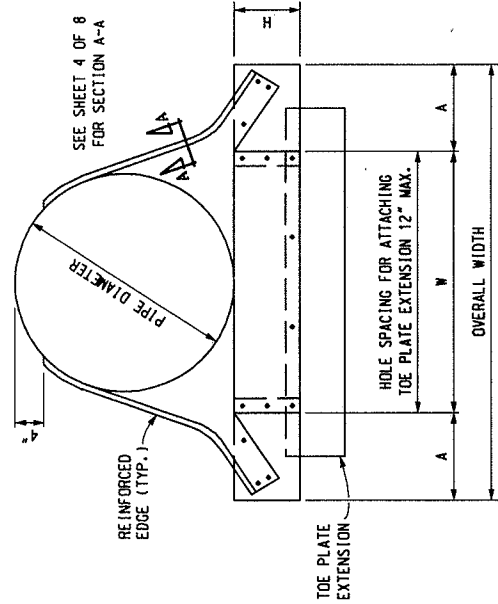


OUTFALL LABEL STAMPED INTO STEEL
(LABEL PLACED ON THE INSIDE OF THE END
SECTION AT THE SPRINGLINE OF THE PIPE)
(LETTERING: 1/2" HIGH x 1" WIDE x 1/8" DEEP)
SEE NOTES

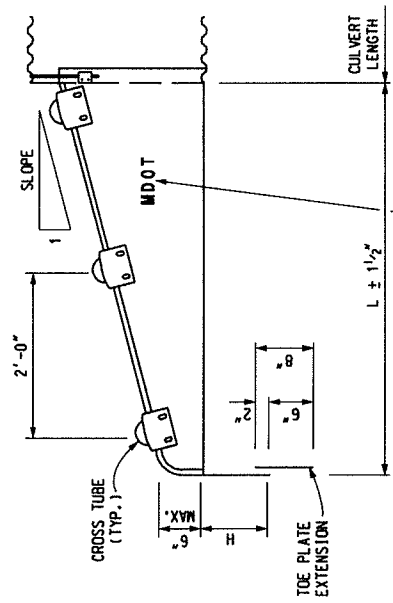
SIDE VIEW
(TRANSVERSE DRAINAGE INSTALLATION SHOWN)

METAL CULVERT SLOPED END SECTION FOR CORRUGATED METAL PIPE



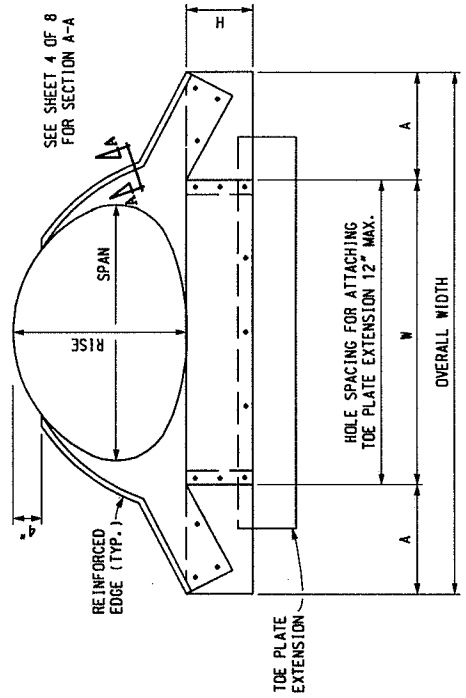
SEE SHEET 4 OF 8
FOR SECTION A-A

END VIEW



OUTFALL LABEL STAMPED INTO STEEL
(LABEL PLACED ON THE INSIDE OF THE END
SECTION AT THE SPRINGLINE OF THE PIPE)
(LETTERING: 1/2" HIGH x 1" WIDE x 1/8" DEEP)
SEE NOTES

SIDE VIEW
(LONGITUDINAL DRAINAGE INSTALLATION SHOWN)



SEE SHEET 4 OF 8
FOR SECTION A-A

END VIEW

METAL CULVERT SLOPED END SECTION FOR ARCH PIPE



PREPARED BY
DESIGN
SUPPORT AREA
DRAWN BY: B.L.T.
CHECKED BY: W.K.P.

