | 1'  | 6.5'  |
|             | 5'              | 11' | 2'  | 2'  | 5.5'  |
|             | 6'              | 9'  | 3'  | 3'  | 4.5'  |
|             | 7'              | 7'  | 4'  | 4'  | 3.5'  |
|             | 8'              | 5'  | 5'  | 5'  | 2.5'  |
| 9"          | 1'              | 15' | 1'  | 1'  | 7.5'  |
|             | 5'              | 13' | 2'  | 2'  | 6.5'  |
|             | 6'              | 11' | 3'  | 3'  | 5.5'  |
|             | 7'              | 9'  | 4'  | 4'  | 4.5'  |
|             | 8'              | 7'  | 5'  | 5'  | 3.5'  |
| 10"         | 1'              | 17' | 1'  | 1'  | 8.5'  |
|             | 5'              | 15' | 2'  | 2'  | 7.5'  |
|             | 6'              | 13' | 3'  | 3'  | 6.5'  |
|             | 7'              | 11' | 4'  | 4'  | 5.5'  |
|             | 8'              | 9'  | 5'  | 5'  | 4.5'  |
| 11"         | 1'              | 19' | 1'  | 1'  | 9.5'  |
|             | 5'              | 17' | 2'  | 2'  | 8.5'  |
|             | 6'              | 15' | 3'  | 3'  | 7.5'  |
|             | 7'              | 13' | 4'  | 4'  | 6.5'  |
|             | 8'              | 11' | 5'  | 5'  | 5.5'  |
| 12"         | 1'              | 21' | 1'  | 1'  | 10.5' |
|             | 5'              | 19' | 2'  | 2'  | 9.5'  |
|             | 6'              | 17' | 3'  | 3'  | 8.5'  |

ALL ABOVE DIMENSIONS BASED ON CURB LIP OF 1/2"±0"

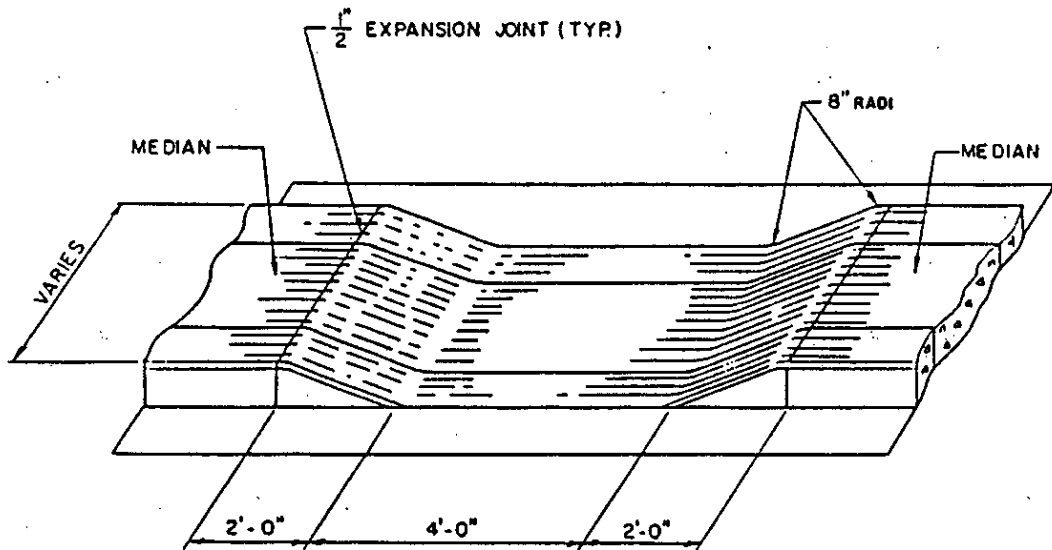


ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

APPROVED  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE 4/7/88

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 SIDEWALK RAMPS METHOD

| REVISED |    |
|---------|----|
| 9/22/92 | 1  |
|         | 22 |



ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS

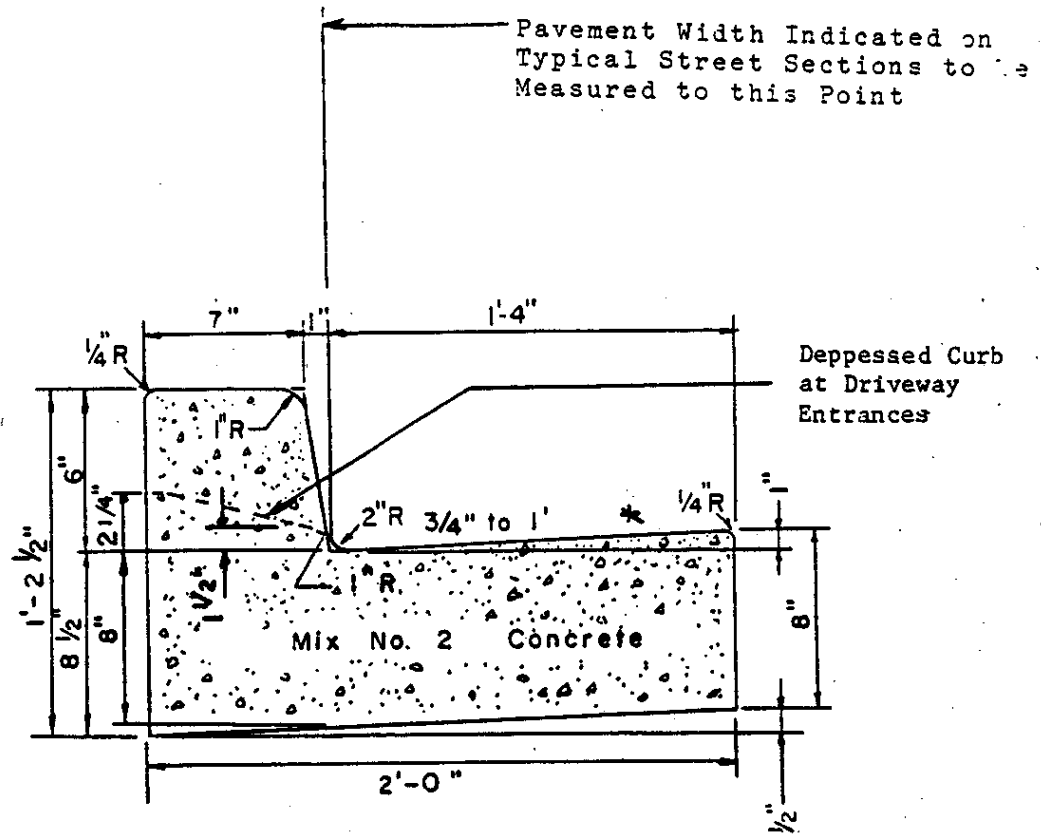
APPROVED  
*[Signature]*  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE

STANDARD ROADWAY &  
 SITE IMPROVEMENT DETAILS  
 MEDIAN & ISLAND OPENINGS

REVISED

|  |
|--|
|  |
|  |
|  |
|  |

1  
 23



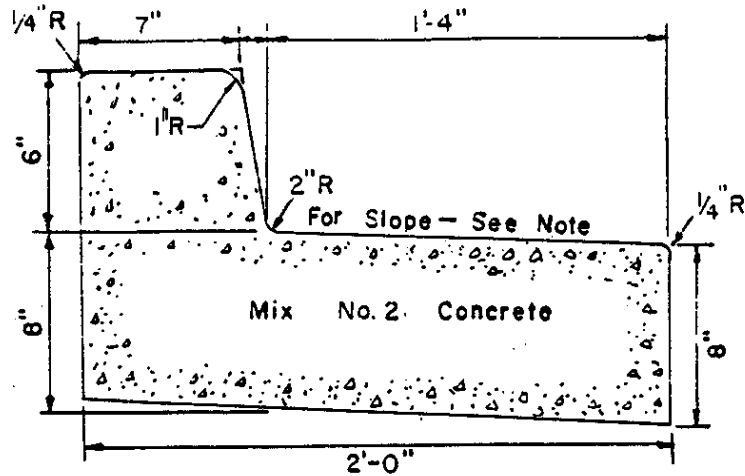
\* GUTTER PAN AT THE MEDIAN EDGE OF INTERMEDIATE ARTERIALS OR THE HIGH SIDE OF SUPERELEVATED SECTIONS SHALL BE SLOPED AT THE SAME RATE AND IN THE SAME DIRECTION AS THE PAVEMENT. MATCH PAVEMENT CROSS SLOPE WHEN CURB IS LOCATED ON THE LOW SIDE OF SUPERELEVATED SECTION AND THE RATE OF SUPERELEVATION IS GREATER THAN 3% FOR MODIFIED CURB AND GUTTER.

ANNE ARUNDEL  
COUNTY  
DEPARTMENT OF  
PUBLIC WORKS

APPROVED  
*[Signature]*  
CHIEF ENGINEER  
DESIGN ENGINEER  
DATE

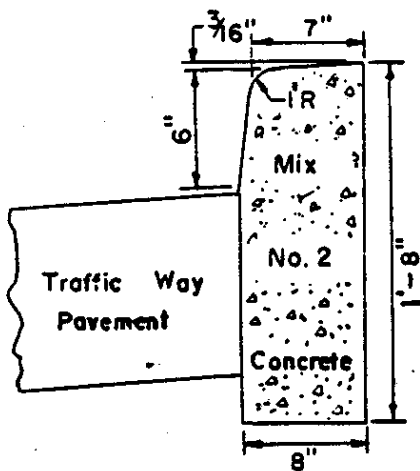
STANDARD ROADWAY &  
SITE IMPROVEMENT DETAILS  
STANDARD COMBINATION  
CURB & GUTTER

| REVISED |    |
|---------|----|
|         | 1  |
|         | 24 |
|         |    |

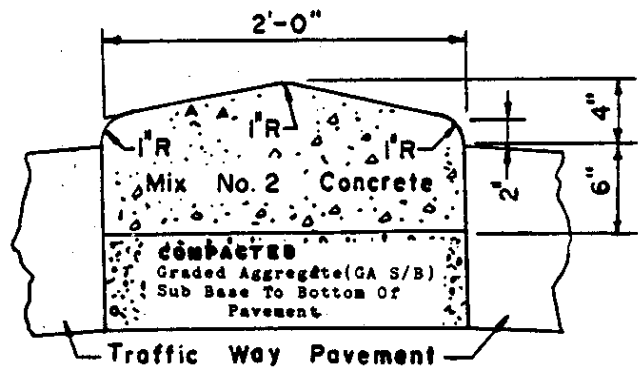


NOTE: SLOPE AT SAME RATE AS LINEAR SLOPE ACROSS PAVING.

REVERSE SLOPE CURB AND GUTTER



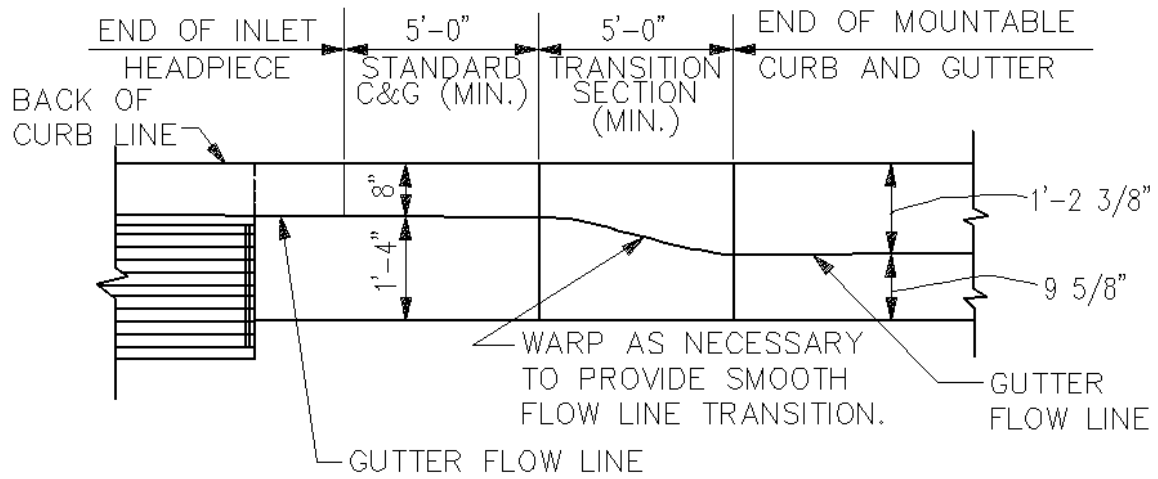
TYPE "A"



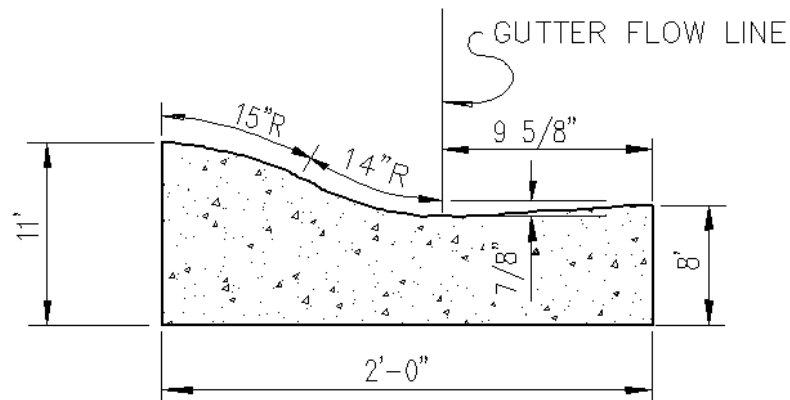
TYPE "B"

NOTE: Type "A" and Type "B" Median Curbs to be used only upon approval of the Department of Public Works.

|  |                 |  |         |    |
|--|-----------------|--|---------|----|
| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | APPROVED        | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>STANDARD MEDIAN CURBS | REVISED | 1  |
|  | CHIEF ENGINEER  |  |         | 25 |
|  | DESIGN ENGINEER |  |         |    |
|  | DATE            |  |         |    |



TYPICAL TRANSITION STANDARD CURB AND GUTTER TO MOUNTABLE CURB AND GUTTER

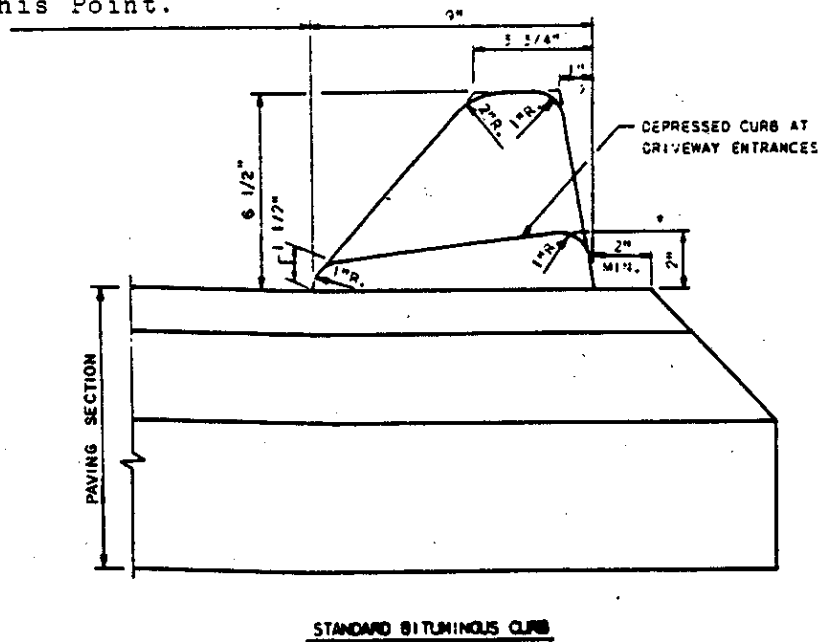


MOUNTABLE CURB AND GUTTER

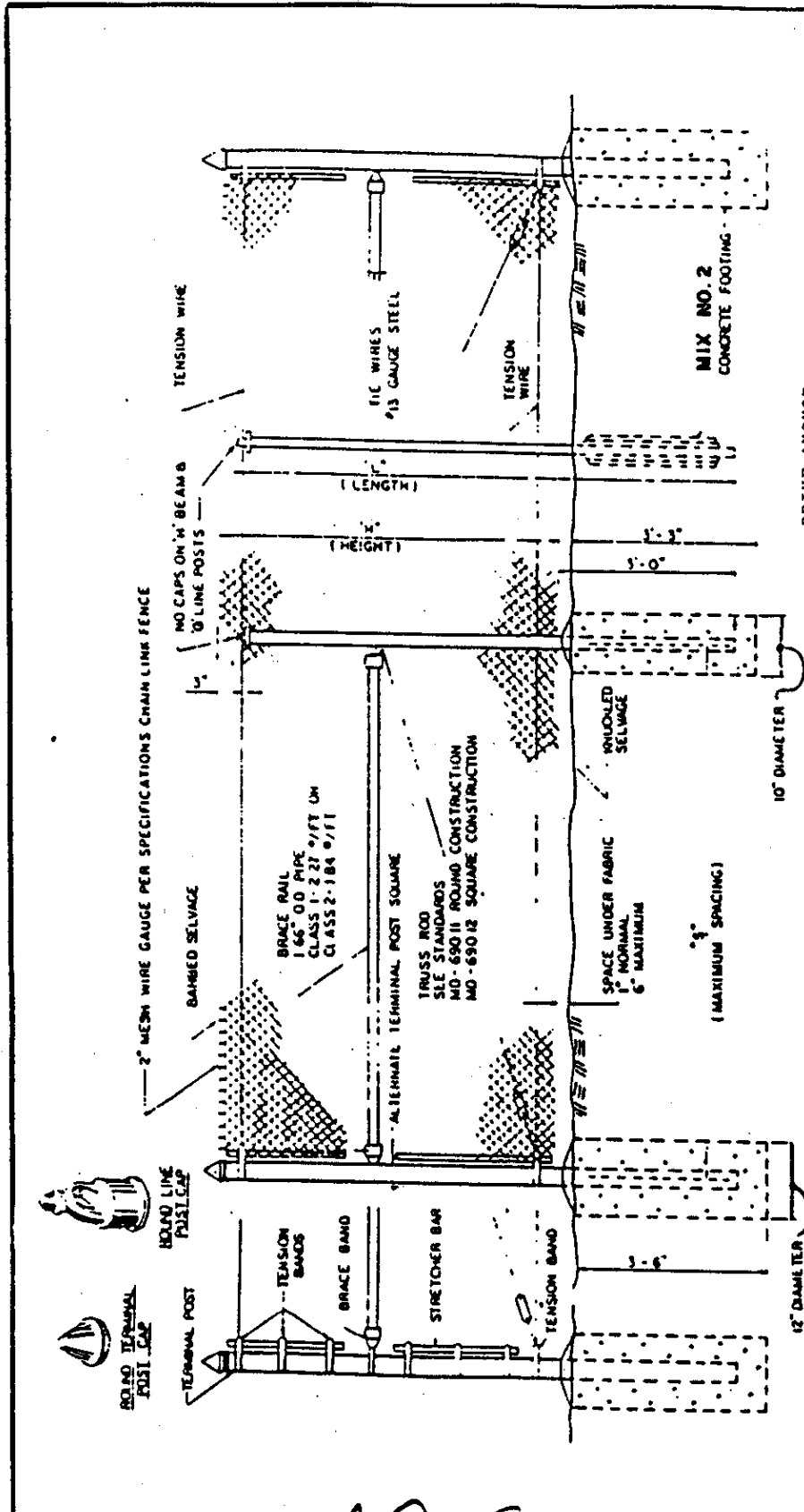
|   |                                     |  |                  |  |
|---|-------------------------------------|--|------------------|--|
| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br>_____<br>CHIEF ENGINEER | <b>STANDARD ROADWAY AND SITE IMPROVEMENT DETAILS</b><br><br><b>MOUNTABLE CURB AND GUTTER</b> | REVISED<br>_____ | 1<br><hr style="width: 10px; margin: 0 auto;"/> 26 |
|   | _____<br>DESIGN ENGINEER            |  | _____            |  |
|   | DATE: _____                         |  | _____            |  |
|   | _____                               |  | _____            |  |
|   | _____                               |  | _____            |  |



Pavement Width Indicated on Typical Street Sections to be Measured To This Point.



|   |  |  |         |    |
|---|--|--|---------|----|
| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>STANDARD BITUMINOUS<br>CONCRETE CURB | REVISED | 1  |
|   | DESIGN ENGINEER<br>9/7/88<br>DATE                |  |         | 27 |
|   |  |  |         |    |
|   |  |  |         |    |
|   |  |  |         |    |



DRIVE ANCHOR  
 SQUARE OR ROUND TERMINAL POST  
 CONSTRUCTION.  
 ALTERNATE TO CONCRETE FOOTING  
 SEE DETAIL 1/32, 1/34, 1/35

NOTES

1. ALL ROUND LIVE POSTS TO BE CAPPED WITH LOOP CAPS TENSION WIRE TO RUN THROUGH LOOP CAPS TO BE FASTENED TO ALL TERMINAL POSTS WITH TENSION BANDS.
2. FASTEN FABRIC TO TENSION WIRE WITH HOG RINGS 9/16" C/C HOG RINGS TO BE 1 1/2" GAUGE GALVANIZED STEEL WIRE.
3. MATERIALS TO MEET REQUIREMENTS OF AASHTO M 181.
4. COLOR OF VINYL SHALL BE WARM GRAY OR BLACK BLACK SEE SPECIAL PROVISIONS.

