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=====
; ADAPT-ABI                ABI                SOFTWARE EXAMPLES
=====
; name of this file: staged-b.inp
;
; This example illustrated the segmental construction cycle and
; the significance of sequence in installation of new segments
;
; Two span beam, constructed in two stages
;

START
TITLE N=1
      ACI SI UNITS      N-mm

UNITS U=SI

CONCRETE PARAMETERS N=1
1 M=ACI

MESH INPUT
  NODES N=9
    1 X=0      Y=0
    9 X=4000   Y=0 G=1,9

  CONCRETE PROPERTIES N=2
    1 Fpc=34 Cr=2.5 Sh=0.003 W=0
    2 Fpc=34 Cr=2.5 Sh=0.003 W=0

  MILD STEEL PROPERTIES N=1
    1 Es=2E5 P=0.02

  SECTION PROPERTIES N=1
    1 Area=200000 I=1.0E9 C=300 300

  ELEMENTS N=8
    FRAME N=8
      1,1,2 C=1 X=1 St=1 Day=1 G=1,8,1,1,1

MESH COMPLETE

SET Day=10 T=20
CHANGE STRUCTURE
  BUILD N=1,5,1 ; stage 1 construction
  RESTRAINTS
    1 R=1,1,0
    5 R=0,1,0

CHANGE COMPLETE

LOADING
  N=3 F=0,-10000,0

SOLVE ; note that this solution is
      ; obtain at day 10 for members
      ; cast at day=1

OUTPUT

SOLVE Day=16 ; structure is updated for day=16

CHANGE STRUCTURE
  BUILD N=8,6,-1 day=16 ; stage 2 construction, the negative
                        ; increment of segment means backward
  RESTRAINTS
    9 R=0,1,0 ; construction

