

# **Attachment 3-1**

## **WiMAX Forum™ Mobile System Profile**

**Release 1.0 v1.40**

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# **WiMAX Forum™ Mobile System Profile**

## **Release 1.0 Approved Specification**

### **(Revision 1.4.0: 2007-05-02)**

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## Revision History

**Table 1. Change Control Revision History**

| Version | Date       | Comment                            |
|---------|------------|------------------------------------|
| 1.4.0   | 2007-05-02 | Applied CRs SYP-0001 and SYP-0002. |

## **Abstract**

*This document is prepared by the Technical Working Group (TWG) to provide the descriptions of the OFDMA based system profiles of Mobile WiMAX.*

## **1. Scope**

The main objective of this document is to provide OFDMA System Profile specification of mobile network, complementary to 802.16-2004 as amended by 802.16e-2005 standard, primarily for the purpose of certification of conformant Subscriber Stations and Base Stations.

## 2. References

- [1] **IEEE Standard 802.16-2004**, IEEE Standard for Local and Metropolitan Area Networks - Part 16: Air Interface for Fixed Wireless Access Systems.
- [2] **IEEE Standard 802.16e-2005**, Amendment to IEEE Standard for Local and Metropolitan Area Networks - Part 16: Air Interface for Fixed Broadband Wireless Access Systems- Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands
- [3] **WiMAX Forum™ Mobile Certification Profile**, WiMAX, Certification Working Group, April 2006
- [4] **IEEE 802.16-2004/Cor2 Ballot Commentary 80216-06\_066r2.cmt**, IEEE 802.16 Working Group, November 2006

## 3. Definitions

For the purposes of the present document, the following terms and definitions apply:

### 3.1 Abbreviations

### 3.2 Definitions of system profiles

Profile definitions of different devices/usage models and releases are provided in this subsection.

### 3.3 Conventions

#### 3.3.1 Item column

The Item column contains a number that identifies each description in the table.

#### 3.3.2 Description column

The description column describes in free text each respective item (e.g., parameters, timers, etc.).

#### 3.3.3 Reference column

The reference column indicates the section of [1] and [2] from which the requirement for the item is derived.

#### 3.3.4 Status column

The following notations are used in the status column to indicate whether each item is mandatory or optional in IEEE standard based on 802.16-2004 [1] as amended by 802.16e-2005 [2].

**Table 2. Status Column Entries**

|            |   |
|------------|---|
| <b>m</b>   | Explicitly shown as mandatory in the standard. It is required to implement  |
| <b>pm</b>  | Potentially mandatory, required for the system to perform basic operations (Not explicitly shown as mandatory in the standard). It is required to implement.  |
| <b>o</b>   | Explicitly mentioned as optional in the standard or is not explicitly mentioned but has capability negotiations. It may or may not be implemented.  |
| <b>oi</b>  | Qualified option – for mutually exclusive or selectable options from a set. One or more of the options from the set shall be supported.   |
| <b>po</b>  | Potentially optional. Not explicitly mentioned as mandatory, but from the standard we may conclude it is, though not really required for the system to perform basic operations. We have to decide whether it should be defined as optional |
| <b>n/a</b> | Not applicable – in the given context, it is impossible to use the capability.  |

### 3.3.5 BS/MS Required column

The Required column indicates whether the item is required for every BS/MS to implement for WiMAX certification purposes.

**Table 3. Required Column Entries**

|                |  |
|----------------|--|
| <b>Y or y.</b> | Required to implement  |
| <b>N or n</b>  | Not required to implement.   |
| <b>IO-NNNN</b> | Inter-operable Options: Item belongs to NNNN group of features for which it is requested to provide testing procedure and distinct labeling of BS equipment. More specifically <ul style="list-style-type: none"><li>▪ The item is not required to get general “WiMAX certified” label and</li><li>▪ Is required to get distinct “WiMAX certified with NNNN capability” label.</li></ul> |
| <b>n/a</b>     | Not applicable   |

The following Inter-operable Options are defined and used in this document.

1. IO-MIMO: Group of Inter-operable Option features related to Multiple Input Multiple Output (MIMO) operation.
2. IO-BF: Group of Inter-operable Option features related to Beam Forming (BF) operation.
3. IO-MBS: Group of Inter-operable Option features related to Multicast and Broadcast Services (MBS) operation.
4. IO-ETHx (x = 1, 2, 3): Groups of Inter-operable Option features related to Ethernet CS

### 3.3.6 BS/MS Values column

This column indicates the specific value or range of values for each BS/MS to implement for WiMAX certification purposes.

**Table 4. Value Column Entries**

|                |                      |
|----------------|----------------------|
| <b>xx</b>      | Set to value xx      |
| <b>aa - bb</b> | Set to range aa - bb |
| <b>n/a</b>     | Not applicable       |

### 3.3.7 Comment column

This column provides additional clarification and reasoning for each item.



## 4. PHY Profile

### 4.1 Profiles of BS and MS

#### 4.1.1 System Parameters

##### 4.1.1.1 PHY Mode

**Table 5. PHY Mode**

| Item | Description | Reference | Status | BS Required | MS Required | Comment   |
|------|-------------|-----------|--------|-------------|-------------|---|
| 1    | OFDMA       | 8.4       | m      | Y           | Y           | OFDMA is the sole PHY mode within the scope of this document. |

##### 4.1.1.2 Band Class Index

System profile requirements of this document are applied to the following band class indices. Each index shall specify one frequency range and one or more combinations of channel bandwidth, FFT size, channel raster and duplexing mode.

BS support for a particular band class requires support of a frequency range that is a subset of the complete frequency range defined by the band-class. The BS vendor shall provide a declaration of the supported frequency range. The supported frequency range shall be a minimum of three (3) times the largest supported channel bandwidth. MS must support the entire range of frequency defined by a band class (or sub-bands) while the BS is required to support only sub-range of the band class declared by vendor.

**Table 6. Band Class Index**

| Band Class Index | Frequency Range (GHz)    | Channel Frequency Step (kHz)   | Channel Bandwidth(s) (MHz) | FFT Size | Duplexing Mode | Comments                                    |
|------------------|--------------------------|--------------------------------|----------------------------|----------|----------------|---|
| 1                | 2.3-2.4                  | 250                            | 5                          | 512      | TDD            | Both bandwidths must be supported by the MS |
|                  |                          |                                | 10                         | 1024     | TDD            |   |
|                  |                          |                                | 8.75                       | 1024     | TDD            |   |
| 2                | 2.305-2.320, 2.345-2.360 | 250                            | 3.5                        | 512      | TDD            |   |
|                  |                          |                                | 5                          | 512      | TDD            |   |
|                  |                          |                                | 10                         | 1024     | TDD            |   |
| 3                | 2.496-2.69               | 250 (200 KHz step size is also | 5                          | 512      | TDD            | Both bandwidths must be supported           |
|                  |                          |                                | 10                         | 1024     | TDD            |   |

|   |         |   |    |      |     |              |
|---|---------|---|----|------|-----|--------------|
|   |         | recommended for<br>band class 3 in<br>Europe) |    |      |     | to by the MS |
| 4 | 3.3-3.4 | 250   | 5  | 512  | TDD |              |
|   |         |   | 7  | 1024 | TDD |              |
|   |         |   | 10 | 1024 | TDD |              |
| 5 | 3.4-3.8 | 250   | 5  | 512  | TDD |              |
|   |         |   | 7  | 1024 | TDD |              |
|   |         |   | 10 | 1024 | TDD |              |
|   | 3.4-3.6 | 250   | 5  | 512  | TDD |              |
|   |         |   | 7  | 1024 | TDD |              |
|   |         |   | 10 | 1024 | TDD |              |
|   | 3.6-3.8 | 250   | 5  | 512  | TDD |              |
|   |         |   | 7  | 1024 | TDD |              |
|   |         |   | 10 | 1024 | TDD |              |

#### 4.1.1.3 Sampling Factor

**Table 7. Sampling Factor**

| Item | Description  | Reference | Status | BS Required | MS Required | Comment |
|------|--|-----------|--------|-------------|-------------|---------|
| 1    | If channel bandwidth is a multiple of 1.75MHz then n=8/7 else if channel bandwidth is a multiple of any of 1.25, 1.5, 2 or 2.75 MHz then n=28/25 else if not otherwise specified then n=8/7. | 8.4.2.3   | m      | Y           | Y           |         |

#### 4.1.1.4 Cyclic Prefix

**Table 8. Cyclic Prefix**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
| 1    | 1/4         | 8.4.2.3   | oi     | N           | N           |         |
| 2    | 1/8         | 8.4.2.3   | oi     | Y           | Y           |         |
| 3    | 1/16        | 8.4.2.3   | oi     | N           | N           |         |
| 4    | 1/32        | 8.4.2.3   | oi     | N           | N           |         |

#### 4.1.1.5 Frame Length

**Table 9. Frame Length**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
| 1    | 20 ms       | 8.4.5.2   | oi     | N           | N           |         |
| 2    | 12.5        | 8.4.5.2   | oi     | N           | N           |         |
| 3    | 10          | 8.4.5.2   | oi     | N           | N           |         |

|   |     |         |    |   |   |  |
|---|-----|---------|----|---|---|--|
| 4 | 8   | 8.4.5.2 | oi | N | N |  |
| 5 | 5   | 8.4.5.2 | oi | Y | Y |  |
| 6 | 4   | 8.4.5.2 | oi | N | N |  |
| 7 | 2.5 | 8.4.5.2 | oi | N | N |  |
| 8 | 2   | 8.4.5.2 | oi | N | N |  |

#### 4.1.1.6 TTG/RTG

This parameter shall be applicable only to TDD mode.

**Table 10. TTG/RTG**

| Item | Description | Reference | Status | BS Required | BS Values   | MS Required | Comment   |
|------|-------------|-----------|--------|-------------|---|-------------|---|
| 1    | TTG         | 8.4.5.2   | m      | Y           | 296 PS for 10 MHz, 218 PS for 8.75 MHz, 376 PS for 7 MHz, 148 PS for 5 MHz and 188 PS for 3.5 MHz | n/a         | 5 us minimum specified in the referred section. The requirement is equivalent to "5 msec - (RTG+ Number of OFDM symols x symbol duration)" where "Number of OFDM symols" = 47 for 10 and 5 MHz, 42 for 8.75 MHz and 33 for 7 MHz. |
| 2    | RTG         | 8.4.5.2   | m      | Y           | 168 PS for 10 MHz, 186 PS for 8.75 MHz, 120 PS for 7 MHz, 84 PS for 5 MHz and 60 PS for 3.5 MHz   | n/a         | 5 us minimum specified in the referred section. The requirement is equivalent to 60 us for 5, 10 and 7 MHz BW and 74.4 us for 8.75 MHz BW.  |

#### 4.1.1.7 Number of OFDM Symbols in DL and UL

This feature shall be applicable to TDD operation only and specifies number of OFDM symbols in DL and UL subframes.

**Table 11. Number of OFDM Symbols in DL and UL**

| Item | Description | Reference | Status | BS Required | BS Values | MS Required | MS Values | Comment |
|------|-------------|-----------|--------|-------------|-----------|-------------|-----------|---------|
|------|-------------|-----------|--------|-------------|-----------|-------------|-----------|---------|

| Item | Description  | Reference | Status | BS Required | BS Values   | MS Required | MS Values             | Comment |
|------|--|-----------|--------|-------------|---|-------------|-----------------------|---------|
| 1    | Number of OFDM Symbols in DL and UL for 5 and 10 MHz BW  | 8.4.4.2   | oi     | Y           | (35, 12),<br>(34, 13),<br>(33, 14),<br>(32, 15),<br>(31, 16),<br>(30, 17),<br>(29, 18),<br>(28, 19),<br>(27, 20),<br>(26, 21) | Y           | The same as BS values |         |
| 2    | Number of OFDM Symbols in DL and UL for 8.75 MHz BW      | 8.4.4.2   | oi     | Y           | (30, 12),<br>(29, 13),<br>(28, 14),<br>(27, 15),<br>(26, 16),<br>(25, 17),<br>(24, 18)  | Y           | The same as BS values |         |
| 3    | Number of OFDM Symbols in DL and UL for 7 and 3.5 MHz BW | 8.4.4.2   | oi     | Y           | (24, 09),<br>(23, 10),<br>(22, 11),<br>(21, 12),<br>(20, 13),<br>(19, 14),<br>(18, 15)  | Y           | The same as BS values |         |

## 4.1.2 Subcarrier Allocation

### 4.1.2.1 DL Subcarrier Allocation

**Table 12. DL Subcarrier Allocation**

| Item | Description                | Reference                 | Status | BS Required | MS Required | Comment        |
|------|----------------------------|---------------------------|--------|-------------|-------------|----------------|
| 1    | PUSC                       | 8.4.6.1.2.1               | m      | Y           | Y           |                |
| 2    | PUSC w/ all subchannels    | 8.4.6.1.2.1               | po     | Y           | Y           |                |
| 3    | PUSC w/ dedicated pilots   | 8.4.6.1.2.1 and 8.4.5.3.4 | po     | IO-BF       | Y           | Also refer [4] |
| 4    | FUSC                       | 8.4.6.1.2.2               | po     | Y           | Y           |                |
| 5    | FUSC w/ dedicated pilots   | 8.4.6.1.2.2 and 8.4.5.3.4 | po     | N           | N           |                |
| 6    | Optional FUSC              | 8.4.6.1.2.3               | o      | N           | N           |                |
| 7    | O-FUSC w/ dedicated pilots | 8.4.6.1.2.3 and 8.4.5.3.4 | o      | N           | N           |                |
| 8    | AMC 1x6                    | 8.4.6.3                   | o      | N           | N           |                |

|    |                             |                          |   |       |   |                               |
|----|-----------------------------|--------------------------|---|-------|---|-------------------------------|
|    | AMC 2x3                     | 8.4.6.3                  | o | Y     | Y |                               |
|    | AMC 3x2                     | 8.4.6.3                  | o | N     | N |                               |
|    | Default Type                | 8.4.6.3 and 6.3.2.3.43.2 | o | N     | N | Only applicable with HARQ_MAP |
| 9  | AMC 1x6 w/ dedicated pilots | 8.4.6.3 and 8.4.5.3.4    | o | N     | N |                               |
|    | AMC 2x3 w/ dedicated pilots | 8.4.6.3 and 8.4.5.3.4    | o | IO-BF | Y | Also refer [4]                |
|    | AMC 3x2 w/ dedicated pilots | 8.4.6.3 and 8.4.5.3.4    | o | N     | N |                               |
| 10 | PUSC-ASCA                   | 8.4.6.4.1                | o | N     | N |                               |

#### 4.1.2.2 UL Subcarrier Allocation

Table 13. UL Subcarrier Allocation

| Item | Description                  | Reference | Status | BS Required | MS Required | Comment                |
|------|------------------------------|-----------|--------|-------------|-------------|------------------------|
| 1.   | PUSC                         | 8.4.6.2.1 | po     | Y           | Y           |                        |
| 2.   | PUSC w/o subchannel rotation | 11.3.1    | o      | IO-BF       | Y           | Also refer [4]         |
| 3.   | Optional PUSC                | 8.4.6.2.5 | o      | N           | N           |                        |
| 4.   | AMC 1x6                      | 8.4.6.3   | o      | N           | N           |                        |
|      | AMC 2x3                      | 8.4.6.3   | o      | Y           | Y           | Also refer [4]         |
|      | AMC 3x2                      | 8.4.6.3   | o      | N           | N           |                        |
| 5.   | Mini-subchannel              | 8.4.6.2.4 | o      | N           | N           | Only for PUSC & O-PUSC |

#### 4.1.2.3 Common SYNC Symbol

Table 14. Common SYNC Symbol

| Item | Description                       | Reference   | Status | BS Required | MS Required | Comment |
|------|-----------------------------------|-------------|--------|-------------|-------------|---------|
| 1    | Support of the Common SYNC Symbol | 8.4.6.1.1.1 | o      | N           | N           |         |

#### 4.1.2.4 UL Sounding

Table 15. UL Sounding 1

| Item | Description   | Reference   | Status | BS Required | MS Required | Comment |
|------|---|-------------|--------|-------------|-------------|---------|
| 1    | Type A w/ Cyclic shift - support for P values other than 9 and 18 | 8.4.6.2.7.1 | o      | IO-BF       | Y           |         |

| Item | Description   | Reference                   | Status | BS Required | MS Required | Comment |
|------|---|-----------------------------|--------|-------------|-------------|---------|
| 2    | Type A w/ Cyclic shift – Support P values of 9 and 18                                     | 8.4.6.2.7.1                 | o      | IO-BF       | Y           |         |
| 3    | Type A w/ Decimation  | 8.4.6.2.7.1                 | o      | IO-BF       | Y           |         |
| 4    | Type B  | 8.4.6.2.7.1                 | o      | N           | N           |         |
| 5    | Send Sounding Report Flag   | 8.4.6.2.7.1                 | o      | N           | N           |         |
| 6    | Direct transmission of DL channel coefficients (Include additional feedback, option 0b01) | 8.4.6.2.7.1 and 8.4.6.2.7.3 | o      | N           | N           |         |
| 7    | Decimation with randomization   | 8.4.6.2.7.1                 | o      | N           | N           |         |
| 8    | Power Assignment Method: Equal Power (0b00)   | 8.4.6.2.7.1 and 8.4.6.2.7.  | oi     | IO-BF       | Y           |         |
| 9    | Power Assignment Method: Interference dependent. Per subcarrier power limit; (0b10)       | 8.4.6.2.7.1 and 8.4.6.2.7.2 | oi     | N           | N           |         |
| 10   | Power Assignment Method: Interference dependent. Total power limit.; (0b11)               | 8.4.6.2.7.1 and 8.4.6.2.7.2 | oi     | N           | N           |         |
| 11   | Power Boost   | 8.4.6.2.7.1 and 8.4.6.2.7.2 | o      | N           | N           |         |
| 12   | Feedback of Received Pilot Coefficients (include additional feedback option = 0b10)       | 8.4.6.2.7.1 and 8.4.6.2.7.4 | o      | N           | N           |         |
| 13   | Feedback of message (include additional feedback option = 0b11)                           | 8.4.6.2.7.1                 | o      | N           | N           |         |

1

2

**Table 16. UL Sounding 2**

| Item | Description                         | Reference                   | Status | MS Required | MS Value   | Comment  |
|------|-------------------------------------|-----------------------------|--------|-------------|------------|--|
| 1    | Sounding response time capability   | 8.4.6.2.7.1 and 11.8.3.7.14 | o      | Y           | Next Frame |  |
| 2    | max number of simultaneous sounding | 8.4.6.2.7.1 and 11.8.3.7.14 | o      | Y           | 2          | This parameter specifies the max number of sounding transmutations |

|  |              |  |  |  |  |                   |
|--|--------------|--|--|--|--|-------------------|
|  | instructions |  |  |  |  | by MS in a frame. |
|--|--------------|--|--|--|--|-------------------|

