

Dif SI English version 6.20

1.Solver condition

Table—1 Solver condition

Category	Contents
Program name	Dif SI English
Version	6.20
Development origin	Digital Soil

2.Calculation condition

Title:

Drain Examination

2.1.Basic data

Table—2.1.1 Basic data

Group	Category	Contents	Value
FEM-condition-1	Computational conditions	—	Plain strain condition
	Initial stress	—	$\gamma t \cdot Ki$
	Theory	—	Coupled analysis
		Water level	—
	Buoyancy	—	Without
FEM-condition-2	Solve method	—	ICCG
	Mesh divide number of times	—	Without
FEM-condition-3	Dispose of after initial stress	—	Data none
	Initial stress of unsaturated area	—	Data none
	Method of sekiguchi·ohta	Flow rule	Data none

2.2.Material data

Table—2.2.1 Liner

No	Name	γt (kN/m ³)	E (kN/m ²)	ν	Kind of consolidation
1	As	18.0	4900.0	0.333	1
3	Ds	20.0	2.8000E4	0.333	1
4	Embankment	19.0	3500.0	0.333	1

Table—2.2.2 Sekiguchi·Ohta

No	Name	γt (kN/m ³)	D	Λ	M	ν	K0	λk	Kind of consolidation
2	Ac	15.0	8.4E-2	0.85	1.2	0.333	0.5	0.39	2

5	Ac_PBD12	15.0	8.4E-2	0.85	1.2	0.333	0.5	0.39	3
6	Ac_PBD13	15.0	8.4E-2	0.85	1.2	0.333	0.5	0.39	4
7	Ac_PBD14	15.0	8.4E-2	0.85	1.2	0.333	0.5	0.39	5

2.3.Consolidation characteristic

Table—2.3.1 Consolidation characteristic

No	Name	k (cm/sec)	Rate of k	Pc relation (N/cm ²)	Cc	e0
1	Sand	1.0E-3	1.0	—	—	—
2	Ac	1.0E-7	1.0	$\Delta P_c = 0.0$	0.9	2.3
3	PBD12	5.44E-6	1.0	OCR = 1.0	0.9	2.3
4	PBD13	4.52E-6	1.0	OCR = 1.0	0.9	2.3
5	PBD14	3.8E-6	1.0	OCR = 1.0	0.9	2.3

2.4.Mesh data

Table—2.4.1 Node data

No	X coordinates	Y coordinates	No	X coordinates	Y coordinates
1	0.00	0.00	11	0.00	-18.00
2	0.00	-20.00	12	100.00	-3.00
3	100.00	-20.00	13	100.00	-18.00
4	100.00	0.00	14	0.00	1.00
5	20.00	0.00	15	0.00	2.00
6	18.00	1.00	16	0.00	3.00
7	15.00	1.00	17	0.00	4.00
8	9.00	5.00	18	13.50	2.00
9	0.00	5.00	19	12.00	3.00
10	0.00	-3.00	20	10.50	4.00

Table—2.4.2 Area data

No	Area name	Area configuration node number
1	Total area	9 2 3 4 5 6 7 8
2	Ds	11 2 3 13
3	Ac	10 11 13 12
4	As	1 10 12 4
5	B-1	14 1 5 6
6	B-2	15 14 7 18
7	B-3	16 15 18 19
8	B-4	17 16 19 20
9	B-5	9 17 20 8