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CHANGE COMPLETE

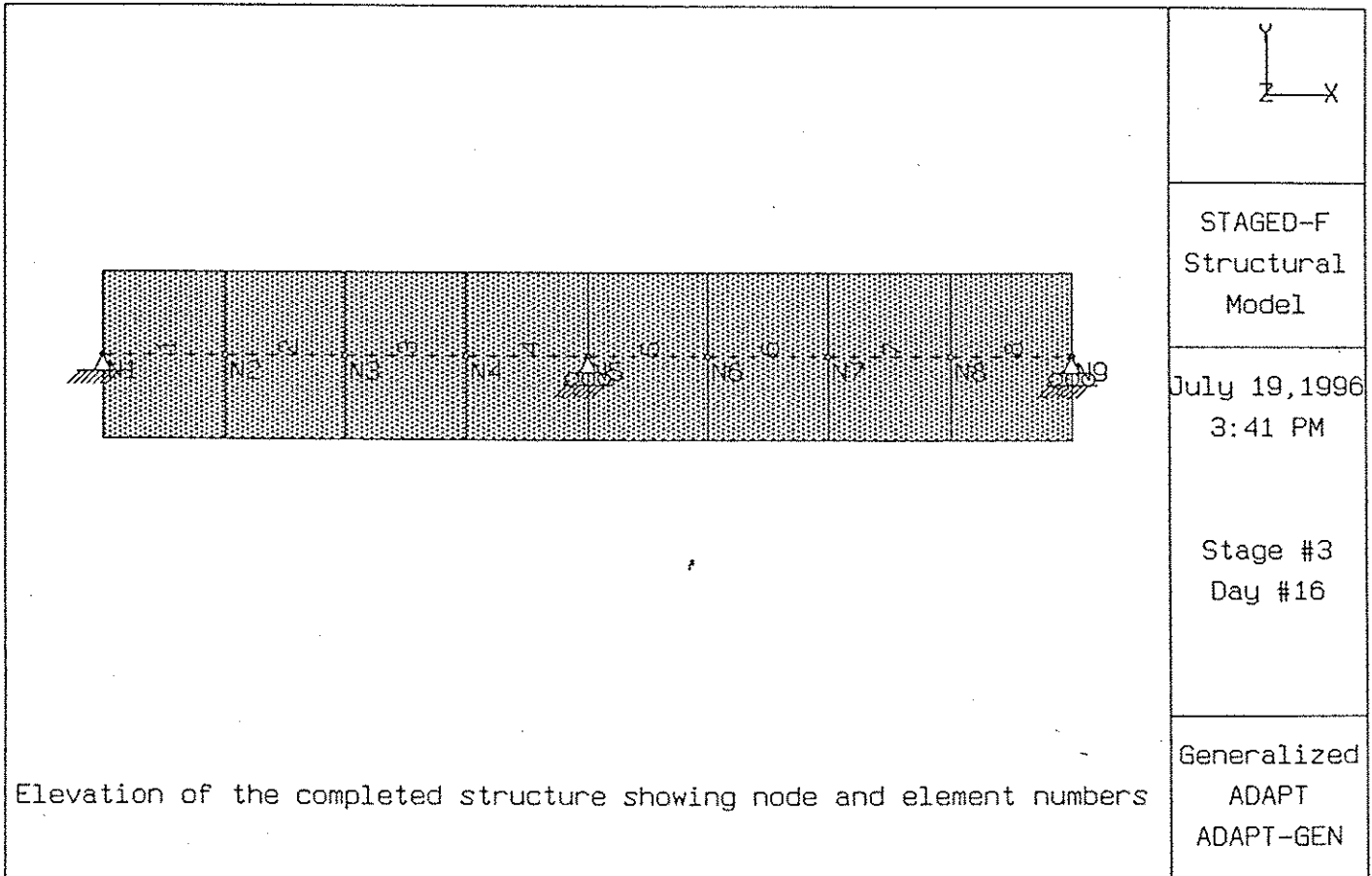
SOLVE Day=16
OUTPUT

LOADING
N=7 F=0,-10000,0

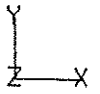
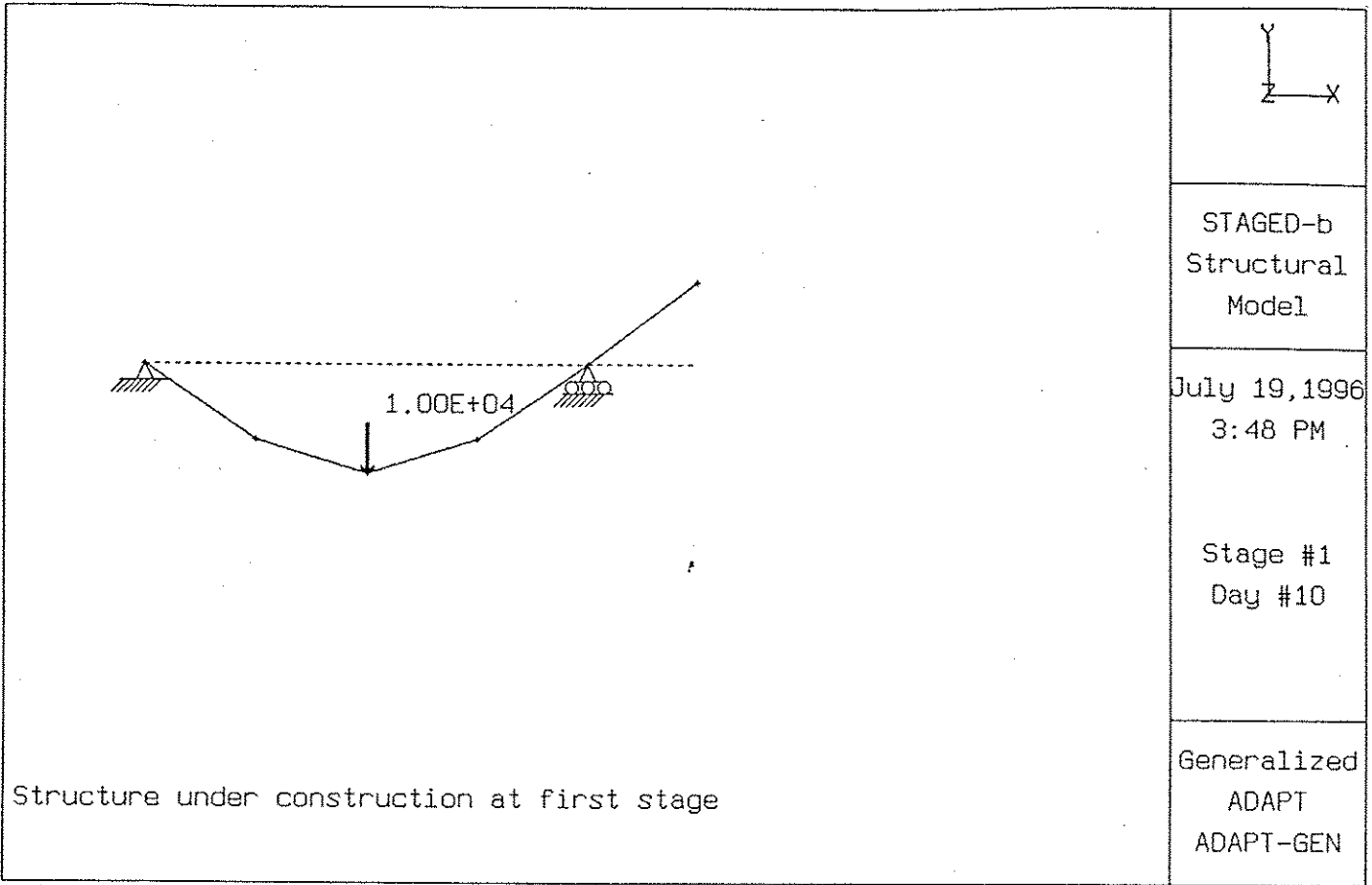
SOLVE ! OUTPUT
SOLVE Day=500 Steps=3 ! OUTPUT

