

Selection step	$2\ell_{\text{os}} + 1\tau_{\text{h}}$	$4\ell + 0\tau_{\text{h}}$
Targeted $t\bar{t}H$ decays	$t \rightarrow b\ell\nu, t \rightarrow bqq'$ with $H \rightarrow \tau^+\tau^- \rightarrow \ell\nu\nu\tau_{\text{h}}\nu$	$t \rightarrow b\ell\nu, t \rightarrow b\ell\nu$ with $H \rightarrow WW \rightarrow \ell\nu\ell\nu$ $t \rightarrow b\ell\nu, t \rightarrow b\ell\nu$ with $H \rightarrow ZZ \rightarrow \ell\ell qq'$ or $\ell\ell\nu\nu$
Trigger	Single- and double-lepton triggers	Single-, double- and triple-lepton triggers
Lepton p_{T}	$p_{\text{T}} > 25 / 15 \text{ GeV (e) or } 10 \text{ GeV } (\mu)$	$p_{\text{T}} > 25 / 15 / 15 / 10 \text{ GeV}$
Lepton η	$ \eta < 2.5 \text{ (e) or } 2.4 \text{ } (\mu)$	
$\tau_{\text{h}} p_{\text{T}}$	$p_{\text{T}} > 20 \text{ GeV}$	—
$\tau_{\text{h}} \eta$	$ \eta < 2.3$	—
τ_{h} identification	tight	—
Charge requirements	$\sum_{\ell} q = 0$ and $\sum_{\ell, \tau_{\text{h}}} q = \pm 1$	$\sum_{\ell} q = 0$
Multiplicity of central jets	≥ 3 jets	≥ 2 jets
b tagging requirements	≥ 1 tight b-tagged jet or ≥ 2 loose b-tagged jets	
Missing transverse momentum	$L_{\text{D}} > 30 \text{ GeV}^{\dagger}$	$L_{\text{D}} > 0 / 30 / 45 \text{ GeV}^{\ddagger}$
Dilepton invariant mass	$m_{\ell\ell} > 12 \text{ GeV}$	$ m_{\ell\ell} - m_{\text{Z}} > 10 \text{ GeV}^{\S}$ and $m_{\ell\ell} > 12 \text{ GeV}$
Four-lepton invariant mass	—	$m_{4\ell} > 140 \text{ GeV}^{\P}$

[†] Only applied to events containing two electrons.

[‡] See text for a complete description of this requirement.

[§] Applied to all SFOS lepton pairs.

[¶] If the event contains two SFOS pairs of leptons passing the loose lepton selection criteria.