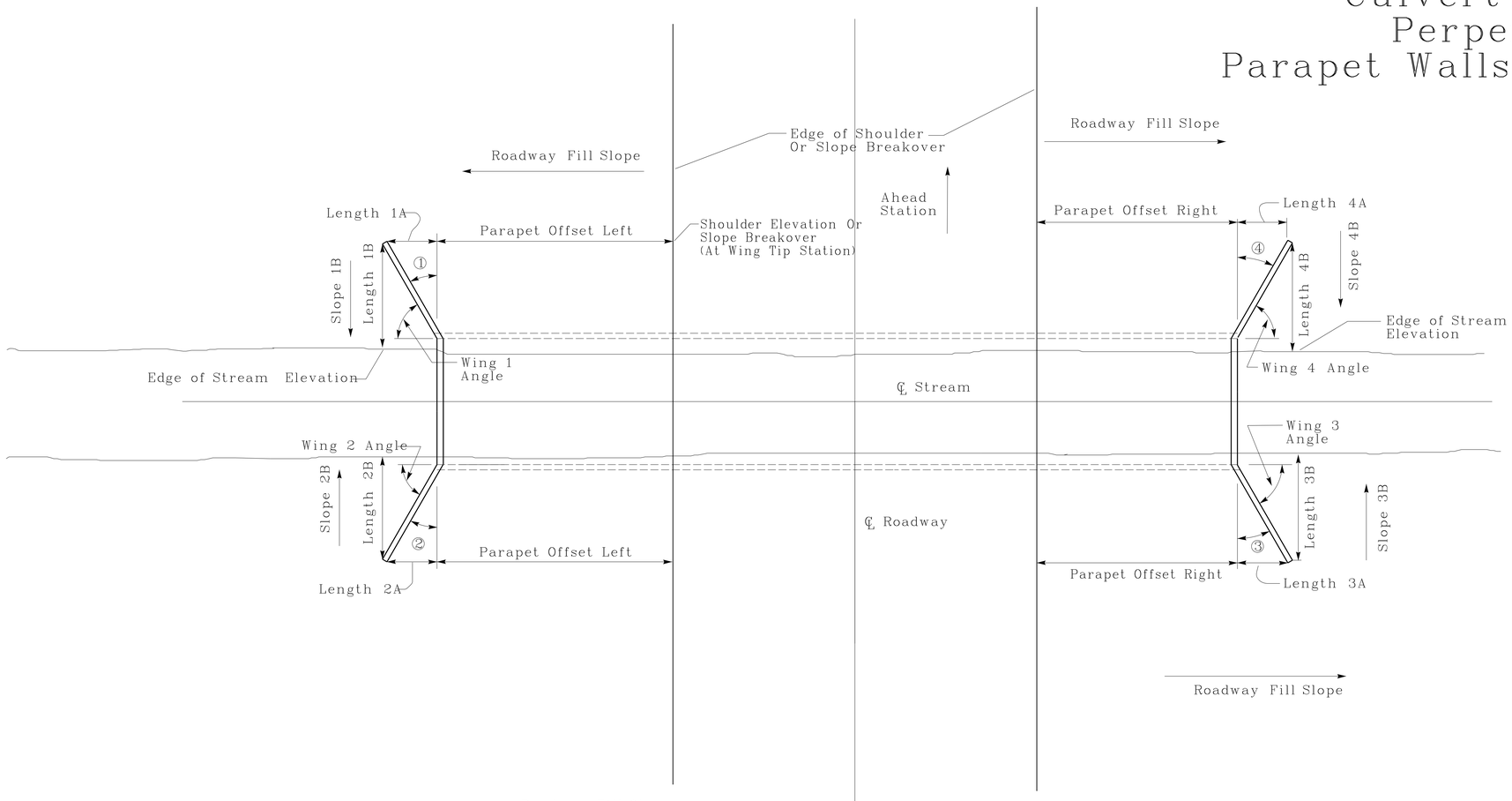
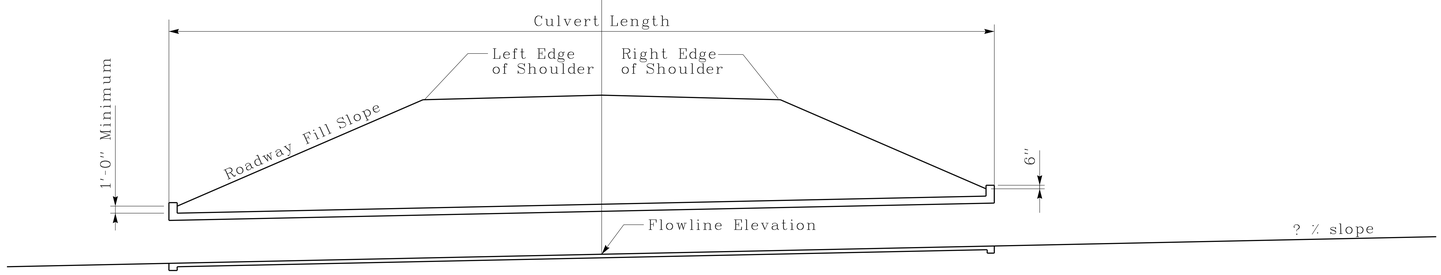
Culvert Layout Procedure
Perpendicular Culvert
Parapet Walls Perpendicular to Stream





