Annex 1-1

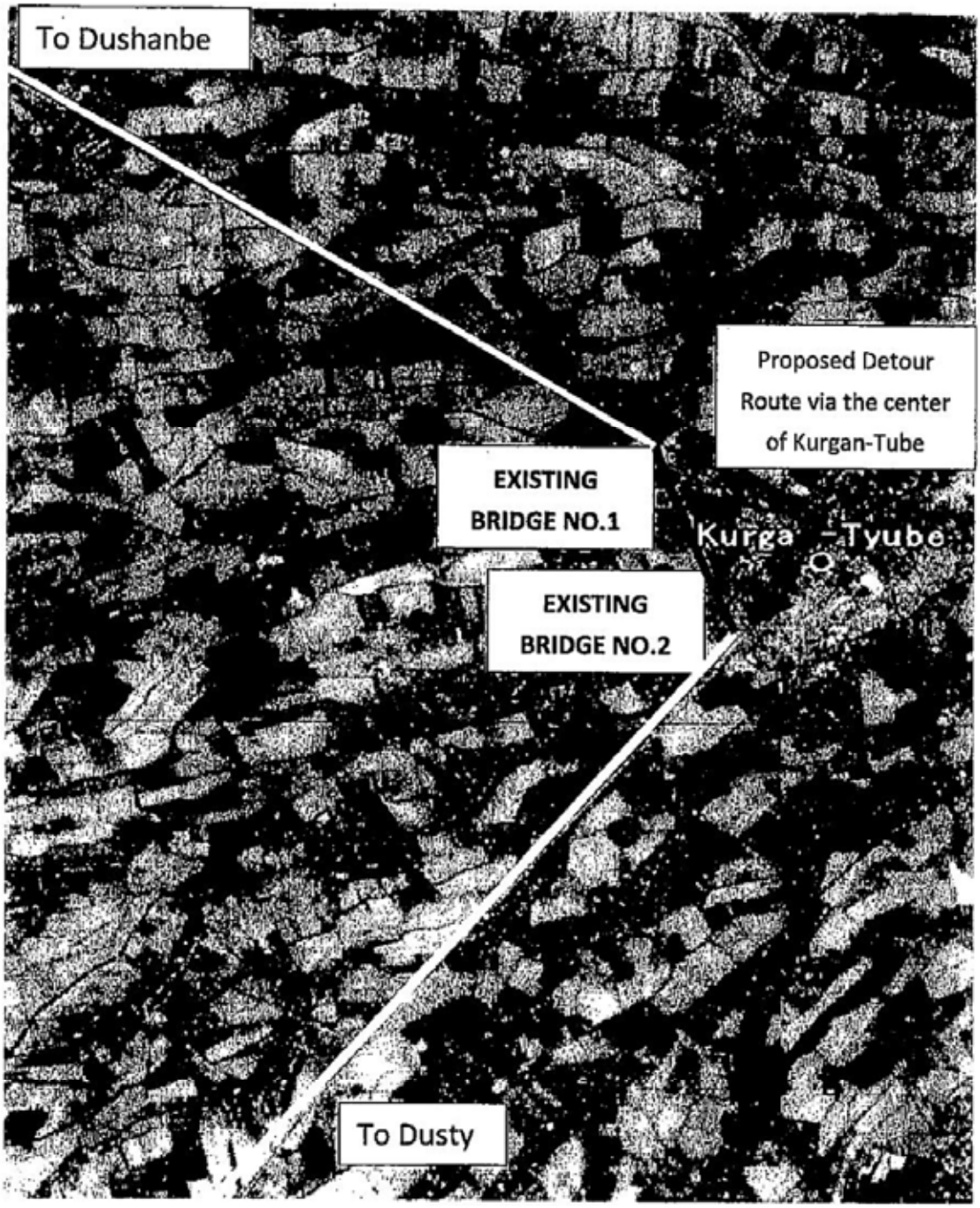
Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	to secure lots of land necessary for the implementation of the Project and to clear the sites;		●
2	To ensure prompt customs clearance of the products and to assist internal transportation of the products in the recipient country		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the Products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
3	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted		●
4	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
5	To ensure that the Facilities be maintained and used properly and effectively for the implementation of the Project		●
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
7	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
8	To give due environmental and social consideration in the implementation of the Project.		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

Annex-2

Proposed Detour (Traffic Diversion) route for through traffic via the center of Kurgan-Tyube



資料4－8

Technical Notes (2011 年 2 月 26 日署名)

26 February 2011

Technical Notes

These Technical Notes should be read in conjunction with Minutes of Discussion signed on 25 February 2011(M/D) between MOTC and the Team for the Project for Rehabilitation of Kurgan Tyube – Dusti Road (Phase II)(the Project). Both sides further agreed the following items in respect of design of the Project.

1. **Principle**

   Except for the box culverts No.1 to No.5 both inclusive, other part of detailed design made by CPC will be applied without any major design change. Design of box culverts will be changed as stated below.

Bridge No.	Design in B/D Study	Agreed design in the Study
No.1	Box Culverts, B 5.0mx2.4m	Rehabilitation of existing bridge
No.2	Box Culverts, (5.0+7.0+5.0)mx6.3m	Bridge
No.3	Box Culverts, (4.5+4.5+4.5)mx3.5m	Bridge
No.4	Box Culverts, 6.0mx5.3m	Bridge
No.5	Box Culverts, (4.5+4.5)mx2.2m	Bridge

2. **Design Loading of Bridges**

   Class B Load of Japan Road Association, which is used by CPC for his design and satisfied requirements in Table 4 Asian Highway Design Standard, minimum AASHTO HS20-44, is also applied as Structure Live Load in the design of the Project.

3. **Relocation, Removal and Area for detour etc.**

   In respect of Sub-Clause 6-2, 6-3 and 6-4 in M/D, the Team will try to minimize relocation, removal and/or area to be used for detours and submit to MOTC detailed drawings with photos, which shows objects to be removed/relocated and area necessary for detours, during the course of detailed design.

4. **Reuse of steel material of existing Bridge No.2**

   Although the Team further studies a method of removal of existing Bridge No.2, the Team is unable to guarantee that removed steel materials of existing bridge No.2 are kept in reusable conditions for other locations. MOTC will arrange transportation of removed steel materials from No.2 Bridge site when MOTC elects to reuse them.

5. **Construction Permission**

MOTC confirmed that Construction Permission obtained for original 60km Rehabilitation of Kurgan Tyube – Dusti Road was still valid. The design change for rehabilitation of existing brides made by the Team may or may not be subject to approval of Independent State Department of Construction Projects Experts (ISDCPE), GOSSTOROY. The Team will send his design drawings bride by bridge basis and MOTC will process them accordingly as per Sub-Clause 7.2 of M/D. Target Schedule is as follows.

- Completion of design and submission of all drawings by the Team to MOTC
  : by the end of April 2011
- Completion of construction permission process in Tajikistan by MOTC
  : within two months after acceptance of drawings by MOTC, by the end of June 2011

6. **Quarry**

MOTC will assist that the quarry from which aggregates were produced for Phase I project can be used for Phase II also.

Agreed by

Mr. Jumakhon Zukhurov	MITANI Katsuaki
First Deputy Minister	Chief Consultant
Ministry of Transport and Communication	Implementing Review Study Team
The Republic of Tajikistan	Japan International Cooperation Agency

MINUTES OF DISCUSSIONS ON
THE IMPLEMENTING REVIEW STUDY ON
"THE PROJECT FOR REHABILITATION OF KURGAN TYUBE – DUSTI ROAD (PHASE II)"
IN THE REPUBLIC OF TAJIKISTAN
(EXPLANATION OF DRAFT FINAL REPORT)

In February 2011, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Implementing Review Study Team on the Project for Rehabilitation of Kurgan Tyube – Dusti Road (Phase II) (hereinafter referred to as "the Project") to the Republic of Tajikistan (hereinafter referred to as "Tajikistan"). Through discussions, field survey, and further technical examination in Japan, JICA prepared a draft final report on the Project.

Accordingly, Mr. Jiro IIDA, Resident Representative, JICA Tajikistan Office explained to the Government of Tajikistan on the contents of the draft final report.

As a result of discussions, both sides confirmed the main items as described in the attached sheets.

Dushanbe, July 4, 2011

飯田次郎

Jiro IIDA
Resident Representative
JICA Tajikistan Office
Japan International Cooperation Agency

Zuhurov Jumakhon
First Deputy Minister
Ministry of Transport
The Republic of Tajikistan

ATTACHMENT

1. Components of the project:

The Tajik side agreed and accepted in principle the component of the draft final report of Implementing Review Study explained by the JICA side.

2. Japan's Grant Aid Scheme:

The Tajik side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Tajik side as explained by the JICA side and described in Annex-1 of the Minutes of Discussions signed by both sides on February 25, 2011.

3. Schedule of the Study:

JICA will complete the final report in accordance with the confirmed item and send it to the Government of Tajikistan by August 2011.

4. Project Cost Estimation:

The JICA side explained to the Tajik side the project cost estimation as described in Annex-I. Both sides confirmed that this cost estimation was provisional and would be examined further by the Government of Japan for its approval as the grant aid.

Both sides also confirmed that the project cost estimation should never be duplicated in any form nor released to any other party before signing of all the contract(s) for the Project. This confidentiality of the project cost estimation is necessary to ensure fairness of tender procedure.

5. Other Relevant Issues:

5-1. Construction permission

The Tajik side assured that the construction permission for the Project is to be obtained by the Tajik side before commencement of tender procedures in principle.

5-2. Undertakings of the Tajik side

The Tajik side confirmed that the following undertakings will be taken by the Tajik side at its own expenses. The Tajik side assured that the necessary budget for these undertakings will be secured in a timely manner.

a) Securing and clearance of the land for road, bridge and box culvert construction area for the Project,
b) Relocation of existing facilities (electricity power, telecommunication, water, sewage, gas, etc.) required for implementation of the Project,
c) Removal of existing properties (including building, trees, plants, etc.) required for implementation of the Project,
d) Necessary arrangement of detours for public traffic at necessary sections during the construction of roads, e.g. securing of land, public announcement etc,
e) Necessary arrangement of traffic diversion to the road connecting to the Kurgan-Tyube regional center as shown in Annex-II during the road construction of diverted section,
f) Securing and clearance of land for a temporary site office, warehouse, and stock yard

near the Project site during the implementation period,

g) Securing site and providing support for obtaining relevant permission and rights for borrow pit, quarry and disposal of waste (scarified asphalt concrete, excavated unsuitable soil, etc.),
h) Necessary arrangement for public utilities for the temporary yard to be used for site facilities such as site offices, plant yards, dormitory, etc. and for temporary works,
i) Necessary arrangement and coordination with concerned Ministry and/or Agency,
j) Exemption of Value Added Tax, custom duties and any other taxes and fiscal levies imposed in the Tajik arisen from the Project activities,
k) Budget allocation for the commission for Banking Arrangement (B/A), Authorization to Pay (A/P) and Payment,
l) Provide security for all concerned Japanese nationals working for the project, if deemed necessary.

5-3. Control of over-loaded vehicles

Both sides confirmed that it is necessary to control over-loaded vehicles in order to make road maintenance rationally. To this end, two sets of track scale on each side of the road are included based on the request made by Tajik side, on condition that the equipment will be used at the designated places to avoid unnecessary damage to the road surface. The exact location of such places and the specifications of equipment shall be discussed with the consultant in detail and reflected in the tender documents.

The Tajik side shall make an operational plan on the control of overloaded vehicles between Kurgan Tyube and Dusti to avoid unnecessary damage to the road surface, and bear the necessary expenses for the implementation of the operational plan.

5-4. Proper maintenance of newly rehabilitated road

The Tajik side shall secure enough budget and personnel necessary for the operation and maintenance of the facilities improved by the Project, including periodical maintenance work after the completion of the project.

5-5. Environmental and Social Consideration

Both sides agreed the necessity of monitoring environmental affect so that possible negative impact would be mitigated. The basic idea for monitoring is as Annex III. However this will be further refined by the Tajik side and contractor at the early stage of the Project.

5-6. Language

Both sides confirmed that the English text shall prevail when any doubt arises in interpretation of this Minutes of Discussions.

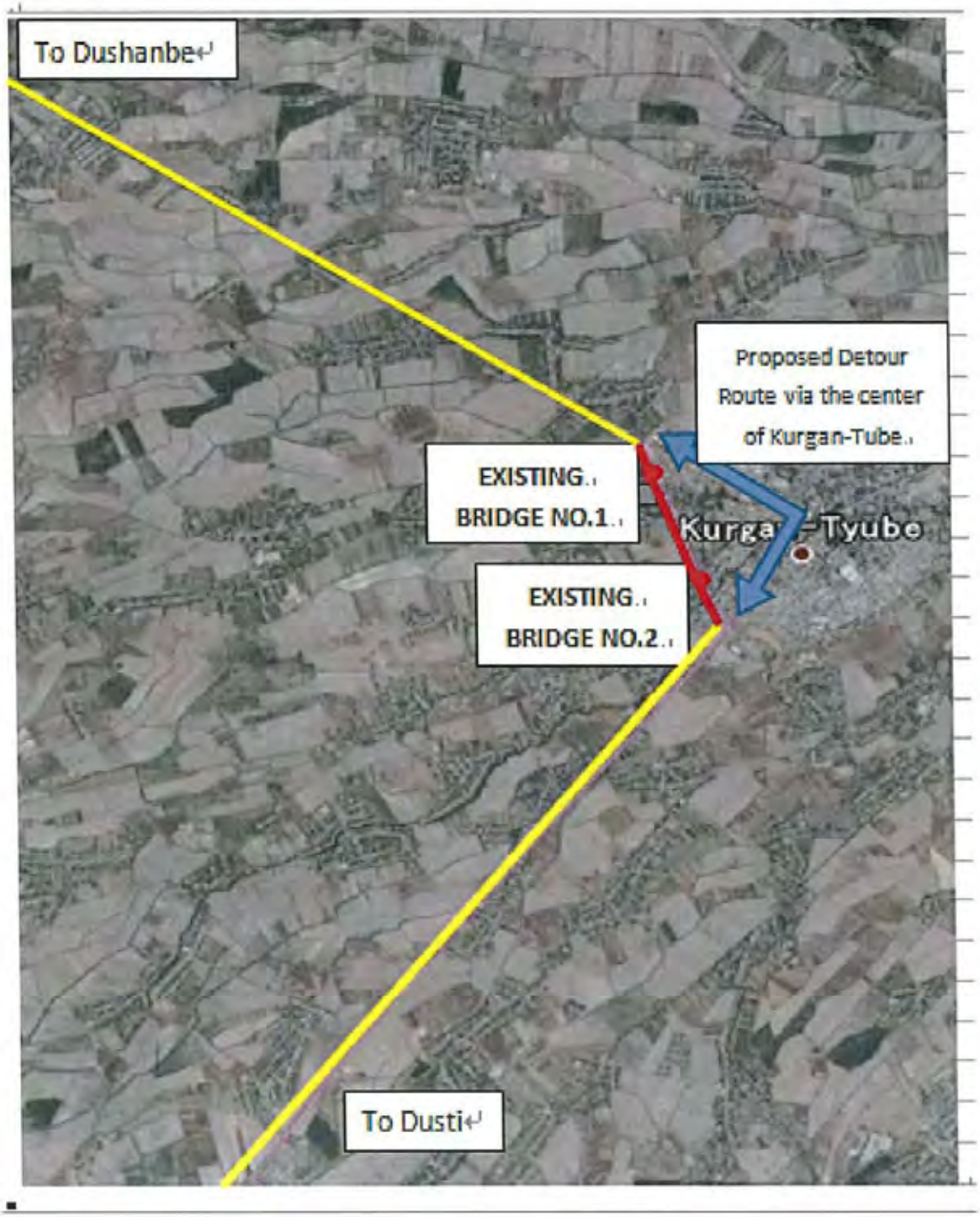
Annex I	Project Cost Estimation
Annex II	Traffic Diversion Route in Kurgan Tyube
Annex III	Environmental Monitoring (Provisional)

End

Annex-1 Project Cost Estimation

「タ」国政府と工事業者の工事契約締結まで非公表とする。

Annex II. Traffic Diversion Route in Kurgan Tyube



資料4-15

Annex III.

Environmental Monitoring (Provisional)

Impact Items	Sections or Places	Impact Activities	Mitigation Measures	Timing of Monitoring
Air Quality Dust	At least 2 places in Urbanized area in Kurgan Tyube	Road construction No.2 Bridge construction No.1 Bridge repair	Periodic sprinkling by hand or by water tanker (cart).	Visual check and photos taken at the fixed position and angle Base line: Before commencement of the works During Construction: Once a month After open to the public: At the time of completion
Water Quality pH	Juibor river under Bridge site No.2	No.2 Construction of Bridge Abutment construction	Apply water tight cofferdam such as steel sheet pile cofferdam	Measurement by pH meter Base line: Before commencement of the works During Construction: Once a month After open to the public: At the time of completion
Noise dB(A)	At least 2 places in Urbanized area in Kurgan Tyube	Road construction No.2 Bridge construction No.1 Bridge repair	On Sunday or early in the morning, try to make best efforts not to carry out works which causes considerable noise	Measurement by Noise meter Base line: Before commencement of the works During Construction: Once a month After open to the public: At the time of completion

資料4-16

資料 5－参考資料/入手資料リスト

資料の言語は特に注記のない限りロシア語である。

日本語	ロシア語	英語	媒体・備考
アジアハイウェイ政府間協定書（英文）		Intergovernmental Agreement on the Asian Highway Network	冊子
タジキスタン共和国 2015 年までの国家開発戦略（英文訳）		National Development Strategy of the Republic of Tajikistan for the period to 2015	冊子
国家投資・グラント・技術協力プログラム、2008 年 - 2010 年	Программа государственных инвестиций, грантов и технической помощи на 2008 – 2010 годы		冊子
道路分野における外国からの援助（英文）		Foreign aid for road transport	電子データ
運輸通信省 (Ministry of Transport and Communication, MOTC) 組織図※	Организационная структура МТК		紙コピー
ドゥシャンベークルガンチュベークリヤブ間道路改修工事の情報			紙コピー
建設鑑定書	Экспертное заключение №	No. GE-375 of 2008 年 6 月 20 日	紙コピー
建設企画コンサルタント作成の Gosstroy からのコメントに対する回答書（英文）		Submission of the answer to the comment of design examination from GOSSTROY for the basic design of Kurgan Tyube- Dusti Road Rehabilitation Project	紙コピー
Gosstroy からのコメント		No. GE-154 of 2008 年 2 月 27 日	
タジキスタン共和国の既存および今後の自動車道（英文訳）		Scheme of Existing and Perspective Roads of the Republic of Tajikistan	紙コピー

※2011 年 4 月 1 日付けで政府の組織改正により運輸省(Ministry of Transport, MOT)となった。

資料 6-　図面集

図面リスト

図面番号	図面内容	図面枚数
CS-01,07,14,21,27,34, 41,47,54,61,67,74,81, 87,94,101,107,114,119	横断図※ STA. 42+000 から STA 59+000 及び STA 59+875	19 枚
BR1-01	橋梁 No.1 (補修)	1 枚
BR2-01～14	橋梁 No.2 (鋼橋)	14 枚
BR3-01～04	橋梁 No.3 (RC ポータルラーメン橋)	4 枚
BR4-01～04	橋梁 No.4 (RC ポータルラーメン橋)	4 枚
BR5-01～04	橋梁 No.5 (RC ポータルラーメン橋)	4 枚
	合計	46 枚

※横断図は 25m 間隔で 120 枚作成したが、代表的な図面と言うことで 1 キロあたり 1 枚を抽出して 19 枚添付した。

資料6-2

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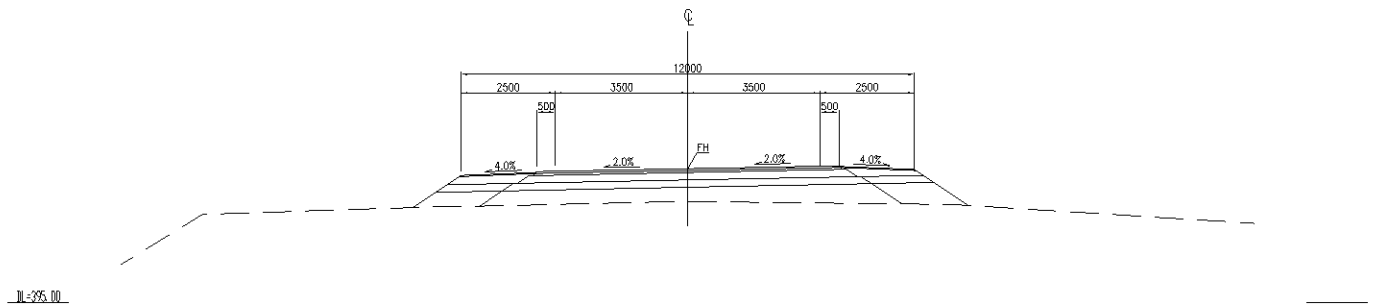

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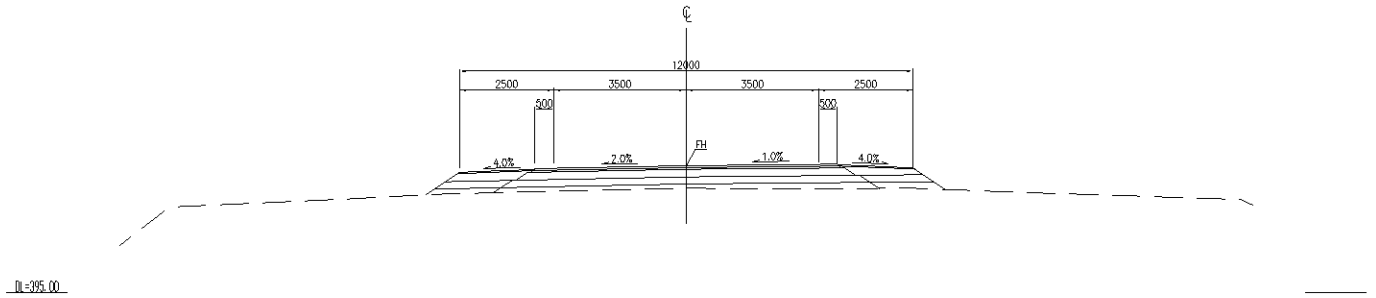

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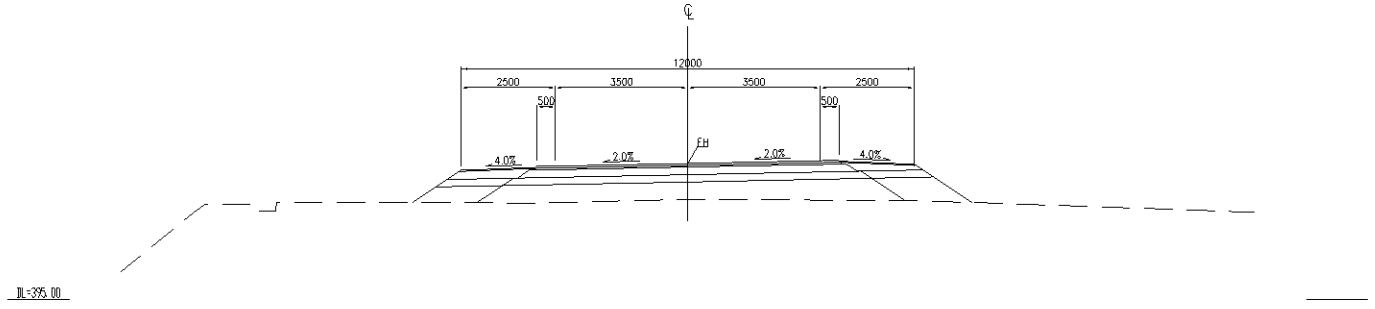

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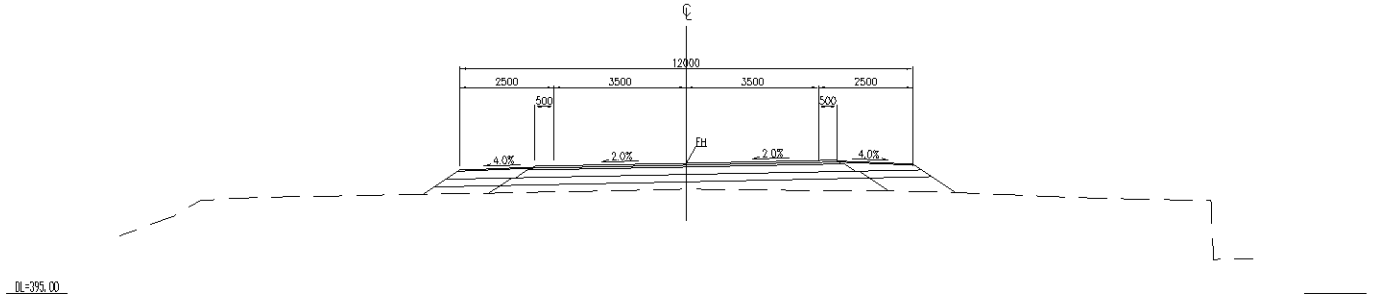

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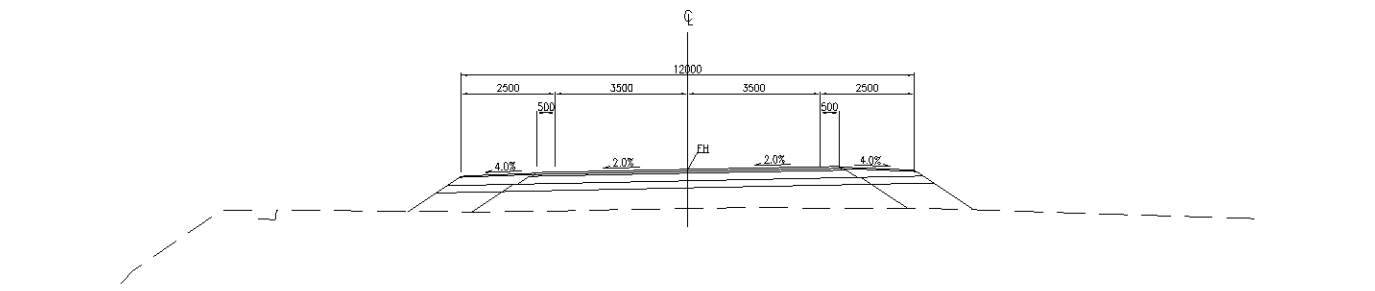

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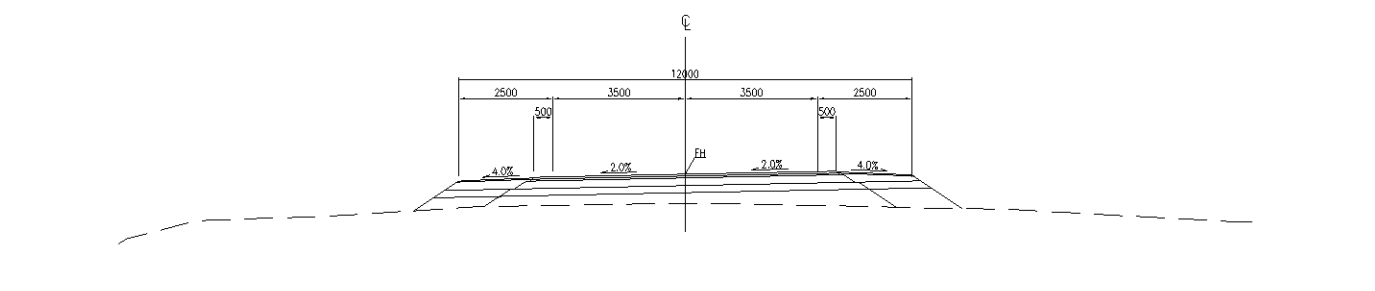