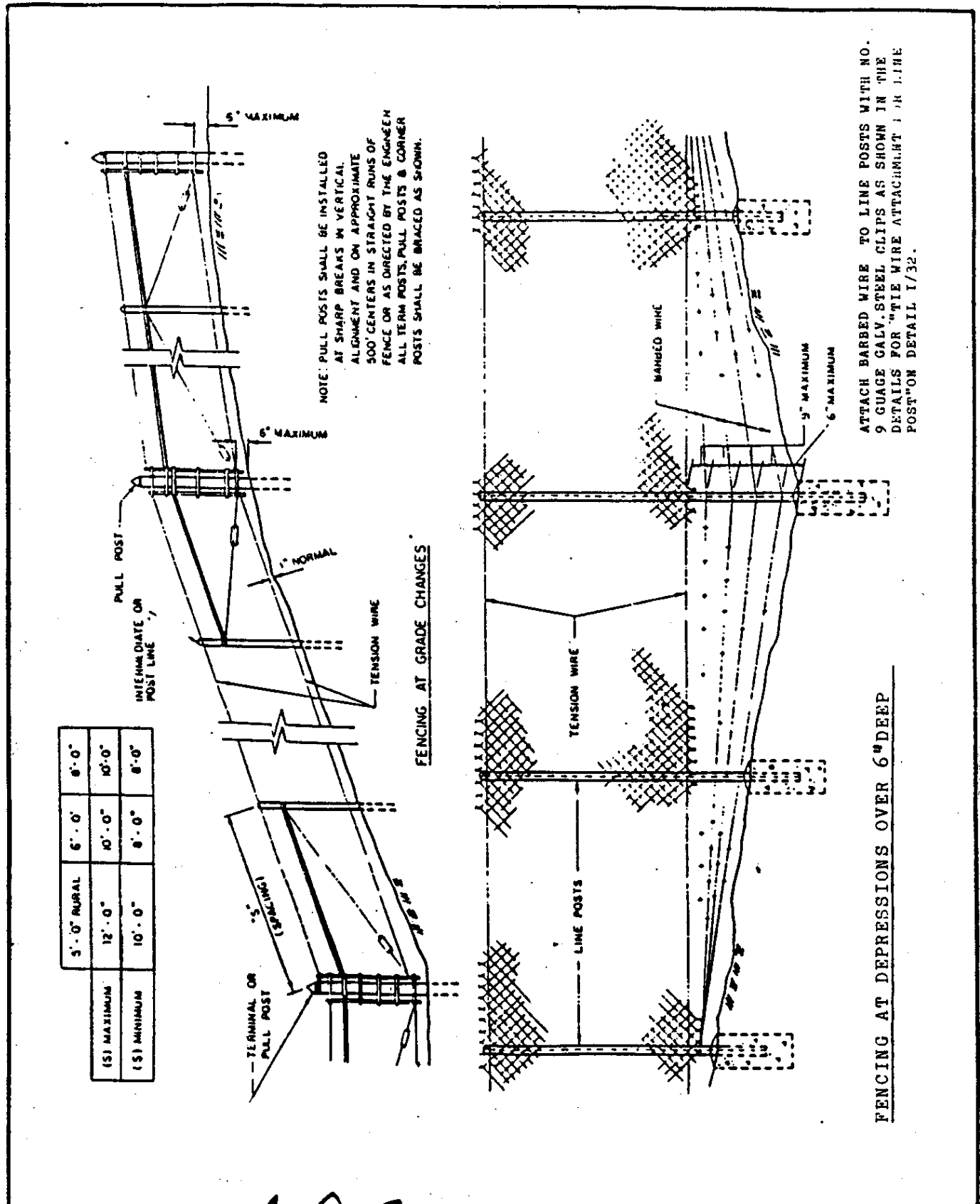
| LINE POSTS      | 5'-0" RURAL             |                         | 6'-0"                   |                         | 8'-0"                   |                         |
|-----------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                 | ROUND - CLASS 1         | ROUND - CLASS 2         | ROUND - CLASS 1         | ROUND - CLASS 2         | ROUND - CLASS 1         | ROUND - CLASS 2         |
| M-BEAM - STEEL  | 190° 00' @ 272° / FT    | 190° 00' @ 228° / FT    | 2375° 00' @ 365° / FT   | 2375° 00' @ 312° / FT   | 2375° 00' @ 365° / FT   | 2375° 00' @ 312° / FT   |
| M-BEAM - ALUM   | 1975° 1625' @ 270° / FT | 1975° 1625' @ 270° / FT | 1875° 1625' @ 270° / FT | 1875° 1625' @ 270° / FT | 1875° 1625' @ 270° / FT | 1875° 1625' @ 270° / FT |
| C-POST - STEEL  | 225° 195' @ 125° 9/11   | 225° 195' @ 125° 9/11   | 225° 195' @ 125° 9/11   | 225° 195' @ 125° 9/11   | 225° 195' @ 125° 9/11   | 225° 195' @ 125° 9/11   |
| ROUND - CLASS 1 | 2375° 00' @ 365° / FT   | 2375° 00' @ 312° / FT   | 2875° 00' @ 575° / FT   | 2875° 00' @ 464° / FT   | 2875° 00' @ 575° / FT   | 2875° 00' @ 464° / FT   |
| ROUND - CLASS 2 | 2375° 00' @ 312° / FT   | 2375° 00' @ 270° / FT   | 2875° 00' @ 464° / FT   | 2875° 00' @ 365° / FT   | 2875° 00' @ 464° / FT   | 2875° 00' @ 365° / FT   |
| SQUARE - ALT.   | 200° 50' @ 360° / FT    | 200° 50' @ 360° / FT    | 250° 50' @ 570° / FT    | 250° 50' @ 464° / FT    | 250° 50' @ 570° / FT    | 250° 50' @ 464° / FT    |

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

APPROVED  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE

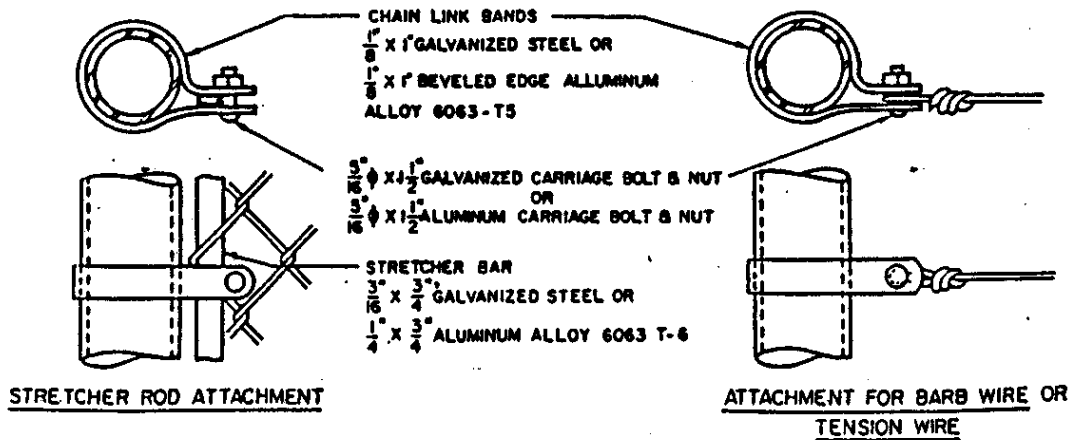
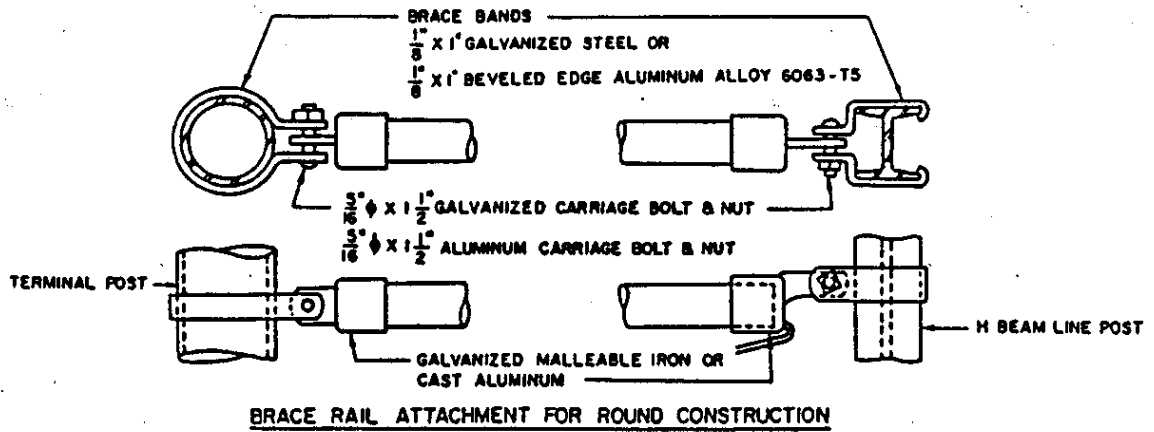
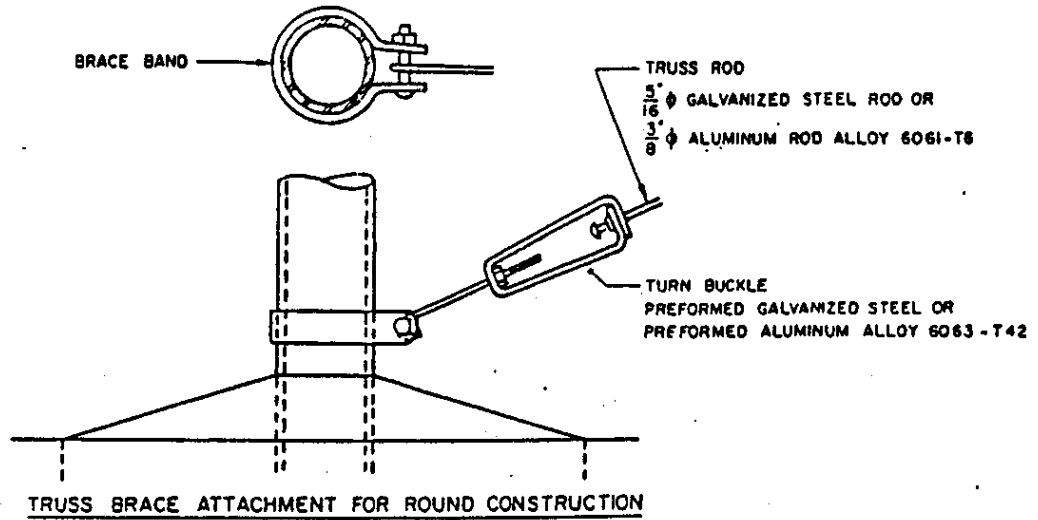
STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 CHAIN LINK FENCE TYPICAL  
 5 FT. RURAL 6 FT. & 8 FT.

|         |    |
|---------|----|
| REVISED | 1  |
|         | 28 |

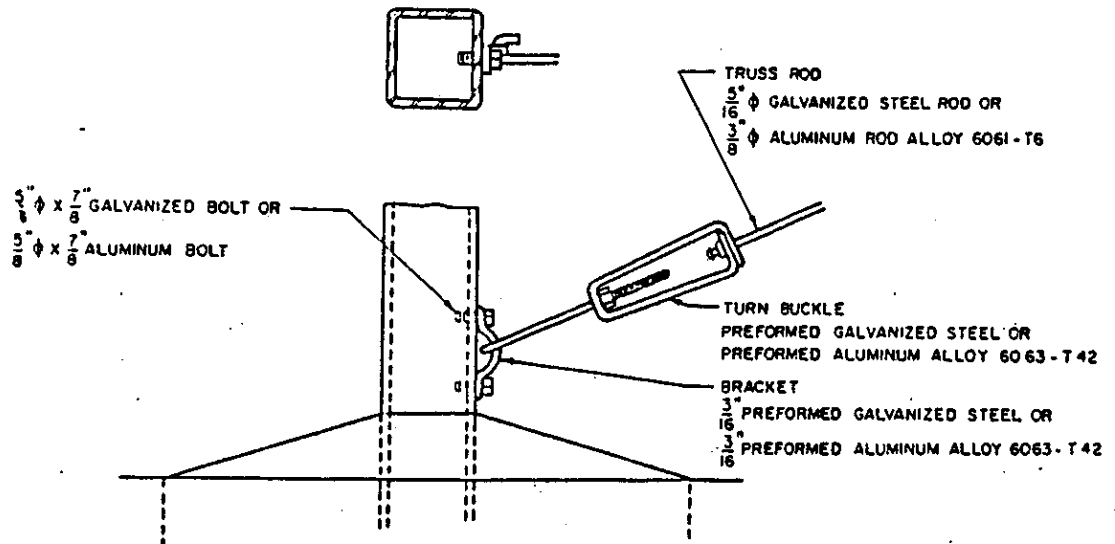


|             |             |        |        |
|-------------|-------------|--------|--------|
| (S) MAXIMUM | 5'-0" RURAL | 6'-0"  | 8'-0"  |
| (S) MINIMUM | 12'-0"      | 10'-0" | 10'-0" |
|             | 10'-0"      | 8'-0"  | 8'-0"  |

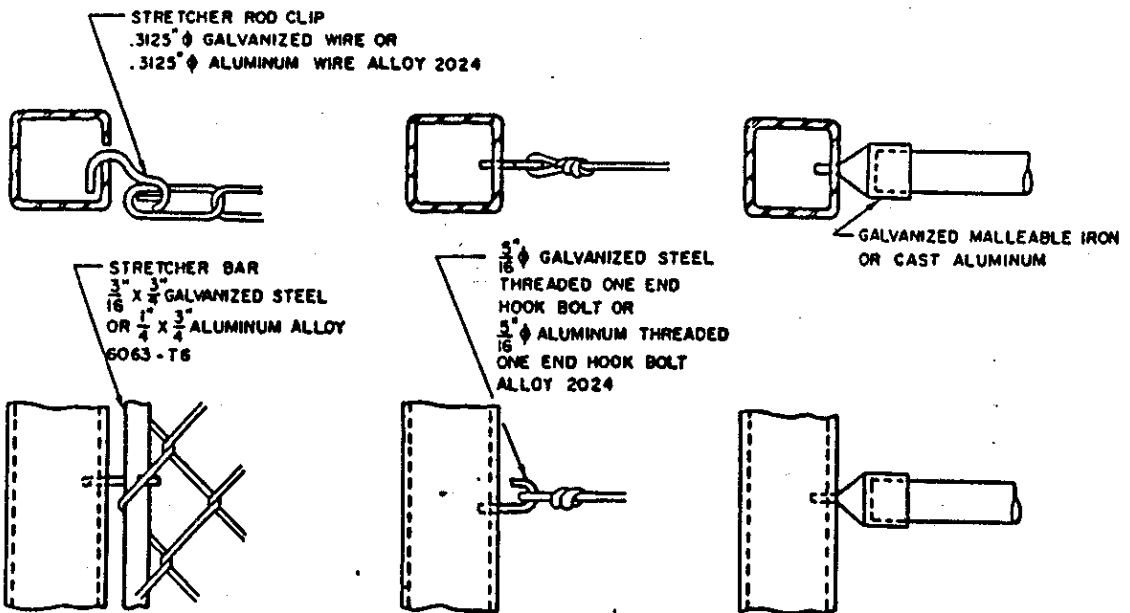
|   |  |  |         |   |
|---|--|--|---------|---|
| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>CHAIN LINK FENCE AT GRADE<br>CHANGES & DEPRESSIONS | REVISED | 1 |
|   | DESIGNED<br><i>[Signature]</i><br>DATE           |  | 29      |   |



|   |                 |   |         |    |
|---|-----------------|---|---------|----|
| ANNE ARUNDEL<br>COUNTY<br>DEPARTMENT OF<br>PUBLIC WORKS | APPROVED        | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>CHAIN LINK FENCE BRACE &<br>ROD ATTACHMENTS - ROUND<br>CONSTRUCTION | REVISED | 1  |
|   | CHIEF ENGINEER  |   |         | 30 |
|   | DESIGN ENGINEER |   |         |    |
|   | DATE            |   |         |    |



ALTERNATE TRUSS BRACE ATTACHMENT FOR SQUARE CONSTRUCTION



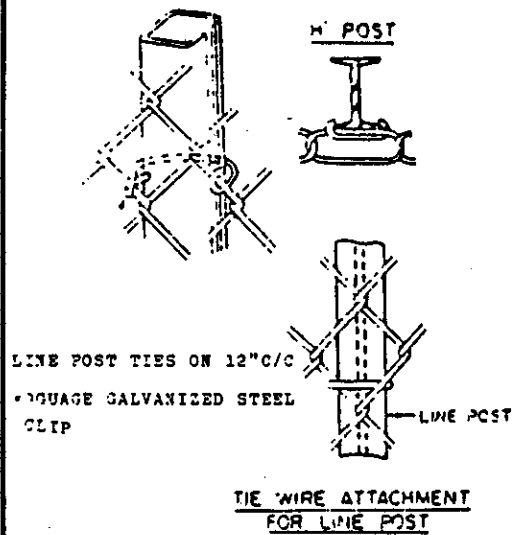
ALTERNATE STRETCHER  
 ROD ATTACHMENT

ALTERNATE ATTACHMENT  
 FOR BARB WIRE  
 OR  
 TENSION WIRE

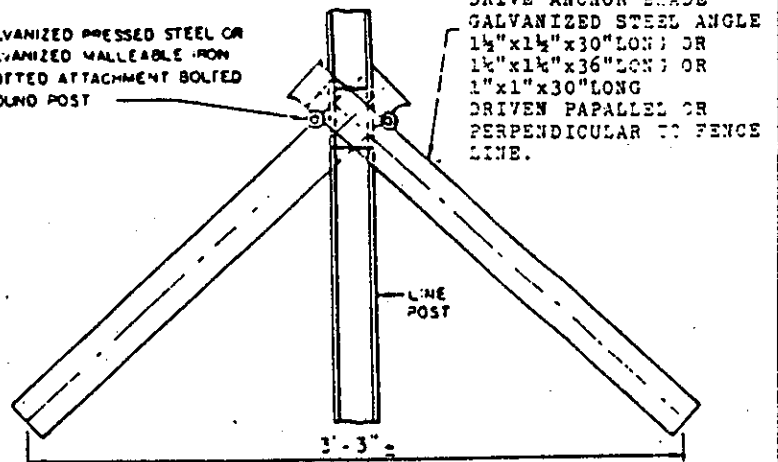
ALTERNATE BRACE RAIL ATTACHMENT  
 FOR SQUARE CONSTRUCTION

|   |                                    |  |         |       |
|---|------------------------------------|--|---------|-------|
| ANNE ARUNDEL<br>COUNTY<br>DEPARTMENT OF<br>PUBLIC WORKS | APPROVED<br><br>CHIEF ENGINEER     | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>CHAIN LINK FENCE BRACE &<br>ROD ATTACHMENTS - SQUARE<br>CONSTRUCTION | REVISED | 1     |
|   | DESIGN ENGINEER<br>9/17/88<br>DATE |  | _____   | 31    |
|   | _____                              |  | _____   | _____ |
|   | _____                              |  | _____   | _____ |

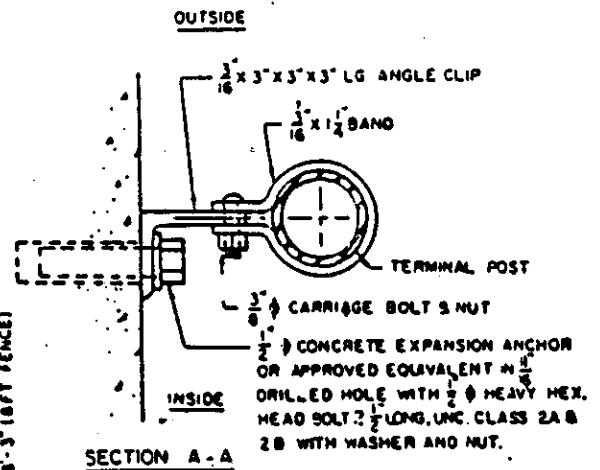
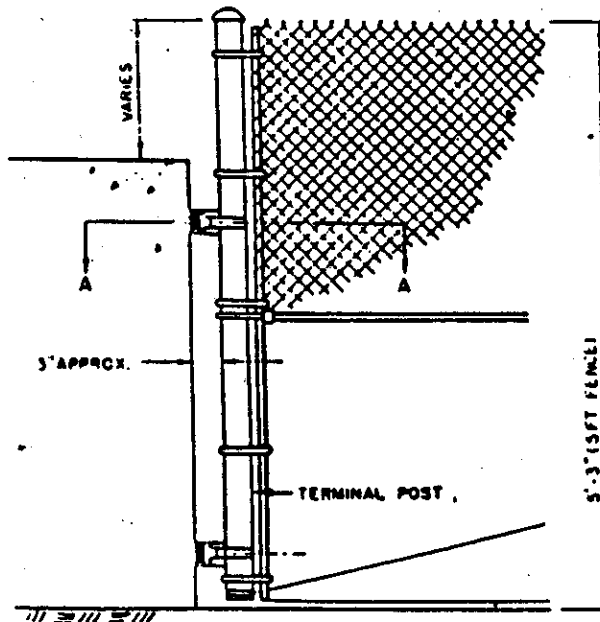
"H" POST OR "ROUND" POST



