```
D = 2100 ; d = 1500;
fck = 40 ; fy = 500;
%Inputting T Matrix which consists of no. of layers of steel in 1st column,
% its respective depth from top in 2nd column and Area in 3rd column
T = readmatrix('myfile.csv');
P = []; M = [];Phi = [];Xu =[];Emax =[];P =[];
for phi = 0:0.0000001:0.00003
    for ecmax = 0.00005:0.0000001:0.0035
        pct = 0 ;mct =0;pst=0;mst=0;
        xu = ecmax/phi;
        if(xu>=2100)
            t = 42 ;
        else
            t = xu/50;
        end
        if(t~=0)
            for i = 1:50
                eci = phi*(xu-(2*i-1)*(t/2));
                if(eci<0.002)
                    sigmaci = 26.8*(eci/0.002)*(2-(eci/0.002));
                else
                    sigmaci = 26.8;
                end
                pci = sigmaci * strip_area(i,t);
                mci = pci*(1050-(2*i-1)*(t/2));
                pct = pct + pci;
                mct = mct + mci;
            end
        else
            pct = 0;
            mct = 0;
        end
        for j =1 :21
        % esi and sigmasi are strain and stress in given steel layer
        esi = phi* (xu -T(j,2));
        sigmasi = unfactored_steel_stress(esi);
        % psi and msi are force and moment in given steel layer
        psi = sigmasi * T(j,3);
        msi = psi*(1050-T(j,2));
        pst = pst+psi;
        mst = mst+msi;
        end
        pt = (pst+pct)/1000;
        mt = (mst+mct)/10^6;
        if(pt>=1950 && pt<=2050)
            Phi(end+1) = phi ;
            M (end+1) = mt;
            Xu(end+1) = xu;
            Emax(end+1) = ecmax;
            P(end+1) = pt;
            break
        end
    end
end
title("M-Phi Curve")
xlabel("Phi(rad/mm)")
ylabel("M(KNm)")
hold on
plot(Phi,M,"LineStyle","-","LineWidth",1,'Color','b','Marker','o','MarkerEdgeColor','r','MarkerFaceColor','y','MarkerSize',5,'MarkerIndices',[8 30 91])
ax = gca;
ax.XAxisLocation = 'origin';
ax.YAxisLocation = 'origin';
grid on
display(Phi)
display(M)
display(Xu)
display(Emax)
display(P)
```

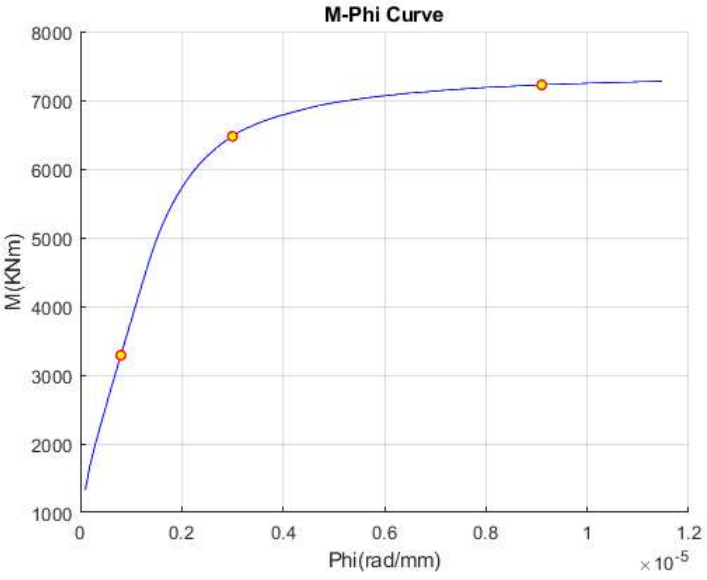
```
Phi =

   1.0e-04 *

  Columns 1 through 7

    0.0010    0.0020    0.0030    0.0040    0.0050    0.0060    0.0070

  Columns 8 through 14

    0.0080    0.0090    0.0100    0.0110    0.0120    0.0130    0.0140

  Columns 15 through 21

    0.0150    0.0160    0.0170    0.0180    0.0190    0.0200    0.0210

  Columns 22 through 28

    0.0220    0.0230    0.0240    0.0250    0.0260    0.0270    0.0280

  Columns 29 through 35
```

```
    0.0290    0.0300    0.0310    0.0320    0.0330    0.0340    0.0350

  Columns 36 through 42

    0.0360    0.0370    0.0380    0.0390    0.0400    0.0410    0.0420

  Columns 43 through 49

    0.0430    0.0440    0.0450    0.0460    0.0470    0.0480    0.0490

  Columns 50 through 56

    0.0500    0.0510    0.0520    0.0530    0.0540    0.0550    0.0560

  Columns 57 through 63

    0.0570    0.0580    0.0590    0.0600    0.0610    0.0620    0.0630

  Columns 64 through 70

    0.0640    0.0650    0.0660    0.0670    0.0680    0.0690    0.0700

  Columns 71 through 77

    0.0710    0.0720    0.0730    0.0740    0.0750    0.0760    0.0770

  Columns 78 through 84

    0.0780    0.0790    0.0800    0.0810    0.0820    0.0830    0.0840

  Columns 85 through 91

    0.0850    0.0860    0.0870    0.0880    0.0890    0.0900    0.0910

  Columns 92 through 98

    0.0920    0.0930    0.0940    0.0950    0.0960    0.0970    0.0980

