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1 1992 65

2009 8 27

2009 8 27

2 2010 39

2015 7 1

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2015 75 2015 7 1

5 2006

3 2015 5 29 80

2015 7 1

6

2017 29 2017 10 10

7

2009 20 2015 3 23 78

2018 12

2018 12 4

8 2016

88 2019 7 11 2

2019 9 1

9

2020 15 2020 2 21

10 <

> 2022 4 2022 2 8

11

2022 8 2022 3 17

12 2022 26 2022

7 1

13 < >

2022 88 2022 9 1

14 < >

2022 136 2022 11 21

15 < >

2023 124 2023 9 12

16

20 21 3 8 25

17 24 1

2024 1 10

18 2024

2024 1 2024 1 19

19 <

2024-2026 > 2024 2 2024 1 21

20 2024

8 2024 3 1

21 <

> 2024 41 2024 4 23

1.3.46

1

2016 29 2016 8 16

2

2018 29 2018 7 19

3 2009 3 19

229 2021 5 18 341

2021 5 18

4

1.3.5

1 GBJ22 1987 1988.8.1

2 AQ8001-2007 2007.4.1

3 SL 191-2008 2009.2.10

4 GB/T 14161-2008 2009.10.1

5 AQ2030-2010 2010.9.6

6 2016 (GB50011-2010 2010.12.1
)

7 GB50187-2012 2012.8.1

8 GB50863-2013 2013.12.1

9 GB50201-2014 2015.5.1

10 SL210-2015 2015.5.9

11 GB18306-2015 2016.6.1

12 GB18218-2018 2019.3.1

13 GB/T50046-2018 2019.3.1

14 5
GB/T2893.5-2020 2020.10.1

15 SL274-2020 2021.2.28

16 GB/T29639-2020 2021.4.1

17 GB18599-2020 2021.7.1

18 GB 39496 2020 2021.9.1

19 GB55006-2021 2022.1.1

20 GB55002-2021 2022.1.1

21 1 GB39800.1-2020 2022.1.1

22 4 GB39800.4-2020 2022.1.1

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2.1

2.1.1

1991 10 21

40×10^4t 6×10^4t 34×10^4t 365d 3 8h

2.1.2

2011 6

“ ”

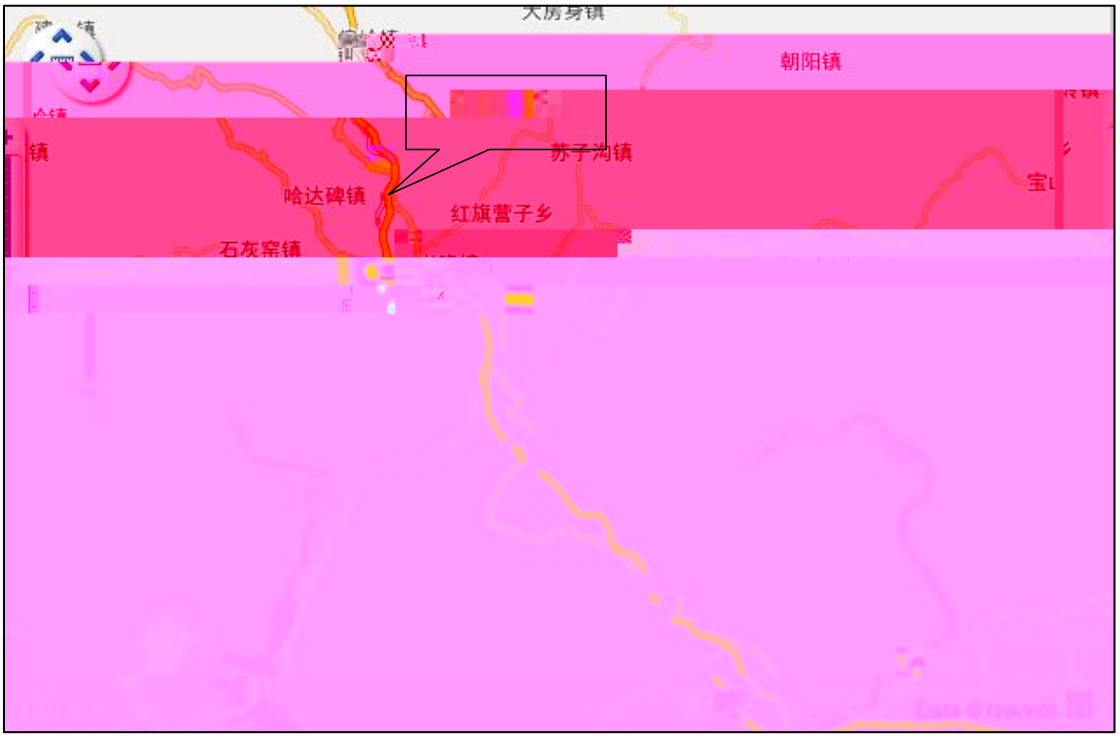
“ ”