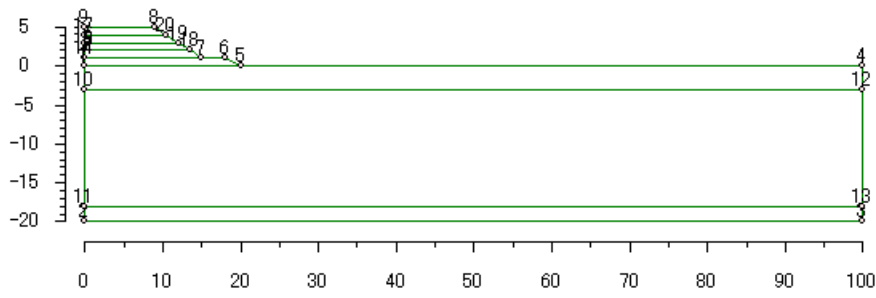


Fig-2.4.1 Node number chart

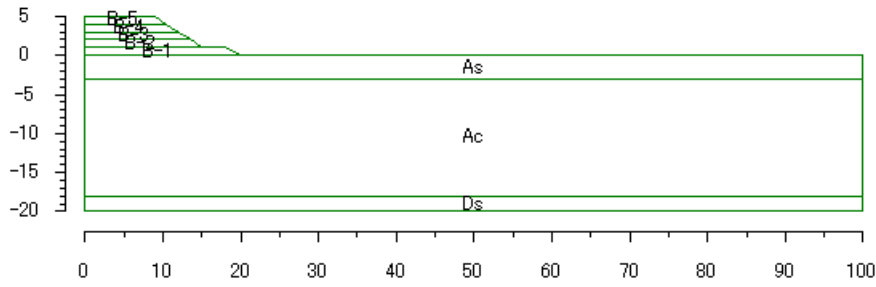


Fig-2.4.2 Area chart

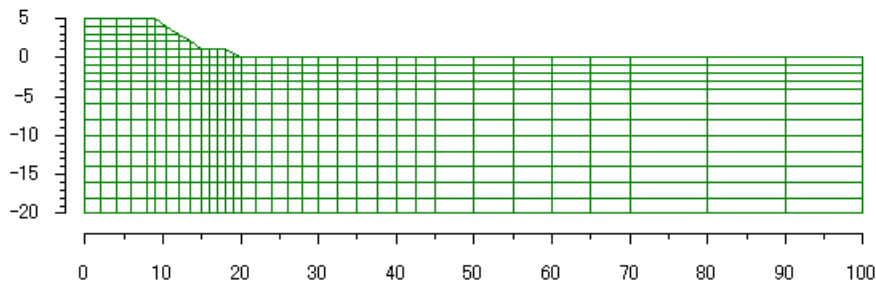


Fig-2.4.3 Mesh chart

2.5.Process data

Table-2.5.1 Process data

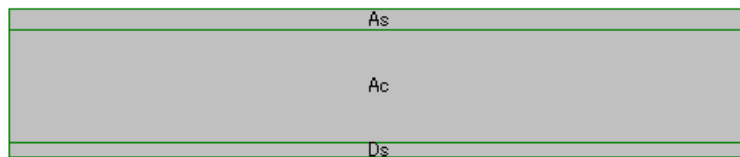
No	Construction schedule	Required time	Step divide number	Output	Stability
1	Initial	1.000	1	YES	NO
2	Embankment-1	20.000	3	NO	NO
3	Embankment-2	20.000	3	NO	NO
4	Embankment-3	20.000	3	NO	NO
5	Embankment-4	20.000	3	NO	NO
6	Embankment-5	20.000	3	NO	NO
7	1Month	30.000	3	NO	NO
8	3Month	60.000	3	NO	NO
9	6Month	90.000	3	NO	NO
10	1Year	185.000	3	NO	NO
11	2Year	365.000	3	NO	NO
12	3Year	365.000	3	NO	NO

13	5Year	730.000	3	NO	NO
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Stage-1 : Initial

Table—2.5.2 Area definition

Area name	Material name
Ds	Ds
Ac	Ac
As	As



Fig—2.5.1 Area definition

Table—2.5.3 Boundary definition(undrain)

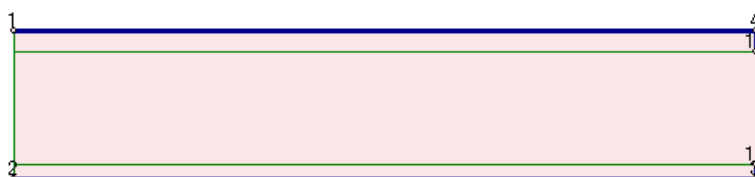
inod	jnod	—	—	—
1	2	Xdirect Fix	Ydirect Free	Rdirect Free
4	3	Xdirect Fix	Ydirect Free	Rdirect Free



Fig—2.5.2 Boundary definition(undrain)

Table—2.5.4 Boundary definition(drain)

inod	jnod	—	—	—	—	head
1	4	Xdirect Free	Ydirect Free	Rdirect Free	drain	0.000
4	12	Xdirect Fix	Ydirect Free	Rdirect Free	drain	0.000
13	3	Xdirect Fix	Ydirect Free	Rdirect Free	drain	0.000
2	3	Xdirect Fix	Ydirect Fix	Rdirect Free	drain	0.000

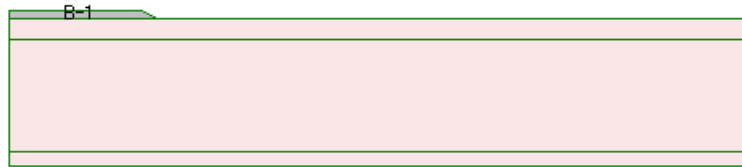


Fig—2.5.3 Boundary definition(drain)

