# Draft Text Specification

The proposed text changes are based on the document JCTVC-L1005-v4-JCTVC-L1003\_v34.doc. The changes are marked in yellow.

**7.3.8.11 Residual coding syntax**

|  |  |
| --- | --- |
| residual\_coding( x0, y0, log2TrafoSize, cIdx ) { | **Descriptor** |
| … |  |
| for( n = 15; n >= 0; n− − ) { |  |
| xC = ( xS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 0 ] |  |
| yC = ( yS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 1 ] |  |
| if( sig\_coeff\_flag[ xC ][ yC ] ) { |  |
| if( numGreater1Flag < 8 ) { |  |
| **coeff\_abs\_level\_greater1\_flag**[ n ] | ae(v) |
| numGreater1Flag++ |  |
| if( coeff\_abs\_level\_greater1\_flag[ n ] && lastGreater1ScanPos = = −1 ) |  |
| lastGreater1ScanPos = n |  |
| } |  |
| if( lastSigScanPos = = −1 ) |  |
| lastSigScanPos = n |  |
| firstSigScanPos = n |  |
| } |  |
| } |  |
| signHidden = ( lastSigScanPos − firstSigScanPos > 3 && !cu\_transquant\_bypass\_flag ) |  |
| if (cu\_transform\_skip\_flag && CuPredMode[ x0 ][ y0 ] == MODE\_INTRA && ( (22 <= predModeIntra <= 30 ) || (6 <= predModeIntra <= 14 ) ) ) |  |
| signHidden = 0 |  |
| if( lastGreater1ScanPos != −1 ) |  |
| … |  |

## 8.6.2 Scaling and transformation process

Inputs to this process are:

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

– a variable trafoDepth specifying the hierarchy depth of the current block relative to the coding block,

– a variable cIdx specifying the colour component of the current block,

– a variable nTbS specifying the size of the current transform block.

Output of this process is the (nTbS)x(nTbS) array of residual samples r with elements r[ x ][ y ].

The quantization parameter qP is derived as follows:

– If cIdx is equal to 0,

qP = Qp′Y (8‑264)

– Otherwise, if cIdx is equal to 1,

qP = Qp′Cb (8‑265)

– Otherwise (cIdx is equal to 2),

qP = Qp′Cr (8‑266)

The (nTbS)x(nTbS) array of residual samples r is derived as follows:

* If cu\_transquant\_bypass\_flag is equal to 1, the (nTbS)x(nTbS) array r is set equal to the (nTbS)x(nTbS) array of transform coefficients TransCoeffLevel[ xTbY ][ yTbY ][ cIdx ].
* Otherwise, if transform\_skip\_flag[ xTbY ][ yTbY ][ cIdx ] is equal to 1 and CuPredMode[ xTbY ][ yTbY ] is equal to MODE\_INTRA and predModeIntra (predModeIntra is set equal to IntraPredModeY[ xTbY ][ yTbY ] if cIdx is equal to 0, otherwise, predModeIntra is set equal to IntraPredModeC) is in the range 22 to 30, inclusive, or in the range 6 to 14, inclusive, the following ordered steps apply:
* The (nTbS)x(nTbS) array r is set equal to the (nTbS)x(nTbS) array of transform coefficients TransCoeffLevel[ xTbY ][ yTbY ][ cIdx ].
* The intra residual transform-bypass decoding process as specified in subclause 8.6.6 is invoked with the size of the transform block nTbS, the intra prediction mode predModeIntra, and the (nTbS)x(nTbS) array r as the inputs, and the output is a modified version of the (nTbS)x(nTbS) array r.
* Otherwise, the following ordered steps apply:

1. The scaling process for transform coefficients as specified in subclause 8.6.3 is invoked with the transform block location ( xTbY, yTbY ), the size of the transform block nTbS, the colour component variable cIdx, and the quantization parameter qP as inputs, and the output is an (nTbS)x(nTbS) array of scaled transform coefficients d.
2. The (nTbS)x(nTbS) array of residual samples r is derived as follows:

* If transform\_skip\_flag[ xTbY ][ yTbY ][ cIdx ] is equal to 1, the residual sample array values r[ x ][ y ] with x = 0..nTbS − 1, y = 0..nTbS − 1 are derived as follows:

r[ x ][ y ] = ( d[ x ][ y ]  <<  7 ) (8‑267)

* Otherwise (transform\_skip\_flag[ xTbY ][ yTbY ][ cIdx ] is equal to 0), the transformation process for scaled transform coefficients as specified in subclause 8.6.4 is invoked with the transform block location ( xTbY, yTbY ), the size of the transform block nTbS, the colour component variable cIdx, and the (nTbS)x(nTbS) array of scaled transform coefficients d as inputs, and the output is an (nTbS)x(nTbS) array of residual samples r.

1. The variable bdShift is derived as follows:

bdShift = ( cIdx = = 0 ) ? 20 − BitDepthY : 20 − BitDepthC (8‑268)

1. The residual sample values r[ x ][ y ] with x = 0..nTbS − 1, y = 0..nTbS − 1 are modified as follows:

r[ x ][ y ] = ( r[ x ][ y ] + ( 1  <<  ( bdShift − 1 ) ) ) >> bdShift (8‑269)

**8.6.6 Intra residual transform-bypass decoding process**

This process is invoked when cu\_transquant\_bypass\_flag is equal to 1, pred\_mode\_flag is equal to 1, and the applicable intra prediction mode is in the range 22 to 30, inclusive, or in the range 6 to 14, inclusive. The process for the Cb and Cr components is applied in the same way as for the luma component.

Inputs to this process are:

* a variable nT specifying the transform block size
* a variable predModeIntra specifying the intra prediction mode
* an (nT)x(nT) array r with elements r[ x ][ y ] which is either an array relating to a residual transform-bypass block of the luma component or an array relating to a residual transform-bypass block of the Cb and Cr component.

Output of this process is a modified version of the (nT)x(nT) array r with elements r[ x ][ y ] containing the result of the intra residual transform-bypass decoding process.

Let f be a temporary (nT)x(nT) array with element f[ x ][ y ], which are derived by;

f[ x ][ y ] = r[ x ][ y ] with x=0..nT-1 and y=0..nT-1

Depending on predModeIntra, the following applies:

* If predModeIntra is in the range 22 to 30, inclusive, the modified array r is derived by:

 with x=0..nT-1 and y=0..nT-1

Otherwise (predModeIntra is in the range 6 to 14, inclusive), the modified array r is derived by:

 with x=0..nT-1 and y=0..nT-1