C:/Users/torsten/GitHub/colore/ontologies/simple_features/sfc_fol.clif

1. $\forall x\ \forall y\ \Big[\big[\text{sf\_geometry}(x) \leftrightarrow \text{S}(x)\big]\Big]$
2. $\forall x\ \forall y\ \Big[\Big[\text{sf\_relate}(x,y) \leftrightarrow \big(\text{sf\_intersects}(x,y) \vee \text{sf\_disjoint}(x,y)\big)\Big]\Big]$
3. $\forall x\ \forall y\ \Big[\big[\text{SC}(x,y) \rightarrow \text{C}(x,y)\big]\Big]$
4. $\forall x\ \forall y\ \Big[\Big[\text{SC}(x,y) \rightarrow \neg\exists z\ \Big[\big(\text{Cont}(z,x) \wedge \text{P}(z,y)\big)\Big]\Big]\Big]$
5. $\forall x\ \forall y\ \Big[\Big[\text{SC}(x,y) \rightarrow \neg\exists z\ \Big[\big(\text{P}(z,x) \wedge \text{Cont}(z,y)\big)\Big]\Big]\Big]$
6. $\forall x\ \forall y\ \Big[\Big[\Big(\text{C}(x,y) \wedge \forall z\ \Big[\Big(\neg\big(\text{Cont}(z,x)\big) \vee \neg\big(\text{Cont}(z,y)\big) \vee \Big(\neg\big(\text{P}(z,x)\big) \wedge \neg\big(\text{P}(z,y)\big)\Big)\Big)\Big]\Big) \rightarrow \text{SC}(x,y$
7. $\forall x\ \Big[\neg\big(\text{SC}(x,x)\big)\Big]$
8. $\forall x\ \forall y\ \Big[\big[\text{SC}(x,y) \rightarrow \text{SC}(y,x)\big]\Big]$
9. $\forall x\ \forall y\ \Big[\Big[\text{SC}(x,y) \rightarrow \exists z\ \Big[\big(\text{lt}(z,x) \wedge \text{lt}(z,y) \wedge \text{Cont}(z,x) \wedge \text{Cont}(z,y)\big)\Big]\Big]\Big]$
10. $\forall x\ \forall y\ \Big[\Big[\text{SC}(x,y) \leftrightarrow \Big(\exists z\ \Big[\big(\text{Cont}(z,x) \wedge \text{Cont}(z,y)\big)\Big] \wedge \forall z\ \Big[\Big[\big(\text{Cont}(z,x) \wedge \text{Cont}(z,y)\big) \rightarrow \big(\text{leq}(z,x) \wedge -$
11. $\forall x\ \forall y\ \Big[\Big[\text{EqDim}(x,y) \leftrightarrow \big(\text{leq}(x,y) \wedge \text{leq}(y,x)\big)\Big]\Big]$
12. $\forall x\ \forall y\ \Big[\big[\text{leq}(x,y) \rightarrow \text{S}(x)\big]\Big]$
13. $\forall x\ \forall y\ \Big[\big[\text{leq}(x,y) \rightarrow \text{S}(y)\big]\Big]$
14. $\forall x\ \Big[\big[\text{ZEX}(x) \rightarrow \text{S}(x)\big]\Big]$
15. $\forall x\ \Big[\big[\text{S}(x) \rightarrow \text{leq}(x,x)\big]\Big]$

16. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{leq}(x,y) \wedge \mathrm{leq}(y,z)\big) \rightarrow \mathrm{leq}(x,z)\Big]\Big]$

17. $\forall x\ \forall y\ \Big[\Big[\big(\mathrm{ZEX}(x) \wedge \mathrm{ZEX}(y)\big) \rightarrow =(x,y)\Big]\Big]$

18. $\forall x\ \forall y\ \Big[\Big[\big(\mathrm{ZEX}(x) \wedge \mathrm{S}(y)\big) \rightarrow \mathrm{leq}(x,y)\Big]\Big]$

