H.7.4.9.5.1 Depth mode parameter semantics

The variable Log2MaxDmmCbSize is set equal to 5.

**depth\_intra\_mode\_set\_indication\_flag** indicates the set of possible depth intra modes.

The variables depthIntraModeSet is derived as specified in the following:

* If cLog2CbSize is equal to 6, depthIntraModeSet is set equal to 0.
* Otherwise, if cLog2CbSize is equal to 3 and PartMode[ xC ][ yC ] is equal to PART\_NxN, depthIntraModeSet is set equal to 1.
* Otherwise ( (cLog2CbSize = = 3 && PartMode[ xC ][ yC ]  = =  PART\_2Nx2N) || (cLog2CbSize > 3 && cLog2CbSize < 6 ), the following applies:
  + If depth\_intra\_mode\_set\_indication\_flag is equal to 1, depthIntraModeSet is set equal to 2.
  + Otherwise ( depth\_intra\_mode\_set\_indication\_flag is equal to 0 ), depthIntraModeSet is set equal to 3.

**depth\_intra\_mode**[ x0 ][ y0 ] specifies the depth intra mode of the current prediction unit. specifies the value of the variable depthIntraModeMaxLen depending on depthIntraModeSet and the value of the variable DepthIntraMode and the associated name depending an the on depth\_intra\_mode and depthIntraModeSet.

The variable SdcFlag[ x0 ][ y0 ] is derived as specified in the following:

* 1. SdcFlag[ x0 ][ y0 ] = ( DepthIntraMode[ x0 ][ y0 ]  = =  INTRA\_DEP\_SDC\_PLANAR )  | |   (‑17)  
      ( DepthIntraMode[ x0 ][ y0 ]  = =  INTRA\_DEP\_SDC\_DMM\_WFULL )   | |

( DepthIntraMode[ x0 ][ y0 ]  = =  INTRA\_DEP\_SDC\_HOR )  | |

* 1. ( DepthIntraMode[ x0 ][ y0 ]  = =  INTRA\_DEP\_SDC\_VER)

1. Table ‑2 – Specification of DepthIntraMode and associated name depending on depthIntraModeSet and depth\_intra\_mode and specification of and depthIntraModeMaxLen depdending on depthIntraModeSet

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **depthIntraModeSet** | **0** | **1** | **2** | **3** |
|  | **depthIntraModeMaxLen** | **1** | **3** | **3** | **2** |
| **DepthIntraMode** | **Associated name** | **depth\_intra\_mode** | | | |
| 0 | INTRA\_DEP\_SDC\_PLANAR | 0 | - | 0 | - |
| 1 | INTRA\_DEP\_NONE | 1 | 0 | - | 0 |
| 2 | INTRA\_DEP\_SDC\_DMM\_WFULL | - | - | - | 1 |
| 3 | INTRA\_DEP\_DMM\_WFULL | - | 1 | 3 | - |
| 4 | INTRA\_DEP\_DMM\_CPREDTEX | - | - | - | 2 |
| 5 | INTRA\_DEP\_DMM\_WPREDTEX | - | 2 | 2 | - |
| 6 | INTRA\_DEP\_CHAIN | - | 3 | 1 | - |
| 7 | INTRA\_DEP\_SDC\_HOR | 2 | - | - | 3 |
| 8 | INTRA\_DEP\_SDC\_VER | 3 | - | - | 4 |

H.8.4.2 Derivation process for luma intra prediction mode

Inputs to this process are:

– a luma location ( xB, yB ) specifying the top-left luma sample of the current block relative to the top‑left luma sample of the current picture,

– a variable log2PbSize specifying the size of the current luma prediction block.

specifies the value for the intra prediction mode and the associated names.

Table ‑4 – Specification of intra prediction mode and associated names

|  |  |
| --- | --- |
| **Intra prediction mode** | **Associated names** |
| 0 | Intra\_Planar |
| 1 | Intra\_DC |
| 2..34 | Intra\_Angular |
| 35...40 | Intra\_DepthPartition (used only for depth) |
| Otherwise (41, 42) | Intra\_Chain (used only for depth) |

[Ed. (GT): Since the Intra\_FromLuma mode has been removed in the HEVC text spec used as base for this document, the dmm mode and intra chain numbers are here decremented by 1 compared to HTM-7.0.]

