SAE-170519-056-2733 판테크

구 조 계 산 서

Structural Check Report

for

비고정형 케이블(체인) 버팀대 허용 내력 검토

2017. 05.

위 건축물(공작물)에 대하여 국토해양부 고시 건축구조기준(KBC)에 따라 건축구조기술사가 구조설계를 수행하여 구조안전을 확인하였으므로, 본 구조설계서에 표시된 구조형식, 사용재료 및 강도, 하중조건, 지반특성, 구조설계의 취지를 올바르게 파악하여 구조설계도에 표기하시기 바랍니다. 구조안전을 확인한 구조설계도서(구조설계도, 구조설계서, 구조체공사시방서)에는 사단법인 한국건축구조기술사회에 등록된 인장으로 날인합니다. 시공상세도서에 대한 구조안전 확인, 시공 중 구조안전 확인, 유지관리 중 구조안전 확인이 필요한 경우에는 미리 건축구조기술사에게 구조안전의 확인을 요청하시기 바랍니다.

0	2017. 05. 22.	INITIAL ISSUE			S. C. LEE
차 례	일 자	구 조 설 계 단 계	설 계 자	검 토 자	승 인 자

KSEA 사단법인 한국건축구조기술사회 THE KOREAN STRUCTURAL ENGINEERS ASSOCIATION

설 계 자 : DESIGNED BY

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C O N T E N T S

1.0 DESIGN CRITERIA

1.1 구조물 개요

가) 공 사 명 : 비고정형 케이블(체인) 버팀대 설치공사

나) 구 조 : 철골구조

1.2 구조용 재료

가) 철골 : SS400(SS41) : Fy = 235 MPa (Fy = 2400 kgf/cm^2)

1.3 설계적용 규준

가) 국토해양부 고시 “건축구조기준 및 해설”, 대한건축학회, 2016

1.4 검토방법

가) 본 구조물은 chain에 의한 행거구조물로서 구조물은 횡력에 대하여 불안정구조이므로 수직하중에 대한 허용내력만 산정한다.

나) 부재내 opening을 고려하여 단면손실없는 단면과 전체단면의 단명성질계수의 비를 부재내력비를 하여 검토한다.

다) 허용내력은 각부재가 받을 수 있는 허용내력중 최저값을 허용내력으로 한다.