### 4.1.3 UL Control Channels

#### 4.1.3.1 Initial Ranging

**Table 17. Initial Ranging**

| Item | Description  | Reference | Status | BS Required | MS Required | Comment |
|------|--|-----------|--------|-------------|-------------|---------|
| 1    | Initial Ranging in PUSC zone w/ 2 symbols          | 8.4.7.1   | oi     | Y           | Y           |         |
| 2    | Initial Ranging in PUSC zone w/ 4 symbols          | 8.4.7.1   | oi     | N           | N           |         |
| 3    | Initial Ranging in Optional PUSC zone w/ 2 symbols | 8.4.7.1   | oi     | N           | N           |         |
| 4    | Initial Ranging in Optional PUSC zone w/ 4 symbols | 8.4.7.1   | oi     | N           | N           |         |
| 5    | Initial Ranging in AMC zone w/ 2 symbols           | 8.4.7.1   | oi     | N           | N           |         |
| 6    | Initial Ranging in AMC zone w/ 4 symbols           | 8.4.7.1   | oi     | N           | N           |         |

#### 4.1.3.2 HO Ranging

**Table 18. HO Ranging**

| Item | Description                                   | Reference | Status | BS Required | MS Required | Comment |
|------|---|-----------|--------|-------------|-------------|---------|
| 1    | HO Ranging in PUSC zone w/ 2 symbols          | 8.4.7.1   | o      | Y           | Y           |         |
| 2    | HO Ranging in PUSC zone w/ 4 symbols          | 8.4.7.1   | o      | N           | N           |         |
| 3    | HO Ranging in Optional PUSC zone w/ 2 symbols | 8.4.7.1   | o      | N           | N           |         |
| 4    | HO Ranging in Optional PUSC zone w/ 4 symbols | 8.4.7.1   | o      | N           | N           |         |
| 5    | HO Ranging in AMC zone w/ 2 symbols           | 8.4.7.1   | o      | N           | N           |         |
| 6    | HO Ranging in AMC zone w/ 4 symbols           | 8.4.7.1   | o      | N           | N           |         |

#### 4.1.3.3 Periodic Ranging

**Table 19. Periodic Ranging**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
|------|-------------|-----------|--------|-------------|-------------|---------|

| Item | Description   | Reference | Status | BS Required | MS Required | Comment |
|------|---|-----------|--------|-------------|-------------|---------|
| 1    | Periodic Ranging in PUSC zone w/ 1 symbols          | 8.4.7.2   | oi     | Y           | Y           |         |
| 2    | Periodic Ranging in PUSC zone w/ 3 symbols          | 8.4.7.2   | oi     | N           | N           |         |
| 3    | Periodic Ranging in Optional PUSC zone w/ 1 symbols | 8.4.7.2   | oi     | N           | N           |         |
| 4    | Periodic Ranging in Optional PUSC zone w/ 3 symbols | 8.4.7.2   | oi     | N           | N           |         |
| 5    | Periodic Ranging in AMC zone w/ 1 symbols           | 8.4.7.2   | oi     | N           | N           |         |
| 6    | Periodic Ranging in AMC zone w/ 3 symbols           | 8.4.7.2   | oi     | N           | N           |         |

#### 4.1.3.4 BW Request

**Table 20. BW Request**

| Item | Description                                   | Reference | Status | BS Required | MS Required | Comment |
|------|---|-----------|--------|-------------|-------------|---------|
| 1    | BW Request in PUSC zone w/ 1 symbols          | 8.4.7.2   | oi     | Y           | Y           |         |
| 2    | BW Request in PUSC zone w/ 3 symbols          | 8.4.7.2   | oi     | N           | N           |         |
| 3    | BW Request in Optional PUSC zone w/ 1 symbols | 8.4.7.2   | oi     | N           | N           |         |
| 4    | BW Request in Optional PUSC zone w/ 3 symbols | 8.4.7.2   | oi     | N           | N           |         |
| 5    | BW Request in AMC zone w/ 1 symbols           | 8.4.7.2   | oi     | N           | N           |         |
| 6    | BW Request in AMC zone w/ 3 symbols           | 8.4.7.2   | oi     | N           | N           |         |

#### 4.1.3.5 Fast-Feedback/CQI Channel Encoding

**Table 21. Fast-Feedback/CQI Channel Encoding**

| Item | Description       | Reference     | Status | BS Required | MS Required | Comment                          |
|------|-------------------|---------------|--------|-------------|-------------|----------------------------------|
| 1    | 4 bits            | 8.4.5.4.10    | po     | N           | N           |                                  |
| 2    | 6 bits            | 8.4.5.4.10.5  | o      | Y           | Y           | This feature is needed for FBSS. |
| 3    | 3 bits            | 8.4.5.4.10.5  | o      | N           | N           |                                  |
| 4    | Primary/Secondary | 8.4.5.4.10.12 | o      | N           | N           |                                  |

Note on Item 2: If the "Feedback Type" in CQICH\_Alloc\_IE() is set to "0b01 = Effective CINR Feedback" and the MS negotiation capability "Type 173, bit#1 = Enhanced FAST\_FEEDBACK" is



enabled which indicates support for "6-bit CQI", the reported effective CINR shall be in the 0b00xxxx format where the 4 LSBs is described in Table 298b of Section 8.4.5.4.10.4 in [2].

#### 4.1.3.6 *Fast-Feedback/CQI Channel Allocation Method*

**Table 22. Fast-Feedback/CQI Channel Allocation Method**

| Item | Description   | Reference  | Status | BS Required | MS Required | Comment |
|------|---|------------|--------|-------------|-------------|---------|
| 1    | Fast-Feedback Allocation Subheader support                          | 6.3.2.2.6  | o      | N           | N           |         |
| 2    | Fast feedback channel allocation using CQICH Allocation IE          | 8.4.5.4.12 | o      | Y           | Y           |         |
| 3    | Fast feedback channel allocation using CQICH Enhanced Allocation IE | 8.4.5.4.16 | o      | N           | N           |         |

#### 4.1.4 **Channel Coding**

##### 4.1.4.1 *Repetition*

**Table 23. Repetition**

| Item | Description | Reference | Status | BS Required | MS Required | Comment                              |
|------|-------------|-----------|--------|-------------|-------------|--------------------------------------|
| 1    | Repetition  | 8.4.9     | m      | Y           | Y           | FCH uses repetition coding (8.4.4.4) |

##### 4.1.4.2 *Randomization*

**Table 24. Randomization**

| Item | Description   | Reference | Status | BS Required | MS Required | Comment |
|------|---------------|-----------|--------|-------------|-------------|---------|
| 1    | Randomization | 8.4.9.1   | m      | Y           | Y           |         |

##### 4.1.4.3 *Convolutional Code*

**Table 25. Convolutional Code**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
| 1    | Tail Biting | 8.4.9.2.1 | m      | Y           | Y           |         |
| 2    | Zero Tail   | 8.4.9.2.4 | o      | N           | N           |         |

#### 4.1.4.4 Convolutional Turbo Code

**Table 26. Convolutional Turbo Code**

| Item | Description | Reference                       | Status | BS Required | MS Required | Comment |
|------|-------------|---------------------------------|--------|-------------|-------------|---------|
| 1    | CTC         | 8.4.9.2.3 excluding 8.4.9.2.3.5 | o      | Y           | Y           |         |

#### 4.1.4.5 BTC

**Table 27. Block Turbo Code**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
| 1    | BTC         | 8.4.9.2.2 | o      | N           | N           |         |

#### 4.1.4.6 LDPC

**Table 28. Low Density Parity Check Code**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
| 1    | LDPC        | 8.4.9.2.5 | o      | N           | N           |         |

#### 4.1.4.7 Interleaving

**Table 29. Interleaving**

| Item | Description                 | Reference                | Status | BS Required | MS Required | Comment   |
|------|-----------------------------|--------------------------|--------|-------------|-------------|---|
| 1    | Interleaving                | 8.4.9.3                  | m      | Y           | Y           | The interleaving subject of this section should not be applied to CTC mode. |
| 2    | Optional interleaver for CC | 8.4.9.3.1 and 11.8.3.7.3 | o      | N           | N           | This interleaver mode is only applicable to Convolutional Encoding          |

#### 4.1.5 H-ARQ Support

#### 4.1.5.1 Chase Combining

**Table 30. Chase Combining H-ARQ**

| Item | Description     | Reference | Status | BS Required | MS Required | Comment |
|------|-----------------|-----------|--------|-------------|-------------|---------|
| 1    | Chase w/ CC     | 8.4.15.1  | o      | N           | N           |         |
| 2    | Chase w/ CTC    | 8.4.15.1  | o      | Y           | Y           |         |
| 3    | Chase with LDPC | 8.4.15.1  | o      | N           | N           |         |

**Table 31. HARQ Parameters for Chase with CTC**

| Item | Parameter Description             | Reference        | Values  | Comment  |
|------|-----------------------------------|------------------|---|--|
| 1    | H-ARQ DL Buffer size per channel  | 11.8.3.7.19      | Category 1 = 16,384 (K=20),<br>Category 2 = 8192 (K=16),<br>Category 3 = 16,384 (K=20),<br>Category 4 = 23,170 (K=22)   | Status for the four categories is oi, that is support for values of items 1-4 and 7-8 corresponding to one or more of the categories from the set shall be supported.  |
| 2    | H-ARQ UL Buffer size per channel  | 11.8.3.7.19      | Category 1 = 16,384 (K=20),<br>Category 2 = 16,384 (K=20),<br>Category 3 = 16,384 (K=20),<br>Category 4 = 16,384 (K=20) | Status for the four categories is oi, that is support for values of items 1-4 and 7-8 corresponding to one or more of the categories from the set shall be supported.  |
| 3    | DL Aggregate flag for HARQ buffer | 11.8.3.7.19      | Category 1 = ON or OFF, Category 2 = ON, Category 3 = ON, Category 4 = ON   | Status for the four categories is oi, that is support for values of items 1-4 and 7-8 corresponding to one or more of the categories from the set shall be supported.  |
| 4    | UL Aggregate flag for HARQ buffer | 11.8.3.7.19      | Category 1 = OFF, Category 2 = ON, Category 3 = ON, Category 4 = ON   | Status for the four categories is i.o, that is support for values of items 1-4 and 7-8 corresponding to one or more of the categories from the set shall be supported. |
| 5    | HARQ ACK Delay for DL Burst       | 6.3.17.1, 11.3.1 | 1   |  |
| 6    | HARQ ACK Delay for UL Burst       | 6.3.17.1, 11.4.1 | N/A   |  |

| Item | Parameter Description                       | Reference             | Values   | Comment   |
|------|---|-----------------------|--|---|
| 7    | Number of DL H-ARQ Channels supported by MS | 11.8.3.7.2 and 7.3 D5 | Category 1 = 4,<br>Category 2 = 16,<br>Category 3 = 16,<br>Category 4 = 16 | Status for the four categories is oi, that is support for values of items 1-4 and 7-8 corresponding to one or more of the categories from the set shall be supported. |
| 8    | Number of UL H-ARQ Channels supported by MS | 11.8.3.7.2 and 7.3 D5 | Category 1 = 4,<br>Category 2 = 8,<br>Category 3 = 8,<br>Category 4 = 8    | Status for the four categories is oi, that is support for values of items 1-4 and 7-8 corresponding to one or more of the categories from the set shall be supported. |

Note that the HARQ buffer size shall be interpreted as softbits buffer size, i.e. relating to coded data bits and not un-coded. This means the buffer size refers to both the systematic and parity bits transmitted over the air. It is left to vendor's implementation to determine the amount of memory space for each bit of transmitted information. The buffer size is related to buffer size parameter K according to the following Equation.

$$\text{Buffer size} = \text{floor}[512 * 2^{(K/4)}]$$

#### 4.1.5.2 Incremental Redundancy

**Table 32. Incremental Redundancy H-ARQ**

| Item | Description | Reference   | Status | BS Required | MS Required | Comment |
|------|-------------|-------------|--------|-------------|-------------|---------|
| 1    | IR w/ CC    | 8.4.9.2.1.1 | o      | N           | N           |         |
| 2    | IR w/ CTC   | 8.4.9.2.3.5 | o      | N           | N           |         |

#### 4.1.5.3 ACK Channel

**Table 33. ACK Channel**

| Item | Description | Reference  | Status | BS Required | MS Required | Comment                       |
|------|-------------|------------|--------|-------------|-------------|-------------------------------|
| 1    | ACKCH       | 8.4.5.4.13 | m      | Y           | Y           | Conditioned by H-ARQ" support |

#### 4.1.6 Control Mechanism

#### 4.1.6.1 Synchronization

**Table 34. Synchronization**

| Item | Description                                    | Reference              | Status | BS Required | MS Required | Comment  |
|------|--|------------------------|--------|-------------|-------------|--|
| 1    | BS Synchronization in time /slot               | 8.4.10.1.1, 6.3.2.3.47 | o      | Y           | N/A         | Refer to "Time/Frequency Synchronization Indicator" in Table 108h of the referred section. |
| 2    | BS Synchronization in frequency                | 8.4.10.1.1             | o      | Y           | N/A         |  |
| 3    | BS to Neighbor BS Synchronization in frequency | 6.3.2.3.47             | o      | Y           | N/A         | Refer to "Time/Frequency Synchronization Indicator" in Table 108h of the referred section. |
| 4    | SS Synchronization                             | 8.4.10.1.2             | m      | N/A         | Y           |  |

#### 4.1.6.2 Closed-loop Power Control

**Table 35. Closed-loop Power Control**

| Item | Description      | Reference  | Status | BS Required | MS Required | Comment |
|------|------------------|------------|--------|-------------|-------------|---------|
| 1    | CL Power Control | 8.4.10.3.1 | m      | Y           | Y           |         |

#### 4.1.6.3 Open-loop Power Control

**Table 36. Open-loop Power Control**

| Item | Description   | Reference                      | Status | BS Required | MS Required | Comment |
|------|---|--------------------------------|--------|-------------|-------------|---------|
| 1    | OL Power Control  | 8.4.10.3.2                     | o      | Y           | Y           |         |
| 2    | Passive Uplink open loop power control  | 8.4.10.3.2                     | o      | Y           | Y           |         |
| 3    | Active Uplink open loop power control   | 8.4.10.3.2                     | o      | N           | N           |         |
| 4    | UL Tx power and Headroom transmission condition using bandwidth request and UL Tx Power Report header | 8.4.10.3.2.1 and 6.3.2.1.2.1.2 | o      | Y           | Y           |         |

|   |  |                                |   |   |   |  |
|---|--|--------------------------------|---|---|---|--|
| 5 | UL Tx power and Headroom transmission condition using PHY channel report header          | 8.4.10.3.2.1 and 6.3.2.1.2.1.5 | o | N | N |  |
| 6 | UL Tx power and Headroom transmission condition using Tx power report extended subheader | 8.4.10.3.2.1 and 6.3.2.2.7.5   | o | N | N |  |

## 4.1.7 Channel Measurement

### 4.1.7.1 CINR Measurement

**Table 37. CINR Measurement**

| Item | Description   | Reference                                   | Status | BS Required | MS Required | Comment   |
|------|---|---|--------|-------------|-------------|---|
| 1    | Physical CINR measurement from the preamble for frequency reuse==1 (feedback type=0b00 and report type=0 and CINR preamble report type=0)       | 6.3.18, 8.4.5.4.12, 8.4.11.3 and 11.8.3.7.9 | oi     | Y           | Y           |   |
| 2    | Physical CINR measurement from the preamble for frequency reuse==3 (feedback type=0b00 and report type=0 and CINR preamble report type=1)       | 6.3.18, 8.4.5.4.12, 8.4.11.3 and 11.8.3.7.9 | oi     | Y           | Y           |   |
| 3    | Physical CINR measurement for a permutation zone from pilot subcarriers (feedback type=0b00 and report type=1 and CINR zone measurement type=0) | 6.3.18, 8.4.5.4.12, 8.4.11.3 and 11.8.3.7.9 | oi     | Y           | Y           | Also refer [4]  |
| 4    | Physical CINR measurement for a permutation zone from data subcarriers (feedback type=0b00 and report type=1 and CINR zone measurement type=1)  | 6.3.18, 8.4.5.4.12, 8.4.11.3 and 11.8.3.7.9 | oi     | N           | N           |   |
| 5    | Effective CINR measurement from the preamble for frequency reuse==1 (feedback type=0b01 and report type=0 and CINR preamble report type=0)      | 6.3.18, 8.4.5.4.12, 8.4.11.3 and 11.8.3.7.9 | oi     | N           | N           | This option provides capability to the MS to report MCS preference to BS. |

| Item | Description  | Reference                                   | Status | BS Required | MS Required | Comment  |
|------|--|---|--------|-------------|-------------|--|
| 6    | Effective CINR measurement from the preamble for frequency reuse==3 (feedback type=0b01 and report type=0 and CINR preamble report type=1)       | 6.3.18, 8.4.5.4.12, 8.4.11.3 and 11.8.3.7.9 | oi     | N           | N           | This option provides capability to the MS to report MCS preference to BS.                      |
| 7    | Effective CINR measurement for a permutation zone from pilot subcarriers (feedback type=0b01 and report type=1 and CINR zone measurement type=0) | 6.3.18, 8.4.5.4.12, 8.4.11.3 and 11.8.3.7.9 | oi     | Y           | Y           | This option provides capability to the MS to report MCS preference to BS. Also refer [4]       |
| 8    | Effective CINR measurement for a permutation zone from data subcarriers (feedback type=0b01 and report type=1 and CINR zone measurement type=1)  | 6.3.18, 8.4.5.4.12, 8.4.11.3 and 11.8.3.7.9 | oi     | N           | N           | This option provides capability to the MS to report MCS preference to BS.                      |
| 9    | Support for 2 concurrent CQI channels with effective CINR reports  | 6.3.18, 8.4.5.4.12 and 11.8.3.7.9           | o      | N           | N           | This feature only addresses two concurrent CQI channels reporting Effective CINR measurements. |
| 10   | Frequency selectivity characterization report  | 8.4.5.4.12, 8.4.11.4 and 11.8.3.7.9         | o      | N           | N           |  |
| 11   | Major group indication (applicable to PUSC zone only)  | 8.4.5.4.12                                  | o      | IO-BF       | Y           |  |
| 12   | MIMO permutation feedback cycle (applicable to MIMO only)  | 8.4.5.4.12                                  | o      | IO-MIMO     | Y           |  |

#### 4.1.7.2 RSSI Measurement

**Table 38. RSSI Measurement**

| Item | Description      | Reference               | Status | BS Required | MS Required | Comment            |
|------|------------------|-------------------------|--------|-------------|-------------|--------------------|
| 1    | RSSI Measurement | 8.4.11.2 and 6.3.2.3.50 | m      | N/A         | Y           | Processing of RSSI |

|  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
|  |  |  |  |  |  | measurements in the BS is specified in Section 6.3.2.3.33. |
|--|--|--|--|--|--|--|

