1. **Test Dataset: AA500001**

**S‐58 Recommended ENC Validation Checks covered in this section:**

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| **S‐58 Check** | **Description** |
| 13a | For each feature object of geometric primitive line which references multiple edges where the vector records are not referenced sequentially. |
| 13c | For each feature object of geometric primitive area where a polygon ring references multiple edges where the vector records are not referenced sequentially. |
| 13d | For each feature object of geometric primitive area where a polygon ring references multiple edges where the end node of a vector record is not identical to the beginning node of the following vector record. |
| 20a | For each feature object where a geometric primitive is not one of those permitted. |
| 20b | For each spatial record which is not referenced by a feature object. |
| 22 | For each edge where the End node is referenced before the beginning node. |
| 84a | For each node which is physically isolated AND is marked as connected. |
| 84b | For each node which is not physically isolated AND is marked as isolated. |

**Secondary Errors**

Critical – 15, 25a, 26a, 555,

Error – 28, 53b, 1565

Warnings – 90b, 1670

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| **Dataset Name** | AA500001 | | | **S-58 Check** | | 13a | | | **Type** | | C |
| **S-58 Description** | For each feature object of geometric primitive line which references multiple edges where the vector records are not referenced sequentially. | | | | | | | | | | |
| **Message** | Edges are not referenced sequentially. | | | | | | | | | | |
| **Solution** | Amend records to reference edges sequentially. | | | | | **Conformity** | | Part 3 (4.7.2) | | | |
| **Test Case No. 1** | LNDELV feature line edges are not created sequentially. | | | | | | | | | | |
| **Location** | | **Feature** | **Attributes** | | **FRID** | | **FOID** | | | **VRID** | |
| LNDELV (L) | | LNDELV (L) | ELEVAT=10 | | FE-186 | | AA 1521529362 00001 | | | VE-308;  VE-309;  VE-311 | |
| **Screen Capture/ASCII** |  | | | | | | | | | | |
| **Expected Test Results** | 13a: Error “Edges are not referenced sequentially” must be triggered. | | | | | | | | | | |
| **Secondary Critical Errors** | None. | | | | | | | | | | |
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| **Dataset Name** | AA500001 | | | **S-58 Check** | | 13c | | | **Type** | | C |
| **S-58 Description** | For each feature object of geometric primitive area where a polygon ring references multiple edges where the vector records are not referenced sequentially. | | | | | | | | | | |
| **Message** | Edges are not referenced sequentially. | | | | | | | | | | |
| **Solution** | Amend records to reference edges sequentially. | | | | | **Conformity** | | Part 3 (4.7.2) and (4.7.3) | | | |
| **Test Case No. 1** | BUAARE (A) feature created with multiple edges which are not referenced sequentially. | | | | | | | | | | |
| **Location** | | **Feature** | **Attributes** | | **FRID** | | **FOID** | | | **VRID** | |
| 32°28'12.54"S 60°55'13.40"E | | BUAARE (A) | - | | FE-181 | | AA 1516275166 00001 | | | VE-287;  VE-290;  VE-289;  VE-286;  VE-288 | |
| **Screen Capture/ASCII** |  | | | | | | | | | | |
| **Expected Test Results** | 13c: error “Edges are not referenced sequentially” must be triggered. | | | | | | | | | | |
| **Secondary Critical Errors** | 15: additional error “First and last edge of an area boundary do not meet at a common  connected node” must be triggered. | | | | | | | | | | |
|  | | | | | | | | | | | |
| **Dataset Name** | AA500001 | | | **S-58 Check** | | 13d | | | **Type** | | C |
| **S-58 Description** | For each feature object of geometric primitive area where a polygon ring references multiple edges where the end node of a vector record is not identical to the beginning node of the following vector record. | | | | | | | | | | |
| **Message** | Sequential edges do not have the same end and beginning nodes. | | | | | | | | | | |
| **Solution** | Ensure end and beginning nodes of sequential edges match. | | | | | **Conformity** | | Part 3 (4.7.2) and (4.7.3) | | | |
| **Test Case No. 1** | LNDRGN (A) feature created with sequential edges and without same end, beginning nodes. | | | | | | | | | | |
| **Location** | | **Feature** | **Attributes** | | **FRID** | | **FOID** | | | **VRID** | |
| 32°28'05.75"S 60°54'54.26"E | | LNDRGN (A) | CATLND=2 | | FE-182 | | AA 1516275371 00001 | | | VE-303;  VE-304 | |
| **Screen Capture/ASCII** |  | | | | | | | | | | |
| **Expected Test Results** | 13d: Error “Sequential edges do not have the same end and beginning nodes” must be triggered. | | | | | | | | | | |
| **Secondary Critical Errors** | 15: additional error “First and last edge of an area boundary do not meet at a common  connected node” must be triggered. | | | | | | | | | | |
|  | | | | | | | | | | | |
| **Dataset Name** | AA500001 | | | **S-58 Check** | | 20a | | | **Type** | | C |