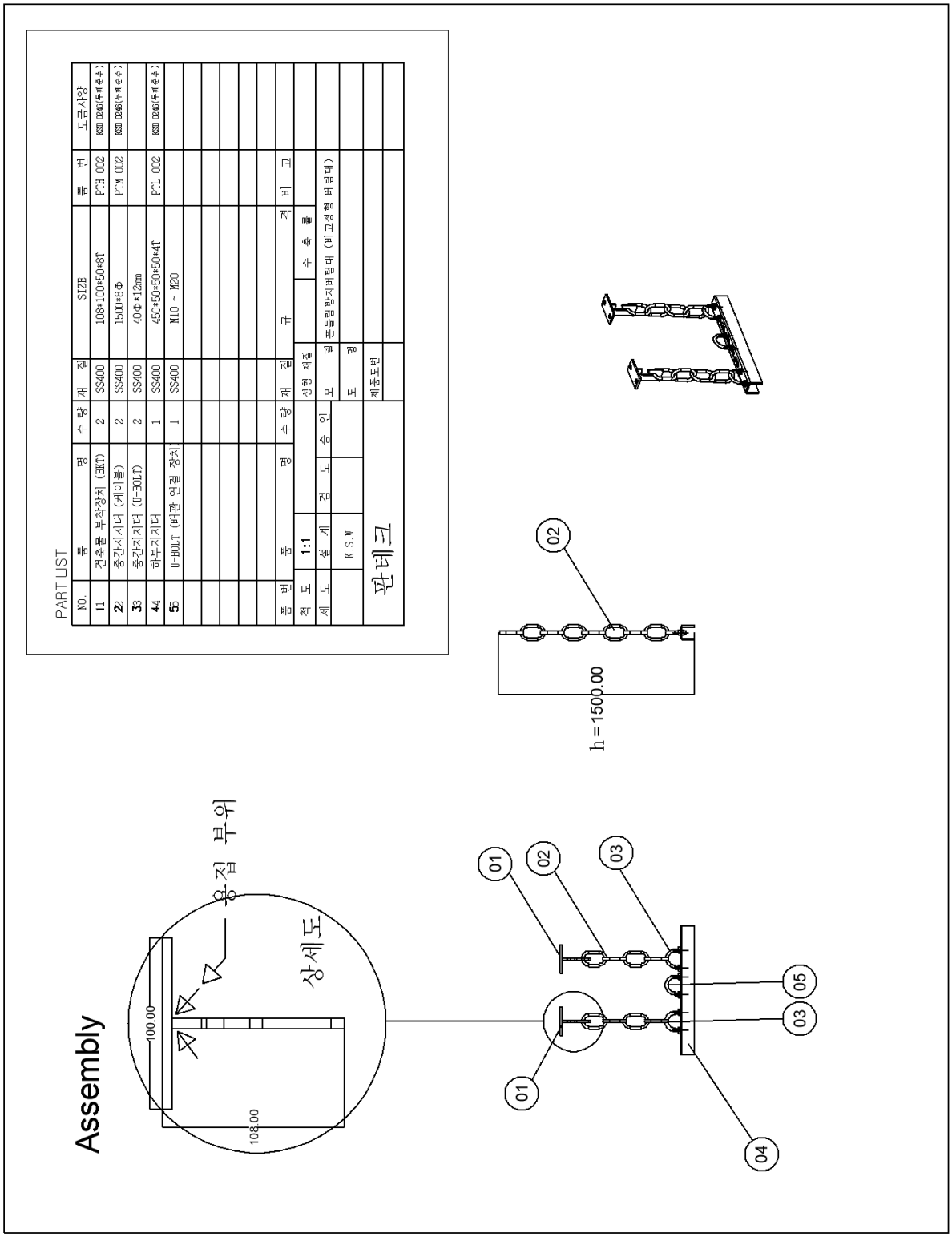
2.0 DESIGN LOADS

2.1 고정하중

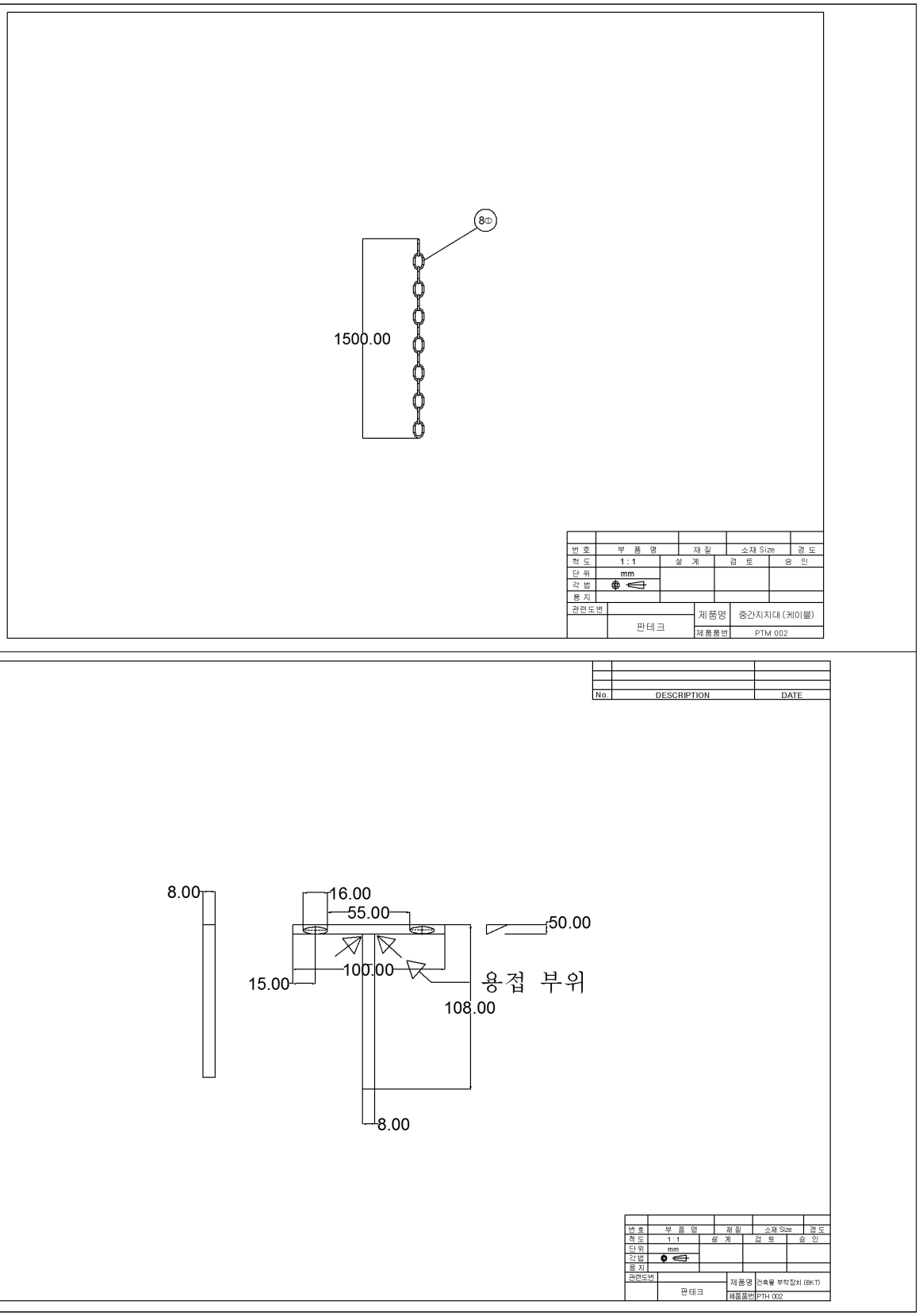
가) FRAME 자중 : MIDAS GEN SELF WEIGHT로 적용함

나) DEAD LOAD : 중앙부 배관 집중하중 적용 : 5kN (가정치)