2019 9

2024 7 5

2.1.3

123 ° 01 ′ 04 ″ 40 ° 22 ′ 18 ″



2-1

2.2

2.2.1

271.4 287.6m

16.2m

2.2.2

6.5

37.0 -36.6 3.0m/s

120cm 7

2.2.3

GB50011-2010 2016

GB18306-2015 7

0.10g

2.3

2.3.1

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30-100mm 300mm

2.4.2

1

“ ” 59m $346.56\times10^4m^3$

2

285.5m 4.0m 15m 1:2.0

ě –

– 323.9m~280.0m

– 5.0m

5.0m 1:2.5 1:3.5

0.5m×0.5m

2.0m 1.2m

1.2m 2.5m Φ25mm

500g/m^2

5m

800mm ×500mm

15.2m 1.0m 1.5m

3

—

3.0m 15.0m 6

1.5m

4

2.5

2.5.1

1km 420.0m 1km

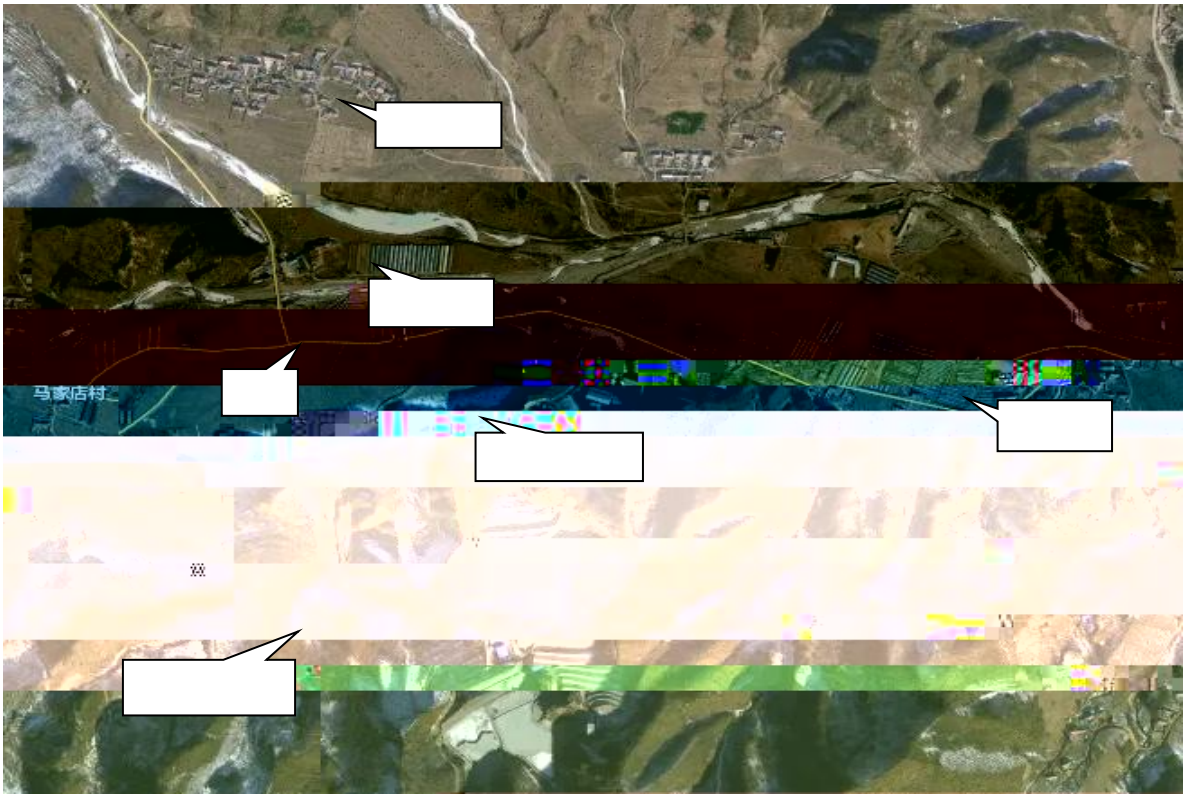
61

800m

50.0m 2.5m

230m 5.0m

4.0m



2-2

2.5.2

$346.56 \times 10^4 m^3$ 59m

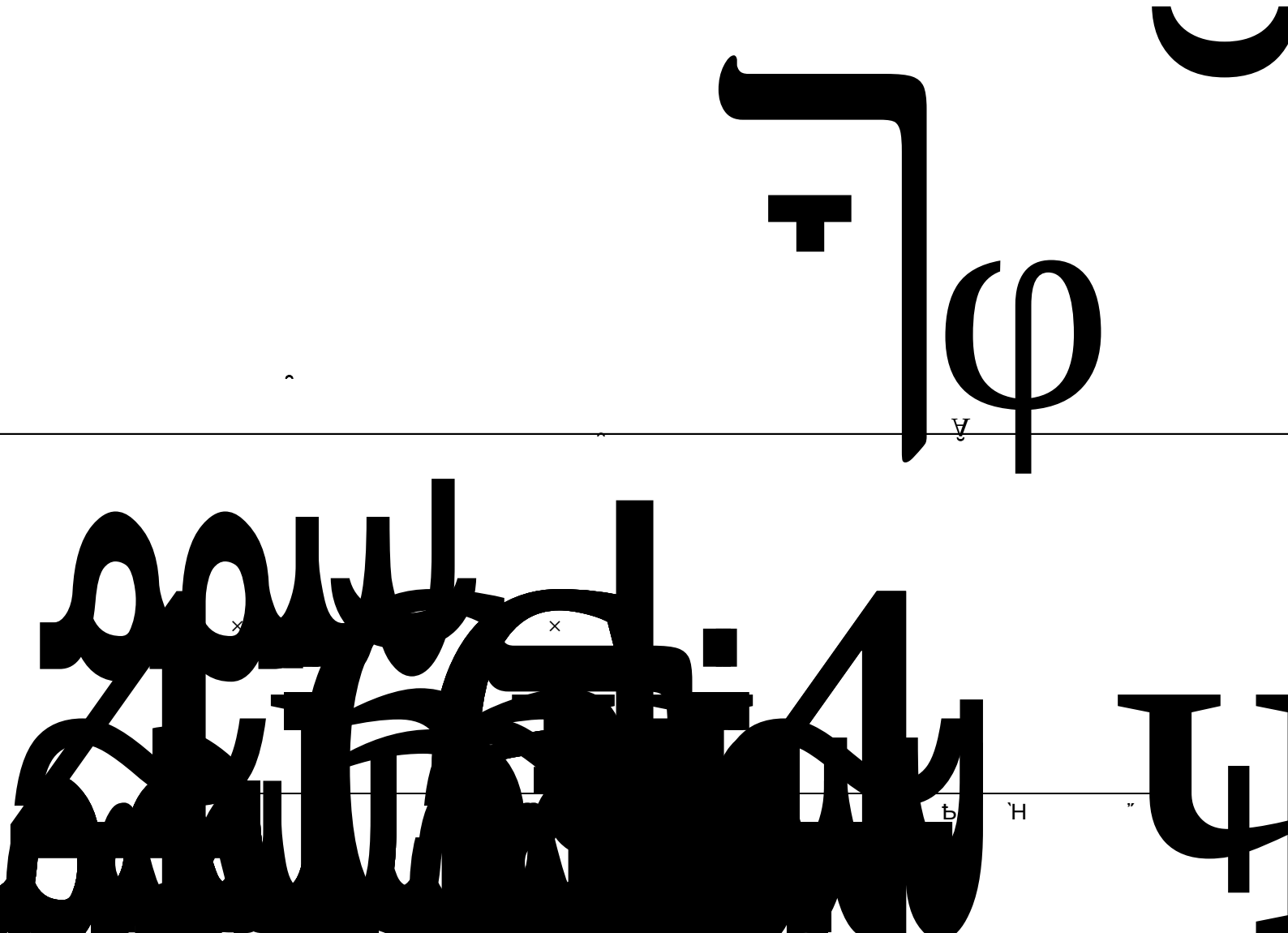
$280.5 \times 10^4 m^3$ $66.06 \times 10^4 m^3$ 3

