$$\frac{-\alpha}{\alpha \to \alpha} \xrightarrow{1} I, 1$$

$$\frac{\alpha \quad \alpha \to \beta}{\beta} \quad \to E$$

$$\frac{\alpha \quad \alpha \to (\neg \beta \to \gamma)}{\neg \beta \to \gamma} \quad \to E \quad \frac{\alpha \quad \alpha \to \neg \beta}{\neg \beta} \quad \to E$$

$$\frac{\overbrace{\alpha} \qquad \alpha \to \beta}{\frac{\beta}{\frac{\bot}{\alpha \to \bot}} \rightarrow E}$$

$$\frac{\alpha \to \beta \quad \overline{\not \beta}}{\frac{\neg \alpha}{\neg \beta \to \neg \alpha}}$$