19. $\forall x\ \forall y\ \Big[\big[\mathrm{Cont}(x,y) \rightarrow \mathrm{leq}(x,y)\big]\Big]$

20. $\exists x\ \big[\mathrm{MinDim}(x)\big]$

21. $\forall x\ \Big[\Big[\mathrm{MaxDim}(x) \leftrightarrow \Big(\mathrm{S}(x) \wedge \neg\big(\mathrm{ZEX}(x)\big) \wedge \forall y\ \Big[\big[\mathrm{S}(y) \rightarrow \mathrm{leq}(y,x)\big]\Big]\Big)\Big]\Big]$

22. $\forall x\ \Big[\Big[\mathrm{MinDim}(x) \leftrightarrow \Big(\mathrm{S}(x) \wedge \neg\big(\mathrm{ZEX}(x)\big) \wedge \forall y\ \Big[\Big[\Big(\mathrm{S}(y) \wedge \neg\big(\mathrm{ZEX}(y)\big)\Big) \rightarrow \mathrm{leq}(x,y)\Big]\Big]\Big)\Big]\Big]$

23. $\forall x\ \Big[\Big[\Big(\mathrm{S}(x) \wedge \neg\big(\mathrm{ZEX}(x)\big)\Big) \leftrightarrow \mathrm{Cont}(x,x)\Big]\Big]$

24. $\forall x\ \forall y\ \Big[\Big[\big(\mathrm{Cont}(x,y) \wedge \mathrm{Cont}(y,x)\big) \rightarrow =(x,y)\Big]\Big]$

25. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{Cont}(x,y) \wedge \mathrm{Cont}(y,z)\big) \rightarrow \mathrm{Cont}(x,z)\Big]\Big]$

26. $\forall x\ \forall y\ \Big[\Big[\mathrm{ZEX}(x) \rightarrow \Big(\mathrm{S}(x) \wedge \neg\big(\mathrm{Cont}(y,x)\big) \wedge \neg\big(\mathrm{Cont}(x,y)\big)\Big)\Big]\Big]$

27. $\forall x\ \forall y\ \Big[\Big[\big(\mathrm{ZEX}(x) \wedge \mathrm{ZEX}(y)\big) \rightarrow =(x,y)\Big]\Big]$

28. $\forall x\ \forall y\ \Big[\big[\mathrm{P}(x,y) \leftrightarrow \big(\mathrm{Cont}(x,y) \wedge \mathrm{EqDim}(x,y)\big)\big]\Big]$

29. $\forall x\ \forall y\ \Big[\Big[\mathrm{C}(x,y) \leftrightarrow \exists z\ \Big[\big(\mathrm{Cont}(z,x) \wedge \mathrm{Cont}(z,y)\big)\Big]\Big]\Big]$

30. $\forall x\ \Big[\neg\big(\mathrm{Inc}(x,x)\big)\Big]$

31. $\forall x\ \forall y\ \Big[\big[\mathrm{Inc}(x,y) \rightarrow \mathrm{Inc}(y,x)\big]\Big]$

32. $\forall x\ \forall y\ \Big[\Big[\mathrm{EqDim}(x,y) \to \neg\big(\mathrm{Inc}(x,y)\big)\Big]\Big]$

33. $\forall x\ \forall y\ \Big[\Big[\mathrm{Inc}(x,y) \to \big(\mathrm{lt}(x,y) \vee \mathrm{lt}(y,x)\big)\Big]\Big]$

34. $\forall x\ \forall y\ \Big[\Big[\big(\mathrm{Cont}(x,y) \wedge \mathrm{lt}(x,y)\big) \to \mathrm{Inc}(x,y)\Big]\Big]$

35. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{Inc}(x,y) \wedge \mathrm{P}(y,z)\big) \to \mathrm{Inc}(x,z)\Big]\Big]$