#### 4.1.8 Modulation

##### 4.1.8.1 PRBS (Subcarrier Randomization)

**Table 39. PRBS**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
| 1    | PRBS        | 8.4.9.4.1 | m      | Y           | Y           |         |

##### 4.1.8.2 Downlink

**Table 40. Downlink Modulation**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
| 1    | QPSK        | 8.4.9.4.2 | m      | Y           | Y           |         |
| 2    | 16-QAM      | 8.4.9.4.2 | m      | Y           | Y           |         |
| 3    | 64-QAM      | 8.4.9.4.2 | o      | Y           | Y           |         |

##### 4.1.8.3 Uplink

**Table 41. Uplink Modulation**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
| 1    | QPSK        | 8.4.9.4.2 | m      | Y           | Y           |         |
| 2    | 16-QAM      | 8.4.9.4.2 | m      | Y           | Y           |         |
| 3    | 64-QAM      | 8.4.9.4.2 | o      | N           | N           |         |

##### 4.1.8.4 Pilot Modulation

**Table 42. Pilot Modulation**

| Item | Description      | Reference | Status | BS Required | MS Required | Comment |
|------|------------------|-----------|--------|-------------|-------------|---------|
| 1    | Pilot Modulation | 8.4.9.4.3 | m      | Y           | Y           |         |



#### 4.1.8.5 *Preamble Modulation*

**Table 43. Preamble Modulation**

| Item | Description         | Reference   | Status | BS Required | MS Required | Comment                          |
|------|---------------------|-------------|--------|-------------|-------------|----------------------------------|
| 1    | Preamble Modulation | 8.4.9.4.3.1 | m      | Y           | N/A         | MS shall demodulate the preamble |

#### 4.1.8.6 *Ranging Modulation*

**Table 44. Ranging Modulation**

| Item | Description        | Reference | Status | BS Required | MS Required | Comment                                 |
|------|--------------------|-----------|--------|-------------|-------------|---|
| 1    | Ranging Modulation | 8.4.7.3   | m      | N/A         | Y           | BS shall demodulate the ranging signal. |

#### 4.1.9 **MAP Support**

##### 4.1.9.1 *Normal MAP*

**Table 45. Normal MAP**

| Item | Description | Reference               | Status | BS Required | MS Required | Comment |
|------|-------------|-------------------------|--------|-------------|-------------|---------|
| 1    | Normal MAP  | 6.3.2.3.2 and 6.3.2.3.4 | m      | Y           | Y           |         |

##### 4.1.9.2 *Compressed MAP*

**Table 46. Compressed MAP**

| Item | Description    | Reference | Status | BS Required | MS Required | Comment |
|------|----------------|-----------|--------|-------------|-------------|---------|
| 1    | Compressed MAP | 8.4.5.6   | po     | Y           | Y           |         |

##### 4.1.9.3 *Sub-DL-UL MAP*

**Table 47. Sub-DL-UL MAP**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
|      |             |           |        |             |             |         |

|   |               |            |   |   |   |   |
|---|---------------|------------|---|---|---|---|
| 1 | Sub-DL-UL MAP | 6.3.2.3.60 | o | Y | Y | See 11.8.3.7.12 OFDMA MAP Capability of [2]. Support for Extended HARQ IE in Normal MAP mandates a support for Sub MAP for first zone. Also refer [4] |
|---|---------------|------------|---|---|---|---|

#### 4.1.9.4 H-ARQ MAP Message

**Table 48. H\_ARQ MAP Message**

| Item | Description       | Reference  | Status | BS Required | MS Required | Comment |
|------|-------------------|------------|--------|-------------|-------------|---------|
| 1    | Compact DL-MAP IE | 6.3.2.3.43 | o      | N           | N           |         |
| 2    | Compact UL-MAP IE | 6.3.2.3.43 | o      | N           | N           |         |

#### 4.1.9.5 Extended HARQ IE in the Normal MAP

**Table 49. Extended H-ARQ IE in Normal MAP**

| Item | Description                        | Reference   | Status | BS Required | MS Required | Comment |
|------|------------------------------------|---|--------|-------------|-------------|---------|
| 1    | Extended HARQ IE in the Normal MAP | 8.4.5.3.21 & 8.4.5.3.22 & 8.4.5.4.25 & 8.4.5.4.24 | o      | Y           | Y           |         |

#### 4.1.9.6 DL Region Definition

**Table 50. DL Region Definition Support**

| Item | Description                  | Reference                           | Status | BS Required | MS Required | Comment |
|------|------------------------------|-------------------------------------|--------|-------------|-------------|---------|
| 1    | DL Region Definition Support | 8.4.5.3.21, 8.4.5.3.23, 11.8.3.7.12 | o      | N           | N           |         |

#### 4.1.10 AAS

#### 4.1.10.1 AAS Zone Support

**Table 51. AAS Zone Support**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
| 1    | DL AAS Zone | 8.4.4.6   | o      | N           | N           |         |
| 2    | UL AAS Zone | 8.4.4.6   | o      | N           | N           |         |

#### 4.1.10.2 Supported Permutation in DL

**Table 52. Supported Permutation in DL**

| Item | Description   | Reference                 | Status | BS Required | MS Required | Comment   |
|------|---------------|---------------------------|--------|-------------|-------------|---|
| 1    | PUSC          | 8.4.4.6.1 and 8.4.6.1.2.1 | oi     | N           | N           | Support for all the items in this table is conditional to the support of DL AAS Zone. |
| 2    | FUSC          | 8.4.4.6.1 and 8.4.6.1.2.2 | oi     | N           | N           |   |
| 3    | Optional PUSC | 8.4.4.6.1 and 8.4.6.1.2.3 | oi     | N           | N           |   |
| 4    | AMC 2x3       | 8.4.4.6.1 and 8.4.6.3     | oi     | N           | N           |   |
| 5    | TUSC 1        | 8.4.4.6.1 and 8.4.6.1.2.4 | oi     | N           | N           |   |
| 6    | TUSC 2        | 8.4.4.6.1 and 8.4.6.1.2.5 | oi     | N           | N           |   |

#### 4.1.10.3 Supported Permutation in UL

**Table 53. Supported Permutation in UL**

| Item | Description   | Reference               | Status | BS Required | MS Required | Comment  |
|------|---------------|-------------------------|--------|-------------|-------------|--|
| 1    | PUSC          | 8.4.4.6.1 and 8.4.6.2.1 | oi     | N           | N           | Support for all the items in this table is conditional to the support of AAS Zone. |
| 2    | Optional PUSC | 8.4.4.6.1 and 8.4.6.2.5 | oi     | N           | N           |  |

|   |         |                          |    |   |   |  |
|---|---------|--------------------------|----|---|---|--|
| 3 | AMC 2x3 | 8.4.4.6.1 and<br>8.4.6.3 | oi | N | N |  |
|---|---------|--------------------------|----|---|---|--|

#### 4.1.10.4 AAS DL Preamble

**Table 54. AAS DL Preamble**

| Item | Description             | Reference   | Status | BS Required | MS Required | Comment                 |
|------|-------------------------|-------------|--------|-------------|-------------|-------------------------|
| 1    | Frequency shifted       | 8.4.4.6.4.1 | o      | N           | N           |                         |
| 2    | Time shifted            | 8.4.4.6.4.1 | o      | N           | N           |                         |
| 3    | PHY Modifier            | 8.4.5.3.11  | o      | N           | N           |                         |
| 4    | DL AAS Preamble Support | 8.4.4.6.4.1 | o      | N           | N           | Support for 0-3 symbols |

#### 4.1.10.5 AAS UL Preamble

**Table 55. AAS UL Preamble**

| Item | Description                   | Reference   | Status | BS Required | MS Required | Comment                 |
|------|-------------------------------|-------------|--------|-------------|-------------|-------------------------|
| 1    | Frequency shifted             | 8.4.4.6.4.2 | o      | N           | N           |                         |
| 2    | Time shifted                  | 8.4.4.6.4.2 | o      | N           | N           |                         |
| 3    | Physical Modifier             | 8.4.5.4.14  | o      | N           | N           |                         |
| 4    | UL AAS Preamble Power Control | 8.4.4.6.4   | o      | N           | N           |                         |
| 5    | UL AAS Preamble Support       | 8.4.4.6.4.1 | o      | N           | N           | Support for 0-3 symbols |

#### 4.1.10.6 Diversity MAP Scan

**Table 56. Diversity MAP Scan**

| Item | Description        | Reference | Status | BS Required | MS Required | Comment |
|------|--------------------|-----------|--------|-------------|-------------|---------|
| 1    | Diversity-Map Scan | 8.4.4.6.2 | o      | N           | N           |         |

#### 4.1.10.7 DL AAS-SDMA Pilots

**Table 57. DL AAS-SDMA Pilots**

| Item | Description                       | Reference     | Status | BS Required | MS Required | Comment |
|------|-----------------------------------|---------------|--------|-------------|-------------|---------|
| 1    | AMC AAS-SDMA with All SDMA Pilots | 8.4.6.3.3     | o      | N           | N           |         |
| 2    | PUSC AAS-SDMA                     | 8.4.8.1.2.1.1 | o      | N           | N           |         |

|   |  |             |   |   |   |  |
|---|--|-------------|---|---|---|--|
| 3 | TUSC1 AAS-SDMA                         | 8.4.6.1.2.6 | o | N | N |  |
| 4 | TUSC2 AAS-SDMA                         | 8.4.6.1.2.6 | o | N | N |  |
| 5 | AMC AAS-SDMA with SDMA pilots A&B only | 8.4.6.3.3   | o | N | N |  |

#### 4.1.10.8 *UL AAS-SDMA Pilots*

**Table 58. UL AAS\_SDMA Pilots**

| Item | Description                            | Reference | Status | BS Required | MS Required | Comment |
|------|--|-----------|--------|-------------|-------------|---------|
| 1    | AMC AAS-SDMA with All SDMA Pilots      | 8.4.6.3.3 | o      | N           | N           |         |
| 2    | PUSC AAS-SDMA                          | 8.4.8.1.5 | o      | N           | N           |         |
| 3    | Optional PUSC AAS-SDMA                 | 8.4.8.4.1 | o      | N           | N           |         |
| 4    | AMC AAS-SDMA with SDMA pilots A&B only | 8.4.6.3.3 | o      | N           | N           |         |

#### 4.1.10.9 *AAS Private MAP*

**Table 59. AAS Private MAP**

| Item | Description                       | Reference | Status | BS Required | MS Required | Comment |
|------|-----------------------------------|-----------|--------|-------------|-------------|---------|
| 1    | AAS Private MAP                   | 8.4.5.6   | o      | N           | N           |         |
| 2    | Reduced Private MAP               | 8.4.5.8   | o      | N           | N           |         |
| 3    | Reduced Private MAP Chain Support | 8.4.5.8   | o      | N           | N           |         |

#### 4.1.10.10 *AAS-FBCK-REQ/RSP support*

**Table 60. AAS\_FBCK/RSP Support**

| Item | Description              | Reference | Status | BS Required | MS Required | Comment |
|------|--------------------------|-----------|--------|-------------|-------------|---------|
| 1    | AAS-FBCK-REQ/RSP support | 8.4.5.7   | o      | N           | N           |         |

#### 4.1.11 *STC/MIMO*

#### 4.1.11.1 Supported Features for DL PUSC

**Table 61. Supported Features for DL PUSC**

| Item | Description                              | Reference                   | Status | BS Required | MS Required | Comment                           |
|------|--|-----------------------------|--------|-------------|-------------|-----------------------------------|
| 1    | FHDC                                     | 8.4.8.1.3                   | o      | N           | N           |                                   |
| 2    | 2-antenna, matrix A                      | 8.4.8.1.2.1.1<br>8.4.8.1.4  | o      | IO-MIMO     | Y           |                                   |
| 3    | 2-antenna, matrix B, vertical encoding   | 8.4.8.1.4,<br>8.4.8.1.2.1.3 | o      | IO-MIMO     | Y           |                                   |
| 4    | 2-antenna, matrix B, horizontal encoding | 8.4.8.1.4,<br>8.4.8.1.2.1.3 | o      | N           | N           | two modulation and coding modules |
| 5    | 4-antenna enhancement using directivity  | 8.4.8.1.6                   | o      | N           | N           |                                   |
| 6    | 4-antenna, matrix A                      | 8.4.8.2.1<br>8.4.8.2.3      | o      | N           | N           |                                   |
| 7    | 4-antenna, matrix B, vertical encoding   | 8.4.8.2.3                   | o      | N           | N           |                                   |
| 8    | 4-antenna, matrix B, horizontal encoding | 8.4.8.2.3                   | o      | N           | N           |                                   |
| 9    | 4-antenna, matrix C, vertical encoding   | 8.4.8.2.3                   | o      | N           | N           |                                   |
| 10   | 4-antenna, matrix C, horizontal encoding | 8.4.8.2.3                   | o      | N           | N           |                                   |

#### 4.1.11.2 Supported Features for DL FUSC

**Table 62. Supported Features for DL FUSC**

| Item | Description                              | Reference                   | Status | BS Required | MS Required | Comment |
|------|--|-----------------------------|--------|-------------|-------------|---------|
| 1    | FHDC                                     |                             | o      | N           | N           |         |
| 2    | 2-antenna, matrix A                      | 8.4.8.1.2.1.2<br>8.4.8.1.4  | o      | N           | N           |         |
| 3    | 2-antenna, matrix B, vertical encoding   | 8.4.8.1.4,<br>8.4.8.1.2.1.3 | o      | N           | N           |         |
| 4    | 2-antenna, matrix B, horizontal encoding | 8.4.8.1.4,<br>8.4.8.1.2.1.3 | o      | N           | N           |         |
| 5    | 4-antenna enhancement using directivity  | 8.4.8.1.6                   | o      | N           | N           |         |
| 6    | 4-antenna, matrix A                      | 8.4.8.2.2                   | o      | N           | N           |         |
| 7    | 4-antenna, matrix B, vertical encoding   | 8.4.8.2.3                   | o      | N           | N           |         |
| 8    | 4-antenna, matrix B, horizontal encoding | 8.4.8.2.3                   | o      | N           | N           |         |

| Item | Description                              | Reference | Status | BS Required | MS Required | Comment |
|------|--|-----------|--------|-------------|-------------|---------|
| 9    | 4-antenna, matrix C, vertical encoding   | 8.4.8.2.3 | o      | N           | N           |         |
| 10   | 4-antenna, matrix C, horizontal encoding | 8.4.8.2.3 | o      | N           | N           |         |

#### 4.1.11.3 Supported Features for DL Optional FUSC

**Table 63. Supported Features for DL Optional FUSC**

| Item | Description                              | Reference                                    | Status | BS Required | MS Required | Comment  |
|------|--|--|--------|-------------|-------------|--|
| 1    | 2-antenna, matrix A                      | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.3    | o      | N           | N           | 2 consecutive OFDMA symbols                      |
| 2    | 2-antenna, matrix B, vertical encoding   | 8.4.8.3.1.2.2<br>8.4.8.3.3,<br>8.4.8.1.2.1.3 | o      | N           | N           |  |
| 3    | 2-antenna, matrix B, horizontal encoding | 8.4.8.3.1.2.2<br>8.4.8.3.3,<br>8.4.8.1.2.1.3 | o      | N           | N           |  |
| 4    | 2-antenna, matrix C                      | 8.4.8.3.1.2.2<br>8.4.8.3.3                   | o      | N           | N           |  |
| 5    | 3-antenna, matrix A                      | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.4    | o      | N           | N           | 2 logical subcarriers over 2 consecutive symbols |
| 6    | 3-antenna, matrix B                      | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.4    | o      | N           | N           |  |
| 7    | 3-antenna, matrix C                      | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.4    | o      | N           | N           |  |
| 8    | 4-antenna, matrix A                      | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.5    | o      | N           | N           | 2 logical subcarriers over 2 consecutive symbols |
| 9    | 4-antenna, matrix B, vertical encoding   | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.5    | o      | N           | N           |  |
| 10   | 4-antenna, matrix B, horizontal encoding | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.5    | o      | N           | N           |  |

| Item | Description                              | Reference                                 | Status | BS Required | MS Required | Comment |
|------|--|---|--------|-------------|-------------|---------|
| 11   | 4-antenna, matrix C, vertical encoding   | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.5 | o      | N           | N           |         |
| 12   | 4-antenna, matrix C, horizontal encoding | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.5 | o      | N           | N           |         |

#### 4.1.11.4 Supported Features for DL Optional AMC

**Table 64. Supported Features for DL Optional AMC**

| Item | Description                              | Reference                                    | Status | BS Required | MS Required | Comment   |
|------|--|--|--------|-------------|-------------|---|
| 1    | 2-antenna, matrix A                      | 8.4.8.3.1.1<br>8.4.8.3.1.2.1<br>8.4.8.3.3    | o      | N           | N           | 2 bins over 6 OFDMA symbols                       |
| 2    | 2-antenna, matrix B, vertical encoding   | 8.4.8.3.1.2.1<br>8.4.8.3.3,<br>8.4.8.1.2.1.3 | o      | N           | N           | Figure 251i                                       |
| 3    | 2-antenna, matrix B, horizontal encoding | 8.4.8.3.1.2.1<br>8.4.8.3.3,<br>8.4.8.1.2.1.3 | o      | N           | N           | Figure 251i                                       |
| 4    | 2-antenna, matrix C                      | 8.4.8.3.1.2.1<br>8.4.8.3.3                   | o      | N           | N           |   |
| 5    | 3-antenna, matrix A                      | 8.4.8.3.1.1<br>8.4.8.3.1.2.1<br>8.4.8.3.4    | o      | N           | N           | 2 adjacent subcarriers over 2 consecutive symbols |
| 6    | 3-antenna, matrix B                      | 8.4.8.3.1.1<br>8.4.8.3.1.2.1<br>8.4.8.3.4    | o      | N           | N           |   |
| 7    | 3-antenna, matrix C                      | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.4    | o      | N           | N           |   |
| 8    | 4-antenna, matrix A                      | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.5    | o      | N           | N           | 2 adjacent subcarriers over 2 consecutive symbols |
| 9    | 4-antenna, matrix B, vertical encoding   | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.5    | o      | N           | N           |   |
| 10   | 4-antenna, matrix B, horizontal encoding | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.5    | o      | N           | N           |   |



| Item | Description                              | Reference                                 | Status | BS Required | MS Required | Comment |
|------|--|---|--------|-------------|-------------|---------|
| 11   | 4-antenna, matrix C, vertical encoding   | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.5 | o      | N           | N           |         |
| 12   | 4-antenna, matrix C, horizontal encoding | 8.4.8.3.1.1<br>8.4.8.3.1.2.2<br>8.4.8.3.5 | o      | N           | N           |         |