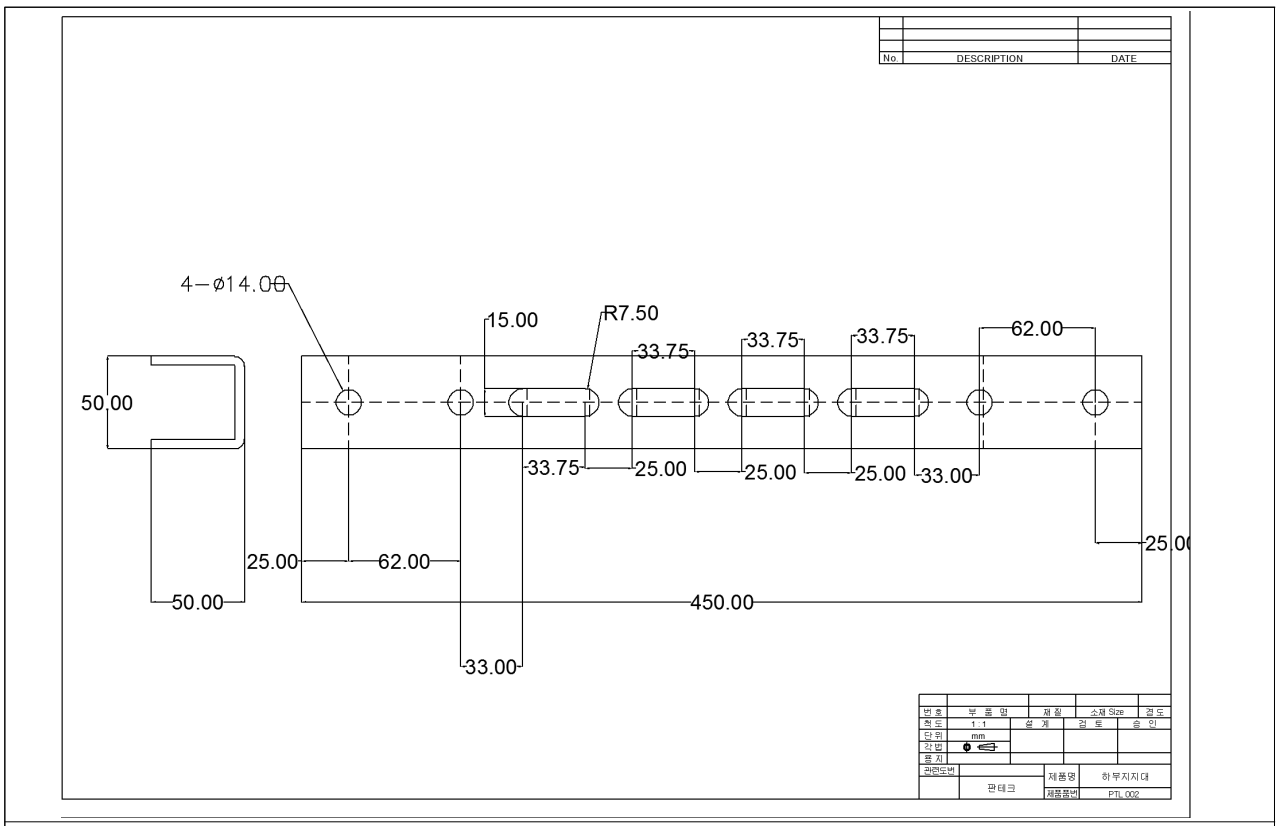
3.0 DESIGN DRAWING

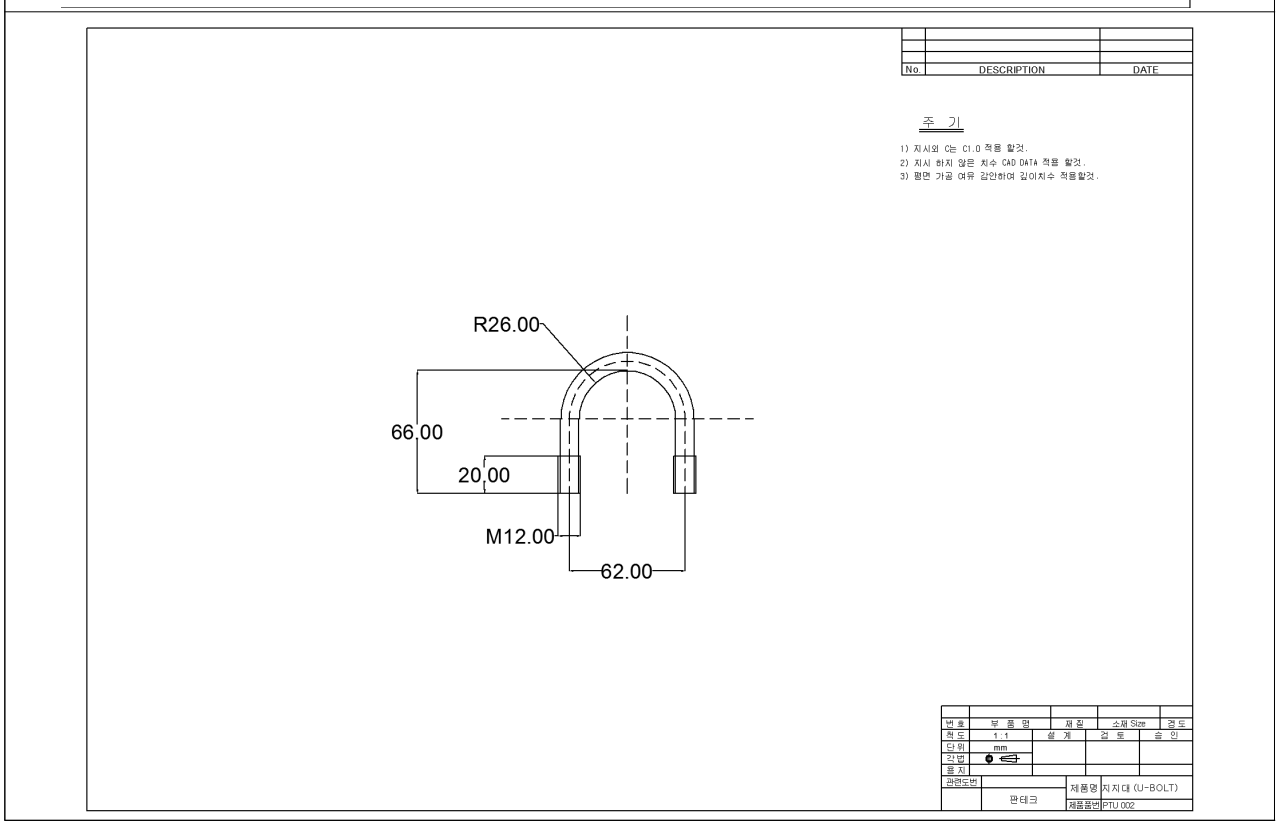


3.0 DESIGN DRAWING



3.0 DESIGN DRAWING

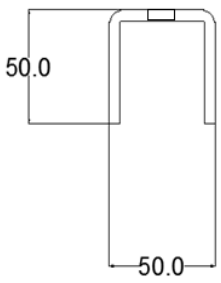


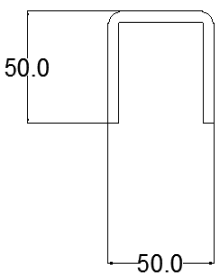


4.0 MEMBER'S PROPERTIES

단면성질계수 계산

C-50X50X50X4 OPENING 15MM		C-50X50X50X4 OPENING 0MM	
FLANGE	50 MM	FLANGE	50 MM
WEB	50 MM	WEB	50 MM
THK	4 MM	THK	4 MM
OPEN	15 MM	OPEN	0 MM
A1 =	400 MM^2	A1 =	400 MM^2
A2=	108 MM^2	A2=	168 MM^2
AREA=	508	AREA=	568
단면중심		단면중심	
CX=	25.00 MM	CX=	25.00 MM
CY=	29.88976378 MM	CY=	31.80 MM
MOMENT OF INERTIA		MOMENT OF INERTIA	
Io1x	83333.3 MM^3	Io1x	83333.3 MM^3
io2x	144.0 mm^3	io2x	224.0 mm^3
Io3x	44985.8	Io3x	62585.9
Ix =	128463.2 MM^3	Ix =	146143.2 MM^3
Io1y	533.3 MM^3	Io1y	533.3 MM^3
io2y	23571.0 mm^3	io2y	24696.0 mm^3
Io3y	211600.0	Io3y	211600.0
Iy =	235704.3 MM^3	Iy =	236829.3 MM^3
단면계수		단면계수	
Sx=	4297.9 MM^3	Sx =	4595.3 MM^3
Sy=	9428.2 MM^3	Sy=	9473.2 MM^3
단면2차반경		단면2차반경	
rx=	15.9 mm	rx=	16.0 mm
ry=	21.5 mm	ry=	20.4 mm