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資料6-3

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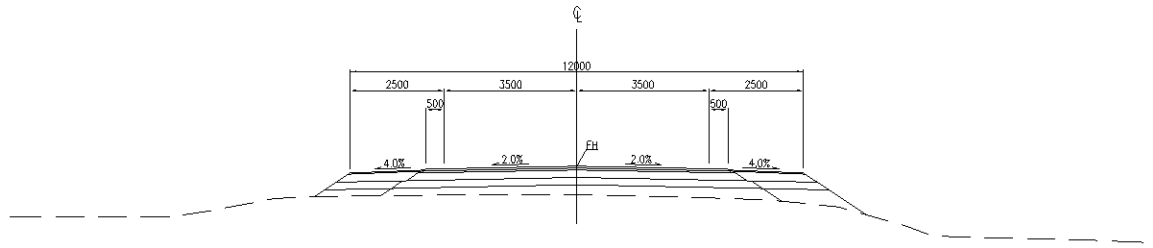

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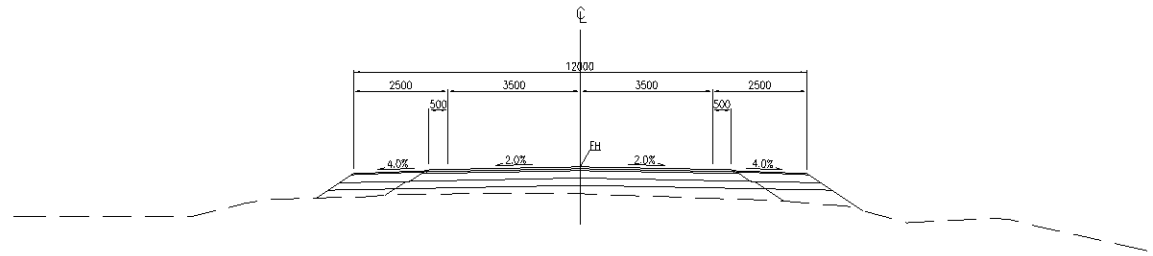

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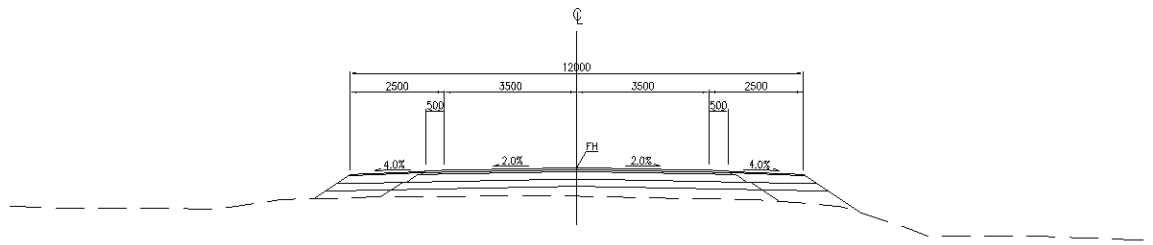

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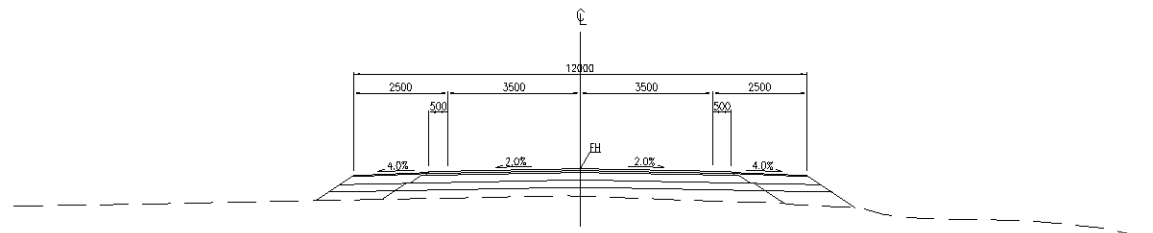

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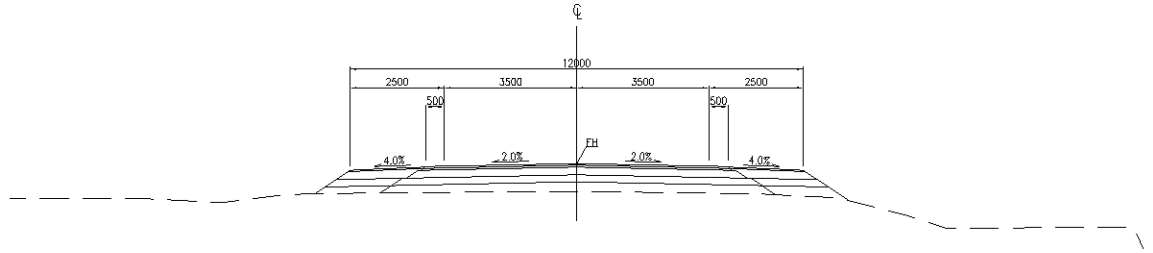

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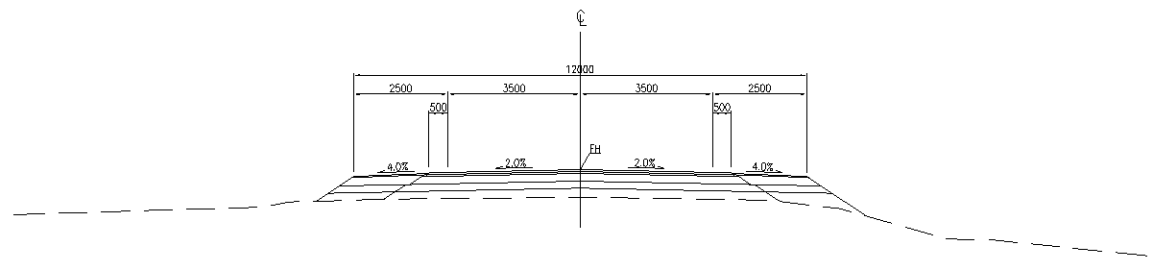

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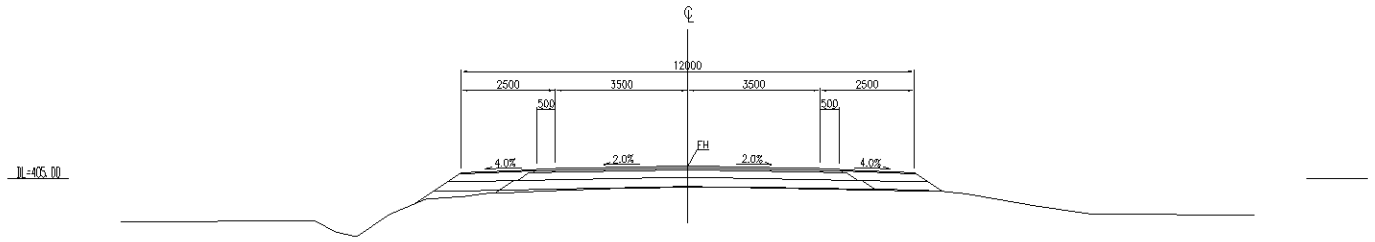

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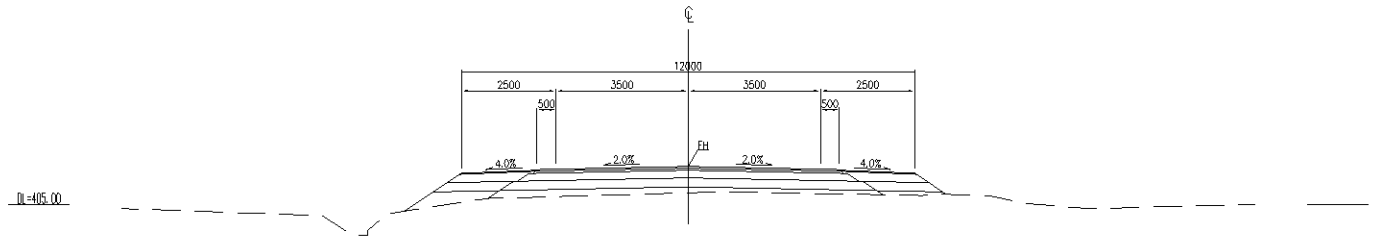

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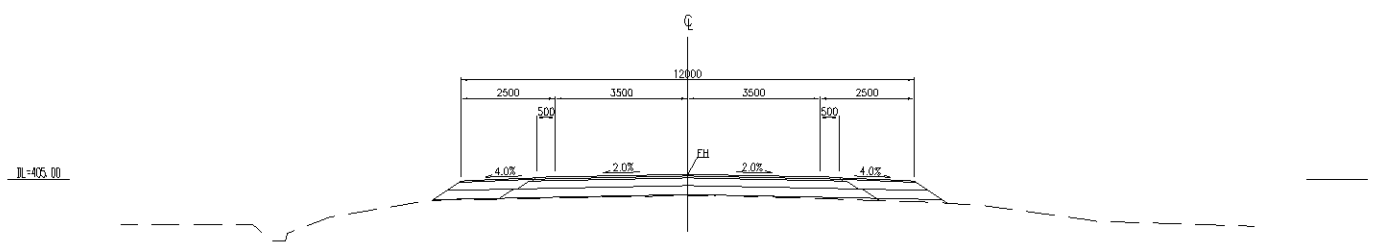

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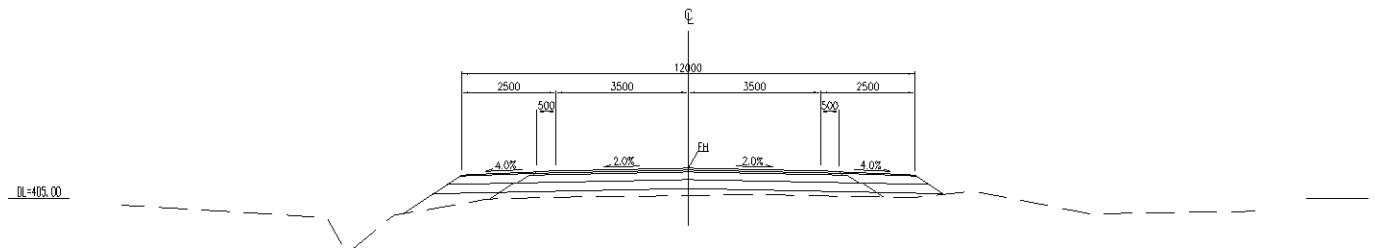

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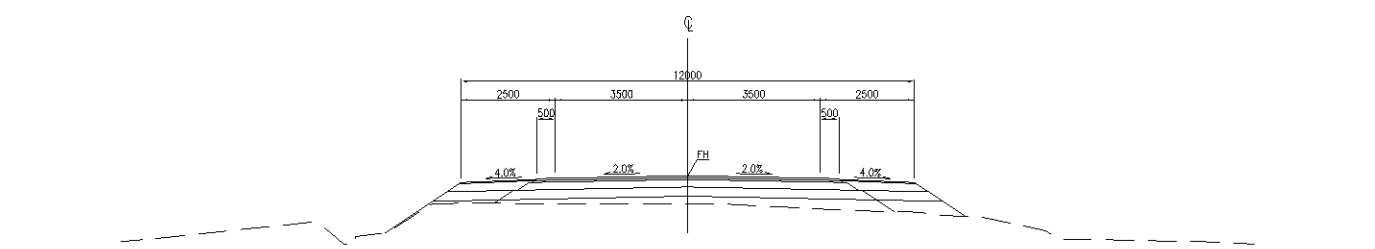

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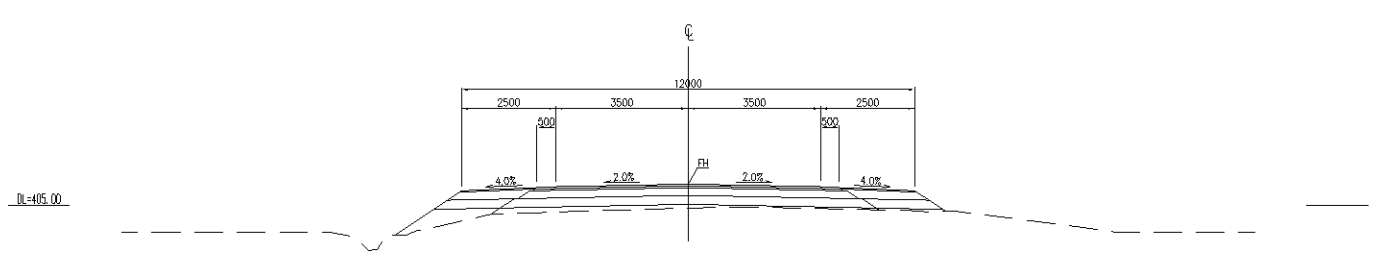

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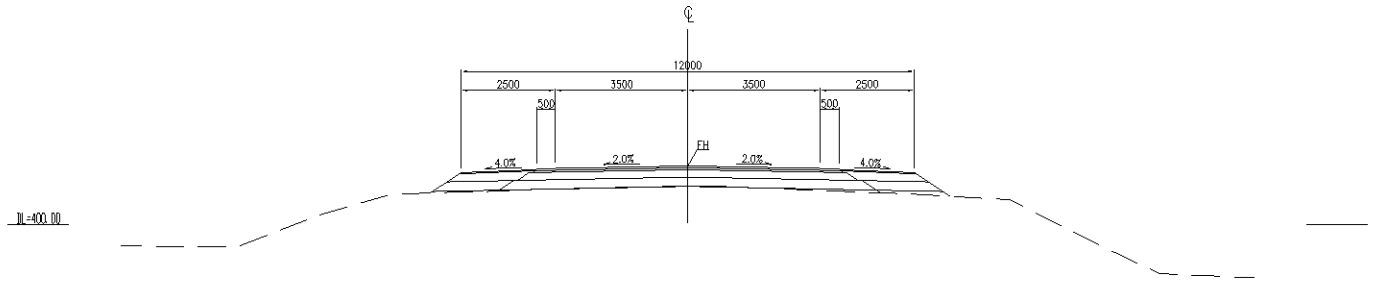

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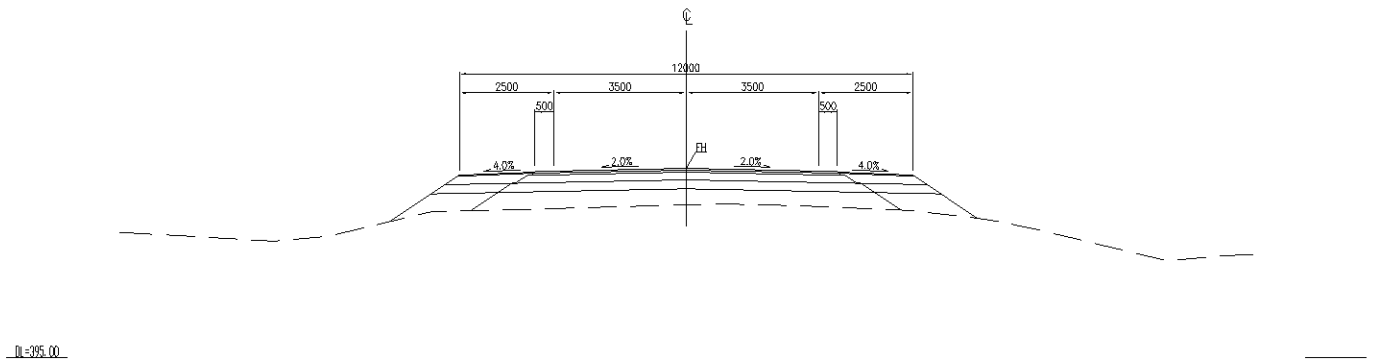

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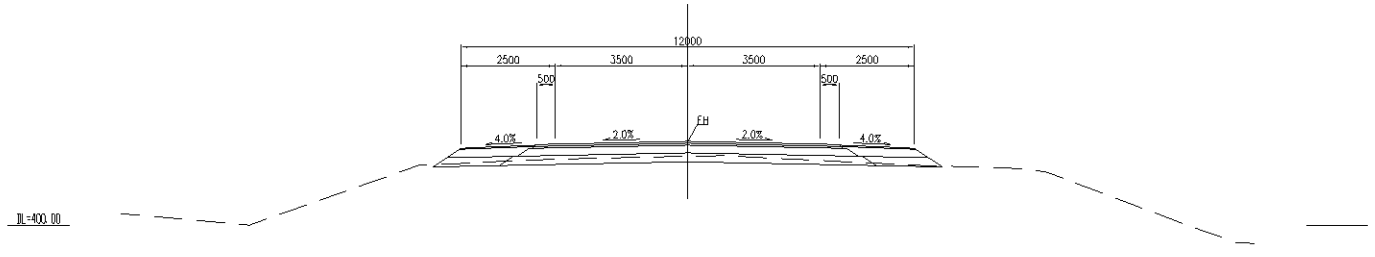

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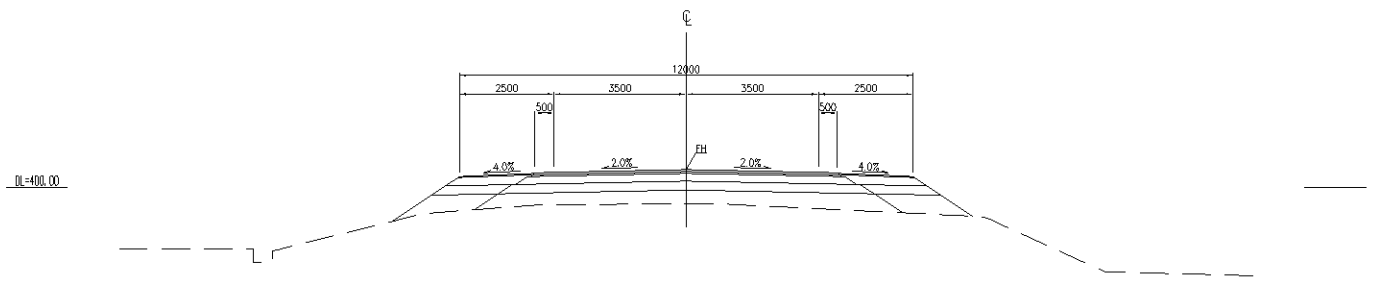

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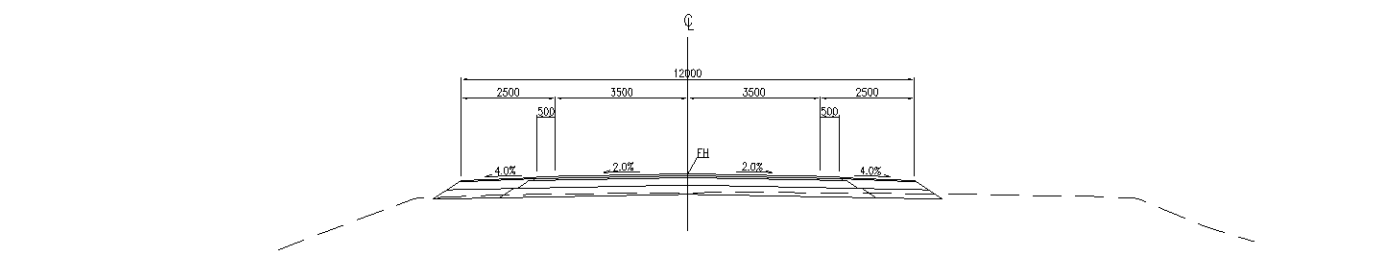

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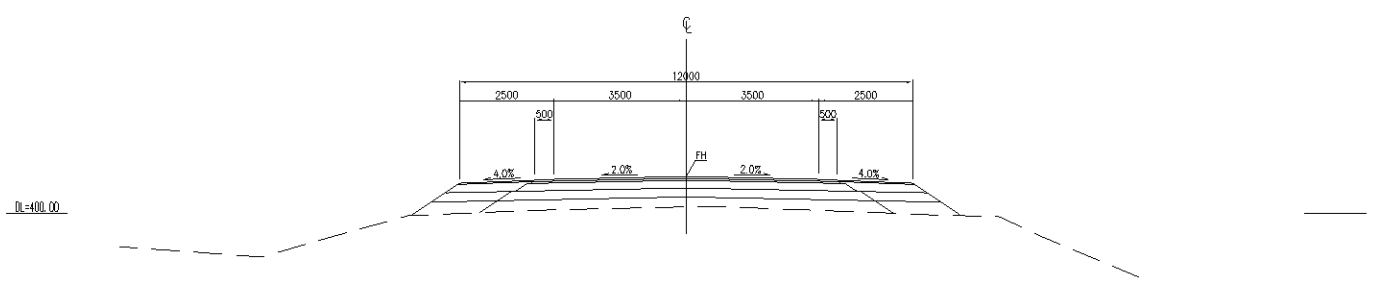
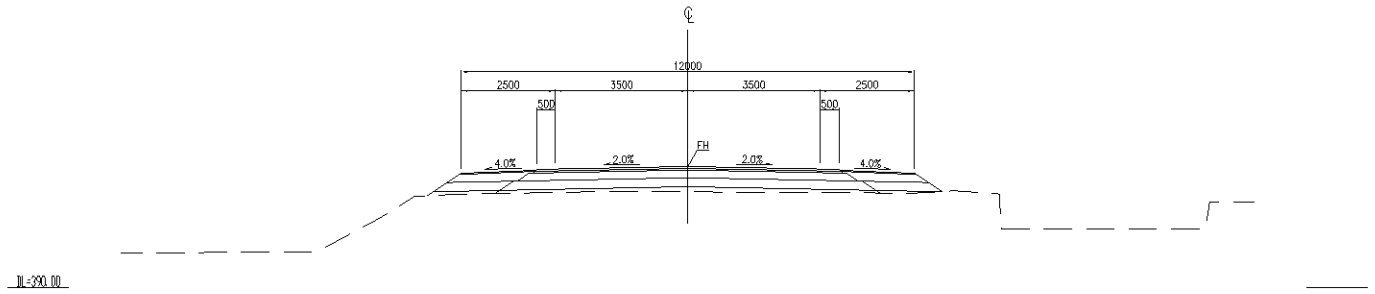
FH=400.981

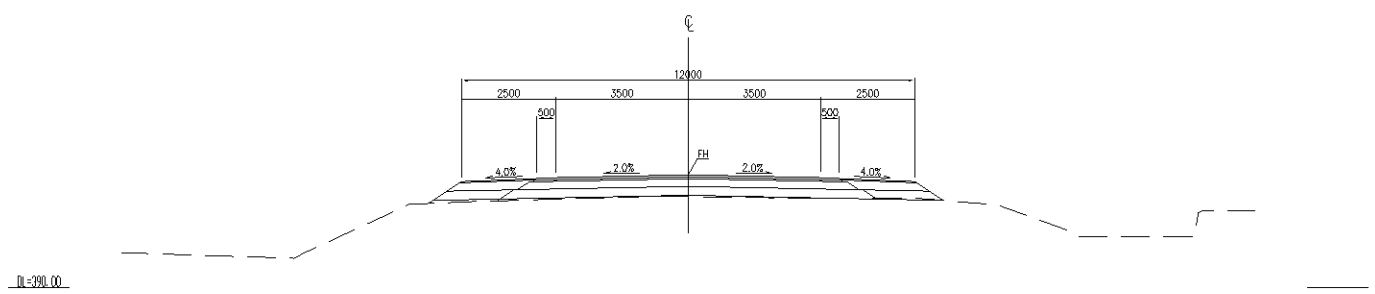


KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : CROSS SECTION (21) 45+000~45+125	SCALE : 1/200	DRAWING No: CS-21 Rv.