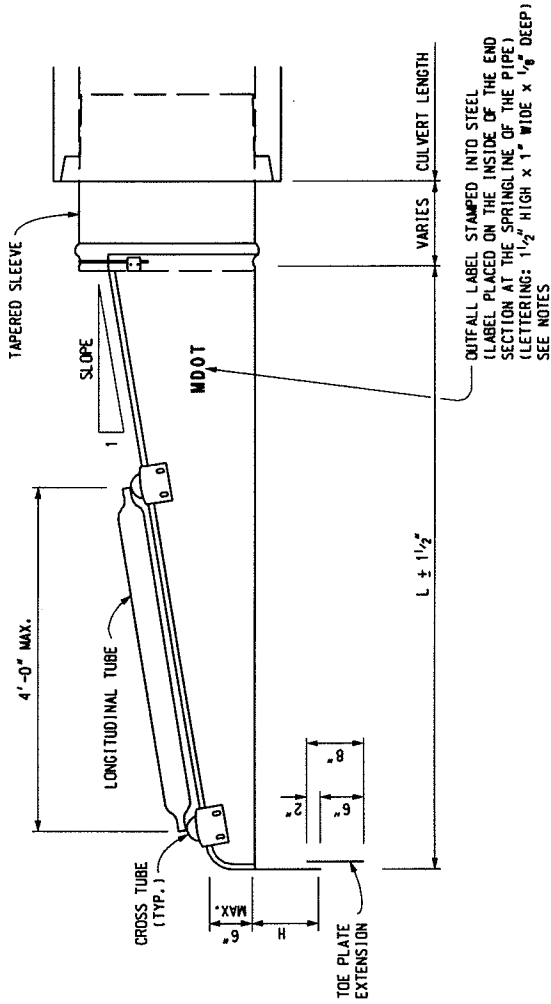
DEPARTMENT DIRECTOR
Gloria J. Jeff
APPROVED BY: _____
ENGINEER OF DELIVERY
APPROVED BY: _____
ENGINEER OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

**CULVERT
SLOPED END SECTIONS
(CONCRETE AND METAL)**

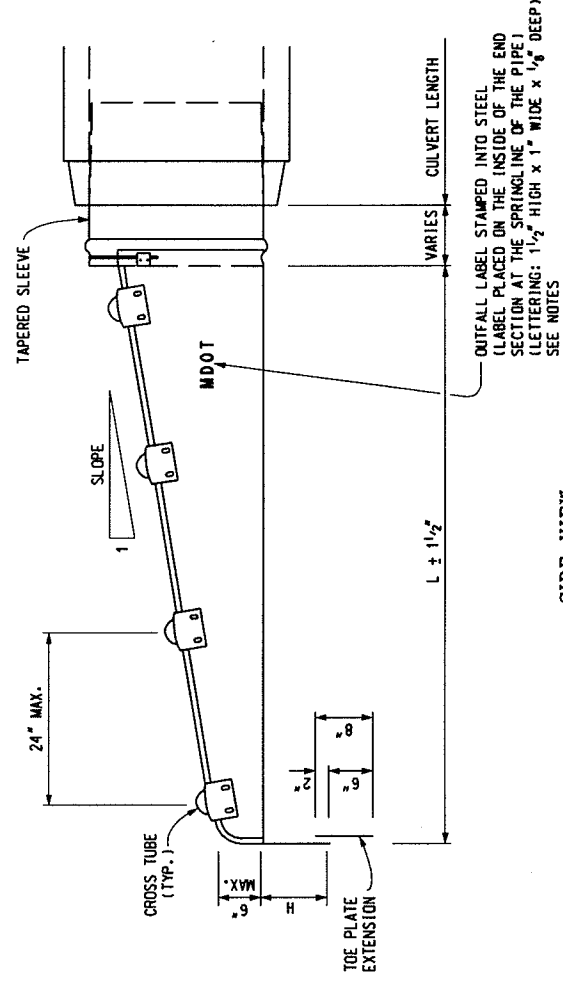
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|---------------------------------|------------------------|---------------|-----------------|
| 11-17-2005 F.H.W.A. APPROVAL | 4-22-2005 PLAN DATE | R-95-F | SHEET 1 OF 7 |
|---------------------------------|------------------------|---------------|-----------------|

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL SIGNED COPY APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE



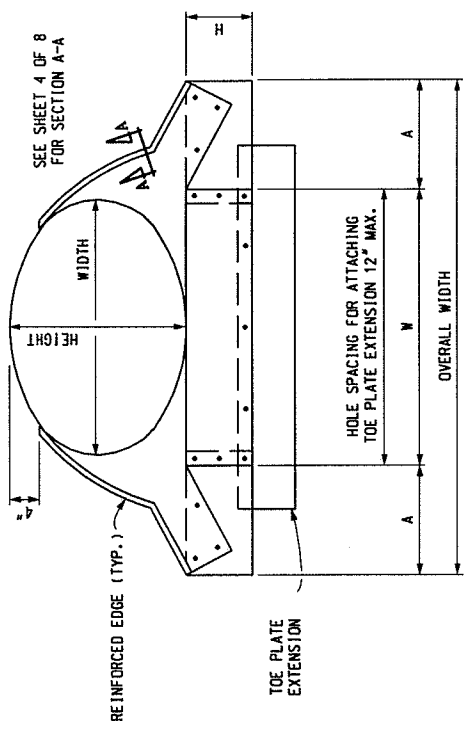
SIDE VIEW
(TRANSVERSE DRAINAGE INSTALLATION SHOWN)