36. $\forall x\ \forall y\ \Big[\Big[\mathrm{Inc}(x,y) \leftrightarrow \Big(\exists z\ \Big[\Big(\mathrm{leq}(z,x) \wedge \neg\big(\mathrm{EqDim}(z,x)\big) \wedge \mathrm{Cont}(z,x) \wedge \mathrm{P}(z,y)\Big)\Big] \vee \exists z\ \Big[\Big(\mathrm{leq}(z,y) \wedge \neg\big(\mathrm{E}$

37. $\forall x\ \Big[\Big[\Big(\mathrm{S}(x) \wedge \neg\big(\mathrm{ZEX}(x)\big)\Big) \to \mathrm{PO}(x,x)\Big]\Big]$

38. $\forall x\ \forall y\ \Big[\big[\mathrm{PO}(x,y) \to \mathrm{PO}(y,x)\big]\Big]$

39. $\forall x\ \forall y\ \Big[\big[\mathrm{PO}(x,y) \to \mathrm{EqDim}(x,y)\big]\Big]$

40. $\forall x\ \forall y\ \Big[\Big[\mathrm{PO}(x,y) \leftrightarrow \exists z\ \Big[\big(\mathrm{P}(z,x) \wedge \mathrm{P}(z,y)\big)\Big]\Big]\Big]$

41. $\forall x\ \Big[\Big[\mathrm{Max}(x) \leftrightarrow \Big(\mathrm{S}(x) \wedge \neg\big(\mathrm{ZEX}(x)\big) \wedge \forall y\ \Big[\neg\big(\mathrm{PP}(x,y)\big)\Big]\Big)\Big]\Big]$

42. $\forall x\ \Big[\Big[\mathrm{Min}(x) \leftrightarrow \Big(\mathrm{S}(x) \wedge \neg\big(\mathrm{ZEX}(x)\big) \wedge \forall y\ \Big[\neg\big(\mathrm{PP}(y,x)\big)\Big]\Big)\Big]\Big]$

43. $\forall x\ \forall y\ \Big[\Big[\mathrm{PP}(x,y) \leftrightarrow \Big(\mathrm{P}(x,y) \wedge \neg\big(=(x,y)\big)\Big)\Big]\Big]$

44. $\forall x\ \forall y\ \Big[\Big[\mathrm{BCont}(x,y) \to \Big(\mathrm{Cont}(x,y) \wedge \neg\big(\mathrm{EqDim}(x,y)\big)\Big)\Big]\Big]$

45. $\forall x\ \forall y\ \forall v\ \forall z\ \Big[\Big[\big(\mathrm{SC}(x,y) \wedge \mathrm{Min}(x) \wedge \mathrm{P}(x,v) \wedge \mathrm{Cont}(y,v) \wedge \mathrm{Cont}(z,x) \wedge \mathrm{Cont}(z,y)\big) \to \mathrm{BCont}(z,x)\Big]\Big]$

46. $\forall x\ \forall y\ \forall z\ \forall v\ \Big[\Big[\big(\mathrm{SC}(x,y) \wedge \mathrm{P}(x,v) \wedge \mathrm{P}(y,v) \wedge \mathrm{Cont}(z,x) \wedge \mathrm{Cont}(z,y) \wedge \mathrm{Covers}(v,z)\big) \to \neg\big(\mathrm{BCont}(z,v)\big)\Big]$

47. $\forall x\ \forall y\ \forall z\ \Big[\Big[\Big[\Big(\mathrm{BCont}(x,y) \wedge \mathrm{P}(y,z) \wedge \forall v\ \forall w\ \Big[\Big[\Big(\mathrm{P}(v,z) \wedge \neg\big(\mathrm{PO}(v,y)\big) \wedge \mathrm{P}(w,x)\Big) \rightarrow \neg\big(\mathrm{Cont}(w,v)\big)\Big]\Big]\Big)$

48. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{BCont}(x,y) \wedge \mathrm{Cont}(z,x)\big) \rightarrow \mathrm{BCont}(z,y)\Big]\Big]$