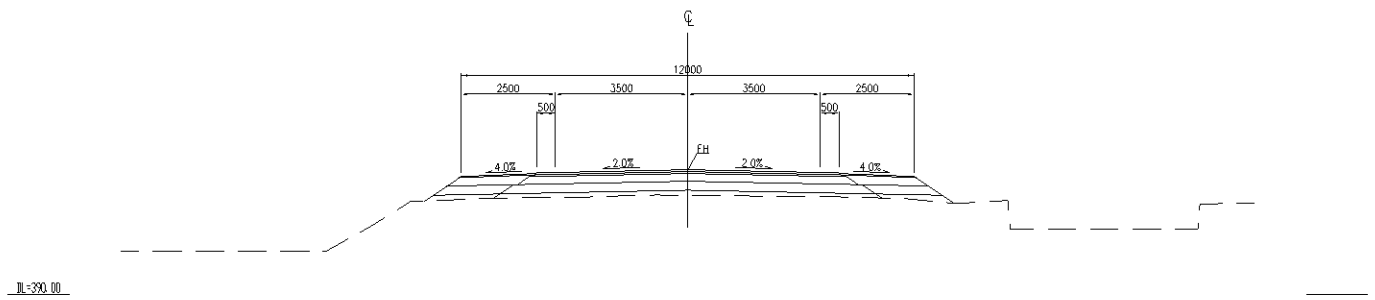
STA. 45+950
FH=393.218



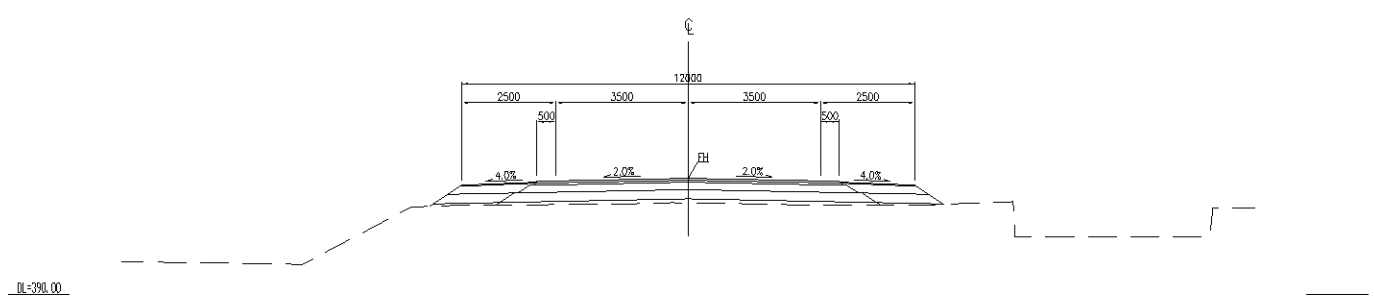
STA. 46+025
FH=392.993



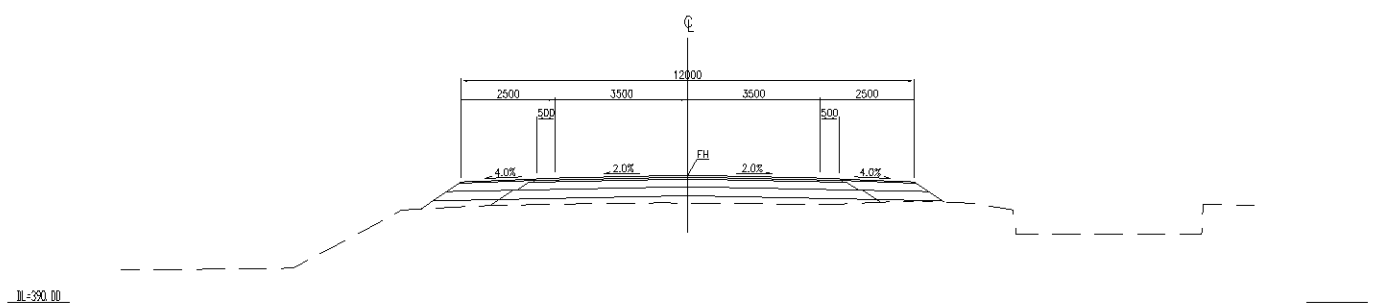
STA. 45+925
FH=393.293



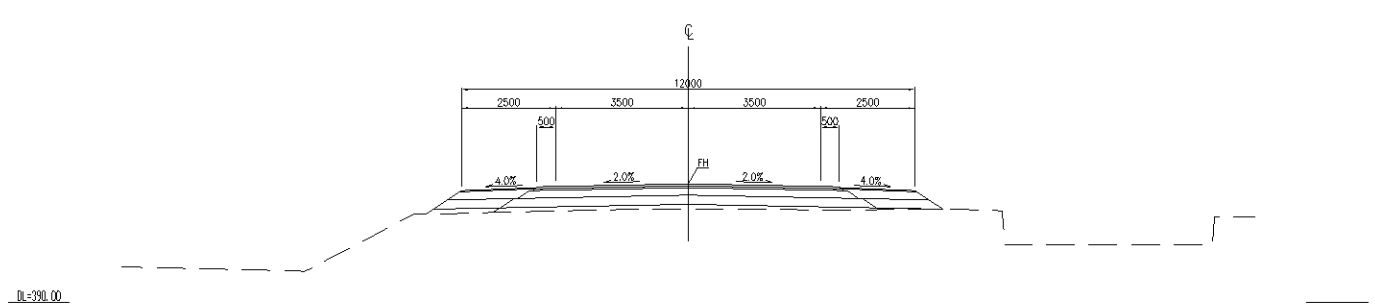
STA. 46+000
FH=393.068



STA. 45+900
FH=393.368



STA. 45+975
FH=393.143



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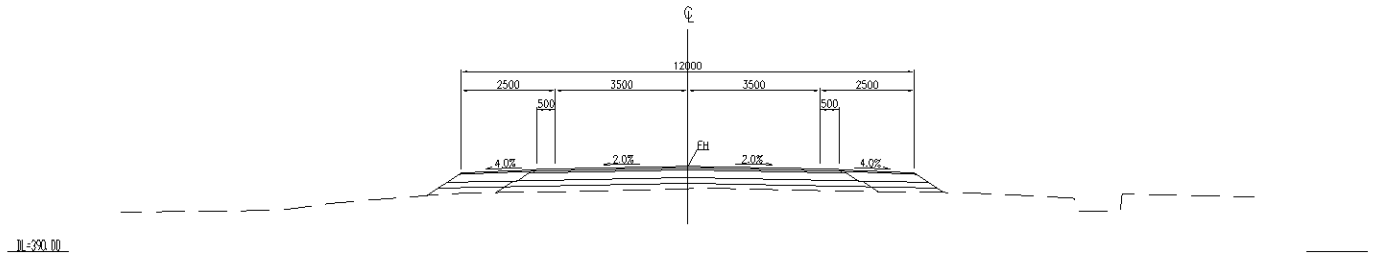
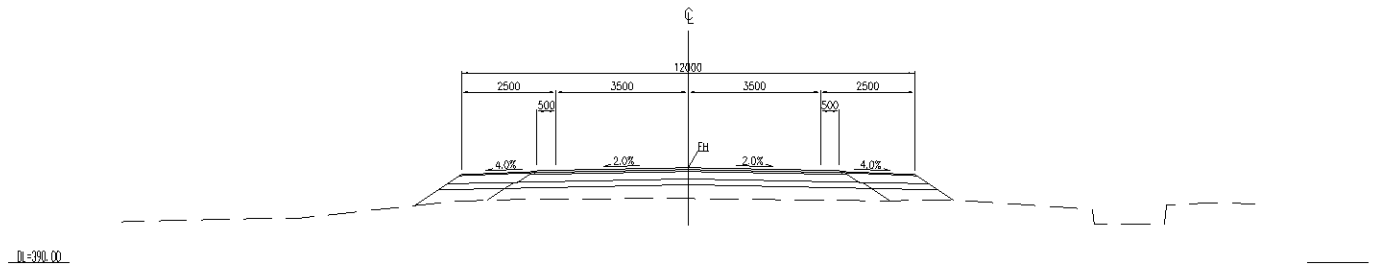
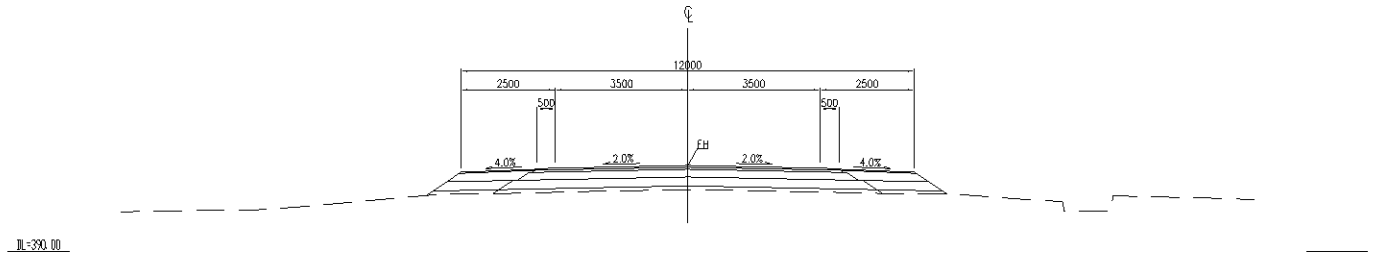
STA. 47+000
FH=392.271



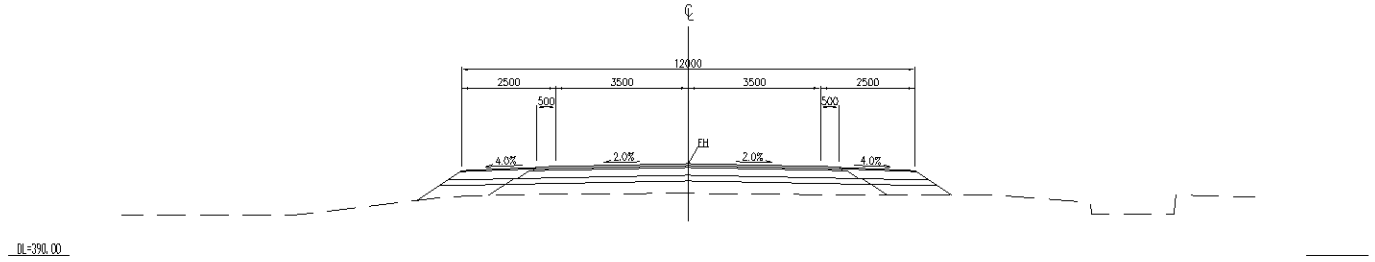
STA. 47+075
FH=392.521



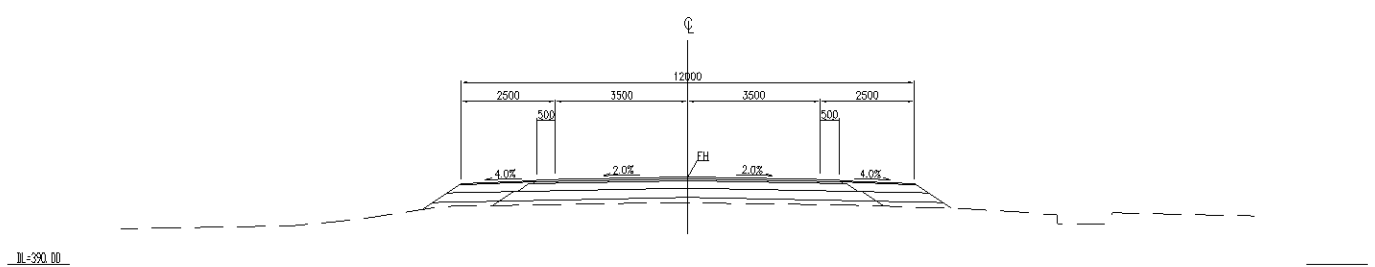
STA. 46+975
FH=392.271



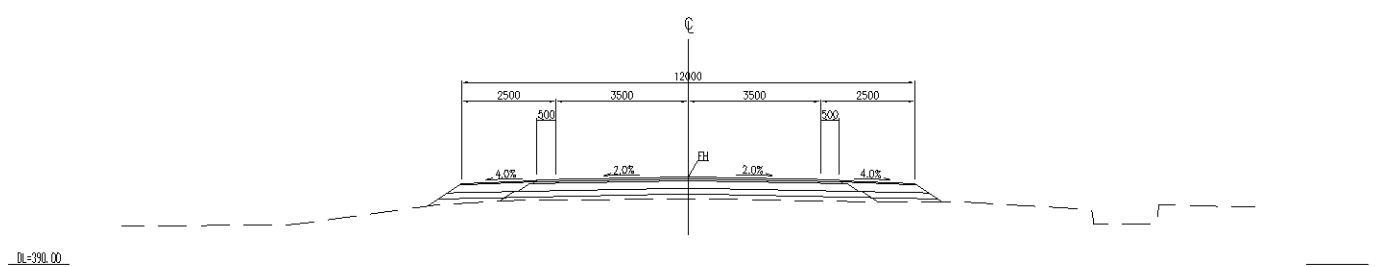
STA. 47+050
FH=392.421



STA. 46+950
FH=392.321



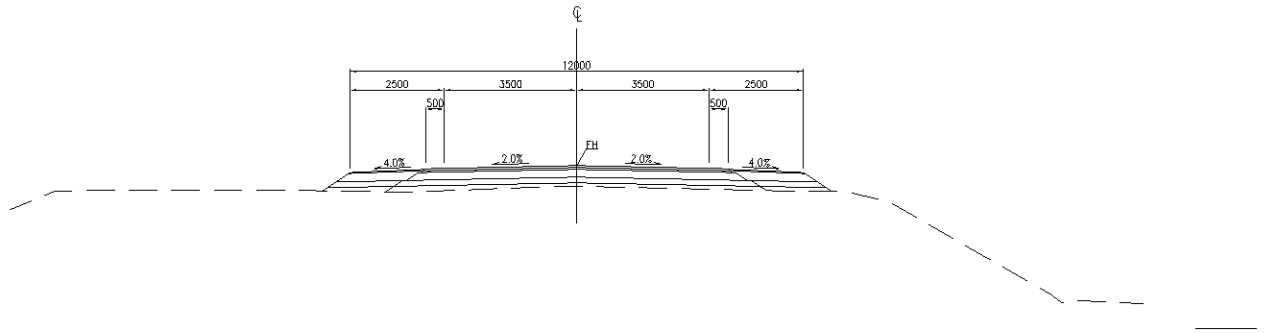
STA. 47+025
FH=392.321



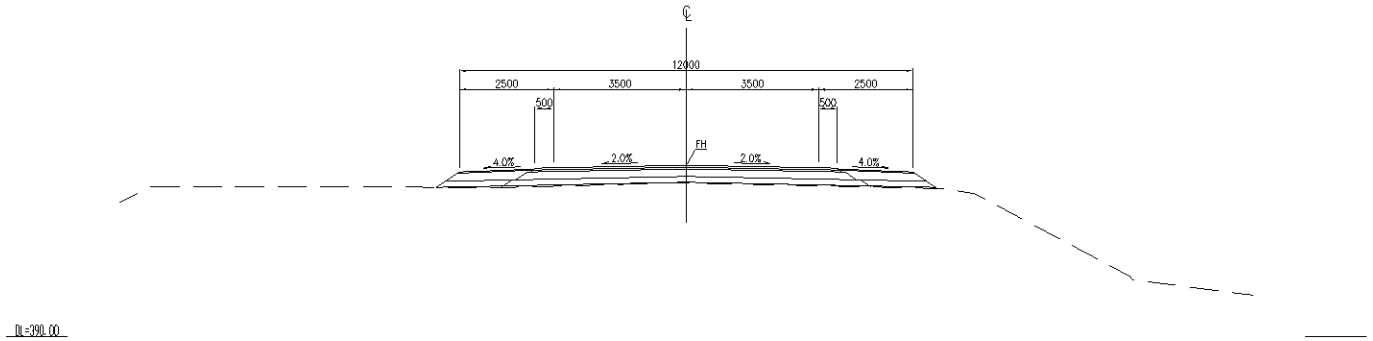
資料6-7

KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : CROSS SECTION (34) 46+950~47+075	SCALE : 1/200	DRAWING No: CS-34	Rv.

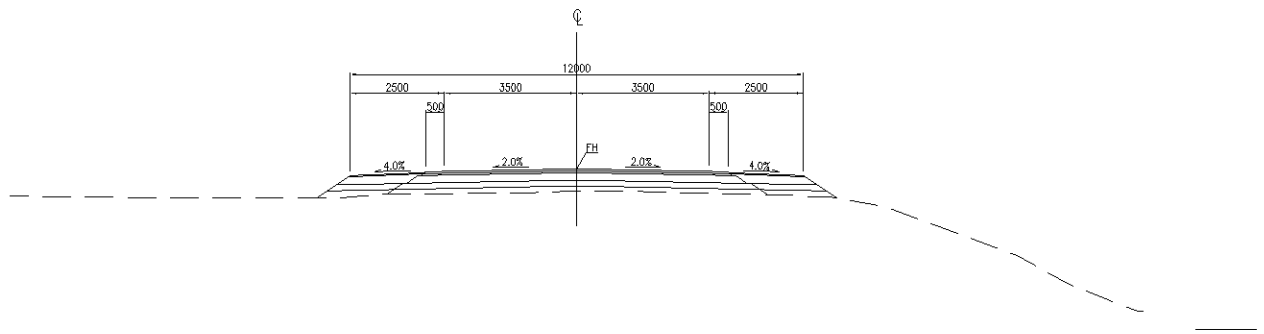
STA. 48+050
FH=394. 321



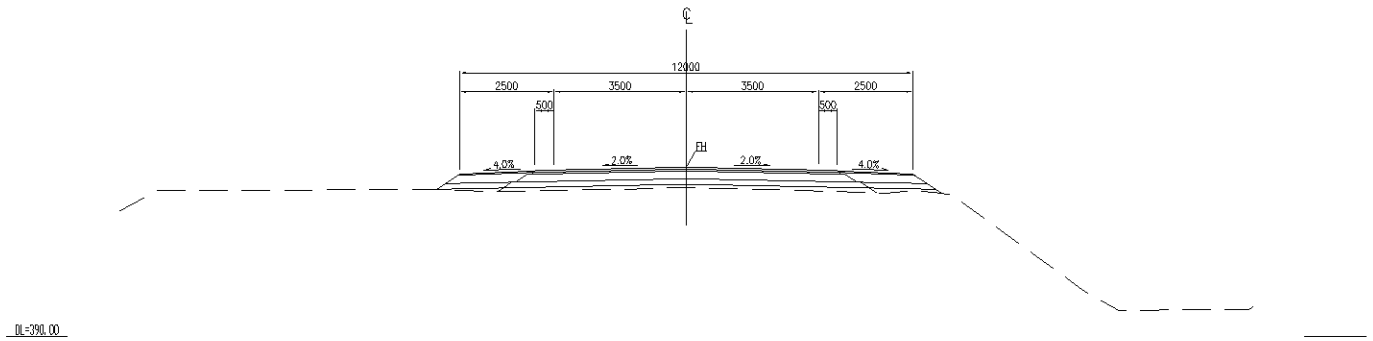
STA. 48+125
FH=394. 546



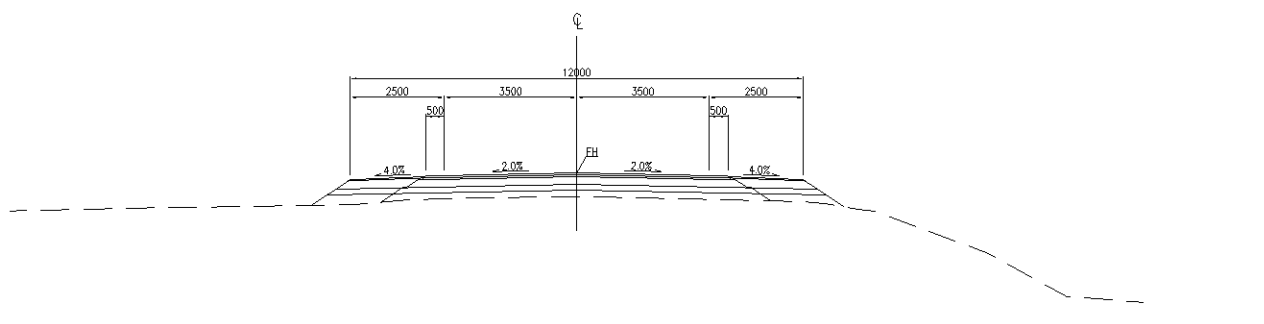
STA. 48+025
FH=394. 246



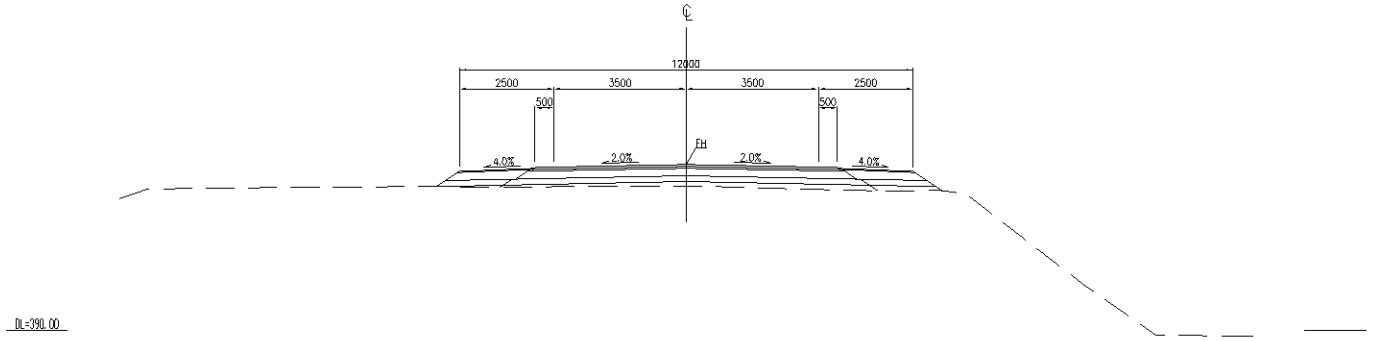
STA. 48+100
FH=394. 471



STA. 48+000
FH=394. 171



STA. 48+075
FH=394. 396



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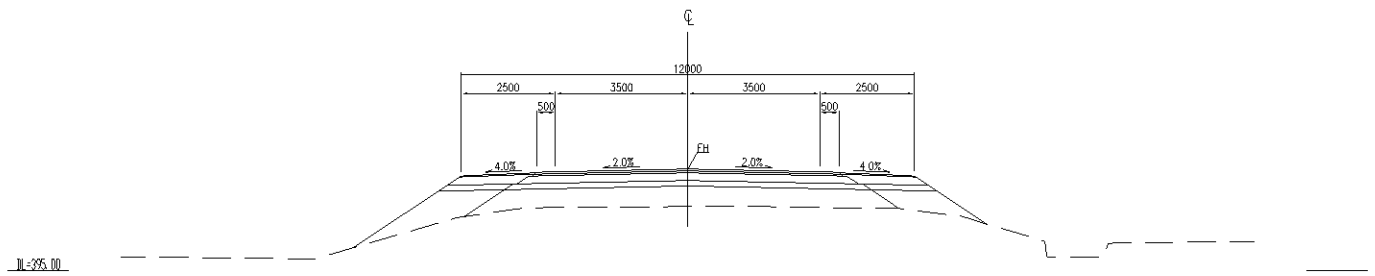
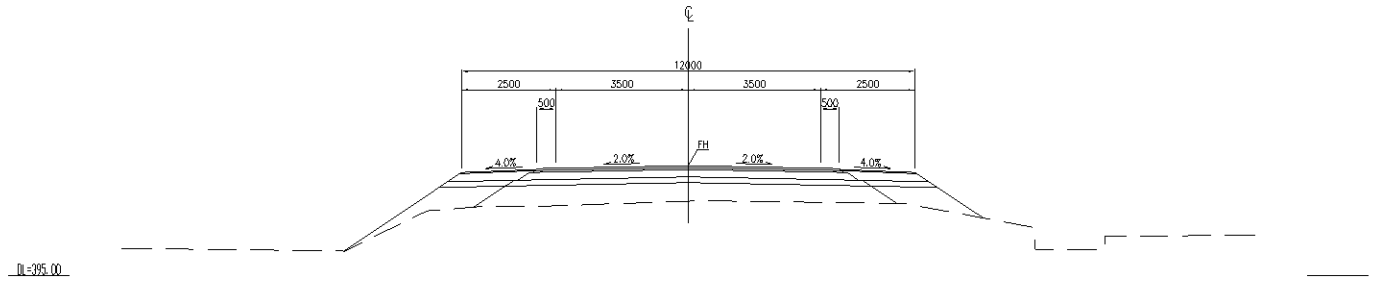
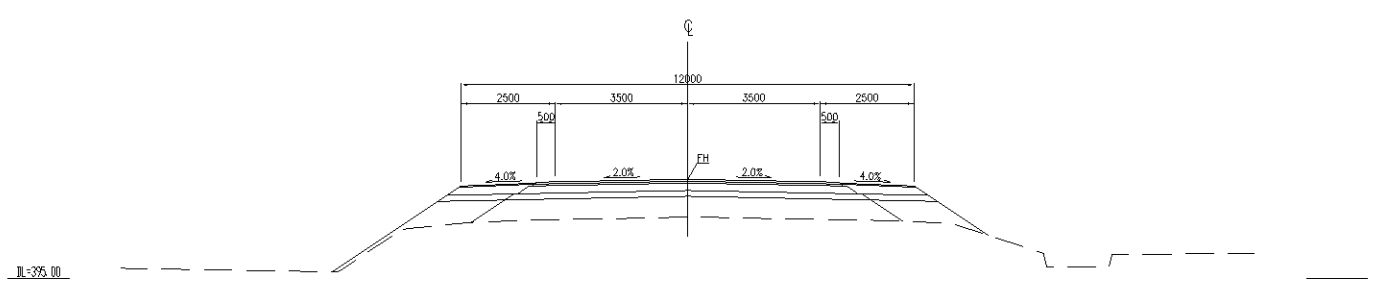
STA. 48+950
FH=397.696



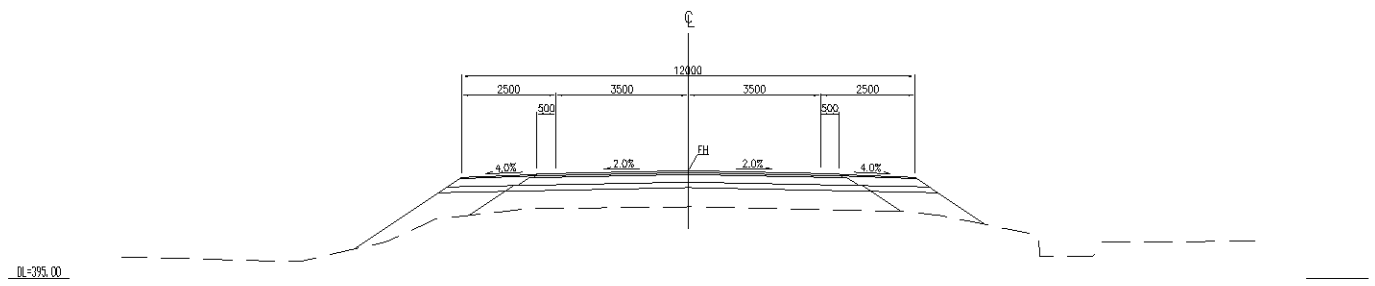
STA. 49+025
FH=397.921



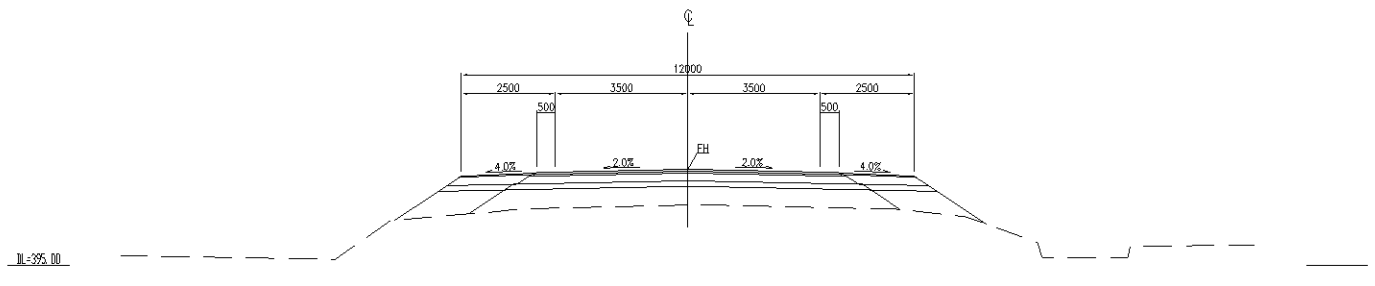
STA. 48+925
FH=397.621



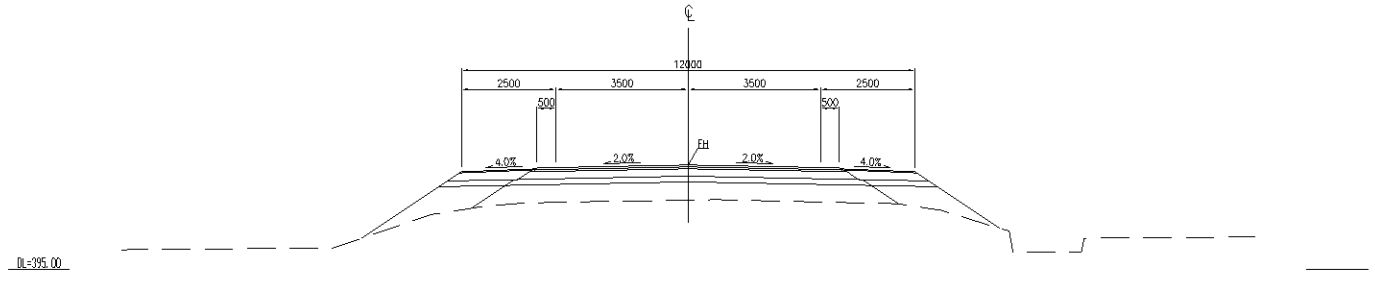
STA. 49+000
FH=397.846



STA. 48+900
FH=397.546



STA. 48+975
FH=397.771



資料6-9

KATAHIRA & ENGINEERS INTERNATIONAL
Designed by : Date :
Checked by : Date :

MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN
Approved by : Date :

THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)

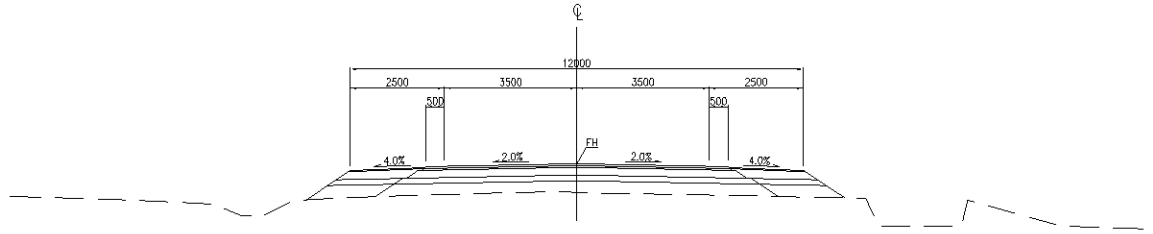
TITLE : CROSS SECTION (47)
48+900~49+025

SCALE : 1/200

DRAWING No: CS-47

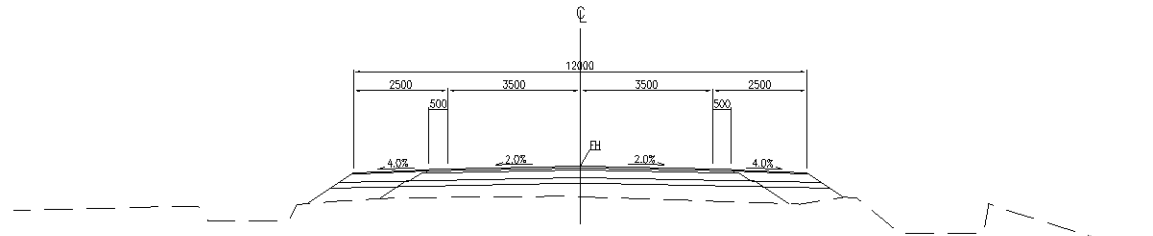
Rv.