LOADING
L=1,4,1 T=40,40

SOLVE Day=1000 Steps=3 ! OUTPUT
STOP



F2

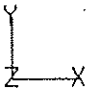
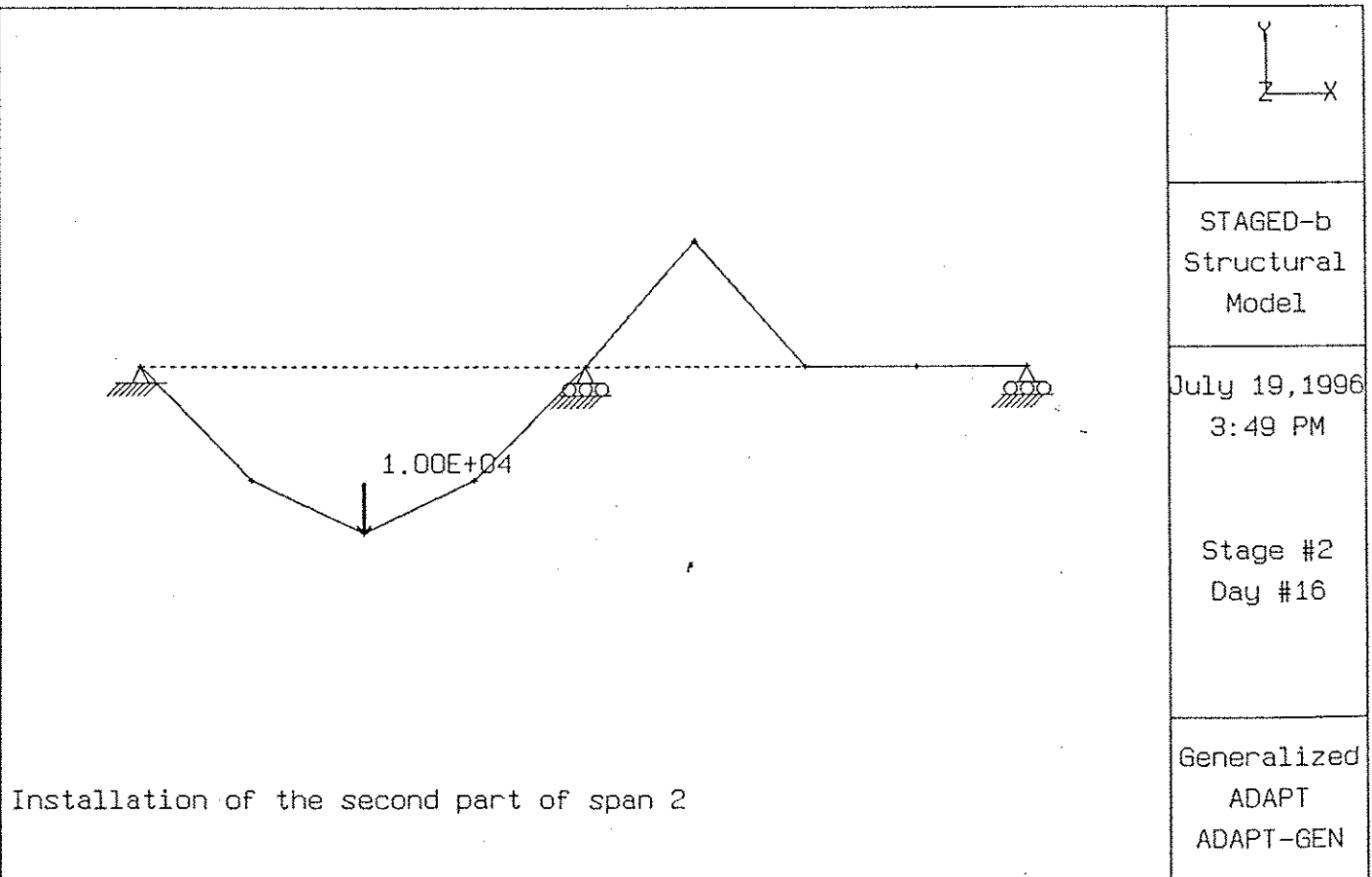