GALVANIZED PRESSED STEEL OR GALVANIZED MALLEABLE IRON SLOTTED ATTACHMENT BOLTED AROUND POST

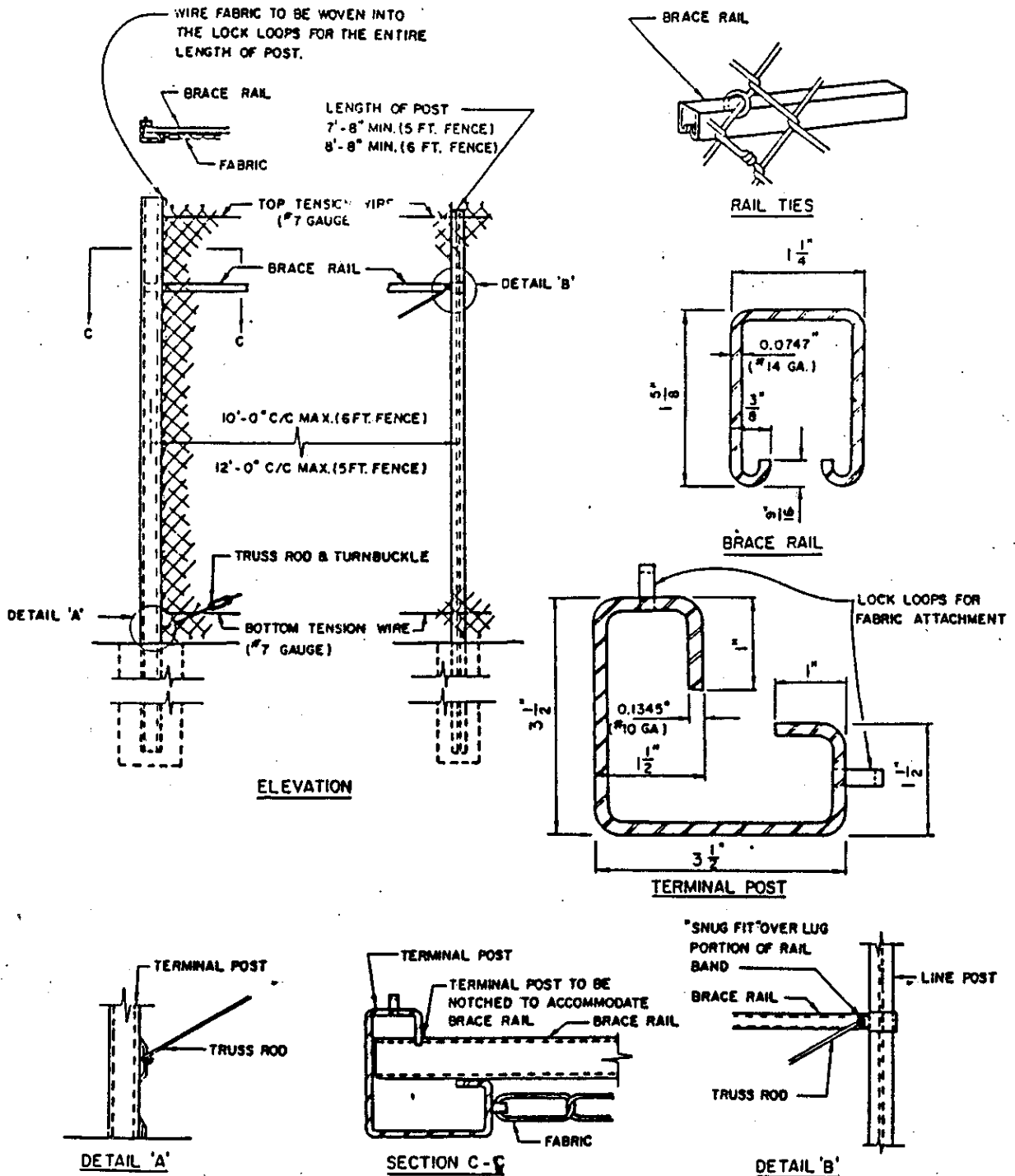


DRIVE ANCHOR FOR LINE POST  
ALTERNATE TO CONCRETE FOOTING

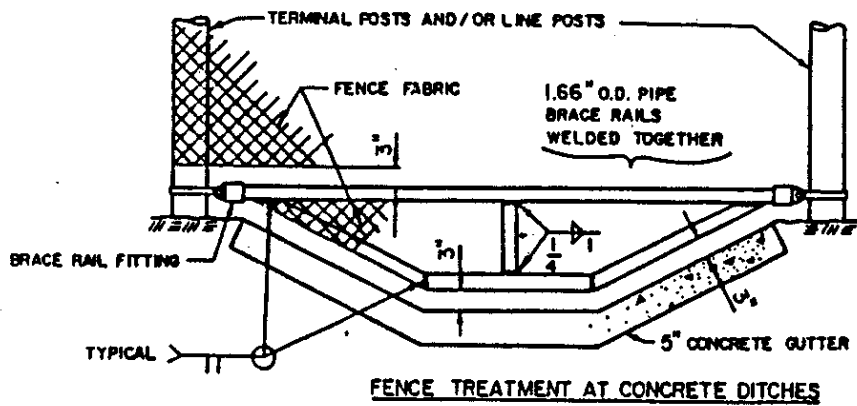
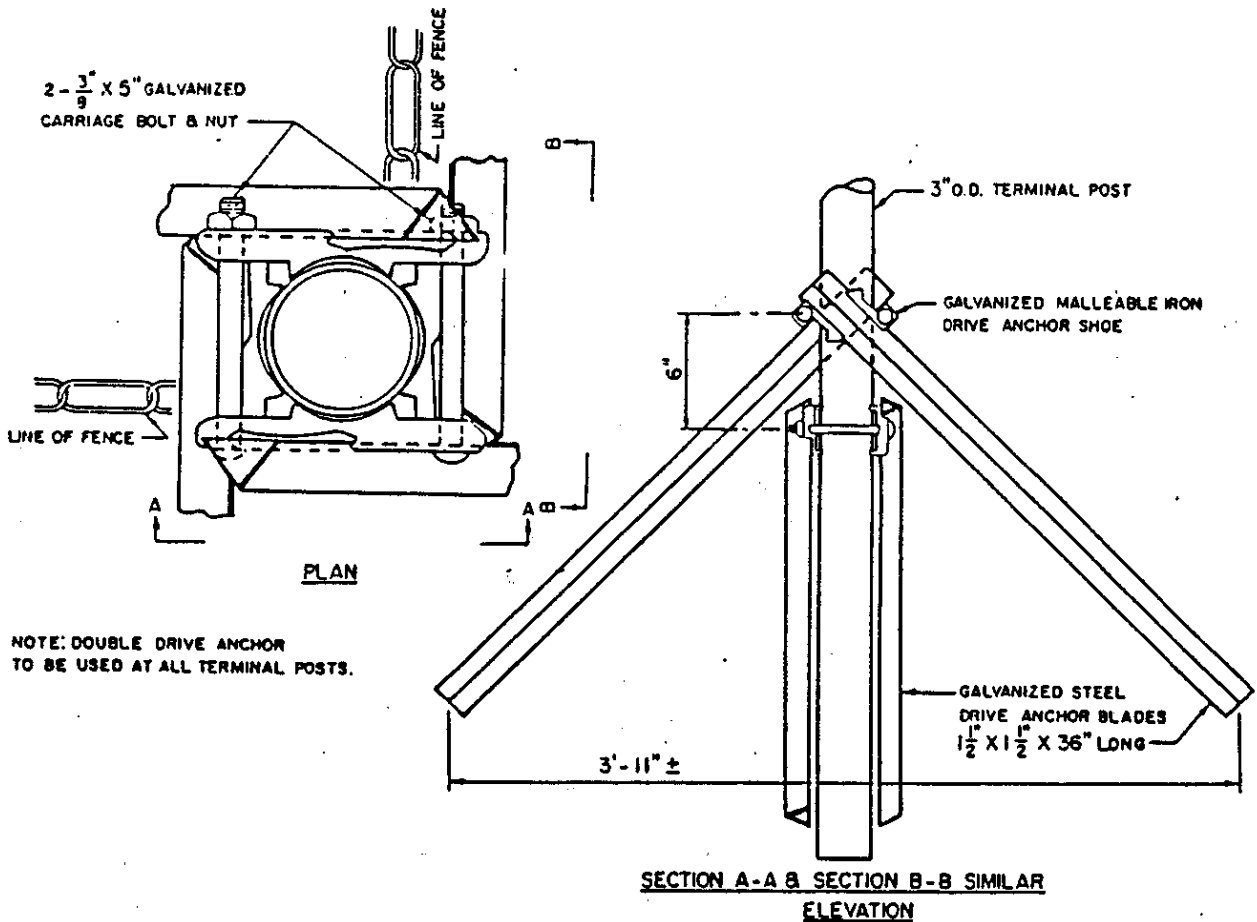


ALTERNATE POST ATTACHMENT AT BRIDGE END

|   |  |  |                |                 |
|---|--|--|----------------|-----------------|
| <p>ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS</p> | <p>APPROVED<br/><i>[Signature]</i><br/>CHIEF ENGINEER<br/>DESIGN ENGINEER<br/>DATE 9/15/88</p> | <p>STANDARD ROADWAY &amp; SITE IMPROVEMENT DETAILS<br/>CHAIN LINK FENCE DRIVE ANCHOR &amp; POST ATTACHMENT AT BRIDGE</p> | <p>REVISED</p> | <p>1<br/>32</p> |
|---|--|--|----------------|-----------------|

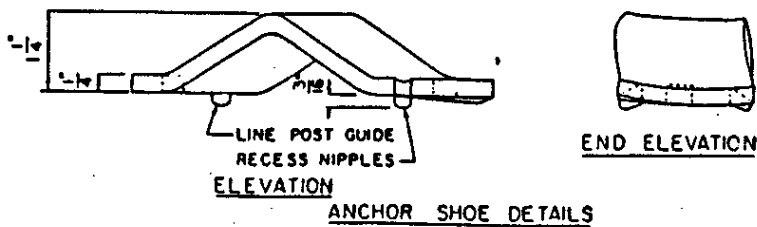
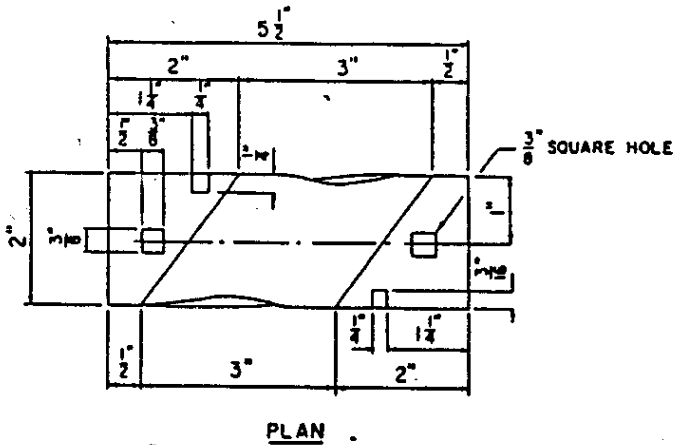
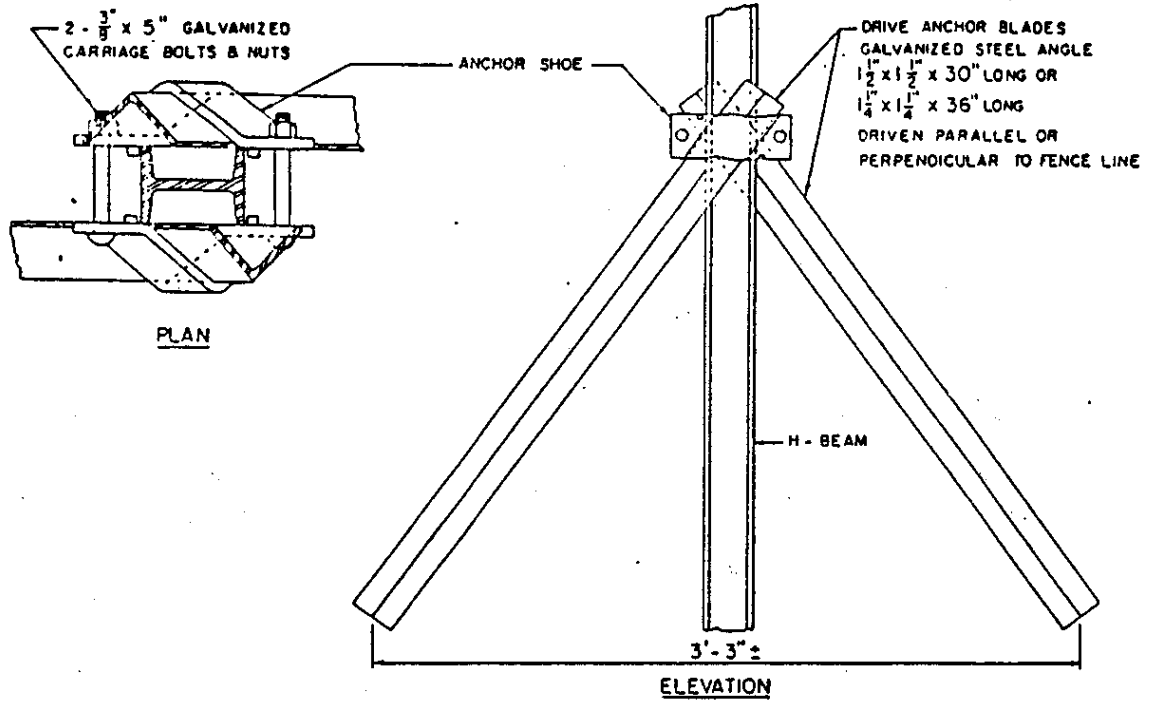


|   |  |   |         |       |
|---|--|---|---------|-------|
| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>CHAIN LINK FENCE ALTERNATE<br>TERMINAL POST | REVISED | 1     |
|   | DESIGN ENGINEER<br>9/2/88<br>DATE                |   | _____   | 33    |
|   | _____  |   | _____   | _____ |
|   | _____  |   | _____   | _____ |

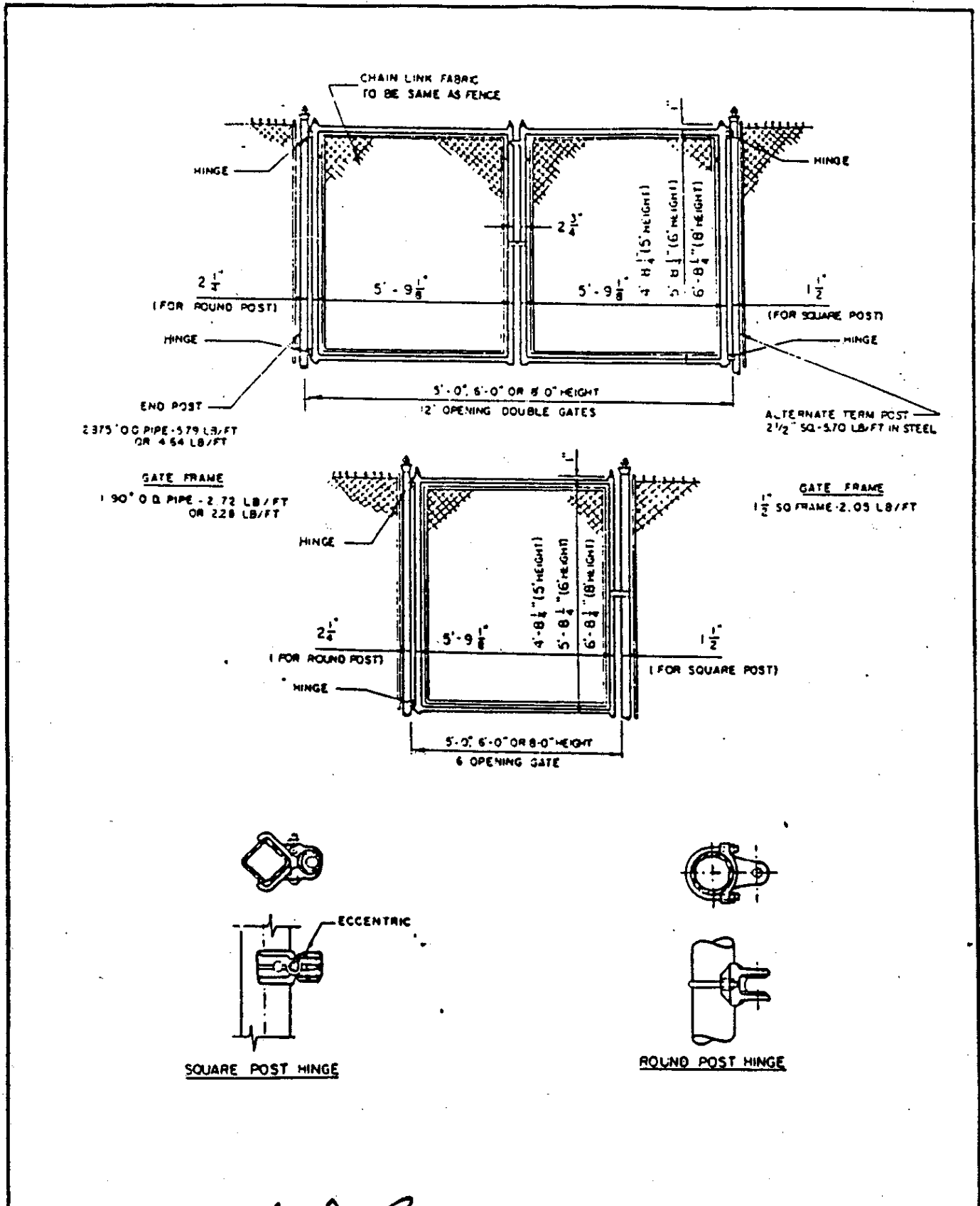


|  |  |   |         |       |
|--|--|---|---------|-------|
| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>CHAIN LINK FENCE DOUBLE DRIVE ANCHOR & DITCH TREATMENT | REVISED | 1     |
|  | DESIGN ENGINEER<br>9/7/88<br>DATE                |   | _____   | 34    |
|  | _____  |   | _____   | _____ |
|  | _____  |   | _____   | _____ |

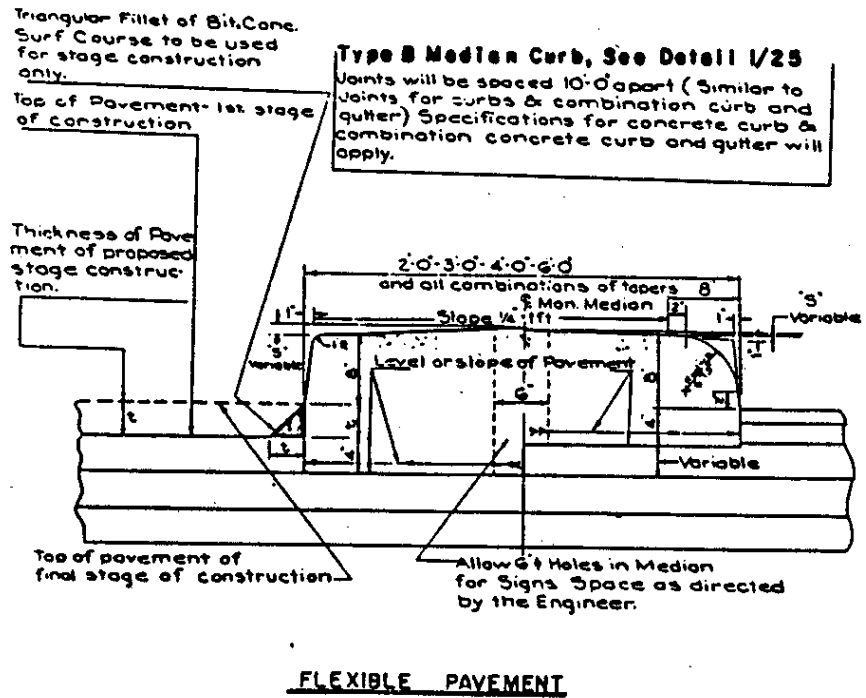
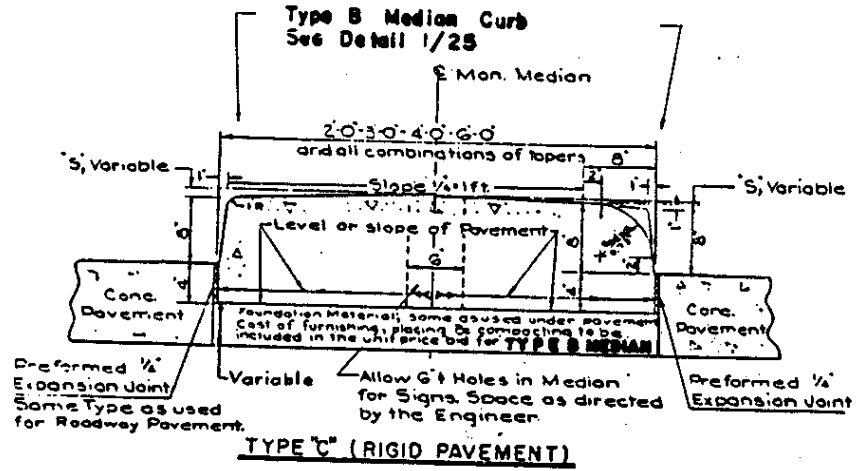


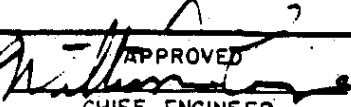


|  |  |  |         |       |
|--|--|--|---------|-------|
| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>CHAIN LINK FENCE DRIVE ANCHOR SHOE ASSEMBLY | REVISED | 1     |
|  | DESIGN ENGINEER<br>9/17/88<br>DATE               |  | _____   | 35    |
|  | _____  |  | _____   | _____ |
|  | _____  |  | _____   | _____ |
|  | _____  |  | _____   | _____ |

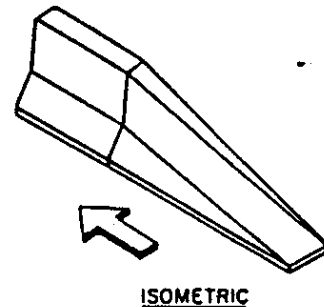
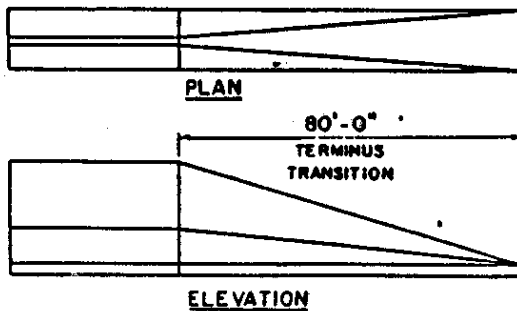
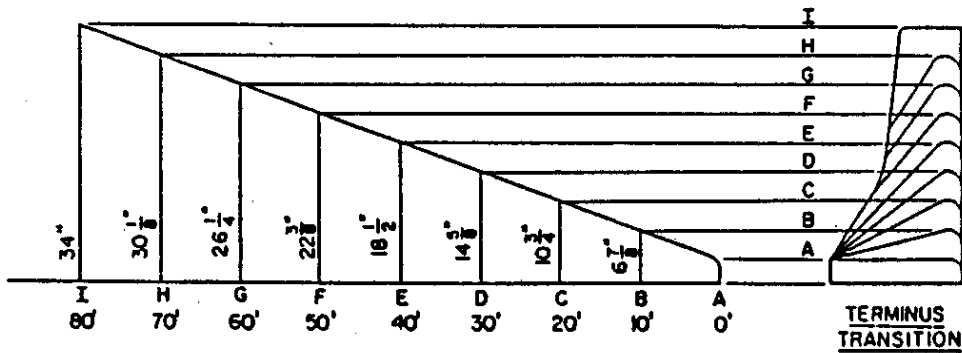
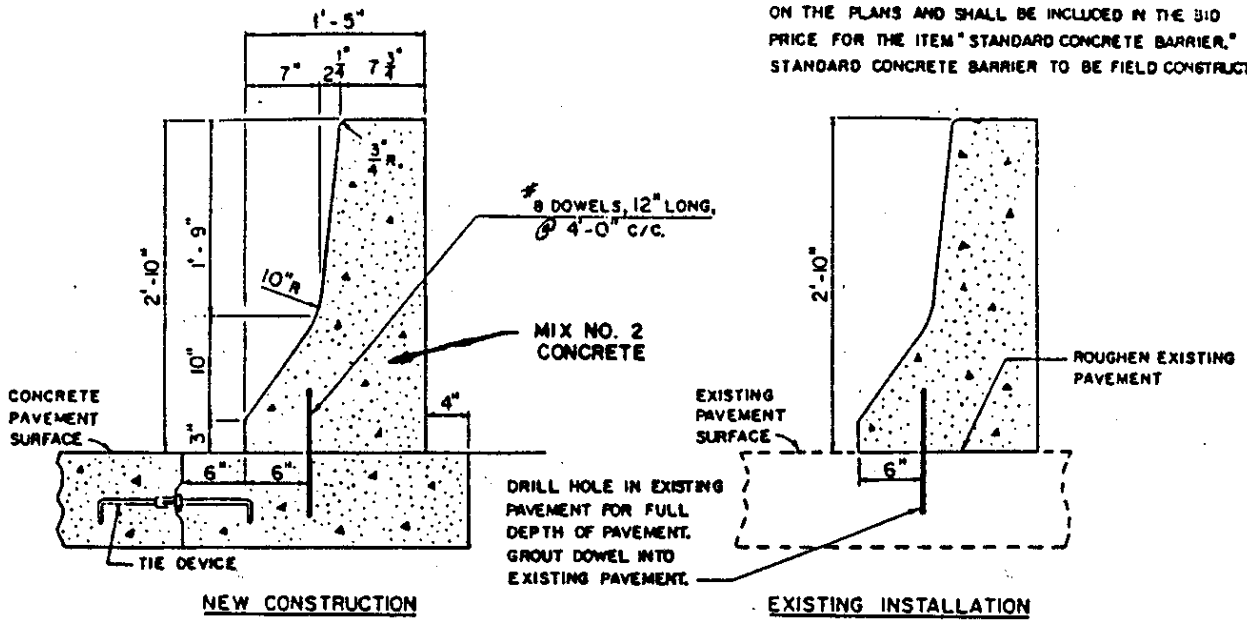


|   |   |  |         |    |
|---|---|--|---------|----|
| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>William L. ...</i><br>CHIEF ENGINEER | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>CHAIN LINK FENCE<br>GATE DETAILS | REVISED | 1  |
|   | DESIGN ENGINEER<br>DATE                             |  |         | 36 |
|   |   |  |         |    |
|   |   |  |         |    |
|   |   |  |         |    |



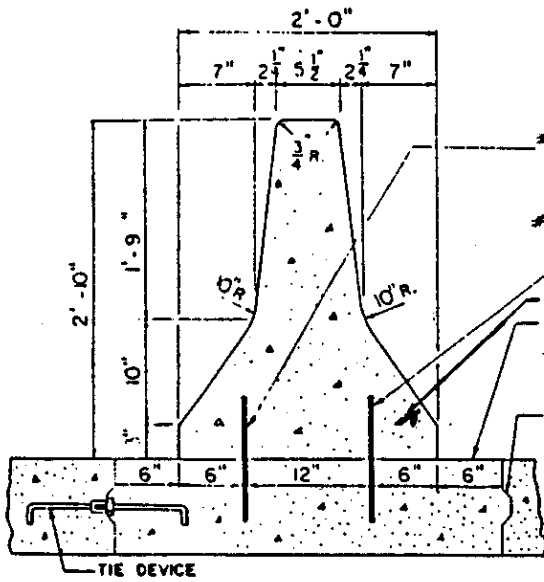
|  |   |  |         |       |
|--|---|--|---------|-------|
| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | APPROVED<br><br>CHIEF ENGINEER | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>STANDARD MONOLITHIC CONCRETE MEDIAN | REVISED | 1     |
|  | DESIGN ENGINEER<br>9/13/88<br>DATE  |  | _____   | 37    |
|  | _____   |  | _____   | _____ |
|  | _____   |  | _____   | _____ |

NOTE: WHEN EPOXY COATING IS DESIRED, IT IS TO BE NOTED ON THE PLANS AND SHALL BE INCLUDED IN THE BID PRICE FOR THE ITEM "STANDARD CONCRETE BARRIER," STANDARD CONCRETE BARRIER TO BE FIELD CONSTRUCTED.