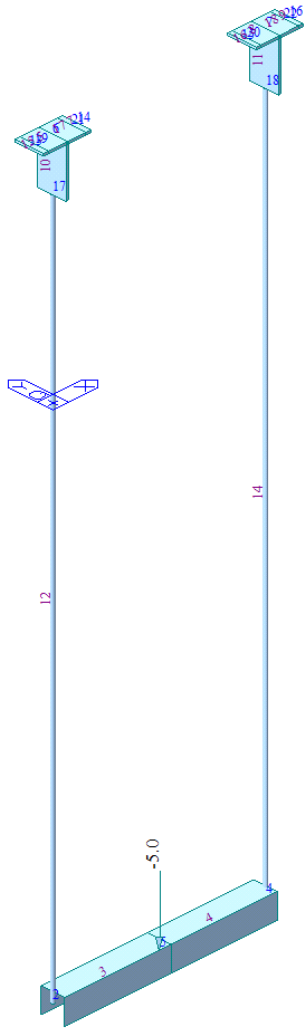




휨에의한 단면비율 : x축비 =4297/4595 = 0.935 , y축비 =9428/9473 =0.99

5.0 FRAME ANALYSIS

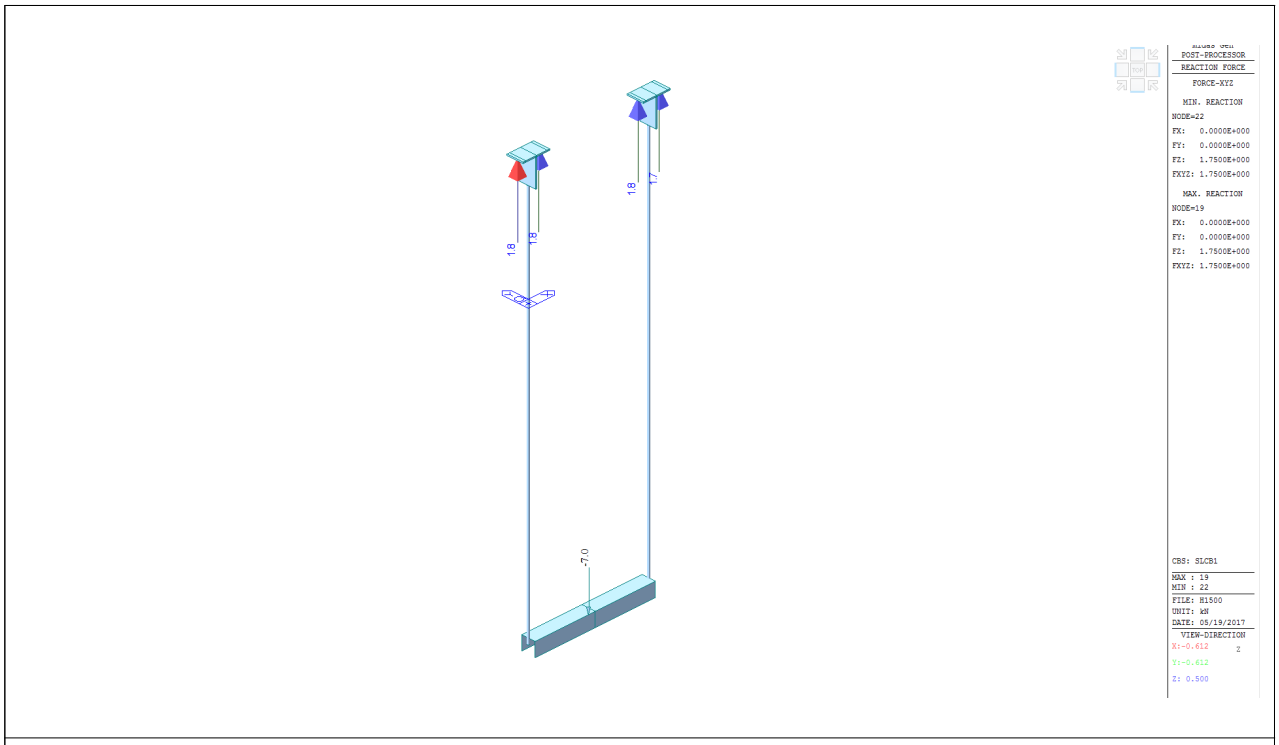
5.1 3D MODELING & LOADING



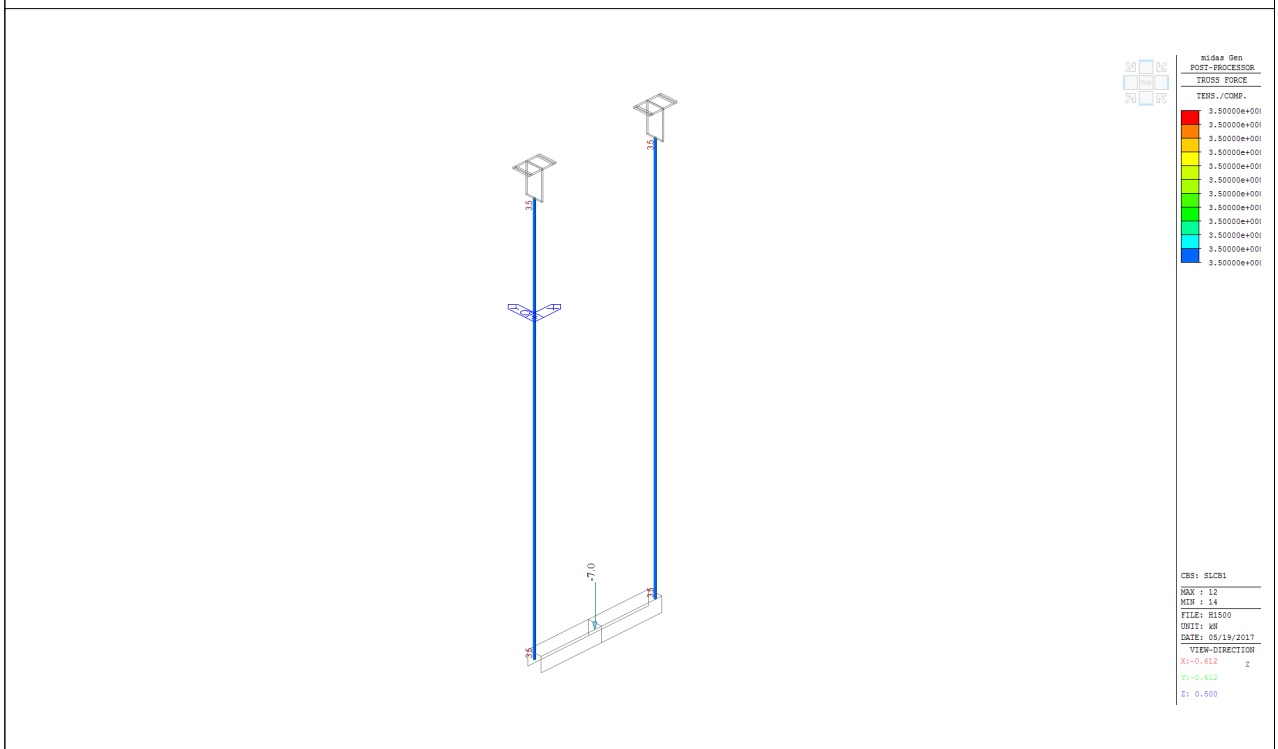
Pd= 5 KN

5.0 FRAME ANALYSIS

5.3 ANALYSIS RESULTS



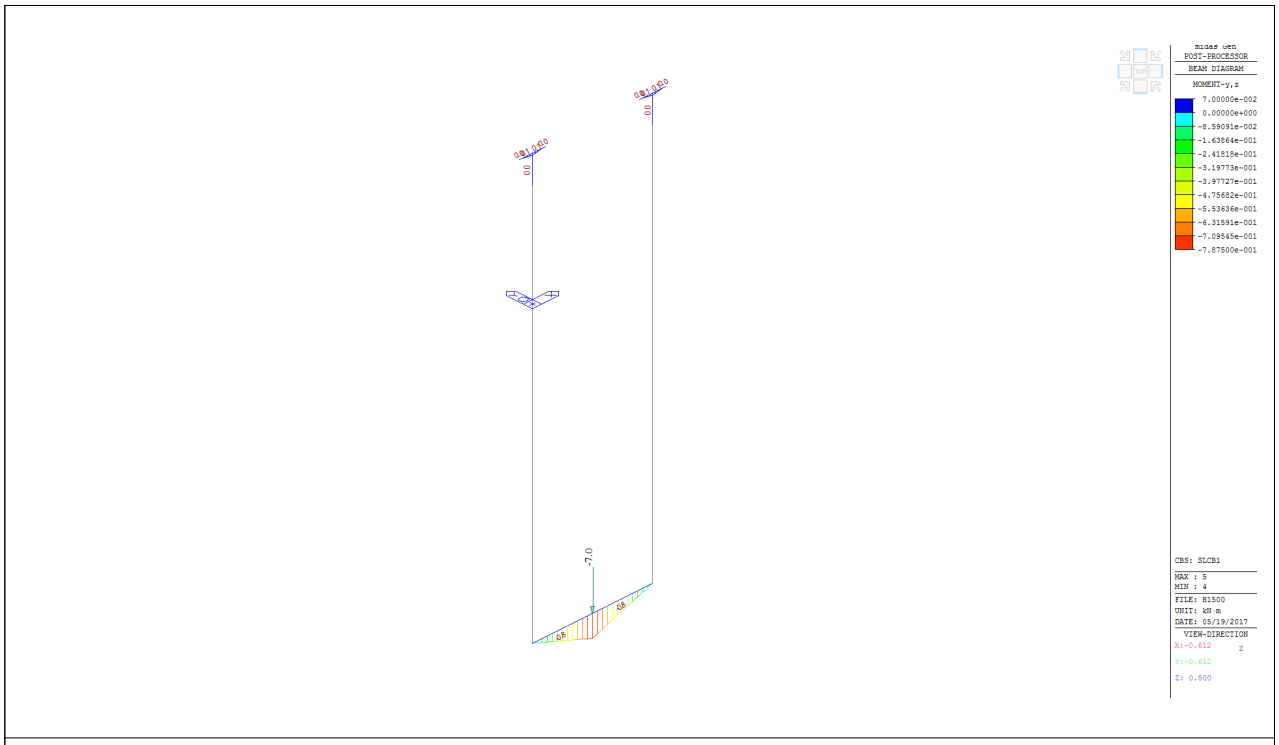
REACTION : 1.4D



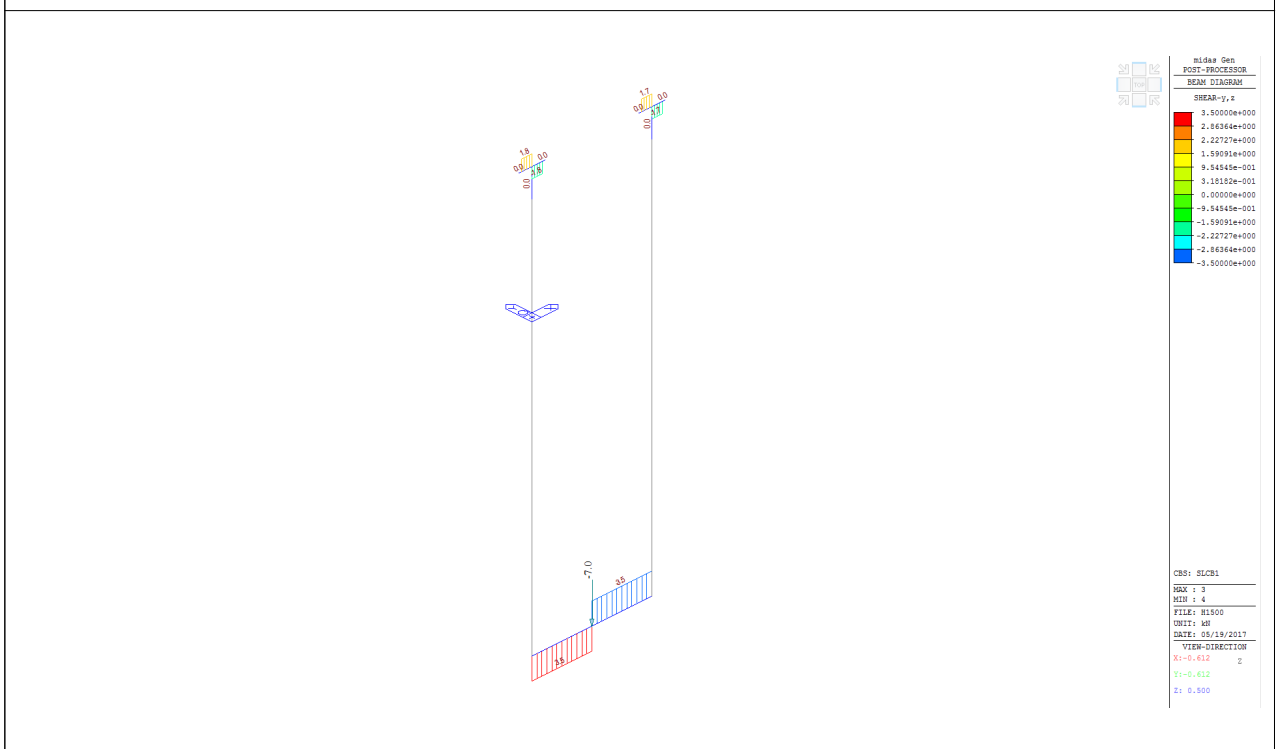
AXIAL DIAGRAM : 1.4D (kN)

5.0 FRAME ANALYSIS

5.3 ANALYSIS RESULTS



B. M. D. 1.4D KN.m



S.F.D. 1.4D KN.m

5.0 FRAME ANALYSIS

5.4 INPUT DATA FILE

```
;;------------------------------------------------------------------------------
;   midas Gen Text(MGT) File.
;   Date : 2017/5/22
;------------------------------------------------------------------------------
*VERSION
    8.6.0
*UNIT      ; Unit System
; FORCE, LENGTH, HEAT, TEMPER
    KN    , M, KCAL, C
*PROJINFO      ; Project Information
    USER=이수철
    ADDRESS=seng
*REBAR-MATL-CODE      ; Rebar Material Code
; CONC_CODE, CONC_MDB, SRC_CODE, SRC_MDB
 KS01(RC), SD400, KS01(RC), SD400
*NODE      ; Nodes
; iNO, X, Y, Z
       2, 0, 0, -1.04
       4, 0.45, 0, -1.04
       5, 0.225, 0, -1.04
       6, 0, 0, 0.46
       7, 0.45, 0, 0.46
      13, -0.05, 0, 0.46
      14, 0.05, 0, 0.46
      15, 0.4, 0, 0.46
      16, 0.5, 0, 0.46
      17, 0, 0, 0.36
      18, 0.45, 0, 0.36
      19, -0.04, 0, 0.46
      20, 0.41, 0, 0.46
      21, 0.04, 0, 0.46
      22, 0.49, 0, 0.46
*ELEMENT      ; Elements
; iEL, TYPE, iMAT, iPRO, iN1, iN2, ANGLE, iSUB, EXVAL, iOPT(EXVAL2) ; Frame  Element
; iEL, TYPE, iMAT, iPRO, iN1, iN2, ANGLE, iSUB, EXVAL, EXVAL2, bLMT ; Comp/Tens Truss
; iEL, TYPE, iMAT, iPRO, iN1, iN2, iN3, iN4, iSUB, iWID , LCAXIS      ; Planar Element