STA. 50+000
FH=403. 396



IL=400. 00

STA. 50+075
FH=403. 621



IL=400. 00

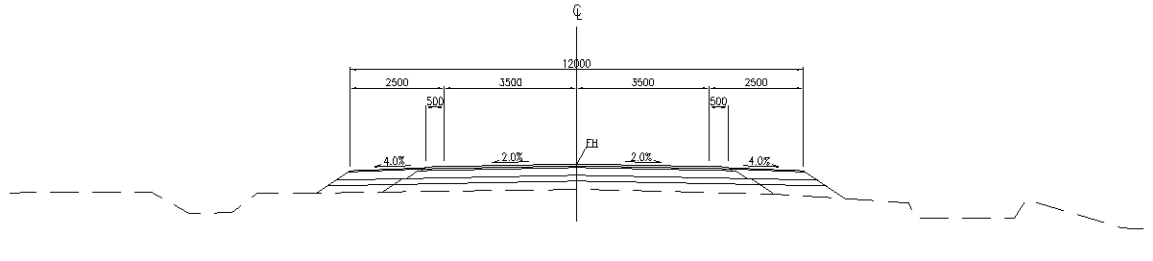
STA. 49+975
FH=403. 321

IL=400. 00

STA. 50+050
FH=403. 546

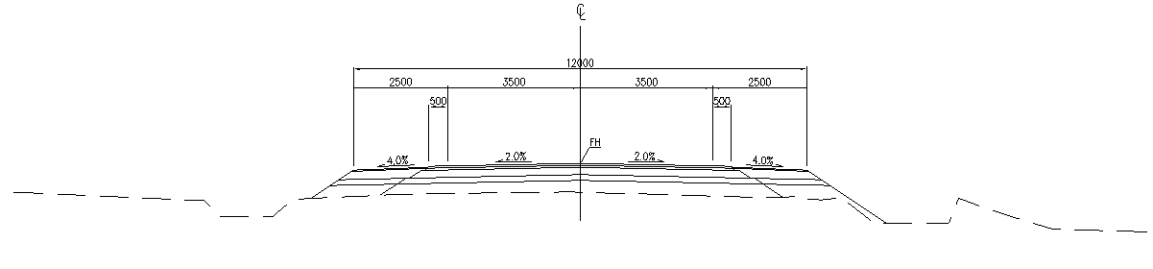
IL=400. 00

STA. 49+950
FH=403. 246



IL=400. 00

STA. 50+025
FH=403. 471

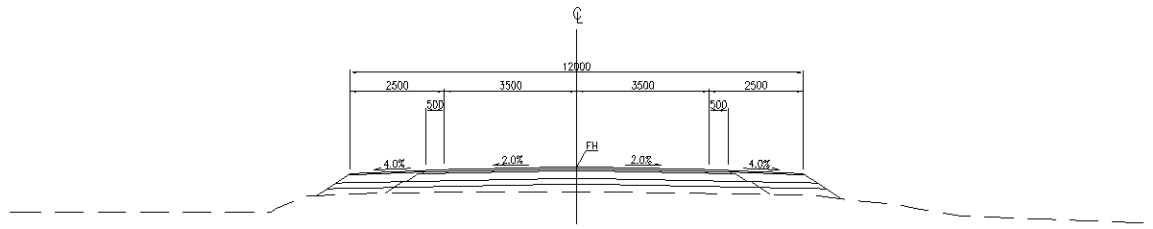


IL=400. 00

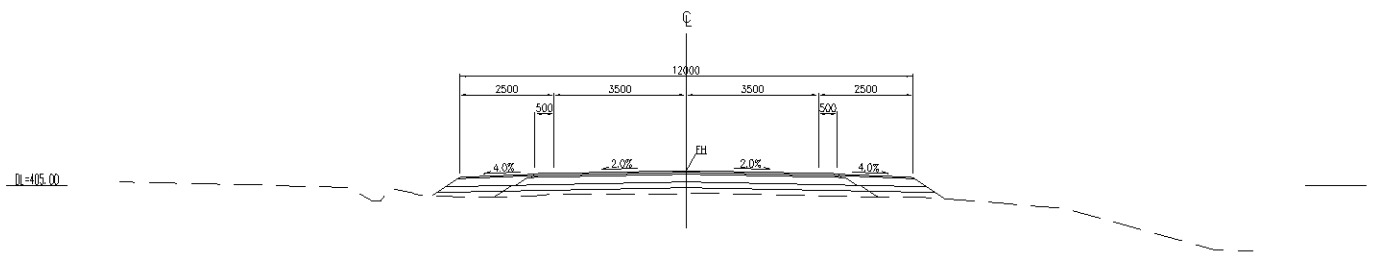
資料6-10

KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : CROSS SECTION (54) 49+950~50+075	SCALE : 1/200	DRAWING No: CS-54 Rv.

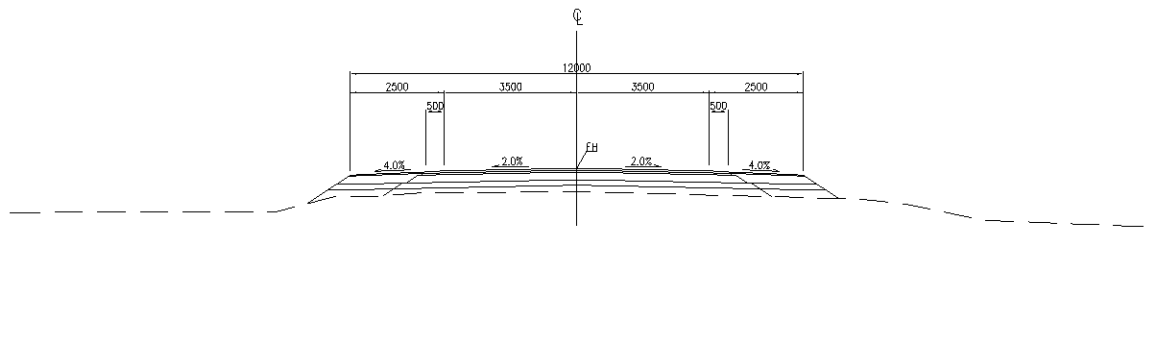
STA. 51+050
FH=404. 846



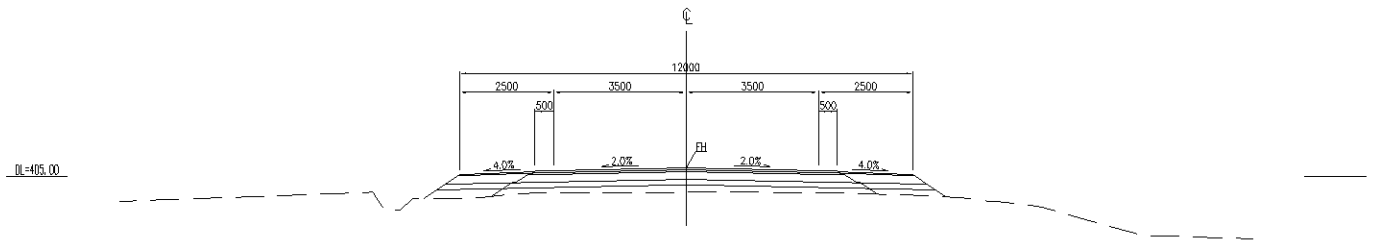
STA. 51+125
FH=405. 408



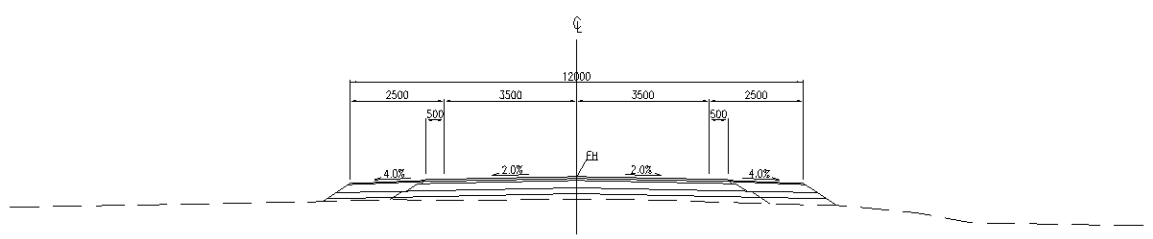
STA. 51+025
FH=404. 658



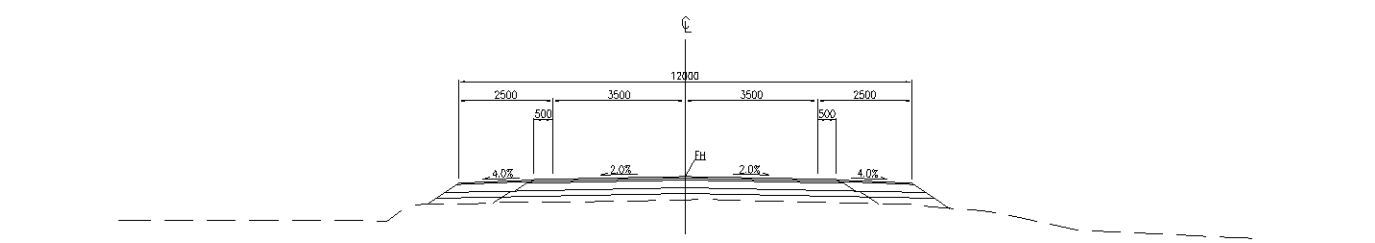
STA. 51+100
FH=405. 221



STA. 51+000
FH=404. 471



STA. 51+075
FH=405. 033



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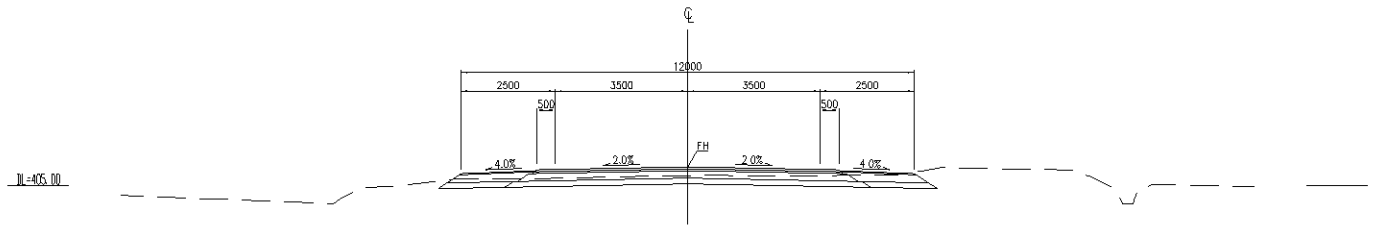
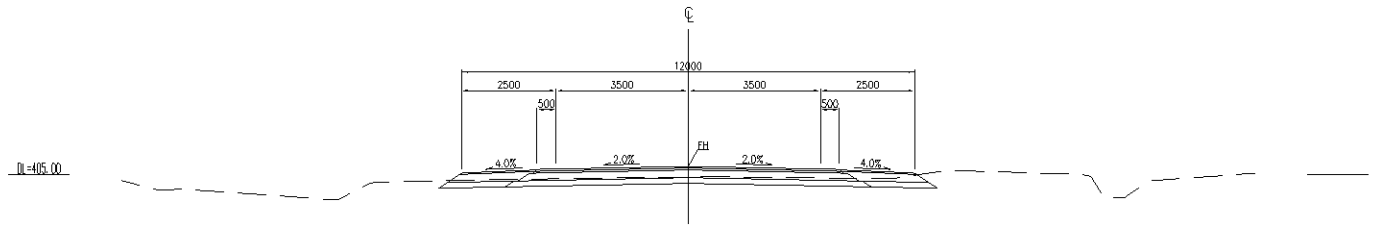
資料6-12

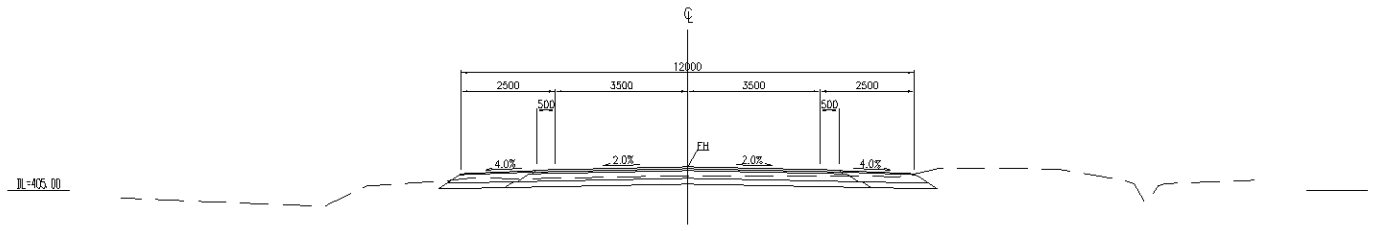
STA. 51+950
FH=405. 508



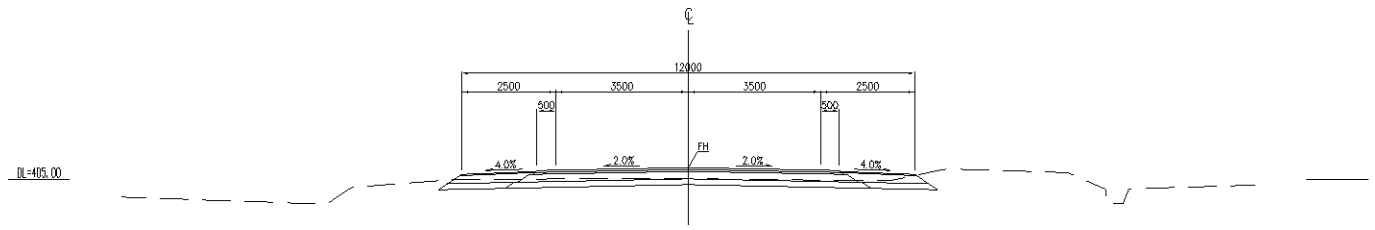
STA. 52+025
FH=405. 230



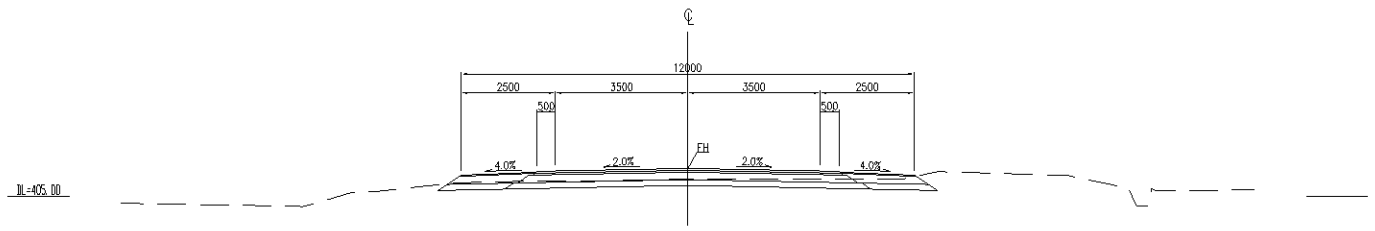
STA. 51+925
FH=405. 617



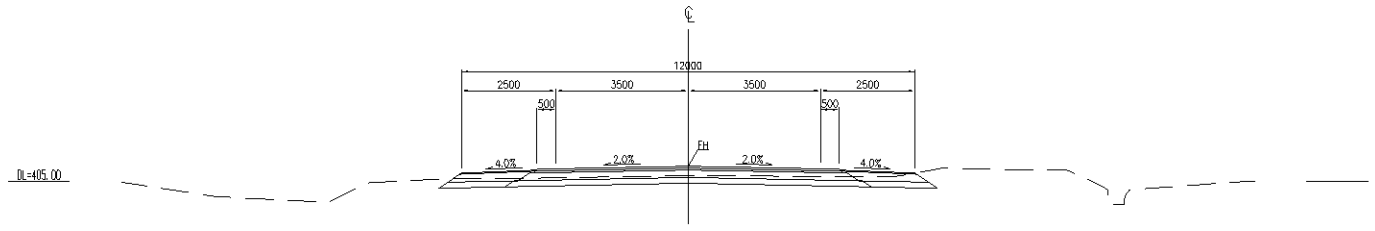
STA. 52+000
FH=405. 308



STA. 51+900
FH=405. 746



STA. 51+975
FH=405. 408



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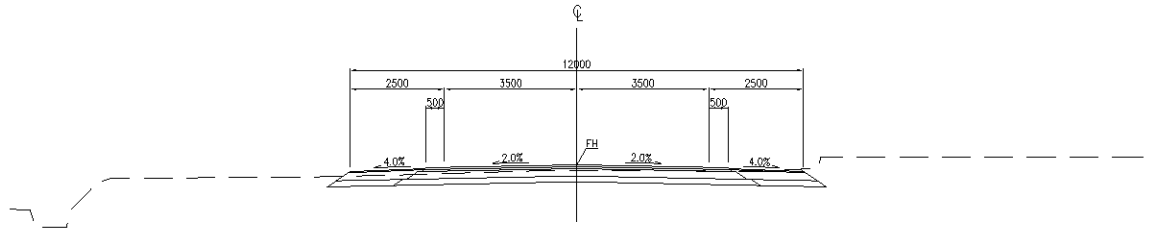
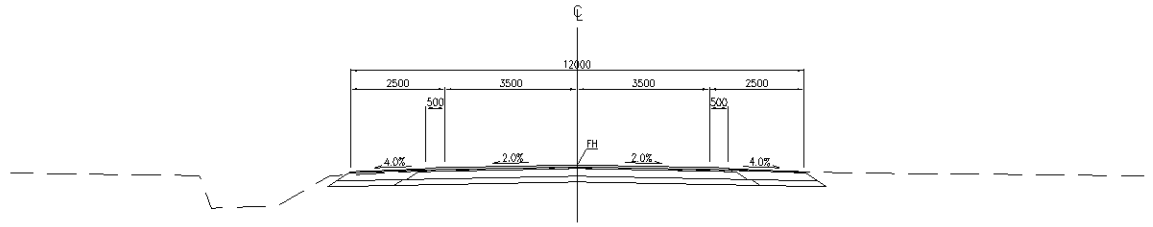
資料6-13

STA. 53+000
FH=409. 691



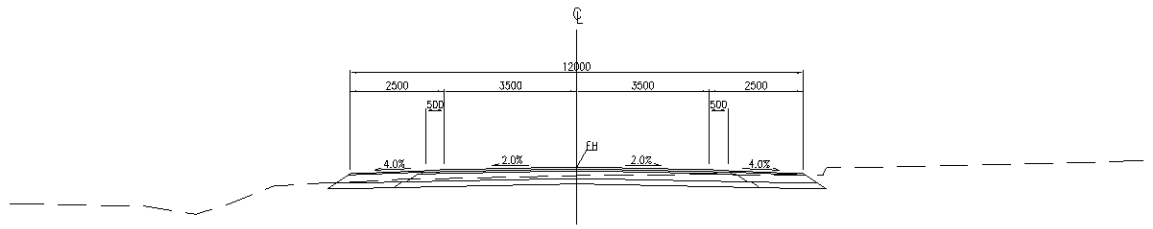
IL=405. 00

STA. 53+075
FH=410. 005



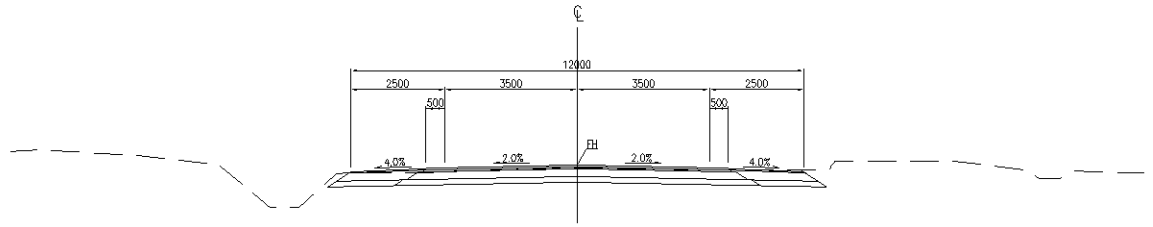
IL=405. 00

STA. 52+975
FH=409. 506



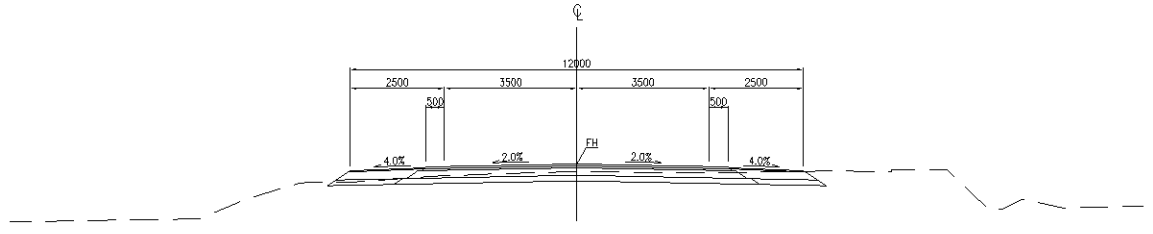
IL=405. 00

STA. 53+050
FH=409. 928



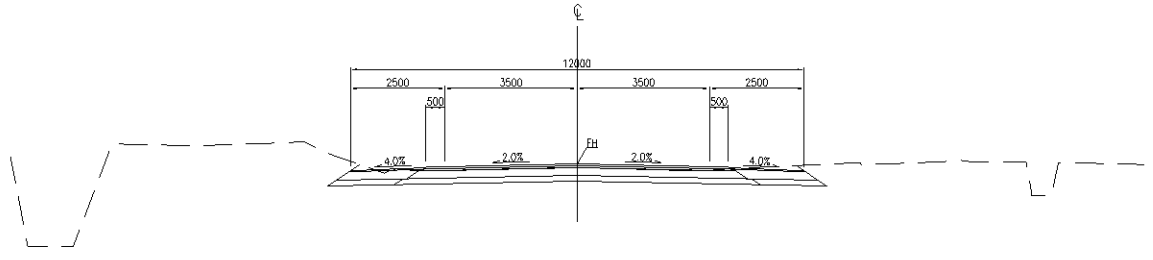
IL=405. 00

STA. 52+950
FH=409. 278



IL=405. 00

STA. 53+025
FH=409. 831



IL=405. 00

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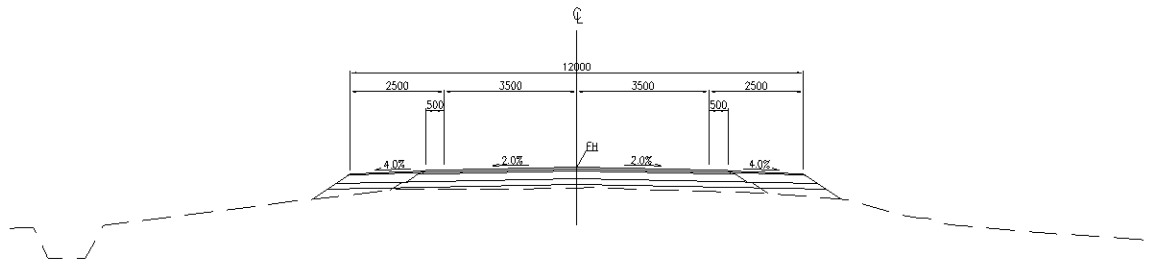
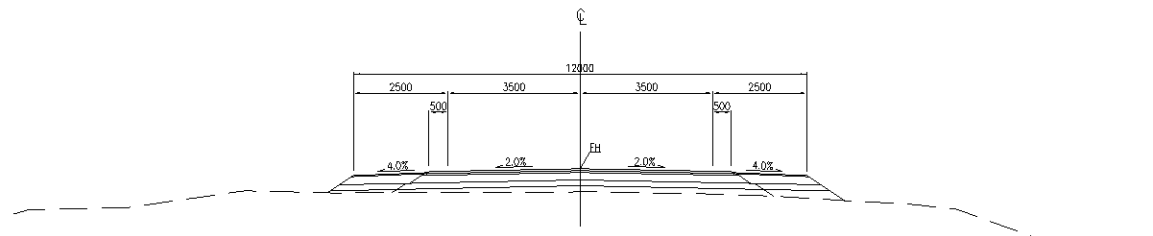
STA. 54+050
FH=409. 253



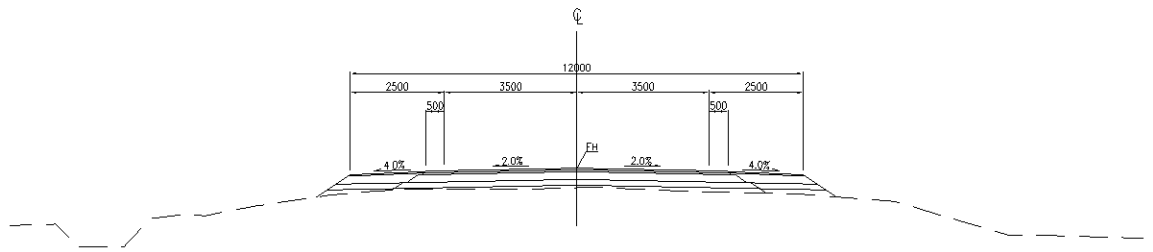
IL=405. 00

STA. 54+125
FH=409. 428



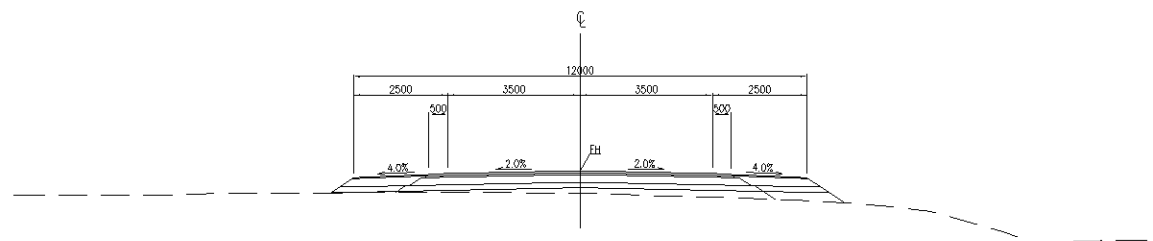
IL=405. 00

STA. 54+025
FH=409. 241



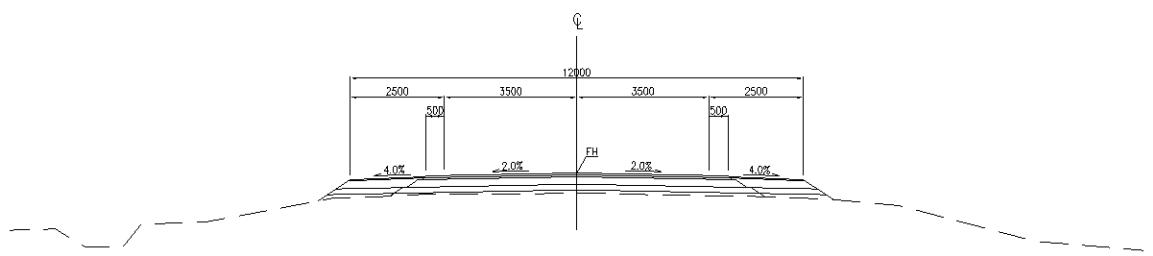
IL=405. 00

STA. 54+100
FH=409. 353



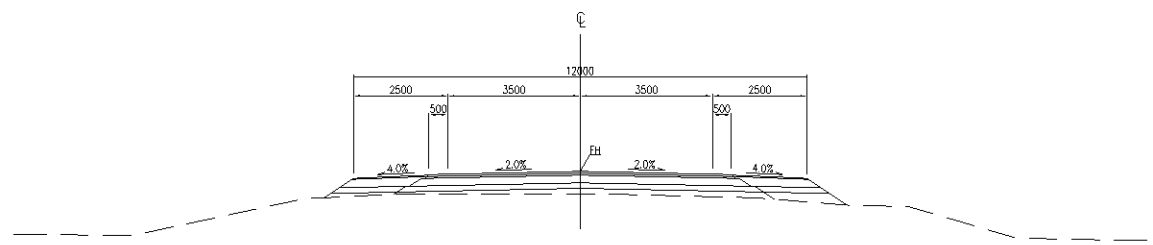
IL=405. 00

STA. 54+000
FH=409. 253



IL=405. 00

STA. 54+075
FH=409. 291



IL=405. 00

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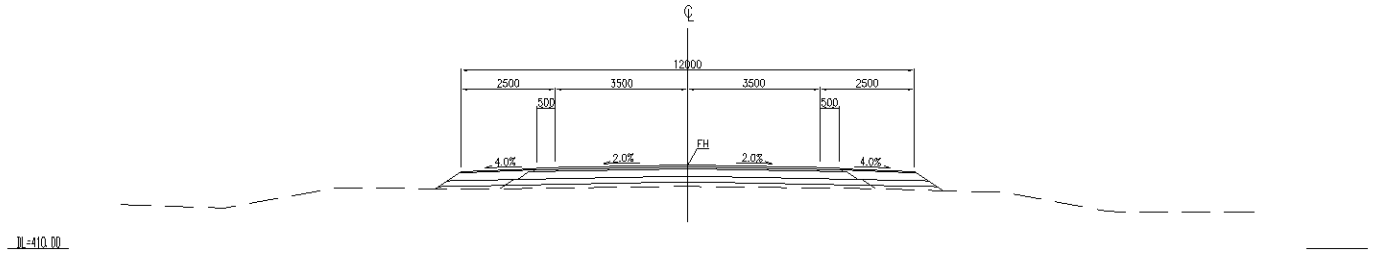
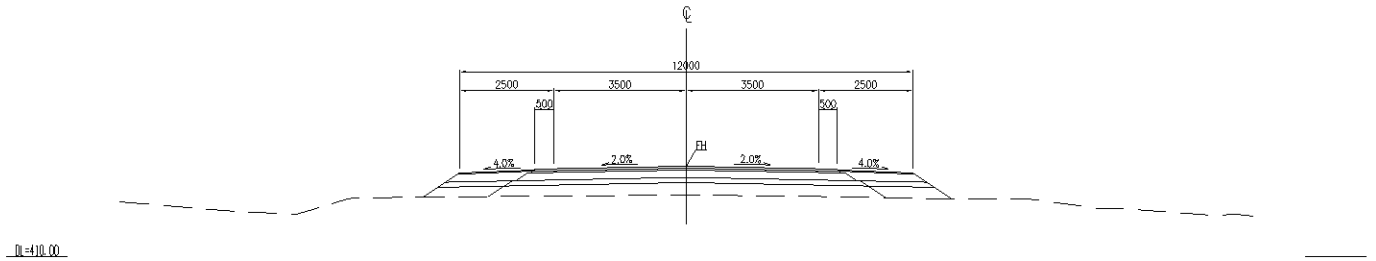
資料6-15