Stage-2 : Embankment-1

Table—2.5.5 Area definition

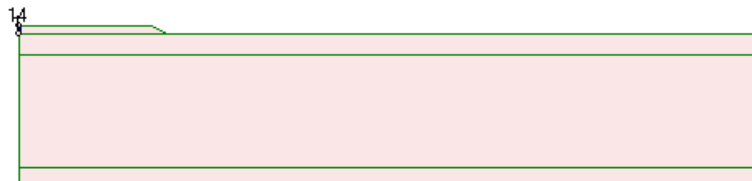
Area name	Material name
B-1	Embankment



Fig—2.5.4 Area definition

Table—2.5.6 Boundary definition(undrain)

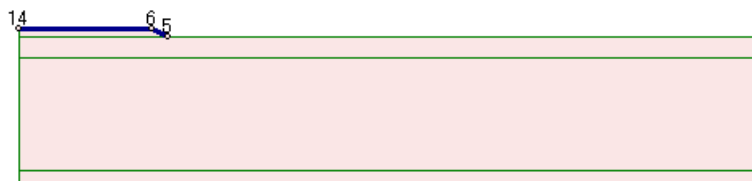
inod	jnod	—	—	—
14	1	Xdirect Fix	Ydirect Free	Rdirect Free



Fig—2.5.5 Boundary definition(undrain)

Table—2.5.7 Boundary definition(drain)

inod	jnod	—	—	—	—	head
14	6	Xdirect Free	Ydirect Free	Rdirect Free	drain	0.000
6	5	Xdirect Free	Ydirect Free	Rdirect Free	drain	0.000



Fig—2.5.6 Boundary definition(drain)

Stage-3 : Embankment-2

Table—2.5.8 Area definition

Area name	Material name
B-2	Embankment

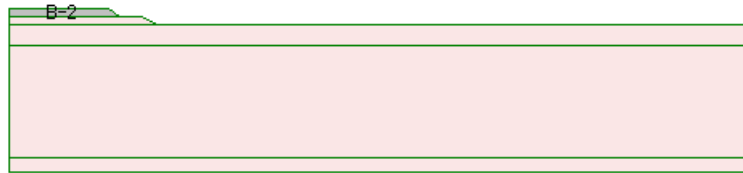


Fig-2.5.7 Area definition

Table-2.5.9 Boundary definition(undrain)

inod	jnod	-	-	-
15	14	Xdirect Fix	Ydirect Free	Rdirect Free

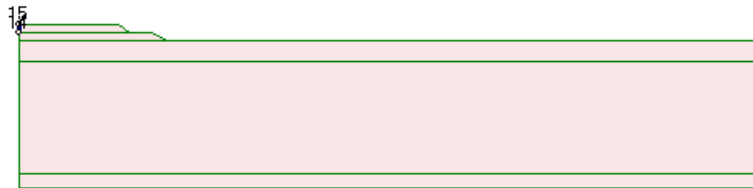


Fig-2.5.8 Boundary definition(undrain)

Table-2.5.10 Boundary definition(drain)

inod	jnod	-	-	-	-	head
15	18	Xdirect Free	Ydirect Free	Rdirect Free	drain	0.000
18	7	Xdirect Free	Ydirect Free	Rdirect Free	drain	0.000

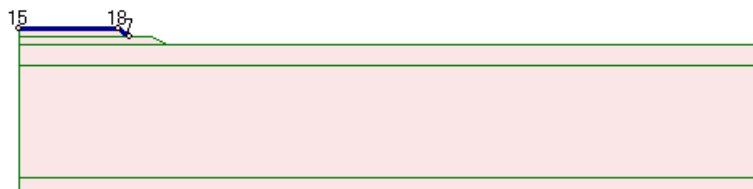


Fig-2.5.9 Boundary definition(drain)

Stage-4 : Embankment-3

Table-2.5.11 Area definition

Area name	Material name
B-3	Embankment

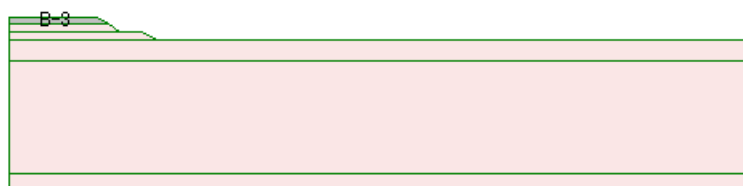
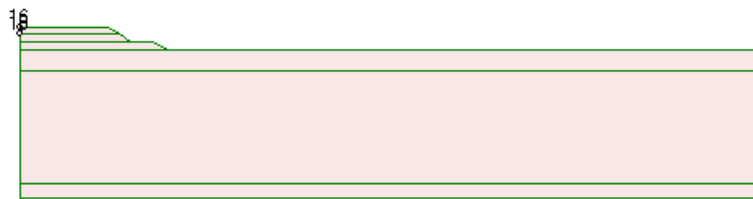