Short 3-Sided Culverts Are Generally Level Along Thier Lenght.
However, Long 3-Sided Culverts May Have a Slope.

Generalized Culvert Layout Procedure

Asymmetrical Wing Walls are shown. However, wing walls may be symmetrical.

The length and parapet offsets will be calculated first. Generally the parapet offsets are equal. Determine the length of culvert needed such that the normal roadway slopes intersect the ends of the culvert at a minimum of 1' above the top of culvert at the centerline of the culvert.

Wing Lenghts can vary due to elevation differnences.

At each corner of the structure a wingwall layout will be needed. First, select a wing angle and make an initial guess at a wing length. Using these parameters, determine the station of the wing tip. Determine the elevation of the shoulder at this station. Calculate wing tip elevation using the shoulder elevation, Length 1, Headwall Offset and the roadway fill slope. Using the wing tip elevation, Slope 2 and Length 2, calculate an elevation for the edge of the stream. Compare this to the actual elevation of the edge of stream. Repeat this procedure using different wing lengths until the computed edge of stream elevation is less than or equal to the actual edge of stream elevation. Repeat this procedurefor the other wing walls.

Lenths 1B, 2B, 3B & 4B may need to be adjusted by actual field measurements.

Angles ① ② ③ & ④ = 90° - Wing Angle
Lenth 1A = Wing Lenght x Sin ① (Same for other wings)
Lenth 1B = Wing Length x Sin (Wing 1 Angle) (Same for other wings)
Slopes 1B, 2B, 3B & 4B are usually assumed to be 2:1

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Commonwealth of Ke
DEPARTMENT OF HIGHWAYS