  Columns 99 through 105

    0.0990    0.1000    0.1010    0.1020    0.1030    0.1040    0.1050

  Columns 106 through 112

    0.1060    0.1070    0.1080    0.1090    0.1100    0.1110    0.1120

  Columns 113 through 115

    0.1130    0.1140    0.1150

M =

   1.0e+03 *

  Columns 1 through 7

    1.3416    1.7146    2.0045    2.2715    2.5311    2.7863    3.0383

  Columns 8 through 14

    3.2884    3.5374    3.7848    4.0321    4.2772    4.5224    4.7505

  Columns 15 through 21

    4.9649    5.1504    5.3180    5.4676    5.6020    5.7210    5.8330

  Columns 22 through 28

    5.9381    6.0283    6.1116    6.1841    6.2499    6.3136    6.3724

  Columns 29 through 35

    6.4255    6.4746    6.5226    6.5628    6.5971    6.6315    6.6624

  Columns 36 through 42

    6.6917    6.7177    6.7432    6.7656    6.7862    6.8066    6.8262

  Columns 43 through 49

    6.8461    6.8657    6.8846    6.9031    6.9192    6.9346    6.9498

  Columns 50 through 56

    6.9635    6.9760    6.9878    6.9985    7.0084    7.0186    7.0291

  Columns 57 through 63

    7.0381    7.0470    7.0558    7.0642    7.0724    7.0808    7.0889

  Columns 64 through 70
```

```
    7.0961    7.1027    7.1090    7.1152    7.1211    7.1272    7.1332

  Columns 71 through 77

    7.1390    7.1450    7.1505    7.1559    7.1607    7.1657    7.1705

  Columns 78 through 84

    7.1751    7.1796    7.1843    7.1881    7.1920    7.1957    7.1993

  Columns 85 through 91

    7.2028    7.2063    7.2095    7.2128    7.2160    7.2190    7.2224

  Columns 92 through 98

    7.2252    7.2284    7.2312    7.2339    7.2364    7.2392    7.2417

  Columns 99 through 105

    7.2439    7.2461    7.2484    7.2506    7.2530    7.2550    7.2570

  Columns 106 through 112

    7.2590    7.2609    7.2630    7.2647    7.2667    7.2686    7.2704

  Columns 113 through 115

    7.2722    7.2741    7.2758


Xu =

   1.0e+03 *

  Columns 1 through 7

    1.2990    0.9230    0.7737    0.6915    0.6396    0.6037    0.5773

  Columns 8 through 14

    0.5571    0.5413    0.5286    0.5183    0.5096    0.5024    0.4957

  Columns 15 through 21

    0.4896    0.4834    0.4774    0.4715    0.4658    0.4602    0.4550

  Columns 22 through 28

    0.4500    0.4450    0.4403    0.4356    0.4311    0.4269    0.4228

  Columns 29 through 35

    0.4189    0.4151    0.4115    0.4080    0.4044    0.4011    0.3978

  Columns 36 through 42

    0.3947    0.3917    0.3888    0.3859    0.3832    0.3806    0.3781

  Columns 43 through 49

    0.3757    0.3734    0.3712    0.3692    0.3671    0.3650    0.3631

  Columns 50 through 56

    0.3612    0.3593    0.3575    0.3557    0.3540    0.3523    0.3507

  Columns 57 through 63

    0.3491    0.3476    0.3461    0.3447    0.3433    0.3419    0.3407

  Columns 64 through 70

    0.3394    0.3381    0.3369    0.3357    0.3346    0.3335    0.3324

  Columns 71 through 77

    0.3314    0.3304    0.3294    0.3285    0.3275    0.3267    0.3258

  Columns 78 through 84

    0.3249    0.3241    0.3233    0.3225    0.3217    0.3209    0.3202

  Columns 85 through 91

    0.3194    0.3187    0.3180    0.3173    0.3166    0.3160    0.3153

  Columns 92 through 98

    0.3147    0.3141    0.3135    0.3129    0.3123    0.3117    0.3112

  Columns 99 through 105
```

```
    0.3106    0.3101    0.3096    0.3091    0.3086    0.3082    0.3077