Fig-2.5.10 Area definition

Table—2.5.12 Boundary definition(undrain)

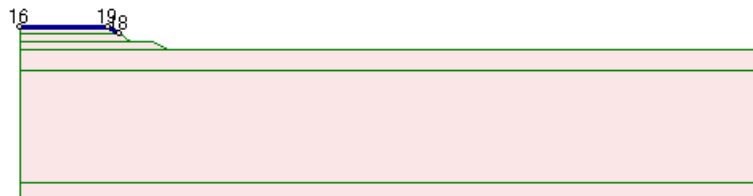
inod	jnod	—	—	—
16	15	Xdirect Fix	Ydirect Free	Rdirect Free



Fig—2.5.11 Boundary definition(undrain)

Table—2.5.13 Boundary definition(drain)

inod	jnod	—	—	—	—	head
16	19	Xdirect Free	Ydirect Free	Rdirect Free	drain	0.000
19	18	Xdirect Free	Ydirect Free	Rdirect Free	drain	0.000

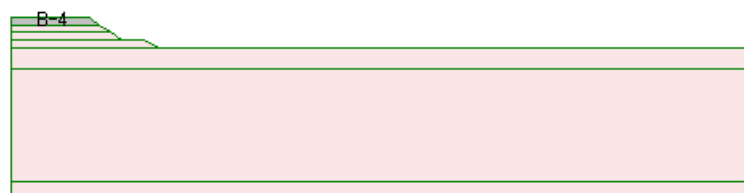


Fig—2.5.12 Boundary definition(drain)

Stage-5 : Embankment-4

Table—2.5.14 Area definition

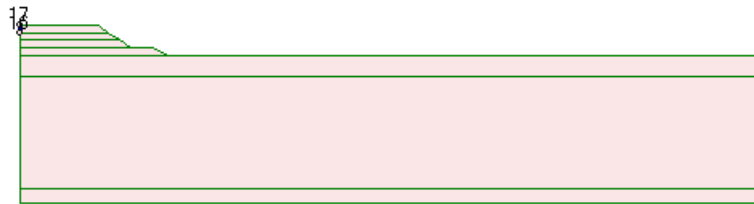
Area name	Material name
B-4	Embankment



Fig—2.5.13 Area definition

Table—2.5.15 Boundary definition(undrain)

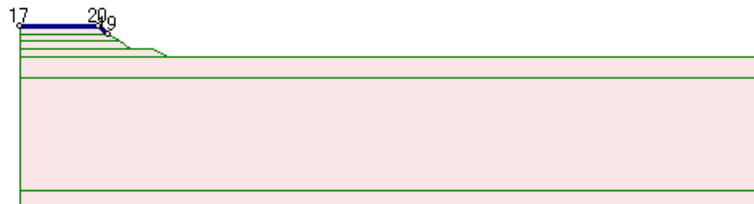
inod	jnod	—	—	—
17	16	Xdirect Fix	Ydirect Free	Rdirect Free



Fig—2.5.14 Boundary definition(undrain)

Table—2.5.16 Boundary definition(drain)

inod	jnod	—	—	—	—	head
17	20	Xdirect Free	Ydirect Free	Rdirect Free	drain	0.000
20	19	Xdirect Free	Ydirect Free	Rdirect Free	drain	0.000

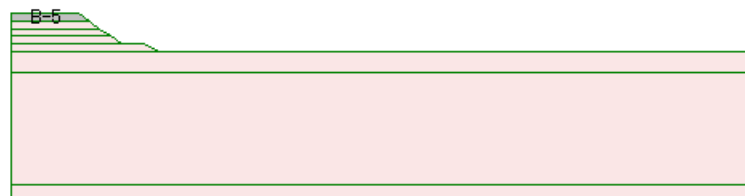


Fig—2.5.15 Boundary definition(drain)