; iEL, TYPE, iMAT, iPRO, iN1, iN2, iN3, iN4, iN5, iN6, iN7, iN8       ; Solid  Element
       3, BEAM   ,     1,      2,      2,      5,    -90,      0
       4, BEAM   ,     1,      2,      5,      4,    -90,      0
       5, BEAM   ,     1,      3,      6,     19,      0,      0
       7, BEAM   ,     1,      3,     14,     21,      0,      0
       8, BEAM   ,     1,      3,      7,     20,      0,      0
       9, BEAM   ,     1,      3,     16,     22,      0,      0
      10, BEAM   ,     1,      3,     17,      6,      0,      0
      11, BEAM   ,     1,      3,     18,      7,      0,      0
      12, TRUSS  ,     1,      4,      2,     17,      0,      0
      14, TRUSS  ,     1,      4,      4,     18,      0,      0
      15, BEAM   ,     1,      3,     19,     13,      0,      0
      16, BEAM   ,     1,      3,     20,     15,      0,      0
      17, BEAM   ,     1,      3,     21,      6,      0,      0
      18, BEAM   ,     1,      3,     22,      7,      0,      0
*MATERIAL      ; Material
; iMAT, TYPE, MNAME, SPHEAT, HEATCO, PLAST, TUNIT, bMASS, DAMPRATIO, [DATA1]              ; STEEL, CONC, USER
; iMAT, TYPE, MNAME, SPHEAT, HEATCO, PLAST, TUNIT, bMASS, DAMPRATIO, [DATA2], [DATA2]   ; SRC
; [DATA1] : 1, DB, NAME, CODE, USEELAST, ELAST
; [DATA1] : 2, ELAST, POISN, THERMAL, DEN, MASS
; [DATA1] : 3, Ex, Ey, Ez, Tx, Ty, Tz, Sxy, Sxz, Syz, Pxy, Pxz, Pyz, DEN, MASS            ; Orthotropic
; [DATA2] : 1, DB, NAME, CODE, USEELAST, ELAST or 2, ELAST, POISN, THERMAL, DEN, MASS
     1, STEEL, SS400                , 0, 0, , C, NO, 0.02, 1, KS16(S)     ,               , SS400           , NO, 2.05e+008
```