METAL CULVERT SLOPED END SECTION FOR ELLIPTICAL CONCRETE PIPE

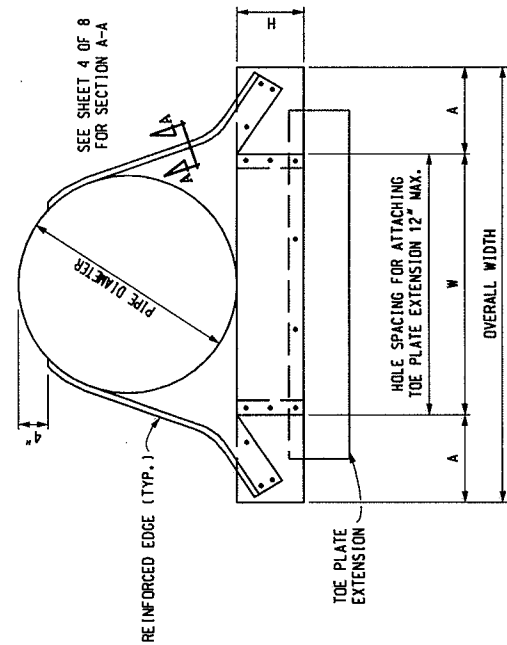


SIDE VIEW
(LONGITUDINAL DRAINAGE INSTALLATION SHOWN)

METAL CULVERT SLOPED END SECTION AND CONNECTION TO CIRCULAR CONCRETE PIPE



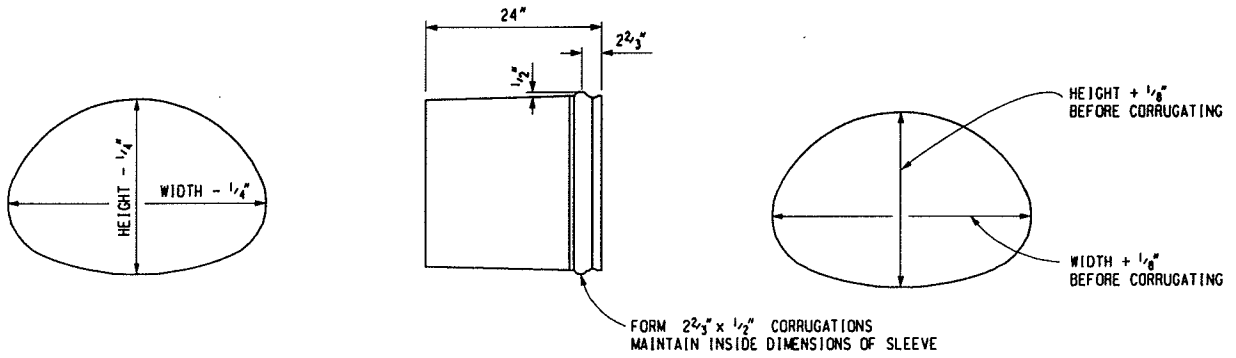
END VIEW



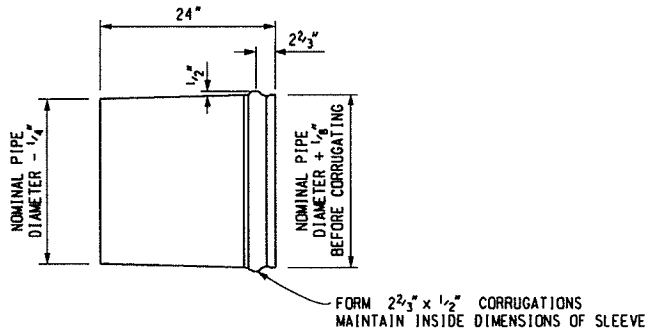
END VIEW

| | | | |
|--|-----------|---------------|--------|
| MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR CULVERT SLOPED END SECTIONS (CONCRETE AND METAL) | | | |
| 11-17-2005 | 4-22-2005 | R-95-F | SHEET |
| F.H.W.A. APPROVAL | PLAN DATE | | 2 OF 7 |

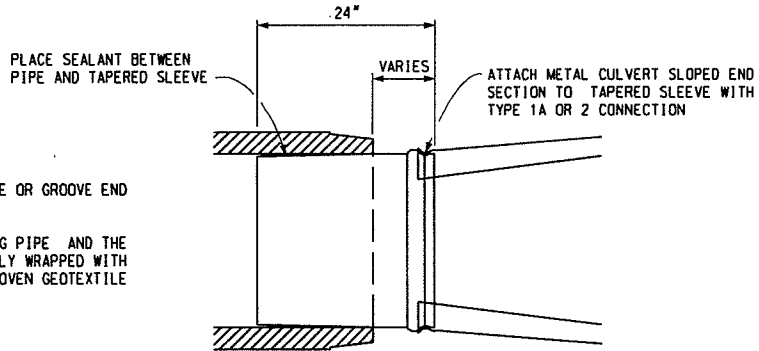
NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL SIGNED COPY APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE



TAPERED SLEEVE FOR ELLIPTICAL PIPE
(METAL END SECTION)



TAPERED SLEEVE FOR CIRCULAR PIPE
(METAL END SECTION)



NOTE:

TAPERED SLEEVE SHALL BE MADE TO FIT TONGUE OR GROOVE END OF PIPE.

THE CONNECTION JOINT BETWEEN THE EXISTING PIPE AND THE METAL SLOPED END SECTION SHALL BE COMPLETELY WRAPPED WITH A 2'-0" WIDTH (1'-6" OVERLAP) OF NON-WOVEN GEOTEXTILE FABRIC.

**TOP VIEW OF TAPERED SLEEVE FOR
CONNECTING METAL CULVERT SLOPED END SECTION
TO CONCRETE PIPE OR CORRUGATED POLYETHYLENE PIPE**

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

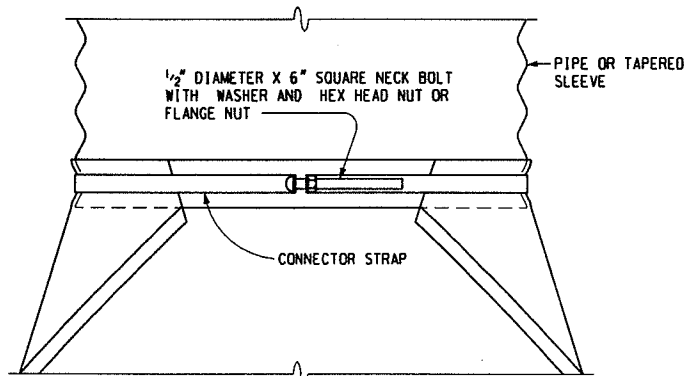
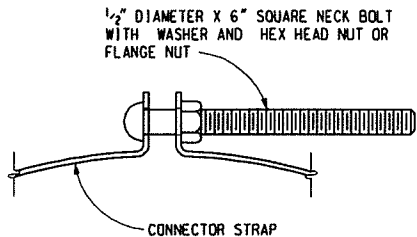
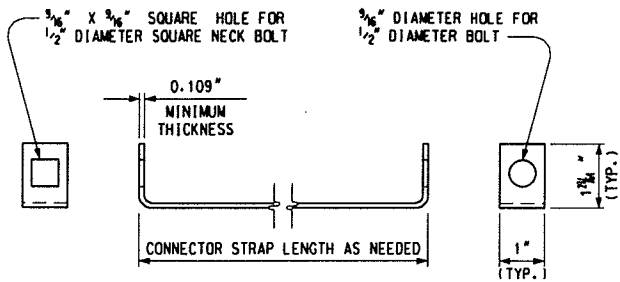
**CULVERT
SLOPED END SECTIONS**
(CONCRETE AND METAL)

11-17-2005
F.H.W.A. APPROVAL

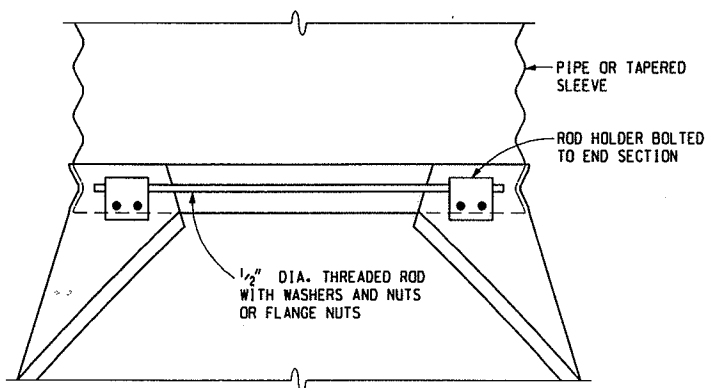
3-22-2005
PLAN DATE

R-95-F

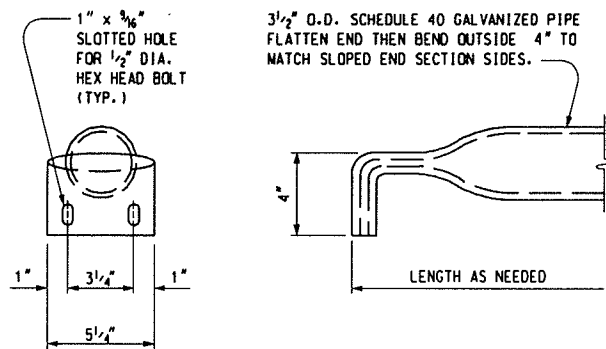
SHEET
3 OF 7



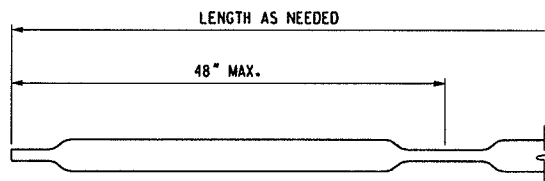
TYPE 1A CONNECTOR
FOR USE ON CIRCULAR PIPE DIAMETERS 15" THROUGH 24"