| **S-58 Description** | For each feature object where a geometric primitive is not one of those permitted. | | | | | | | | | | |
| **Message** | Geometric primitive of this type is not permitted for this object class. | | | | | | | | | | |
| **Solution** | Use alternative geometric primitive or alternative object class as required. | | | | | **Conformity** | | Part 3 (4.2.1), Appendix B.1 (3.3) and Supplement No.3 Ch.3 (3.3) | | | |
| **Test Case No. 1** | These features are created as isolated node. | | | | | | | | | | |
| **Location** | | **Feature** | **Attributes** | | **FRID** | | **FOID** | | | **VRID** | |
| 32°28'27.77"S 60°54'27.67"E | | PONTON (P) | - | | FE-189 | | AA 1521608778 00001 | | | VI-58 | |
| 32°28'32.84"S 60°54'26.50"E | | ACHARE (L) | - | | FE-191 | | AA 1521609412 00001 | | | VE-315 | |
| 32°28'22.22"S 60°54'59.75"E | | COALNE (A) | - | | FE-192 | | AA 1521609839 00001 | | | VE-316 | |
| **Screen Capture/ASCII** |  | | | | | | | | | | |
| **Expected Test Results** | 20a: An error “Geometric primitive of this type is not permitted for this object class” must be triggered. | | | | | | | | | | |
| **Secondary Critical Errors** | None | | | | | | | | | | |
|  | | | | | | | | | | | |
| **Dataset Name** | AA500001 | | | **S-58 Check** | | 20b | | | **Type** | | C |
| **S-58 Description** | For each spatial record which is not referenced by a feature object. | | | | | | | | | | |
| **Message** | Orphaned geometry. | | | | | | | | | | |
| **Solution** | Remove orphaned geometry. | | | | | **Conformity** | | Logical consistency and Part 2 (1) | | | |
| **Test Case No. 1** | Orphan geometry line created. | | | | | | | | | | |
| **Location** | | **Feature** | **Attributes** | | **FRID** | | **FOID** | | | **VRID** | |
| 32°28'07.40"S 60°54'32.77"E | | - | - | | - | | - | | | VC-289 | |
| 32°28'46.66"S 60°54'42.22"E | | - | - | | - | | - | | | VE-11 | |
| **Screen Capture** |  | | | | | | | | | | |
| **Expected Test Results** | 20b: Error “Orphaned geometry” should be triggered. | | | | | | | | | | |
| **Secondary Critical Errors** | None. | | | | | | | | | | |
|  | | | | | | | | | | | |
| **Dataset Name** | AA500001 | | | **S-58 Check** | | 22 | | | **Type** | | C |
| **S-58 Description** | For each edge where the End node is referenced before the beginning node. | | | | | | | | | | |
| **Message** | Beginning and end nodes are not in the correct sequence. | | | | | | | | | | |
| **Solution** | Amend edge to reference beginning node before end node. | | | | | **Conformity** | | Part 3 (5.1.3.2) | | | |
| **Test Case No. 1** | SLOTOP line feature created with beginning and end nodes different sequence. | | | | | | | | | | |
| **Location** | | **Feature** | **Attributes** | | **FRID** | | **FOID** | | | **VRID** | |
| 32°28'12.99"S 60°54'14.26"E  32°28'21.79"S 60°54'14.45"E | | SLOTOP (L) | - | | FE-188 | | AA 1521529970 00001 | | | VE-313 | |
| **ASCII** |  | | | | | | | | | | |
| **Expected Test Results** | 22: error “Beginning and end nodes are not in the correct sequence” must be triggered. | | | | | | | | | | |
| **Secondary Critical Errors** | None. | | | | | | | | | | |
|  | | | | | | | | | | | |
| **Dataset Name** | AA500001 | | | **S-58 Check** | | 84a | | | **Type** | | C |
| **S-58 Description** | For each node which is physically isolated AND is marked as connected. | | | | | | | | | | |
| **Message** | Isolated node marked as connected. | | | | | | | | | | |
| **Solution** | Amend to isolated node. | | | | | **Conformity** | | Part 3 (5.1.1) | | | |
| **Test Case No. 1** | Isolated node created as Connected node. | | | | | | | | | | |
| **Location** | | **Feature** | **Attributes** | | **FRID** | | **FOID** | | | **VRID** | |
| 32°28'07.40"S 60°54'32.77"E | | - | - | | - | | - | | | VC-289 | |
| **Screen Capture** |  | | | | | | | | | | |
| **Expected Test Results** | 84a: An error “Isolated node marked as connected” must be triggered. | | | | | | | | | | |
| **Secondary Critical Errors** | 20b: Error “Orphaned geometry” should be triggered. | | | | | | | | | | |
|  | | | | | | | | | | | |
| **Dataset Name** | AA500001 | | | **S-58 Check** | | 84b | | | **Type** | | C |
| **S-58 Description** | For each node which is not physically isolated AND is marked as isolated. | | | | | | | | | | |
| **Message** | Connected node marked as isolated. | | | | | | | | | | |
| **Solution** | Amend to connected node. | | | | | **Conformity** | | Part 3 (5.1.1) | | | |
| **Test Case No. 1** | Created an isolated node from connected node for SLCONS feature. | | | | | | | | | | |
| **Location** | | **Feature** | **Attributes** | | **FRID** | | **FOID** | | | **VRID** | |
| 32°28'25.45"S 60°54'52.18"E | | SLCONS (L) | CATSLC=1; WATLEV=3 | | FE-194 | | AA 1523967618 00001 | | | VI-319 | |
| **Screen Capture/ASCII** |  | | | | | | | | | | |
| **Expected Test Results** | 84b: error “Connected node marked as isolated” must be triggered. | | | | | | | | | | |
| **Secondary Critical Errors** | 25a: additional error “Beginning or end nodes of an edge are not encoded as connected nodes.” must be triggered. | | | | | | | | | | |