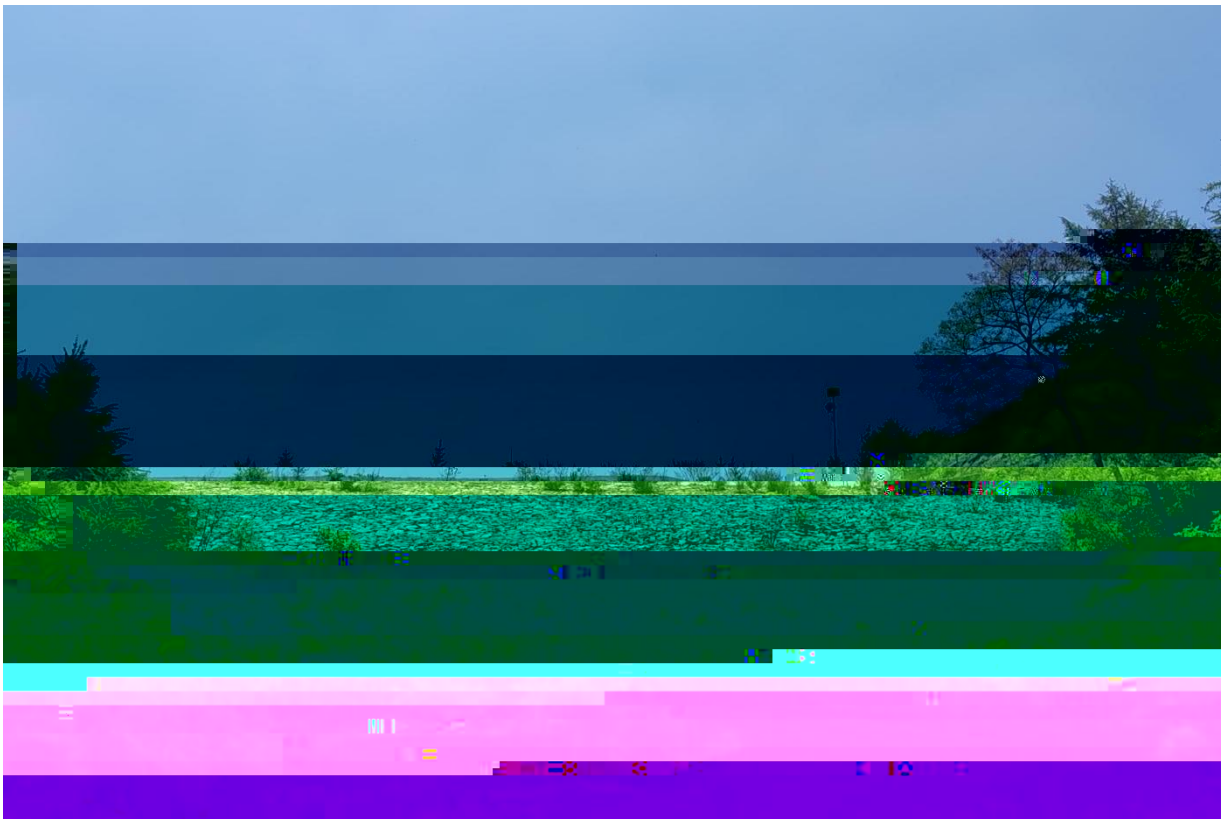
2.5.3

285.5m

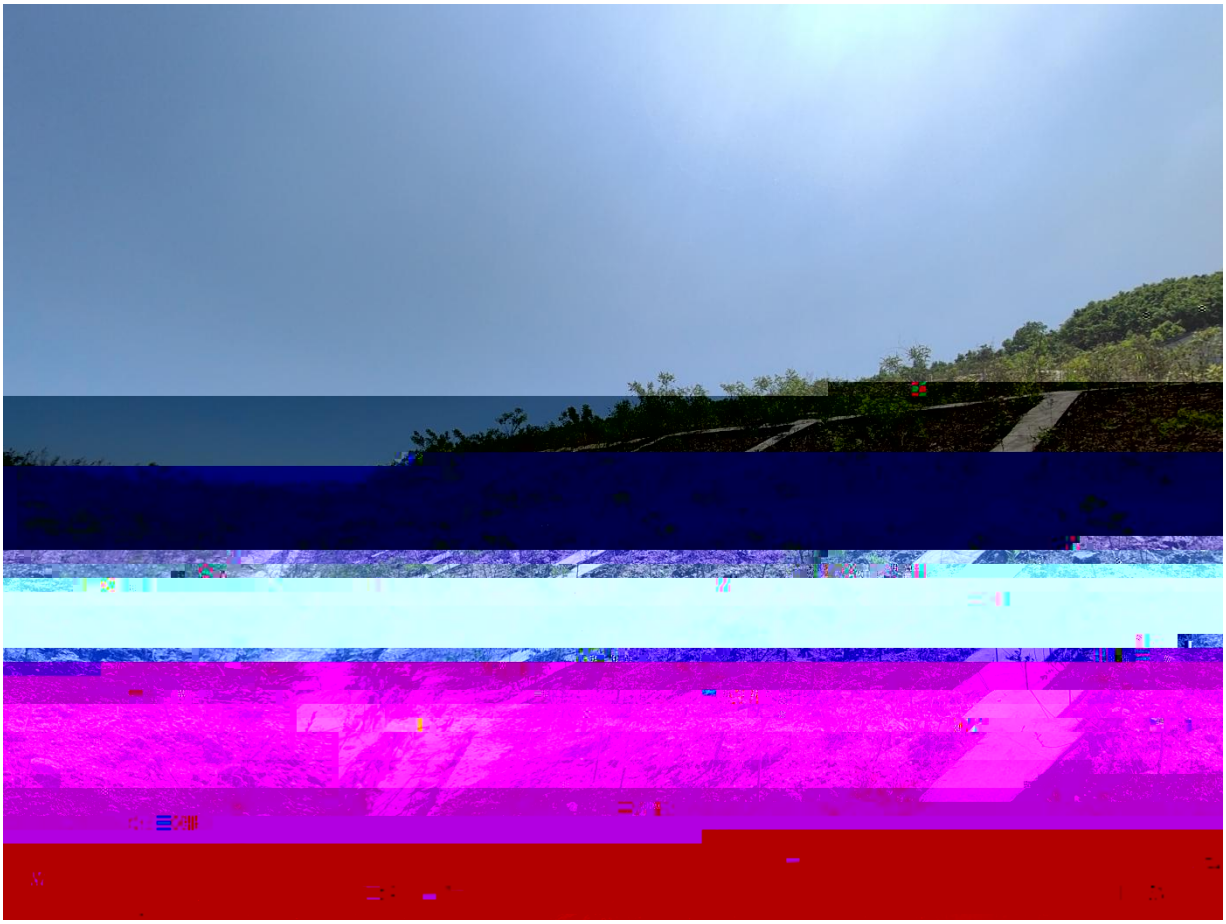
15m B=4m 1 2.0

376m~



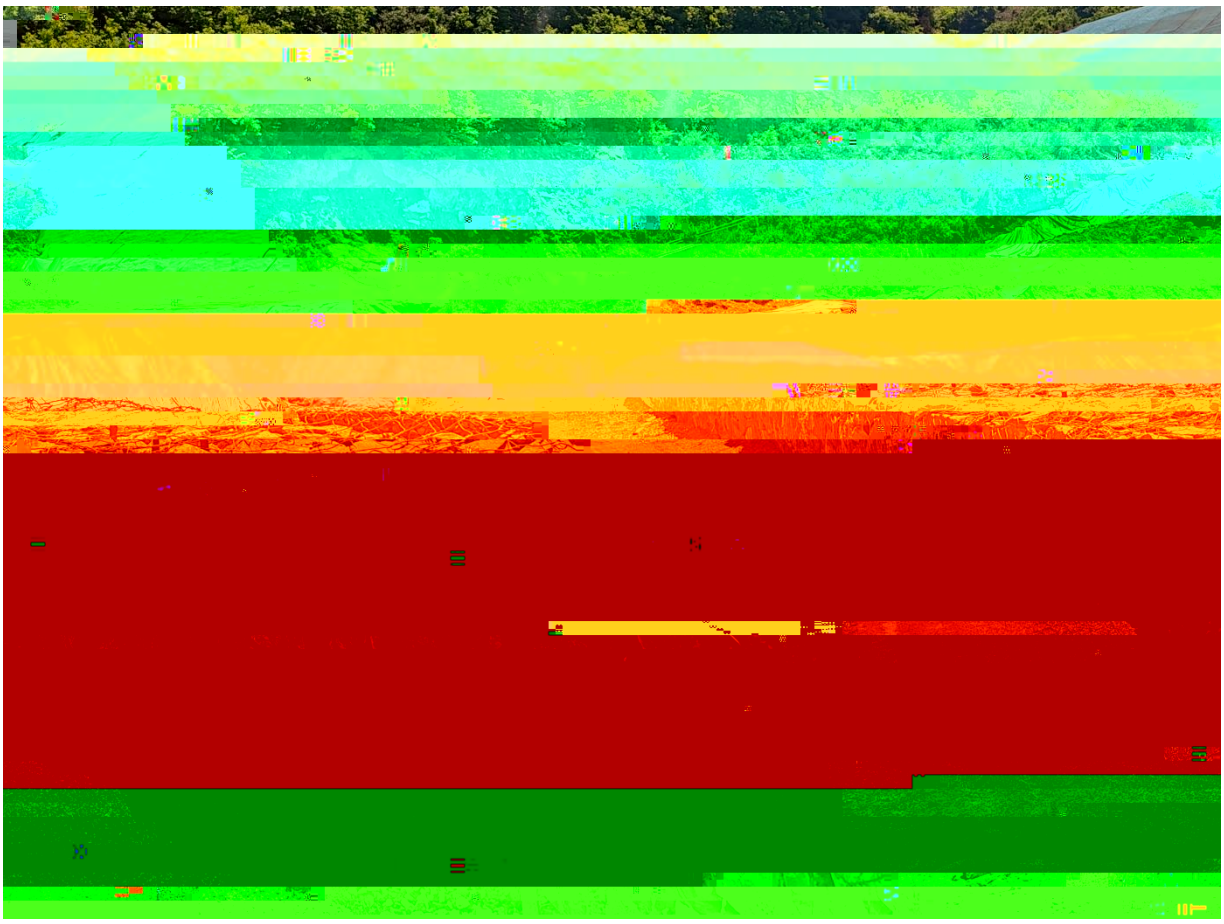


2-3



2-4 1

2-5 2



2-6

2-7

2.5.4

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1 —

1 D=3m

H=15m 6

D=1.5m

2

B×H=1.2m×1.3m 250mm C30

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2.5.5

15t

1 1

5.0m

2.5.6

371.0m 398.0m

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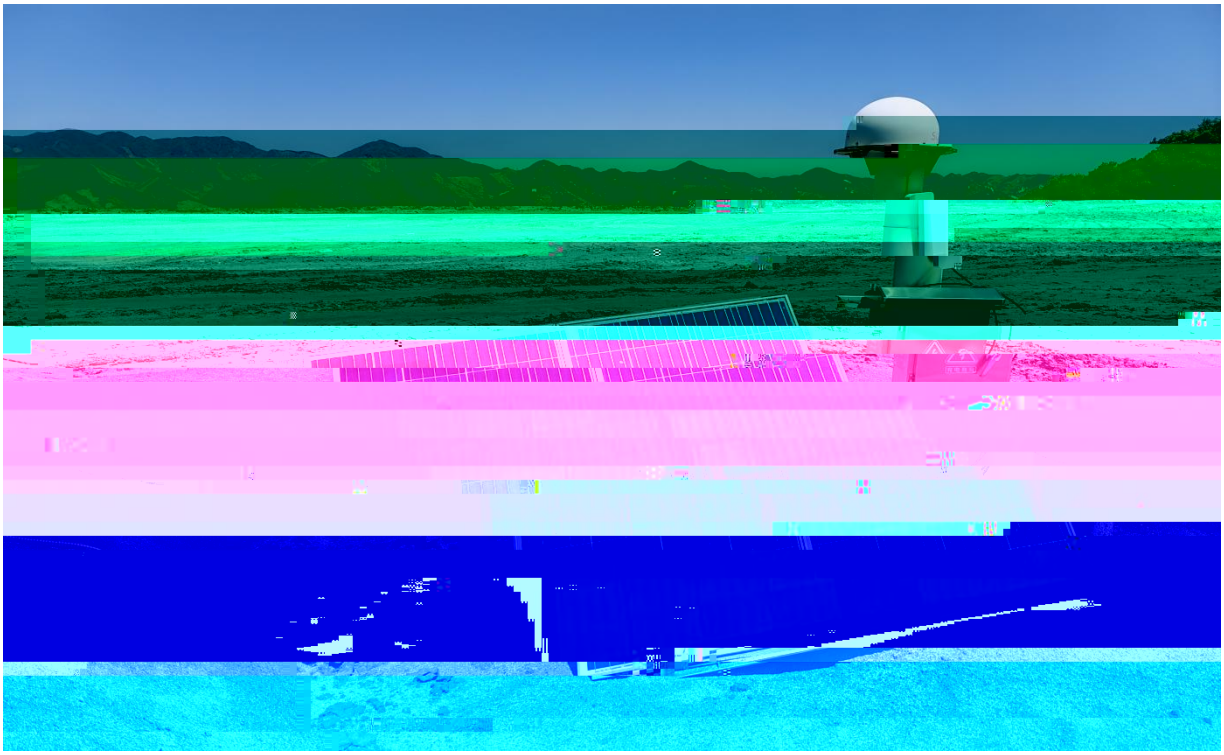

2-11

2.5. ѫm" 2