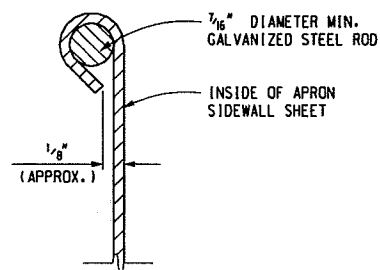
TYPE 2 CONNECTOR
FOR USE ON CIRCULAR PIPE DIAMETERS 27" THROUGH 60"
AND FOR ALL ARCH AND ELLIPTICAL PIPE SIZES



CROSS TUBE



LONGITUDINAL TUBE



SECTION A - A
FOR PLAN VIEW SEE SHEETS 1 AND 2

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

CULVERT
SLOPED END SECTIONS
(CONCRETE AND METAL)

11-17-2005
F.H.W.A. APPROVAL

4-22-2005
PLAN DATE

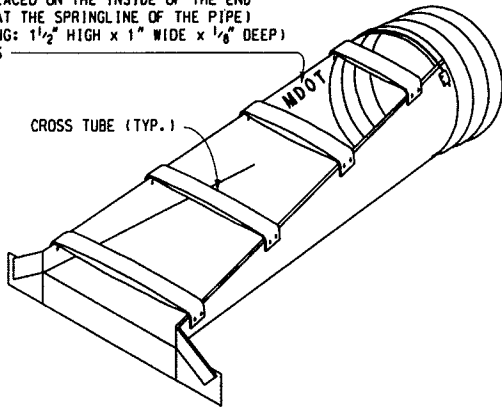
R-95-F

SHEET
4 OF 7

NOTE:

IN LONGITUDINAL DRAINAGE SITUATIONS, CROSS TUBES ARE REQUIRED AT A 24" MAXIMUM SPACING. THE NUMBER OF CROSS TUBES REQUIRED WILL VARY DEPENDING ON THE LENGTH OF THE CULVERT SLOPED END SECTION.

OUTFALL LABEL STAMPED INTO STEEL
(LABEL PLACED ON THE INSIDE OF THE END SECTION AT THE SPRINGLINE OF THE PIPE)
(LETTERING: 1 1/2" HIGH x 1" WIDE x 1/8" DEEP)
SEE NOTES

