The weyl tensor

$$C_{ab}{}^{cd} = R_{ab}{}^{cd} - 2\delta^{[c}_{[a} R^{d]}_{b]} + \tfrac{1}{3} R \delta^{[c}_{[a} \delta^{d]}_{b]}$$

Dual of a 2-rank antisymmetric tensor is defined as

$$\tilde{F}_{ab} = \tfrac{1}{2} \epsilon_{abcd} F^{cd}$$, where ϵ_{abcd} is 4-D Levi civita

Now

$$F_{ab}^{+} = (F_{ab} + \tilde{F}_{ab})\frac{1}{2} \quad \text{[self dual]}$$

$$F_{ab}^{-} = (F_{ab} - \tilde{F}_{ab})\frac{1}{2} \quad \text{[anti self dual]}$$

The self dual and anti-self dual projection operator is -

$$\Pi^{\pm\, cd}_{ab} = \tfrac{1}{2}\left\{ \delta^{[c}_{[a} \delta^{d]}_{b]} \pm \frac{1}{2} \epsilon_{ab}{}^{cd} \right\}$$

Now how to do it for

$R_{ab}{}^{cd}$?

is it $$R^{-\,cd}_{ab} = \Pi^{-\,mn}_{ab}\, \Pi^{-\,cd}_{gh}\, R_{mn}{}^{gh} \;?$$

or.

some other definition?