STAGED-b
Structural
Model

July 19, 1996
3:48 PM

Stage #1
Day #10

Generalized
ADAPT
ADAPT-GEN

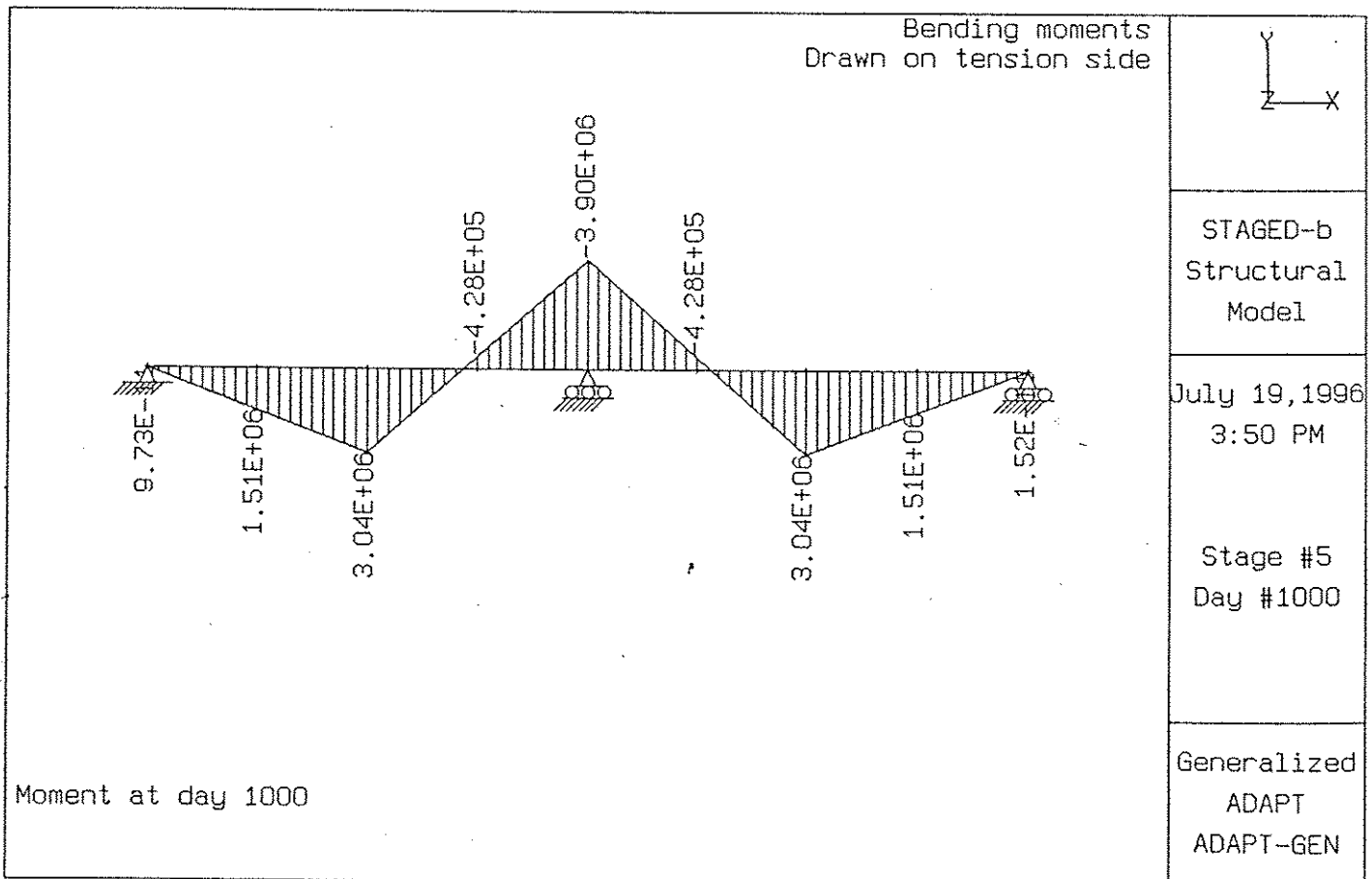
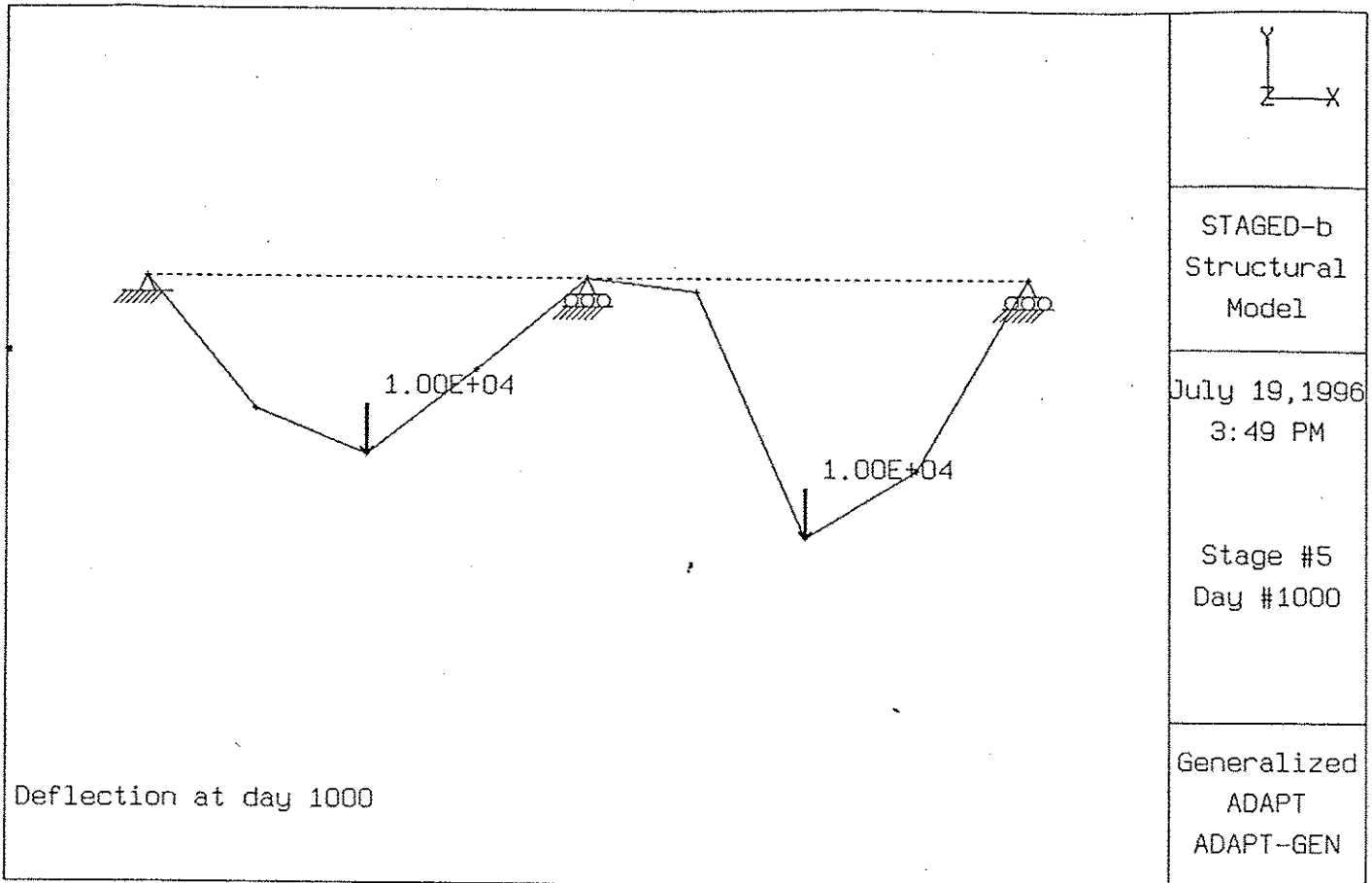


