Formula used in Theorem 4.14

$$
\begin{aligned}
\varphi_n &:= p_0 \wedge \neg p_1 \wedge (\psi \wedge \vartheta \wedge \chi) \wedge \Box(\psi \wedge \vartheta \wedge \chi) \wedge \cdots \Box^n(\psi \wedge \vartheta \wedge \chi) \\
\psi &:= \bigwedge_{i=1..n} p_i \to p_{i-1} \\
\vartheta &:= \bigwedge_{i=0..n-1} \big[(p_i \wedge \neg p_{i+1}) \to \Diamond(p_{i+1} \wedge \neg p_{i+2} \wedge q_{i+1}) \\
&\qquad\qquad \wedge \Diamond(p_{i+1} \wedge \neg p_{i+2} \wedge \neg q_{i+1})\big] \\
\chi &:= \bigwedge_{i=1..n-1} (p_i \wedge q_i \to \Box(p_i \to q_i)) \\
&\qquad \wedge (p_i \wedge \neg q_i \to \Box(p_i \to \neg q_i))
\end{aligned}
$$

Formula used in Theorem 4.17

$$
\begin{aligned}
\varphi_Q &:= p_0 \wedge \neg p_1 \wedge (\psi \wedge \vartheta' \wedge \chi) \wedge \Box(\psi \wedge \vartheta' \wedge \chi) \wedge \cdots \Box^n(\psi \wedge \vartheta' \wedge \chi) \\
&\quad \wedge \Box^n((p_n \wedge \neg p_{n+1}) \to \sigma) \\
\vartheta' &:= \bigwedge_{\substack{i=0..n-1 \\ Q_{i+1}=\exists}} \big[(p_i \wedge \neg p_{i+1}) \to \Diamond(p_{i+1} \wedge \neg p_{i+2})\big] \\
&\quad \wedge \bigwedge_{\substack{i=0..n-1 \\ Q_{i+1}=\forall}} \big[(p_i \wedge \neg p_{i+1}) \to \Diamond(p_{i+1} \wedge \neg p_{i+2} \wedge q_{i+1}) \\
&\qquad\qquad \wedge \Diamond(p_{i+1} \wedge \neg p_{i+2} \wedge \neg q_{i+1})\big]
\end{aligned}
$$