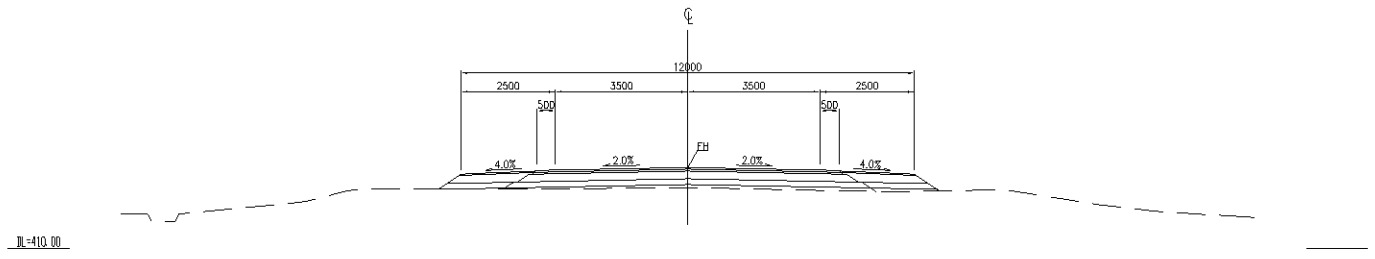
STA. 54+950
FH=412. 227



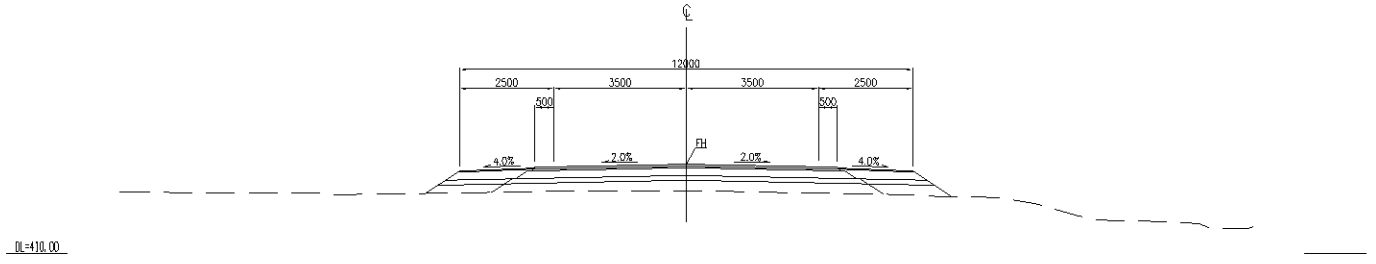
STA. 55+025
FH=412. 404



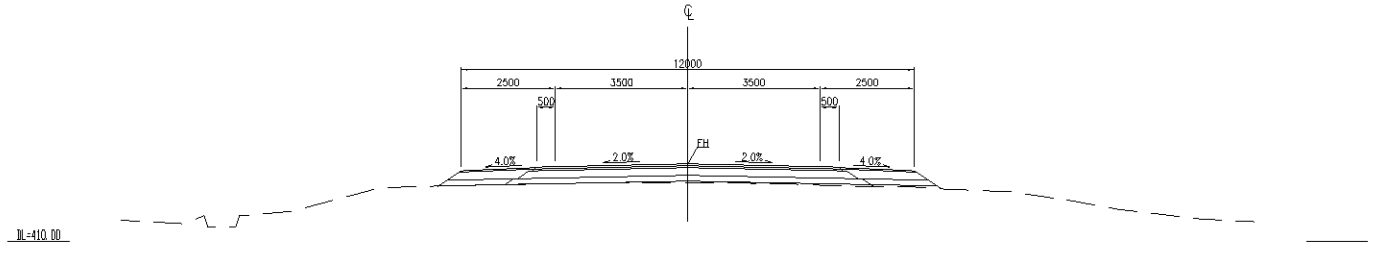
STA. 54+925
FH=412. 141



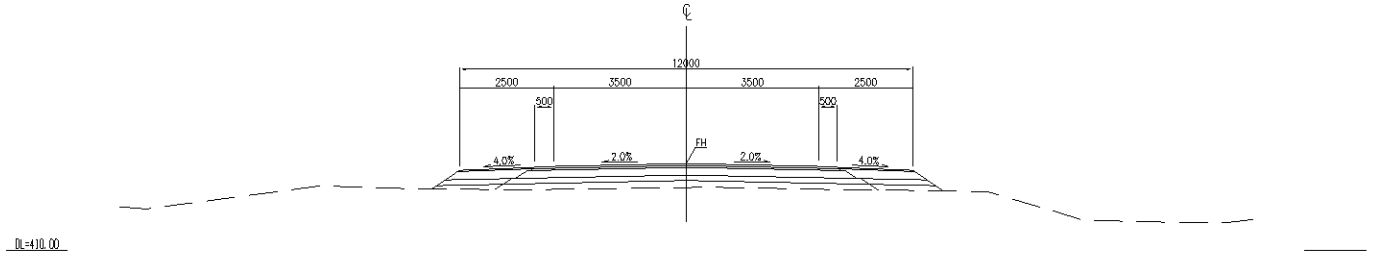
STA. 55+000
FH=412. 360



STA. 54+900
FH=412. 053



STA. 54+975
FH=412. 301



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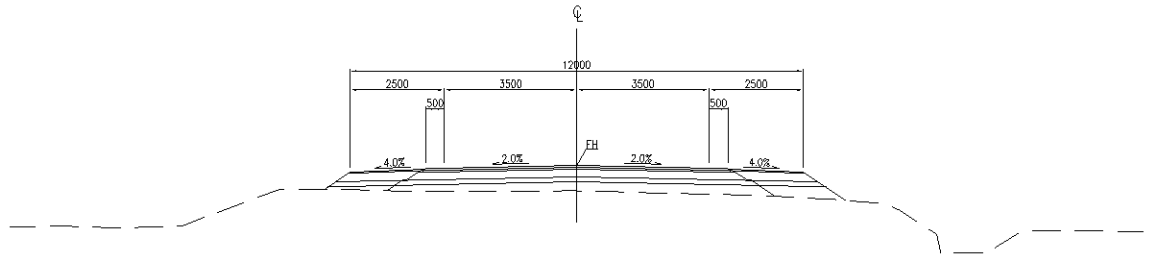
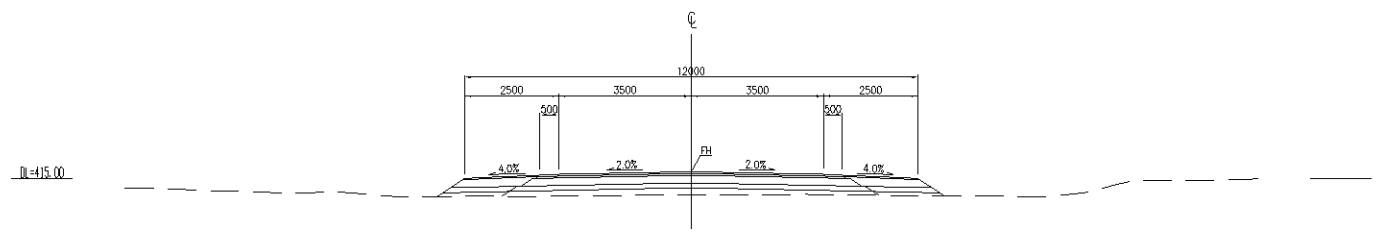
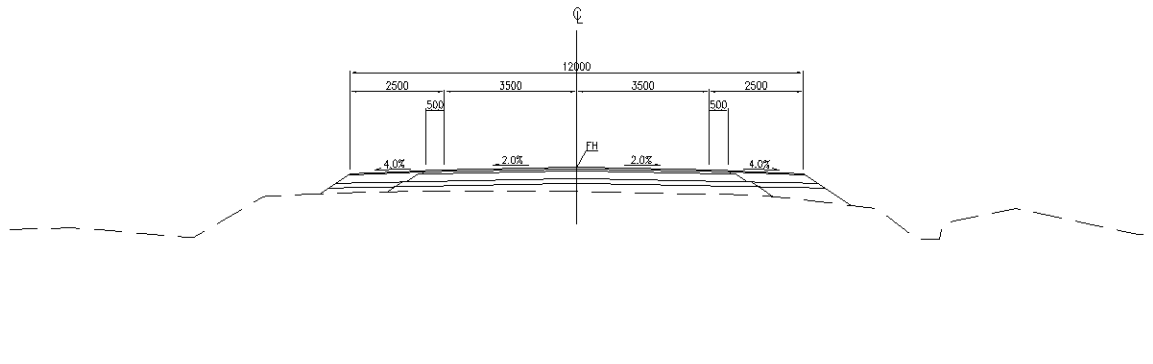
STA. 56+000
FH=415.068



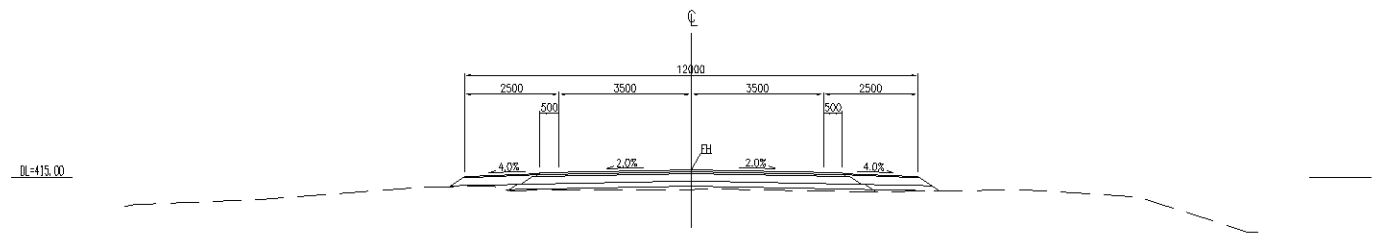
STA. 56+075
FH=415.196



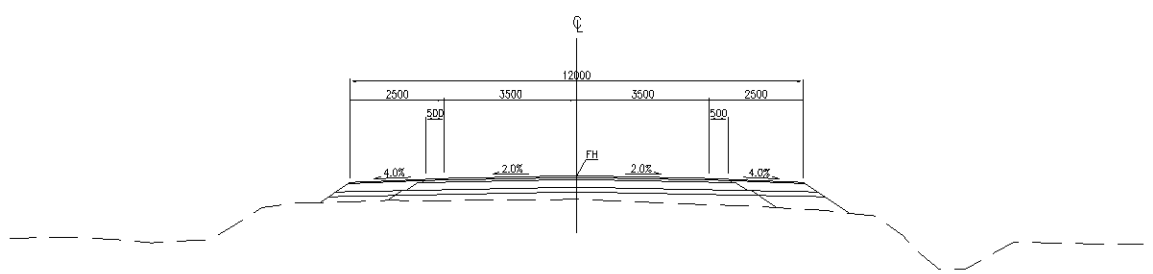
STA. 55+975
FH=414.981



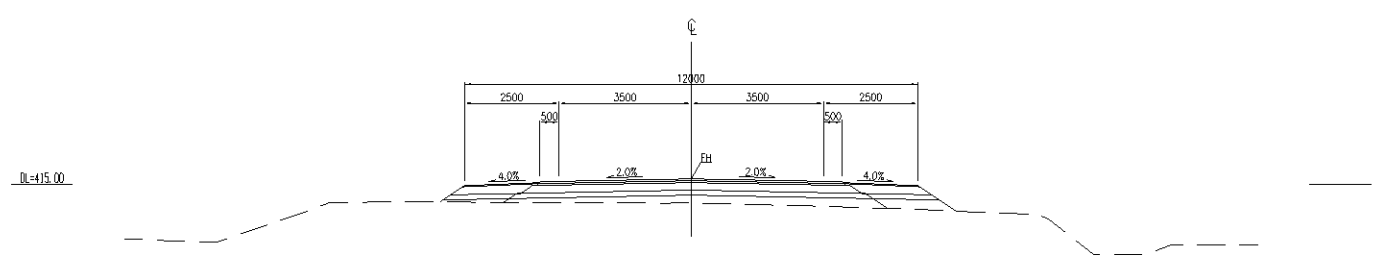
STA. 56+050
FH=415.198



STA. 55+950
FH=414.893



STA. 56+025
FH=415.152



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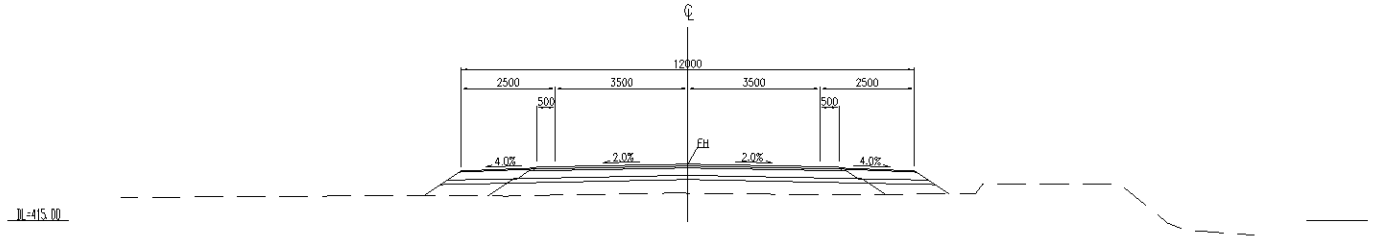
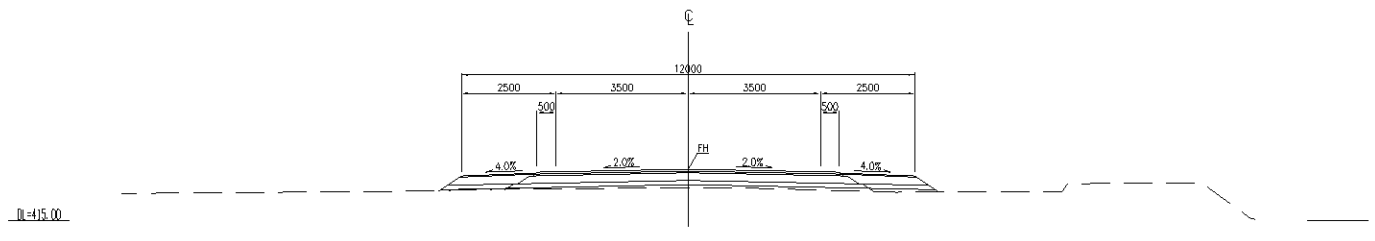
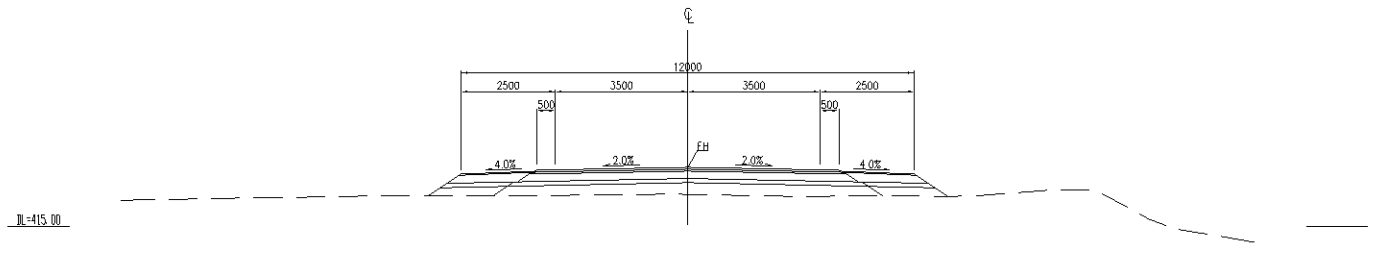
STA. 57+050
FH=416. 506



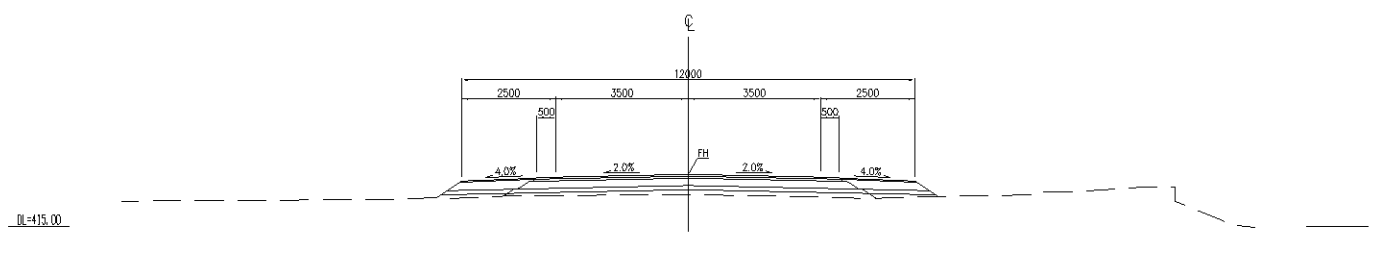
STA. 57+125
FH=416. 372



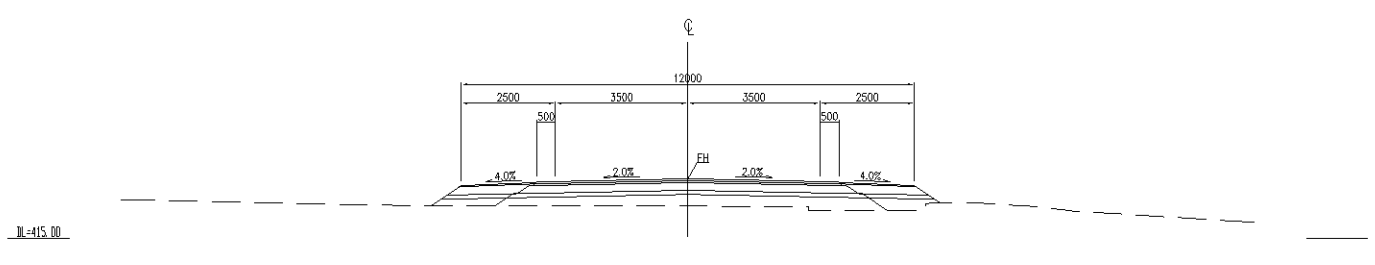
STA. 57+025
FH=416. 562



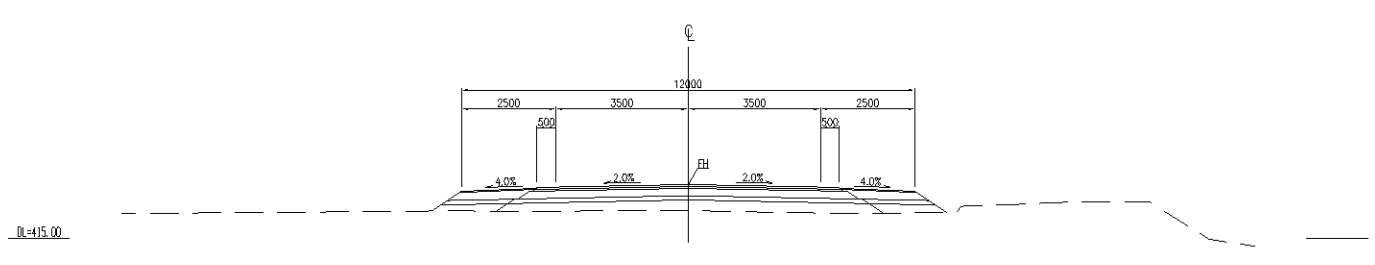
STA. 57+100
FH=416. 374



STA. 57+000
FH=416. 581



STA. 57+075
FH=416. 431



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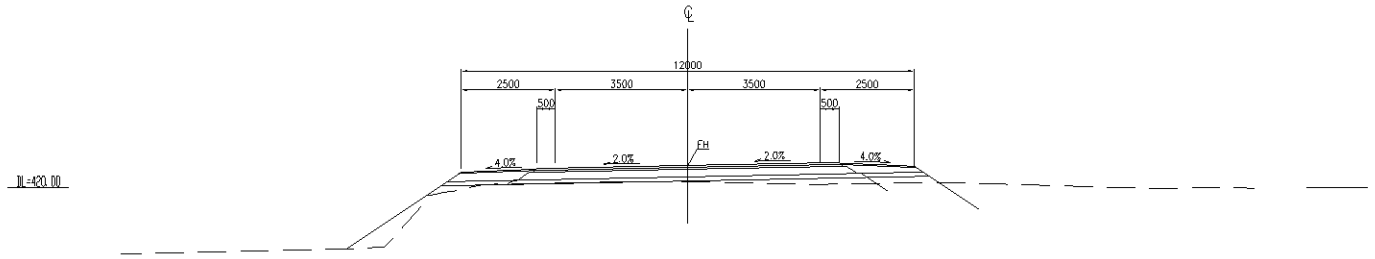
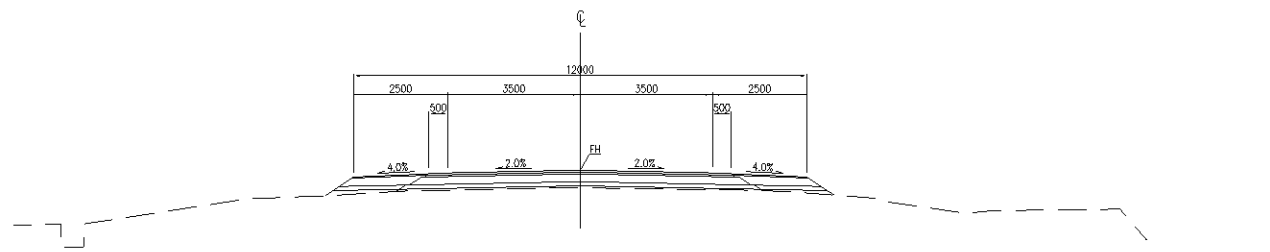
資料6-18

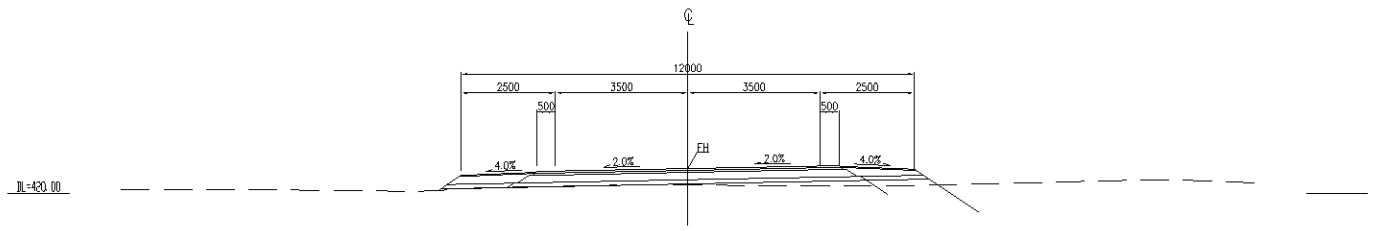
STA. 57+950
FH=420.595



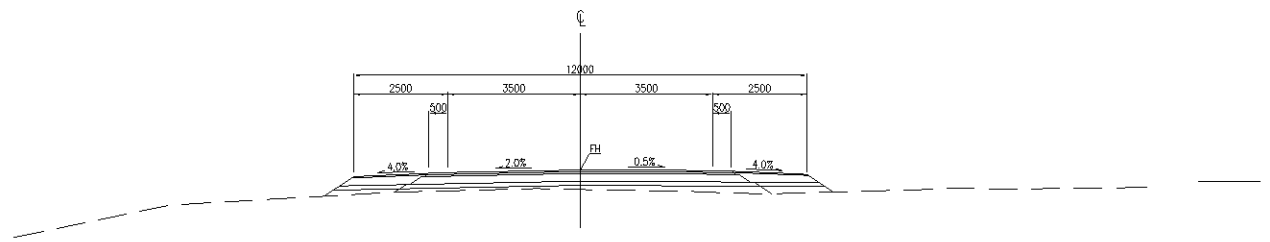
STA. 58+025
FH=420.076



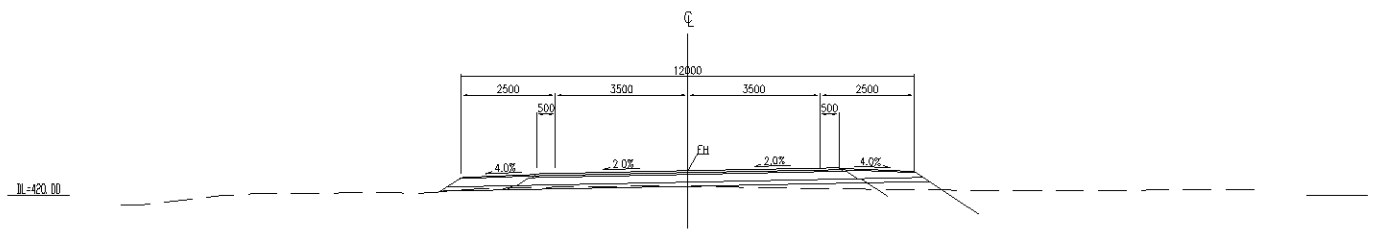
STA. 57+925
FH=420.655



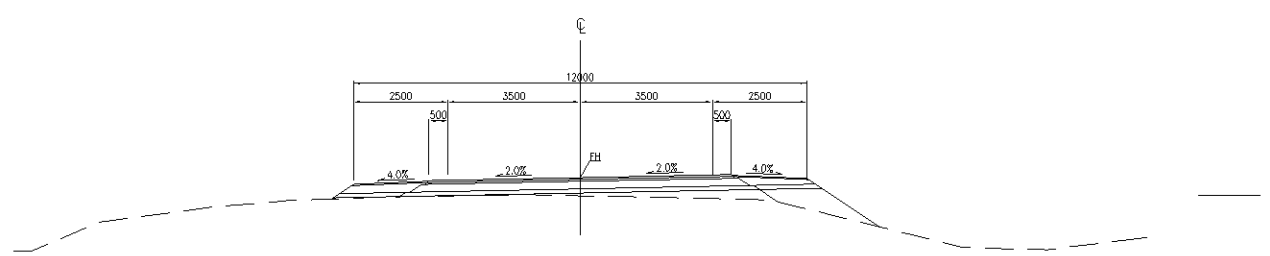
STA. 58+000
FH=420.303



STA. 57+900
FH=420.657



STA. 57+975
FH=420.478



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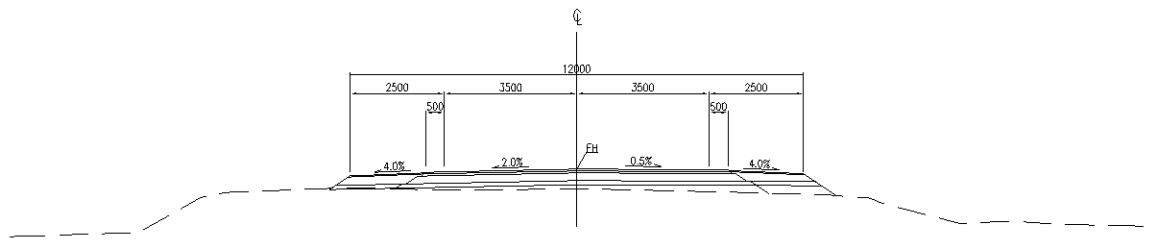
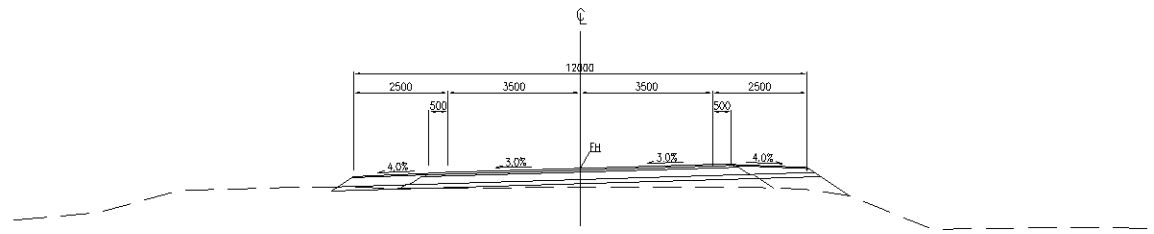
STA. 59+000
FH=419. 654