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		9.5.2		
10		9.5.3		

3.1.2

3-2

1		6.3.11		
2		6.1.9		
3		9.3.3		
4		9.3.4		
5		9.3.5		

3.2.2

1		6.1.9		
2		6.3.2		
3		6.3.6		
4		6.3.7		

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8		9.3.3		
9		9.3.4		
10		9.3.5		
11		9.3.6		

3.2.3

3.2.3.1

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3.2.3.2

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3.2.3.3

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2019 9

3-4

		kNm^3	kNm^3	kPa		cm/s	cm/s
1	( )	19.4	19.7	10.5	30.5	3.15×10^{-2}	3.10×10^{-2}
2		18.8	19.2	15.9	28.0	3.32×10^{-4}	3.60×10^{-4}
3		19.9	19.9	0	32.5	2.50×10^{-3}	2.50×10^{-3}
4		25.5	25.5	100.0	35.0	2.00×10^{-5}	2.00×10^{-5}
5		25.5	25.5	100.0	35.0	2.00×10^{-5}	2.00×10^{-5}

3.2.4.2

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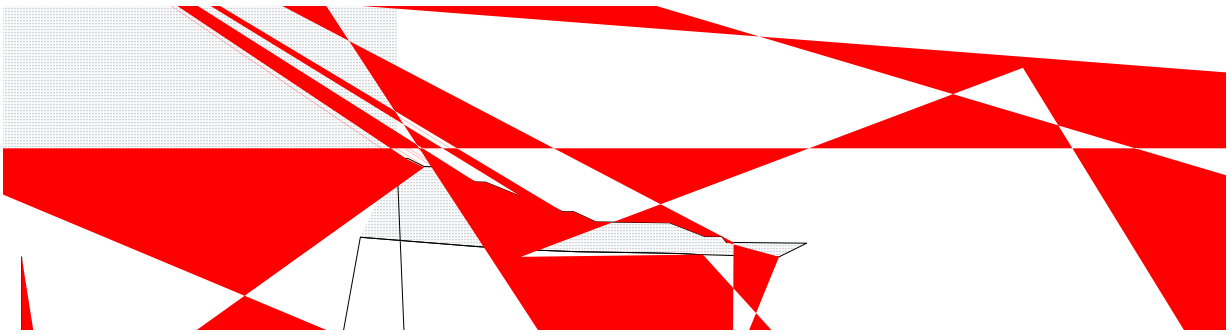
1	1	
2	2	
	3	
4	4	
5	5	0.10g



3		5.4.12		
4		6.4.2	2024	
5	72 h	6.4.4		
6		6.4.5		
7		9.2.5		
8		9.2.6	2.5.4	

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9.2.8 2.5.4 . .

