#### 8.7.2.4 Derivation process of boundary filtering strength

Inputs to this process are:

– a luma picture sample array recPictureL,

– a luma location ( xCb, yCb ) specifying the top-left sample of the current luma coding block relative to the top-left luma sample of the current picture,

– a variable log2CbSize specifying the size of the current luma coding block,

– a variable edgeType specifying whether a vertical (EDGE\_VER) or a horizontal (EDGE\_HOR) edge is filtered,

– a two-dimensional (nCbS)x(nCbS) array edgeFlags.

Output of this process is a two-dimensional (nCbS)x(nCbS) array bS specifying the boundary filtering strength.

The variables xDi, yDj, xN, and yN are derived as follows:

* If edgeType is equal to EDGE\_VER, xDi is set equal to ( i  <<  3 ), yDj is set equal to ( j  <<  2 ), xN is set equal to ( 1  <<  ( log2CbSize − 3 ) ) − 1, and yN is set equal to ( 1  <<  ( log2CbSize − 2 ) ) − 1.
* Otherwise (edgeType is equal to EDGE\_HOR), xDi is set equal to ( i  <<  2 ), yDj is set equal to ( j  <<  3 ), xN is set equal to ( 1  <<  ( log2CbSize − 2 ) ) − 1, and yN is set equal to ( 1  <<  ( log2CbSize − 3 ) ) − 1.

For xDi with i = 0..xN and yDj with j = 0..yN, the following applies:

* If edgeFlags[ xDi ][ yDj ] is equal to 0, the variable bS[ xDi ][ yDj ] is set equal to 0.
* Otherwise (edgeFlags[ xDi ][ yDj ] is equal to 1), the following applies:
* The sample values p0 and q0 are derived as follows:
  + - If edgeType is equal to EDGE\_VER, p0 is set equal to recPictureL[ xCb + xDi − 1 ][ yCb + yDj ] and q0 is set equal to recPictureL[ xCb + xDi ][ yCb + yDj ].
    - Otherwise (edgeType is equal to EDGE\_HOR), p0 is set equal to recPictureL[ xCb + xDi ][ yCb + yDj − 1 ] and q0 is set equal to recPictureL[ xCb + xDi ][ yCb + yDj ].
* The variable bS[ xDi ][ yDj ] is derived as follows:
  + - If the sample p0 or q0 is in the luma coding block of a coding unit coded with intra block copy prediction mode, bS[ xDi ][ yDj ] is set equal to 1.
    - Otherwise, if the sample p0 or q0 is in the luma coding block of a coding unit coded with intra prediction mode, bS[ xDi ][ yDj ] is set equal to 2.
    - Otherwise, if the block edge is also a transform block edge and the sample p0 or q0 is in a luma transform block which contains one or more non-zero transform coefficient levels, bS[ xDi ][ yDj ] is set equal to 1.
    - Otherwise, if one or more of the following conditions are true, bS[ xDi ][ yDj ] is set equal to 1:
      * For the prediction of the luma prediction block containing the sample p0 different reference pictures or a different number of motion vectors are used than for the prediction of the luma prediction block containing the sample q0.

NOTE 1 – The determination of whether the reference pictures used for the two luma prediction blocks are the same or different is based only on which pictures are referenced, without regard to whether a prediction is formed using an index into reference picture list 0 or an index into reference picture list 1, and also without regard to whether the index position within a reference picture list is different.

NOTE 2 – The number of motion vectors that are used for the prediction of a luma prediction block with top-left luma sample covering ( xPb, yPb ), is equal to PredFlagL0[ xPb ][ yPb ] + PredFlagL1[ xPb ][ yPb ].

* + - * One motion vector is used to predict the luma prediction block containing the sample p0 and one motion vector is used to predict the luma prediction block containing the sample q0, and the absolute difference between the horizontal or vertical component of the motion vectors used is greater than or equal to 4 in units of quarter luma samples.
      * Two motion vectors and two different reference pictures are used to predict the luma prediction block containing the sample p0, two motion vectors for the same two reference pictures are used to predict the luma prediction block containing the sample q0, and the absolute difference between the horizontal or vertical component of the two motion vectors used in the prediction of the two luma prediction blocks for the same reference picture is greater than or equal to 4 in units of quarter luma samples.
      * Two motion vectors for the same reference picture are used to predict the luma prediction block containing the sample p0, two motion vectors for the same reference picture are used to predict the luma prediction block containing the sample q0, and both of the following conditions are true:
        + The absolute difference between the horizontal or vertical component of list 0 motion vectors used in the prediction of the two luma prediction blocks is greater than or equal to 4 in quarter luma samples, or the absolute difference between the horizontal or vertical component of the list 1 motion vectors used in the prediction of the two luma prediction blocks is greater than or equal to 4 in units of quarter luma samples.
        + The absolute difference between the horizontal or vertical component of list 0 motion vector used in the prediction of the luma prediction block containing the sample p0 and the list 1 motion vector used in the prediction of the luma prediction block containing the sample q0 is greater than or equal to 4 in units of quarter luma samples, or the absolute difference between the horizontal or vertical component of the list 1 motion vector used in the prediction of the luma prediction block containing the sample p0 and list 0 motion vector used in the prediction of the luma prediction block containing the sample q0 is greater than or equal to 4 in units of quarter luma samples.
    - Otherwise, the variable bS[ xDi ][ yDj ] is set equal to 0.