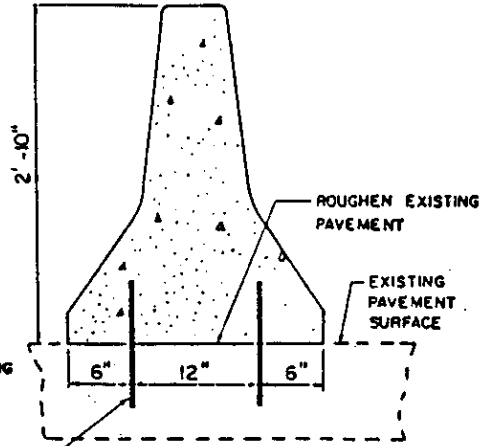
|   |   |  |         |       |
|---|---|--|---------|-------|
| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER  | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>STANDARD CONCRETE BARRIER<br>SINGLE FACE | REVISED | 1     |
|   | DESIGNED<br><i>[Signature]</i><br>9/17/88<br>DATE |  | _____   | 38    |
|   | _____   |  | _____   | _____ |
|   | _____   |  | _____   | _____ |

NOTE: WHEN EPOXY COATING IS DESIRED, IT IS TO BE NOTED ON THE PLANS AND SHALL BE INCLUDED IN THE B.O PRICE FOR THE ITEM "STANDARD CONCRETE BARRIER" STANDARD CONCRETE BARRIER TO BE FIELD CONSTRUCTED.

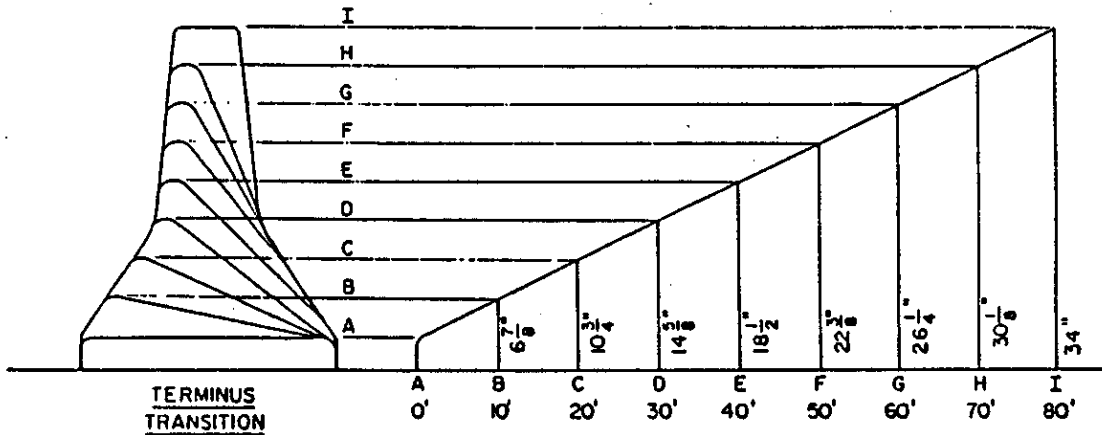


NEW CONSTRUCTION

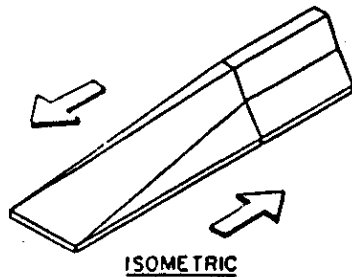
#8 DOWELS, 12" LONG,  
@ 4'-0" C/C.  
STAGGERED WITH  
#8 DOWELS, 12" LONG,  
@ 4'-0" C/C.  
MIX NO.2 CONCRETE  
CONCRETE PAVEMENT  
SURFACE  
JOINTS TO BE  
KEYED & COATED  
DRILL HOLE IN EXISTING  
PAVEMENT FOR FULL  
DEPTH OF PAVEMENT,  
GROUT DOWEL INTO  
EXISTING PAVEMENT.



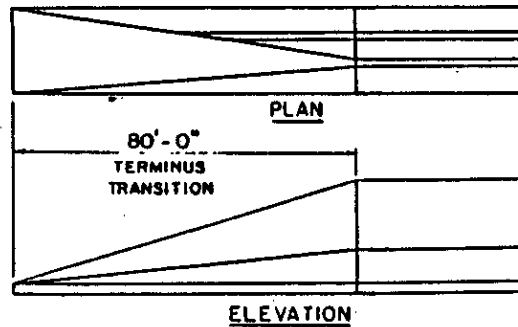
EXISTING INSTALLATION



TERMINUS TRANSITION



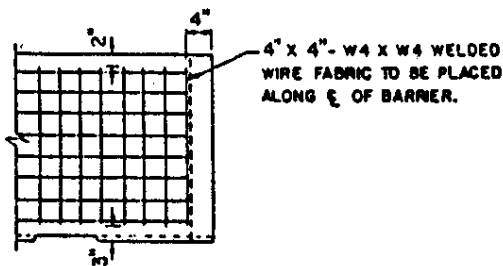
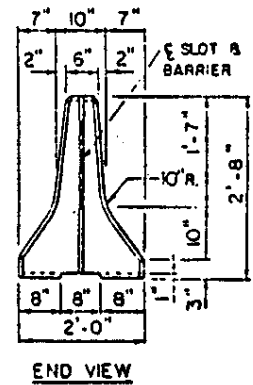
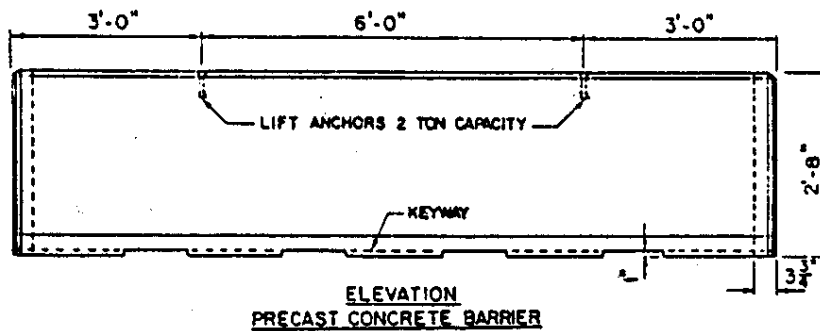
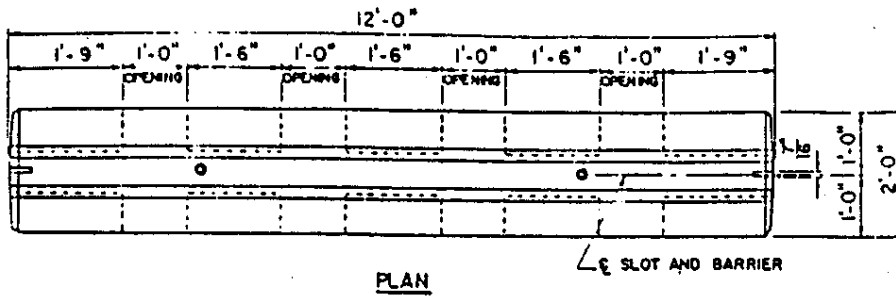
ISOMETRIC



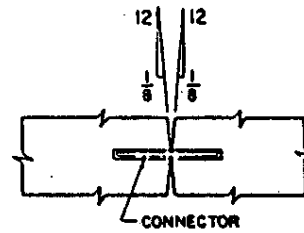
PLAN

ELEVATION

|  |                 |   |         |
|--|-----------------|---|---------|
| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | APPROVED        | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>STANDARD CONCRETE BARRIER<br>DOUBLE FACE | REVISED |
|  | CHIEF ENGINEER  |   |         |
|  | DESIGN ENGINEER |   |         |
|  | DATE            |   | 1/39    |



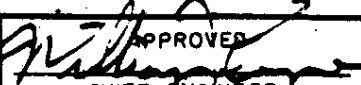

REINFORCING STEEL DETAILS

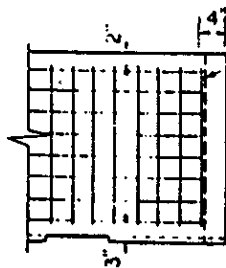
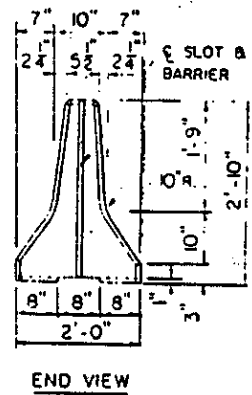
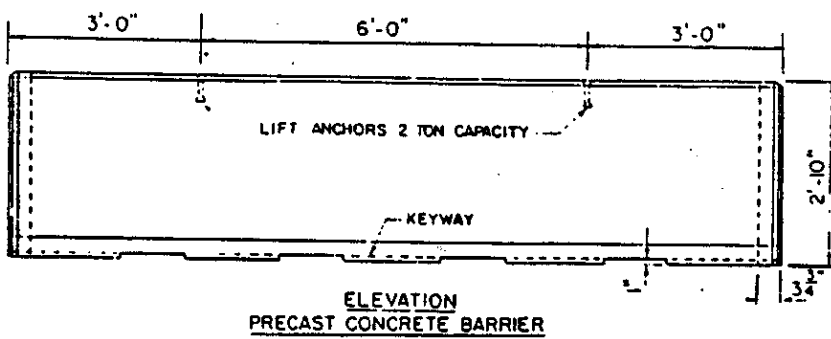
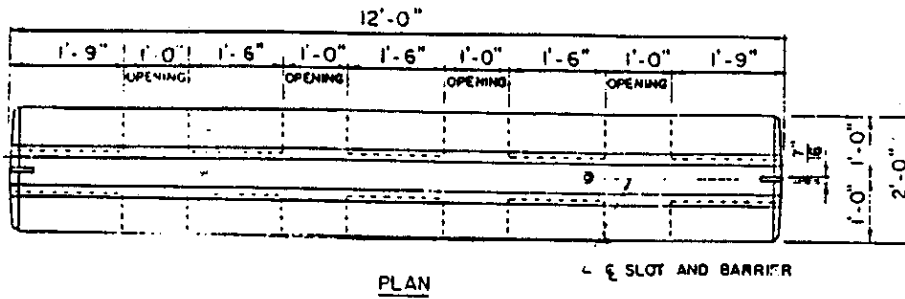


CONNECTION DETAIL

**GENERAL NOTES**

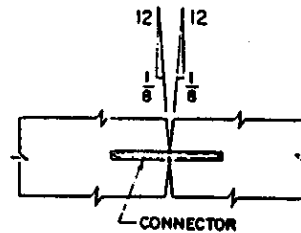
1. ALL CONCRETE FOR BARRIER TO BE MIX NO. 6 (4500 PSI).
2. EXPOSED FACE AND TOP OF PRECAST BARRIER TO BE COATED WITH TWO COATS OF WHITE EPOXY PAINT.
3. 25"x7"x5/16" GALVANIZED STEEL PLATE - TO BE FURNISHED AS CONNECTOR, AND INCIDENTAL TO THE CONCRETE BARRIER.

|   |   |   |         |        |
|---|---|---|---------|--------|
| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br><br>CHIEF ENGINEER     | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>TEMPORARY PRECAST CONCRETE BARRIER DOUBLE FACE | REVISED | 1 / 40 |
|   | DESIGN ENGINEER<br><br>DATE 9/7/88 |   | _____   |        |
|   | _____   |   | _____   |        |
|   | _____   |   | _____   |        |



4" x 4" W4 x W4 WELDED WIRE FABRIC TO BE PLACED ALONG  $\epsilon$  OF BARRIER.

REINFORCING STEEL DETAILS



CONNECTION DETAIL

GENERAL NOTES

1. ALL CONCRETE FOR BARRIER TO BE MIX NO.6(4500PSI).
2. EXPOSED FACE AND TOP OF PRECAST BARRIER TO BE COVERED WITH TWO COATS OF WHITE EPOXY PAINT.
3. 27"x7'x5/16" GALVANIZED STEEL PLATE-TO BE FURNISHED AS CONNECTOR, AND INCIDENTAL TO THE CONCRETE BARRIER.

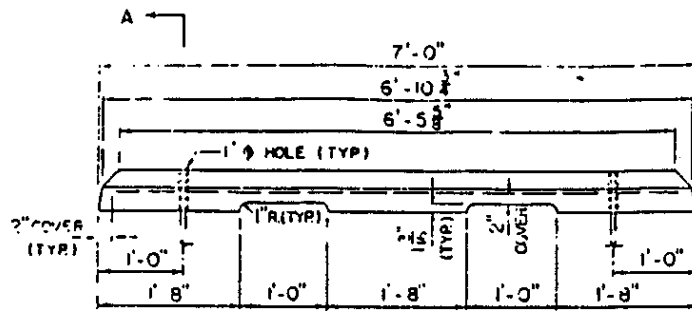
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

APPROVED  
  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE 9/2/88

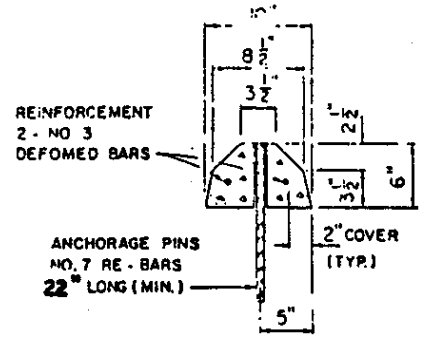
STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 PRECAST CONCRETE BARRIER  
 DOUBLE FACE

REVISED

1  
 41



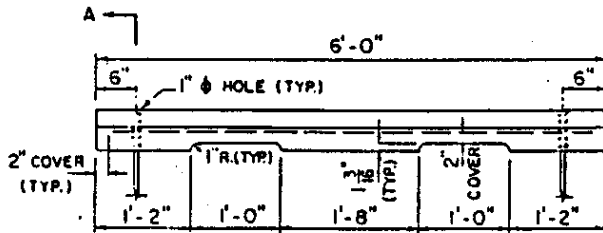
ELEVATION  
TYPE I  
(AUTOMOBILE)



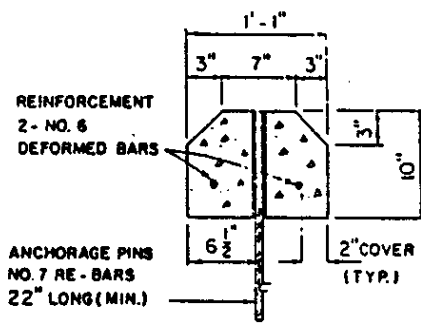
REINFORCEMENT  
2 - NO 3  
DEFORMED BARS

ANCHORAGE PINS  
NO. 7 RE - BARS  
22" LONG (MIN.)

SECTION A-A  
(TYPICAL - TYPE I & II)



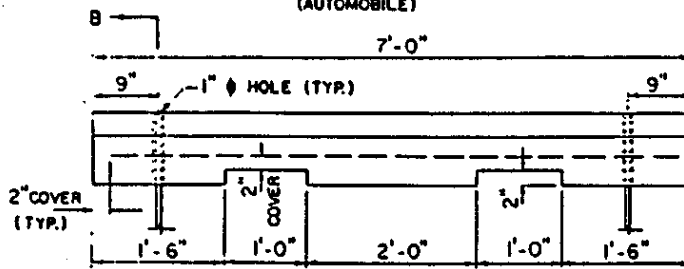
ELEVATION  
TYPE II  
(AUTOMOBILE)



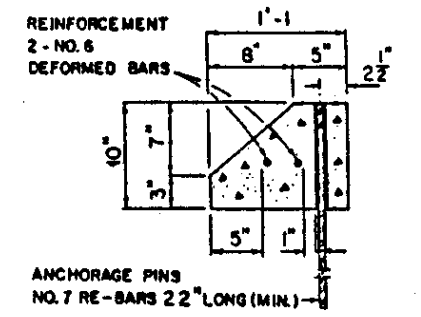
REINFORCEMENT  
2 - NO. 6  
DEFORMED BARS

ANCHORAGE PINS  
NO. 7 RE - BARS  
22" LONG (MIN.)

SECTION B-B



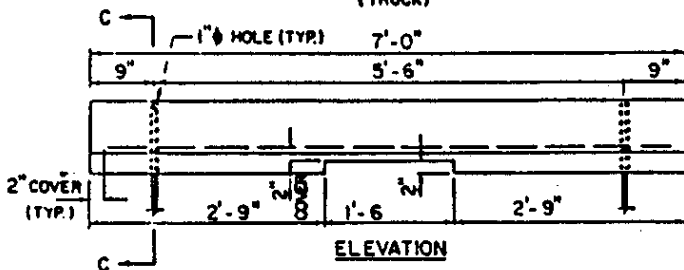
ELEVATION  
TYPE III-A  
(TRUCK)



REINFORCEMENT  
2 - NO. 6  
DEFORMED BARS

ANCHORAGE PINS  
NO. 7 RE - BARS  
22" LONG (MIN.)



SECTION C-C



ELEVATION  
TYPE III-B  
(TRUCK)

**NOTE**

1. PRECAST CONCRETE WHEEL STOPS SHALL BE LOCATED AS SHOWN ON THE PLANS, THEN SECURED IN PLACE WITH TWO (2) NO. 7 REINFORCEMENT BARS PER WHEEL STOP.
2. CONCRETE TO BE MIX NO. 2.

|  |  |   |         |   |
|--|--|---|---------|---|
| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | APPROVED<br><br>CHIEF ENGINEER      | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>PRECAST CONCRETE WHEEL STOPS | REVISED | 1 |
|  | DESIGN ENGINEER<br><br>DATE 9/17/88 |   | 42      |   |
|  | DATE   |   | 42      |   |
|  | DATE   |   | 42      |   |



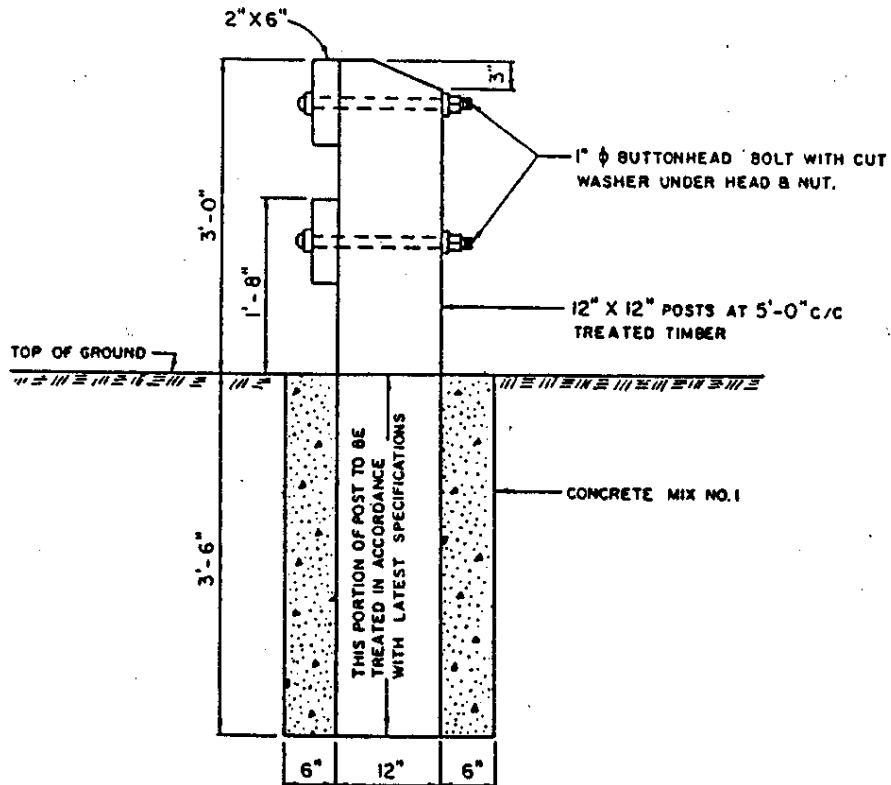
RAILS TO BE UNTREATED TIMBER.

POSTS TO BE TREATED TIMBER, WHERE PAINT IS CALLED FOR, TWO COATS TO BE APPLIED.

ALL LUMBER TO BE SOUTHERN YELLOW PINE OF 1400<sup>+</sup> STRESS GRADE OR BETTER.

TO BE PAINTED IN A COLOR SCHEME AND STRIPING DETAILS IN ACCORDANCE WITH THE LATEST "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES."

• TO BE USED WHERE NOTED ON PLANS •

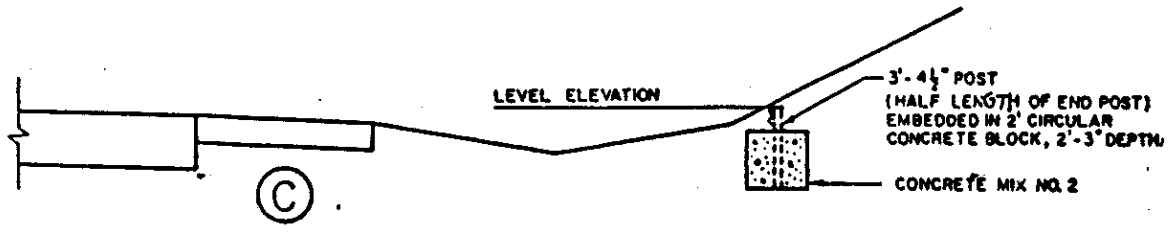
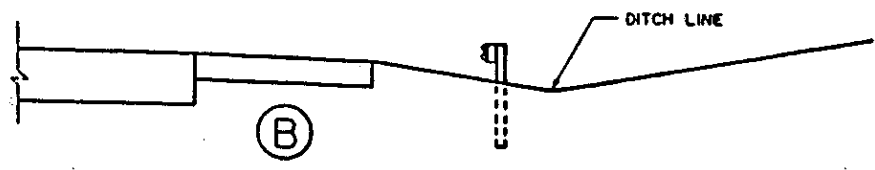
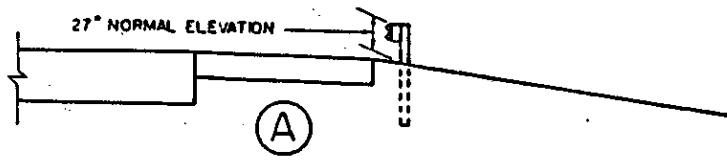
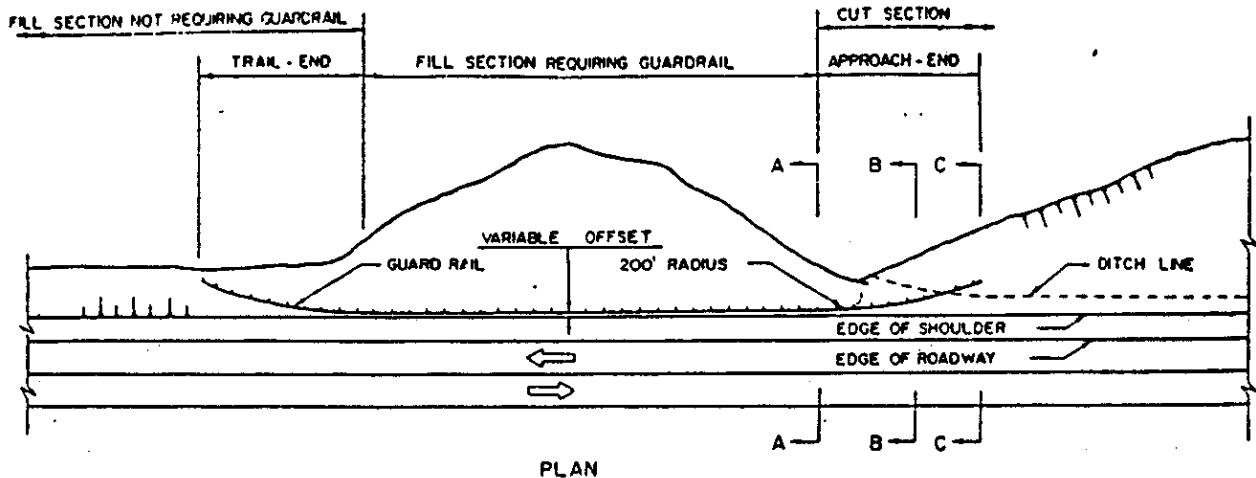


THE COST OF ALL EXCAVATION AND BACKFILL TO BE INCLUDED IN LUMP SUM PRICE BID FOR TIMBER BARRICADE.