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3.3.3

3.3.3.1

1

GB50863-2013

59m 346.56×10⁴m³ 280.5×10⁴m³

59m 346.56×10⁴m³

1km

500

$0.026km^2$ 3 $0.059km^2$ 4

$0.012km^2$

p_3 =150mm C_v=0.55

p_{24}=120mm C_v=0.55

P_6=75mm C_v=0.55

p_1=35mm C_v=0.53

P_{10}=15mm C_v=0.50

1

$$Q_p = 0.278 \varphi_p i_p F$$

$$i_p = \frac{P_{\tau p}}{\tau}$$

$$\tau = x\left(\frac{L}{J}\right)^y$$

Q_p— m^3/s

φ_p—

i_p— τ mm/h

F— km^2

$P_{\tau p}$ — τ

τ — h.

L— m "

α P α (-24) P F

3

$$r_p = \frac{W_{24p}}{Q_p \times 52 \times 0.36}$$

4

24

W W 24

24

2/3 24 W_{24}

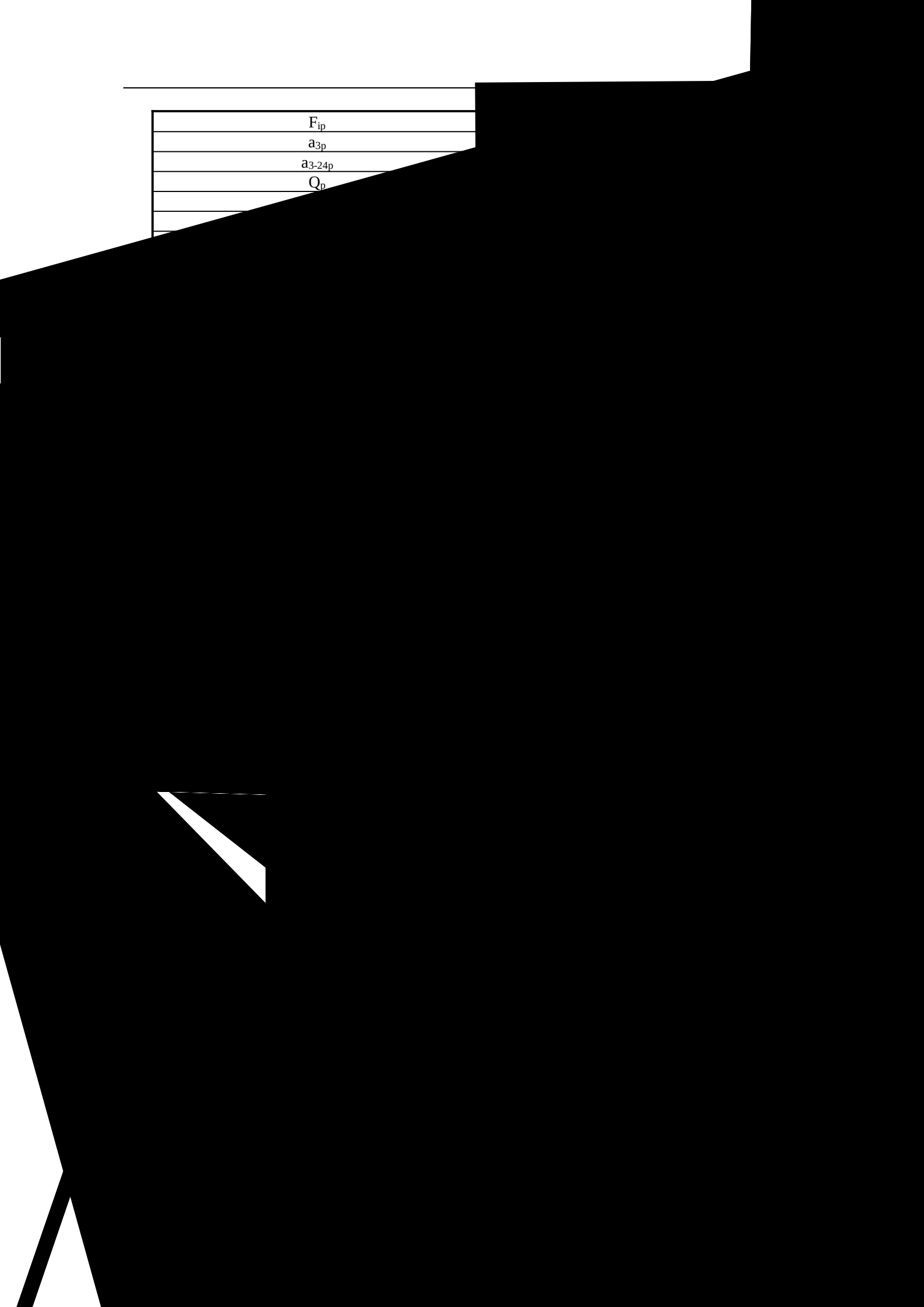
W 2/3

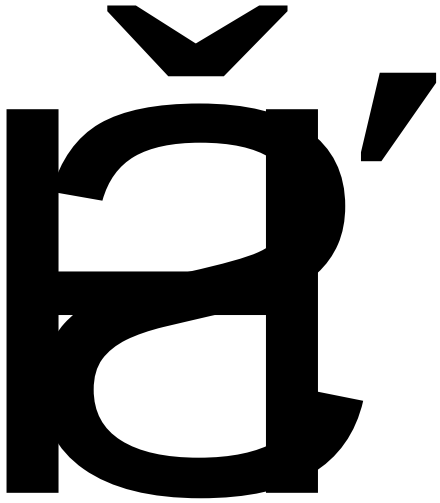
W =2/3(W_{24}- W) + W

=0.67 W_{24}+0.33 Q_P ·

M ·

=


F_{ip}
a_{3p}
$a_{3\text{-}24p}$
Q_p



2

$$\frac{{}_{s}\sqrt{2g}}{\sqrt{1 \quad {}_{i}f_{2}^{2} \quad {}_{2} \quad {}_{3}f_{1}^{2} \quad {}_{4}f_{1}^{2} \quad {}_{5}f_{7}^{2}}}$$

3

$$\frac{{}_{x}\sqrt{2gH_{z}}}{\sqrt{1 \quad {}_{g} — f_{3}^{2} \quad f_{3}^{2} \quad {}_{2}f_{9}^{2} \quad {}_{3}f_{3}^{2} \quad {}_{4}f_{5}^{2} \quad {}_{5}f_{8}^{2}}}$$

H_i— i m

H— m

H_z— m

ω_c— m^2

ω_j— m^2

ω— m^2

ω_1— m^2

ω_2— m^2

F_s— m^2 $Fs= \varepsilon_b F_e$

F_e— m^2

F_x— m^2

ζ —

ζ_1— $\zeta_1= 1.707-\omega_1/\omega_2$ ^{2}

ζ_2— $\zeta_2=0.5$ ζ $_2=0.2\sim0.25$ $\zeta_2=0.1\sim0.2$