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*MATL-COLOR
; iMAT, W_R, W_G, W_B, HF_R, HF_G, HF_B, HE_R, HE_G, HE_B, bBLEND, FACT
     1, 128,    0, 128,   255,    0,    0,     0, 255,    0,   NO, 0.5
*SECTION     ; Section
; iSEC, TYPE, SNAME, [OFFSET], bSD, bWE, SHAPE, [DATA1], [DATA2]                    ; 1st line - DB/USER
; iSEC, TYPE, SNAME, [OFFSET], bSD, bWE, SHAPE, BLT, D1, ..., D8, iCEL              ; 1st line - VALUE
;         AREA, ASy, ASz, Ixx, Iyy, Izz                                            ; 2nd line
;         CyP, CyM, CzP, CzM, QyB, QzB, PERI_OUT, PERI_IN, Cy, Cz                  ; 3rd line
;         Y1, Y2, Y3, Y4, Z1, Z2, Z3, Z4, Zyy, Zzz                                 ; 4th line
; iSEC, TYPE, SNAME, [OFFSET], bSD, bWE, SHAPE, ELAST, DEN, POIS, POIC, SF, THERMAL ; 1st line - SRC
;         D1, D2, [SRC]                                                            ; 2nd line
; iSEC, TYPE, SNAME, [OFFSET], bSD, bWE, SHAPE, 1, DB, NAME1, NAME2, D1, D2        ; 1st line - COMBINED
; iSEC, TYPE, SNAME, [OFFSET], bSD, bWE, SHAPE, 2, D11, D12, D13, D14, D15, D21, D22, D23, D24
; iSEC, TYPE, SNAME, [OFFSET2], bSD, bWE, SHAPE, iyVAR, izVAR, STYPE               ; 1st line - TAPERED
;         DB, NAME1, NAME2                                                         ; 2nd line(STYPE=DB)
;         [DIM1], [DIM2]                                                           ; 2nd line(STYPE=USER)
;         D11, D12, D13, D14, D15, D16, D17, D18                                   ; 2nd line(STYPE=VALUE)
;         AREA1, ASy1, ASz1, Ixx1, Iyy1, Izz1                                      ; 3rd line(STYPE=VALUE)
;         CyP1, CyM1, CzP1, CzM1, QyB1, QzB1, PERI_OUT1, PERI_IN1, Cy1, Cz1        ; 4th line(STYPE=VALUE)
;         Y11, Y12, Y13, Y14, Z11, Z12, Z13, Z14, Zyy1, Zyy2                       ; 5th line(STYPE=VALUE)
;         D21, D22, D23, D24, D25, D26, D27, D28                                   ; 6th line(STYPE=VALUE)
;         AREA2, ASy2, ASz2, Ixx2, Iyy2, Izz2                                      ; 7th line(STYPE=VALUE)
;         CyP2, CyM2, CzP2, CzM2, QyB2, QzB2, PERI_OUT2, PERI_IN2, Cy2, Cz2        ; 8th line(STYPE=VALUE)
;         Y21, Y22, Y23, Y24, Z21, Z22, Z23, Z24, Zyy2, Zzz2                       ; 9th line(STYPE=VALUE)
; [DATA1] : 1, DB, NAME or 2, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10
; [DATA2] : CCSHAPE or iCEL or iN1, iN2
; [SRC]  : 1, DB, NAME1, NAME2 or 2, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, iN1, iN2
; [DIM1], [DIM2] : D1, D2, D3, D4, D5, D6, D7, D8
; [OFFSET] : OFFSET, iCENT, iREF, iHORZ, HUSER, iVERT, VUSER
; [OFFSET2]: OFFSET, iCENT, iREF, iHORZ, HUSERI, HUSERJ, iVERT, VUSERI, VUSERJ
     1, DBUSER     , 중간지지대          , CC, 0, 0, 0, 0, 0, 0, YES, NO, C   , 2, 0.05, 0.05, 0.005, 0.005, 0, 0, 0, 0, 0, 0
     2, DBUSER     , 하부지지대          , CC, 0, 0, 0, 0, 0, 0, NO, NO, C   , 2, 0.05, 0.05, 0.005, 0.005, 0, 0, 0, 0, 0, 0
     3, DBUSER     , P50X8               , CC, 0, 0, 0, 0, 0, 0, YES, NO, SB , 2, 0.008, 0.05, 0, 0, 0, 0, 0, 0, 0, 0
     4, DBUSER     , SR 8                , CC, 0, 0, 0, 0, 0, 0, YES, NO, SR , 1, KS, SR 8
*SECT-COLOR
; iSEC, W_R, W_G, W_B, HF_R, HF_G, HF_B, HE_R, HE_G, HE_B, bBLEND, FACT
     1, 128,    0, 128,   255,    0,    0,     0, 255,    0,   NO, 0.5
     2, 128,    0, 128,   255,    0,    0,     0, 255,    0,   NO, 0.5
     3, 128,    0, 128,   255,    0,    0,     0, 255,    0,   NO, 0.5
     4, 128,    0, 128,   255,    0,    0,     0, 255,    0,   NO, 0.5
*DGN-SECT
; iSEC, TYPE, SNAME, [OFFSET], bSD, bWE, SHAPE, [DATA1], [DATA2]                    ; 1st line - DB/USER
; iSEC, TYPE, SNAME, [OFFSET], bSD, bWE, SHAPE, BLT, D1, ..., D8, iCEL              ; 1st line - VALUE
;         AREA, ASy, ASz, Ixx, Iyy, Izz                                            ; 2nd line
;         CyP, CyM, CzP, CzM, QyB, QzB, PERI_OUT, PERI_IN, Cy, Cz                  ; 3rd line
;         Y1, Y2, Y3, Y4, Z1, Z2, Z3, Z4, Zyy, Zzz                                 ; 4th line
; iSEC, TYPE, SNAME, [OFFSET], bSD, bWE, SHAPE, ELAST, DEN, POIS, POIC, SF, THERMAL ; 1st line - SRC
;         D1, D2, [SRC]                                                            ; 2nd line
; iSEC, TYPE, SNAME, [OFFSET], bSD, bWE, SHAPE, 1, DB, NAME1, NAME2, D1, D2        ; 1st line - COMBINED
; iSEC, TYPE, SNAME, [OFFSET], bSD, bWE, SHAPE, 2, D11, D12, D13, D14, D15, D21, D22, D23, D24
; iSEC, TYPE, SNAME, [OFFSET2], bSD, bWE, SHAPE, iyVAR, izVAR, STYPE               ; 1st line - TAPERED
;         DB, NAME1, NAME2                                                         ; 2nd line(STYPE=DB)
;         [DIM1], [DIM2]                                                           ; 2nd line(STYPE=USER)
;         D11, D12, D13, D14, D15, D16, D17, D18                                   ; 2nd line(STYPE=VALUE)
;         AREA1, ASy1, ASz1, Ixx1, Iyy1, Izz1                                      ; 3rd line(STYPE=VALUE)
;         CyP1, CyM1, CzP1, CzM1, QyB1, QzB1, PERI_OUT1, PERI_IN1, Cy1, Cz1        ; 4th line(STYPE=VALUE)
;         Y11, Y12, Y13, Y14, Z11, Z12, Z13, Z14, Zyy1, Zyy2                       ; 5th line(STYPE=VALUE)
;         D21, D22, D23, D24, D25, D26, D27, D28                                   ; 6th line(STYPE=VALUE)
;         AREA2, ASy2, ASz2, Ixx2, Iyy2, Izz2                                      ; 7th line(STYPE=VALUE)
;         CyP2, CyM2, CzP2, CzM2, QyB2, QzB2, PERI_OUT2, PERI_IN2, Cy2, Cz2        ; 8th line(STYPE=VALUE)
;         Y21, Y22, Y23, Y24, Z21, Z22, Z23, Z24, Zyy2, Zzz2                       ; 9th line(STYPE=VALUE)
; [DATA1] : 1, DB, NAME or 2, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10
; [DATA2] : CCSHAPE or iCEL or iN1, iN2
; [SRC]  : 1, DB, NAME1, NAME2 or 2, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, iN1, iN2
```