THE LUMP SUM PRICE BID SHALL INCLUDE THE FURNISHING OF ALL MATERIALS, PRESERVATIVE TREATMENTS, TIMBER CONNECTORS AND HARDWARE, PAINTING, GALVANIZING AND CONCRETE AS WELL AS ALL LABOR, TOOLS AND EQUIPMENT AND ALL WORK INCIDENTAL THERETO.

|   |  |   |         |    |
|---|--|---|---------|----|
| ANNE ARUNDEL<br>COUNTY<br>DEPARTMENT OF<br>PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>STANDARD TIMBER BARRICADE | REVISED | 1  |
|   | DESIGN ENGINEER<br><i>[Signature]</i><br>9/7/88  |   |         | 43 |
|   | DATE   |   |         |    |
|   |  |   |         |    |





APPROACH END TO BE FLARED AT NORMAL ELEVATION FROM SHOULDER TO DITCH LINE AND EXTENDED AT LEVEL ELEVATION INTO CUT BACKSLOPE ANCHORED WITH POST AND CONCRETE BLOCK TO END GUARD RAIL. THE CONTRACTOR SHALL ADJUST THE PLACEMENT OF POSTS, WHERE NECESSARY, TO AVOID POSTS BEING INSTALLED IN THE CENTER OF THE DITCH.  
 THE COST OF THE CONCRETE BLOCK TO BE INCIDENTAL TO THE ITEM - GUARD RAIL W BEAM.

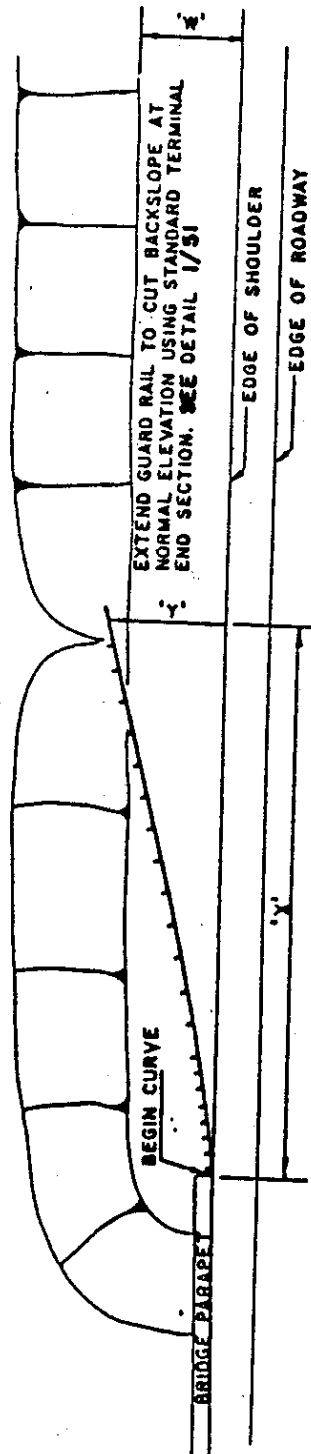
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

APPROVED  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE 9/7/88

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 GUARD RAIL W BEAM  
 END TREATMENT - CUT TO FILL

|         |    |
|---------|----|
| REVISED | 1  |
|         | 45 |

## GUARD RAIL W BEAM TREATMENT FOR BRIDGE APPROACHES (CUT ADJACENT TO BRIDGE APPROACH)



FOR GUARD RAIL ATTACHMENT TO STRUCTURE, SEE DETAIL 1/52

| W=12 FT.                                   | W=14 FT.                                   | W=15 FT.                                   | W=17 FT.                                   | W=20 FT.                                   |
|--|--|--|--|--|
| <b>CURVE DATA</b>                          | <b>CURVE DATA</b>                          | <b>CURVE DATA</b>                          | <b>CURVE DATA</b>                          | <b>CURVE DATA</b>                          |
| A=6°53'48"                                 | A=7°17'03"                                 | A=6°53'43"                                 | A=7°11'03"                                 | A=7°07'30"                                 |
| D=28°38'52"                                | D=28°38'52"                                | D=28°38'52"                                | D=28°38'52"                                | D=28°38'52"                                |
| R=200.00'                                  | R=200.00'                                  | R=200.00'                                  | R=200.00'                                  | R=200.00'                                  |
| L=24.07'                                   | L=25.43'                                   | L=24.07'                                   | L=25.08'                                   | L=24.87'                                   |
| T=12.03'                                   | T=12.73'                                   | T=12.05'                                   | T=12.56'                                   | T=12.45'                                   |
| <b>LENGTH OF GUARD RAIL=162.50' (MIN.)</b> | <b>LENGTH OF GUARD RAIL=175.00' (MIN.)</b> | <b>LENGTH OF GUARD RAIL=187.50' (MIN.)</b> | <b>LENGTH OF GUARD RAIL=200.00' (MIN.)</b> | <b>LENGTH OF GUARD RAIL=212.50' (MIN.)</b> |
| X CUT                                      | X CUT                                      | X CUT                                      | X CUT                                      | X CUT                                      |
| 159.95'                                    | 172.23'                                    | 184.77'                                    | 197.06'                                    | 209.39'                                    |
| Y  | Y  | Y  | Y  | Y  |
| 17.88'                                     | 20.39'                                     | 20.88'                                     | 23.23'                                     | 25.32'                                     |

ALL DIMENSIONS ARE TO THE FACE OF THE GUARD RAIL

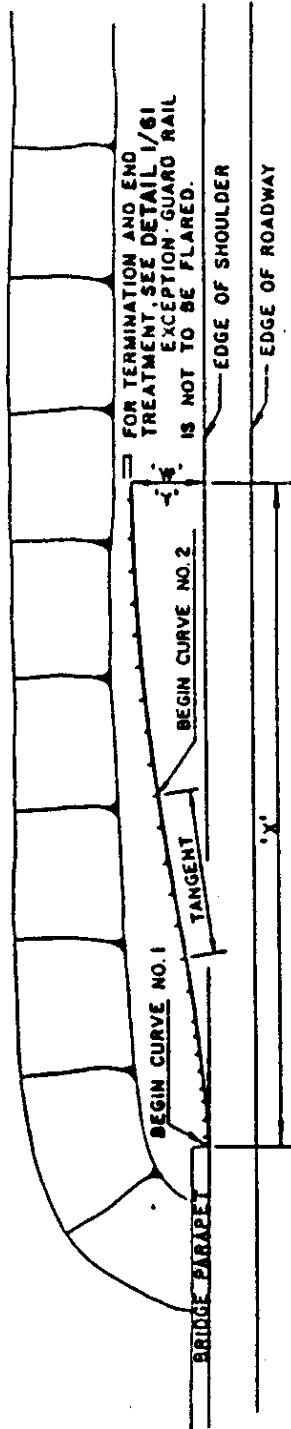
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

APPROVED  
  
 CHIEF ENGINEER  
  
 DESIGN ENGINEER  
 9/7/88  
 DATE

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 GUARD RAIL W BEAM TREATMENT FOR BRIDGE APPROACHES-CUT

|         |    |
|---------|----|
| REVISED | 1  |
|         | 46 |


## GUARD RAIL W BEAM TREATMENT FOR BRIDGE APPROACHES (EMBANKMENT LESS THAN 15 FEET)



FOR GUARD RAIL ATTACHMENT TO STRUCTURE, DETAIL 1/52

| W=12 FT.                              |             | W=14 FT.                              |             | W=15 FT.                              |             | W=17 FT.                              |             | W=20 FT.                              |             |
|---------------------------------------|-------------|---------------------------------------|-------------|---------------------------------------|-------------|---------------------------------------|-------------|---------------------------------------|-------------|
| CURVE NO. 1                           | CURVE NO. 2 | CURVE NO. 1                           | CURVE NO. 2 | CURVE NO. 1                           | CURVE NO. 2 | CURVE NO. 1                           | CURVE NO. 2 | CURVE NO. 1                           | CURVE NO. 2 |
| Δ=6°53'48"                            | Δ=6°53'48"  | Δ=7°17'05"                            | Δ=6°53'43"  | Δ=7°11'03"                            | Δ=6°53'43"  | Δ=7°11'03"                            | Δ=7°11'03"  | Δ=7°07'30"                            | Δ=7°07'30"  |
| D=28°38'52"                           | D=14°19'26" | D=28°38'52"                           | D=28°38'52" | D=28°38'52"                           | D=14°19'26" | D=28°38'52"                           | D=14°19'26" | D=28°38'52"                           | D=14°19'26" |
| R=200.00'                             | R=400.00'   | R=200.00'                             | R=200.00'   | R=200.00'                             | R=400.00'   | R=200.00'                             | R=400.00'   | R=200.00'                             | R=400.00'   |
| L=24.07'                              | L=48.15'    | L=25.43'                              | L=24.07'    | L=25.08'                              | L=48.14'    | L=25.08'                              | L=50.16'    | L=24.87'                              | L=49.47'    |
| T=12.03'                              | T=24.10'    | T=12.73'                              | T=12.03'    | T=12.56'                              | T=24.10'    | T=12.56'                              | T=24.11'    | T=12.45'                              | T=24.90'    |
| LENGTH OF GUARD RAIL = 137.50' (MIN.) |             | LENGTH OF GUARD RAIL = 150.00' (MIN.) |             | LENGTH OF GUARD RAIL = 162.50' (MIN.) |             | LENGTH OF GUARD RAIL = 175.00' (MIN.) |             | LENGTH OF GUARD RAIL = 200.00' (MIN.) |             |
| EMBANKMENT                            |             | EMBANKMENT                            |             | EMBANKMENT                            |             | EMBANKMENT                            |             | EMBANKMENT                            |             |
| X                                     | Y           | X                                     | Y           | X                                     | Y           | X                                     | Y           | X                                     | Y           |
| 135.36'                               | 12.00'      | 147.71'                               | 14.00'      | 160.18'                               | 15.00'      | 172.53'                               | 17.00'      | 197.33'                               | 20.00'      |

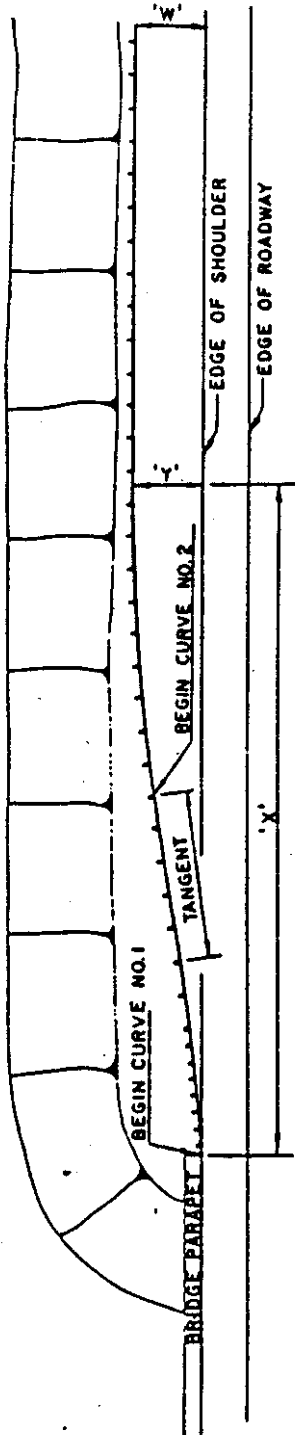
ALL DIMENSIONS ARE TO THE FACE OF THE GUARD RAIL

APPROVED  
  
 ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE 9/17/88

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 GUARD RAIL W BEAM TREATMENT FOR BRIDGE APPROACHES - EMBANK. <15'

REVISED  
 1  
 47

GUARD RAIL W BEAM TREATMENT FOR BRIDGE APPROACHES  
(EMBANKMENT GREATER THAN 15 FEET)



FOR GUARD RAIL ATTACHMENT TO STRUCTURE, SEE DETAIL V/52

| W=12 FT.                              |             | W=14 FT.                              |             | W=15 FT.                              |             | W=17 FT.                              |             | W=20 FT.                              |             |
|---------------------------------------|-------------|---------------------------------------|-------------|---------------------------------------|-------------|---------------------------------------|-------------|---------------------------------------|-------------|
| CURVE NO. 1                           | CURVE NO. 2 | CURVE NO. 1                           | CURVE NO. 2 | CURVE NO. 1                           | CURVE NO. 2 | CURVE NO. 1                           | CURVE NO. 2 | CURVE NO. 1                           | CURVE NO. 2 |
| A=6°53'48"                            | A=6°53'48"  | A=7°17'05"                            | A=7°17'05"  | A=6°53'43"                            | A=6°53'43"  | A=7°11'03"                            | A=7°11'03"  | A=7°07'30"                            | A=7°07'30"  |
| D=28°38'52"                           | D=14°19'26" | D=28°38'52"                           | D=14°19'26" | D=28°38'52"                           | D=14°19'26" | D=28°38'52"                           | D=14°19'26" | D=28°38'52"                           | D=14°19'26" |
| R=200.00'                             | R=400.00'   | R=200.00'                             | R=400.00'   | R=200.00'                             | R=400.00'   | R=200.00'                             | R=400.00'   | R=200.00'                             | R=400.00'   |
| L=24.07'                              | L=48.15'    | L=25.43'                              | L=50.86'    | L=24.07'                              | L=48.14'    | L=25.08'                              | L=50.16'    | L=24.87'                              | L=49.47'    |
| T=12.05'                              | T=24.10'    | T=12.73'                              | T=25.46'    | T=12.05'                              | T=24.10'    | T=12.56'                              | T=25.11'    | T=12.45'                              | T=24.90'    |
| LENGTH OF GUARD RAIL = 137.50' (MIN.) |             | LENGTH OF GUARD RAIL = 150.00' (MIN.) |             | LENGTH OF GUARD RAIL = 162.50' (MIN.) |             | LENGTH OF GUARD RAIL = 175.00' (MIN.) |             | LENGTH OF GUARD RAIL = 200.00' (MIN.) |             |
| EMBANKMENT                            |             | EMBANKMENT                            |             | EMBANKMENT                            |             | EMBANKMENT                            |             | EMBANKMENT                            |             |
| X                                     | Y           | X                                     | Y           | X                                     | Y           | X                                     | Y           | X                                     | Y           |
| 133.36'                               | 12.00'      | 151.71'                               | 14.00'      | 160.18'                               | 15.00'      | 172.53'                               | 17.00'      | 197.35'                               | 20.00'      |

ALL DIMENSIONS ARE TO THE FACE OF THE GUARD RAIL

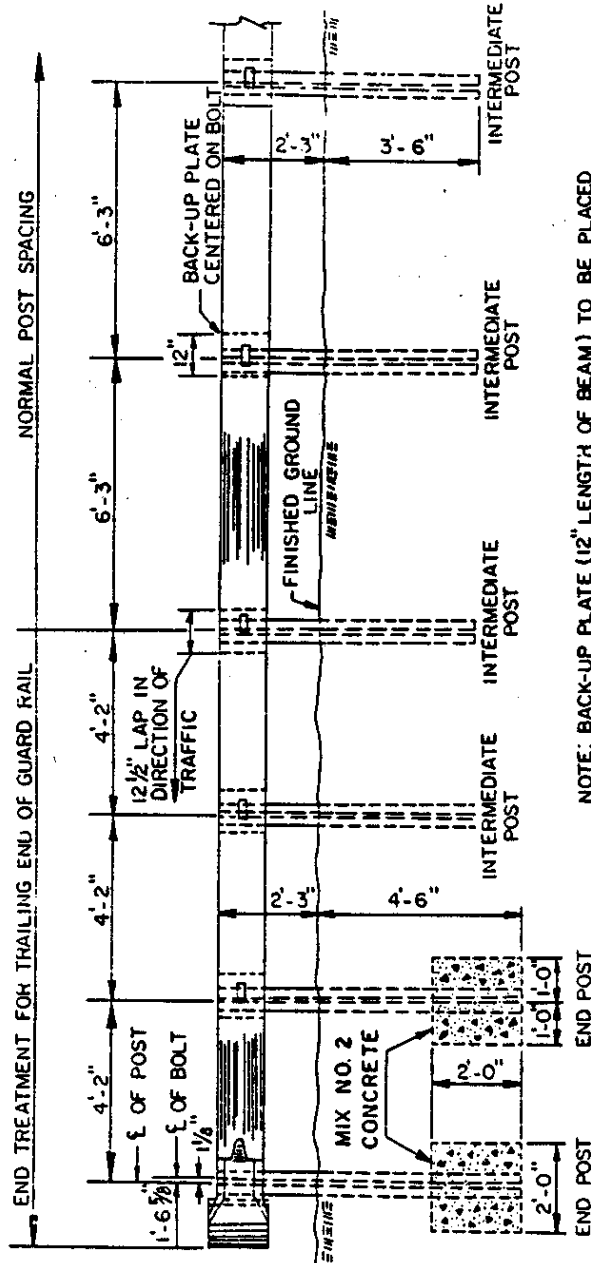
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

APPROVED  
  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE 9/5/88

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 GUARD RAIL W BEAM TREATMENT FOR BRIDGE APPROACHES - EMBANK. >15'

REVISED

1  
48



NOTE: BACK-UP PLATE (12" LENGTH OF BEAM) TO BE PLACED WHERE NO OVERLAP OF RAIL SPLICE OCCURS.

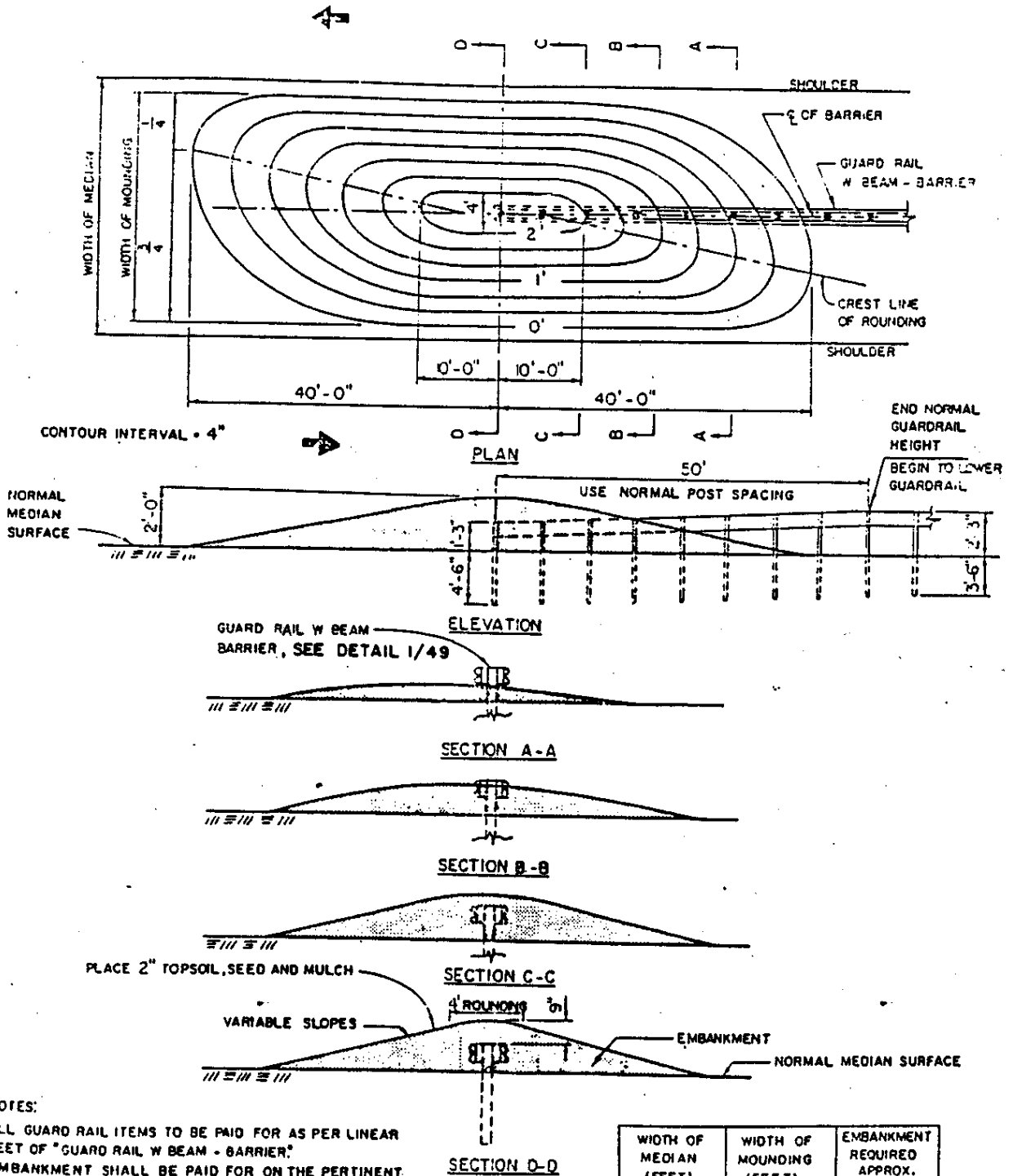
END POSTS - 6WF15.5, 6'-9" LONG  
 INTERMEDIATE POSTS - 6WF8.5, 5'-9" LONG  
 CONCRETE BLOCK FOR END POST 2 X 2 X 2

|         |    |
|---------|----|
| REVISED | 1  |
|         | 49 |

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 GUARD RAIL W / BEAM  
 POST SPACING & TRAIL - END TREATMENT

APPROVED  
*[Signature]*  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE 5/1/88

ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS



NOTES:  
 ALL GUARD RAIL ITEMS TO BE PAID FOR AS PER LINEAR FEET OF "GUARD RAIL W BEAM - BARRIER".  
 EMBANKMENT SHALL BE PAID FOR ON THE PERTINENT EXCAVATION ITEMS OF WORK.