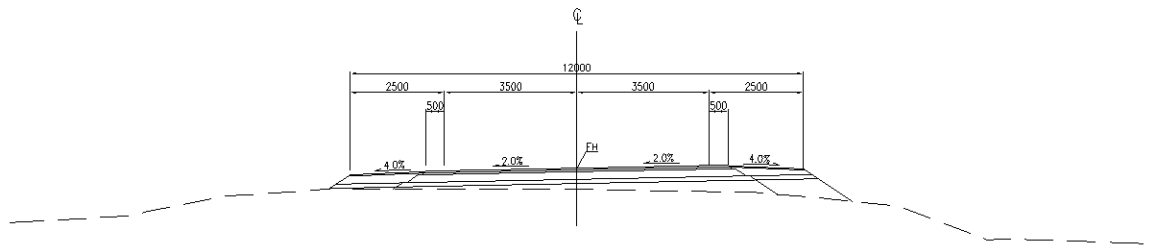
DL=415. 00

STA. 59+075
FH=419. 175



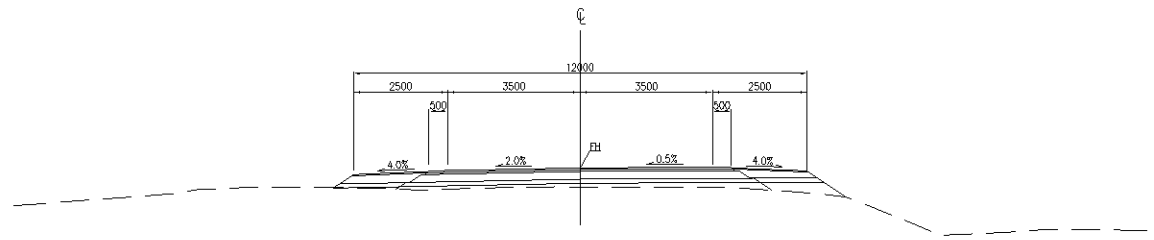
DL=415. 00

STA. 58+975
FH=419. 876



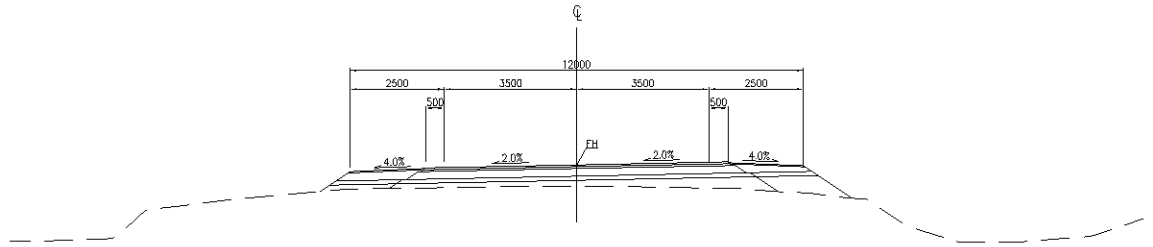
DL=415. 00

STA. 59+050
FH=419. 300



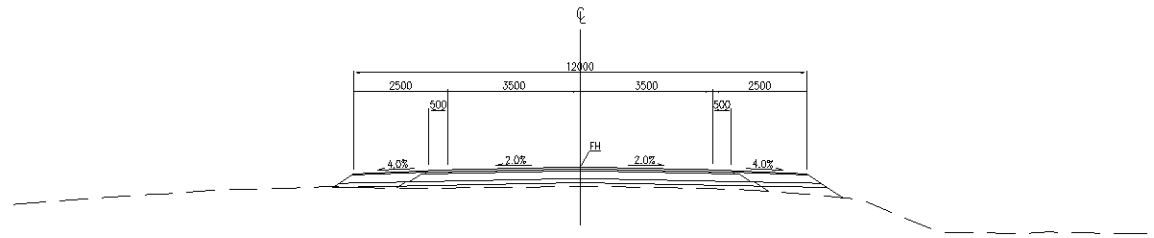
DL=415. 00

STA. 58+950
FH=420. 101



DL=415. 00

STA. 59+025
FH=419. 460



DL=415. 00

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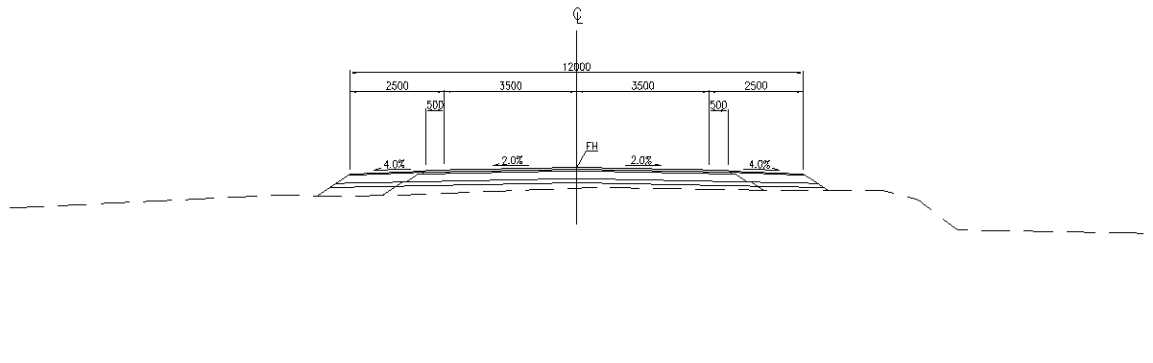
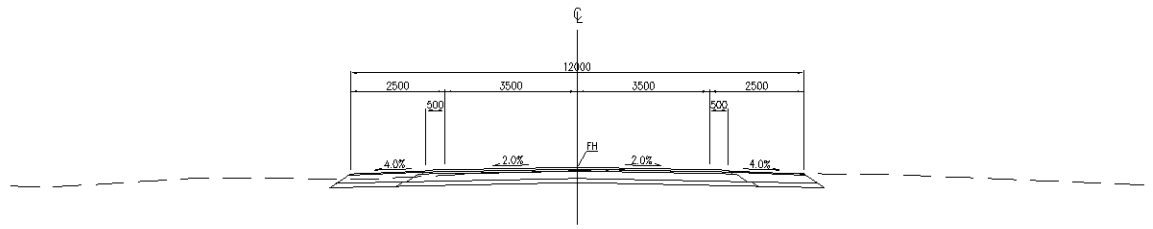
STA. 59+750
FH=415.048



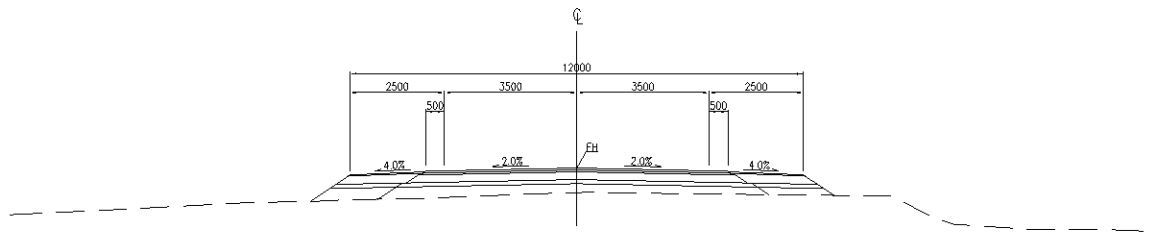
IL=410.00

STA. 59+825
FH=414.546



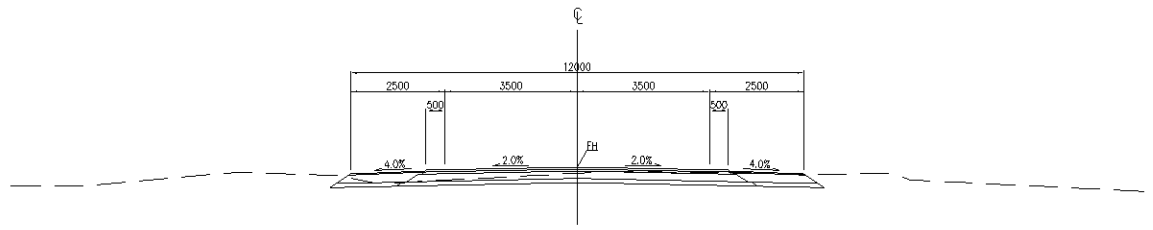
IL=410.00

STA. 59+725
FH=415.321



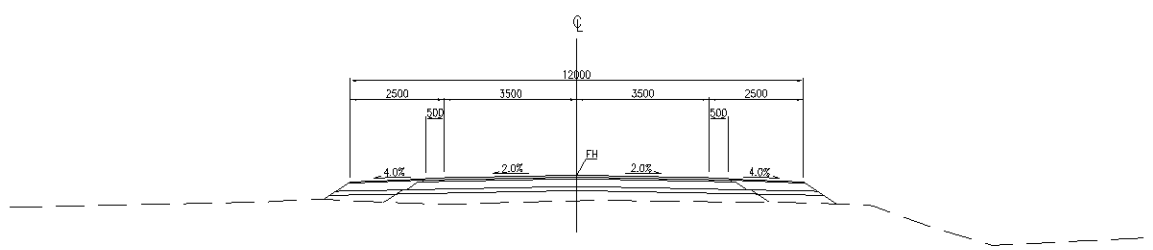
IL=415.00

STA. 59+800
FH=414.660



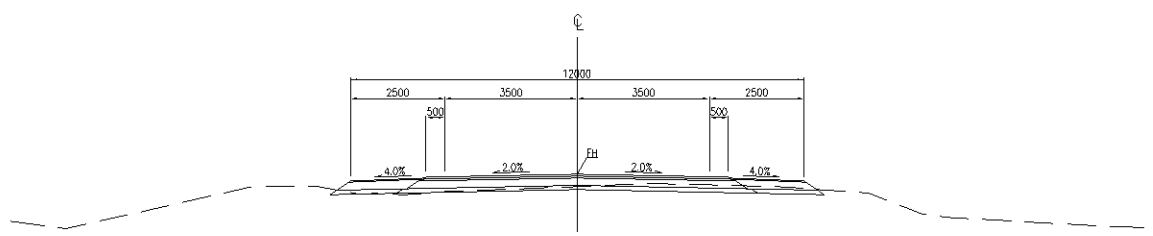
IL=410.00

STA. 59+700
FH=415.621



IL=415.00

STA. 59+775
FH=414.827



IL=410.00

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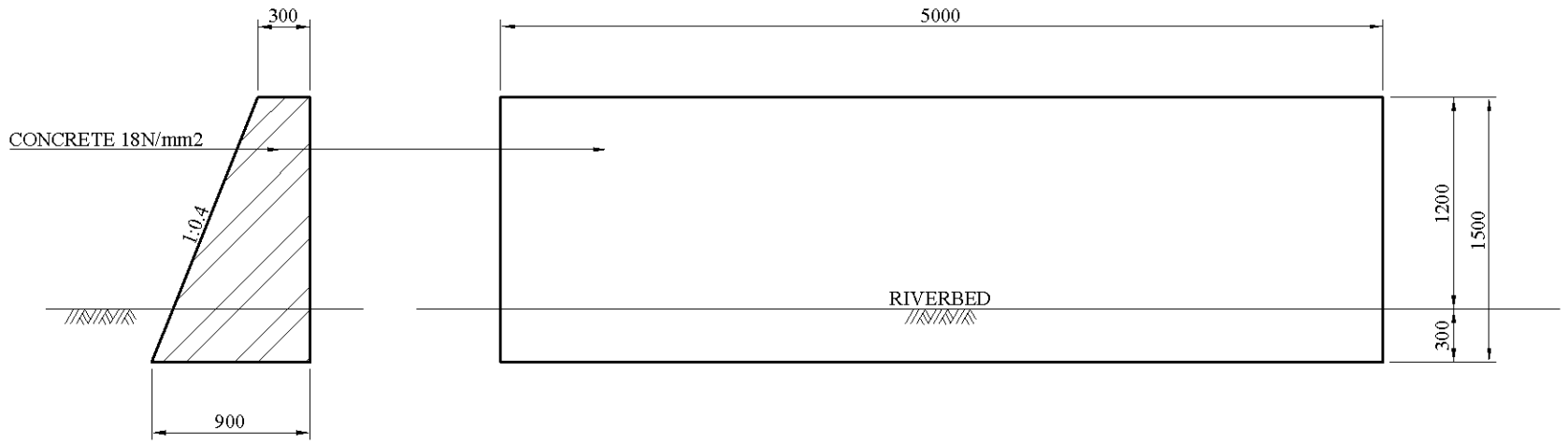
RETAINING WALL AND TOE REINFORCEMENT OF NO. 1 BRIDGE

SCALE AS SHOWN

RETAINING WALL OF NO. 1 BRIDGE

SCALE A3 1:40 A4 70.7%

SECTION

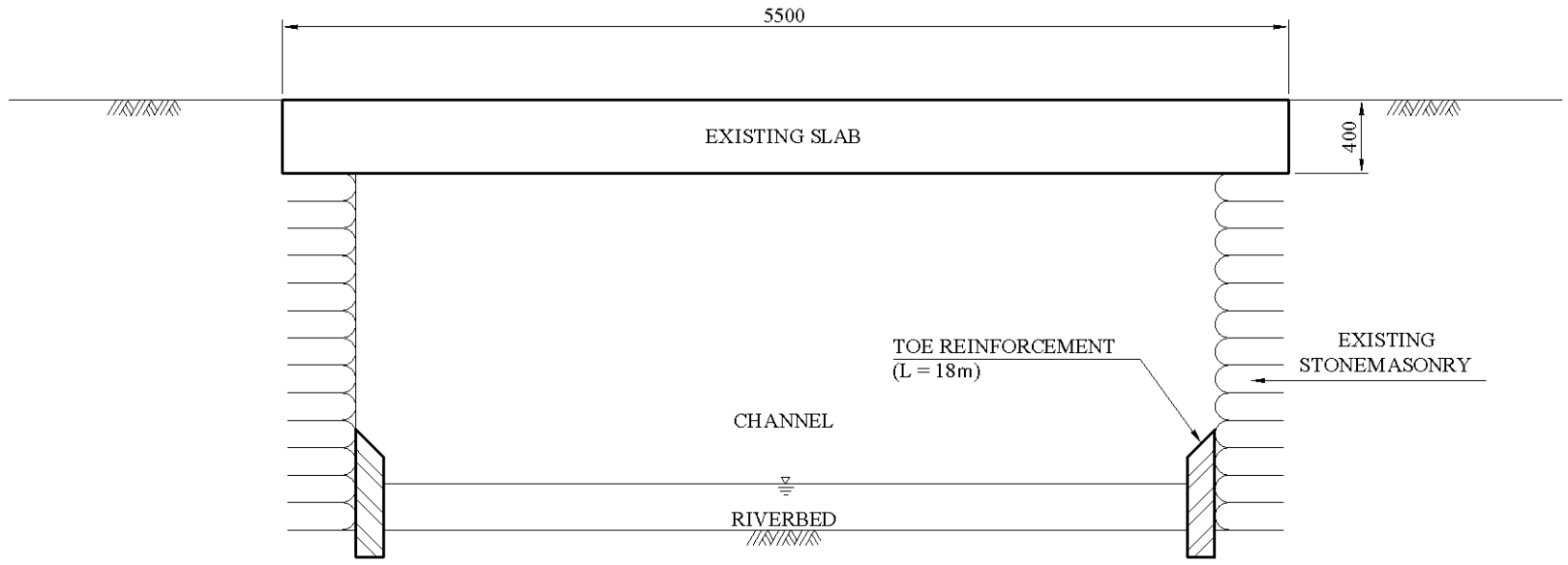


ELAVATION

TOE REINFORCEMENT OF NO. 1 BRIDGE

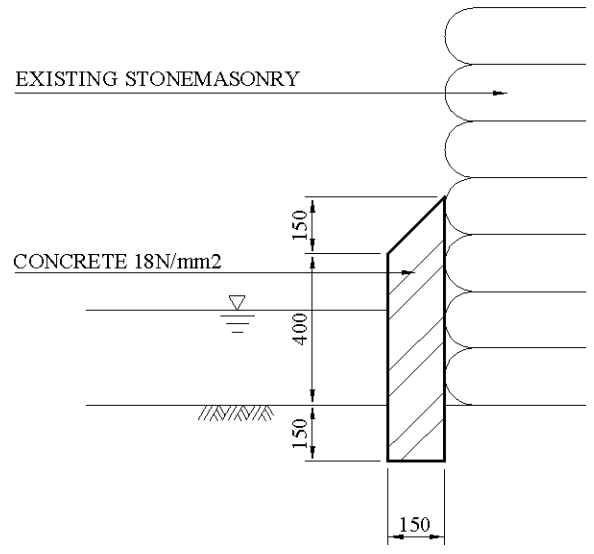
SCALE A3 1:40 A4 70.7%

SECTION



DETAIL OF TOE REINFORCEMENT

SCALE A3 1:20 A4 70.7%



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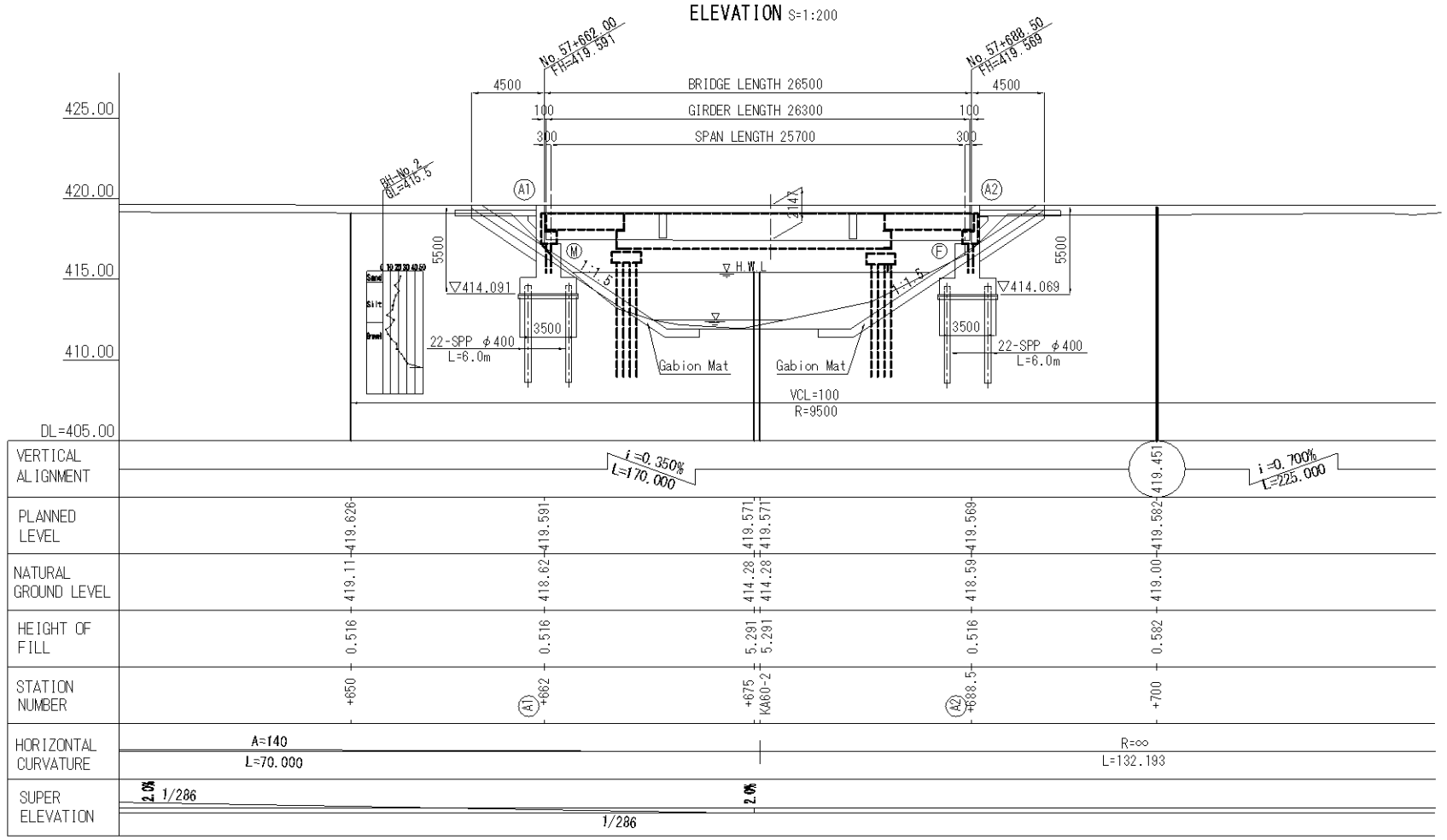
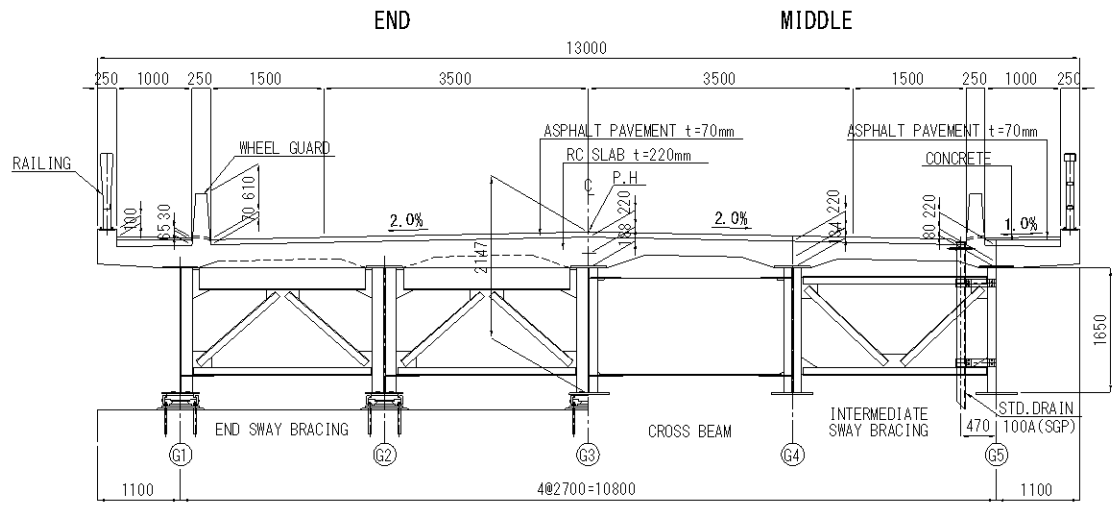
GENERAL VIEW OF No. 2 BRIDGE