```
; [DIM1], [DIM2] : D1, D2, D3, D4, D5, D6, D7, D8
; [OFFSET] : OFFSET, iCENT, iREF, iHORZ, HUSER, iVERT, VUSER
; [OFFSET2]: OFFSET, iCENT, iREF, iHORZ, HUSERI, HUSERJ, iVERT, VUSERI, VUSERJ
     1, DBUSER     , 중간지지대          , CC, 0, 0, 0, 0, 0, 0, YES, NO, C   , 2, 0.05, 0.05, 0.005, 0.005, 0, 0, 0, 0, 0, 0
     2, DBUSER     , 하부지지대          , CC, 0, 0, 0, 0, 0, 0, NO, NO, C   , 2, 0.05, 0.05, 0.005, 0.005, 0, 0, 0, 0, 0, 0
     3, DBUSER     , P50X8               , CC, 0, 0, 0, 0, 0, 0, YES, NO, SB , 2, 0.008, 0.05, 0, 0, 0, 0, 0, 0, 0, 0
     4, DBUSER     , SR 8                , CC, 0, 0, 0, 0, 0, 0, YES, NO, SR , 1, KS, SR 8
*THICKNESS     ; Thickness
; iTHK, TYPE, bSAME, THIK-IN, THIK-OUT, bOFFSET, OFFTYPE, VALUE ; TYPE=VALUE
; iTHK, TYPE, SUBTYPE, RPOS, WEIGHT                              ; TYPE=STIFFENED, SUBTYPE=VALUE
;         SHAPE, THIK-IN, THIK-OUT, HU, HL                       ;       for yz section
;         SHAPE, THIK-IN, THIK-OUT, HU, HL                       ;       for xz section
; iTHK, TYPE, SUBTYPE, RPOS, PLATETHIK                           ; TYPE=STIFFENED, SUBTYPE=USER
;         bRIB {, SHAPE, DIST, SIZE1, SIZE2, ..., SIZE6}         ;       for yz section
;         bRIB {, SHAPE, DIST, SIZE2, SIZE2, ..., SIZE6}         ;       for xz section
; iTHK, TYPE, SUBTYPE, RPOS, PLATETHIK, DBNAME                   ; TYPE=STIFFENED, SUBTYPE=DB
;         bRIB {, SHAPE, DIST, SNAME}                            ;       for yz section
;         bRIB {, SHAPE, DIST, SNAME}                            ;       for xz section
     1, VALUE, YES, 0.005, 0,  NO, 0, 0
*THIK-COLOR
; iTHK, W_R, W_G, W_B, HF_R, HF_G, HF_B, HE_R, HE_G, HE_B, bBLEND, FACT
     1, 128,   0, 128,  255,   0,   0,    0, 255,   0,  NO, 0.5
*STLDCASE     ; Static Load Cases
; LCNAME, LCTYPE, DESC
    DL    , D ,
    EX    , E ,
    EY    , E ,
*CONSTRAINT     ; Supports
; NODE_LIST, CONST(Dx,Dy,Dz,Rx,Ry,Rz), GROUP
    19to22, 111000,
*USE-STLD, DL
*CONLOAD     ; Nodal Loads
; NODE_LIST, FX, FY, FZ, MX, MY, MZ, GROUP
    5, 0, 0, -5, 0, 0, 0,
; End of data for load case [DL] --------------------------
*LOADCOMB     ; Combinations
; NAME=NAME, KIND, ACTIVE, bES, iTYPE, DESC, iSERV-TYPE, nLCOMTYPE    ; line 1
;       ANAL1, LCNAME1, FACT1, ...                                    ; from line 2
    NAME=sLCB1, STEEL, ACTIVE, 0, 0, 1.4(D), 0, 0
          ST, DL, 1.4
    NAME=sLCB2, STEEL, SERVICE, 0, 0, SERV :(D), 0, 0
          ST, DL, 1
*LC-COLOR     ; Diagram Color for Load Case
; ANAL, LCNAME, iR1(ALL), iG1(ALL), iB1(ALL), iR2(MIN), iG2(MIN), iB2(MIN), iR3(MAX), iG2(MAX), iB2(MAX)
 ST, DL, 0, 128, 192, 192, 0, 128, 192, 128, 0
 ST, EX, 255, 87, 128, 255, 255, 255, 210, 210, 210
 ST, EY, 255, 192, 87, 192, 0, 128, 255, 0, 192
 CBS, sLCB1, 255, 128, 0, 255, 160, 255, 85, 0, 192
 CBS, sLCB2, 255, 87, 128, 255, 87, 128, 212, 160, 255
*DGN-MATL     ; Modify Steel(Concrete) Material
; iMAT, TYPE, MNAME, [DATA1]                                        ; STEEL
; iMAT, TYPE, MNAME, [DATA2], [R-DATA], FCI, bSERV, SHORT, LONG ; CONC
; iMAT, TYPE, MNAME, [DATA3], [DATA2], [R-DATA]                     ; SRC
; iMAT, TYPE, MNAME, [DATA5]                                        ; STEEL(None) & KSCE-ASD05
; [DATA1] : 1, DB, CODE, NAME or 2, ELAST, POISN, FU, FY1, FY2, FY3, FY4
;             FY5, FY6, AFT, AFT2, AFT3, FY, AFV, AFV2, AFV3
; [DATA2] : 1, DB, CODE, NAME or 2, FC, CHK, LAMBDA
; [DATA3] : 1, DB, CODE, NAME or 2, ELAST, FU, FY1, FY2, FY3, FY4
;                FY5, FY6, AFT, AFT2, AFT3, FY, AFV, AFV2, AFV3
; [DATA4] : 1, DB, CODE, NAME or 2, FC
; [DATA5] : 3, ELAST, POISN, AL1, AL2, AL3, AL4, AL5, AL6, AL7, AL8, AL9, AL10
;                MIN1, MIN2, MIN3
; [R-DATA]: RBCODE, RBMAIN, RBSUB, FY(R), FYS
     1, STEEL, SS400              , 1, KS16(S)     ,              ,SS400          , 2, 0, , , , 0, 0,NO,0.0000e+000,       0,, 0, 0,0, 0,
```

0,0, 0, 0,0, 0, 0,0, 0, 0,0.0000e+000, 0,, 0, 0,0, 0, 0,0, 0, 0,0, 0, 0,0, 0, 0,0.0000e+000, 0,, 0, 0,0, 0, 0,0, 0, 0,0, 0, 0,0, 0, 0,