| WIDTH OF MEDIAN (FEET) | WIDTH OF MOUNDING (FEET) | EMBANKMENT REQUIRED APPROX. (CU. YDS) |
|------------------------|--------------------------|---------------------------------------|
| 24                     | 15                       | 40                                    |
| 30                     | 22                       | 60                                    |
| 36 & GREATER           | 28                       | 80                                    |

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 DEPARTMENT OF PUBLIC WORKS

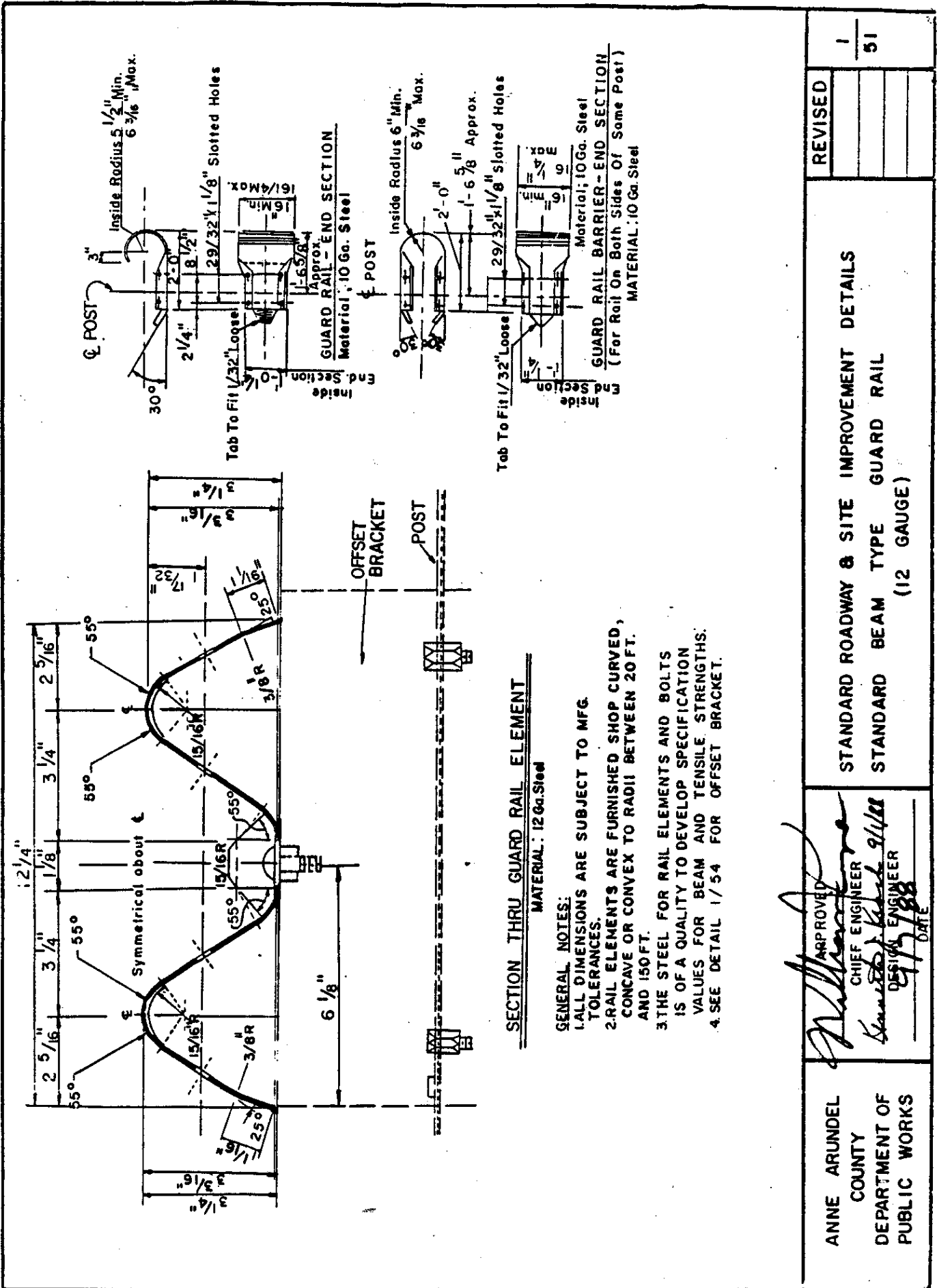
*[Signature]*  
 CHIEF ENGINEER  
*[Signature]* 9/1/82  
 DESIGN ENGINEER  
 9/7/82  
 DATE

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 GUARD RAIL W/ BEAM BARRIER END ENCLOSURE

REVISED

1/50





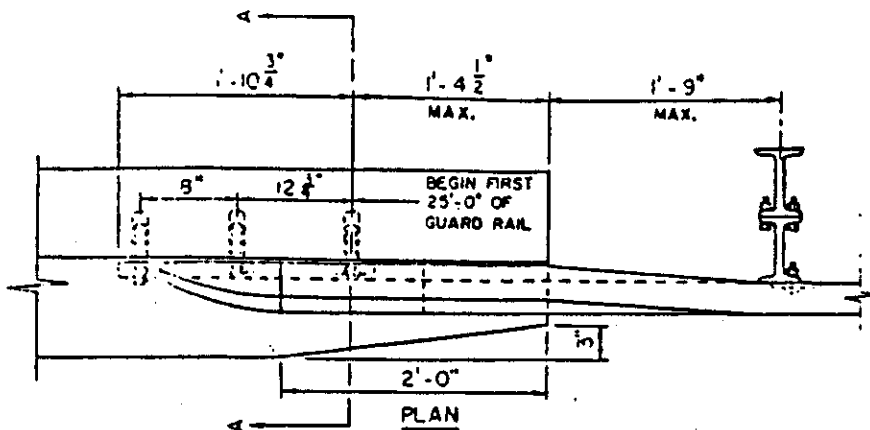
**SECTION THRU GUARD RAIL ELEMENT**

MATERIAL: 12 Ga. Steel

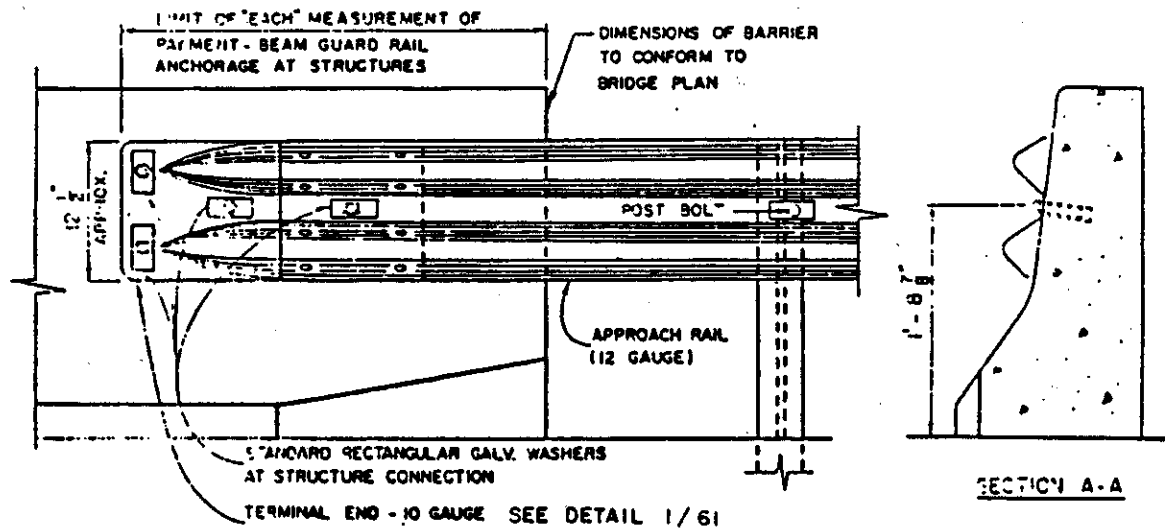
**GENERAL NOTES:**

1. ALL DIMENSIONS ARE SUBJECT TO MFG. TOLERANCES.
2. RAIL ELEMENTS ARE FURNISHED SHOP CURVED, CONCAVE OR CONVEX TO RADIUS BETWEEN 20 FT. AND 150 FT.
3. THE STEEL FOR RAIL ELEMENTS AND BOLTS IS OF A QUALITY TO DEVELOP SPECIFICATION VALUES FOR BEAM AND TENSILE STRENGTHS.
4. SEE DETAIL 1/54 FOR OFFSET BRACKET.

|  |   |   |    |
|--|---|---|----|
| ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | APPROVED<br><br>CHIEF ENGINEER<br>DESIGN ENGINEER<br>DATE 9/17/88 | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS |    |
|  |   | STANDARD BEAM TYPE GUARD RAIL (12 GAUGE)    |    |
|  |   | REVISION                                    | 1  |
|  |   |   | 51 |
|  |   |   |    |



ROAD CONTRACTOR SHALL FURNISH AND INSTALL 4 -  $\frac{7}{8}$ "  $\phi$  CONCRETE EXPANSION ANCHORS OR APPROVED EQUIVALENT, IN  $1\frac{1}{8}$ "  $\phi$  DRILLED HOLES WITH 4 -  $\frac{7}{8}$ "  $\phi$  HEAVY HEX. HEAD BOLTS,  $1\frac{1}{2}$ " LONG, GALV. UNC CLASS 2A & 2B, AND 4 REC-TANGULAR GALV. WASHERS AS SHOWN ON DETAIL 1/54 MODIFIED TO FIT  $\frac{7}{8}$ "  $\phi$  BOLT.

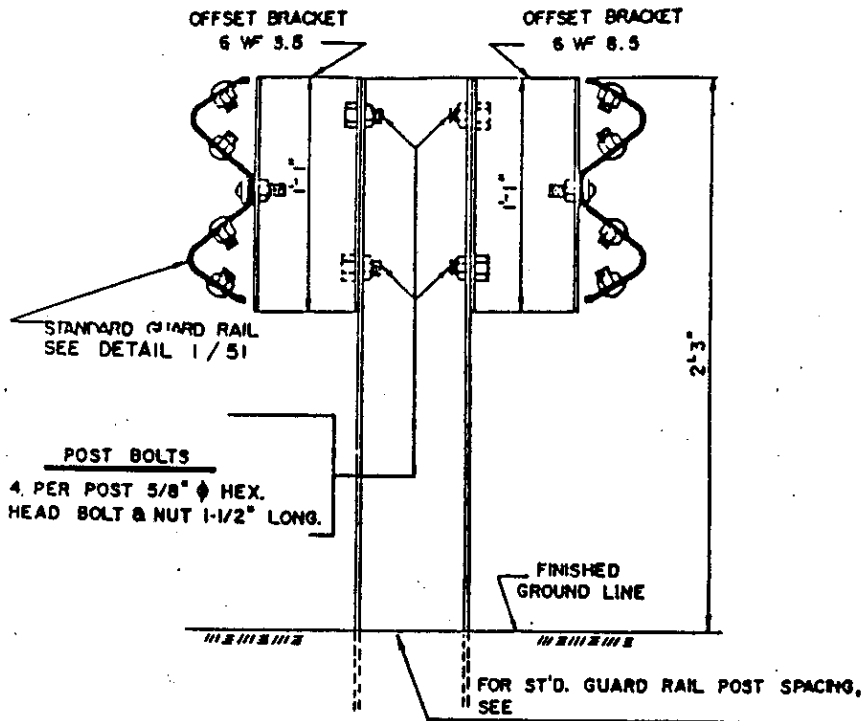


ELEVATION

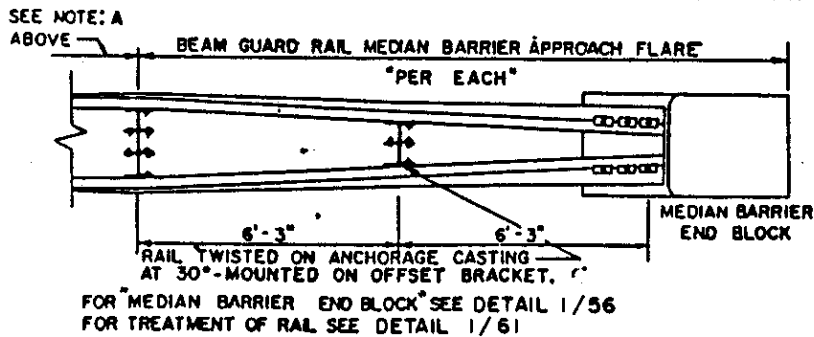
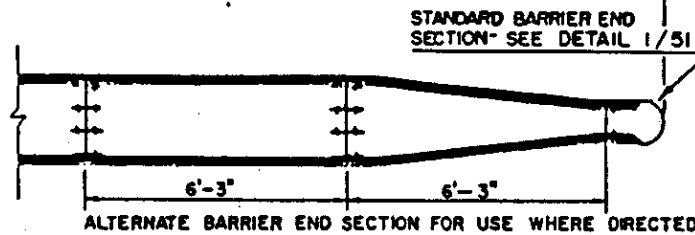
GENERAL NOTES

FIRST 25'-0" OF GUARD RAIL AFFIXED TO BRIDGE ON THE APPROACH END. PLACE FIRST POST MAXIMUM 1'-9" FROM BRIDGE AND NEXT SEVEN POSTS SPACED 3'-1 $\frac{1}{2}$ " C/C. PLACE AN ADDITIONAL OFFSET BRACKET AT THE FOURTH AND FIFTH POSTS FROM THE BRIDGE TO AVOID CONFLICT WITH INLETS. WHEN AFFIXING GUARD RAIL TO BRIDGE ON THE TRAILING END, USE NORMAL POST SPACING WITH AN ADDITIONAL OFFSET BRACKET PLACED AT THE SECOND POST TO AVOID CONFLICT WITH INLETS. COST OF ADDITIONAL POSTS AND OFFSET BRACKETS TO BE INCLUDED IN THE BID PRICE PER LINEAR FOOT OF GUARD RAIL. IN GENERAL, TWO OFFSET BRACKETS SHALL BE USED WHEREVER NECESSARY TO AVOID CONFLICT WITH DRAINAGE INLETS.

|   |                            |   |         |         |
|---|----------------------------|---|---------|---------|
| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br>CHIEF ENGINEER | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>GUARD RAIL W/ BEAM<br>ANCHORAGE AT STRUCTURES | REVISED | 1<br>52 |
|   | DESIGN ENGINEER<br>9/17/88 |   |         |         |
|   | DATE                       |   |         |         |
|   |                            |   |         |         |
|   |                            |   |         |         |



NOTE: A-LIMIT OF LINEAR FOOT LENGTH OF ST'D. BEAM TYPE GUARD RAIL MEDIAN BARRIER

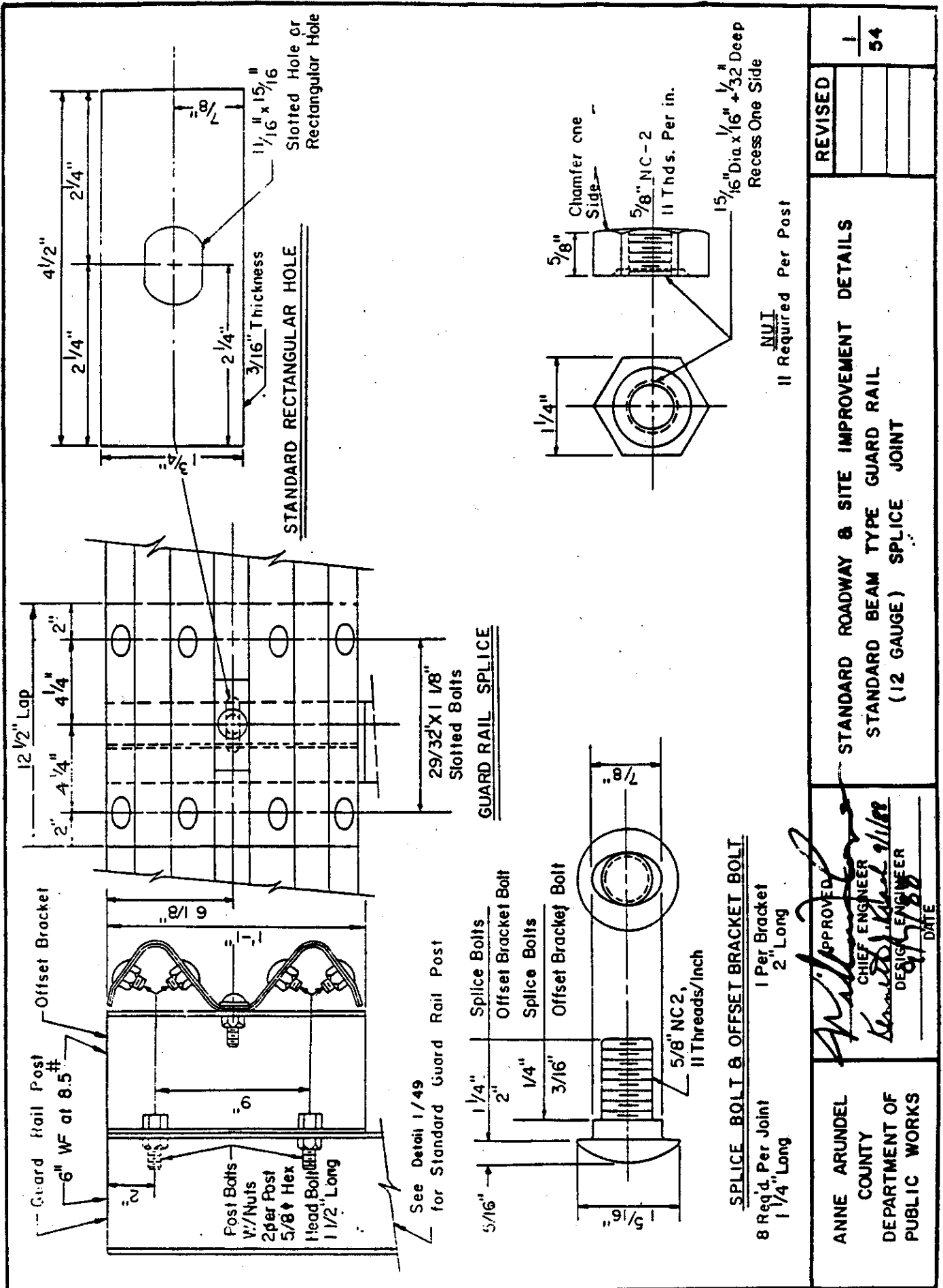


ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

APPROVED  
*[Signature]*  
 CHIEF ENGINEER  
 Kennedy J. Koch 9/1/88  
 DESIGN ENGINEER  
 9/7/88  
 DATE

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 GUARD RAIL W/ BEAM  
 MEDIAN BARRIER & APPROACH FLARES

|         |    |
|---------|----|
| REVISED | 1  |
|         | 53 |
|         |    |
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|         |    |
|---------|----|
| REVISED | 1  |
|         | 54 |

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 STANDARD BEAM TYPE GUARD RAIL  
 (12 GAUGE) SPLICE JOINT

APPROVED  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

SPLICE BOLT & OFFSET BRACKET BOLT  
 8 Req'd Per Joint  
 1 1/4" Long  
 1 Per Bracket  
 2" Long

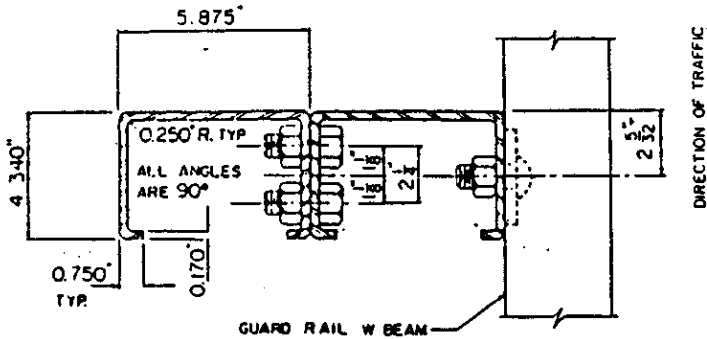
GUARD RAIL SPLICE  
 Slotted Bolts

NUT  
 11 Required Per Post

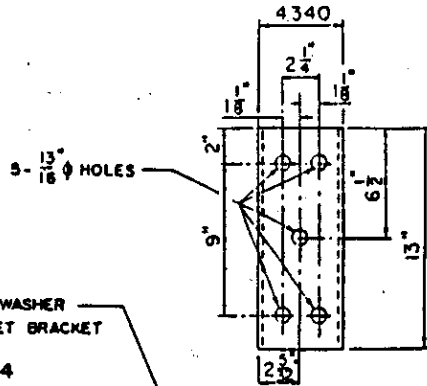
See Detail 1/49 for Standard Guard Rail Post

GENERAL NOTES:

1. ALL DIMENSIONS ARE SUBJECT TO MFG TOLERANCES.
2. POSTS TO BE 5'-9" LONG, SPACED AT 6'-3" C/C.
3. BACK-UP PLATE (12" LENGTH OF BEAM) CENTERED ON OFFSET BRACKET BOLT TO BE PLACED WHERE NO OVERLAP OF RAIL SPLICE OCCURS.
4. MATERIAL - ASTM A-570 WITH MECHANICAL PROPERTIES EQUAL TO A-36.
5. GALVANIZING - AASHTO MILL ASTM A-123.