  Columns 106 through 112

    0.3072    0.3068    0.3063    0.3059    0.3055    0.3051    0.3047

  Columns 113 through 115

    0.3043    0.3039    0.3035

Emax =

  Columns 1 through 7

    0.0001    0.0002    0.0002    0.0003    0.0003    0.0004    0.0004

  Columns 8 through 14

    0.0004    0.0005    0.0005    0.0006    0.0006    0.0007    0.0007

  Columns 15 through 21

    0.0007    0.0008    0.0008    0.0008    0.0009    0.0009    0.0010

  Columns 22 through 28

    0.0010    0.0010    0.0011    0.0011    0.0011    0.0012    0.0012

  Columns 29 through 35

    0.0012    0.0012    0.0013    0.0013    0.0013    0.0014    0.0014

  Columns 36 through 42

    0.0014    0.0014    0.0015    0.0015    0.0015    0.0016    0.0016

  Columns 43 through 49

    0.0016    0.0016    0.0017    0.0017    0.0017    0.0018    0.0018

  Columns 50 through 56

    0.0018    0.0018    0.0019    0.0019    0.0019    0.0019    0.0020

  Columns 57 through 63

    0.0020    0.0020    0.0020    0.0021    0.0021    0.0021    0.0021

  Columns 64 through 70

    0.0022    0.0022    0.0022    0.0022    0.0023    0.0023    0.0023

  Columns 71 through 77

    0.0024    0.0024    0.0024    0.0024    0.0025    0.0025    0.0025

  Columns 78 through 84

    0.0025    0.0026    0.0026    0.0026    0.0026    0.0027    0.0027

  Columns 85 through 91

    0.0027    0.0027    0.0028    0.0028    0.0028    0.0028    0.0029

  Columns 92 through 98

    0.0029    0.0029    0.0029    0.0030    0.0030    0.0030    0.0030

  Columns 99 through 105

    0.0031    0.0031    0.0031    0.0032    0.0032    0.0032    0.0032

  Columns 106 through 112

    0.0033    0.0033    0.0033    0.0033    0.0034    0.0034    0.0034

  Columns 113 through 115

    0.0034    0.0035    0.0035

P =

   1.0e+03 *

  Columns 1 through 7

    1.9510    1.9501    1.9517    1.9500    1.9506    1.9511    1.9508

  Columns 8 through 14
```

```
  1.9504    1.9507    1.9501    1.9511    1.9501    1.9507    1.9500

Columns 15 through 21

  1.9507    1.9500    1.9501    1.9510    1.9501    1.9509    1.9503

Columns 22 through 28

  1.9506    1.9505    1.9504    1.9509    1.9502    1.9503    1.9505

Columns 29 through 35

  1.9506    1.9505    1.9501    1.9509    1.9501    1.9500    1.9501

Columns 36 through 42

  1.9508    1.9500    1.9503    1.9505    1.9502    1.9507    1.9503

Columns 43 through 49

  1.9505    1.9506    1.9500    1.9506    1.9504    1.9501    1.9506

Columns 50 through 56

  1.9502    1.9504    1.9505    1.9506    1.9501    1.9501    1.9505

Columns 57 through 63

  1.9502    1.9504    1.9505    1.9504    1.9501    1.9502    1.9502

Columns 64 through 70

  1.9504    1.9504    1.9503    1.9503    1.9500    1.9502    1.9502

Columns 71 through 77

  1.9501    1.9504    1.9502    1.9505    1.9503    1.9505    1.9504

Columns 78 through 84

  1.9503    1.9500    1.9504    1.9501    1.9502    1.9503    1.9504

Columns 85 through 91

  1.9502    1.9503    1.9501    1.9502    1.9502    1.9501    1.9504

Columns 92 through 98

  1.9501    1.9504    1.9504    1.9503    1.9500    1.9503    1.9503

Columns 99 through 105

  1.9502    1.9501    1.9501    1.9500    1.9503    1.9502    1.9502

Columns 106 through 112

  1.9502    1.9501    1.9503    1.9501    1.9501    1.9501    1.9501

Columns 113 through 115

  1.9501    1.9503    1.9503
```



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