$$\frac{\Delta^\star \vdash \Gamma}{\Delta^\star;\Gamma \vdash \textbf{true} : (\textbf{bool}) \mathbin{@} \bot}\ \text{WFT:TRUE} \qquad \frac{\Delta^\star \vdash \Gamma}{\Delta^\star;\Gamma \vdash \textbf{false} : (\textbf{bool}) \mathbin{@} \bot}\ \text{WFT:FALSE}$$

$$\frac{\Delta^\star \vdash \Gamma \qquad x:\sigma \in \Gamma}{\Delta^\star;\Gamma \vdash x : \sigma}\ \text{WFT:VAR} \qquad \frac{\Delta^\star;\Gamma, x{:}\sigma_1 \vdash e : \sigma_2 \qquad \Delta^\star \vdash \sigma_1}{\Delta^\star;\Gamma \vdash \lambda x{:}\sigma_1.e : \sigma_1 \xrightarrow{\bot} \sigma_2}\ \text{WFT:ABS}$$

$$\frac{\Delta^\star;\Gamma \vdash e_1 : \sigma_1 \xrightarrow{\ell} \sigma_2 \qquad \Delta^\star;\Gamma \vdash e_2 : \sigma_1}{\Delta^\star;\Gamma \vdash e_1 e_2 : \sigma_2 \sqcup \ell}\ \text{WFT:APP} \qquad \frac{\Delta^\star, \alpha{:}\star^\ell;\Gamma \vdash e : \sigma}{\Delta^\star;\Gamma \vdash \Lambda\alpha{:}\star^\ell.e : \forall^\bot \alpha{:}\star^\ell.\sigma}\ \text{WFT:TABS}$$

$$\frac{\Delta^\star;\Gamma \vdash e : \forall^\ell \alpha{:}\star^{\ell'}.\sigma \qquad \Delta^\star \vdash \tau : \star^{\ell'}}{\Delta^\star;\Gamma \vdash e[\tau] : \sigma[\tau/\alpha] \sqcup \ell}\ \text{WFT:TAPP} \qquad \frac{\Delta^\star;\Gamma \vdash e_1 : \sigma_1 \qquad \Delta^\star;\Gamma \vdash e_2 : \sigma_2}{\Delta^\star;\Gamma \vdash \langle e_1, e_2\rangle : \sigma_1 \times^\bot \sigma_2}\ \text{WFT:PAIR}$$

$$\frac{\Delta^\star;\Gamma \vdash e : \sigma_1 \times^\ell \sigma_2}{\Delta^\star;\Gamma \vdash \textbf{fst}\, e : \sigma_1 \sqcup \ell}\ \text{WFT:FST} \qquad \frac{\Delta^\star;\Gamma \vdash e : \sigma_1 \times^\ell \sigma_2}{\Delta^\star;\Gamma \vdash \textbf{snd}\, e : \sigma_2 \sqcup \ell}\ \text{WFT:SND}$$

$$\frac{\Delta^\star;\Gamma, x{:}\sigma \vdash e : \sigma \qquad \Delta^\star \vdash \sigma}{\Delta^\star;\Gamma \vdash \textbf{fix}\, x{:}\sigma.e : \sigma}\ \text{WFT:FIX}$$

$$\frac{\Delta^\star;\Gamma \vdash e_1 : (\textbf{bool}) \mathbin{@} \ell \qquad \Delta^\star;\Gamma \vdash e_2 : \sigma \qquad \Delta^\star;\Gamma \vdash e_3 : \sigma}{\Delta^\star;\Gamma \vdash \textbf{if}\ e_1\ \textbf{then}\ e_2\ \textbf{else}\ e_3 : \sigma \sqcup \ell}\ \text{WFT:IF}$$

$$\frac{\begin{array}{c}\Delta^\star \vdash \tau : \star^\ell \qquad \Delta^\star, \gamma{:}\star^\ell \vdash \sigma \\ \ell \sqsubseteq \ell' \qquad \Delta^\star;\Gamma \vdash e_{\textbf{bool}} : \sigma[\textbf{bool}/\gamma] \qquad \Delta^\star;\Gamma \vdash e_{\to} : \forall^{\ell'} \alpha{:}\star^\ell.\forall^{\ell'}\beta{:}\star^\ell.\sigma[\alpha \to \beta/\gamma] \\ \Delta^\star;\Gamma \vdash e_{\times} : \forall^{\ell'} \alpha{:}\star^\ell.\forall^{\ell'}\beta{:}\star^\ell.\sigma[\alpha \times \beta/\gamma] \qquad \text{where } \ell' = \mathcal{L}(\sigma[\tau/\gamma])\end{array}}{\Delta^\star;\Gamma \vdash \textbf{typecase}\ [\gamma.\sigma]\ \tau\ e_{\textbf{bool}}\ e_{\to}\ e_{\times} : \sigma[\tau/\gamma]}\ \text{WFT:TCASE}$$

$$\frac{\Delta^\star;\Gamma \vdash e : \sigma_1 \qquad \Delta^\star \vdash \sigma_1 \le \sigma_2}{\Delta^\star;\Gamma \vdash e : \sigma_2}\ \text{WFT:SUB}$$

Figure 2·4: Term well-formedness

$$\frac{\Delta^\star \vdash \tau : \star^\ell}{\Delta^\star \vdash (\tau) \mathbin{@} \bot}\ \text{WFTP:CON} \qquad \frac{\Delta^\star \vdash \sigma_1 \qquad \Delta^\star \vdash \sigma_2}{\Delta^\star \vdash \sigma_1 \xrightarrow{\bot} \sigma_2}\ \text{WFTP:ARR} \qquad \frac{\Delta^\star \vdash \sigma_1 \qquad \Delta^\star \vdash \sigma_2}{\Delta^\star \vdash \sigma_1 \times^\bot \sigma_2}\ \text{WFTP:PROD}$$

$$\frac{\Delta^\star, \alpha{:}\star^\ell \vdash \sigma}{\Delta^\star \vdash \forall^\bot \alpha{:}\star^\ell.\sigma}\ \text{WFTP:ALL}$$

Figure 2·5: Type well-formedness