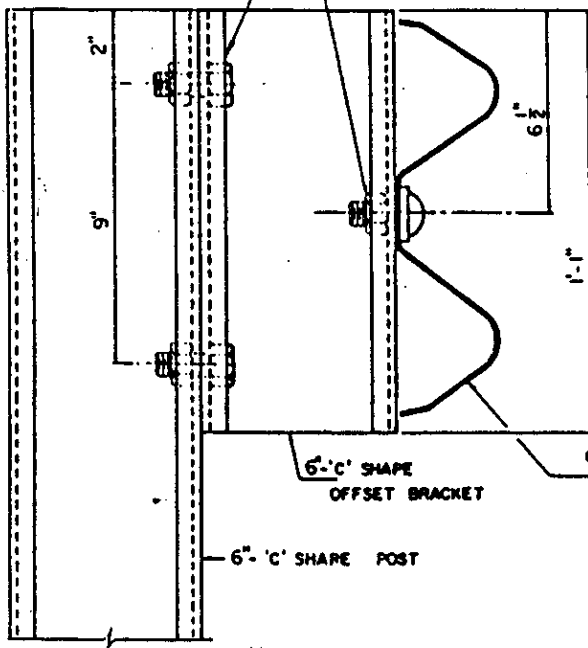
PLAN



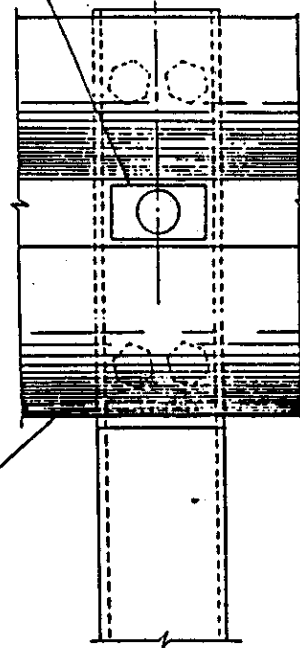
OFFSET BRACKET

OPEN SIDE OF C SHAPE POST & OFFSET BRACKETS TO BE PLACED AWAY FROM DIRECTION OF TRAFFIC

ST'D. RECTANGULAR WASHER  
ST'D. SPLICE & OFFSET BRACKET  
NUTS & BOLTS  
SEE DETAIL 1/54

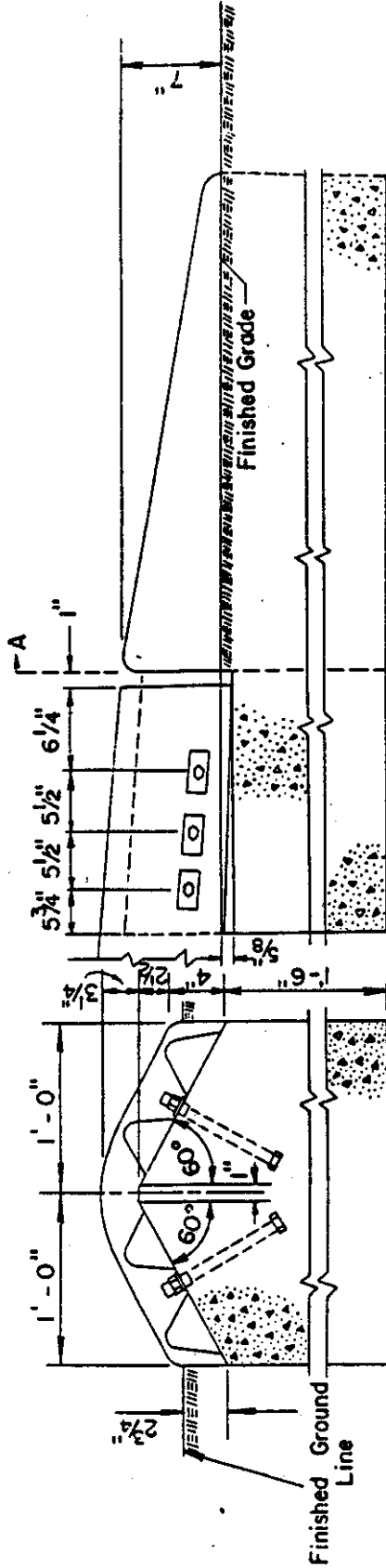


SIDE ELEVATION



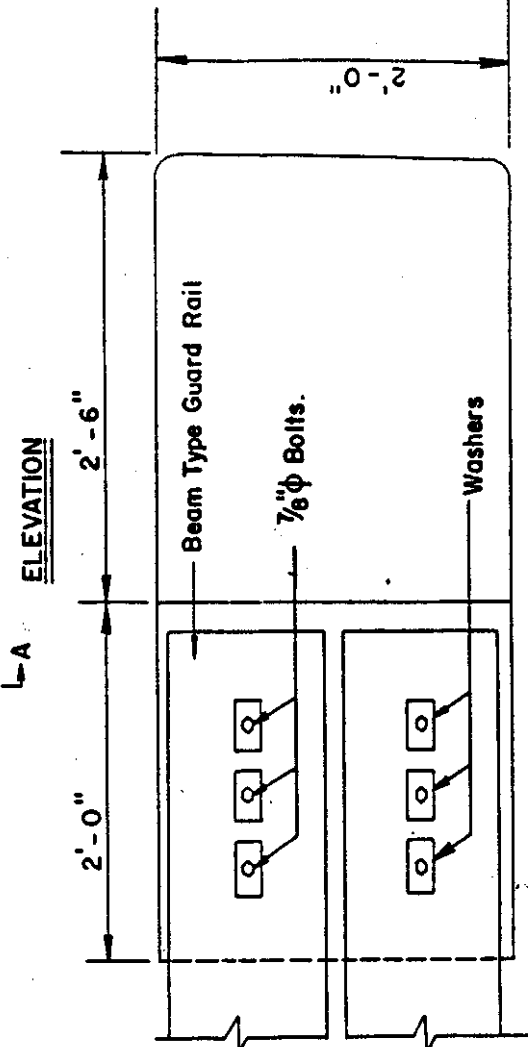
FRONT ELEVATION

|   |  |  |         |      |
|---|--|--|---------|------|
| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>GUARD RAIL W/ BEAM<br>ALTERNATE 'C' SHAPE STRONG POST | REVISED | 1/55 |
|   | DESIGN ENGINEER<br><i>[Signature]</i><br>DATE    |  |         |      |
|   |  |  |         |      |
|   |  |  |         |      |
|   |  |  |         |      |



**SECTION A-A**  
 Install 6 7/8"  $\phi$  Bolts and Nuts 10" Long, 2" Projection,  
 and 6 Rectangular Galvanized Washers as shown  
 on Detail 1/54 Modified to fit 7/8"  $\phi$  Bolts

Concrete for End Block to be Mix  
 No. 3 Concrete.

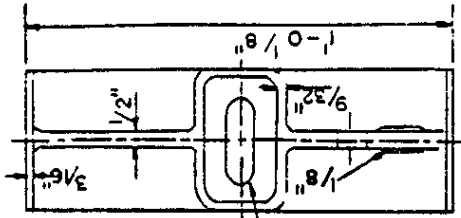


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| REVISED | 56 |
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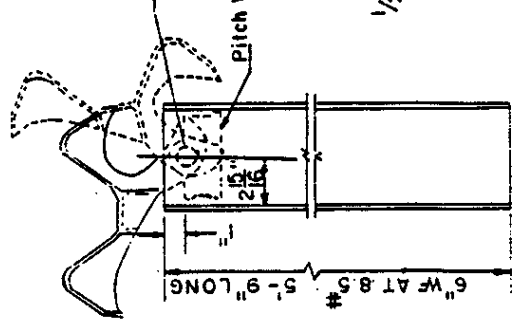
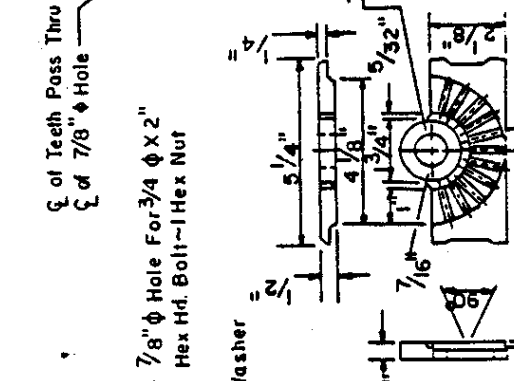
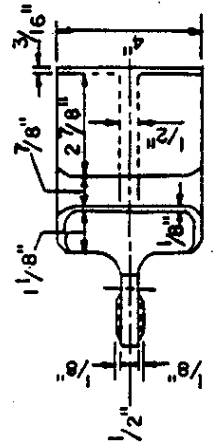
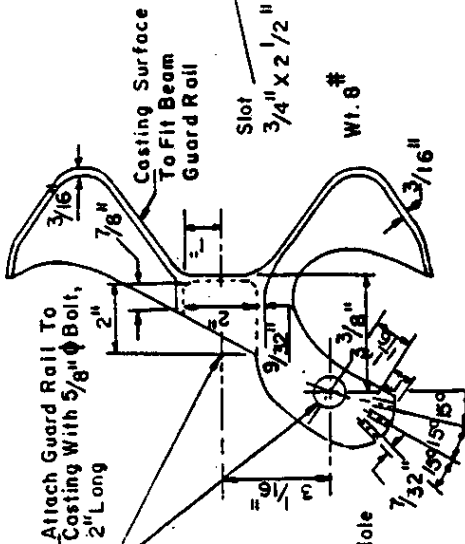
STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 GUARD RAIL W / BEAM  
 MEDIAN BARRIER END BLOCK

APPROVED  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE

ANNE ARUNDEL  
 COUNTY  
 DEPARTMENT OF  
 PUBLIC WORKS



CASTING



METHOD OF ANCHORAGE

MATERIAL REQUIREMENTS

- 1-THE METAL CASTING SHALL CONFORM TO THE A.S.T.M. DESIGNATION A-47, GRADE 32510
- 2-THE ZINC COATING SHALL CONFORM TO THE A.S.T.M. DESIGNATION A-153, CLASS A.
- 3-ALL PARTS TO BE GALVANIZED

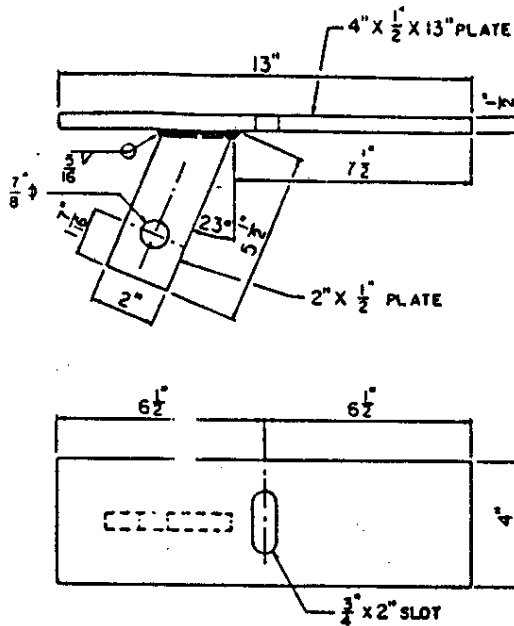
|         |    |
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| REVISED | 1  |
|         | 57 |

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS

GUARD RAIL ANCHORAGE CASTING

APPROVED *[Signature]*  
 CHIEF ENGINEER  
 DESIGN ENGINEER *[Signature]* 9/11/88  
 DATE 9/17/88

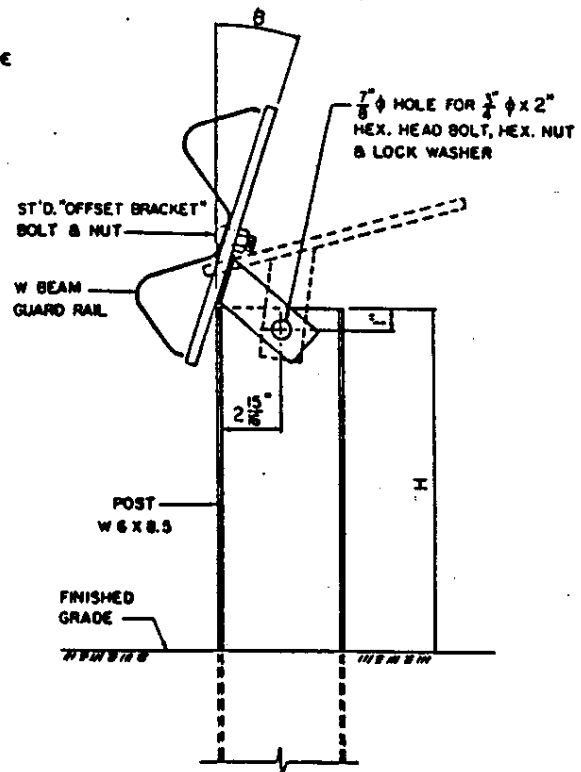
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS



ALL STEEL TO BE A.S.T.M. DESIGNATION A-36  
HOT DIPPED GALVANIZED AFTER FABRICATION  
TO A.S.T.M. DESIGNATION A-123

H = HEIGHT OF TOP OF GUARD POST ABOVE FINISHED GRADE  
θ = ANGLE OF PITCH OF RAIL

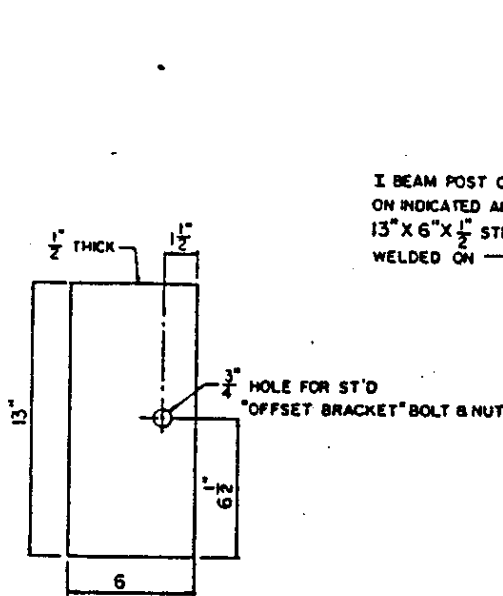
| POST | H          | θ   |
|------|------------|-----|
| A    | 2'-3"      | 0°  |
| B    | 2'-3"      | 0°  |
| C    | 2'-3"      | 0°  |
| D    | 2'-3"      | 0°  |
| E    | 2'-3"      | 0°  |
| F    | 2'-3"      | 0°  |
| G    | 1'-1 1/2"  | 15° |
| H    | 0'-10 1/2" | 30° |
| I    | 0'-7"      | 45° |
| J    | 0'-4 1/2"  | 60° |
| K    | 0'-1 1/2"  | 75° |
| L    | 0'-0"      | 90° |



**METHOD OF ANCHORAGE**  
NOTE: - USE OF ANCHORAGE BRACKET IN PLACE OF  
OFFSET BRACKET BEGINS AT POST G WITH  
WITH AN ANGLE OF 15°

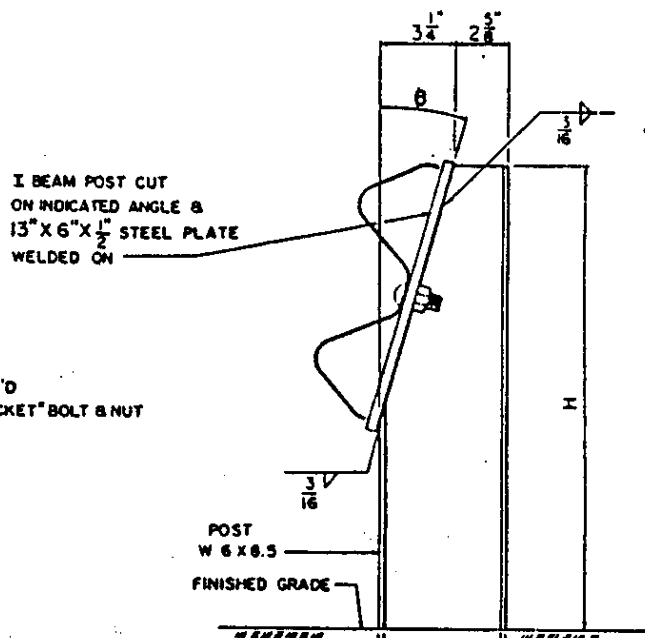
|   |  |  |         |    |
|---|--|--|---------|----|
| ANNE ARUNDEL<br>COUNTY<br>DEPARTMENT OF<br>PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER         | STANDARD ROADWAY &<br>SITE IMPROVEMENT DETAILS<br>GUARD RAIL W BEAM<br>ANCHORAGE BRACKET | REVISED | 1  |
|   | DESIGN ENGINEER<br><i>[Signature]</i><br>9/17/88<br>DATE |  |         | 58 |
|   |  |  |         |    |
|   |  |  |         |    |
|   |  |  |         |    |





**STEEL PLATE DETAIL**

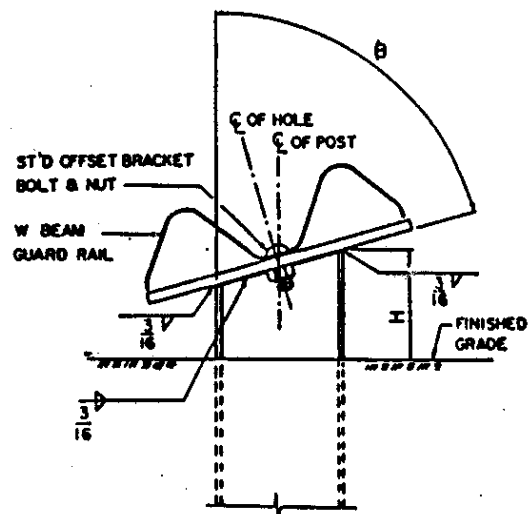
NOTE: ALL STEEL IS TO BE ASTM DESIGNATION A-36 HOT DIPPED GALVANIZED AFTER FABRICATION TO ASTM DESIGNATION A-123.



**METHOD OF ANCHORAGE (POST G)**

H = HEIGHT OF TOP OF GUARD POST ABOVE FINISHED GRADE  
 theta = ANGLE OF PITCH OF RAIL

| POST | H         | theta |
|------|-----------|-------|
| A    | 2'-3"     | 0°    |
| B    | 2'-3"     | 0°    |
| C    | 2'-3"     | 0°    |
| D    | 2'-3"     | 0°    |
| E    | 2'-3"     | 0°    |
| F    | 2'-3"     | 0°    |
| G    | 2'-0 1/2" | 15°   |
| H    | 1'-8"     | 30°   |
| I    | 1'-2 1/2" | 45°   |
| J    | 0'-9 1/2" | 60°   |
| K    | 0'-4 1/4" | 75°   |
| L    | 0'-0"     | 90°   |



**TYPICAL METHOD OF ANCHORAGE (POSTS H, I, J & K)**

NOTE: USE OF ANCHORAGE PLATE IN PLACE OF OFFSET BRACKET BEGINS AT POST G WITH AN ANGLE OF 15°.

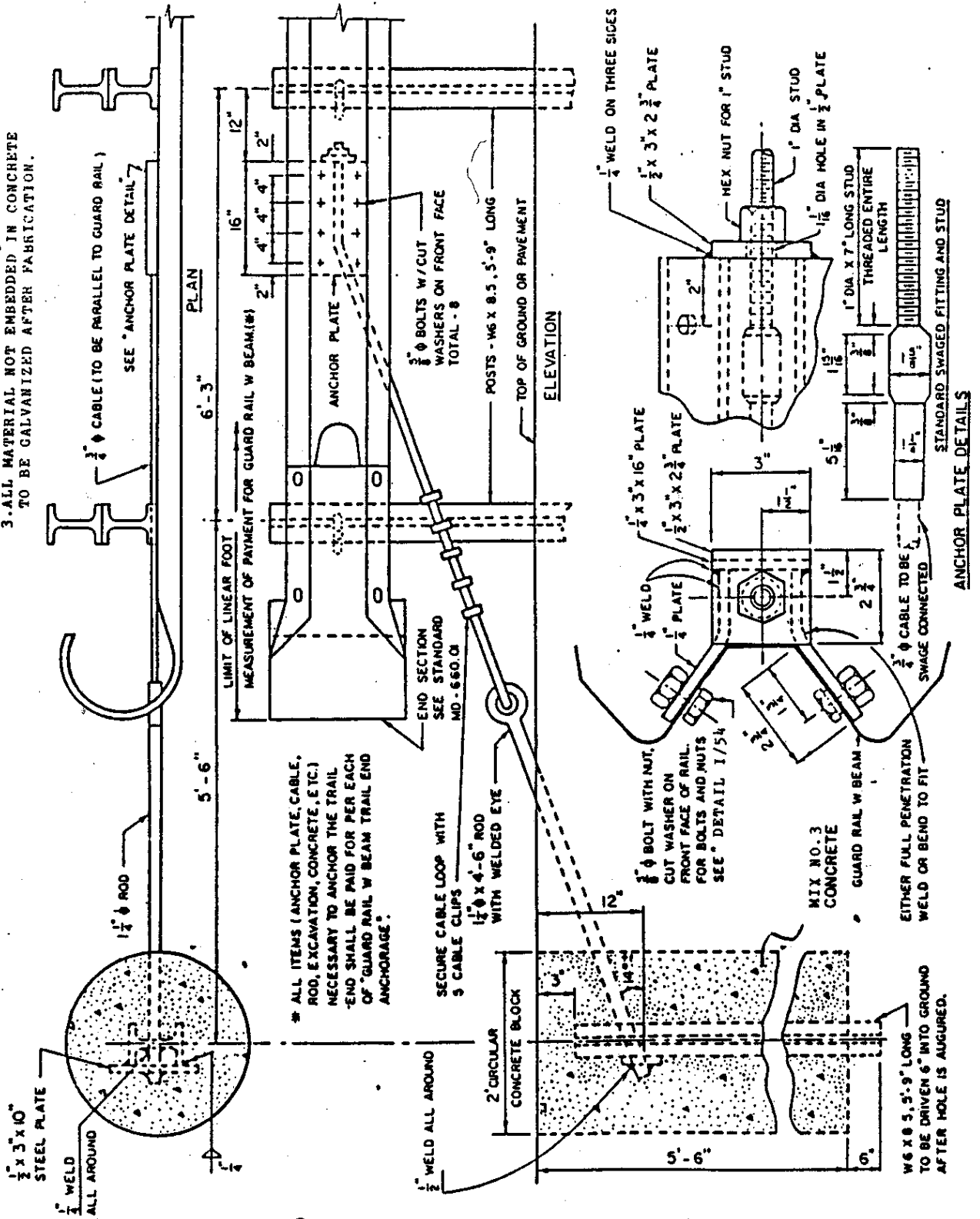
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

APPROVED  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 GUARD RAIL W BEAM ANCHORAGE PLATE

| REVISED |    |
|---------|----|
|         | 1  |
|         | 59 |

- NOTES: 1. ALL CONCRETE TO BE CONCRETE MIX NO. 2.  
 2. ALL STEEL PLATES TO BE A-36.  
 3. ALL MATERIAL NOT EMBEDDED IN CONCRETE TO BE GALVANIZED AFTER FABRICATION.



\* ALL ITEMS (ANCHOR PLATE, CABLE, ROD, EXCAVATION, CONCRETE, ETC.) NECESSARY TO ANCHOR THE TRAIL END SHALL BE PAID FOR PER EACH OF GUARD RAIL W BEAM TRAIL END ANCHORAGE.