Stage-6 : Embankment-5

Table—2.5.17 Area definition

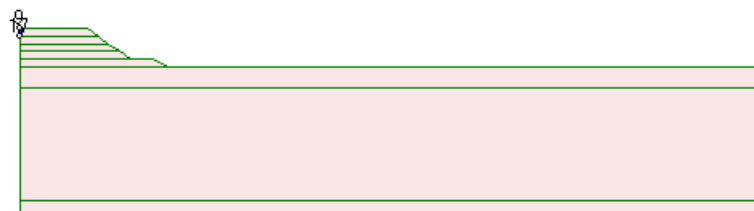
Area name	Material name
B-5	Embankment



Fig—2.5.16 Area definition

Table—2.5.18 Boundary definition(undrain)

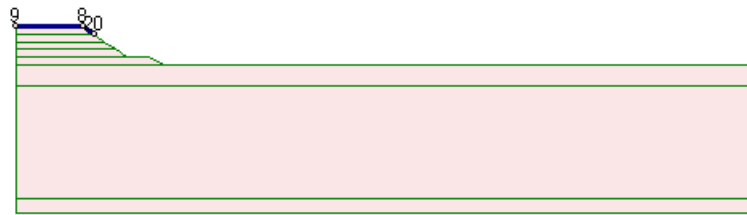
inod	jnod	—	—	—
9	17	Xdirect Fix	Ydirect Free	Rdirect Free



Fig—2.5.17 Boundary definition(undrain)

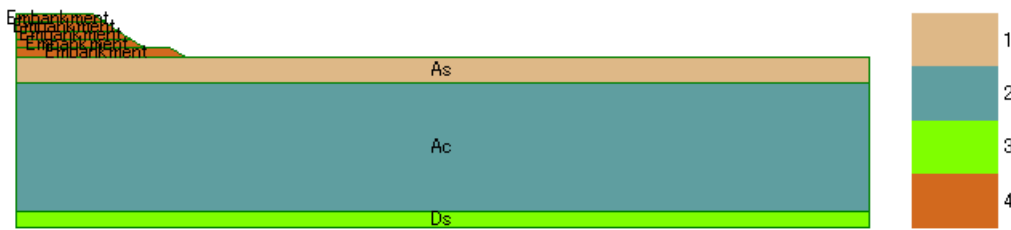
Table—2.5.19 Boundary definition(drain)

inod	jnod	—	—	—	—	head
9	8	Xdirect Free	Ydirect Free	Rdirect Free	drain	0.000
8	20	Xdirect Free	Ydirect Free	Rdirect Free	drain	0.000

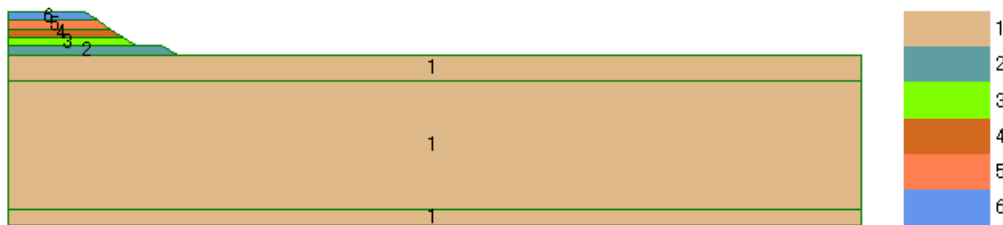


Fig—2.5.18 Boundary definition(drain)

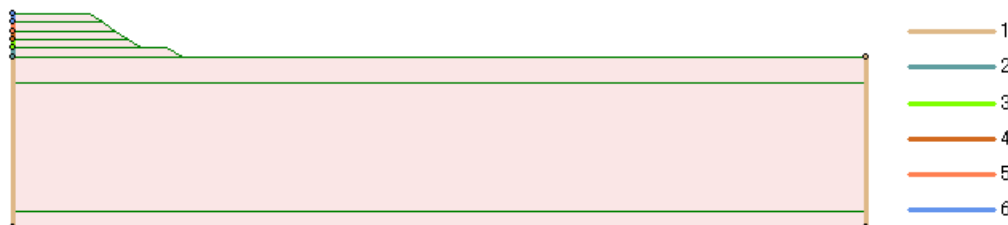
Final stage condition



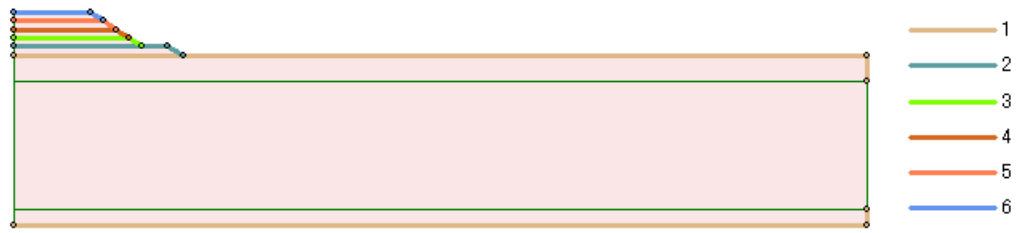
Fig—2.5.19 Area (Material number color)