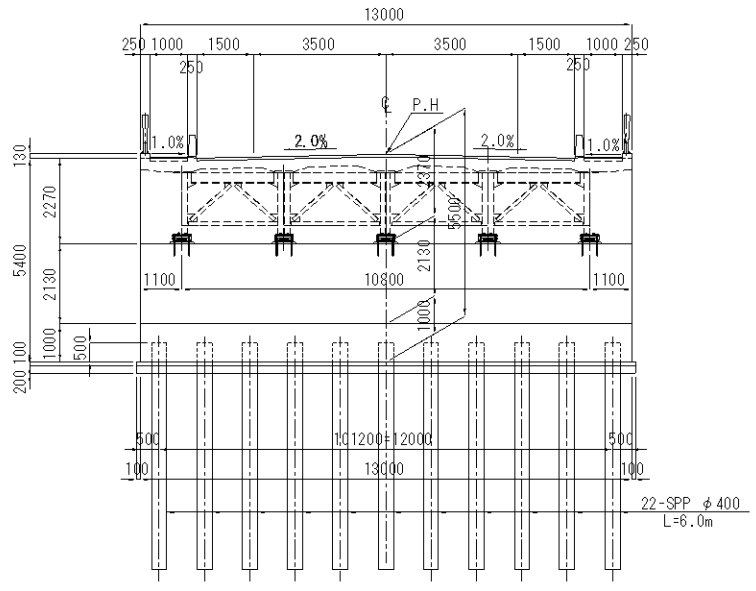
ELEVATION S=1:200



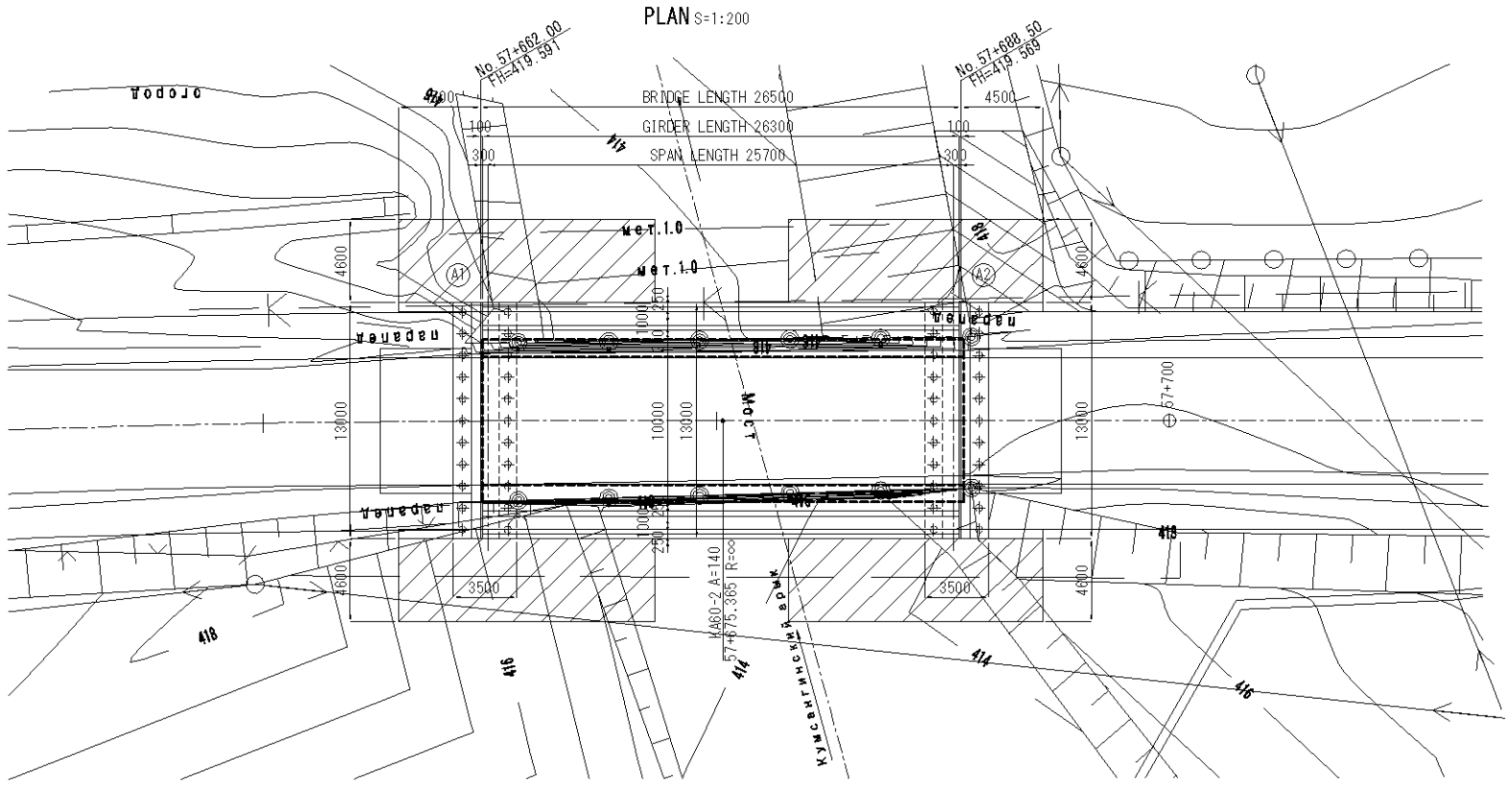
BRIDGE CROSS SECTION S=1:50



A1, A2 ABUTMENTS S=1:100



PLAN S=1:200



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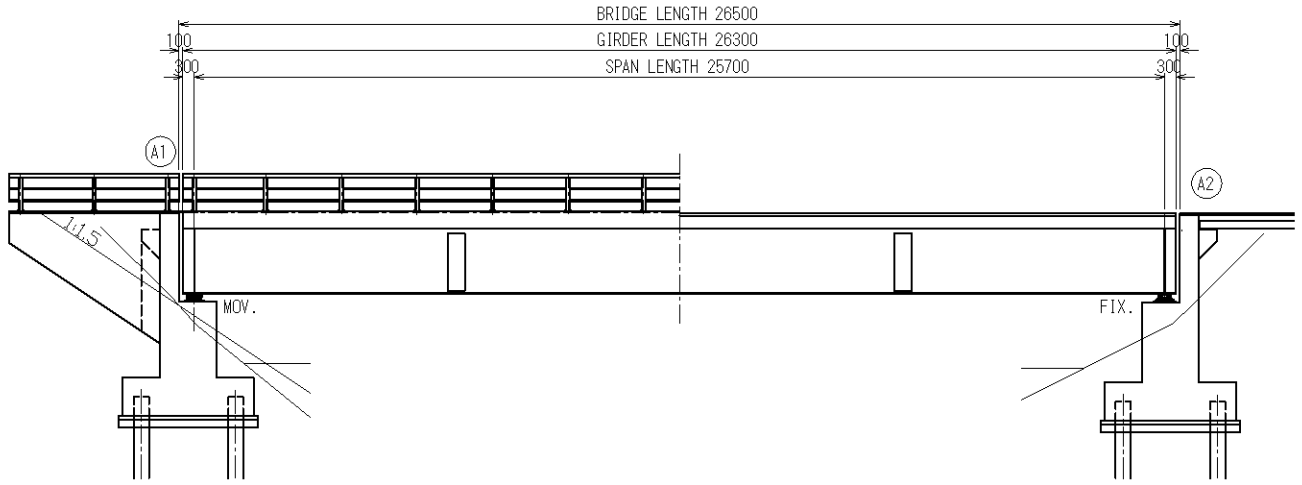
資料6-22

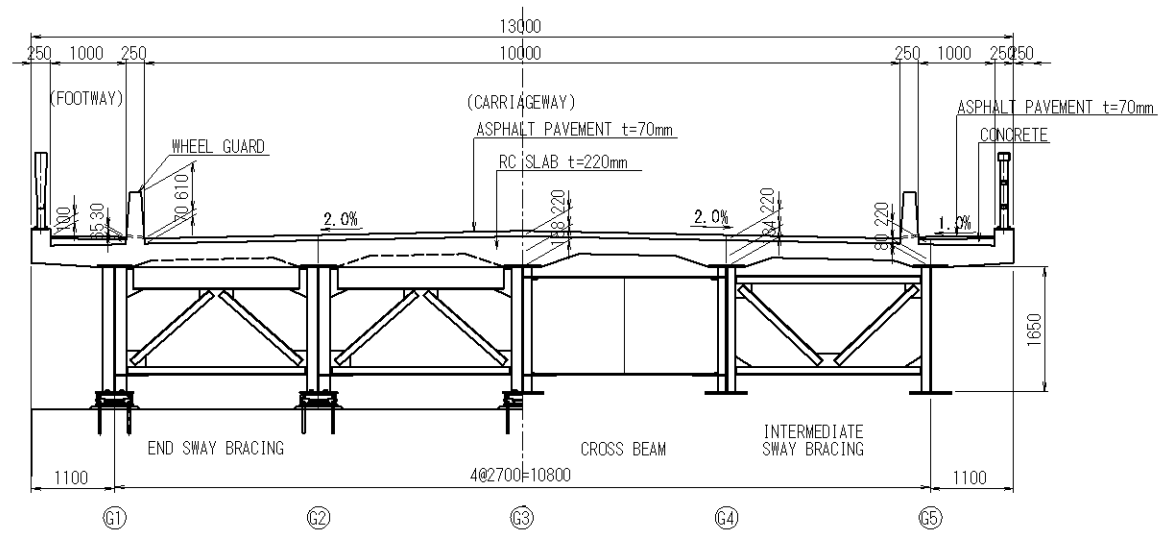
STRUCTURAL DRAWING OF SUPERSTRUCTURE

資料6-23

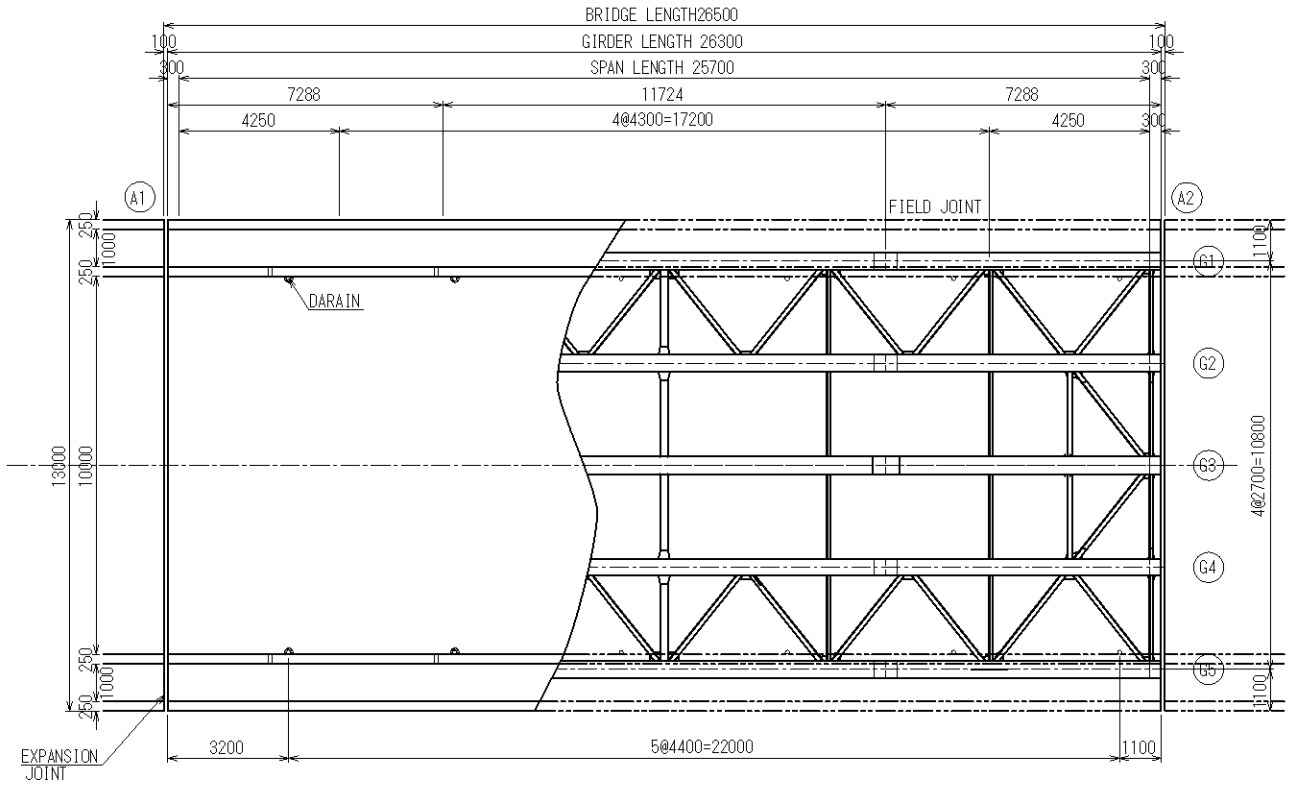
PROFILE S=1:100



CROSS SECTION S=1:50

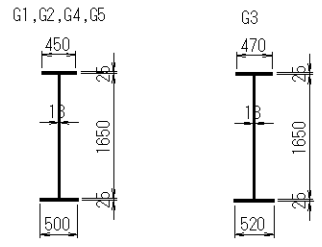


PLAN S=1:100



TYPICAL SECTION S=1:50

CENTER OF SPAN



HEIGHT OF BRIDGE BASE G3 (G1,G2,G4,G5)

	A1	A2
LEVEL OF ROAD	419.591	419.569
PAVEMENT THICKNESS	70	
TRANSVERSE SLOPE	108	
SLAB THICKNESS	220	
HEIGHT OF HAUNCH	80	
HEIGHT OF WEB	1650	
L.FLANGE THICKNESS	22(19)	
SOLE PLLATE THICKNESS	22	
HEIGHT OF SHOE	157	173
MORTAR THICKNESS	30(33)	
TOTAL	2359	2375
LEVEL OF BRIDGE BASE	417.232	417.194

DESIGN CONDITION

ROAD CLASS	NATIONAL ROAD
DESIGN SPEED	V=80km/h
DESIGN DAILY TRAFFIC VOLUME OF HEAVY VEHICLE	500～1000/DAY/WAY
LIVE LOAD	LIVE LOAD TYPE-B (JAPAN ROAD ASSOCIATION)
TYPE OF SUPERSTRUCTURE	SIMPLE NON-COMPOSITE STEEL GIRDER
BRIDGE LENGTH	26.500 m
GIRDER LENGTH	26.300 m
SPAN LENGTH	25.700 m
CARRIAGE WIDTH	10.000 m
FOOT WAY WIDTH	1.000 m
VERTICAL SLOPE	0.000 %
TRANSVERSE SLOPE	1.000 % 2.000 % 2.000 % 1.000 %
PLANE ALIGNMENT	R=∞
SKEW ANGLE	90° 00'00"
SEISMIC COEFFICIENT	kh=0.05
PAVEMENT	ASPHALT PAVEMENT CARRIAGE WAY t=70mm FOOTWAY t=30mm
SLAB	RC-SLAB t=220mm (σck=24 N/mm2) REINFORCING BAR : SD295A
RAILING	H=1.1m
MATERIAL GRADE	SS400,SM400,SM490,S10T
DESIGN STANDARD	SPECIFICATIONS FOR HIGHWAY BRIDGES JAPAN ROAD ASSOCIATION I～V (MARCH-2002)

MATERIALS

ITEM	UNIT	QUANTITY	REMARKS
STEEL	t	58.1	LARGE 45.1 SMALL 11.3 PURCHASING 1.7
CONCRETE	m³	103.4	
DEFORMED BAR	t	20.4	SD295A
PAVEMENT(CARRIAGE WAY)	m²	263.0	ASPHALT 70mmTHICK
PAVEMENT(FOOT WAY)	m²	52.6	ASPHALT 30mmTHICK
RAILING	m	52.8	STEEL 2.1t
EXPANSION JOINT	m	25.0	STEEL 5.6t
DRAINS	piece	12	STEEL 0.34t
STEEL BEARING SHOE	piece	10	STANDARD B TYPE FIX-800kNx5,MOV-860kNx5

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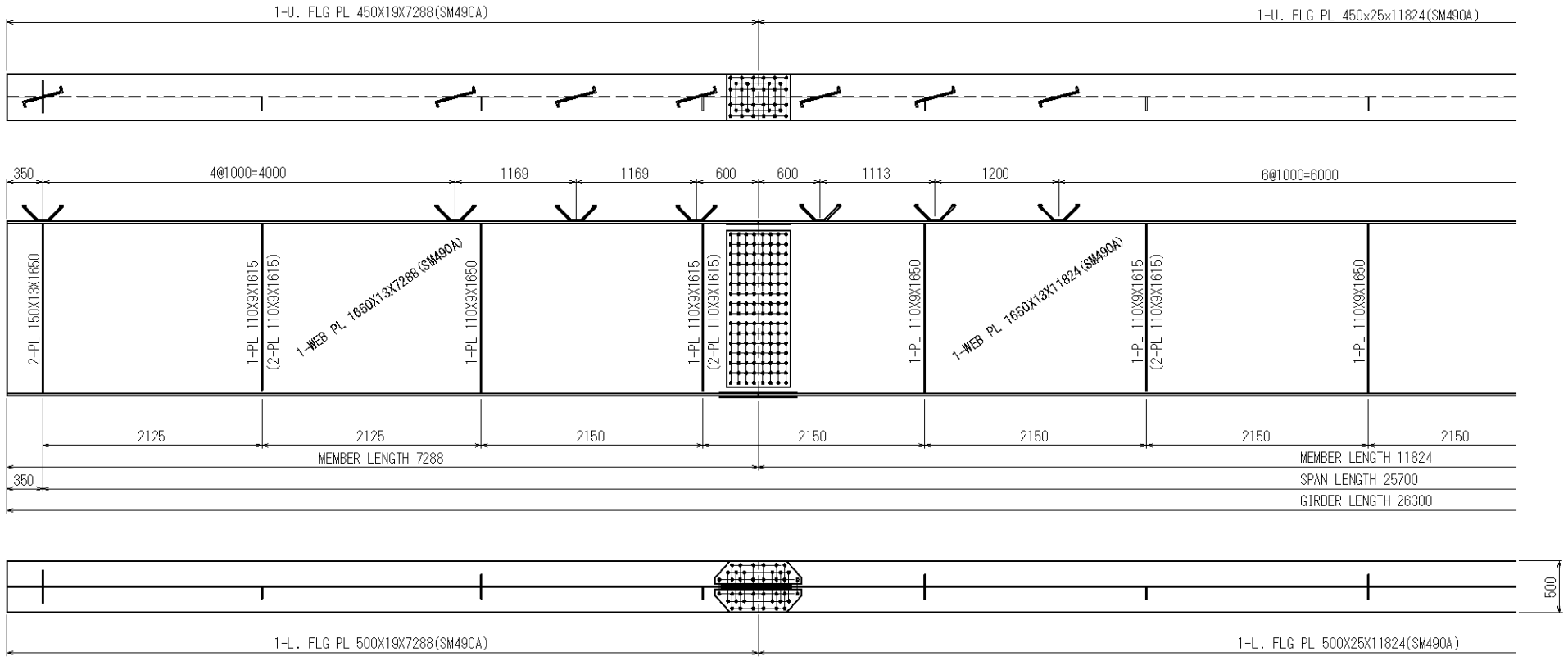
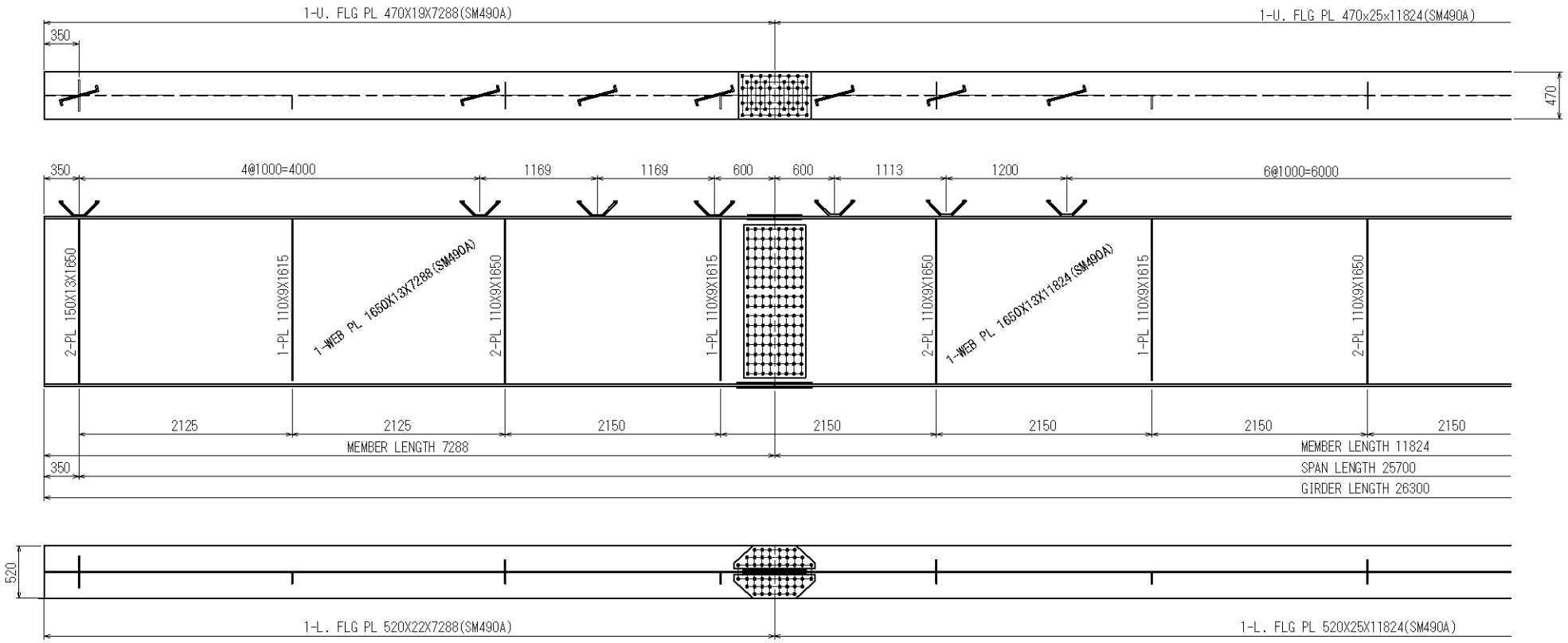
MAIN GIRDER SCALE 1:30

G1, G5(G2, G4) GIRDER



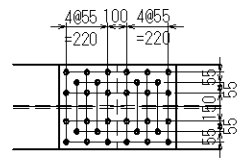
G3 GIRDER



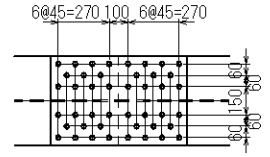
DETAIL OF FIELD JOINT SCALE 1:20

G1, G5(G2, G4) G3

U. FLG

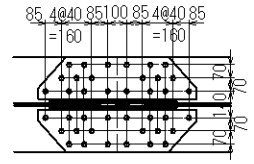


1-SPL PL 450X10X620(SM490A)
2-SPL PL 190X12X620(SM490A)
1-FILL PL 450X6X310(SS400)
32-TCB M22X85(S10T)

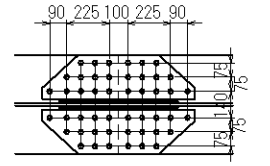


1-SPL PL 470X12X720(SM490A)
2-SPL PL 200X14X720(SM490A)
1-FILL PL 470X6X360(SS400)
44-TCB M22X90(S10T)

L. FLG

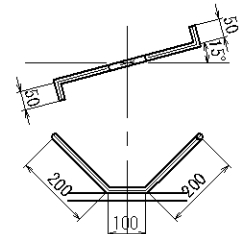


1-SPL PL 500X12X840(SM490A)
2-SPL PL 220X14X840(SM490A)
1-FILL PL 500X6X420(SS400)
40-TCB M22X90(S10T)



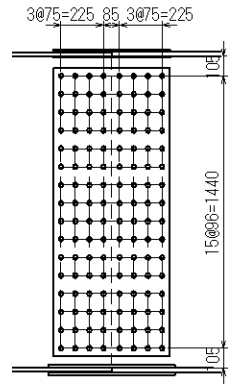
1-SPL PL 520X14X810(SM490A)
2-SPL PL 230X16X810(SM490A)
1-FILL PL 520X3.2X405(SS400)
48-TCB M22X90(S10T)

SLAB ANCHOR SCALE 1:10



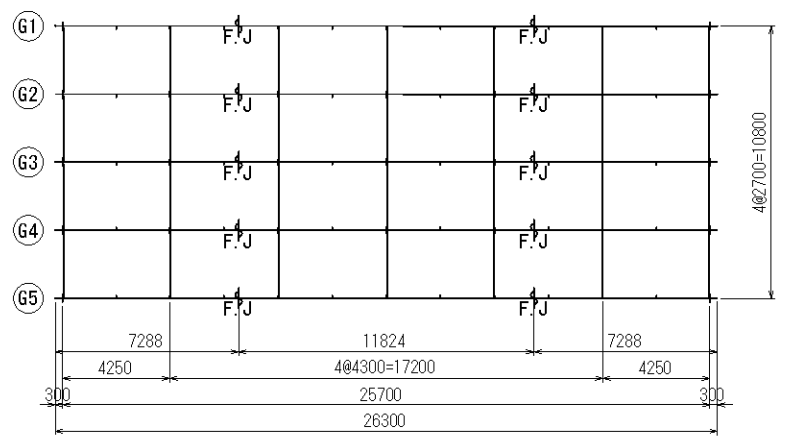
RB-Φ16X600(SS400)

WEB



2-SPL PL 1520X9X615(SM490A)
128-TCB M22X70(S10T)

MARKING DIAGRAM



NOTE
1 UNLESS OTHERWISE SPECIFIED ALL MATERIALS SHALL BE SM400A .

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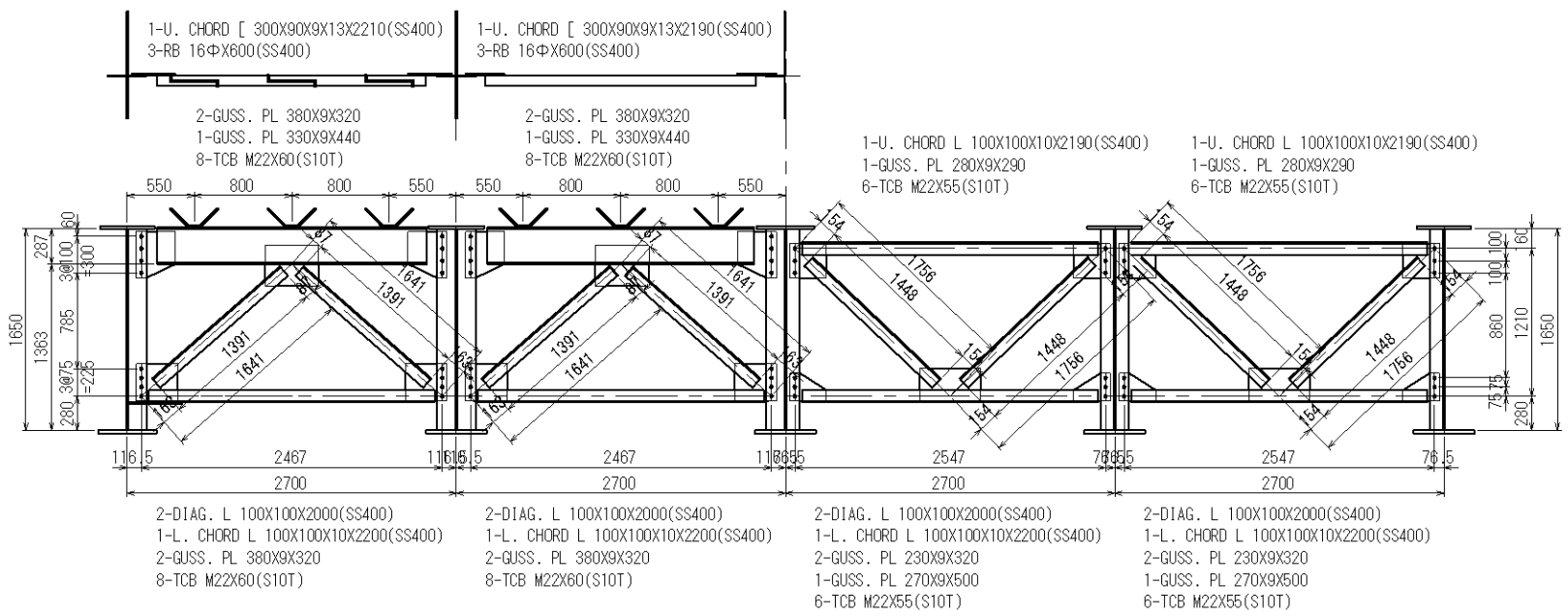
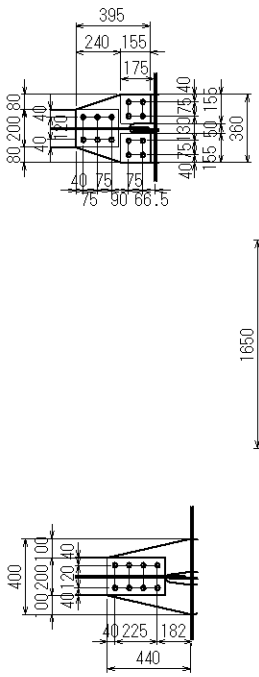
TRANSVERSE MEMBERS AND LATERAL BRACING SCALE 1:30

