1. Estimate the energy ratio optimum, ER_{opt}

```
if R==95
    if ESALs*10^-7<0.14
        % ERopt=0.276*ESALs*10^-7+0.65;
        ERopt=0.329*ESALs*10^-7+0.65;
    elseif ESALs*10^-7>=0.14 && ESALs*10^-7 <=0.8
        ERopt=0.640*ESALs*10^-7+0.61;
    elseif ESALs*10^-7>=0.8
        ERopt=0.256*ESALs*10^-7+0.92;
    end
end

% TRAFFIC AND RELIABILITY
ESALs=10*10^6;   % has to be in millions
R=95;
ERopt=eropt(ESALs,R);  %Run function to find Optimum Energyratio, ERopt
```

ER_{opt} = <u>1.176</u>

2. Estimate the tensile strength S_t

```
% Dynamic modulus mater curve parameters
delta=2.718879 + 0.079524*p200 - 0.007294*p200^2 + 0.002085*(100-p4) -
0.01293*Va+0.08541*Vbeff/(Vbeff+Va);

alpha=3.559267 - 0.005451*(100-p4) + 0.020711*(100-p38) - 0.0003507*(100-p38)^2 +
0.0053204*(100-p34);

St = st_c0 + st_c1*x + st_c2*x*x +st_c3*x^3 + st_c4*x^4 + st_c5*x^5;  % in Mpa

% fcm.m file

St=tensile_strength(Tref,maat,mixparam,time,t1800,z); % unit in MPa
```

St =<u>3.0847 MPa</u>

3. Estimate creep parameters D_1 *and* m

```
% Dynamic modulus mater curve parameters
delta=2.718879 + 0.079524*p200 - 0.007294*p200^2 + 0.002085*(100-p4) -
0.01293*Va+0.08541*Vbeff/(Vbeff+Va);

alpha=3.559267 - 0.005451*(100-p4) + 0.020711*(100-p38) - 0.0003507*(100-
p38)^2 + 0.0053204*(100-p34);

% Creep compliance parameters

D0=10^(-delta - alpha - log10(lambda));
temp=(exp(beta + 3*gama));

% fcm.m file

[D1 m]=creep_parameters(mixparam,maat,Tref,time,z);    % D1 in 1/psi
```

D_1 = <u>1.7092*10^-6 1/psi</u> ,   **m=<u>0.4376</u>**

4. Determine the AC thickness $\boldsymbol{H_{tot}}$

```
% Dynamic modulus mater curve parameters
delta=2.718879 + 0.079524*p200 - 0.007294*p200^2 + 0.002085*(100-p4) -
0.01293*Va+0.08541*Vbeff/(Vbeff+Va);

alpha=3.559267 - 0.005451*(100-p4) + 0.020711*(100-p38) - 0.0003507*(100-
p38)^2 + 0.0053204*(100-p34);

% deptha at which modulus is calculated
z=[0.125*Hac 0.5*Hac];

% fcm.m file
```

H_{tot}=**7.2 inch**