STAGED-b
Structural
Model

July 19, 1996
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Stage #2
Day #16

Generalized
ADAPT
ADAPT-GEN



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=====
; ADAPT-ABI ABI SOFTWARE EXAMPLES
=====
; name of this file: staged-f.inp
;
; This example illustrated the segmental construction cycle and
; the significance of sequence in installation of new segments
;
; Two span beam, constructed in two stages
;

START
TITLE N=1
      ACI SI UNITS      N-mm

UNITS U=SI

CONCRETE PARAMETERS N=1
1 M=ACI

MESH INPUT
  NODES N=9
    1 X=0      Y=0
    9 X=4000   Y=0 G=1,9

  CONCRETE PROPERTIES N=2
    1 Fpc=34 Cr=2.5 Sh=0.003 W=0
    2 Fpc=34 Cr=2.5 Sh=0.003 W=0

  MILD STEEL PROPERTIES N=1
    1 Es=2E5 P=0.02

  SECTION PROPERTIES N=1
    1 Area=200000 I=1.0E9 C=300 300

  ELEMENTS N=8
    FRAME N=8
      1,1,2 C=1 X=1 St=1 Day=1 G=1,8,1,1,1

MESH COMPLETE

SET Day=10 T=20
CHANGE STRUCTURE
  BUILD N=1,5,1 ; stage 1 construction
  RESTRAINTS
    1 R=1,1,0
    5 R=0,1,0

