Definition of nothing in mathematical logic

We assume the method and apparatus of Meth8/VŁ4 with Tautology as the designated *proof* value, F as contradiction, N as truthity (non-contingency), and C as falsity (contingency). The repeating fragment(s) of 16-valued truth table(s) is row-major and horizontal.

LET p, q: proposition; collection of propositions
~ Not; & And; + Or; > Imply, greater than; < Not Imply, lesser than; = Equivalent
% possibility, one or some; # necessity, every or all; (p=p) Tautology, proof.

We define a proposition p in four-valued logic as p=(p=p) ; FTFT FTFT FTFT FTFT (11.2)

as alternating FT for non-tautology (contradiction) and tautology (proof).

We define the opposite of a proposition as not p as ~p=(p=p) ; TFTF TFTF TFTF TFTF (12.2)

as alternating TF for tautology (proof) and non-tautology (contradiction).

We define the antonym of nothing as some thing %p as not one thing versus some, one thing %p=(p=p) ; CTCT CTCT CTCT CTCT (13.2)

as alternating CT for contingency (falsity) and tautology (proof).

We define the opposite of some thing %p as not some thing ~%p=(p=p) ; NFNF NFNF NFNF NFNF (14.2)

as alternating NF non-contingency (truthity) and non-tautology (contradiction).

We define the antonym of all or every thing #p as ~#p as not all or not every thing #p=(p=p); FNFN FNFN FNFN FNFN (15.2)

as alternating FN for non-tautology (contradiction) and non-contingency (truthity).

We define the opposite of all or every thing as not all or not every thing ~#p=(p=p) ; TCTC TCTC TCTC TCTC (16.2)

as alternating TC for tautology (proof) and contingency (falsity).

This leads to how to collect not everything as nothing in multiple variables into a larger nothing variable, implying a set of nothing as a null set. We write this as nothing in p and nothing in q and nothing in r are all greater than nothing in s. (17.1)

((~#p&~#q)&~#r)>~#s ; TTTT TTTT CTTT TTTT (17.2)

Eq. 17.2 as rendered is *not* tautologous, although nearly so with one deviant C contingency (falsity) value. Hence a collection of nothing does not imply anything outside itself. By extension, the null set is not logically feasible and cannot exist: a collection must contain something even though it is nothing.