Fig—2.5.20 Area (Stage number color)



Fig—2.5.21 Boundary definition(undrain)(Stage number color)

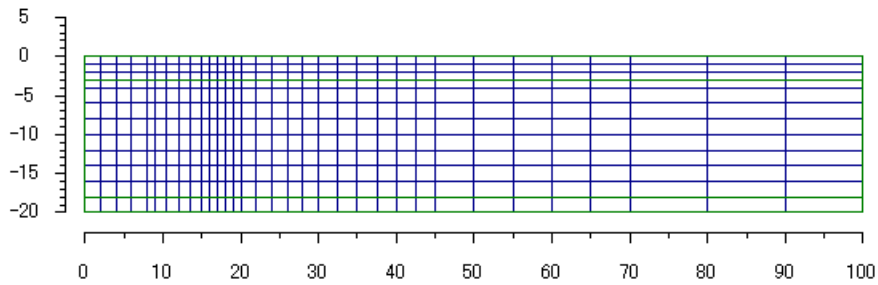


Fig—2.5.22 Boundary definition(drain)(Stage number color)

3.Result

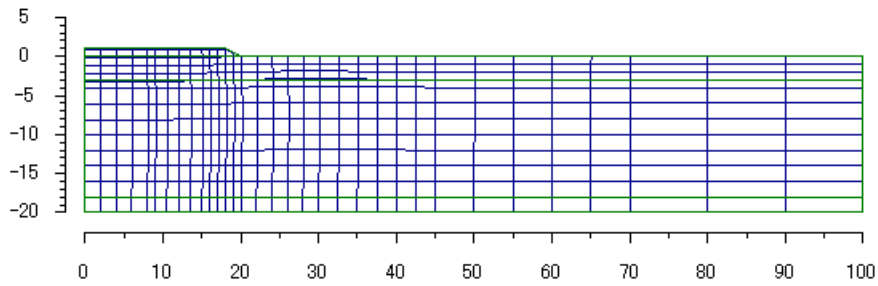
3.1.Mesh deformation

Stage-1 : Initial



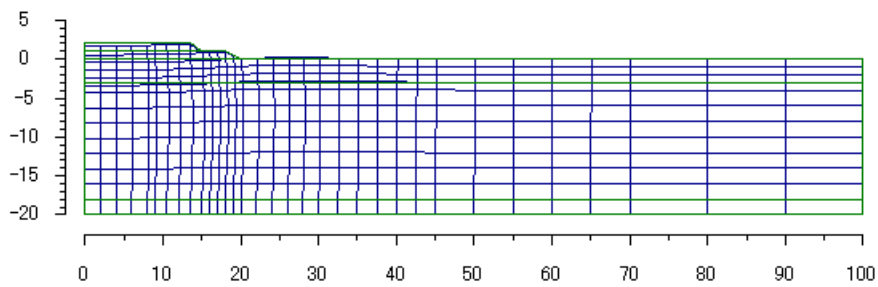
Fig—3.1.1 Mesh deformation (Displacement scale=2.00 times)

Stage-2 : Embankment-1



Fig—3.1.2 Mesh deformation (Displacement scale=2.00 times)

Stage-3 : Embankment-2



Fig—3.1.3 Mesh deformation (Displacement scale=2.00 times)

Stage-4 : Embankment-3

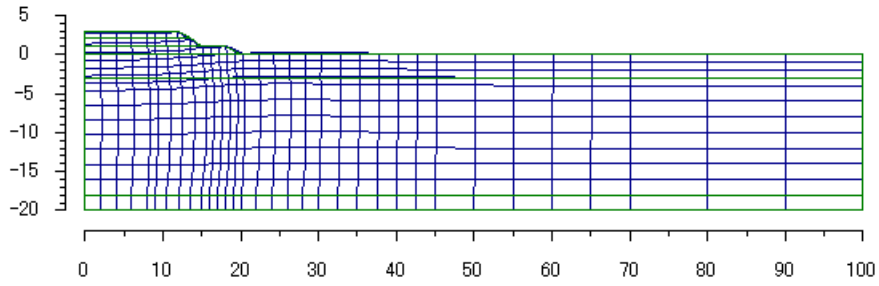


Fig-3.1.4 Mesh deformation (Displacement scale=2.00 times)