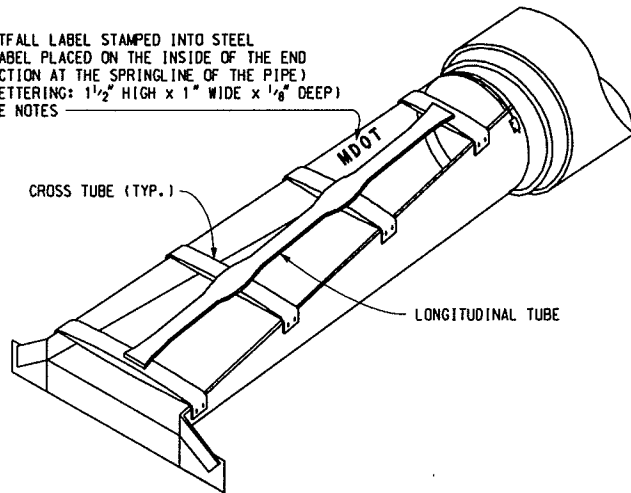


METAL CULVERT SLOPED END SECTION SHOWING CROSS TUBES USED FOR LONGITUDINAL DRAINAGE INSTALLATIONS

| SPAN/ RISE (INCHES) | MINIMUM THICKNESS (INCHES) | DIMENSIONS (INCHES) | | | | L DIMENSIONS (INCHES) | |
|---------------------------|----------------------------------|---------------------|----|----|------------------|-----------------------|-----------------------|
| | | A | H | W | OVERALL WIDTH | LENGTH (SLOPE 4:1) | LENGTH (SLOPE 6:1) |
| 21 X 15 | .064 | 8 | 6 | 27 | 43 | 20 | 30 |
| 24 X 18 | .064 | 8 | 6 | 30 | 46 | 32 | 48 |
| 28 X 20 | .064 | 8 | 6 | 34 | 50 | 40 | 60 |
| 35 X 24 | .079 | 12 | 9 | 41 | 65 | 56 | 84 |
| 42 X 29 | .109 | 12 | 9 | 48 | 72 | 76 | 114 |
| 49 X 33 | .109 | 16 | 12 | 55 | 87 | 92 | 138 |
| 57 X 38 | .109 | 16 | 12 | 63 | 95 | 112 | 168 |
| 64 X 43 | .109 | 16 | 12 | 70 | 102 | 132 | 198 |
| 71 X 47 | .109 | 16 | 12 | 77 | 109 | 148 | 222 |
| 77 X 52 | .109 | 16 | 12 | 83 | 115 | 168 | 252 |
| 83 X 57 | .109 | 16 | 12 | 89 | 121 | 188 | 282 |

| PIPE DIA. (INCHES) | MINIMUM THICKNESS (INCHES) | DIMENSIONS (INCHES) | | | | L DIMENSIONS (INCHES) | |
|--------------------------|----------------------------------|---------------------|----|----|------------------|-----------------------|-----------------------|
| | | A | H | W | OVERALL WIDTH | LENGTH (SLOPE 4:1) | LENGTH (SLOPE 6:1) |
| 15 | .064 | 8 | 6 | 21 | 37 | 20 | 30 |
| 18 | .064 | 8 | 6 | 24 | 40 | 32 | 48 |
| 21 | .064 | 8 | 6 | 27 | 43 | 44 | 66 |
| 24 | .064 | 8 | 6 | 30 | 46 | 56 | 84 |
| 27 | .109 | 12 | 9 | 33 | 57 | 68 | 102 |
| 30 | .109 | 12 | 9 | 36 | 60 | 80 | 120 |
| 36 | .109 | 12 | 9 | 42 | 66 | 104 | 156 |
| 42 | .109 | 16 | 12 | 48 | 80 | 128 | 192 |
| 48 | .109 | 16 | 12 | 54 | 86 | 152 | 228 |
| 54 | .109 | 16 | 12 | 60 | 92 | 176 | 264 |
| 60 | .109 | 16 | 12 | 66 | 98 | 200 | 300 |

OUTFALL LABEL STAMPED INTO STEEL
(LABEL PLACED ON THE INSIDE OF THE END SECTION AT THE SPRINGLINE OF THE PIPE)
(LETTERING: 1 1/2" HIGH x 1" WIDE x 1/8" DEEP)
SEE NOTES



NOTE:

IN TRANSVERSE DRAINAGE SITUATIONS, NO TUBES ARE REQUIRED WHEN THE "W" DIMENSION IS 30" OR LESS. CROSS TUBES ARE REQUIRED WHEN THE CLEAR SPAN DIMENSION IS LARGER THAN 30". THE NUMBER OF CROSS TUBES WILL VARY DEPENDING ON THE LENGTH OF THE LONGITUDINAL TUBE REQUIRED. WHEN THE "W" DIMENSION IS 36" TO 60", ONE LONGITUDINAL TUBE IS REQUIRED. WHEN THE "W" DIMENSION IS LARGER THAN 60", TWO LONGITUDINAL TUBES EQUALLY SPACED ARE REQUIRED. LONGITUDINAL TUBES SHALL BE WELDED TO CROSS TUBES TO ATTAIN A SINGLE PIECE STRUCTURE.

METAL CULVERT SLOPED END SECTION SHOWING CROSS TUBES AND LONGITUDINAL TUBE USED FOR TRANSVERSE DRAINAGE INSTALLATIONS (CONNECTED TO CONCRETE PIPE SHOWN)

| HEIGHT/ WIDTH (INCHES) | MINIMUM THICKNESS (INCHES) | DIMENSIONS (INCHES) | | | | L DIMENSIONS (INCHES) | |
|------------------------------|----------------------------------|---------------------|----|----|------------------|-----------------------|-----------------------|
| | | A | H | W | OVERALL WIDTH | LENGTH (SLOPE 4:1) | LENGTH (SLOPE 6:1) |
| 14 X 23 | .064 | 8 | 6 | 29 | 45 | 16 | 24 |
| 19 X 30 | .064 | 8 | 6 | 36 | 52 | 36 | 54 |
| 22 X 34 | .079 | 12 | 9 | 40 | 64 | 48 | 72 |
| 24 X 38 | .079 | 12 | 9 | 44 | 68 | 56 | 84 |
| 27 X 42 | .109 | 12 | 9 | 48 | 72 | 68 | 102 |
| 29 X 45 | .109 | 16 | 12 | 51 | 83 | 76 | 114 |
| 34 X 53 | .109 | 16 | 12 | 59 | 91 | 96 | 144 |
| 38 X 60 | .109 | 16 | 12 | 66 | 98 | 112 | 168 |
| 43 X 68 | .109 | 16 | 12 | 74 | 106 | 132 | 198 |
| 48 X 76 | .109 | 16 | 12 | 80 | 112 | 152 | 228 |