49. $\forall x\ \forall y\ \Big[\Big[\mathrm{Covers}(x,y) \leftrightarrow \Big(\mathrm{lt}(y,x) \wedge \forall z\ \Big[\Big[\mathrm{S}(z) \rightarrow \neg\big(\mathrm{lt}(y,z) \wedge \mathrm{lt}(z,x)\big)\Big]\Big]\Big)\Big]\Big]$

50. $\forall x\ \forall y\ \Big[\big[\mathrm{gt}(x,y) \leftrightarrow \mathrm{lt}(y,x)\big]\Big]$

51. $\forall x\ \forall y\ \Big[\big[\mathrm{geq}(x,y) \leftrightarrow \mathrm{leq}(y,x)\big]\Big]$

52. $\forall x\ \forall y\ \Big[\Big[\mathrm{lt}(x,y) \leftrightarrow \Big(\mathrm{leq}(x,y) \wedge \neg\big(\mathrm{EqDim}(x,y)\big)\Big)\Big]\Big]$

53. $\forall x\ \Big[\Big[\mathrm{Closed}(x) \leftrightarrow \forall y\ \Big[\neg\big(\mathrm{BCont}(y,x)\big)\Big]\Big]\Big]$

54. $\forall x\ \forall y\ \Big[\Big[\mathrm{sf\_contains}(x,y) \leftrightarrow \big(\mathrm{sf\_geometry}(x) \wedge \mathrm{sf\_geometry}(y) \wedge \mathrm{Cont}(x,y)\big)\Big]\Big]$

55. $\forall x\ \Big[\big[\mathrm{sf\_multi\_polygon}(x) \rightarrow \mathrm{sf\_multi\_surface}(x)\big]\Big]$

56. $\forall x\ \Big[\Big[\mathrm{sf\_geometry\_collection}(x) \rightarrow \Big(\neg\big(\mathrm{sf\_point}(x)\big) \wedge \neg\big(\mathrm{sf\_curve}(x)\big) \wedge \neg\big(\mathrm{sf\_surface}(x)\big)\Big)\Big]\Big]$

57. $\forall x\ \Big[\Big[\mathrm{sf\_geometry\_collection}(x) \leftrightarrow \big(\mathrm{sf\_multi\_point}(x) \vee \mathrm{sf\_multi\_curve}(x) \vee \mathrm{sf\_multi\_surface}(x)\big)\Big]\Big]$

58. $\forall x\ \Big[\Big[\mathrm{sf\_point}(x) \rightarrow \Big(\neg\big(\mathrm{sf\_curve}(x)\big) \wedge \neg\big(\mathrm{sf\_surface}(x)\big) \wedge \neg\big(\mathrm{sf\_geometry\_collection}(x)\big)\Big)\Big]\Big]$

59. $\forall x\ \Big[\Big[\mathrm{sf\_geometry}(x) \leftrightarrow \big(\mathrm{sf\_point}(x) \vee \mathrm{sf\_curve}(x) \vee \mathrm{sf\_surface}(x) \vee \mathrm{sf\_geometry\_collection}(x)\big)\Big]\Big]$

60. $\forall x\ \Big[\Big[\mathrm{sf\_surface}(x) \rightarrow \Big(\neg\big(\mathrm{sf\_point}(x)\big) \wedge \neg\big(\mathrm{sf\_curve}(x)\big) \wedge \neg\big(\mathrm{sf\_geometry\_collection}(x)\big)\Big)\Big]\Big]$

61. $\forall x\ \Big[\Big[\mathrm{sf\_curve}(x) \rightarrow \Big(\neg\big(\mathrm{sf\_point}(x)\big) \wedge \neg\big(\mathrm{sf\_surface}(x)\big) \wedge \neg\big(\mathrm{sf\_geometry\_collection}(x)\big)\Big)\Big]\Big]$

62. $\forall x \ \Big[\big[\text{sf\_multi\_line\_string}(x) \rightarrow \text{sf\_multi\_curve}(x)\big]\Big]$