#### 4.1.11.5 Supported Features for DL PUSC-ASCA

**Table 65. Supported Features for DL PUSC-ASCA**

| Item | Description            | Reference | Status | BS Required | MS Required | Comment |
|------|------------------------|-----------|--------|-------------|-------------|---------|
| 1    | STC/MIMO for PUSC-ASCA | 8.4.8.3.2 | o      | N           | N           |         |

#### 4.1.11.6 Supported Features in UL PUSC

**Table 66. Supported Features in UL PUSC**

| Item | Description  | Reference | Status | BS Required | MS Required | Comment                              |
|------|--|-----------|--------|-------------|-------------|--------------------------------------|
| 1    | 2-antenna, matrix A                                      | 8.4.8.1.5 | o      | N           | N           |                                      |
| 2    | 2-antenna, matrix B, vertical encoding                   | 8.4.8.1.5 | o      | N           | N           |                                      |
| 3    | 2-antenna, matrix B, horizontal encoding                 | 8.4.8.1.5 | o      | N           | N           | pp. 574 in [2]                       |
| 4    | Collaborative SM for two MS with single transmit antenna | 8.4.8.1.5 | o      | IO-MIMO     | Y           |                                      |
| 5    | Collaborative SM for two MS with two transmit antennas   | 8.4.8.1.5 | o      | N           | N           | Pilot pattern C and D defined in [2] |

#### 4.1.11.7 Supported Features in UL Optional PUSC

**Table 67. Supported Features in UL Optional PUSC**

| Item | Description         | Reference                           | Status | BS Required | MS Required | Comment             |
|------|---------------------|-------------------------------------|--------|-------------|-------------|---------------------|
| 1    | 2-antenna, matrix A | 8.4.8.4.1<br>8.4.8.4.2<br>8.4.8.4.3 | o      | N           | N           | 2 consecutive slots |

| Item | Description  | Reference                           | Status | BS Required | MS Required | Comment |
|------|--|-------------------------------------|--------|-------------|-------------|---------|
| 2    | 2-antenna, matrix B, vertical encoding                   | 8.4.8.4.1<br>8.4.8.4.2<br>8.4.8.4.3 | o      | N           | N           |         |
| 3    | 2-antenna, matrix B, horizontal encoding                 | 8.4.8.4.1<br>8.4.8.4.2<br>8.4.8.4.3 | o      | N           | N           |         |
| 4    | Collaborative SM for two MS with single transmit antenna | 8.4.8.4.1<br>8.4.8.4.2<br>8.4.8.4.3 | o      | N           | N           |         |

#### 4.1.11.8 Supported Features in UL Optional AMC

**Table 68. Supported Features in UL Optional AMC**

| Item | Description  | Reference                           | Status | BS Required | MS Required | Comment                             |
|------|--|-------------------------------------|--------|-------------|-------------|-------------------------------------|
| 1    | 2-antenna, matrix A                                      | 8.4.8.4.1<br>8.4.8.4.2<br>8.4.8.4.3 | o      | N           | N           | Same AMC pilots as in DL 1x6 format |
| 2    | 2-antenna, matrix B, vertical encoding                   | 8.4.8.4.1<br>8.4.8.4.2<br>8.4.8.4.3 | o      | N           | N           |                                     |
| 3    | 2-antenna, matrix B, horizontal encoding                 | 8.4.8.4.1<br>8.4.8.4.2<br>8.4.8.4.3 | o      | N           | N           |                                     |
| 4    | Collaborative SM for two MS with single transmit antenna | 8.4.8.4.1<br>8.4.8.4.2<br>8.4.8.4.3 | o      | N           | N           |                                     |

#### 4.1.11.9 Closed-Loop MIMO

**Table 69. Closed-loop MIMO**

| Item | Description                        | Reference                    | Status | BS Required | MS Required | Comment                  |
|------|------------------------------------|------------------------------|--------|-------------|-------------|--------------------------|
| 1    | Antenna Grouping w/ 3 Tx matrix A  | 8.4.5.4.10.3<br>8.4.8.3.4.1  | o      | N           | N           | Table 298                |
| 2    | Antenna Grouping w/ 3 Tx matrix B  | 8.4.5.4.10.3<br>8.4.8.3.4.2  | o      | N           | N           |                          |
| 3    | Antenna Selection w/ 3 Tx matrix C | 8.4.5.4.10.3,<br>8.4.8.3.4.3 | o      | N           | N           | Table 298a<br>Table 317f |
| 4    | Antenna Grouping w/ 4 Tx matrix A  | 8.4.5.4.10.3<br>8.4.8.3.5.1  | o      | N           | N           | Table 298                |
| 5    | Antenna Grouping w/ 4 Tx matrix B  | 8.4.5.4.10.3<br>8.4.8.3.5.2  | o      | N           | N           |                          |

| Item | Description                        | Reference                    | Status | BS Required | MS Required | Comment                  |
|------|------------------------------------|------------------------------|--------|-------------|-------------|--------------------------|
| 6    | Antenna Selection w/ 4 Tx matrix C | 8.4.5.4.10.3,<br>8.4.8.3.5.3 | o      | N           | N           | Table 298a<br>Table 317g |
| 7    | Codebook Based Precoding           | 8.4.8.3.6,<br>8.4.5.4.11     | o      | N           | N           |                          |
| 8    | Quantized Weight Feedback          | 8.4.5.4.10.2                 | o      | N           | N           | 4-bit<br>CQICH           |
| 9    | Quantized Weight Feedback          | 8.4.5.4.10.6                 | o      | N           | N           | 6-bit<br>CQICH           |

#### 4.1.11.10 MIMO Feedback

**Table 70. MIMO Feedback**

| Item | Description   | Reference                                    | Status | BS Required | MS Required | Comment |
|------|---|--|--------|-------------|-------------|---------|
| 1    | Fast MIMO Feedback (complex weights) w/ 4 bits            | 8.4.5.4.10.2                                 | o      | N           | N           |         |
| 2    | Mode Selection Feedback w/ 4 bits                         | 8.4.5.4.10.3                                 | o      | N           | N           |         |
| 3    | 3-bit MIMO Fast Feedback                                  | 8.4.5.4.10.4                                 | o      | N           | N           |         |
| 4    | Fast DL measurement feedback w/ more than one Rx antennas | 8.4.5.4.10.5<br>8.4.5.4.10.6<br>8.4.5.4.10.1 | o      | IO-MIMO     | Y           |         |
| 5    | Fast MIMO Feedback (complex weights) w/ 6 bits            | 8.4.5.4.10.7                                 | o      | N           | N           |         |
| 6    | Mode Selection Feedback w/ 6 bits                         | 8.4.5.4.10.8                                 | o      | IO-MIMO     | Y           |         |

#### 4.1.11.11 MIMO Midamble

**Table 71. MIMO Midamble**

| Item | Description | Reference   | Status | BS Required | MS Required | Comment |
|------|-------------|-------------|--------|-------------|-------------|---------|
| 1    | 2 Tx        | 8.4.8.5.2.1 | o      | N           | N           |         |
| 2    | 3 Tx        | 8.4.8.5.2.2 | o      | N           | N           |         |
| 3    | 4 Tx        | 8.4.8.5.2.2 | o      | N           | N           |         |

#### 4.1.11.12 MIMO Soft-Handover Based Macro-diversity

**Table 72. MIMO Soft-Handover Macro-diversity**

| Item | Description   | Reference | Status | BS Required | MS Required | Comment |
|------|---------------|-----------|--------|-------------|-------------|---------|
| 1    | Macro MIMO w/ | 8.4.8.2.4 | o      | N           | N           |         |

|   |   |           |   |   |   |  |
|---|---|-----------|---|---|---|--|
|   | MIMO_in_another_BS_IE()                   |           |   |   |   |  |
| 2 | Macro MIMO w/<br>Macro MIMO_DL_Basic_IE() | 8.4.8.2.4 | o | N | N |  |

#### 4.1.11.13 H-ARQ Downlink Support for MIMO

**Table 73. H-ARQ Downlink Support for MIMO**

| Item | Description                       | Reference                   | Status | BS Required | MS Required | Comment   |
|------|-----------------------------------|-----------------------------|--------|-------------|-------------|---|
| 1    | MIMO DL Chase                     | 8.4.5.3.21                  | o      | IO-MIMO     | Y           | MIMO DL Chase is applicable to CC, CTC or LDPC from the perspective of IEEE 802.16. In this document, the feature is only used in CTC mode. |
| 2    | MIMO DL IR                        | 8.4.5.3.21<br>8.4.8.3.1.2.3 | o      | N           | N           | w/ CTC  |
| 3    | MIMO DL IR for Convolutional Code | 8.4.5.3.21                  | o      | N           | N           |   |
| 4    | MIMO DL STC                       | 8.4.5.3.21.1                | o      | N           | N           |   |

#### 4.1.11.14 H-ARQ Uplink Support for MIMO

**Table 74. H-ARQ Uplink Support for MIMO**

| Item | Description                       | Reference    | Status | BS Required | MS Required | Comment   |
|------|-----------------------------------|--------------|--------|-------------|-------------|---|
| 1    | MIMO UL Chase                     | 8.4.5.4.24   | o      | IO-MIMO     | Y           | MIMO DL Chase is applicable to CC, CTC or LDPC from the perspective of IEEE 802.16. In this document, the feature is only used in CTC mode. |
| 2    | MIMO UL IR                        | 8.4.5.4.24   | o      | N           | N           |   |
| 3    | MIMO UL IR for Convolutional Code | 8.4.5.4.24   | o      | N           | N           |   |
| 4    | MIMO UL STC                       | 8.4.8.4.24.2 | o      | N           | N           |   |

#### 4.1.12 HO Support in PHY

#### 4.1.12.1 *FBSS*

**Table 75. Fast Base Station Switching**

| Item | Description               | Reference                   | Status | BS Required | MS Required | Comment                                       |
|------|---------------------------|-----------------------------|--------|-------------|-------------|---|
| 1    | Anchor BS Report for FBSS | 8.4.5.4.10.8 and 8.4.5.4.23 | o      | N           | N           | Anchor BS CQI and switch indication via CQICH |

#### 4.1.12.2 *MIMO Soft-handover based macro-diversity transmission*

**Table 76. MIMO Soft-handover based macro-diversity transmission**

| Item | Description   | Reference   | Status | BS Required | MS Required | Comment |
|------|---|-------------|--------|-------------|-------------|---------|
| 1    | MIMO Soft-handover based macro-diversity transmission                           | 8.4.8.2.4   | o      | N           | N           |         |
| 2    | Support Macro Diversity Handover using DL soft combining                        | 8.4.5.3.6   | o      | N           | N           |         |
| 3    | Support Macro Diversity Handover using DL burst in another segment in PUSC mode | 8.4.5.3.13  | o      | N           | N           |         |
| 4    | Support anchor BS indication of DL data burst in active BS                      | 8.4.5.3.14  | o      | N           | N           |         |
| 5    | Support of active BS indication of DL data burst in anchor BS                   | 8.4.5.3. 15 | o      | N           | N           |         |
| 6    | Support of CID translation between Anchor BS and Active BS                      | 8.4.5.3.16  | o      | N           | N           |         |

#### 4.1.12.3 *UL Macro diversity*

**Table 77. UL Macro Diversity**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
|------|-------------|-----------|--------|-------------|-------------|---------|

| Item | Description   | Reference  | Status | BS Required | MS Required | Comment  |
|------|---|------------|--------|-------------|-------------|--|
| 1    | UL Macro diversity  | 8.4.5.4.17 | o      | N           | N           | To be used with UL PUSC Burst Allocation in Other Segment IE |
| 2    | Support of Macro Diversity Handover using UL transmission in another segment in PUSC mode | 8.4.5.4.17 | o      | N           | N           |  |
| 3    | Support of anchor BS indication of UL data burst in active BS                             | 8.4.5.4.18 | o      | N           | N           |  |
| 4    | Support of active BS indication of UL data burst in anchor BS                             | 8.4.5.4.19 | o      | N           | N           |  |

## 4.2 Performance/Fidelity Requirements

### 4.2.1 MS Minimum Performance

#### 4.2.1.1 SSTTG/SSRTG

**Table 78. SSTTG/SSRTG**

| Item | Description | Reference | Status | MS Required | MS Values | Comment |
|------|-------------|-----------|--------|-------------|-----------|---------|
| 1    | SSTTG       | 8.4.4.2   | m      | Y           | 50 usec   |         |
| 2    | SSRTG       | 8.4.4.2   | m      | Y           | 50 usec   |         |

#### 4.2.1.2 Max DL Concurrent Bursts

**Table 79. Maximum DL Concurrent Bursts**

| Item | Description          | Reference             | Status | MS Required | MS Values | Comment |
|------|----------------------|-----------------------|--------|-------------|-----------|---------|
| 1    | Max Concurrent Burst | 8.4.4.2 and 11.7.8.13 | m      | Y           | 10        |         |

#### 4.2.1.3 *Max Bursts in DL Subframe*

**Table 80. Max Bursts in DL Subframe**

| Item | Description        | Reference | Status | MS Required | MS Values | Comment |
|------|--------------------|-----------|--------|-------------|-----------|---------|
| 1    | Max Burst in Frame | 8.4.4.2   | m      | Y           | 16        |         |

#### 4.2.1.4 *Max Number of Zones in DL/UL Subframe*

**Table 81. Max Number of Zones in DL and UL Subframes**

| Item | Description                 | Reference | Status | MS Required | MS Values | Comment   |
|------|-----------------------------|-----------|--------|-------------|-----------|---|
| 1    | Maximum numbers of zones UL |           |        | Y           | 3         | The number is the same as the number of Zone Switch IEs plus 1. |
| 2    | Maximum numbers of zones DL | 8.4.4.2   | Max 8  | Y           | 5         | The number is the same as the number of Zone Switch IEs plus 1. |

#### 4.2.1.5 *Measurement Processes and CQI Channels*

**Table 82. Measurement Processes and CQI Channels**

| Item | Description  | Reference | Status | MS Required | MS Values | Comment   |
|------|--|-----------|--------|-------------|-----------|---|
| 1    | Maximum numbers of CQI Channels transmitted by an MS per frame |           |        | Y           | 2         |   |
| 2    | Maximum number of concurrent CINR measurement processes        |           |        | Y           | 2         | Maximum number of CINR measurement processes (for physical or effective CINR) that are active concurrently. A CINR measurement process is active from the frame in which it was allocated by a CQICH_Alloc_IE() until the frame in which the last CQI periodic transmission is sent or in which the CQI was de-allocated by the BS. |

#### 4.2.1.6 Max H-ARQ Bursts in DL/UL Subframe

**Table 83. Max H-ARQ Bursts**

| Item | Description                         | Reference                        | Status | MS Required | MS Values  | Comment   |
|------|-------------------------------------|----------------------------------|--------|-------------|--|---|
| 1    | Max Burst in DL Subframe with H-ARQ | 8.4.4.2, 8.4.15.1.3, 11.8.3.7.15 | o      | Y           | Category 1 = 2, Category 2 = 5, Category 3 = 5, Category 4 = 5 | Status for the four categories is oi, i.e. support for values corresponding to one or more of the categories from the set shall be supported in correlation to the categories of Section 4.1.5.1. |
| 2    | Max Burst in UL Subframe with H-ARQ | 8.4.4.2, 8.4.15.1.3, 11.8.3.7.15 | o      | Y           | Category 1 = 2, Category 2 = 2, Category 3 = 2, Category 4 = 2 |   |

#### 4.2.2 Transmit Requirements

*Note: unless specified otherwise, requirement applies to both BS and MS.*

**Table 84. Transmitter Requirements**

| Item | Requirement                                  | Reference | Values Specified  | Values Required   |
|------|--|-----------|---|---|
| 1.   | BS Tx dynamic Range                          | 8.4.12.1  |   | 10 dB   |
| 2.   | MS Tx dynamic Range                          | 8.4.12.1  |   | 45 dB   |
| 3.   | MS Tx power level min adjustment step        | 8.4.12.1  | 1 dB  | 1 dB  |
| 4.   | MS Tx power level min relative step accuracy | 8.4.12.1  | Single step size m   Required relative accuracy<br><br> m  = 1dB   +/- 0.5 dB<br> m  = 2dB   +/- 1 dB<br> m  = 3dB   +/- 1.5 dB<br>4db<  m <= 10dB   +/- 2 dB<br><br>Two exception points of at least 10 dB apart are allowed over the 45 dB range, where in these two points an accuracy of up to +/- 2 dB is allowed for any size step. | Single step size m   Required relative accuracy<br><br> m  = 1dB   +/- 0.5 dB<br> m  = 2dB   +/- 1 dB<br> m  = 3dB   +/- 1.5 dB<br>4db<  m <= 10dB   +/- 2 dB<br><br>Two exception points of at least 10 dB apart are allowed over the 45 dB range, where in these two points an accuracy of up to +/- 2 dB is allowed for any size step. |
| 5.   | Spectral flatness                            | 8.4.12.2  | ≤ ±2 dB for spectral lines from −Nused/4 to −1 and +1 to  | ≤ ±2 dB for spectral lines from −Nused/4 to −1 and +1 to  |



| Item | Requirement                                   | Reference                               | Values Specified   | Values Required   |
|------|---|---|--|---|
|      |   |   | $N_{used}/4$<br>Within +2/-4 dB for spectral lines from $-N_{used}/2$ to $-N_{used}/4$ and $+N_{used}/4$ to $N_{used}/2$   | $N_{used}/4$<br>Within +2/-4 dB for spectral lines from $-N_{used}/2$ to $-N_{used}/4$ and $+N_{used}/4$ to $N_{used}/2$  |
| 6.   | Power difference between adjacent subcarriers | 8.4.12.2                                | $\leq 0.4$ dB  | $\leq 0.4$ dB   |
| 7.   | BS Tx reference timing accuracy               | 8.4.12.4, 8.4.10.1.1                    | Tx downlink radio frame shall be time-aligned with the 1pps timing pulse   | 1 usec  |
| 8.   | Tx relative constellation error               | 8.4.12.3.1 for BS and 8.4.12.3.2 for MS | <div>QPSK 1/2 <math>\leq -15.0</math> dB</div> <div>QPSK 3/4 <math>\leq -18.0</math> dB</div> <div>16-QAM 1/2 <math>\leq -20.5</math> dB</div> <div>16-QAM 3/4 <math>\leq -24.0</math> dB</div> <div>64-QAM 1/2 (if 64-QAM supported) <math>\leq -26.0</math> dB</div> <div>64-QAM 2/3 (if 64-QAM supported) <math>\leq -28.0</math> dB</div> <div>64-QAM 3/4 (if 64-QAM supported) <math>\leq -30.0</math> dB</div> | <div><math>\leq -15.0</math> dB</div> <div><math>\leq -18.0</math> dB</div> <div><math>\leq -20.5</math> dB</div> <div><math>\leq -24.0</math> dB</div> <div><math>\leq -26.0</math> dB</div> <div><math>\leq -28.0</math> dB</div> <div><math>\leq -30.0</math> dB</div> |