Stage-5 : Embankment-4

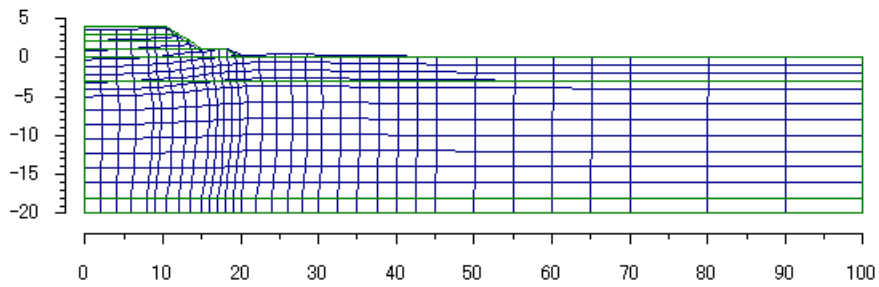


Fig-3.1.5 Mesh deformation (Displacement scale=2.00 times)

Stage-6 : Embankment-5

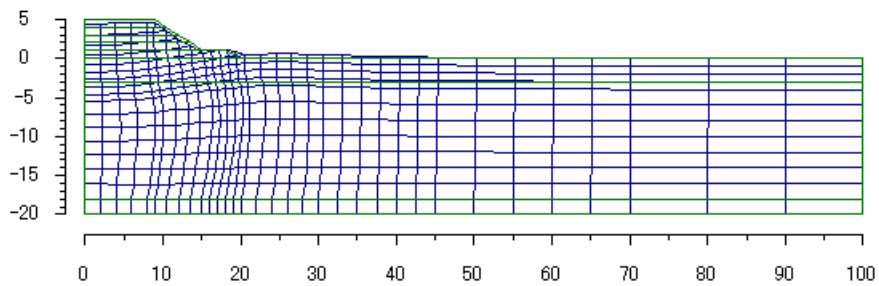


Fig-3.1.6 Mesh deformation (Displacement scale=2.00 times)

Stage-7 : 1Month

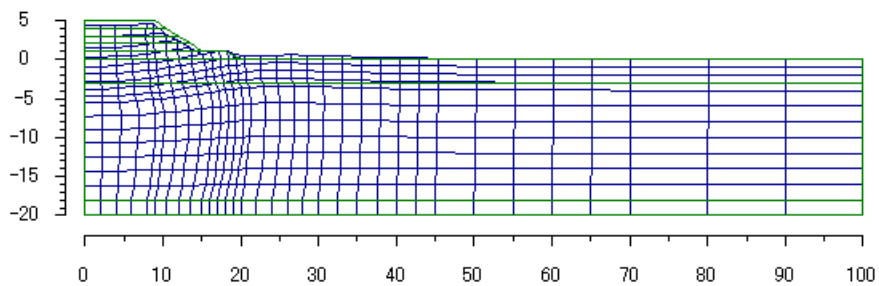


Fig-3.1.7 Mesh deformation (Displacement scale=2.00 times)

Stage-8 : 3Month

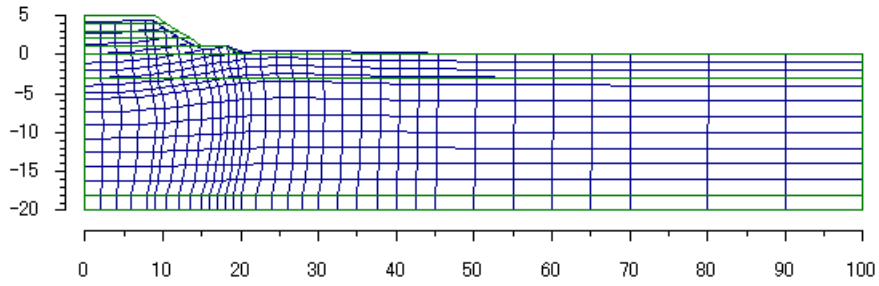


Fig-3.1.8 Mesh deformation (Displacement scale=2.00 times)

Stage-9 : 6Month

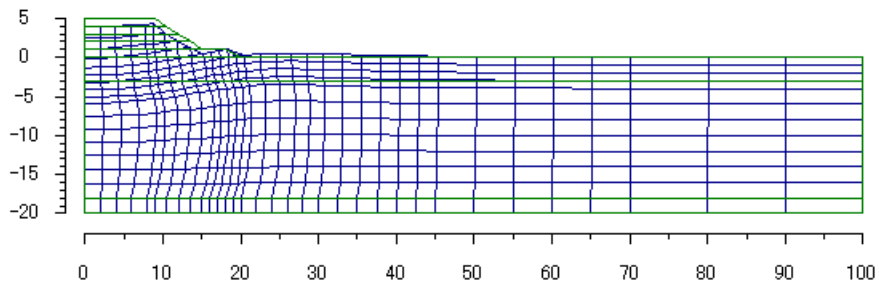


Fig-3.1.9 Mesh deformation (Displacement scale=2.00 times)

Stage-10 : 1Year

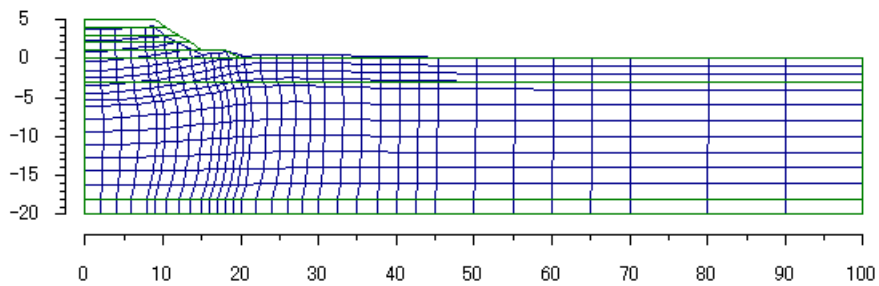


Fig-3.1.10 Mesh deformation (Displacement scale=2.00 times)

Stage-11 : 2Year

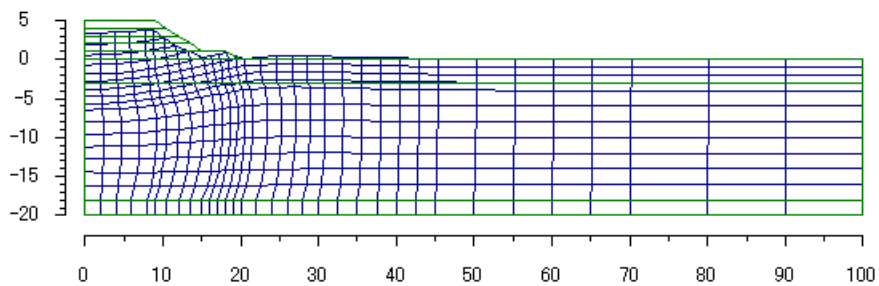


Fig-3.1.11 Mesh deformation (Displacement scale=2.00 times)

Stage-12 : 3Year

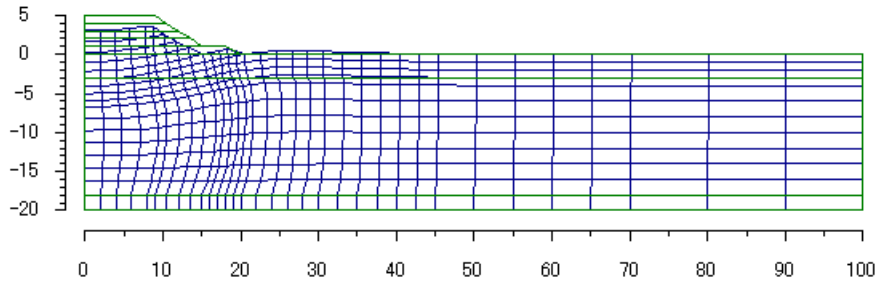


Fig-3.1.12 Mesh deformation (Displacement scale=2.00 times)

Stage-13 : 5Year

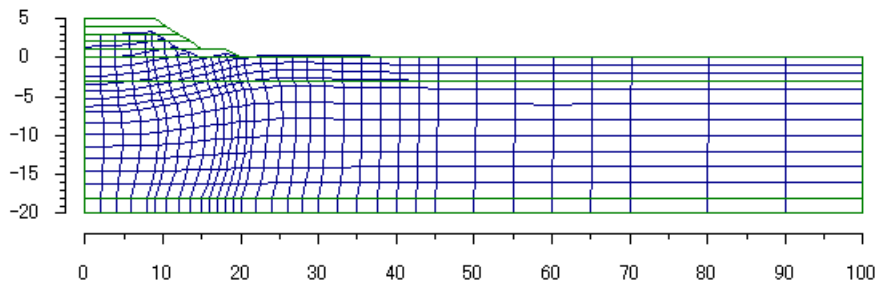


Fig-3.1.13 Mesh deformation (Displacement scale=2.00 times)