63. $\forall x \ \Big[\Big[\text{sf\_triangle}(x) \leftrightarrow \big(\text{sf\_polygon}(x) \wedge \text{sf\_tin}(x)\big)\Big]\Big]$

64. $\forall x \ \Big[\big[\text{sf\_tin}(x) \rightarrow \text{sf\_polyhedral\_surface}(x)\big]\Big]$

65. $\forall x \ \Big[\big[\text{sf\_polyhedral\_surface}(x) \rightarrow \text{sf\_surface}(x)\big]\Big]$

66. $\forall x \ \Big[\big[\text{sf\_polygon}(x) \rightarrow \text{sf\_polyhedral\_surface}(x)\big]\Big]$

67. $\forall x \ \Big[\big[\text{sf\_linear\_ring}(x) \rightarrow \text{sf\_line\_string}(x)\big]\Big]$

68. $\forall x \ \Big[\big[\text{sf\_line\_string}(x) \rightarrow \text{sf\_curve}(x)\big]\Big]$

69. $\forall x \ \Big[\big[\text{sf\_line}(x) \rightarrow \text{sf\_line\_string}(x)\big]\Big]$

70. $\forall x \ \forall y \ \Big[\Big[\big[\text{sf\_overlaps}(x,y) \leftrightarrow \big(\text{sf\_geometry}(x) \wedge \text{sf\_geometry}(y) \wedge \text{PO}(x,y) \wedge \neg\big(\text{P}(x,y)\big) \wedge \neg\big(\text{P}(y,x)\big)\big)\big]\Big]$

71. $\forall x \ \forall y \ \Big[\big[\text{sf\_within}(y,x) \leftrightarrow \text{sf\_contains}(x,y)\big]\Big]$

72. $\forall x \ \forall y \ \Big[\Big[\big[\text{sf\_contains}(x,y) \leftrightarrow \big(\text{sf\_geometry}(x) \wedge \text{sf\_geometry}(y) \wedge \text{Cont}(x,y)\big)\big]\Big]$

73. $\forall x \ \forall y \ \Big[\Big[\big[\text{sf\_crosses}(x,y) \leftrightarrow \Big(\text{sf\_geometry}(x) \wedge \text{sf\_geometry}(y) \wedge \Big(\big(\text{Inc}(x,y) \wedge \neg\big(\text{Cont}(x,y)\big) \wedge \neg\big(\text{Cont}($

74. $\forall x \ \Big[\Big[\big[\text{Curve}(x) \leftrightarrow \Big(\neg\big(\text{ZEX}(x)\big) \wedge \neg\big(\text{MinDim}(x)\big) \wedge \forall y \ \Big[\big[\text{MinDim}(y) \leftrightarrow \text{Covers}(x,y)\big]\Big]\Big)\big]\Big]$

75. $\forall x \ \forall y \ \Big[\Big[\big[\text{sf\_touches}(x,y) \leftrightarrow \Big(\text{sf\_geometry}(x) \wedge \text{sf\_geometry}(y) \wedge \big(\text{SC}(x,y) \vee \text{BCont}(x,y) \vee \text{BCont}(y,x)\big)\Big)$

76. $\forall x \ \forall y \ \Big[\Big[\big[\text{sf\_equals}(x,y) \leftrightarrow \big(\text{sf\_contains}(x,y) \wedge \text{sf\_within}(x,y)\big)\big]\Big]$

77. $\forall x \ \forall y \ \Big[\Big[\big[\text{sf\_intersects}(x,y) \leftrightarrow \big(\text{sf\_geometry}(x) \wedge \text{sf\_geometry}(y) \wedge \neg\big(\text{sf\_disjoint}(x,y)\big)\big)\big]\Big]$

78. $\forall x\ \forall y\ \Big[\Big[\text{sf\_disjoint}(x,y) \rightarrow \Big(\text{sf\_geometry}(x) \wedge \text{sf\_geometry}(y) \wedge \neg\ \big(\text{C}(x,y)\big)\Big)\Big]\Big]$