### 4.2.3 Receiver Requirements

**Table 85. Receiver Requirements**

| Item | Requirement | Reference | Values Specified | Values Required |
|------|-------------|-----------|------------------|-----------------|
|------|-------------|-----------|------------------|-----------------|

| Item | Requirement  | Reference  | Values Specified  |                | Values Required |
|------|--|------------|---|----------------|-----------------|
| 1.   | Min SNR requirements for BER= $10^{-6}$ with CTC in AWGN channel (The Min SNR requirements are used along with Eq. 149b to define sensitivity specifications for CTC.) | 8.4.13.1   | QPSK 1/2 with 60 bytes block size                         |                | 2.9 dB          |
|      |  |            | QPSK 3/4 with 54 bytes block size                         |                | 6.3 dB          |
|      |  |            | 16-QAM 1/2 with 60 bytes block size                       |                | 8.6 dB          |
|      |  |            | 16-QAM 3/4 with 54 bytes block size                       |                | 12.7 dB         |
|      |  |            | 64-QAM 1/2 with 54 bytes block size (if 64-QAM supported) |                | 13.8 dB         |
|      |  |            | 64-QAM 2/3 with 48 bytes block size (if 64-QAM supported) |                | 16.9 dB         |
|      |  |            | 64-QAM 3/4 with 54 bytes block size (if 64-QAM supported) |                | 18 dB           |
|      |  |            | 64-QAM 5/6 with 60 bytes block size (if 64-QAM supported) |                | 19.9 dB         |
| 2.   | MS Rx max input level on-channel reception tolerance   | 8.4.13.3.1 | -30 dB  |                | -30 dB          |
| 3.   | BS Rx Max input level on-channel reception tolerance   | 8.4.13.3.2 | -45 dBm   |                | -45 dBm         |
| 4.   | MS Rx max input level on-channel damage tolerance  | 8.4.13.4.1 | 0 dB  |                | 0 dB            |
| 5.   | BS Rx Max input level on-channel damage tolerance  | 8.4.13.4.2 | -10 dBm   |                | -10 dBm         |
| 6.   | Min adjacent channel rejection at BER= $10^{-6}$ for 3 dB degradation C/I  | 8.4.13.2   | 16-QAM 3/4<br>64-QAM 3/4 (if 64-QAM supported)            | 10 dB<br>4 dB  | 10 dB<br>4 dB   |
| 7.   | Min alternate channel rejection at BER= $10^{-6}$ for 3 dB degradation C/I   | 8.4.13.2   | 16-QAM 3/4<br>64-QAM 3/4 (if 64-QAM supported)            | 29 dB<br>23 dB | 29 dB<br>23 dB  |

| Item   | Requirement   | Reference | Values Specified   | Values Required  |
|--|---|-----------|--|--|
| 8.   | "Implementation loss plus Noise Figure" (dB) value assumed for MS for deriving receiver minimum sensitivity (equation 149b) | 8.4.13.1  | The min requirement for Implementation Loss and Noise Figure in [2] are 5 and 8 dB respectively. | 13 dB<br><br>Note: Eq. 149b of [2] shall be used for calculation of Rx sensitivity requirements where min SNR values for CC are given in Table 338 of [2] and the min SNR values for CTC mode are specified in the item 1 of this table. |
| 9.   | "Implementation loss plus Noise Figure" (dB) value assumed for BS for deriving receiver minimum sensitivity (equation 149b) | 8.4.13.1  | The min requirement for Implementation Loss and Noise Figure in [2] are 5 and 8 dB respectively. | 13 dB<br><br>Note: Eq. 149b of [2] shall be used for calculation of Rx sensitivity requirements where min SNR values for CC are given in Table 338 of [2] and the min SNR values for CTC mode are specified in the item 1 of this table. |
| Comments: [Editor's Note: The Accepted CR #653 calls for above requirements of Items 6 and 7 to be applicable to CC FEC. Considering the fact that TWG members believed that the numbers should be revisited for CTC FEC, it is recommended to consider the same requirements for CTC until an agreement by group is developed for possible update. In the case of CTC, the requirements shall be applied to the most sensitive MCS level for each Modulation order. This means for MS equipments and CTC mode, 64-QAM requirements shall be applied to 64-QAM 5/6 and not to 64-QAM 3/4.] |   |           |  |  |

#### 4.2.4 Frequency and Time Synchronization Requirements

**Table 86. Frequency and Time Synchronization Requirements**

| Item | Requirement                  | Reference  | Values Specified     | Values Required       | Comment  |
|------|------------------------------|------------|----------------------|-----------------------|--|
| 1.   | MS UL symbol timing accuracy | 8.4.10.1.2 | $\leq \pm (T_b/8)/4$ | $\leq \pm (T_b/32)/4$ | This requirement includes only the timing error due to MS component and not the effect of inaccuracy of the BS ranging feedback. |

|    |   |            |                                      |                                      |  |
|----|---|------------|--------------------------------------|--------------------------------------|--|
| 2. | BS reference frequency accuracy                           | 8.4.14.1   | $\leq \pm 2 \cdot 10^{-6}$           | $\leq \pm 2 \cdot 10^{-6}$           |  |
| 3. | BS to BS frequency synchronization accuracy for Hand Over | 6.3.2.3.47 | 1% of OFDMA subcarrier spacing       | 1% of OFDMA subcarrier spacing       |  |
| 4. | MS to BS frequency synchronization tolerance              | 8.4.14.1   | $\leq 2\%$ of the subcarrier spacing | $\leq 2\%$ of the subcarrier spacing |  |

1  
2

## 5. MAC Profile

### 5.1 Profiles of BS and MS

#### 5.1.1 PHS

**Table 87. PHS**

| Item | Description | Reference                   | Status | BS Required | MS Required | Comment |
|------|-------------|-----------------------------|--------|-------------|-------------|---------|
| 1    | PHS         | 5.2.3<br>5.2.3.1<br>5.2.3.2 | o      | Y           | Y           |         |

#### 5.1.2 CS Options

**Table 88. Convergence Sublayer Options**

| Item | Description                      | Reference       | Status | BS Required | MS Required | Comment   |
|------|----------------------------------|-----------------|--------|-------------|-------------|---|
| 1.   | Packet, IPv4                     | 5.2.6, 11.13.19 | oi     | Y           | Y           |   |
| 2.   | Packet, IPv6                     | 5.2.6, 11.13.19 | oi     | Y           | Y           |   |
| 3.   | Packet, 802.3/Ethernet           | 5.2.4, 11.13.19 | oi     | IO-ETH1     | N*          | * For MS, not required for WiMAX certified label, only optionally certified |
| 4.   | Packet, 802.1Q VLAN              | 5.2.5, 11.13.19 | oi     | N           | N           |   |
| 5.   | Packet, IPv4 over 802.3/Ethernet | 5.2.6, 11.13.19 | oi     | IO-ETH2     | N*          | * For MS, not required for WiMAX certified label, only optionally certified |
| 6.   | Packet, IPv6 over 802.3/Ethernet | 5.2.6, 11.13.19 | oi     | IO-ETH3     | N*          | * For MS, not required for WiMAX certified label, only optionally certified |
| 7.   | Packet, IPv4 over 802.1Q VLAN    | 5.2.6, 11.13.19 | oi     | N           | N           |   |
| 8.   | Packet, IPv6 over 802.1Q VLAN    | 5.2.6, 11.13.19 | oi     | N           | N           |   |
| 9.   | ATM                              | 5.2.6, 11.13.19 | oi     | N           | N           |   |

| Item | Description  | Reference       | Status | BS Required | MS Required | Comment |
|------|--|-----------------|--------|-------------|-------------|---------|
| 10.  | Packet, IPv4 with Header Compression (ROHC)                      | 5.2.6, 11.13.19 | oi     | Y           | Y           |         |
| 11.  | Packet, IPv4 with Header Compression (ECRTP)                     | 5.2.6, 11.13.19 | oi     | N           | N           |         |
| 12.  | Packet, IPv6 with Header Compression (ROHC)                      | 5.2.6, 11.13.19 | oi     | Y           | Y           |         |
| 13.  | Packet, IPv6 with Header Compression (ECRTP)                     | 5.2.6, 11.13.19 | oi     | N           | N           |         |
| 14.  | Packet, IPv4 over 802.3/Ethernet with Header Compression (ROHC)  | 5.2.6, 11.13.19 | oi     | N           | N           |         |
| 15.  | Packet, IPv4 over 802.3/Ethernet with Header Compression (ECRTP) | 5.2.6, 11.13.19 | oi     | N           | N           |         |
| 16.  | Packet, IPv6 over 802.3/Ethernet with Header Compression (ROHC)  | 5.2.6, 11.13.19 | oi     | N           | N           |         |
| 17.  | Packet, IPv6 over 802.3/Ethernet with Header Compression (ECRTP) | 5.2.6, 11.13.19 | oi     | N           | N           |         |
| 18.  | Packet, IPv4 over 802.1Q VLAN with Header Compression (ROHC)     | 5.2.6, 11.13.19 | oi     | N           | N           |         |
| 19.  | Packet, IPv4 over 802.1Q VLAN with Header Compression (ECRTP)    | 5.2.6, 11.13.19 | oi     | N           | N           |         |

| Item | Description  | Reference       | Status | BS Required | MS Required | Comment |
|------|--|-----------------|--------|-------------|-------------|---------|
| 20.  | Packet, IPv6 over 802.1Q VLAN with Header Compression (ROHC)   | 5.2.6, 11.13.19 | oi     | N           | N           |         |
| 21.  | Packet, IPv6 over 802.1Q VLAN with Header Compression (EC RTP) | 5.2.6, 11.13.19 | oi     | N           | N           |         |

Note: At least one of options shall be implemented.

### 5.1.3 MAC PDU formats

**Table 89. MAC PDU Formats**

| Item | Description                               | Reference            | Status | BS Required | MS Required | Comment   |
|------|---|----------------------|--------|-------------|-------------|---|
| 1    | Reassembly at Rx                          | 6.3.2.2.1, 6.3.3.3.2 | m      | Y           | Y           |   |
| 2    | Fragmentation at Tx                       | 6.3.2.2.1, 6.3.3.3.2 | m      | Y           | Y           | Capability is mandatory.  |
| 3    | Packing of fixed-length MAC SDUs          | 6.3.2.2.3, 6.3.3.4   | o      | N           | N           |   |
| 4    | Packing of variable-length MAC SDUs at MS | 6.3.2.2.3, 6.3.3.4   | o      | N/A         | Y           | Unpacking is mandatory. Refer 6.3.3.4.  |
| 5    | Packing ARQ Feedback Payload              | 6.3.3.4.3            | o      | Y           | Y           | “ARQ Feedback Payload is treated like any other payload” (Refer to 6.3.3.4.3 of [1])<br>Unpacking of ARQ Feedback Payload is mandatory if ARQ implemented/enabled at the connection |
| 6    | Extended subheader support                | 6.3.2.2.7, 11.7.5    | o      | Y           | Y           | Extended subheader support is negotiated  |

| Item | Description   | Reference | Status | BS Required | MS Required | Comment   |
|------|---|-----------|--------|-------------|-------------|---|
| 7    | Capability of receiving bandwidth requests using Grant management Subheader | 6.3.2.2.2 | o      | Y           | N/A         |   |
| 8    | 3-bit FSN support   |           | o      | N           | N           | See [2] negotiated during SBC, 11 bits is default |

## 5.1.4 MAC Support of PHY layer

### 5.1.4.1 Feedback Mechanism

**Table 90. Feedback Mechanism**

| Item | Description                           | Reference                 | Status | BS Required | MS Required | Comment |
|------|---------------------------------------|---------------------------|--------|-------------|-------------|---------|
| 1.   | Feedback Header                       | 6.3.2.1.2.2.1             | o      | Y           | Y           |         |
| 2.   | FAST-FEEDBACK allocation subheader    | 6.3.2.2.6                 | o      | N           | N           |         |
| 3.   | MIMO mode feedback extended subheader | 8.4.5.4.10.3, 6.3.2.2.7.4 | o      | N           | N           |         |
| 4.   | Feedback request extended subheader   | 6.3.2.2.7.3               | o      | N           | N           |         |
| 5.   | Mini-Feedback extended subheader      | 6.3.2.2.7.6               | o      | N           | N           |         |
| 6.   | Feedback Polling IE                   | 8.4.5.4.28                | o      | Y           | Y           |         |
| 7.   | PHY channel report header             | 6.3.2.1.2.1.5             | o      | N           | N           |         |
| 8.   | UL Tx Power Report extended subheader | 6.3.2.2.7.5               | o      | N           | N           |         |

## 5.1.5 Multicast connection

**Table 91. Multicast Connection**

| Item | Description                  | Reference | Status | BS Required | MS Required | Comment |
|------|------------------------------|-----------|--------|-------------|-------------|---------|
| 1    | Multicast traffic connection | 6.3.13    | o      | Y           | Y           |         |

## 5.1.6 Network Entry



**Table 92. Network Entry**

| Item | Description           | Reference                                     | Status | BS Required | MS Required | Comment                     |
|------|-----------------------|---|--------|-------------|-------------|-----------------------------|
| 1    | SS management support | 6.3.9.9.1, 6.3.9.10-12, 6.3.2.3.28-29, 11.7.2 | o      | N           | N           |                             |
| 2    | IP management mode    | 11.7.3  | o      | N           | N           | Conditional based on item 1 |

### 5.1.7 ARQ

**Table 93. ARQ**

| Item | Description   | Reference        | Status | BS Required | MS Required | Comment   |
|------|---|------------------|--------|-------------|-------------|---|
| 1    | ARQ implementation                                      | 6.3.4            | o      | Y           | Y           | All items below are conditional dependently on ARQ implementation |
| 2    | ARQ ACK type 0 - Selective ACK entry                    | 6.3.4.2, 11.7.23 | o      | N           | N           | Negotiable over REG-REQ/RSP (11.7.23 ARQ-ACK Type)                |
| 3    | ARQ ACK type 1 - Cumulative ACK entry                   | 6.3.4.2, 11.7.23 | o      | Y           | Y           | Negotiable over REG-REQ/RSP (11.7.23 ARQ-ACK Type)                |
| 4    | ARQ ACK type 2 - Cumulative with Selective ACK entry    | 6.3.4.2, 11.7.23 | o      | Y           | Y           | Negotiable over REG-REQ/RSP (11.7.23 ARQ-ACK Type)                |
| 5    | ARQ ACK type 3 - Cumulative ACK with Block Sequence ACK | 6.3.4.2, 11.7.23 | o      | Y           | Y           | Negotiable over REG-REQ/RSP (11.7.23 ARQ-ACK Type)                |

### 5.1.8 MAC support for H-ARQ

**Table 94. MAC Support for HARQ**

| Item | Description  | Reference | Status | BS Required | MS Required | Comment  |
|------|--------------|-----------|--------|-------------|-------------|--|
| 1.   | HARQ Support | 6.3.17    | o      | Y           | Y           | All items below are conditional dependently on HARQ support. |

| Item | Description   | Reference        | Status | BS Required | MS Required | Comment          |
|------|---|------------------|--------|-------------|-------------|------------------|
| 2.   | HARQ Buffer Negotiation Capability                          | 11.8.3.7.19      | o      | Y           | Y           |                  |
| 3.   | HARQ Channel mapping  | 6.3.17, 11.13.32 | o      | Y           | Y           | Determined by BS |
| 4.   | Capability of DL HARQ channels Number negotiation           | 11.8.3.7.2       | o      | Y           | Y           |                  |
| 5.   | Capability of UL HARQ channels Number negotiation           | 11.8.3.7.3       | o      | Y           | Y           |                  |
| 6.   | Capability of HARQ ACK delay negotiation in DL transmission | 11.4.1           | o      | Y           | Y           |                  |
| 7.   | Capability of HARQ ACK delay negotiation in UL transmission | 11.3.1           | o      | Y           | Y           |                  |
| 8.   | PDU SN extended subheader for HARQ reordering               | 11.13.33         | o      | Y           | Y           |                  |

## 5.1.9 QoS

**Table 95. QoS**

| Item | Description                                  | Reference    | Status | BS Required | MS Required | Comment |
|------|--|--------------|--------|-------------|-------------|---------|
| 1    | Dynamic service flow creation - BS-initiated | 6.3.14.7.1.2 | m      | Y           | Y           |         |
| 2    | Dynamic service flow creation -SS-initiated  | 6.3.14.7.1.1 | o      | Y           | Y           |         |
| 3    | Dynamic service flow change - BS-initiated   | 6.3.14.9.4.2 | m      | Y           | Y           |         |
| 4    | Dynamic service flow change -SS-initiated    | 6.3.14.9.4.1 | o      | Y           | Y           |         |
| 5    | Dynamic service flow deletion -BS-initiated  | 6.3.14.9.5.2 | m      | Y           | Y           |         |
| 6    | Dynamic service flow deletion – SS-initiated | 6.3.14.9.5.1 | o      | Y           | Y           |         |

## 5.1.10 Data delivery services for mobile network

**Table 96. Data Delivery Services for Mobile Network**

| Item | Description                                       | Reference               | Status | BS Required | MS Required | Comment |
|------|---|-------------------------|--------|-------------|-------------|---------|
| 1    | Unsolicited Grant service (UGS)                   | 6.3.20.1.1, 6.3.5.2.1   | o      | Y           | Y           |         |
| 2    | Real-Time Variable Rate (RT-VR) Service           | 6.3.20.1.2, 6.3.5.2.2   | o      | Y           | Y           |         |
| 3    | Non-Real-Time Variable Rate (NRT-VR) Service      | 6.3.20.1.3, 6.3.5.2.3   | o      | Y           | Y           |         |
| 4    | Best Effort (BE) Service                          | 6.3.20.1.4, 6.3.5.2.4   | o      | Y           | Y           |         |
| 5    | Extended Real-Time Variable Rate (ERT-VR) service | 6.3.20.1.5, 6.3.5.2.2.1 | o      | Y           | Y           |         |

#### 5.1.11 Request-Grant mechanism

**Table 97. Request-Grant Mechanism**

| Item | Description  | Reference     | Status | BS Required | MS Required | Comment   |
|------|--|---------------|--------|-------------|-------------|---|
| 1.   | Incremental bandwidth request using BW request header    | 6.3.6.1       | o      | Y           | Y           |   |
| 2.   | Aggregate bandwidth request using BW request header      | 6.3.6.1       | pm     | Y           | Y           | [2] mistakenly does not request periodically to transmit aggregate bandwidth requests |
| 3.   | Bandwidth request using Grant Management Subheader       | 6.3.2.2.2     | o      | Y           | Y           |   |
| 4.   | Multicast Polling Assignment Request / response          | 6.3.2.3.18-19 | o      | N           | N           |   |
| 5.   | Request-Grant mechanism combined with CINR report        | 6.3.2.1.2.1.3 | o      | N           | N           |   |
| 6.   | Request-Grant mechanism combined with UL Tx power report | 6.3.2.1.2.1.2 | o      | Y           | Y           |   |

|    |  |               |   |   |   |  |
|----|--|---------------|---|---|---|--|
| 7. | CQICH allocation request using CQICH allocation request header | 6.3.2.1.2.1.4 | o | Y | Y |  |
|----|--|---------------|---|---|---|--|