*ENDDATA

6.0 CHECK OF MEMBERS

6.1 FOR C-50x50x4

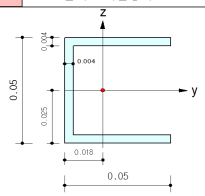
midas Gen **Steel Checking Result**

Certified by :

Company		Project Title	
Author	이수철	File Name	C:\...\판테크\내진행거\H1500.mgb

1. Design Information

Design Code : KSSC-LSD16
Unit System : kN, m
Member No : 3
Material : SS400 (No:1)
(Fy = 235000, Es = 205000000)
Section Name : 하부지지대 (No:2)
(Rolled : 하부지지대).
Member Length : 0.22500



Depth	0.05000	Web Thick	0.00400
Top F Width	0.05000	Top F Thick	0.00400
Bot.F Width	0.05000	Bot.F Thick	0.00400
Area	0.00057	Asz	0.00020
Qyb	0.00137	Qzb	0.00051
Iyy	0.00000	Izz	0.00000
Ybar	0.01820	Zbar	0.02500
Syy	0.00001	Szz	0.00000
ry	0.02042	rz	0.01604

2. Member Forces

Axial Force Fxx = 0.00000 (LCB: 1, POS:J)
Bending Moments My = 0.00000, Mz = -0.7875
End Moments Myi = 0.00000, Myj = 0.00000 (for Lb)
Myi = 0.00000, Myj = 0.00000 (for Ly)
Mzi = 0.00000, Mzj = -0.7875 (for Lz)
Shear Forces Fyy = 3.50000 (LCB: 1, POS:1/2)
Fzz = 0.00000 (LCB: 1, POS:1/2)

3. Design Parameters

Unbraced Lengths Ly = 0.22500, Lz = 0.22500, Lb = 0.22500
Effective Length Factors Ky = 1.00, Kz = 1.00
Moment Factor / Bending Coefficient
Cmy = 1.00, Cmz = 1.00, Cb = 1.00

4. Checking Results

Slenderness Ratio
L/r = 14.0 < 300.0 (Memb:3, LCB: 1)..... O.K
Axial Strength
Pu/phiPn = 0.000/120.132 = 0.000 < 1.000 ..... O.K
Bending Strength
Muy/phiMny = 0.00000/2.31889 = 0.000 < 1.000 ..... O.K
Muz/phiMnz = 0.78750/1.55505 = 0.506 < 1.000 ..... O.K
Combined Strength (Tension+Bending)
Pu/phiPn = 0.00 < 0.20
Rmax = Pu/(2*phiPn) + [Muy/phiMny + Muz/phiMnz] = 0.506 < 1.000 ..... O.K
Shear Strength
Vuy/phiVny = 0.069 < 1.000 ..... O.K
Vuz/phiVnz = 0.000 < 1.000 ..... O.K

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허용 수직하중 Pa1 = 5 / 0.51 * 0.93 = 9.11 KN

6.0 CHECK OF MEMBERS

6.2 FOR PL-50X100X8

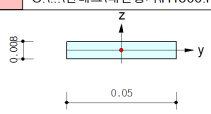
midas Gen **Steel Checking Result**

Certified by :

Company		Project Title	
Author	이수철	File Name	C:\...\판테크\내진행거\H1500.mgb

1. Design Information

Design Code : KSSC-LSD16
Unit System : kN, m
Member No : 18
Material : SS400 (No:1)
(Fy = 235000, Es = 205000000)
Section Name : P50X8 (No:3)
(Rolled : P50X8).
Member Length : 0.04000



Depth	0.00800	Width	0.05000
Area	0.00040	Asz	0.00027
Qyb	0.00001	Qzb	0.00031
Iyy	0.00000	Izz	0.00000
Ybar	0.02500	Zbar	0.00400
Syy	0.00000	Szz	0.00000
ry	0.00231	rz	0.01443

2. Member Forces

Axial Force Fxx = 0.00000 (LCB: 1, POS:J)
Bending Moments My = 0.07000, Mz = 0.00000
End Moments Myi = 0.00000, Myj = 0.07000 (for Lb)
Myi = 0.00000, Myj = 0.07000 (for Ly)
Mzi = 0.00000, Mzj = 0.00000 (for Lz)
Shear Forces Fyy = 0.00000 (LCB: 1, POS:1/2)
Fzz = -1.7500 (LCB: 1, POS:1/2)

3. Design Parameters

Unbraced Lengths Ly = 0.04000, Lz = 0.04000, Lb = 0.04000
Effective Length Factors Ky = 1.00, Kz = 1.00
Moment Factor / Bending Coefficient
Cmy = 1.00, Cmz = 1.00, Cb = 1.00

4. Checking Results

Slenderness Ratio
L/r = 43.3 < 300.0 (Memb:10, LCB: 1)..... O.K
Axial Strength
Pu/phiPn = 0.0000/84.6000 = 0.000 < 1.000 ..... O.K
Bending Strength
Muy/phiMny = 0.07000/0.16920 = 0.414 < 1.000 ..... O.K
Muz/phiMnz = 0.00000/1.05750 = 0.000 < 1.000 ..... O.K
Combined Strength (Tension+Bending)
Pu/phiPn = 0.00 < 0.20
Rmax = Pu/(2*phiPn) + [Muy/phiMny + Muz/phiMnz] = 0.414 < 1.000 ..... O.K
Shear Strength
Vuy/phiVny = 0.000 < 1.000 ..... O.K
Vuz/phiVnz = 0.034 < 1.000 ..... O.K

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Print Date/Time : 05/22/2017 09:54

허용 수직하중 Pa2 = 5 / 0.414 = 12.1 KN

6.0 CHECK OF MEMBERS

6.3 FOR CHAIN 검토

8mm CHAIN

A = 1/4 * 3.14 * 8^2 = 50.2 mm^2

전단내력

ΦVn = 0.7 * 0.6 * 235 * 50.2 * 4 / 1000 = 19.8 KN

허용 수직하중 Pa3 = 19.8 / 1.4 = 14.1 KN

6.4 내진행거 조립대 허용내력

P = MIN (P1, P2, P3) =9.11 KN

7.0 구조검토 결과

비고정형 케이블(체인) 버팀대에 대하여 건축구조기준 및 해설, 2016 을 적용하여 구조해석을 실시하고 단면결손을 고려한 단면성질계수를 고려하여 부재내력을 검토한 결과 버팀대에 작용하는 허용 하중은 다음과 같다.

다 음

CASE	허용배관자중(KN)	허용수평하중(KN)	비고
H=1500	9.11	N/A	

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