79. $\forall x\ \Big[\Big[\text{sf\_geometry\_collection}(x) \rightarrow \big(\text{Multipart\_S}(x) \vee \text{Branched\_S}(x)\big)\Big]\Big]$

80. $\forall x\ \Big[\Big[\text{sf\_multi\_polygon}(x) \leftrightarrow \Big(\text{sf\_multi\_surface}(x) \wedge \forall y\ \Big[\Big[\big(\text{P}(y,x) \wedge \text{Min}(y)\big) \rightarrow \text{sf\_polygon}(y)\Big]\Big]\Big)\Big]\Big]$

81. $\forall x\ \Big[\big[\text{sf\_polygon}(x) \rightarrow \text{Simple\_ArealRegion}(x)\big]\Big]$

82. $\forall x\ \Big[\Big[\text{sf\_polygon}(x) \rightarrow \exists y\ \exists z\ \Big[\big(\text{sf\_linear\_ring}(y) \wedge \text{BCont}(y,x) \wedge =\!(\text{boundary}(z),y) \wedge \text{P}(x,z)\big)\Big]\Big]\Big]$

83. $\forall x\ \Big[\Big[\text{sf\_polygon}(x) \rightarrow \forall v\ \Big[\Big[\text{BCont}(v,x) \rightarrow \exists w\ \Big[\big(\text{P}(v,w) \wedge \text{BCont}(w,x) \wedge \text{sf\_linear\_ring}(w)\big)\Big]\Big]\Big]\Big]\Big]$

84. $\forall x\ \forall y\ \Big[\big[\text{Cont}(x,\text{boundary}(y)) \leftrightarrow \text{BCont}(x,y)\big]\Big]$

85. $\forall x\ \Big[\Big[\text{Simple\_ArealRegion}(x) \leftrightarrow \big(\text{ArealRegion}(x) \wedge \text{Simple\_S}(x)\big)\Big]\Big]$

86. $\forall x\ \Big[\Big[\text{Simple\_S}(x) \leftrightarrow \Big(\text{Connected\_S}(x) \wedge \neg\ \big(\text{Branched\_S}(x)\big)\Big)\Big]\Big]$

87. $\forall x\ \Big[\Big[\text{Branched\_S}(x) \leftrightarrow \Big(\text{Connected\_S}(x) \wedge \exists p\ \exists q\ \exists r\ \exists s\ \Big[\Big(\text{PP}(p,x) \wedge \text{PP}(q,x) \wedge \text{PP}(r,x) \wedge \neg\ \big(\text{PO}(p,q)$

88. $\forall x\ \Big[\Big[\text{Connected\_S}(x) \leftrightarrow \Big(\text{S}(x) \wedge \forall y\ \Big[\big[\text{PP}(y,x) \rightarrow \text{SC}(y,\text{difference}(x,y))\big]\Big]\Big)\Big]\Big]$

89. $\forall x\ \forall y\ \Big[\Big[\Big(\text{S}(x) \wedge \text{S}(y) \wedge \neg\ \big(\text{C}(x,y)\big)\Big) \leftrightarrow \text{ZEX}(\text{intersection}(x,y))\Big]\Big]$

90. $\forall x\ \forall y\ \Big[\Big[\Big(\text{S}(x) \wedge \text{S}(y) \wedge \neg\ \big(\text{ZEX}(\text{intersection}(x,y))\big)\Big) \rightarrow \text{Cont}(\text{intersection}(x,y),x)\Big]\Big]$

91. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\text{Cont}(z,x) \wedge \text{Cont}(z,y)\big) \rightarrow \text{leq}(z,\text{intersection}(x,y))\Big]\Big]$

92. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{Cont}(z,x) \wedge \mathrm{Cont}(z,y) \wedge \mathrm{EqDim}(z,\mathrm{intersection}(x,y))\big) \leftrightarrow \mathrm{P}(z,\mathrm{intersection}(x,y))\Big]\Big]$