[Ed. (GT): Consider reducing number of possible IntraPredMode values by using dmm\_dc\_flag and edge\_dc\_flag explicitly. ]

IntraPredMode[ xB ][ yB ] labelled 0..34 represents directions of predictions as illustrated in Figure 8-1.

* If DepthIntraMode[ xB ][ yB ] is equal to INTRA\_DEP\_SDC\_PLANAR, IntraPredMode[ xB ][ yB ] is set equal to Intra\_Planar.
* Otherwise, if DepthIntraMode[ xB ][ yB ] is equal to INTRA\_DEP\_SDC\_HOR, IntraPredMode[ xB ][ yB ] is set equal to Intra\_Angular (10).
* Otherwise, if DepthIntraMode[ xB ][ yB ] is equal to INTRA\_DEP\_SDC\_VER, IntraPredMode[ xB ][ yB ] is set equal to Intra\_Angular (26).
* Otherwise, if DepthIntraMode[ xB ][ yB ] is equal to INTRA\_DEP\_SDC\_DMM\_WFULL, IntraPredMode[ xB ][ yB ] is set equal to Intra\_DepthPartition( 35 ).
* Otherwise, if DepthIntraMode[ xB ][ yB ] is equal to INTRA\_DEP\_DMM\_WFULL, IntraPredMode[ xB ][ yB ] is set equal to Intra\_DepthPartition( 35 + dmm\_dc\_flag[ xB ][ yB ] ) .
* Otherwise, if DepthIntraMode[ xB ][ yB ] is equal to INTRA\_DEP\_DMM\_WPREDTEX, IntraPredMode[ xB ][ yB ] is set equal to Intra\_DepthPartition( 37 + dmm\_dc\_flag[ xB ][ yB ] ) .
* Otherwise if DepthIntraMode[ xB ][ yB ] is equal to INTRA\_DEP\_DMM\_CPREDTEX, IntraPredMode[ xB ][ yB ] is set equal to Intra\_DepthPartition( 39 + dmm\_dc\_flag[ xB ][ yB ] ) .
* Otherwise if DepthIntraMode[ xB ][ yB ] is equal to INTRA\_DEP\_CHAIN, IntraPredMode[ xB ][ yB ] is set equal to Intra\_Chain( 41 + edge\_dc\_flag[ xB ][ yB ] ).
* Otherwise ( DepthIntraMode[ xB ][ yB ] is equal to INTRA\_DEP\_NONE ), IntraPredMode[ xB ][ yB ] is derived as the following ordered steps.
  1. The neighbouring locations ( xBA, yBA ) and ( xBB, yBB ) are set equal to ( xB−1, yB ) and ( xB, yB−1 ), respectively.
  2. For N being either replaced A or B, the variables candIntraPredModeN are derived as follows.
     + The availability derivation process for a block in z-scan order as specified in subclause 6.4.1 is invoked with the location ( xCurr, yCurr ) set equal to ( xB, yB ) and the neighbouring location ( xN, yN ) set equal to ( xBN, yBN ) as the input and the output is assigned to availableN.
     + The candidate intra prediction mode candIntraPredModeN is derived as follows.
       - If availableN is equal to FALSE, candIntraPredModeN is set equal to Intra\_DC.
       - Otherwise, if PredMode[ xBN ][ yBN ] is not equal to MODE\_INTRA, candIntraPredModeN is set equal to Intra\_DC,
       - Otherwise, if N is equal to B and yB − 1 is less than (( yB >> Log2CtbSizeY ) << Log2CtbSizeY), intraPredModeB is set equal to Intra\_DC.
       - Otherwise, if candIntraPredModeN is larger than 34, candIntraPredModeN is set equal to Intra\_DC.
       - Otherwise, candIntraPredModeN is set equal to IntraPredMode[ xBN ][ yBN ].