SECURE CABLE LOOP WITH 3 CABLE CLIPS 1 1/2" x 4"-6" ROD WITH WELDED EYE

1/2" BOLT WITH NUT, CUT WASHER ON FRONT FACE OF RAIL FOR BOLTS AND NUTS SEE "DETAIL I/54"

MIX NO. 3 CONCRETE  
 EITHER FULL PENETRATION WELD OR BEND TO FIT

ANCHOR PLATE DETAILS

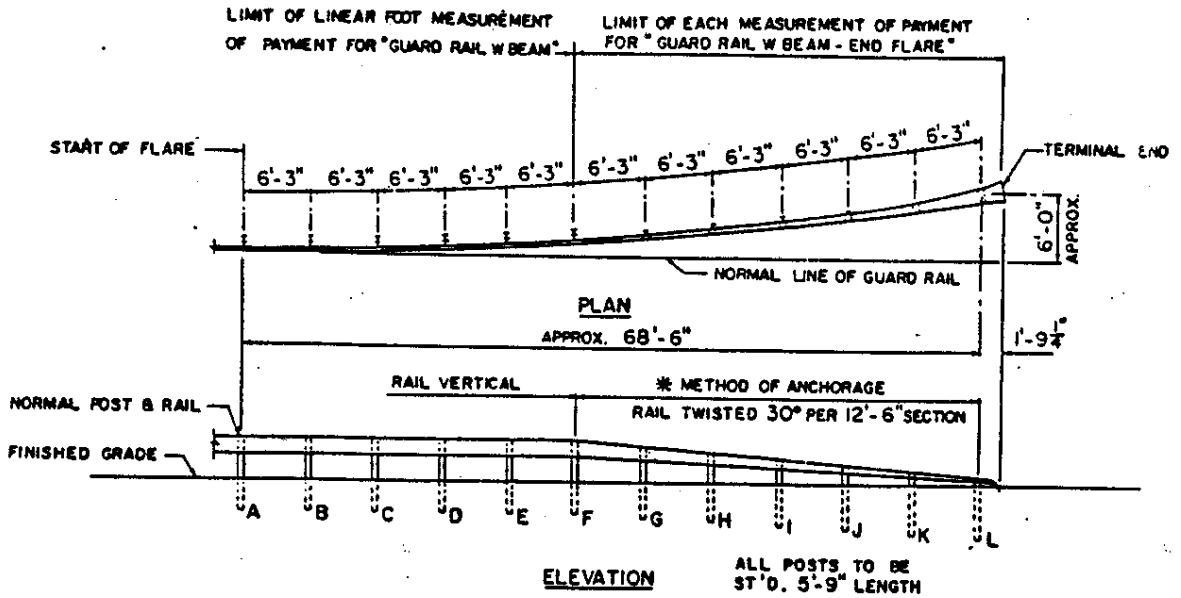
APPROVED  
 ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE

STANDARD ROADWAY 8  
 SITE IMPROVEMENT DETAILS  
 GUARD RAILS W BEAM  
 TRAIL END ANCHORAGE

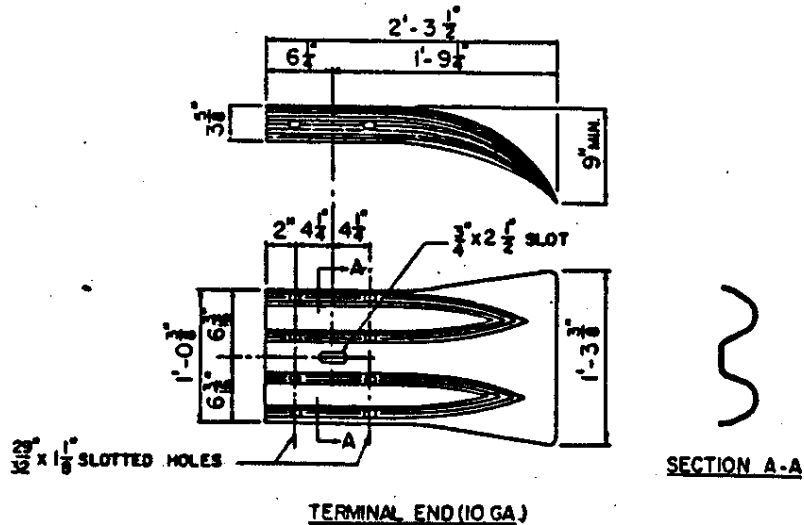
REVISED

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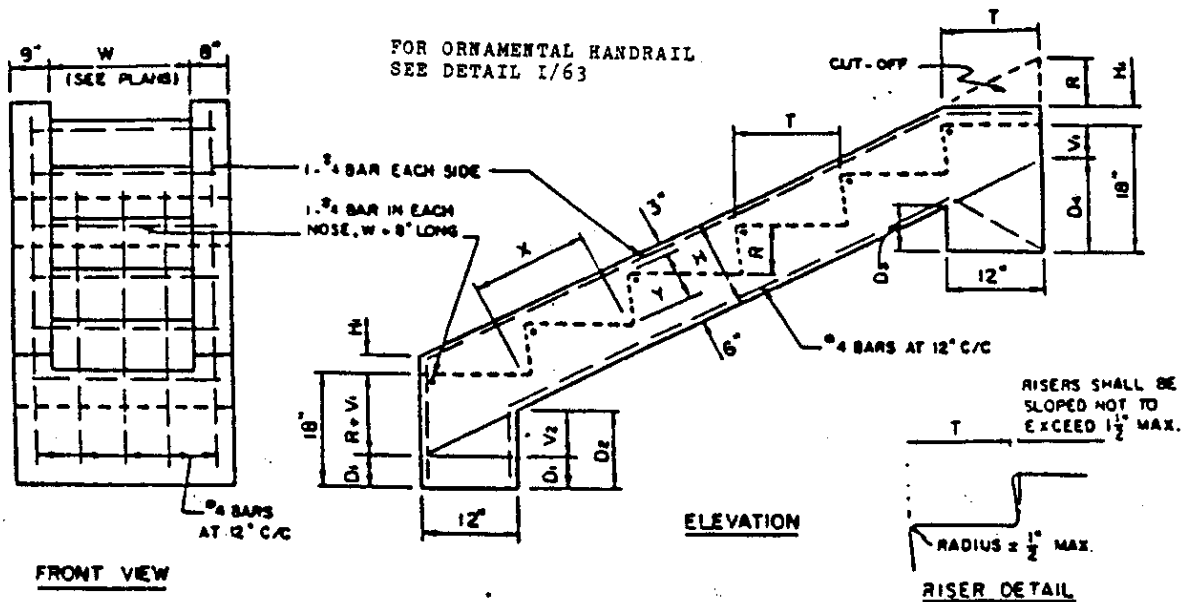
\* NOTE: USE OF GUARD RAIL W BEAM ANCHORAGE IN PLACE OF OFFSET BRACKET BEGINS AT POST G. THE CONTRACTOR HAS THE OPTION FOR THE METHOD OF GUARD RAIL W BEAM ANCHORAGE. FOR DETAILS OF OPTIONS SEE: DETAIL I/57 ANCHORAGE CASTING, DETAIL I/58 ANCHORAGE BRACKET, DETAIL I/59 ANCHORAGE PLATE.

COST OF ANCHORAGE SELECTED SHALL BE INCLUDED IN THE PAYMENT FOR END FLARE AS INDICATED ABOVE.



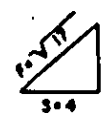
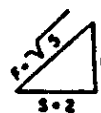
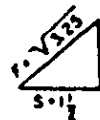
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|---|---|--|-------------------------|---------|
| ANNE ARUNDEL COUNTY<br>DEPARTMENT OF PUBLIC WORKS | APPROVED<br><i>[Signature]</i><br>CHIEF ENGINEER<br>DESIGN ENGINEER<br>DATE 9/17/88 | STANDARD ROADWAY & SITE IMPROVEMENT DETAILS<br>GUARD RAIL W BEAM END FLARE | REVISED<br><br><br><br> | 1<br>61 |
|---|---|--|-------------------------|---------|

NOTE: ALL REINFORCING TO BE #4 BARS, CONFORMING TO AASHTO DESIGNATION M31 GRADE 40.1" MIN. COVER



STANDARD SLOPES, DIMENSIONS & FORMULAE

| SLOPE RATIO<br>S:1<br>VALUES OF S | R      | T   | F    | N <sub>1</sub> | X     | Y     | H     | W     | V <sub>1</sub> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> |
|-----------------------------------|--------|-----|------|----------------|-------|-------|-------|-------|----------------|----------------|----------------|----------------|----------------|
| 1 1/2                             | 7"     | 11" | √325 | 3.61"          | 3.04" | 3.91" | 4.91" | 7.21" | 8"             | 3.79"          | 11.79"         | 2.79"          | 13.79"         |
| 2                                 | 6"     | 12" | √9   | 3.38"          | 3.44" | 3.36" | 4.36" | 6.72" | 6"             | 3.24"          | 11.28"         | 3.28"          | 11.28"         |
| 4                                 | 3 1/2" | 14" | √17  | 3.08"          | 4.44" | 3.39" | 4.39" | 6.8"  | 5"             | 2.3"           | 11.3"          | 6.8"           | 11.8"          |



CONCRETE REQUIRED FOR STANDARD STAIRWAYS  
TABLE OF UNIT QUANTITIES

| ITEM - UNIT OF STAIRWAY                              | SLOPE RATIO & T R |        |        | VOLUMES PER STAIRWAY      |
|--|-------------------|--------|--------|---------------------------|
|  | 1 1/2:1           | 2:1    | 4:1    |                           |
| VOL. OF 1 STEP + BOTTOM SLAB PER 1" WIDTH OF W       | .0631             | .0675  | .0643  | MULTIPLIED BY (N/W) = A   |
| VOL. OF 2 SIDEWALLS PER STEP OR TREAD                | 1.7317            | 1.7870 | 1.6006 | MULTIPLIED BY (N) = B     |
| VOL. OF UPPER & LOWER FOOTINGS PER 1" OF TOTAL WIDTH | 1012              | .1190  | .1387  | MULTIPLIED BY (W + N) = C |
| VOL. OF 2 UPPER SIDE WALL CUT-OFFS TO DEDUCT         | -.3403            | -.3333 | -.2269 | MULTIPLIED BY I = D       |

CONCRETE - MIX NO. 2 (VOLUMES SHOWN IN TABLE ABOVE ARE IN CUBIC FEET)  
TOTAL VOLUME IN CUBIC YARDS / STAIRWAY =  $\frac{A + B + C - D}{27}$

NUMBER OF STEPS OR TREADS = N  
TREAD WIDTH (IN INCHES) = W

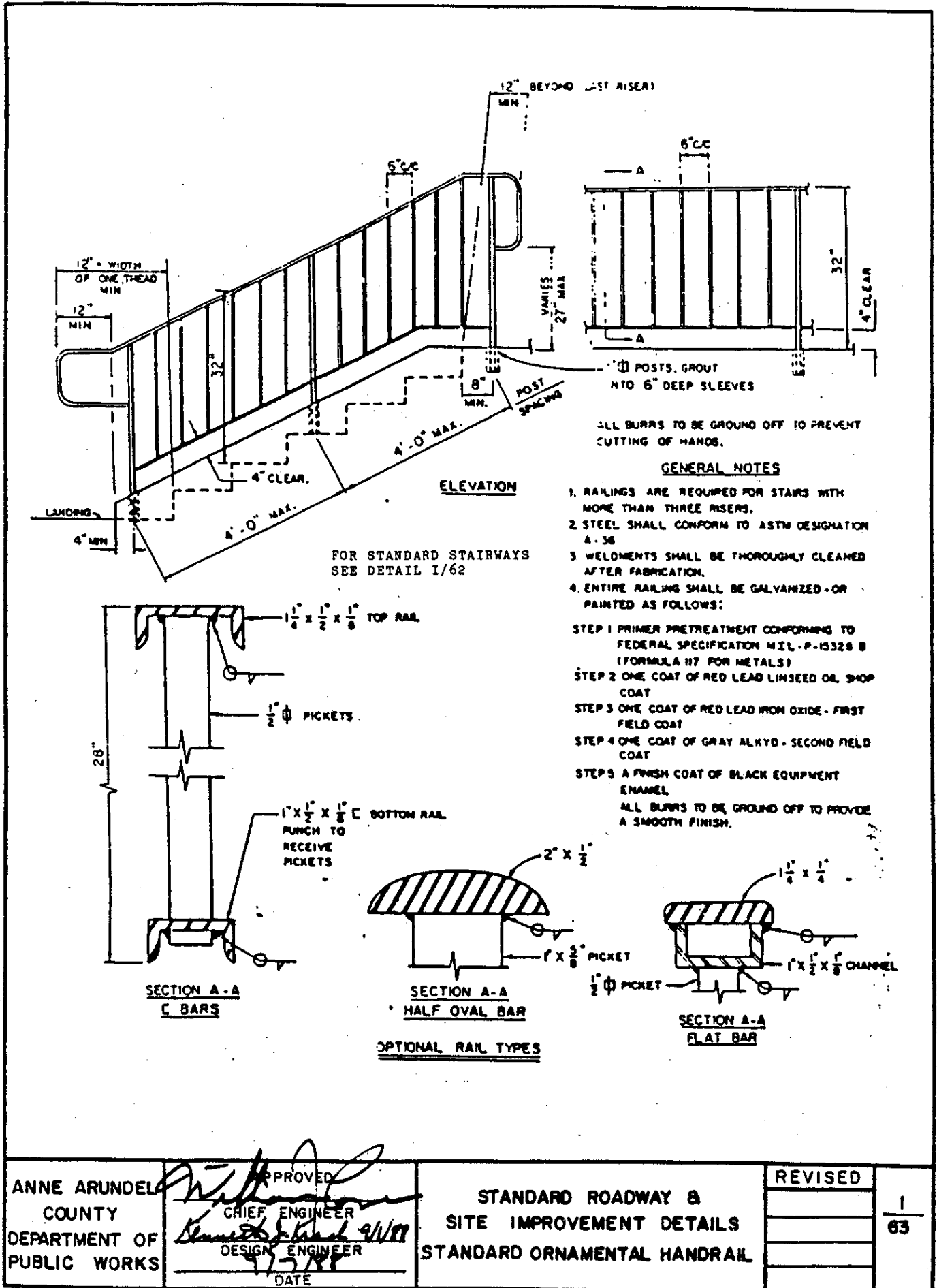
ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

APPROVED  
  
 CHIEF ENGINEER  
  
 DESIGN ENGINEER  
 DATE 9/15/88

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
STANDARD STAIRWAYS

REVISED

1/62



ANNE ARUNDEL COUNTY  
DEPARTMENT OF PUBLIC WORKS

APPROVED  
*[Signature]*  
 CHIEF ENGINEER  
 DESIGN ENGINEER  
 DATE

STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 STANDARD ORNAMENTAL HANDRAIL

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|---------|----|
| REVISED | 1  |
|         | 63 |

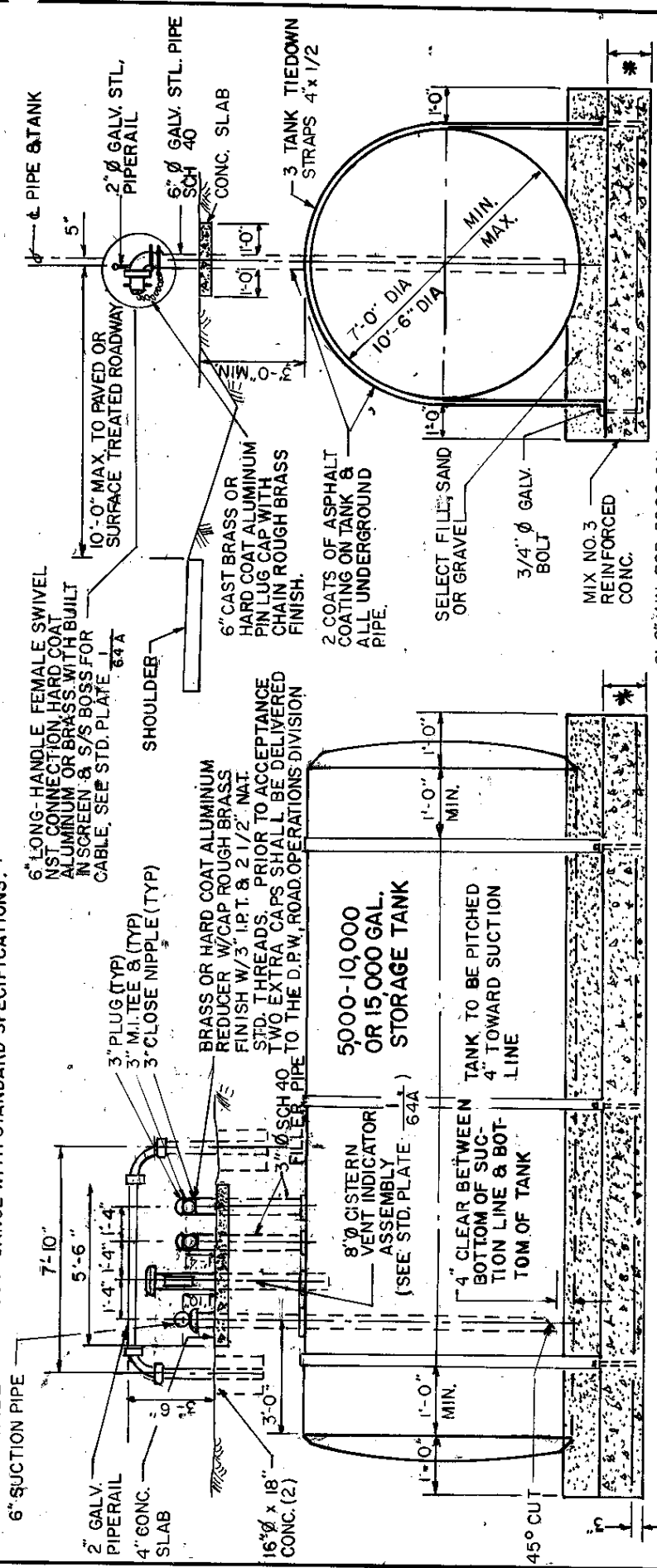
**NOTES:**

1. ALL JOINTS & FITTINGS FOR SUCTION PIPE SHALL BE AIRTIGHT.
2. TANK & SUCTION PIPE WITH FITTINGS SHALL BE AIRTESTED AT A PRESSURE OF 1/2 P.S.I. FOR 20 MIN. BEFORE TANK IS COVERED.
3. REINFORCING SHALL BE #4 BARS 8" C.C. OR #5 BARS 12" C.C.
4. THE CONCRETE SLAB WILL NOT BE REQUIRED WHERE IT HAS BEEN DEMONSTRATED THAT FLOATION WILL NOT OCCUR.
5. SELECT BACKFILL, MAY BE REQUIRED IN ACCORDANCE WITH THE LATEST STANDARD SPECIFICATIONS.
6. THE FOLLOWING ITEMS SHALL BE PAINTED WITH TWO (2) COATS OF INDUSTRIAL ENAMEL B54 SERIES Y27 LEAD FREE SAFETY YELLOW (MANUFACTURED BY SHERWIN WILLIAMS) OR APPROVED EQUAL.
7. PAINTING SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS.

\* IN CALCULATING THIS INFORMATION, THE FOLLOWING ASSUMPTIONS WERE MADE.

- (1) THE GROUNDWATER TABLE IS AT SURFACE.
- (2) THE TANK EXCAVATION HAS NOT BEEN BACKFILLED.
- (3) THE TANK IS EMPTY.
- (4) THE YIELD STRESS OF ALL STEEL IS  $F_y = 36$  KSI
- (5) THE ALLOWABLE STRESS ON STEEL IN TENSION IS  $F_t = .6 X F_y = 21.6$  KSI.
- (6) ALL STRAPS ARE TIGHTENED TO PRODUCE UNIFORM LOADING UPON EACH STRAP.
- (7) ALL STRAPS ARE VERTICAL AT THE POINT OF ANCHORAGE.
- (8) A FACTOR OF SAFETY OF 2 IS USED FOR THE ANCHORAGE STRAP DESIGN.
- (9) WEIGHT OF WATER 8.33 POUNDS PER GALLON.
- (10) WEIGHT OF SUBMERGED CONCRETE IS 80 POUNDS PER CUBIC FOOT

NOTE: UNDERGROUND TANK TIE DOWN SYSTEMS SHOULD BE DESIGNED BY A LICENSED STRUCTURAL ENGINEER, DUE TO THE COMPLEXITY OF SOIL CONDITIONS, MATERIAL LISTED IS ONLY INTENDED AS A GUIDE.



ELEVATION  
 CROSS SECTION

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

APPROVED 12/13/95  
 CHIEF ENGINEER 7/7/95  
 DESIGN ENGINEER  
 DATE

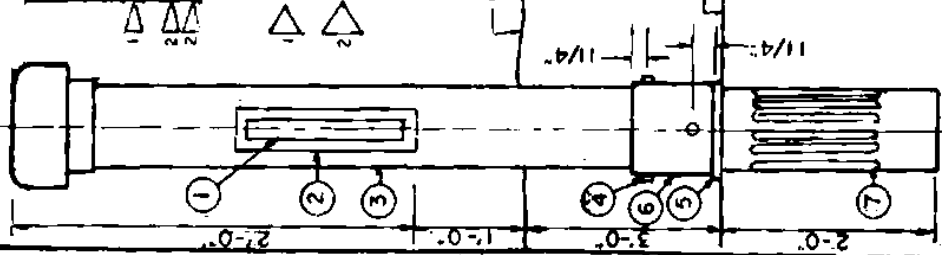
STANDARD ROADWAY & SITE IMPROVEMENT DETAILS  
 UNDERGROUND STORAGE TANK  
 FOR FIRE SUPPRESSION

REVISED 9/94

1/64

# ATTACHMENT 'A'

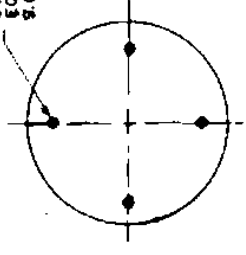
| ITEM | DESCRIPTION                   |
|------|-------------------------------|
| 1    | LENS                          |
| 2    | WINDOW FRAME                  |
| 3    | 8" UPPER VENT PIPE            |
| 4    | 5/16"-18 UNC-2X110S LONG BOOT |
| 5    | 8" SUPPORT FLANGE             |
| 6    | 8" COUPLING PIPE              |
| 7    | 8" LOWER VENT PIPE            |



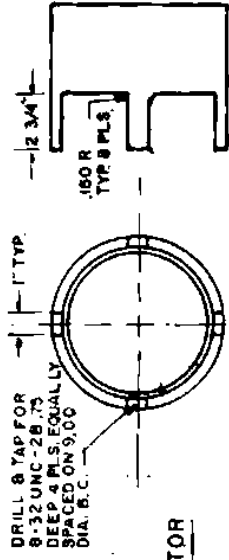
CISTERN VENT/INDICATOR ASSEMBLY

- NOTES:
- 1 DRILL & TAP FOR 5/16"-18 UNC
  - 2 PLACES AS SHOWN 180° APART.
  - 3 PRIME WITH SCHLUMBERGER P/11
  - 4 36018 - 062 PRIOR TO GLUING WITH SCHLUMBERGER P/36018 - 060.
  - 5 FOR ASSEMBLING ITEM 6 TO ITEM 7

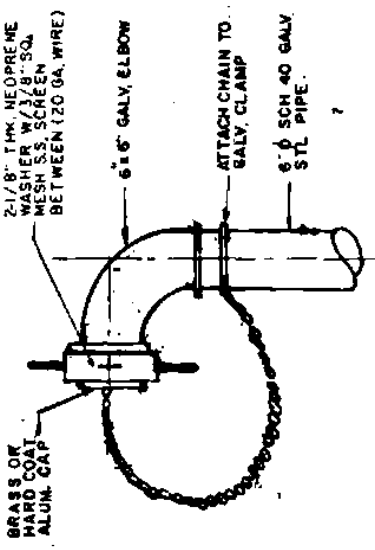
DRILL .156 DIA. TUBES & SINK .340 DIA. 4 PLS. EQUALLY SPACED ON 9.00 DIA. B.C.



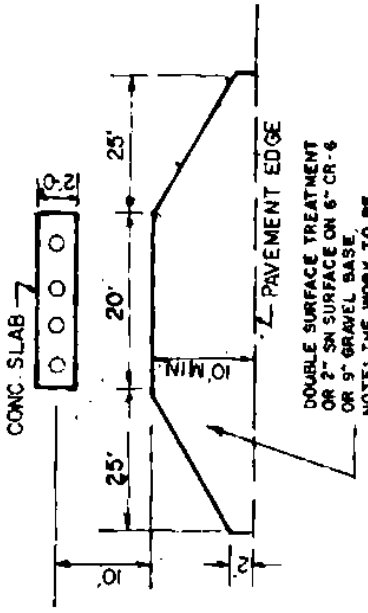
DETAIL OF MACHINING OF PVC CAP



DETAIL OF MACHINING OF PVC COUPLING



SUCTION CONNECTION



DOUBLE SURFACE TREATMENT OR 2" SN SURFACE ON 6" CR-6 OR 9" GRAVEL BASE. NOTE: THE WORK TO BE INCLUDED IN THE COST OF THE TANK.

ACCESS PAD

|         |      |
|---------|------|
| REVISED | 1    |
|         | 9/94 |
|         | 64A  |

## STANDARD ROADWAY & SITE IMPROVEMENT DETAILS UNDERGROUND STORAGE TANK FOR FIRE SUPPRESSION

APPROVED  
*Bradley* ENGINEER  
 OF SIGN. ENGINEER 7/7/95  
 DATE

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS