

PIER / PILE GROUP

C-PHI – SOIL

END BEARING

Input

Data

This is for c-phi soil

Enter depth to firm soil(m): 3.0

Enter length of pier or pile(m): 14.0

Enter diameter of the pile(m): 0.3

Enter the file name in which you want to store the design: soil7

Enter net load(kN): 2000

Enter load transfer 1 - end bearing, 2 - skin friction, 3 - end bearing cum skin friction: 1

Enter steps of iteration on D(mm): 50

Enter number of C and Phi data with depth: 5

Enter depth of water table in firm soil(m): 5.0

Enter thickness of soil layer below base of the pier or pile group(m): 10.0

Enter permissible settlement of the pier or pile group(mm): 75

Soil Data:

Depth (m)	C (kN/m ²)	phi (degrees)	e0	Cc	Unit weight (kN/m ³)	Es (kN/m ²)	Poison's ratio
11.0	16.0	36.0	1.2	0.1	18.5	42000	0.4
13.0	18.0	37.5	1.25	0.09	17.6	41000	0.45
15.0	17.5	39.0	1.3	0.08	16.5	42000	0.5
17.0	18.5	34.5	1.2	0.05	18.0	41000	0.65
19.0	19.0	35.6	1.1	0.04	17.6	40000	0.7

Enter factor of safety for sbp: 3

End bearing:

Pier:

Load bearing analysis:

L(m)= 14.00; Initial trial D(m)= 1.20

Iteration No: 22; L(m)= 14.00; D(m)= 0.30

---Load bearing analysis is over---

End bearing:

Pier:

Settlement analysis:

L(m)= 14.00; Initial trial D(m)= 0.30

Iteration No: 16; L(m)= 14.00; D(m)= 1.05

--- Settlement analysis is over---

End bearing:

Pile group:

Load bearing analysis:

L(m)= 14.00; d(m)= 0.30; Initial trial: No= 1

Do you want to increase diameter of the pile?

Enter 1 - Yes, 2 - No: 2

It is O.K., Press 'Enter' to continue

Iteration No: 1; L(m)= 14.00; D(m)= 0.30; No= 1

---Load bearing analysis is over---

End bearing:

Pile group:

Settlement analysis:

L(m)= 14.00; d(m)= 0.30; Initial trial: No= 1

Iteration No: 1; L(m)= 14.00; d(m)= 0.30; No= 1

This does not satisfy settlement

L(m)= 14.00; d(m)= 0.30; No= 1

Choose one of the following:

1 - increase diameter of pile

2 - increase number of pile

Enter 1 or 2: 2

Iteration No: 4; L(m)= 14.00; d(m)= 0.30; No= 4

---Settlement analysis is over---

Output

Design

Type of soil: cphi - soil

Net load(kN): 2000

Load transfer - by end bearing

Steps of iteration on D(mm): 50

Soil Data:

Depth (m)	C (kN/m ²)	phi (degrees)	e0	Cc	Unit weight (kN/m ³)	Es (kN/m ²)	Poisson's ratio
11.00	16.00	36.00	1.20	0.10	18.50	42000	0.40
13.00	18.00	37.50	1.25	0.09	17.60	41000	0.45
15.00	17.50	39.00	1.30	0.08	16.50	42000	0.50
17.00	18.50	34.50	1.20	0.05	18.00	41000	0.65
19.00	19.00	35.60	1.10	0.04	17.60	40000	0.70

Thickness of weak soil(m): 3.00

Depth of water table in firm soil: 5.00

Thickness of soil layer below base of the pier or pile group(m): 10.00

Factor of safety for sbp: 3
Permissible settlement(mm): 75

Pier:

Length(m): 14.00
Diameter(m): 1.05
Volume(m3): 12.12

Pile group:

Length(m): 14.00
Diameter(m): 0.30
Number: 4
Volume(m3): 3.96

PIER / PILE GROUP

C-PHI - SOIL

SKIN FRICTION

Input

Data

This is for c-phi soil

Enter depth to firm soil(m): 3.0

Enter length of pier or pile(m): 18.0

Enter diameter of the pile(m): 0.3

Enter the file name in which you want to store the design: soil8

Enter net load(kN): 2500

Enter load transfer 1 - end bearing, 2 - skin friction, 3 - end bearing cum skin friction: 2

Enter steps of iteration on D(mm): 50

Enter number of C and Phi data with depth: 5

Enter depth of water table in firm soil(m): 5.0

Enter thickness of soil layer below base of the pier or pile group(m): 10.0

Enter permissible settlement of the pier or pile group(mm): 75

Soil Data:

Depth (m)	C (kN/m ²)	phi (degrees)	e ₀	C _c	Unit weight (kN/m ³)	Es (kN/m ²)	Poisson's ratio
11.0	16.0	36.0	1.2	0.1	18.5	42000	0.55
15.0	18.0	37.5	1.25	0.09	17.6	41000	0.45
19.0	17.5	39.0	1.3	0.08	16.5	42000	0.5
23.0	18.5	34.5	1.2	0.05	18.0	41000	0.65
27.0	19.0	35.6	1.1	0.04	17.6	40000	0.7

Enter factor of safety for skin friction: 3

Enter coefficient of earth pressure for pier: 0.42
Enter coefficient of earth pressure for single pile: 0.42
Enter coefficient of earth pressure for pile group: 0.42
Enter beta value: 0.45
Enter alpha value: 0.75

Skin friction:

Pier:

Load bearing analysis:

L(m)= 18.00; D(m) required= 3.90;

---Load bearing analysis is over---

Do you want to increase the length?

Enter 1-Yes, 2-No: 2

It is O.K., Press 'Enter' to continue

Skin friction:

Pier:

Settlement analysis:

L(m)= 18.00; Initial trial D(m)= 3.90

Iteration No: 1; L(m)= 18.00; D(m)= 3.90

---Settlement analysis is over---

Skin friction:

Pile group:

Load bearing analysis:

L(m)= 18.00; d(m)= 0.30; Initial trial: No= 11;

Do you want to change dimensions of the pile?

Enter 1 - Yes, 2 - No: 2

It is O.K., Press 'Enter' to continue

Iteration No: 1; L(m)= 18.00; d(m)= 0.30; No= 11

---Load bearing analysis is over---

Skin friction:

Pile group:

Settlement analysis:

Iteration No: 1; L(m)= 18.00; d(m)= 0.30 ; No= 11

---Settlement analysis is over---

Output

Design

Type of soil: cphi - soil

Net load(kN): 2500

Load transfer - by skin friction

Steps of iteration on D(mm): 50

Soil Data:

Depth (m)	C (kN/m ²)	phi (degrees)	e0	Cc	Unit weight (kN/m ³)	Es (kN/m ²)	Poisson's ratio
11.00	16.00	36.00	1.20	0.10	18.50	42000	0.55
15.00	18.00	37.50	1.25	0.09	17.60	41000	0.45
19.00	17.50	39.00	1.30	0.08	16.50	42000	0.50
23.00	18.50	34.50	1.20	0.05	18.00	41000	0.65
27.00	19.00	35.60	1.10	0.04	17.60	40000	0.70

Thickness of weak soil(m): 3.00

Depth of water table in firm soil: 5.00

Thickness of soil layer below base of the pier or pile group(m): 10.00

Factor of safety for skin friction: 3

Permissible settlement(mm): 75

Coefficient of earth pressure for pier: 0.42

Coefficient of earth pressure for single pile: 0.42

Coefficient of earth pressure for pile group: 0.42

Beta value: 0.45

Alpha value: 0.75

Pier:

Length(m): 18.00

Diameter(m): 3.90

Volume(m³): 215.02

Pile group:

Length(m): 18.00

Diameter(m): 0.30

Number: 11

Volume(m³): 14.00

PIER / PILE GROUP

C-PHI - SOIL

END BEARING-cum-SKIN FRICTION

Input

Data

This is for c-phi soil

Enter depth to firm soil(m): 3.0

Enter length of pier or pile(m): 14.0

Enter diameter of the pile(m): 0.3

Enter the file name in which you want to store the design: soil9

Enter net load(kN): 2000
 Enter load transfer 1 - end bearing, 2 - skin friction, 3 - end bearing cum skin friction: 3
 Enter steps of iteration on D(mm): 50
 Enter number of C and Phi data with depth: 5
 Enter depth of water table in firm soil(m): 5.0
 Enter thickness of soil layer below base of the pier or pile group(m): 10.0
 Enter permissible settlement of the pier or pile group(mm): 75
Soil Data:

Depth (m)	C (kN/m ²)	phi (degrees)	e0	Cc	Unit weight (kN/m ³)	Es (kN/m ²)	Poisson's ratio
11.0	16.0	36.0	1.2	0.1	18.5	42000	0.55
15.0	18.0	37.5	1.25	0.09	17.6	41000	0.45
19.0	17.5	39.0	1.3	0.08	16.5	42000	0.5
23.0	18.5	34.5	1.2	0.05	18.0	41000	0.65
27.0	19.0	35.6	1.1	0.04	17.6	40000	0.7

Enter factor of safety for sbp: 3
 Enter factor of safety for skin friction: 3
 Enter coefficient of earth pressure for pier: 0.42
 Enter coefficient of earth pressure for single pile: 0.42
 Enter coefficient of earth pressure for pile group: 0.42
 Enter beta value: 0.45
 Enter alpha value: 0.75

End bearing-cum-skin friction:

Pier:

Load bearing analysis:

L(m)= 14.00; Initial trial D(m)= 1.00
 Iteration No: 16 ; L(m)= 14.00 ; D(m)= 0.20
 This does not satisfy load bearing
 Choose one of the following:
 1 - increase length of pier
 2 - increase diameter of pier
 Enter 1 or 2: 2
 Iteration No: 18 ; L(m)= 14.00 ; D(m)= 0.30

---Load bearing analysis is over---

End bearing-cum-skin friction:

Pier:

Settlement analysis:

L(m)= 14.00; Initial trial D(m)= 0.30
 Iteration No: 26; L(m)= 14.00; D(m)= 1.55

--- Settlement analysis is over---

End bearing-cum-skin friction:

Pile group:

Load bearing analysis:

L(m)= 14.00 ; d(m)= 0.30; Initial trial: No= 1

Do you want to change dimensions of the pile?

Enter 1 - Yes, 2 - No: 2

It is O.K., Press 'Enter' to continue

Iteration No: 1; L(m)= 14.00; d(m)= 0.30; No= 1

---Load bearing analysis is over---

End bearing-cum-skin friction:

Pile group:

Settlement analysis:

L(m)= 14.00; d(m)= 0.30; Initial trial: No= 1

Iteration No: 1; L(m)= 14.00; d(m)= 0.30; No= 1

This does not satisfy settlement

L(m)= 14.00; d(m)= 0.30; No= 1

Choose one from following:

1 - increase diameter of pile

2 - increase number of pile

Enter 1 or 2: 2

Iteration No: 8; L(m)= 14.00; d(m)= 0.30; No= 8

---Settlement analysis is over---

Output

Design

Type of soil: cphi - soil

Net load(kN): 2000

Load transfer - by end bearing-cum-skin friction

Steps of iteration on D(mm): 50

Soil Data:

Depth (m)	C (kN/m ²)	phi (degrees)	e0	Cc	Unit weight (kN/m ³)	Es (kN/m ²)	Poisson's ratio
11.00	16.00	36.00	1.20	0.10	18.50	42000	0.55
15.00	18.00	37.50	1.25	0.09	17.60	41000	0.45
19.00	17.50	39.00	1.30	0.08	16.50	42000	0.50
23.00	18.50	34.50	1.20	0.05	18.00	41000	0.65
27.00	19.00	35.60	1.10	0.04	17.60	40000	0.70

Thickness of weak soil(m): 3.00

Depth of water table in firm soil: 5.00

Thickness of soil layer below base of the pier or pile group(m): 10.00

Factor of safety for sbp: 3
Factor of safety for skin friction: 3
Permissible settlement(mm): 75
Coefficient of earth pressure for pier: 0.42
Coefficient of earth pressure for single pile: 0.42
Coefficient of earth pressure for pile group: 0.42
Beta value: 0.45
Alpha value: 0.75

Pier:

Length(m): 14.00
Diameter(m): 1.55
Volume(m3): 26.42

Pile group:

Length(m): 14.00
Diameter(m): 0.30
Number: 8
Volume(m3): 7.92

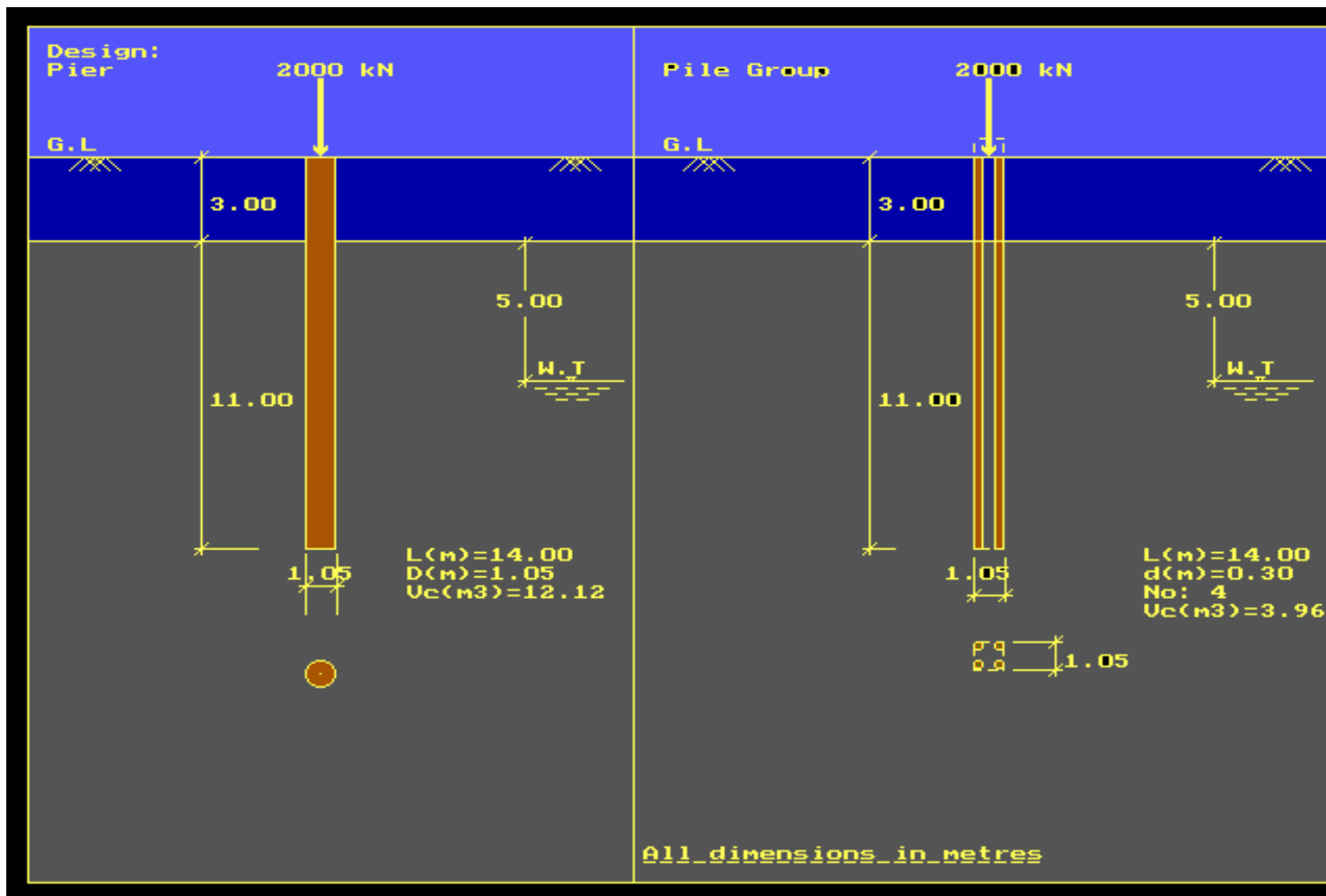


Fig.5.7

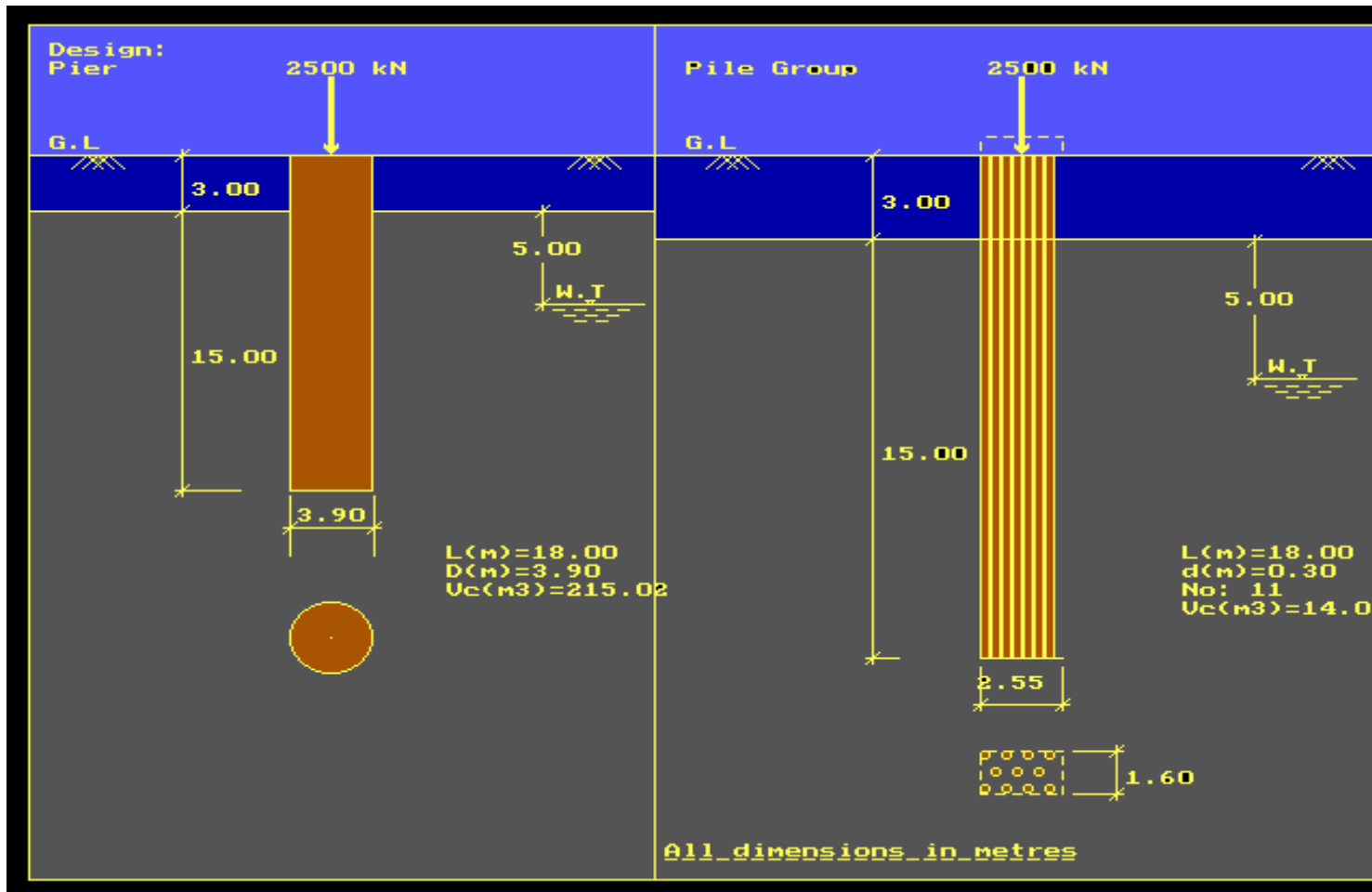


Fig.5.8

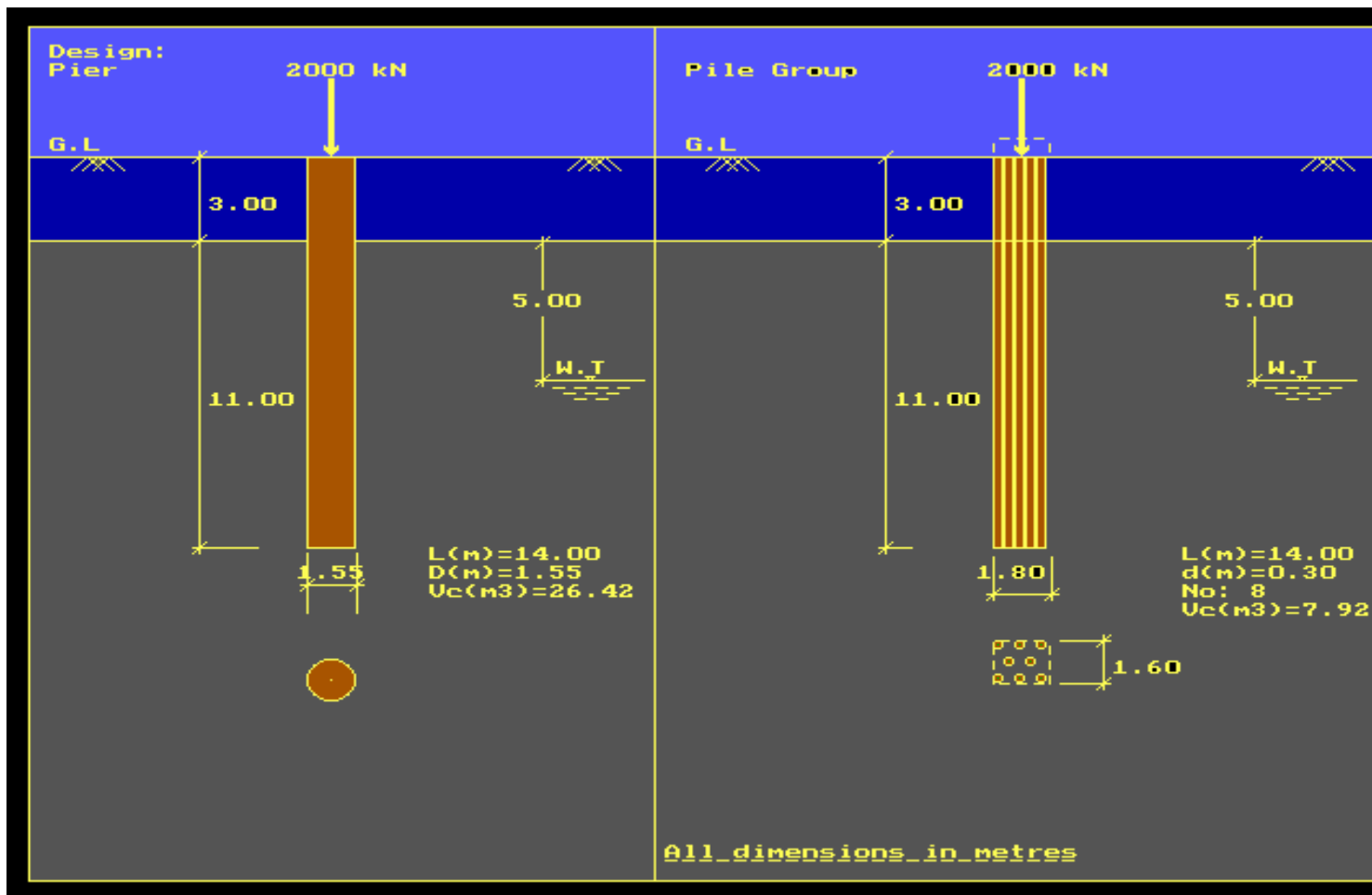


Fig.5.9