## 5.1.12 Neighbor Advertisement

**Table 98. Neighbor Advertisement**

| Item | Description   | Reference                 | Status | BS Required | MS Required | Comment   |
|------|---|---------------------------|--------|-------------|-------------|---|
| 1.   | Neighbor Advertisement  | 6.3.2.3.47                | o      | Y           | Y           | All items below are conditional dependently on Neighbor Advertisement implementation  |
| 2.   | Support BS index at the BS (Use BS index instead of BSID) in Scan/HO related messages, as numbered in MOB_NBR-ADV | 6.3.2.3.48-51, 6.3.2.3.53 | o      | Y           | N/A         | Applicable to MOB_SCN-REQ/RSP, MOB_SCAN-REPORT, MOB_xxHO-REQ/RSP<br>BS may decide not to use the index                        |
| 3.   | Support BS index at the MS (Use BS index instead of BSID) in Scan/HO related messages, as numbered in MOB_NBR-ADV | 6.3.2.3.48-51, 6.3.2.3.53 | pm     | N/A         | Y           | Applicable to MOB_SCN-REQ/RSP, MOB_SCAN-REPORT, MOB_xxHO-REQ/RSPas BS may decide to use the index while MS has to support it. |

## 5.1.13 Scanning and Association

### 5.1.13.1 Scanning

**Table 99. Scanning**

| Item | Description                      | Reference     | Status | BS Required | MS Required | Comment |
|------|----------------------------------|---------------|--------|-------------|-------------|---------|
| 1.   | Scanning for cell selection (HO) | 6.3.2.3.48-49 | o      | Y           | Y           |         |

|    |  |                              |   |     |   |  |
|----|--|------------------------------|---|-----|---|--|
| 2. | MS Requests Scanning Interval Allocations from BS    | 6.3.2.3.48-49<br>6.3.21.1.2  | o | Y   | Y | BS shall respond to MOB_SCN-REQ message from mobile. |
| 3. | Unsolicited Scanning Interval Allocation by BS       | 6.3.2.3.48-49,<br>6.3.21.1.2 | o | Y   | Y |  |
| 4. | Event Triggered Scanning based on serving BS metrics | 6.3.21.1.2                   | o | Y   | Y |  |
| 5. | MS autonomous neighbor cell scanning                 | 8.4.13.1.3                   | o | N/A | Y |  |

### 5.1.13.2 Scan Reporting Type Support

**Table 100. Scan Reporting Type Support**

| Item | Description  | Reference             | Status | BS Required | MS Required | Comment |
|------|--|-----------------------|--------|-------------|-------------|---------|
| 1.   | Periodic reporting as indicated in MOB_SCN-RSP message | 6.3.2.3.49,<br>11.4.1 | o      | Y           | Y           |         |
| 2.   | Event triggered reporting based on metric conditions   | 6.3.2.3.49,<br>11.4.1 | o      | Y           | Y           |         |

### 5.1.13.3 Association

**Table 101. Association**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
|      |             |           |        |             |             |         |

|    |   |                        |   |   |   |  |
|----|---|------------------------|---|---|---|--|
| 1. | Support for association during scanning                       | 6.3.21.1.3, 6.3.2.3.51 | o | N | N | It is recommended to implement the following capabilities for MS: When switching to a different Frequency Assignment, the MS should be capable of independently (without ranging) perform timing, power, and frequency adjustments based on both downlink reception quality ("open loop ranging") and information in the DCD/UCD of the target BS. |
| 2. | Support "Ranging Parameters Validity Time" Indication (by MS) | 11.20                  | o | N | N |  |

#### 5.1.13.4 Association Type Support

**Table 102. Association Type Support**

| Item | Description                                 | Reference               | Status | BS Required | MS Required | Comment  |
|------|---|-------------------------|--------|-------------|-------------|--|
| 1.   | Uncoordinated Association (Level 0)         | 6.3.21.1.3.1 and 11.8.8 | o      | N           | N           | Conditioned on the support of association  |
| 2.   | Coordinated Association (level 1)           | 6.3.21.1.3.2 and 11.8.8 | o      | N           | N           | Conditioned on the support of association  |
| 3.   | NW Assisted Association Reporting (level 2) | 6.3.21.1.3.3 and 11.8.8 | o      | N           | N           | Conditioned on the support of association This feature includes Reporting of Association Result. |

|    |                      |                       |   |   |   |   |
|----|----------------------|-----------------------|---|---|---|---|
| 4. | Directed Association | 6.3.21.1.3,<br>11.8.8 | o | N | N | Conditioned on the support of association |
|----|----------------------|-----------------------|---|---|---|---|

### 5.1.13.5 *HO/Scan/Report Trigger Metrics*

**Table 103. HO/Scan/Report Trigger Metrics**

| Item | Description         | Reference             | Status | BS Required | MS Required | Comment                                 |
|------|---------------------|-----------------------|--------|-------------|-------------|---|
| 1.   | Mean BS CINR        | 6.3.2.3.53,<br>11.8.7 | o      | Y           | Y           | Conditioned by HO and Scanning support. |
| 2.   | Mean BS RSSI        | 6.3.2.3.53,<br>11.8.7 | o      | Y           | Y           | Conditioned by HO and Scanning support  |
| 3.   | Relative Rx Delay   | 6.3.2.3.53,<br>11.8.7 | o      | N           | N           | Conditioned by HO and Scanning support  |
| 4.   | BS Round Trip Delay | 6.3.2.3.53,<br>11.8.7 | o      | Y           | Y           | Conditioned by HO and Scanning support  |

### 5.1.14 **MAC layer HO procedures**

**Table 104. MAC Layer HO Procedures**

| Item | Description                             | Reference               | Status | BS Required | MS Required | Comment                                      |
|------|---|-------------------------|--------|-------------|-------------|--|
| 1.   | General HO Support                      | 6.3.21.2,<br>6.3.2.3.55 | o      | Y           | Y           | Following items are conditioned by this item |
| 2.   | HO initiated by MS support at MS side   |                         | oi     | N/A         | Y           |  |
| 3.   | HO initiated by MS support at BS side   |                         | pm     | Y           | N/A         |  |
| 4.   | HO initiated by BS support at MS side , |                         | oi     | N/A         | Y           |  |
| 5.   | HO initiated by BS support at BS side   | 6.3.21.2.2              | o      | Y           | N/A         |  |
| 6.   | HO Indication                           | 6.3.21.2.5              | o      | Y           | Y           |  |
| 7.   | Cancellation of HO                      | 6.3.21.2.3              | o      | Y           | Y           | Conditioned by support of HO Indication      |
| 8.   | Metric Triggered HO Requests            | 11.1.7 (Table 348g)     | o      | Y           | Y           |  |

|     |   |                           |   |   |   |  |
|-----|---|---------------------------|---|---|---|--|
| 9.  | Resource Retention Support  | 6.3.2.3.52,<br>6.3.2.3.54 | o | Y | Y |  |
| 10. | CDMA HO Ranging   | 6.3.10.3.3                | o | Y | Y |  |
| 11. | HO_ID support   | 6.3.2.3.52,<br>6.3.2.3.54 | o | Y | Y |  |
| 12. | Support negotiating of "HO authorization policy" during HO (i.e. between BSs) | 6.3.2.3.52,<br>6.3.2.3.54 | o | Y | Y | Using MOB_BSHO-REQ/RSP<br>Does not request support of specific policy, just capability of negotiating. |

### 5.1.15 HO Optimization

**Table 105. HO Optimization**

| Item | Description   | Reference                         | Status | BS Required | MS Required | Comment   |
|------|---|-----------------------------------|--------|-------------|-------------|---|
| 1.   | HO Optimization Support   | 6.3.2.3.6,<br>6.3.21.2.7,<br>11.6 | o      | Y           | Y           | 1. HO Optimization requires network support<br>2. All further features are conditioned by this item |
| 2.   | Support Omission of SBC-REQ management messages                           | 6.3.2.3.6,<br>6.3.21.2.7,<br>11.6 | o      | Y           | Y           |   |
| 3.   | Support Omission of PKM Authentication phase except TEK Phase             | 6.3.2.3.6,<br>6.3.21.2.7,<br>11.6 | o      | Y           | Y           |   |
| 4.   | Support Omission of PKM TEK creation phase during re-entry processing     | 6.3.2.3.6,<br>6.3.21.2.7,<br>11.6 | o      | Y           | Y           |   |
| 5.   | Support of Network Address Acquisition at secondary management connection | 6.3.2.3.6,<br>6.3.21.2.7,<br>11.6 | o      | N           | N           | Meaningful only for managed MS.   |
| 6.   | Support of Time of Day Acquisition at secondary management connection     | 6.3.2.3.6,<br>6.3.21.2.7,<br>11.6 | o      | N           | N           | Meaningful only for managed MS.   |



| Item | Description   | Reference                   | Status | BS Required | MS Required | Comment  |
|------|---|-----------------------------|--------|-------------|-------------|--|
| 7.   | Support of TFTP Phase at secondary management connection  | 6.3.2.3.6, 6.3.21.2.7, 11.6 | o      | N           | N           | Meaningful only for managed MS.                                    |
| 8.   | Support "Full State Sharing" – No exchange of network re-entry messages after ranging before resuming normal operations | 6.3.2.3.6, 6.3.21.2.7, 11.6 | o      | Y           | Y           |  |
| 9.   | Notifying MS of DL data Pending   | 6.3.2.3.6, 6.3.21.2.7, 11.6 | o      | N           | N           |  |
| 10.  | Unsolicited SBC-RSP management message with updated capabilities information  | 6.3.2.3.6, 6.3.21.2.7, 11.6 | o      | Y           | Y           |  |
| 11.  | Unsolicited SBC- RSP message in same frame as RNG-RSP   | 6.3.2.3.6, 6.3.21.2.7       | o      | N           | N           |  |
| 12.  | Support SBC- RSP TLVs as part of RNG-RSP message  | 11.6                        | o      | Y           | Y           |  |
| 13.  | Support Omission of REG-REQ during NW reentry   | 6.3.2.3.6, 6.3.21.2.7, 11.6 | o      | Y           | Y           |  |
| 14.  | Unsolicited REG-RSP with updated capabilities information   | 6.3.2.3.6, 6.3.21.2.7, 11.6 | o      | Y           | Y           |  |
| 15.  | Unsolicited REG-RSP in same frame as RNG-RSP message  | 6.3.2.3.6, 6.3.21.2.7       | o      | N           | N           |  |
| 16.  | Support REG-RSP TLV as part of RNG-RSP message  | 11.6                        | o      | Y           | Y           |  |
| 17.  | Support of ARQ continuation using SN report header after NW re-entry  | 6.3.2.3.6, 6.3.21.2.7, 11.6 | o      | Y           | Y           | Requires support of SDU SN extended subheader and SN_REPORT header |

| Item | Description  | Reference                | Status | BS Required | MS Required | Comment |
|------|--|--------------------------|--------|-------------|-------------|---------|
| 18.  | Support continuation of non-ARQ connection using SDU SN extended sub-header before handover and using SN report header after NW re-entry |                          |        | Y           | Y           |         |
| 19.  | OFDMA Fast Ranging IE  | 8.4.5.4.21<br>6.3.21.2.4 | o      | Y           | Y           |         |
| 20.  | Support sending Bandwidth Request header with zero BR as a notification of MS's successful re-entry registration                         | 6.3.21.2.7,<br>11.6      | o      | Y           | Y           |         |
| 21.  | Support sending at BS and receiving at MS traffic IP address refresh bit   | 11.6                     | o      | Y           | Y           |         |

#### 5.1.16 CID and SAID Update

CID update encodings (11.7.9) and SAID update encodings (11.7.18) may be used in RNG-RSP for reestablishment of connections.

**Table 106. CID and SAID Update**

| Item | Description                              | Reference    | Status | BS Required | MS Required | Comment |
|------|--|--------------|--------|-------------|-------------|---------|
| 1.   | CID update from BS by RNG-RSP            | 11.7.9, 11.6 | o      | Y           | N/A         |         |
| 2.   | CID update in MS by RNG-RSP              | 11.7.9       | pm     | N/A         | Y           |         |
| 3.   | CID update from BS by REG-RSP            | 11.7.9       | o      | Y           | N/A         |         |
| 4.   | CID update in MS by REG-RSP              | 11.7.9       | pm     | N/A         | Y           |         |
| 5.   | Compressed CID update from BS by RNG-RSP | 11.7.9.1     | o      | Y           | N/A         |         |
| 6.   | Compressed CID update in MS by RNG-RSP   | 11.7.9.1     | pm     | N/A         | Y           |         |

|     |  |               |    |     |     |  |
|-----|--|---------------|----|-----|-----|--|
| 7.  | Compressed CID update from BS by REG-RSP | 11.7.9.1      | o  | Y   | N/A |  |
| 8.  | Compressed CID update in MS by REG-RSP   | 11.7.9.1      | pm | N/A | Y   |  |
| 9.  | SAID update from BS by RNG-RSP           | 11.7.17, 11.6 | o  | Y   | N/A |  |
| 10. | SAID update in MS by RNG-RSP             | 11.7.17, 11.6 | pm | N/A | Y   |  |
| 11. | SAID update from BS by REG-RSP           | 11.7.17, 11.6 | o  | N   | N/A |  |
| 12. | SAID update in MS by REG-RSP             | 11.7.17, 11.6 | pm | N/A | N   |  |
| 13. | SAID update from BS by SA-TEK-RSP        | 11.7.20       | o  | Y   | N/A |  |
| 14. | SAID update in MS by SA-TEK-RSP          | 11.7.20       | o  | N/A | Y   |  |

### 5.1.17 Fast BS Switching

**Table 107. Fast Base Station Switching**

| Item | Description  | Reference    | Status | BS Required | MS Required | Comment  |
|------|--|--------------|--------|-------------|-------------|--|
| 1.   | General FBSS capability  | 6.3.21.3.2-4 | o      | N           | N           | All further features in the table are conditioned by this item   |
| 2.   | Diversity set Update initiated by MS   | 6.3.21.3.3   | oi     | N           | N           | If FBSS supported, Diversity set update is mandatory   |
| 3.   | Diversity set Update initiated by BS   | 6.3.21.3.3   | oi     | N           | N           |  |
| 4.   | Anchor BS Update using HO messages   | 6.3.21.3.4   | oi     | N           | N           | MS and BS supporting MDHO or FBSS shall implement at least one of the two mechanisms to perform Anchor BS update.      |
| 5.   | Anchor BS Update using fast feedback channel   | 6.3.21.3.4   | oi     | N           | N           |  |
| 6.   | MS implementation of Fast feedback channel pre-allocated by MOB_BSHO-RSP or MOB_BSHO-REQ | 6.3.21.3.4.2 | pm     | N           | N           | Fast-feedback channel shall be allocated by one of the following three methods, if fast-feedback channel is supported. |

| Item | Description  | Reference    | Status | BS Required | MS Required | Comment                                       |
|------|--|--------------|--------|-------------|-------------|---|
| 7.   | BS implementation of Fast feedback channel pre-allocated by MOB_BSHO-RSP or MOB_BSHO-REQ | 6.3.21.3.4.2 | oi     | N           | N           |   |
| 8.   | MS implementation of Fast feedback channel allocation by Anchor_Switch_IE                | 6.3.21.3.4.2 | pm     | N           | N           |   |
| 9.   | BS implementation of Fast feedback channel allocation by Anchor_Switch_IE                | 6.3.21.3.4.2 | oi     | N           | N           |   |
| 10.  | MS implementation of Fast feedback channel allocation by UL_MAP of new Anchor BS         | 6.3.21.3.4.2 | pm     | N           | N           |   |
| 11.  | BS implementation of Fast feedback channel allocation by UL_MAP of new Anchor BS         | 6.3.21.3.4.2 | oi     | N           | N           |   |
| 12.  | Monitoring of multiple MAPs from active BSs  | 11.7.11      | o      | N           | N           |   |
| 13.  | MS assisted coordination of DL transmission using SN report                              | 6.3.21.3.5   | o      | N           | N           |   |
| 14.  | Cancellation of Diversity set update by MOB_HO-IND                                       | 6.3.21.3.3   | o      | N           | N           |   |
| 15.  | Rejection of Diversity set update by MOB_HO-IND  | 6.3.21.3.3   | o      | N           | N           |   |
| 16.  | SN report header   | 6.3.2.1.6    | o      | N           | N           | Conditional, dependent on SN feedback support |
| 17.  | SDU SN extended subheader  | 6.3.2.2.7.1  | o      | N           | N           | Conditional, dependent on SN feedback support |

| Item | Description                          | Reference   | Status | BS Required | MS Required | Comment   |
|------|--------------------------------------|-------------|--------|-------------|-------------|---|
| 18.  | SN request extended subheader        | 6.3.2.2.7.7 | o      | N           | N           |   |
| 19.  | SN feedback support                  | 11.13.28    | o      | N           | N           | No text on optionality in standard, but it is negotiated on a per-connection basis in DS(A/C)-REQ and disabled by default. So it is effectively optional. |
| 20.  | MS autonomous neighbor cell scanning | 8.4.13.1.3  | m      | N           | N           | This feature is conditioned by implementation of FBSS or MDHO.  |

## 5.1.18 Macro Diversity Handover

**Table 108. Macro Diversity Handover**

| Item | Description                                  | Reference                | Status | BS Required | MS Required | Comment  |
|------|--|--------------------------|--------|-------------|-------------|--|
| 1.   | General MDHO capability                      | 6.3.21.3.1, 6.3.21.3.3-4 | o      | N           | N           | Status for all following features is conditional, based on implementation of MDHO capability. Network support may be required to support this feature. |
| 2.   | Diversity set Update initiated by MS         | 6.3.21.3.3               | oi     | N           | N           | If MDHO supported, Diversity set update is mandatory.  |
| 3.   | Diversity set Update initiated by BS         | 6.3.21.3.3               | oi     | N           | N           | If MDHO supported, Diversity set update is mandatory.  |
| 4.   | Anchor BS Update using HO messages           | 6.3.21.3.4               | oi     | N           | N           | If MDHO supported, at least one of the items 4 and 5 shall be implemented.   |
| 5.   | Anchor BS Update using fast feedback channel | 6.3.21.3.4.2             | oi     | N           | N           | If MDHO supported, at least one of the items 4 and 5 shall be implemented.   |

| Item | Description   | Reference   | Status | BS Required | MS Required | Comment   |
|------|---|---|--------|-------------|-------------|---|
| 6.   | MOB_BSHO-RSP for acknowledgement for Diversity set update request from MS   | 6.3.21.3.1  | m      | N           | N           |   |
| 7.   | MDHO DL soft Combining supported with monitoring single MAP from anchor BS  | 8.4.5.3.14<br>8.4.5.3.15<br>8.4.5.4.18<br>8.4.5.4.19<br>11.7.11 | o      | N           | N           |   |
| 8.   | MDHO DL RF Combining supported with monitoring MAPs from all active BS  | 8.4.5.3.14<br>8.4.5.3.15<br>8.4.5.4.18<br>8.4.5.4.19<br>11.7.11 | o      | N           | N           |   |
| 9.   | MDHO DL soft combining supported with monitoring MAPs from all active BS  | 8.4.5.3.14<br>8.4.5.3.15<br>8.4.5.4.18<br>8.4.5.4.19<br>11.7.11 | o      | N           | N           |   |
| 10.  | Recommended BS list in MOB_MSHO-REQ   | 6.3.21.3.3  | po     | N           | N           | MS may provide a list, but BS is not obligated to follow the list.  |
| 11.  | Recommended BS list in MOB_BSHO-RSP   | 6.3.21.3.3  | po     | N           | N           | BS may provide a list ("the BSs may provide a recommended list of BSs to be included in the MS' Diversity set."), but MS is not obligated to follow the list. |
| 12.  | MS implementation of Fast feedback channel pre-allocated at the new Anchor BS by MOB_BSHO-RSP or MOB_BSHO-REQ when a BS is added to the Diversity set | 6.3.21.3.4.2  | pm     | N           | N           | At least one of the following three methods of fast-feedback channel allocation shall be implemented, if fast-feedback channel is supported.                  |

| Item | Description   | Reference    | Status | BS Required | MS Required | Comment  |
|------|---|--------------|--------|-------------|-------------|--|
| 13.  | BS implementation of Fast feedback channel pre-allocated at the new Anchor BS by MOB_BSHO-RSP or MOB_BSHO-REQ when a BS is added to the Diversity set | 6.3.21.3.4.2 | oi     | N           | N           |  |
| 14.  | MS implementation of Fast feedback channel allocation by Anchor_Switch_IE   | 6.3.21.3.4.2 | pm     | N           | N           |  |
| 15.  | BS implementation of Fast feedback channel allocation by Anchor_Switch_IE   | 6.3.21.3.4.2 | oi     | N           | N           |  |
| 16.  | MS implementation of Fast feedback channel allocation by UL_MAP of new Anchor BS  | 6.3.21.3.4.2 | pm     | N           | N           |  |
| 17.  | BS implementation of Fast feedback channel allocation by UL_MAP of new Anchor BS  | 6.3.21.3.4.2 | oi     | N           | N           |  |
| 18.  | UL transmission to multiple BS  | 11.7.11      | o      | N           | N           |  |
| 19.  | MS autonomous neighbor cell scanning  | 8.4.13.1.3   | m      | N           | N           | This feature is conditioned by implementation of FBSS or MDHO. |

## 5.1.19 Sleep Mode

**Table 109. Sleep Mode**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
|------|-------------|-----------|--------|-------------|-------------|---------|

| Item | Description   | Reference               | Status            | BS Required | MS Required | Comment   |
|------|---|-------------------------|-------------------|-------------|-------------|---|
| 1.   | Sleep Mode Implementation in MS   | 6.3.20.2                | o                 | N/A         | Y           | For MS, all items below are conditional based on Sleep Mode implementation  |
| 2.   | Power Saving Class type 1 support                                       | 6.3.20.2                | o                 | Y           | Y           |   |
| 3.   | Support of Traffic Indication Message for Power Saving Class type 1     | 6.3.20.2                | o                 | Y           | Y           | Status of following items related to SLPID is conditional, depends on support of TRF-IND. Three alternative ways to wake an MS are 1) to use SLP-RSP message, and 2) to use downlink sleep control extended sub-header. |
| 4.   | Indicating DL traffic by SLPID bit map in TRF-IND                       | 6.3.20.1                | oi                | Y           | Y           | One of the items 4 or 5 shall be implemented. BS may just not use SLPID. BS must support either this or Short Basic CID   |
| 5.   | Indicating DL traffic by SLPID in TRF-IND                               | 6.3.20.1                | oi                | Y           | Y           | BS must support either this or SLPID  |
| 6.   | Support of SLPID at the MS including SLPID_Update TLV in TRF-IND        | 6.3.20.1                | pm                | N/A         | Y           | MS has no way to signal it does not support SLPID   |
| 7.   | Support of SLPID_Update TLV at BS in TRF-IND                            | 6.3.20.1                | o                 | Y           | N/A         |   |
| 8.   | Traffic triggered wakening flag   | 6.3.2.3.44-45, 6.3.20.2 | m (MS) and o (BS) | Y           | Y           |   |
| 9.   | Power Saving Class type 2 support                                       | 6.3.20.3                | o                 | N           | N           |   |
| 10.  | Power Saving Class type 3 support                                       | 6.3.20.4                | o                 | N           | N           |   |
| 11.  | Activation of Power Saving Class by unsolicited SLP-RSP message from BS | 6.3.20.1                | o                 | Y           | Y           |   |



| Item | Description  | Reference                    | Status | BS Required | MS Required | Comment   |
|------|--|------------------------------|--------|-------------|-------------|---|
| 12.  | Activation of Power Saving Class by RNG-RSP message (type 3 only)                          | 6.3.20.4                     | o      | N           | N           |   |
| 13.  | Activation of Power Saving Class by RNG-REQ message with Power_Saving_Class_Parameters TLV | 6.3.2.3.5                    | o      | N           | N           |   |
| 14.  | DL sleep control extended subheader  | 6.3.2.2.7.2                  | o      | Y           | Y           |   |
| 15.  | Bandwidth request and uplink sleep control header  | 6.3.2.1.5                    | o      | Y           | Y           |   |
| 16.  | Support of periodic ranging in sleep mode  | 6.3.20.5                     | pm     | Y           | Y           |   |
| 17.  | DL Traffic indication by RNG-RSP message   | 6.3.20.5                     | o      | N           | N           |   |
| 18.  | MDHO/FBSS diversity set maintenance during sleep mode at MS                                | 6.3.20.6                     | m      | N/A         | N           | Conditioned by support of MDHO/FBSS               |
| 19.  | MDHO/FBSS diversity set maintenance during sleep mode at BS                                | 6.3.20.6                     | m      | N           | N/A         | Conditioned by support of FBSS/MDHO.              |
| 20.  | Sleep mode multicast CID support at MS   | 10.4                         | m      | N/A         | Y           | MS has to support it as BS can use it.            |
| 21.  | Sleep mode multicast CID support at BS   | 10.4                         | o      | Y           | N/A         |   |
| 22.  | MS Support of triggered action indicated by Enabled-Action-Triggered TLV                   | 6.3.20.1, 11.5, 11.6, 11.7.3 | o      | N/A         | Y           |   |
| 23.  | BS Support of triggered action indicated by Enabled-Action-Triggered TLV                   | 6.3.20.1, 11.5, 11.6, 11.7.3 | o      | Y           | N/A         | If MS transmits the TLV, BS has to respond to it. |

### 5.1.20 Idle Mode

**Table 110. Idle Mode**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
|------|-------------|-----------|--------|-------------|-------------|---------|

| Item | Description   | Reference | Status | BS Required | MS Required | Comment  |
|------|---|-----------|--------|-------------|-------------|--|
| 1.   | General Idle Mode functionality   | 6.3.24    | o      | Y           | Y           | All items below are conditional based on Idle Mode implementation  |
| 2.   | Idle mode initiation by DREG-REQ message from MS  | 6.3.24.1  | oi     | Y           | Y           | One of two Idle mode initiation methods is mandatory.  |
| 3.   | Idle Mode initiation by unsolicited DREG-CMD from BS  | 6.3.24.1  | oi     | Y           | Y           |  |
| 4.   | Maintain connection information at BS during Idle Mode initiation process                               | 6.3.24.1  | m      | Y           | Y           |  |
| 5.   | Request for MS to retain service and operational information by DREG-CMD message                        | 6.3.24.1  | m      | Y           | Y           |  |
| 6.   | Request from MS to BS to retain service and operational information by DREG-REQ message                 | 6.3.24.1  | m      | Y           | Y           | Mandatory feature see 6.3.2.3.42;  |
| 7.   | Implementation in MS of the reception of periodic transmission of MS MAC address hash in Paging message | 6.3.24.1  | m      | N/A         | N           | See 6.3.2.3.5-6. The MS may request BS inclusion of MS MAC Address Hash in MOB_PAG-ADV message at regular intervals, regardless of need for notification |
| 8.   | Implementation in BS of Periodic transmission of MS MAC address hash in Paging message for a idle MS    | 6.3.24.1  | o      | N           | N/A         |  |
| 9.   | BS capability of transmitting Broadcast Control Pointer IE  | 6.3.24.5  | o      | Y           | N/A         |  |
| 10.  | MS capability of receiving Broadcast Control Pointer IE   | 6.3.24.5  | m      | N/A         | Y           |  |

| Item | Description   | Reference    | Status | BS Required | MS Required | Comment   |
|------|---|--------------|--------|-------------|-------------|---|
| 11.  | BS Capability of providing dedicated ranging region and ranging code allocation for location update or network entry of MS in Idle Mode<br>6.3.22.8.1 | 6.3.24.8.1   | o      | N           | N/A         |   |
| 12.  | MS Capability of using dedicated ranging region and ranging code allocation for location update or network entry of MS in Idle Mode                   | 6.3.24.8.1   | m      | N/A         | Y           |   |
| 13.  | Paging Group Update at MS   | 6.3.24.9.1.1 | m      | Y           | Y           |   |
| 14.  | Timer Location Update at MS   | 6.3.24.9.1.2 | m      | Y           | Y           |   |
| 15.  | Power Down Location Update at MS  | 6.3.24.9.1.3 | m      | Y           | Y           |   |
| 16.  | MAC Hash Skip Threshold Location Update at MS   | 6.3.24.9.1.4 | m      | N/A         | N           | This is mandatory under the condition that MAC Hash Skip Threshold option is implemented in the MS. This item is conditioned by Item 7 of this table. |
| 17.  | Secure Location Update  | 6.3.24.9.2.1 | o      | Y           | Y           |   |
| 18.  | Un-secure Location Update   | 6.3.24.9.2.2 | m      | Y           | Y           |   |
| 19.  | Paging Preference   | 11.13.27     | pm     | Y           | Y           |   |
| 20.  | Idle mode multicast CID support at MS   | 10.4         | m      | N/A         | Y           | MS has to support it as BS can use it.  |
| 21.  | Idle mode multicast CID support at BS   | 10.4         | o      | Y           | N/A         |   |

### 5.1.21 Expedited Network Re-entry from Idle Mode

**Table 111. Expedited Network Re-entry from Idle Mode**

| Item | Description | Reference | Status | BS Required | MS Required | Comment |
|------|-------------|-----------|--------|-------------|-------------|---------|
|------|-------------|-----------|--------|-------------|-------------|---------|

| Item | Description   | Reference | Status | BS Required | MS Required | Comment                    |
|------|---|-----------|--------|-------------|-------------|----------------------------|
| 1.   | Expedited network re-entry from Idle Mode support   | 6.3.23.9  | o      | Y           | Y           |                            |
| 2.   | Support Omission of SBC-REQ management messages   | 11.6      | o      | Y           | Y           |                            |
| 3.   | Support Omission of PKM Authentication phase except TEK phase   | 11.6      | o      | Y           | Y           |                            |
| 4.   | Support Omission of PKM TEK creation phase during re-entry processing   | 11.6      | o      | Y           | Y           |                            |
| 5.   | Support of Network Address Acquisition at secondary management connection   | 11.6      | o      | N           | N           |                            |
| 6.   | Support of Time of Day Acquisition at secondary management connection   | 11.6      | o      | N           | N           |                            |
| 7.   | Support TFTP Phase at secondary management connection   | 11.6      | o      | N           | N           |                            |
| 8.   | Support "Full State Sharing" - No exchange of network re-entry messages after ranging before resuming normal operations | 11.6      | o      | Y           | Y           |                            |
| 9.   | Notifying MS of DL data pending   | 11.6      | o      | N           | N           | Not relevant to idle mode. |
| 10.  | Unsolicited SBC-RSP management message with updated capabilities information  | 11.6      | o      | Y           | Y           |                            |
| 11.  | Unsolicited SBC-RSP message in same frame as RNG-RSP  | 11.6      | o      | N           | N           |                            |

| Item | Description  | Reference | Status | BS Required | MS Required | Comment |
|------|--|-----------|--------|-------------|-------------|---------|
| 12.  | Support SBC-RSP TLVs as part of RNG-RSP message  | 11.6      | o      | Y           | Y           |         |
| 13.  | Support Omission of REG-REQ during NW re-entry   | 11.6      | o      | Y           | Y           |         |
| 14.  | Unsolicited REG-RSP with updated capabilities information  | 11.6      | o      | Y           | Y           |         |
| 15.  | Unsolicited REG-RSP in same frame as RNG-RSP message   | 11.6      | o      | N           | N           |         |
| 16.  | Support REG-RSP TLV as part of RNG-RSP message   | 11.6      | o      | Y           | Y           |         |
| 17.  | MS send Bandwidth Request header with zero BR as a notification of MS's successful re-entry registration.  | 11.6      | o      | Y           | Y           |         |
| 18.  | MS trigger a higher layer protocol required to refresh its traffic IP address (e.g. DHCP Discover [IETF RFC 2131] or Mobile IPv4 re-registration [IETF RFC 3344]). | 11.6      | o      | Y           | Y           |         |

## 5.1.22 Security

### 5.1.22.1 Authorization Policy Support

**Table 112. Authorization Policy Support**

| Item | Feature                             | Reference | Status | BS Required | MS Required | Comments |
|------|-------------------------------------|-----------|--------|-------------|-------------|----------|
| 1    | 802.16 Authorization policy support | 11.7.8.7  | o      | Y           | Y           |          |

### 5.1.22.2 PKM Version Support

**Table 113. PKM Version Support**

| Item | Description   | Reference | Status | BS Required | MS Required | Comments |
|------|---------------|-----------|--------|-------------|-------------|----------|
| 1.   | PKMv1 Support | 11.8.4.1  | o      | N           | N           |          |
| 2.   | PKMv2 Support | 11.8.4.1  | o      | Y           | Y           |          |

### 5.1.22.3 PKMv2 Authorization policy support – initial network entry

**Table 114. PKMv2 Authorization Policy Support-Initial Network Entry**

| Item | Description   | Reference | Status | BS Required | MS Required | Comments |
|------|---|-----------|--------|-------------|-------------|----------|
| 1.   | No Authorization  | 11.8.4.2  | o      | Y           | Y           |          |
| 2.   | EAP-based authorization   | 11.8.4.2  | o      | Y           | Y           |          |
| 3.   | EAP-based authorization and Authenticated (EIK) EAP-based authorization | 11.8.4.2  | o      | N           | N           |          |
| 4.   | RSA-based authorization   | 11.8.4.2  | o      | N           | N           |          |
| 5.   | RSA-based authorization and Authenticated (EIK) EAP-based authorization | 11.8.4.2  | o      | N           | N           |          |
| 6.   | RSA-based authorization and EAP-based authorization                     | 11.8.4.2  | o      | N           | N           |          |

### 5.1.22.4 PKMv2 Authorization policy support – network re-entry

**Table 115. PKMv2 Authorization Policy Support-Network Re-entry**

| Item | Description             | Reference | Status | BS Required | MS Required | Comments |
|------|-------------------------|-----------|--------|-------------|-------------|----------|
| 1.   | No Authorization        | 11.8.4.2  | o      | Y           | Y           |          |
| 2.   | EAP-based authorization | 11.8.4.2  | o      | Y           | Y           |          |

|    |  |          |   |     |     |  |
|----|--|----------|---|-----|-----|--|
| 3. | EAP-based authorization and Authenticated (EIK)<br>EAP-based authorization | 11.8.4.2 | o | N/A | N/A |  |
| 4. | RSA-based authorization  | 11.8.4.2 | o | N/A | N/A |  |
| 5. | RSA-based authorization and Authenticated (EIK)<br>EAP-based authorization | 11.8.4.2 | o | N/A | N/A |  |
| 6. | RSA-based authorization and EAP-based authorization                        | 11.8.4.2 | o | N/A | N/A |  |

#### 5.1.22.5 **Supported cryptographic suites**

“Cryptographic suites” includes Data encryption, Data authentication, TEK encryption algorithm.