CHANGE COMPLETE

LOADING
  N=3 F=0,-10000,0

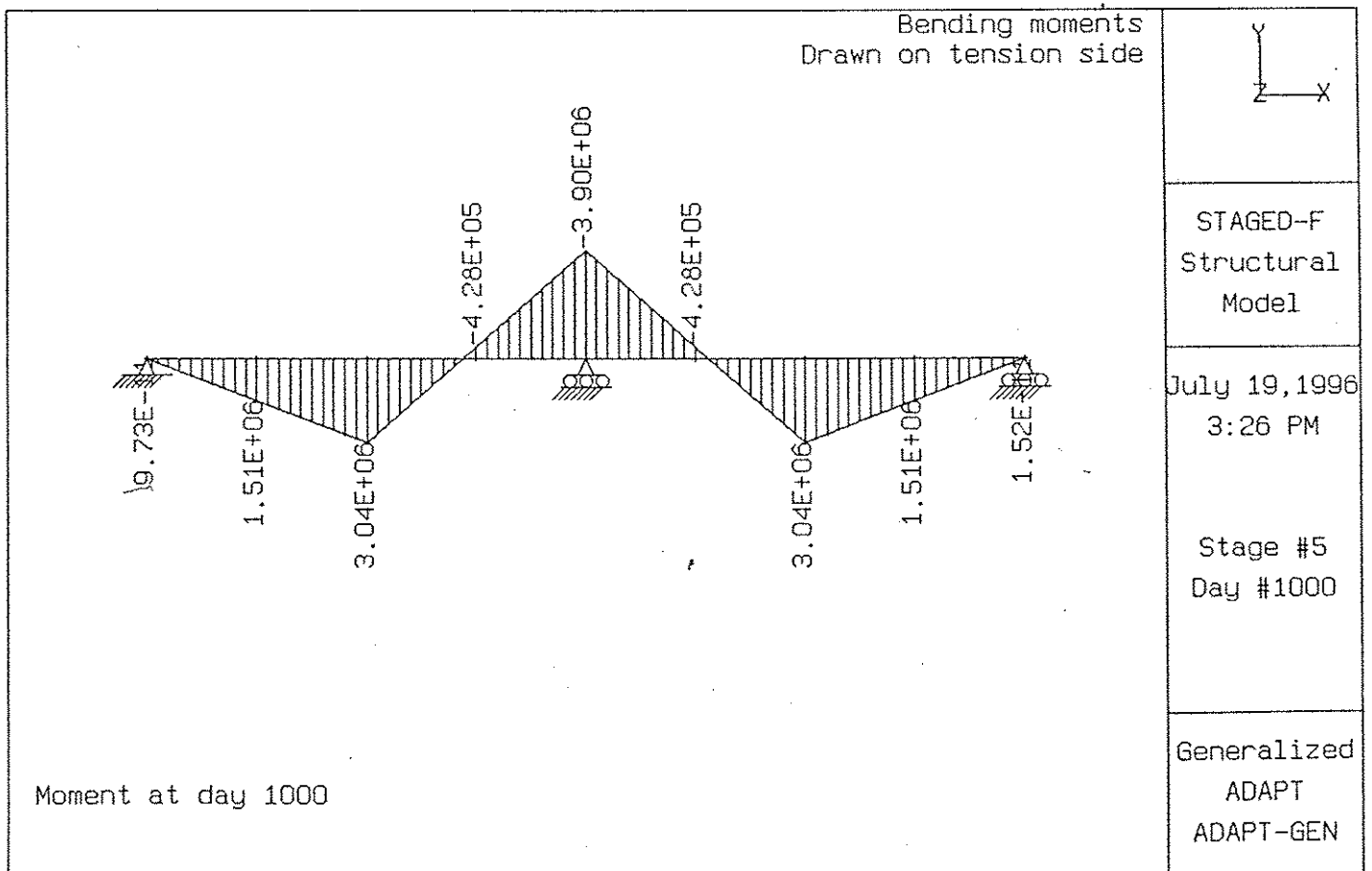
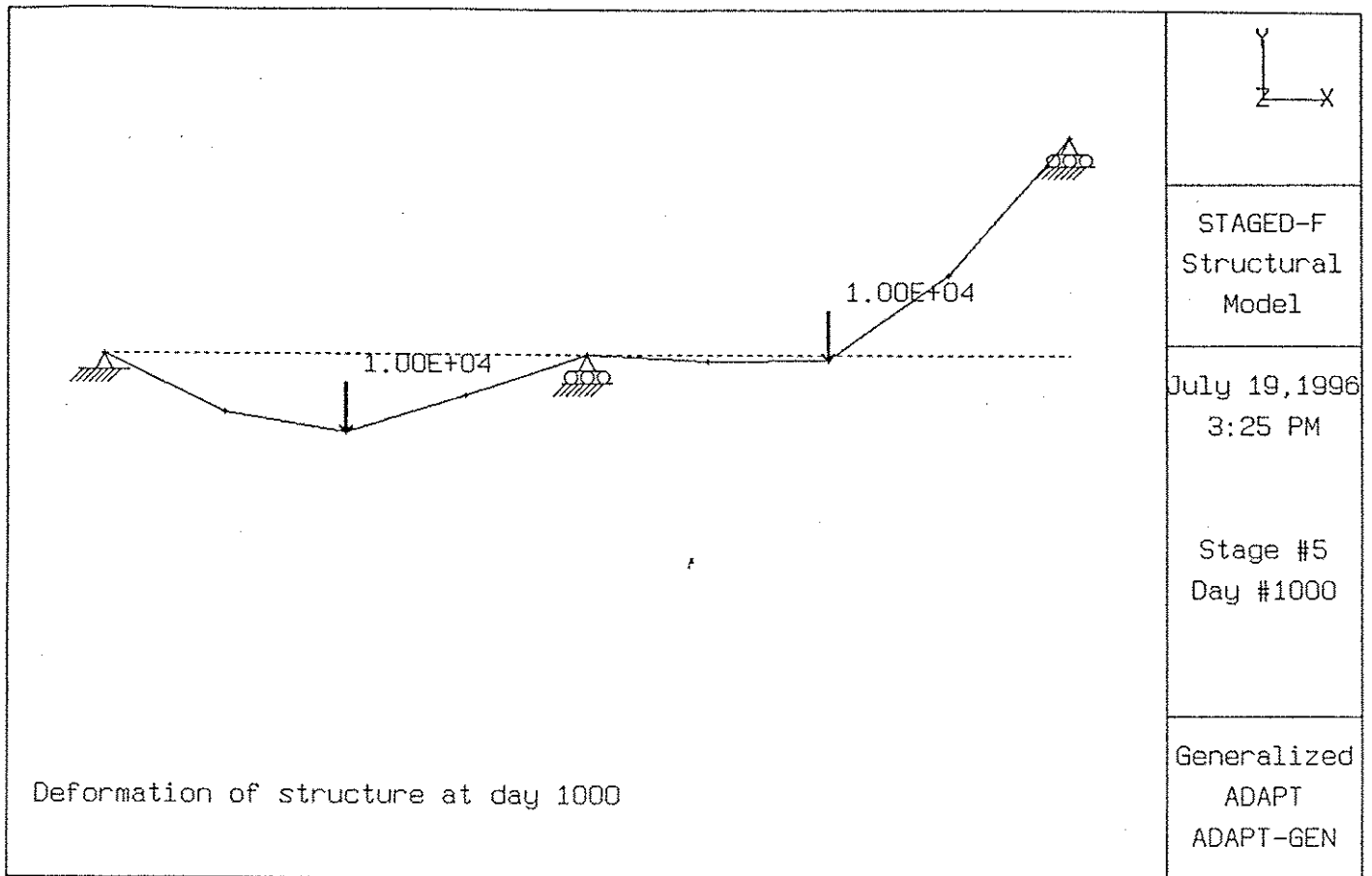
SOLVE ; note that this solution is
      ; obtain at day 10 for members
      ; cast at day=1