93. $\forall x\ \forall y\ \Big[\Big[\Big(\mathrm{S}(x) \wedge \mathrm{S}(y) \wedge \neg\ \big(\mathrm{ZEX}(\mathrm{difference}(x,y))\big)\Big) \rightarrow \mathrm{EqDim}(x,\mathrm{difference}(x,y))\Big]\Big]$

94. $\forall x\ \forall y\ \Big[\big[\mathrm{lt}(y,x) \rightarrow =(x,\mathrm{difference}(x,y))\big]\Big]$

95. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{leq}(x,y) \wedge \mathrm{Cont}(z,x) \wedge \mathrm{lt}(\mathrm{intersection}(z,y),z)\big) \rightarrow \mathrm{Cont}(z,\mathrm{difference}(x,y))\Big]\Big]$

96. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{leq}(x,y) \wedge \mathrm{Cont}(z,\mathrm{difference}(x,y))\big) \rightarrow \mathrm{Cont}(z,x)\Big]\Big]$

97. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{leq}(x,y) \wedge \mathrm{P}(z,\mathrm{difference}(x,y))\big) \rightarrow \mathrm{lt}(\mathrm{intersection}(z,y),z)\Big]\Big]$

98. $\forall x\ \forall y\ \Big[\big[\mathrm{ZEX}(\mathrm{difference}(x,y)) \leftrightarrow \big(\mathrm{ZEX}(x) \vee \mathrm{Cont}(x,y)\big)\big]\Big]$

99. $\forall x\ \Big[\Big[\mathrm{ArealRegion}(x) \leftrightarrow \forall y\ \big[\big[\mathrm{Curve}(y) \rightarrow \mathrm{Covers}(x,y)\big]\big]\Big]\Big]$

100. $\forall x\ \big[\big[\mathrm{sf\_multi\_surface}(x) \rightarrow \mathrm{Multipart\_ArealRegion}(x)\big]\big]$

101. $\forall x\ \Big[\big[\mathrm{Multipart\_ArealRegion}(x) \leftrightarrow \big(\mathrm{ArealRegion}(x) \wedge \mathrm{Multipart\_S}(x)\big)\big]\Big]$

102. $\forall x\ \Big[\Big[\mathrm{Multipart\_S}(x) \leftrightarrow \Big(\mathrm{S}(x) \wedge \neg\ \big(\mathrm{Connected\_S}(x)\big)\Big)\Big]\Big]$

103. $\forall x\ \Big[\Big[\mathrm{sf\_multi\_line\_string}(x) \leftrightarrow \Big(\mathrm{sf\_multi\_curve}(x) \wedge \forall y\ \big[\big[\big(\mathrm{P}(y,x) \wedge \mathrm{Min}(y)\big) \rightarrow \mathrm{sf\_line\_string}(y)\big]\big]\Big)\Big]\Big]$

104. $\forall x\ \big[\big[\mathrm{sf\_multi\_curve}(x) \rightarrow \mathrm{Multipart\_Curve}(x)\big]\big]$

105. $\forall x\ \Big[\big[\mathrm{Multipart\_Curve}(x) \leftrightarrow \big(\mathrm{Curve}(x) \wedge \mathrm{Multipart\_S}(x)\big)\big]\Big]$

106. $\forall x\ \Big[\Big[\mathrm{sf\_multi\_point}(x) \leftrightarrow \Big(\mathrm{PointRegion}(x) \wedge \neg\ \big(\mathrm{Point}(x)\big)\Big)\Big]\Big]$

107. $\forall x\ \Big[\Big[\mathrm{Point}(x) \leftrightarrow \Big(\mathrm{MinDim}(x) \wedge \forall y\ \big[\big[\mathrm{Cont}(y,x) \rightarrow =(y,x)\big]\big]\Big)\Big]\Big]$

108. $\forall x \ \Big[\big[\text{PointRegion}(x) \leftrightarrow \text{MinDim}(x)\big]\Big]$