**Table 116. Supported Cryptographic Suites**

| Item | Description  | Reference | Status | BS Required | MS Required | Comments  |
|------|--|-----------|--------|-------------|-------------|---|
| 1.   | No data encryption, no data authentication & 3-DES, 128                | 11.9.14   | o      | Y           | Y           | This cryptographic suite means no encryption and no TEK exchange. |
| 2.   | CBC-Mode 56-bit DES, no data authentication & 3-DES, 128               | 11.9.14   | o      | N           | N           |   |
| 3.   | No data encryption, no data authentication & RSA, 1024                 | 11.9.14   | o      | N           | N           |   |
| 4.   | CBC-Mode 56-bit DES, no data authentication & RSA, 1024                | 11.9.14   | o      | N           | N           |   |
| 5.   | CCM-Mode 128-bit AES, CCM-Mode, 128-bit, ECB mode AES with 128-bit key | 11.9.14   | o      | N           | N           |   |
| 6.   | CCM-Mode 128-bit AES, CCM-Mode, AES Key Wrap with 128-bit key          | 11.9.14   | o      | Y           | Y           |   |

| Item | Description  | Reference | Status | BS Required | MS Required | Comments |
|------|--|-----------|--------|-------------|-------------|----------|
| 7.   | CBC-Mode 128-bit AES, no data authentication, ECB mode AES with 128-bit key      | 11.9.14   | o      | N           | N           |          |
| 8.   | MBS CTR Mode 128 bits AES, no data authentication, AES ECB mode with 128-bit key | 11.9.14   | o      | N           | N           |          |
| 9.   | MBS CTR mode 128 bits AES, no data authentication, AES Key Wrap with 128-bit key | 11.9.14   | o      | N           | N           |          |

#### 5.1.22.6 *Message Authentication Code Mode*

**Table 117. Message Authentication Code Mode**

| Item | Description               | Reference | Status | BS Required | MS Required | Comments |
|------|---------------------------|-----------|--------|-------------|-------------|----------|
| 1.   | No message authentication | 11.8.4.3  | o      | Y           | Y           |          |
| 2.   | HMAC                      | 11.8.4.3  | o      | N           | N           |          |
| 3.   | CMAC                      | 11.8.4.3  | o      | Y           | Y           |          |
| 4.   | 64-bit short-HMAC         | 11.8.4.3  | o      | N           | N           |          |
| 5.   | 80-bit short-HMAC         | 11.8.4.3  | o      | N           | N           |          |
| 6.   | 96-bit short-HMAC         | 11.8.4.3  | o      | N           | N           |          |

#### 5.1.22.7 *Security Association*

**Table 118. Security Association**

| Item | Description           | Reference | Status | BS Required | MS Required | Comments |
|------|-----------------------|-----------|--------|-------------|-------------|----------|
| 1.   | Support of Static SA  | 7.2.1.1   | o      | Y           | Y           |          |
| 2.   | Support of Dynamic SA | 7.2.1.1   | o      | Y           | Y           |          |
| 3.   | Support of Primary SA | 7.2.1.1   | m      | Y           | Y           |          |



### 5.1.22.8 SA Service Type

**Table 119. SA Service Type**

| Item | Description             | Reference | Status | BS Required | MS Required | Comments                   |
|------|-------------------------|-----------|--------|-------------|-------------|----------------------------|
| 1.   | Unicast                 | 11.9.35   | o      | Y           | Y           |                            |
| 2.   | Group multicast service | 11.9.35   | o      | N           | N           |                            |
| 3.   | MBS Services            | 11.9.35   | po     | N           | N           | Conditioned by MBS support |

### 5.1.22.9 EAP Authentication methods

**Table 120. EAP Authentication Methods**

| Item | Description | Reference | BS Required | MS Required | Comments |
|------|-------------|-----------|-------------|-------------|----------|
| 1.   |             |           |             |             |          |

### 5.1.22.10 Certificate profile

**Table 121. Certificate Profile**

| Item | Description                                   | Reference | Status | BS Required | MS Required | Comments   |
|------|---|-----------|--------|-------------|-------------|--|
| 1.   | X.509 MS certificate for device authorization | 7.6       | pm     | N           | N           | Conditioned by usage of PKM v1 or PKM v2 with RSA authentication |
| 2.   | X.509 Manufacturer certificate                | 7.6       | pm     | N           | N           | Conditioned by usage of PKM v1 or PKM v2 with RSA authentication |
| 3.   | X.509 BS Cert Profile                         | 7.6       | pm     | N           | N           | Conditioned by usage of PKM v1 or PKM v2 with RSA authentication |

### 5.1.22.11 Multicast Broadcast Re-keying Algorithm (MBRA)

**Table 122. Service Type**

| Item | Description                      | Reference | Status | BS Required | MS Required | Comments |
|------|----------------------------------|-----------|--------|-------------|-------------|----------|
| 1.   | MBRA for Group multicast service | 7.9       | o      | N           | N           |          |
| 2.   | MBRA for MBS                     | 7.9       | o      | N           | N           |          |

|  |         |  |  |  |  |  |
|--|---------|--|--|--|--|--|
|  | service |  |  |  |  |  |
|--|---------|--|--|--|--|--|

### 5.1.23 MBS

**Table 123. MBS**

| Item | Description                               | Reference  | Status | BS Required | MS Required | Comments  |
|------|---|------------|--------|-------------|-------------|---|
| 1.   | Single-BS-MBS                             | 6.3.13     | o      | N           | N           |   |
| 2.   | Multi-BS-MBS                              | 6.3.13     | o      | IO-MBS      | Y           | Synchronization between BSs of mapping of MBS service flow IDs to CIDs throughout MBS_ZONE. |
| 3.   | Time diversity scheme in Multi-BS-MBS     | 6.3.2.3.57 | o      | N           | N           | Conditioned by item 2   |
| 4.   | Logical channel ID scheme in Multi-BS-MBS | 6.3.2.3.57 | o      | N           | N           | Conditioned by item 2   |
| 5.   | Support for MBS_MAP-IE                    | 6.3.13.2.3 | pm     | IO-MBS      | Y           | This item depends on multi-BS MBS implementation.   |
| 6.   | MS initiated MBS request using DSA-REQ    | 11.13.20   | oi     | IO-MBS      | Y           | At least one is required. Dependent on MBS implementation (either item 1 or item 2).        |
| 7.   | BS initiated MBS request using DSA-REQ    | 11.13.20   | oi     | IO-MBS      | Y           | Dependent on MBS implementation (either item 1 or item 2).                                  |

### 5.1.24 AAS

**Table 124. AAS**

| Item | Description               | Reference | Status | BS Required | MS Required | Comments |
|------|---------------------------|-----------|--------|-------------|-------------|----------|
| 1.   | General AAS functionality | 6.3.7.6   | o      | N           | N           |          |

### 5.1.25 MS's Network Entry issued by BS restart

**Table 125. MS's Network Entry issued by BS restart**

| Item | Description   | Reference        | Status | BS Required | MS Required | Comments |
|------|---|------------------|--------|-------------|-------------|----------|
| 1.   | MS's Network Entry triggered by BS restart counter change | 6.3.9.11, 11.4.1 | o      | Y           | Y           |          |

## 5.1.26 NSP Selection

**Table 126. NSP Selection**

| Item | Description                       | Reference  | Status | BS Required | MS Required | Comments |
|------|-----------------------------------|--|--------|-------------|-------------|----------|
| 1.   | General NSP Selection TLV Support | 802.16g-D6:: 11.1.8.1-2, 11.8.9, 6.3.2.3, 6.3.2.3.63 | o      | Y           | Y           |          |

## 5.2 Parameters

A default, maximum and minimum should be provided for all parameters.

**Table 127. Parameters**

| Item | Description  | Reference | Status | Min | Def | Max | Comments   |
|------|--|-----------|--------|-----|-----|-----|--|
| 1.   | Number of concurrent outstanding PKM exchanges SS is capable of handling at one time.      |           |        | 2   |     |     |  |
| 2.   | Number of transport security associations that SS is capable of supporting simultaneously. |           |        | 2   |     |     |  |
| 3.   | PN window size in PNs  | 11.8.4.4  | pm     | 128 |     |     | Conditional, depends on support of AES in CCM mode |

| Item | Description                | Reference | Status | Min                     | Def | Max  | Comments  |
|------|----------------------------|-----------|--------|-------------------------|-----|--|---|
| 4.   | UCD Transition             |           | BS     | 50msec                  |     |  | The time the BS shall wait after transmitting a UCD message with an incremented Configuration Change Count before issuing a UL-MAP message referring to Uplink_Burst_Profiles defined in that UCD message   |
| 5.   | DCD Transition             |           | BS     | 50msec                  |     |  | The time the BS shall wait after transmitting a DCD message with an incremented Configuration Change Count before issuing a DL-MAP message referring to Downlink_Burst_Profiles defined in that DCD message |
| 6.   | Tproc                      |           | BS     | Tf =<br>Frame<br>length |     |  | Time provided between arrival of the last bit of a UL-MAP at an SS and effectiveness of that map  |
| 7.   | RNG-RSP<br>processing time |           | MS     |                         |     | 2.5 msec<br>from the<br>start of the<br>frame<br>(n+1) were<br>frame<br>n is the frame<br>containing<br>the<br>RNG_RSP. If<br>there is an<br>UL<br>allocation to<br>the<br>SS before the<br>2.5<br>msec in<br>frame n+1<br>then the<br>power<br>change shall<br>be<br>applied<br>before the<br>end of the<br>frame<br>n+1. | Time allowed for an SS following receipt of a RNG-RSP before it is expected to apply the corrections instructed by the BS Minimum value   |

| Item | Description              | Reference | Status | Min  | Def | Max   | Comments  |
|------|--------------------------|-----------|--------|------|-----|---|---|
| 8.   | Initial Ranging Interval |           | BS     |      |     | 250m  | Time between Initial Ranging regions allocated by the BS  |
| 9.   | Lost DL-MAP Interval     |           | MS     |      |     | 600m  | Time since last received DL-MAP message before downlink synchronization is considered lost  |
| 10.  | Lost UL-MAP Interval     |           | MS     |      |     | 600m  | Time since last received UL-MAP message before uplink synchronization is considered lost  |
| 11.  | T1                       |           | MS     |      |     | min (20 secs , 5x DCD Interval maximum value)   | Wait for DCD timeout  |
| 12.  | T3                       |           | MS     |      |     | 60 ms: RNG-RSP after CDMA ranging or RNG-REQ during initial or periodic ranging<br>50 ms: RNG-RSP after RNG-REQ during HO to negotiated target BS<br>200 ms: RNG-RSP after RNG-REQ during HO to non-negotiated target BS<br>200 ms: RNG-RSP after RNG-REQ during location update or re-entry from idle mode | Ranging Response reception timeout following the transmission of a Ranging Request  |
| 13.  | T4                       |           | MS     | 5sec |     | 35sec   | Wait for unicast ranging opportunity. If the pending-until-complete field was used earlier by this SS, then the value of that field shall be added to this interval (copied from [1]) |

| Item | Description            | Reference | Status | Min      | Def       | Max  | Comments   |
|------|------------------------|-----------|--------|----------|-----------|--|--|
| 14.  | T6                     |           | MS     |          |           | 1sec   | Wait for registration response (copied from [1])   |
| 15.  | T7                     |           | MS/BS  |          |           | 1s   | Wait for DSA/DSC/DSD Response timeout (copied from [1])  |
| 16.  | T8                     |           | MS/BS  |          |           | 100 msec                                     | Wait for DSA/DSC Acknowledge timeout (copied from [1])   |
| 17.  | T12                    |           | MS     |          |           | min (20 sec , 5x UCD Interval maximum value) | Wait for UCD descriptor  |
| 18.  | T14                    |           | MS     |          |           | 100msec                                      | Wait for DSX-RVD Timeout   |
| 19.  | T17                    |           | BS     | 5min     | 5min      |  | Time allowed for SS to complete SS Authorization and Key Exchange  |
| 20.  | T18                    |           | MS     | 50ms     | 50 ms     | 90 ms  | Wait for SBC-RSP timeout   |
| 21.  | T22                    |           | MS/BS  |          |           | 0.5 s  | Wait for ARQ-Reset   |
| 22.  | Idle Mode Timer        |           | MS     | 128 s    | 4096 s    | 65536 s                                      |  |
| 23.  | T43                    |           | MS     |          |           | 100 ms                                       | Time the MS waits for MOB_SLP-RSP  |
| 24.  | T44                    |           | MS     |          |           | 100 ms                                       | Time the MS waits for MOB_SCN-RSP  |
| 25.  | T46                    |           | BS     | 50 ms    |           | 100 ms                                       | Time the BS waits for DREG REQ in case of unsolicited Idle Mode initiation from BS                                     |
| 26.  | T47                    |           |        | 8 frames | 64 frames | 128 frames                                   | PMC_RSP Timer: BS shall send the PMC_RSP before T47 + 1 frames after BS receives PMC_REQ (confirmation = 0) correctly. |
| 27.  | Paging Interval Length |           | MS/BS  | 1 frames | 2 frames  | 5 frames                                     | time duration of Paging Interval of the BS   |
| 28.  | Max Dir Scan Time      |           | MS     |          |           | 2 sec  | Maximum scanning time of neighbor BSs by MS before reporting any results   |

| Item | Description   | Reference                 | Status | Min        | Def | Max  | Comments  |
|------|---|---------------------------|--------|------------|-----|------|---|
| 29.  | Maximum SDU size  |                           |        | 1522 Bytes |     |      | Recommended value to derive Maximum Transmission Unit (MTU) from  |
| 30.  | Number of transport connections in UL                                       |                           |        | 4          |     |      | Minimum number of concurrent transport CIDs MS is capable to support in UL.   |
| 31.  | Number of transport connections in DL                                       |                           |        | 4          |     |      | Minimum number of concurrent transport CIDs MS is capable to support in DL.   |
| 32.  | Total number of power save class instances supported from class types 1 & 2 | 11.8.5                    |        | 1          |     |      | Number of power saving class instances supported by the MS sufficient for the conformance with the profile.         |
| 33.  | ARQ_RESET_MAX_RETRIES   | 6.3.4.6.2, Figures 34, 35 |        |            | 2   |      | The default value must be supported   |
| 34.  | Min required CS Types per MS  |                           | MS     |            | 1   |      | Minimum number of simultaneously supported CS options, which is required for MS certification                       |
| 35.  | ARQ_RETRY_TIME_OUT on non H-ARQ connections                                 | 11.13.18.3                | BS/MS  | 20ms       |     | 1.3s | Used in DSA-REQ and DSA-RSP to indicate the ARQ_Retry_Timeout value. 5msec granularity.                             |
| 36.  | ARQ_RETRY_TIME_OUT on H-ARQ connections                                     | 11.13.18.3                | BS/MS  |            |     | 1.3s | Used in DSA-REQ and DSA-RSP to indicate the ARQ_Retry_Timeout value. 5msec granularity.                             |
| 37.  | ARQ_SYNC_LOSS_TIMEOUT for non H-ARQ connections                             | 11.13.18.5                | BS/MS  | 100ms      |     |      | Used in DSA-REQ and DSA-RSP to indicate timeout for ARQ. 5msec granularity.   |
| 38.  | ARQ_RX_PURGE_TIMEOUT for non H-ARQ connections                              | 11.13.18.7                | BS/MS  | 100ms      |     |      | Used in DSA-REQ and DSA-RSP to indicate timeout for ARQ. 5msec granularity.   |
| 39.  | ARQ_RX_PURGE_TIMEOUT for H-ARQ connections                                  | 11.13.18.7                |        |            |     |      | Used in DSA-REQ and DSA-RSP to indicate timeout for ARQ. 5msec granularity.   |
| 40.  | ARQ_BLOCK_LIFETIME granularity  | 11.13.18.4                |        |            |     |      | 5msec granularity.  |
| 41.  | AI_SN value upon init and after HO (HARQ reset)                             | 6.3.2.3.4.3.4             | BS/MS  |            | 0   |      | AI_SN is used in HARQ to indicate the sequence number of the ACID. Initial value at the network entry and after HO. |

| Item | Description   | Reference | Status | Min | Def | Max               | Comments |
|------|---|-----------|--------|-----|-----|-------------------|----------|
| 42.  | Power_control_IE::Power measurement frame relevance |           | BS/MS  |     |     | 4 MS Transmission |          |

**Table 128. Minimum Performance Requirements**

| Item | Description                   | Reference | Status | Min | Def | Max     | Comments  |
|------|-------------------------------|-----------|--------|-----|-----|---------|---|
| 1.   | HO Parameters Processing Time | 11.7.24   |        |     |     | 3 frame | Time in msec the MS needs to process information on connections provided in RNGRSP or REG-RSP message during HO |

### 5.3 Recommended Configuration

**Table 129. Recommended Configurations**

| Parameter   | Value | Reference                                   |
|---|-------|---|
| PN window size  |       | MS PN window size for HARQ CID              |
| SAID supported - DL   |       | Maximum number of SAID supported - Downlink |
| SAID supported - UL   |       | Maximum number of SAID supported - Uplink   |
| Max SDU size for IP CS  |       |   |
| Maximum number of power save class instances supported from class 1 & 2 |       |   |
| Maximum number of power save class instances supported from class 3     |       |   |



## 6. Radio Profile

Table 130 defines the RF channels to be calculated using the following formula:

$$RFChannel_n = F_{start} + n \cdot \Delta F_c, \forall n \in N_{range}$$

Where:

$F_{start}$  is the start frequency for the specific band,

$\Delta F_c$  is the center frequency step,

$N_{range}$  is the range values for the n parameter

**Table 130. RF Profiles List**

|     | RF Profile Name    | Channel BW (MHz) | Center Frequency Step (KHz) | F <sub>start</sub> (MHz) | N <sub>range</sub> | Comment  |
|-----|--------------------|------------------|-----------------------------|--------------------------|--------------------|--|
| 1.  | Prof1.A_2.3        | 8.75             | 250                         | 2304.5                   | {0, ..., 364}      |  |
| 2.  | Prof1.B_2.3-5      | 5                | 250                         | 2302.5                   | {0, ..., 380}      |  |
|     | Prof1.B_2.3-10     | 10               |                             | 2305                     | {0, ..., 360}      |  |
| 3.  | Prof2.A_2.305      | 3.5              | 250                         | 2306.75 and 2346.75      | {0, ..., 46}       |  |
| 4.  | Prof2.B_2.305      | 5                | 250                         | 2307.5 and 2347.5        | {0, ..., 40}       |  |
| 5.  | Prof2.C_2.305      | 10               | 250                         | 2310 and 2350            | {0, ..., 20}       |  |
| 6.  | Prof3.A_2.496 – 5  | 5                | 250                         | 2498.5                   | {0, ..., 756}      | 200 KHz Frequency step is considered for Europe 2.5 GHz extension.<br>200 KHz Frequency step is considered for Europe 2.5 GHz extension. |
|     | Prof3.A_2.496 – 10 | 10               |                             | 2501                     | {0, ..., 736}      |  |
| 7.  | Prof4.A_3.3        | 5                | 250                         | 3302.5                   | {0, ..., 380}      |  |
| 8.  | Prof4.B_3.3        | 7                | 250                         | 3303.5                   | {0, ..., 372}      |  |
| 9.  | Prof4.C_3.3        | 10               | 250                         | 3305                     | {0, ..., 360}      |  |
| 10. | Prof5.A_3.4        | 5                | 250                         | 3402.5                   | {0, ..., 1580}     |  |
|     | Prof5L.A_3.4       |                  |                             |                          | {0, ..., 780}      |  |
|     | Prof5H.A_3.4       |                  |                             |                          | {800, ..., 1580}   |  |
| 11. | Prof5.B_3.4        | 7                | 250                         | 3403.5                   | {0, ..., 1572}     |  |
|     | Prof5L.B_3.4       |                  |                             |                          | {0, ..., 772}      |  |
|     | Prof5H.B_3.4       |                  |                             |                          | {800, ..., 1572}   |  |
| 12. | Prof5.C_3.4        | 10               | 250                         | 3405                     | {0, ..., 1560}     |  |
|     | Prof5L.C_3.4       |                  |                             |                          | {0, ..., 860}      |  |
|     | Prof5H.C_3.4       |                  |                             |                          | {800, ..., 1560}   |  |

- 1 Note that comprehensive RF raster of Table Table 130 is only for interoperability purposes and not a
- 2 basis for any performance testing on RF channel scanning and synchronization to network. RF preferred
- 3 sets are needed to be developed to be considered as basis for scanning time performance requirements.

## 7. Power Class Profile

The Power Classes listed in following table is developed to cover the complete target range of power levels while different interpretation of applicable modulation levels is addressed through a dual range requirement for QPSK and 16-QAM per Power Class.

**Table 131. Power Classes**

| Class Identifier | Transmit Power (dBm) for 16-QAM | Transmit Power (dBm) for QPSK | MS Required |
|------------------|---------------------------------|-------------------------------|-------------|
| Power Class 1    | $18 \leq P_{Tx,max} < 21$       | $20 \leq P_{Tx,max} < 23$     | oi          |
| Power Class 2    | $21 \leq P_{Tx,max} < 25$       | $23 \leq P_{Tx,max} < 27$     | oi          |
| Power Class 3    | $25 \leq P_{Tx,max} < 30$       | $27 \leq P_{Tx,max} < 30$     | oi          |
| Power Class 4    | $30 \leq P_{Tx,max}$            | $30 \leq P_{Tx,max}$          | oi          |

1

2