ζ_3—

ε — $\varepsilon=1-0.2\zeta_0 H_0/b_c$

ε_b—

d— m

D— m

L— m

λ_g— $\lambda=8g/C^2$

λ_j— $\lambda=8g/C^2$

n_c—

A—

D_c— m

3-13

H m	283.1	283.7	284.3	284.9
Q m^3/s	0	5.44	10.99	12.57

4

283.1m 285.5m

H=1.2m Q=10.99m^3/s Q_p=6.82m^3/s 1.2m

Q=8.7m^3/s Q_p=1.16+2.62+0.53=4.31m^3/s

3.3.4

3.4

3.4.1

3-14

3-14

1 4.42

2 4.4.3

3 5.1.3

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4 5.2.2

5 5.2.2

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3.5.2.2

3.5.2.3

3.5.2.4

3.5.3

3.6

3.6.1

3-16

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1		6.1.1		
2		6.1.3		

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9	2	[2022]4	4 1	
10	2 1	[2022]4	3	

3.6.2

3.7

[2022]88 2022.9.1 <

> 2024 41 2024.4.23

3-17

3-17

	1.	—[2022]88			
	2.	—[2022]88			
	3.	—[2022]88			
	4.	—[2022]88			
	5.	—[2022]88			
	6. GB39496-2020 6.1.9	—[2022]88			
	7.	—[2022]88			
	8.	—[2022]88		2024	
	9.	—[2022]88			

	10.	—[2022]88			
	11.	—[2022]88			
	12.	—[2022]88			
	13.	—[2022]88			
	14.	—[2022]88			
	15. 0.98	—[2022]88			
	16. “ ”	—[2022]88			
	17.	—[2022]88			
	18.	—[2022]88			
	19.	—[2022]88			

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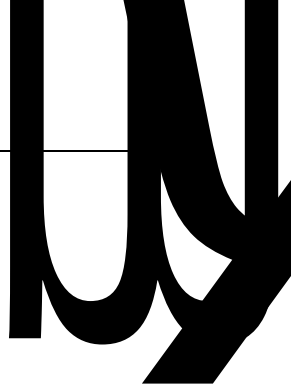

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