$$\frac{\partial}{\partial \tilde{c}_K^Q}\left[\sum_{LMN}\langle \tilde{M}|\hat{T}_{LM}^{\dagger}\hat{H}|\tilde{N}\rangle R_{LP}^{*}R_{NP}\right]$$

$$=\sum_{L}\left[\sum_{M}\sum_{J}\langle J|\tilde{c}_J^{M\dagger}\hat{T}_{LM}^{\dagger}\hat{H}|K\rangle R_{QP}+\sum_{N}\sum_{I}\langle K|\hat{T}_{LM}^{\dagger}\hat{H}\tilde{c}_I^{N}|I\rangle R_{NP}\right]R_{LP}^{*}$$

$$\sum_{L}\left[\sum_{M}\sum_{J}\Big(\langle J|\tilde{c}_J^{M\dagger}T_{LM,abcd}^{\dagger}(\hat{E}_{ab}\hat{E}_{cd}-\delta_{bc}\hat{E}_{ad})(\hat{E}_{wx}\hat{E}_{yz}-\delta_{xy}\hat{E}_{wz})g(1,2)|K\rangle+ \quad (1)$$

$$\langle J|\tilde{c}_J^{M\dagger}T_{LM,abcd}^{\dagger}(\hat{E}_{ab}\hat{E}_{cd}-\delta_{bc}\hat{E}_{ad})\hat{E}_{wx}h(1)|K\rangle\Big)R_{QP}+ \quad (2)$$

$$\sum_{N}\sum_{I}\Big(\langle K|T_{LQ,abcd}^{\dagger}(\hat{E}_{ab}\hat{E}_{cd}-\delta_{bc}\hat{E}_{ad})(\hat{E}_{wx}\hat{E}_{yz}-\delta_{xy}\hat{E}_{wz})g(1,2)\tilde{c}_I^{N}|I\rangle \quad (3)$$

$$\langle K|T_{LQ,abcd}^{\dagger}(\hat{E}_{ab}\hat{E}_{cd}-\delta_{bc}\hat{E}_{ad})\hat{E}_{wx}h(1)\tilde{c}_I^{N}|I\rangle\Big)R_{NP}\Bigg]R_{LP}^{*} \quad (4)$$

$$(1)=$$