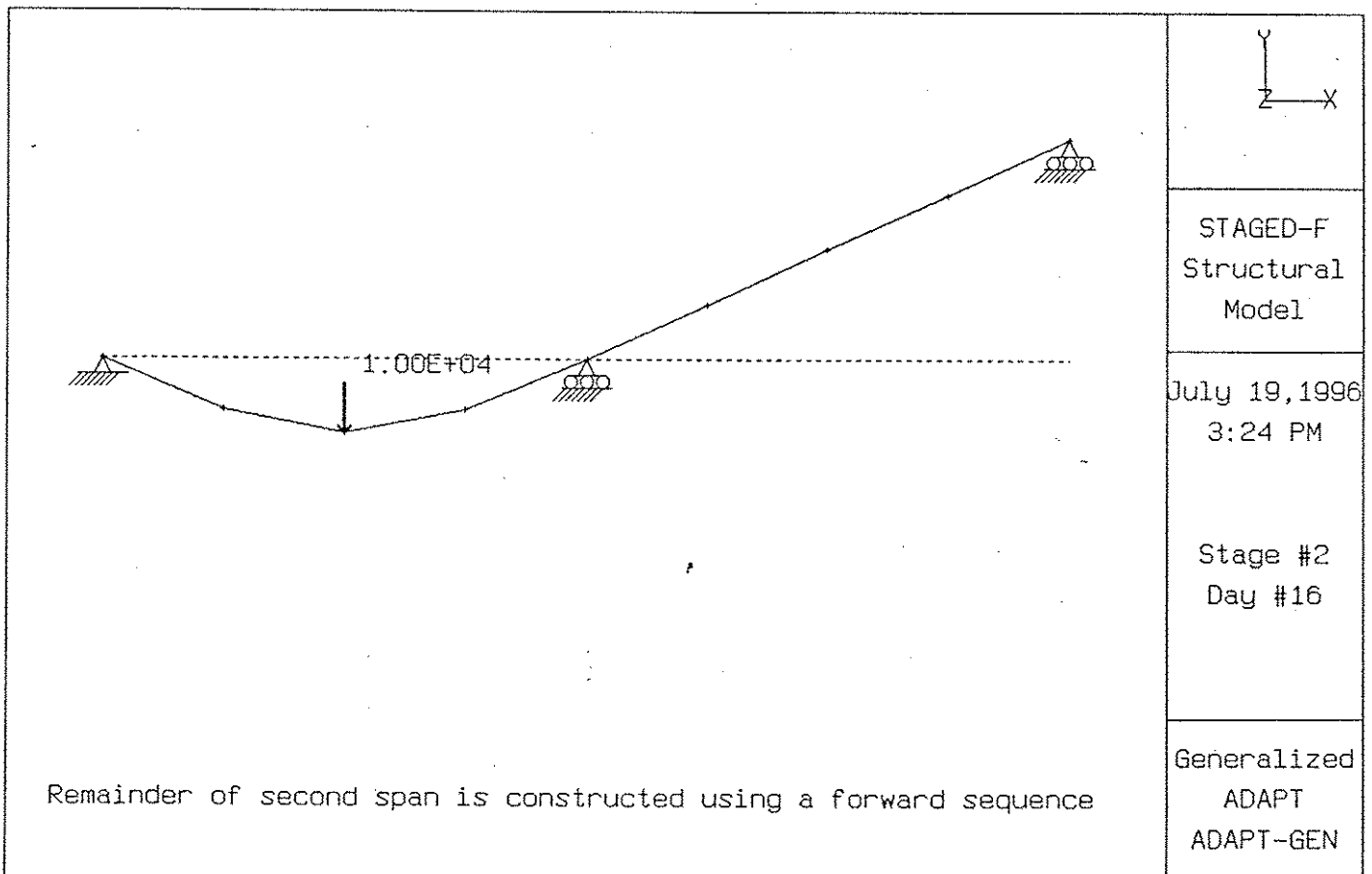
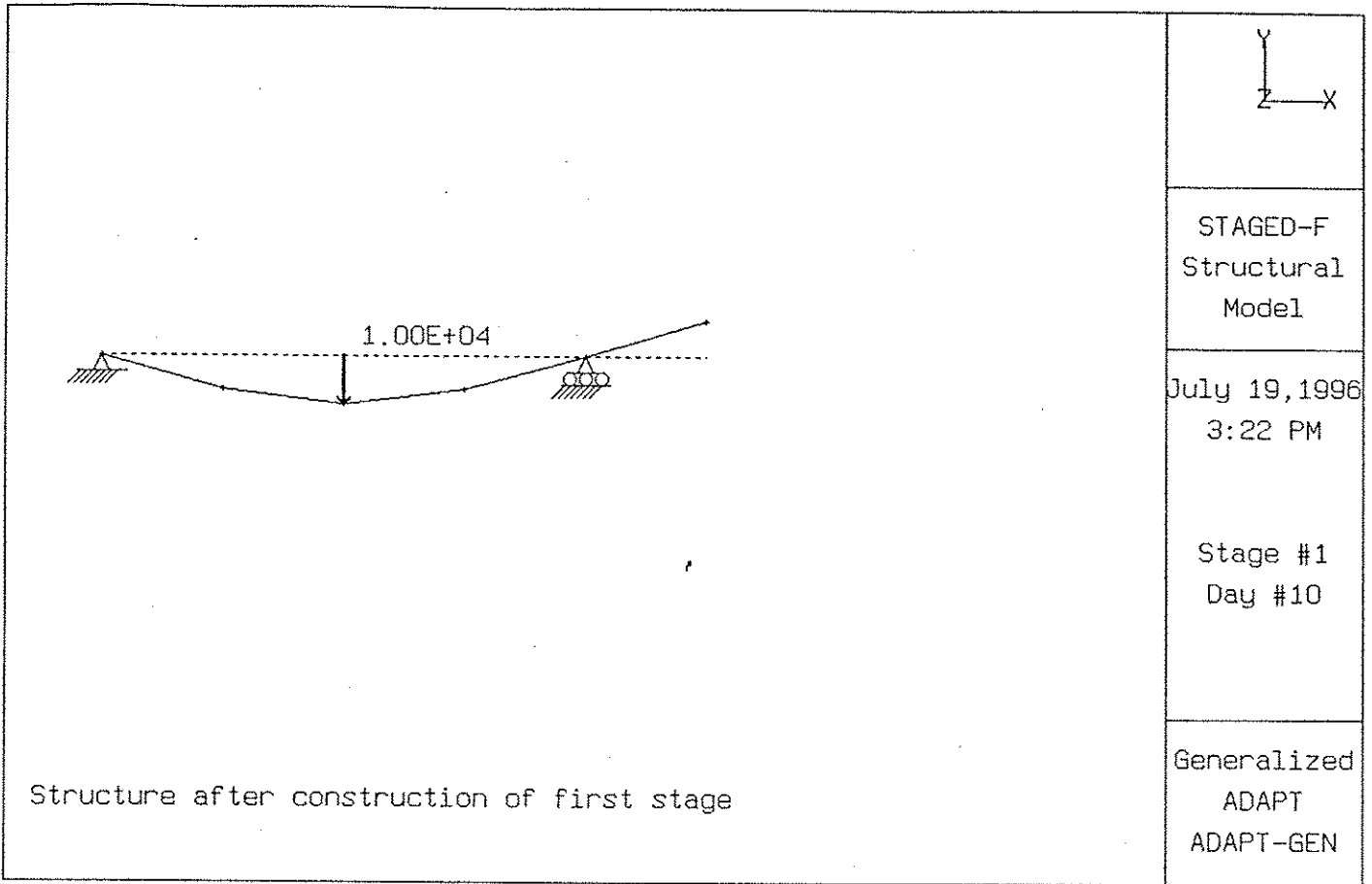
OUTPUT