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

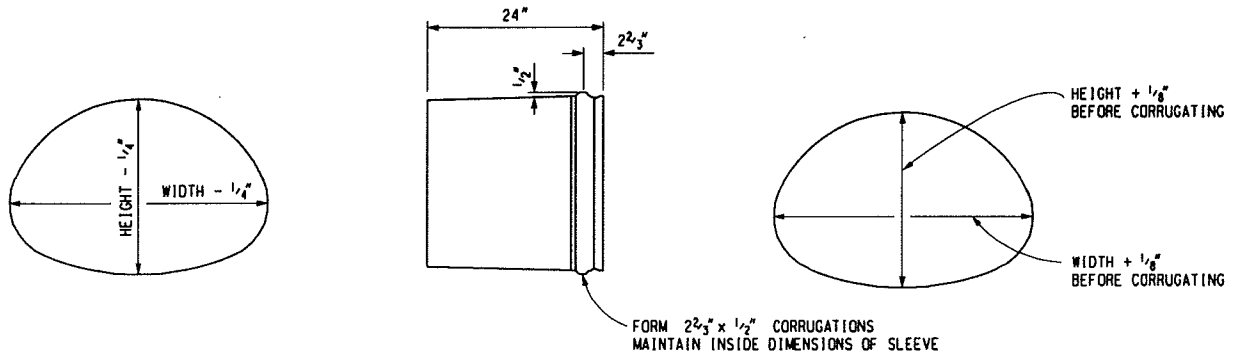
**CULVERT
SLOPED END SECTIONS
(CONCRETE AND METAL)**

11-17-2005
F.H.W.A. APPROVAL

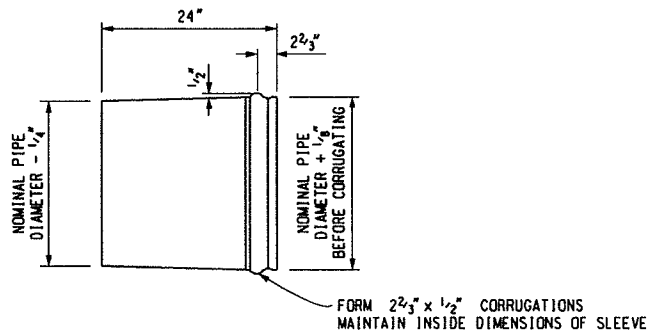
4-22-2005
PLAN DATE

R-95-F

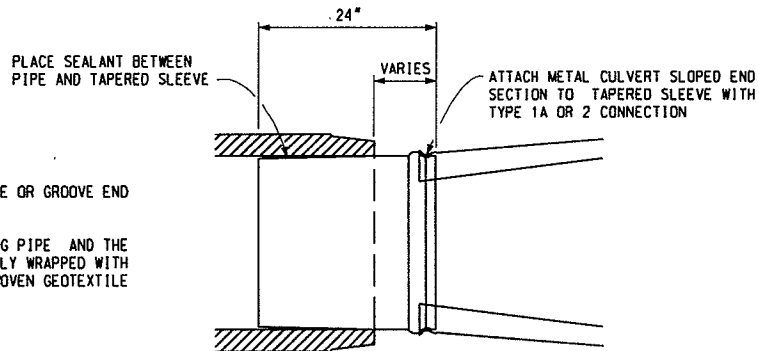
SHEET
5 OF 7



TAPERED SLEEVE FOR ELLIPTICAL PIPE
(METAL END SECTION)



TAPERED SLEEVE FOR CIRCULAR PIPE
(METAL END SECTION)



NOTE:

TAPERED SLEEVE SHALL BE MADE TO FIT TONGUE OR GROOVE END OF PIPE.

THE CONNECTION JOINT BETWEEN THE EXISTING PIPE AND THE METAL SLOPED END SECTION SHALL BE COMPLETELY WRAPPED WITH A 2'-0" WIDTH (1'-6" OVERLAP) OF NON-WOVEN GEOTEXTILE FABRIC.