H.8.4.4.3 Depth value reconstruction process

Inputs to this process are:

* a luma location ( xB, yB ) specifying the top-left luma sample of the current block relative to the top-left luma sample of the current picture,
* a variable nT specifying the prediction size
* predicted samples predSamples[ x ][ y ], with x, y =0..nT−1
* a variable intraPredMode specifying the prediction mode of the current prediction block

Output of this process is:

* reconstructed depth value samples resSamples[ x ][ y ], with x, y = −1..2\*nT−1.

Depending on intraPredMode the array wedgePattern[ x ][ y ] with x, y =0..nT−1 specifying the binary segmentation pattern is derived as follows.

* If intraPredMode is equal to Intra\_DepthPartition( 35 ), the following applies.
  + 1. wedgePattern = WedgePatternTable[ Log2( nT) ][ wedge\_full\_tab\_idx[ xB ][ yB ] ]
* Otherwise ( intraPredMode is not equal to Intra\_DepthPartition( 35 ) ), the following applies.
  + For x, y = 0..nT − 1 wedgePattern[ x ][ y ] is set equal to 0.

Depending on dlt\_flag[ nuh\_layer\_id ] the reconstructed depth value samples resSamples[ x ][ y ] are derived as specified in the following:

* If dlt\_flag[ nuh\_layer\_id ] is equal to 0, the following applies:
  + For x, y = 0..nT − 1, the reconstructed depth value samples resSamples[ x ][ y ] are derived as specified in the following:
    - 1. resSamples[ x ][ y ] = predSamples[ x ][ y ] + SdcResidual[ xB ][ yB ][wedgePattern[ x ][ y ] ] (H‑54)
* Otherwise ( dlt\_flag[ nuh\_layer\_id ] is equal to 1 ), the following applies:
  + The variables dcPred[ 0 ] and dcPred[ 1 ] are derived as specified in the following:
    - If intraPredMode is equal to Intra\_DC, the following applies:
      * 1. dcPred[ 0 ] = predSamples[ nT − 1 ][ nT − 1 ] (H‑55)
    - Otherwise, if intraPredMode is equal to Intra\_Planar, the following applies:
      * 1. dcPred[ 0 ] = ( predSamples[ 0 ][ 0 ] + predSamples[ 0 ][ nT − 1 ] + predSamples[ nT − 1 ][ 0 ]  
            + predSamples[ nT − 1 ][ nT − 1 ] + 2 ) >> 2 (H‑56)
    - Otherwise, if intraPredMode is equal to Intra\_Angular (10), the following applies:
      * 1. dcPred[ 0 ] = ( predSamples[ 0 ][ 0 ] + predSamples[ 0 ][ nT − 1 ] + 1 ) >> 1 (‑56)
    - Otherwise, if intraPredMode is equal to Intra\_Angular (26), the following applies:
      * 1. dcPred[ 0 ] = ( predSamples[ 0 ][ 0 ] + predSamples[ nT − 1 ][ 0 ] + 1 ) >> 1 (‑56)
    - Otherwise, ( intraPredMode is equal to Intra\_DepthPartition( 35 ) ), the following applies.
      * 1. dcPred[ wedgePattern[ 0 ][ 0 ] ] = predSamples[ 0 ][ 0 ] (H‑57)
        2. dcPred[ wedgePattern[ nT − 1 ][ 0 ] ] = predSamples[ nT − 1 ][ 0 ] (H‑58)
        3. dcPred[ wedgePattern[ 0 ][ nT − 1 ] ] = predSamples[ 0 ][ nT − 1 ] (H‑59)
        4. dcPred[ wedgePattern[ nT − 1 ][ nT − 1 ] ] = predSamples[ nT − 1 ][ nT − 1 ] (H‑60)
  + For x, y = 0..nT − 1, the reconstructed depth value samples resSamples[ x ][ y ] are derived as specified in the following:

dltIdxPred = DepthValue2Idx[ dcPred[ wedgePattern[ x ][ y ] ] ] (H‑61)  
dltIdxResi = SdcResidual[ xB ][ yB ][wedgePattern[ x ][ y ] ] (H‑62)  
resSamples[ x ][ y ] = predSamples[ x ][ y ] + Idx2DepthValue[ dltIdxPred + dltIdxResi ]  −   
 dcPred[ wedgePattern[ x ][ y ] ] (H‑63)