COUNTY

ROUTE | CROSSING

ITEM NUMBER

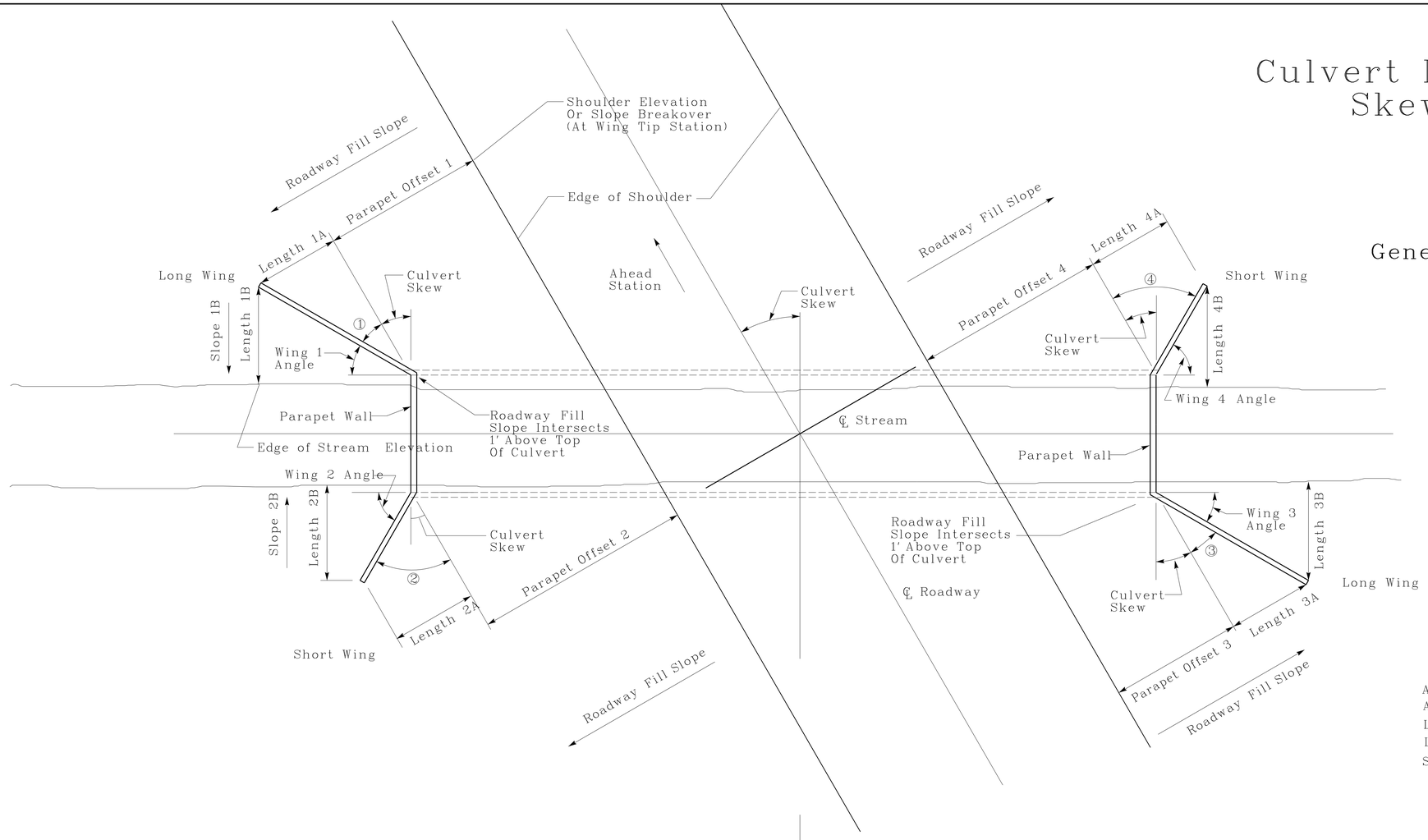
PREPARED BY
Division of Bridge Design

SHEET NO.

DRAWING NO.

SHEET LOCATION: A1A DATE: $$$$DATE$$$$ USERNAME: $$$$plottedby$$$$ FILE NAME: $$$$design$filespecification$$$$

Culvert Layout Procedure
Skewed Culverts



Generalized Culvert Layout Procedure

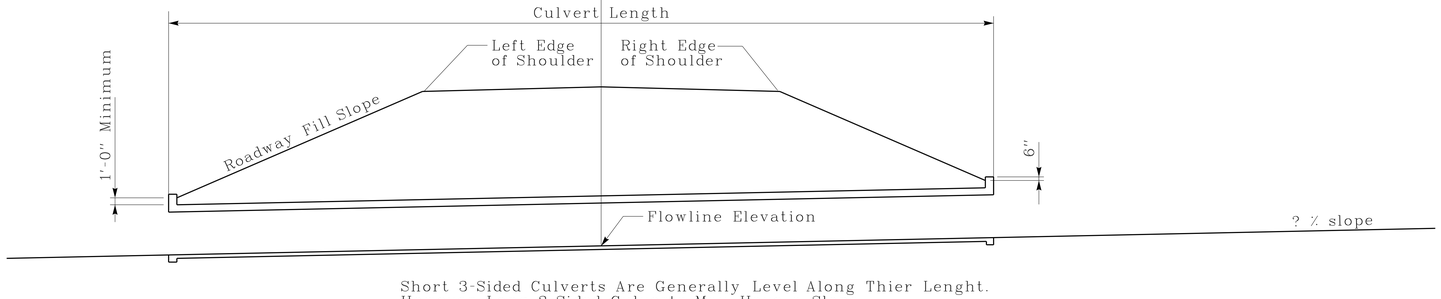
Asymmetrical Wing Walls are shown. However, wing walls may be symmetrical.

The length and parapet offsets will be calculated first. Determine the length of culvert needed such that the normal roadway slopes intersect the ends of the culvert at a minimum of 1' above the top of culvert at the controlling corner. In this drawing the controlling corners are located at Parapet Offset 1 and Parapet Offset 3. For arch shapes, assume the top of the culvert elevation at the corners is equal to the top of the culvert at the centerline.

At each corner of the structure a wing wall layout will be needed. First, select a wing angle and make an initial guess at a wing length. Using these parameters, determine the station of the wing tip. Determine the elevation of the shoulder at this station. Calculate wing tip elevation using the shoulder elevation, Length 1A, Parapet Offset 1 and the roadway fill slope. Using the wing tip elevation, Slope 1B and Length 1B, calculate an elevation for the edge of the stream. Compare this to the actual elevation of the edge of stream. Repeat this procedure using different wing lengths until the computed edge of stream elevation is less than or equal to the actual edge of stream elevation. Repeat this procedure for the other wing walls.

Lenths 1B, 2B, 3B & 4B may need to be adjusted by actual field measurements.

Angles ① & ③ = 90° - Culvert Skew - Wing Angle
Angles ② & ④ = 90° - Wing Angle + Culvert Skew
Lenth 1A = Wing Lenght x Sin ① (Same for other wings)
Lenth 1B = Wing Length x Sin [Wing 1 Angle] (Same for other wings)
Slopes 1B, 2B, 3B & 4B are usually assumed to be 2:1



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