**TOP VIEW OF TAPERED SLEEVE FOR
CONNECTING METAL CULVERT SLOPED END SECTION
TO CONCRETE PIPE OR CORRUGATED POLYETHYLENE PIPE**

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

**CULVERT
SLOPED END SECTIONS
(CONCRETE AND METAL)**

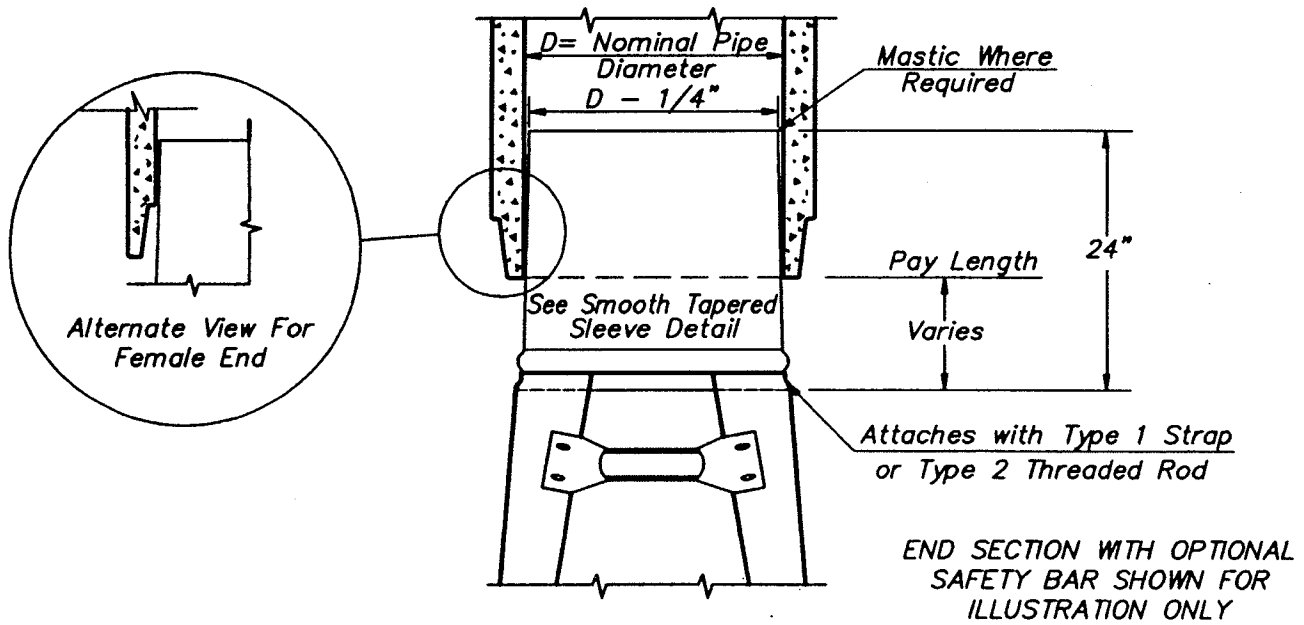
11-17-2005
F.H.W.A. APPROVAL

3-22-2005
PLAN DATE

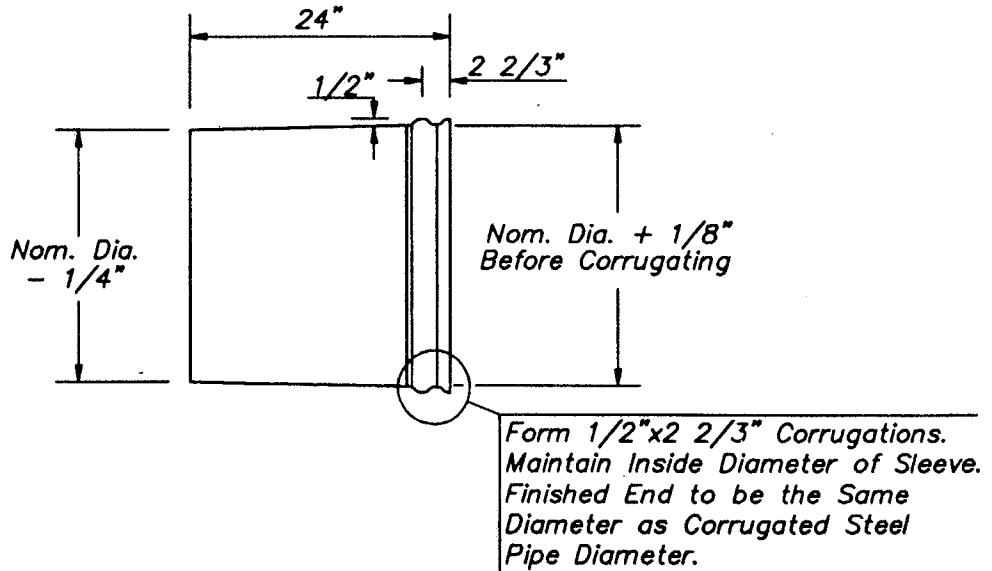
R-95-F

SHEET
3 OF 7

SMOOTH TAPERED SLEEVE



TAPERED SLEEVE FOR ATTACHING STEEL END SECTIONS TO SMOOTH PIPE



SMOOTH TAPERED SLEEVE DETAIL