SOLVE Day=16 ; structure is updated for day=16

CHANGE STRUCTURE
  BUILD N=6,8,1 day=16 ; stage 2 construction, the positive
                        ; increment of segment means forward
  RESTRAINTS
    9 R=0,1,0

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CHANGE COMPLETE

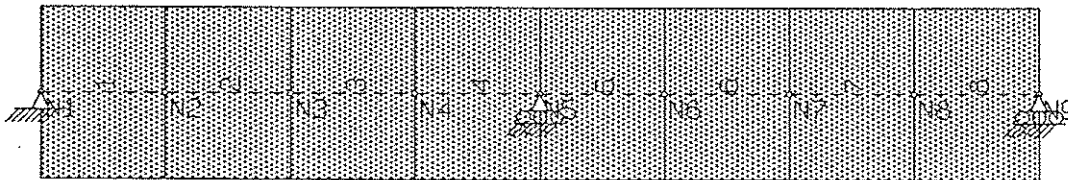
SOLVE Day=16
OUTPUT

LOADING
N=7 F=0,-10000,0

SOLVE ! OUTPUT
SOLVE Day=500 Steps=3 ! OUTPUT

LOADING
L=1,4,1 T=40,40

SOLVE Day=1000 Steps=3 ! OUTPUT
STOP



STAGED-F
Structural
Model

July 19, 1996
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Stage #3
Day #16

Generalized
ADAPT
ADAPT-GEN

Elevation of the completed structure showing node and element numbers

F4