SWAY BRACING

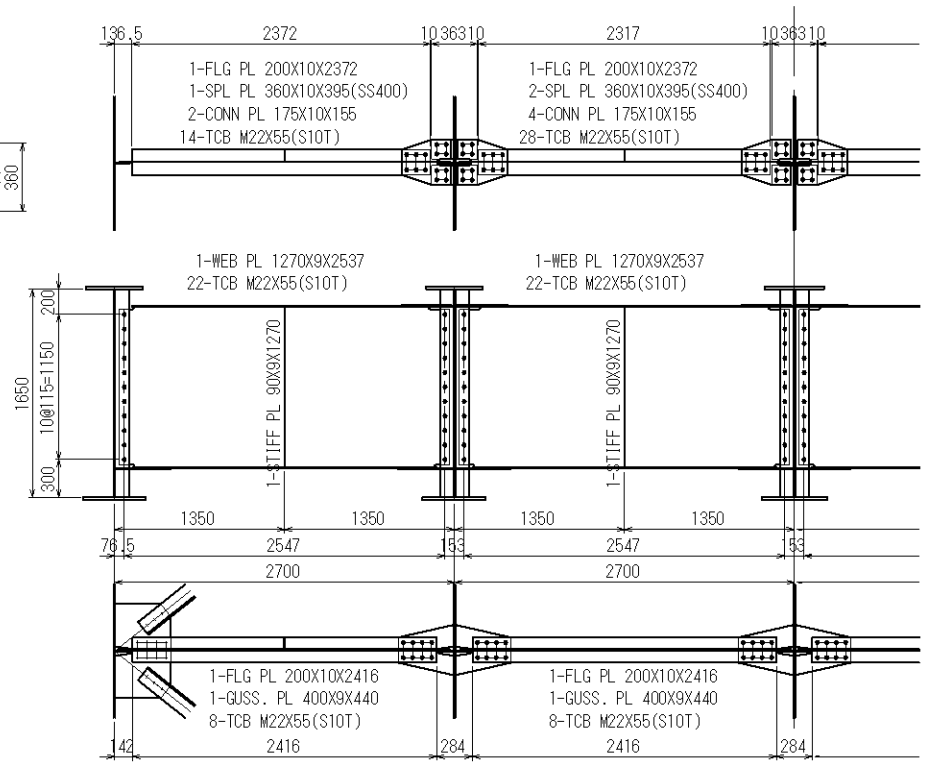
END SWAY ⑤1 ⑤2



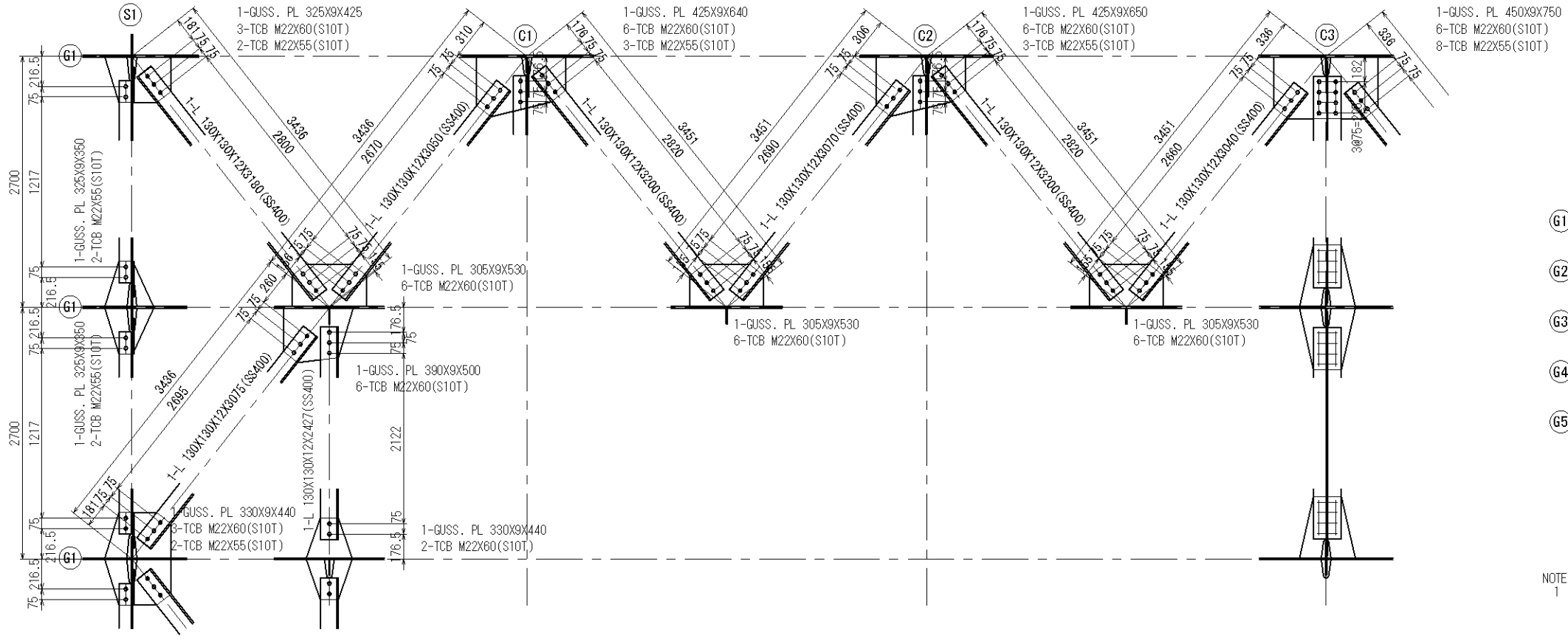
INTERMEDIATE SWAY ⑤1 ⑤2 ⑤4 ⑤5



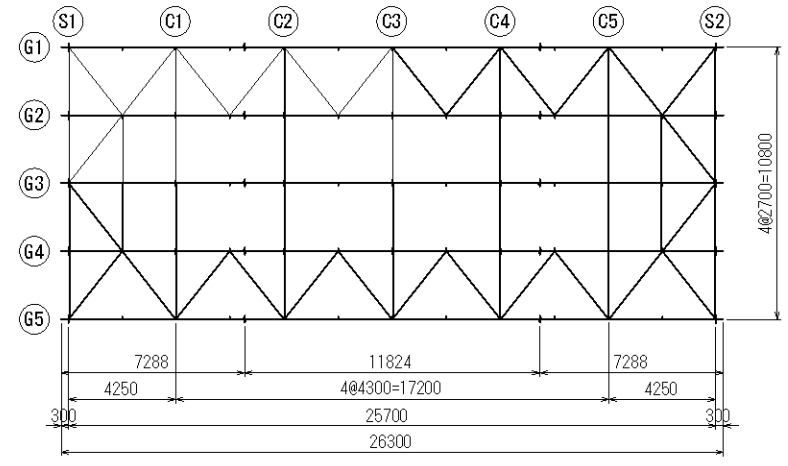
CROSS BEAM ⑤3



LOWER LATERAL BRACING



MARKING DIAGRAM



NOTE
1 UNLESS OTHERWISE SPECIFIED ALL MATERIALS SHALL BE SM400A .

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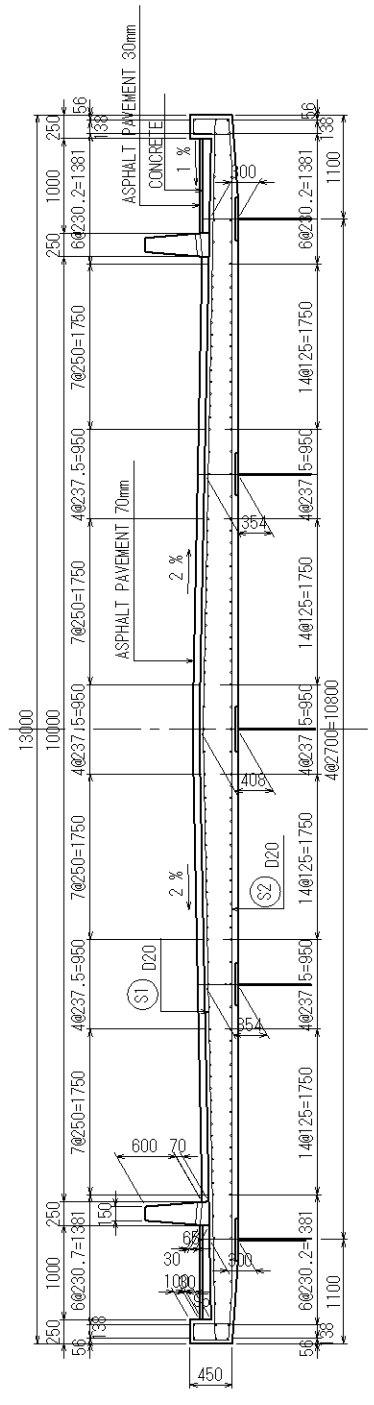
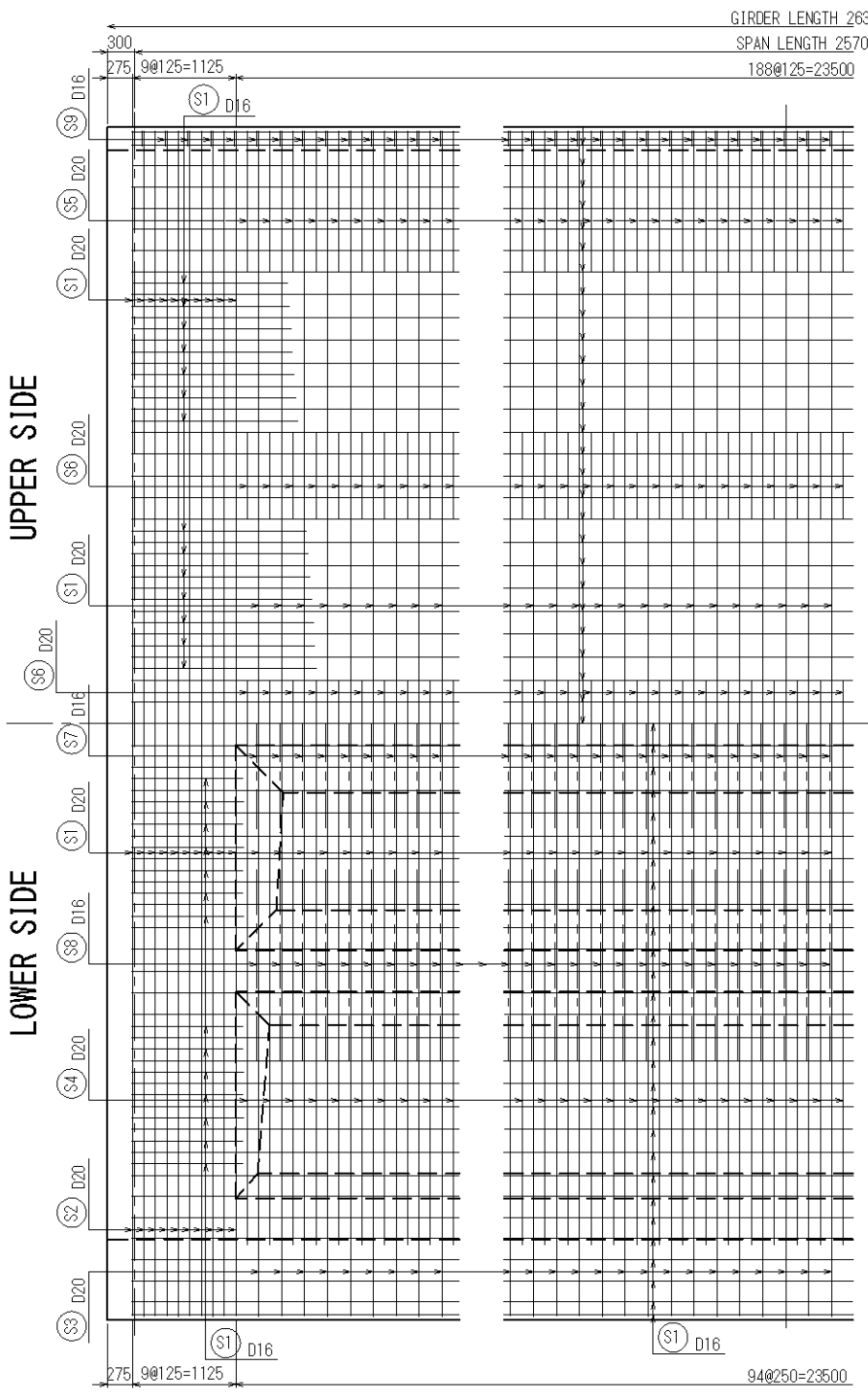
BAR ARRANGEMENT OF RC SLAB

SCALE 1:40

SECTION OF END

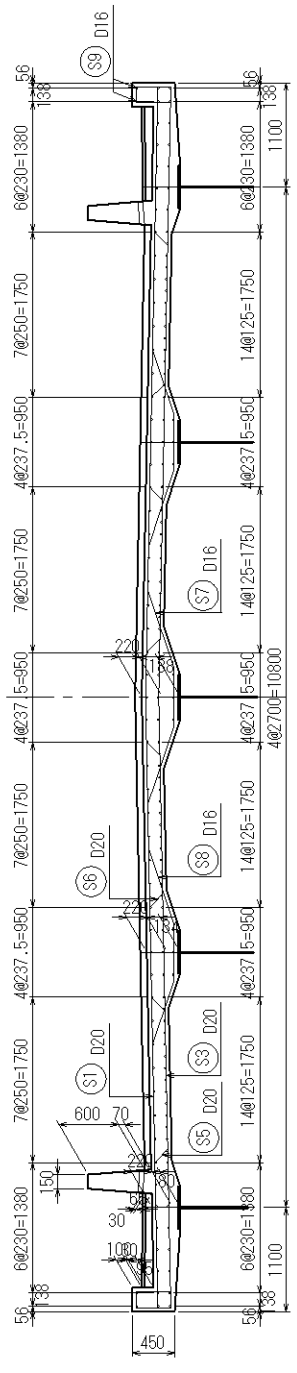


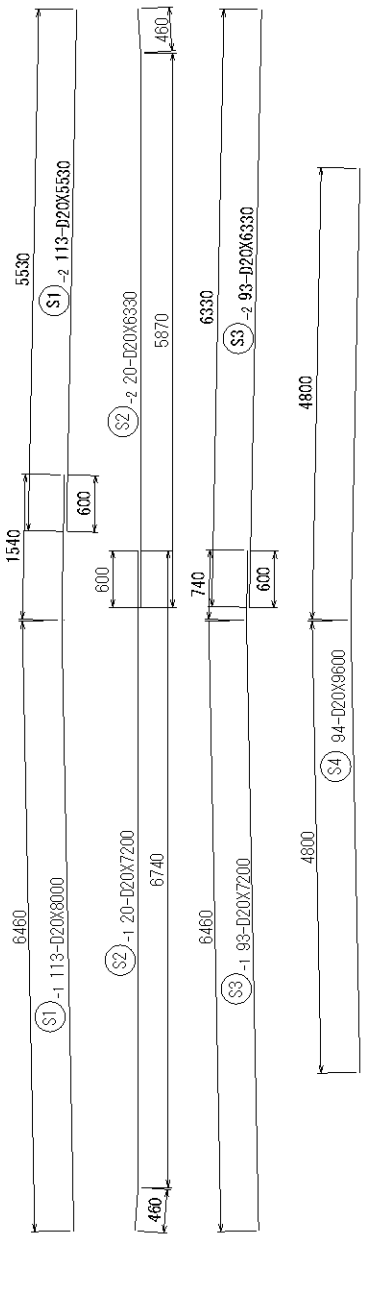
UPPER SIDE

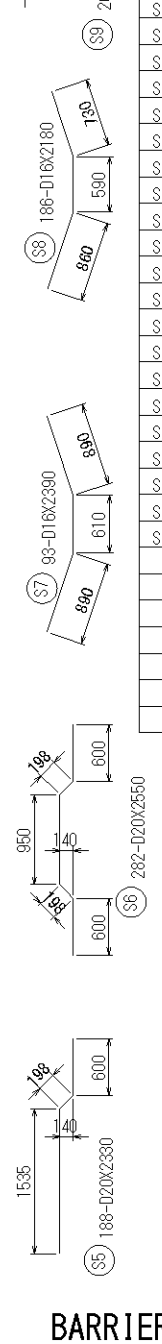


LOWER SIDE

SECTION OF INTERMEDIATE





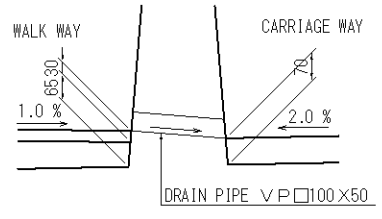


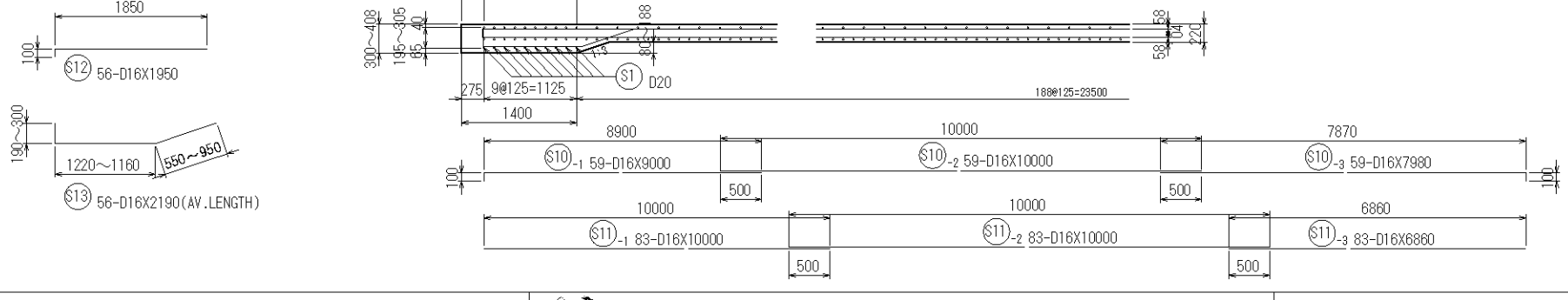
MATERIAL LIST

MARK	DIA.	LENGTH	NUMBER	W/M	W/PIECE	WEIGHT	REMARK
S1-1	D20	8000	113	2.466	19.73	2229	
S1-1	D20	5530	113	〃	13.64	1541	
S2-1	D20	7800	20	〃	19.23	385	
S2-2	D20	6330	20	〃	15.61	312	
S3-1	D20	7200	93	〃	17.76	1652	
S3-2	D20	6330	93	〃	15.61	1452	
S4	D20	9600	94	〃	23.67	2225	
S5	D20	2330	188	〃	5.75	1081	
S6	D20	2550	282	〃	6.29	1774	
S7	D16	2390	93	1.578	3.77	351	
S8	D16	2180	186	〃	3.44	640	
S9	D16	930	206	〃	1.47	303	
S10-1	D16	8000	55	〃	12.62	745	
S10-2	D16	10000	55	〃	15.78	931	
S10-3	D16	7980	55	〃	12.59	931	
S11-1	D16	8000	83	〃	12.62	1047	
S11-2	D16	10000	83	〃	15.78	1310	
S11-3	D16	6860	83	〃	10.83	899	
S12	D16	1950	56	〃	3.08	172	
S13	D16	2190	56	〃	3.46	194	
S14	D16	820	129	〃	1.29	166	
S14	D16	8680	18	〃	13.70	247	
						20399 kg	

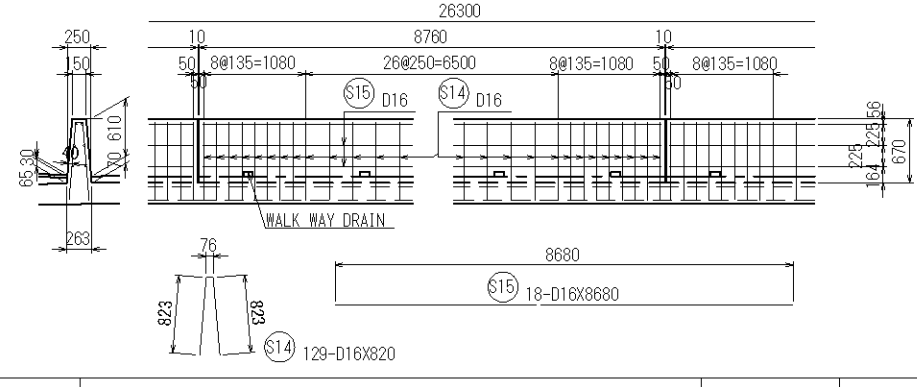
BAR	D20	12651 kg
	D16	7748 kg
	TOTAL	20399 kg
CONCRETE		103.4 m³
FORM		390.7 m²

WALK WAY DRAINAGE SCALE 1:10





BARRIER



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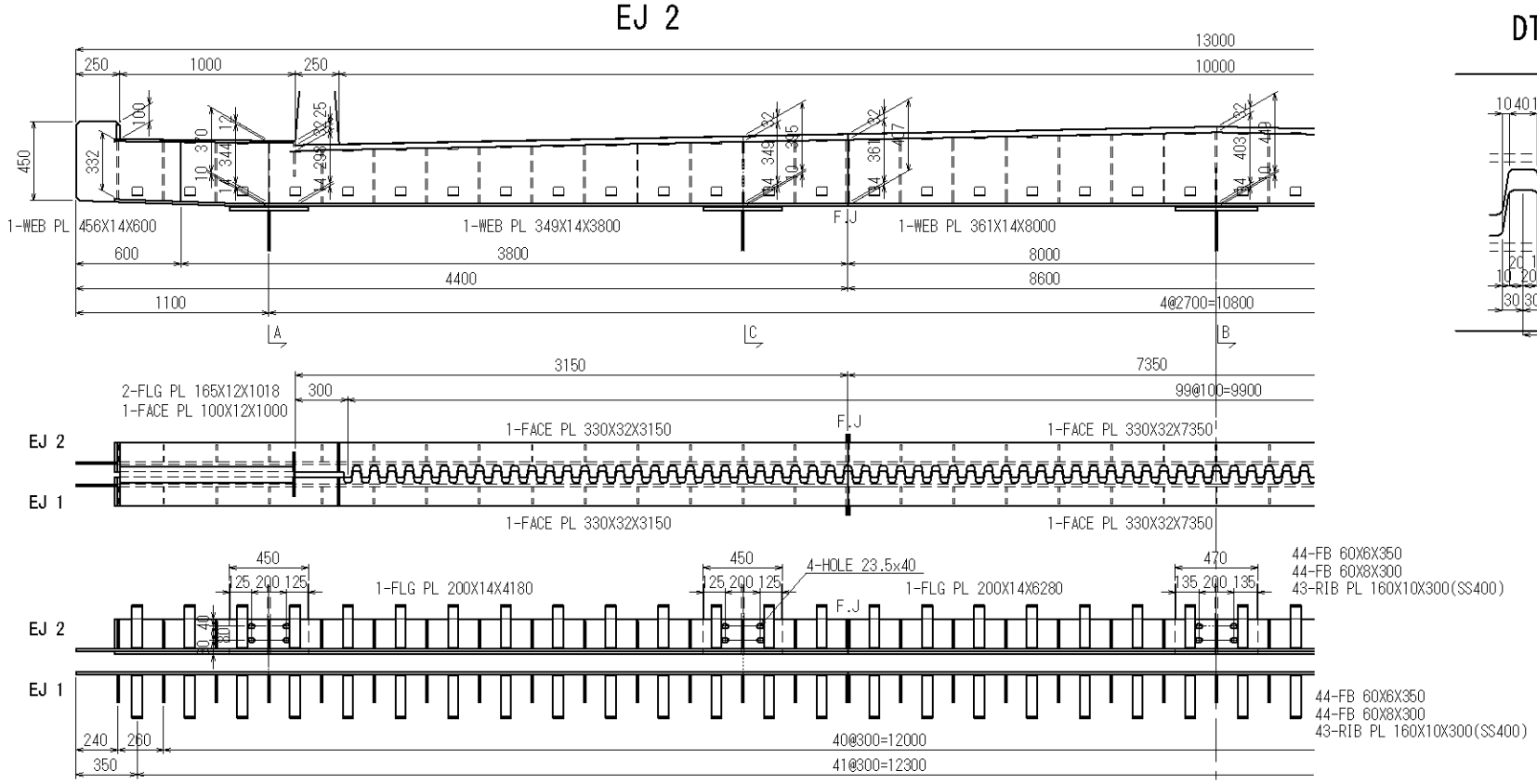
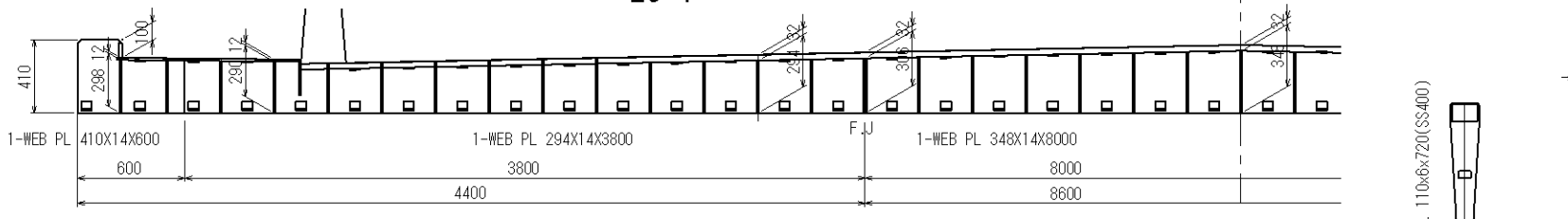
EXPANSION JOINT AND ANNEXED STRUCTURES S=1:20

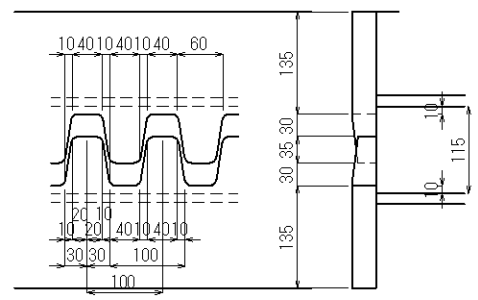
EJ 2



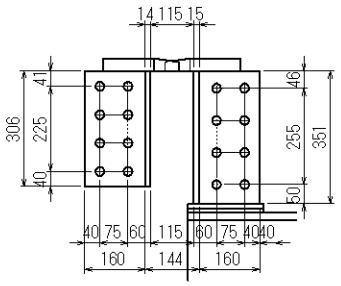
EJ 1



DTAIL OF FINGER S=1:5



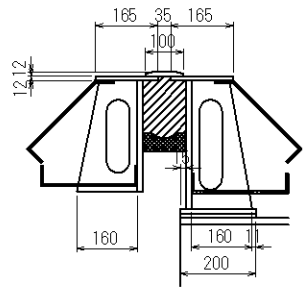
C-C S=1:10



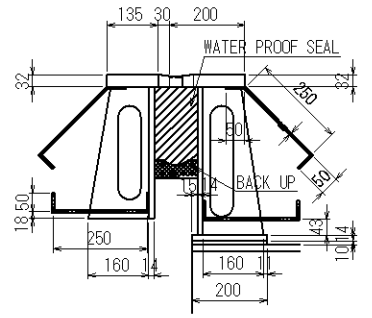
2-RIB PL 160X10X306(SS400)
8-TCB M22X55(S10T)

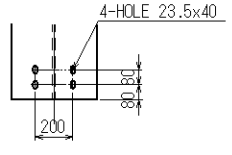
2-RIB PL 160X10X351(SS400)
8-TCB M22X55(S10T)

A-A S=1:10



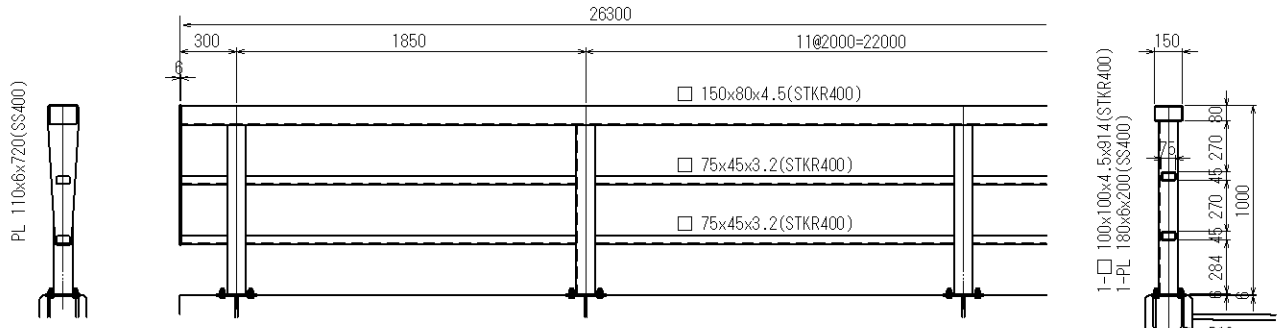
B-B S=1:10





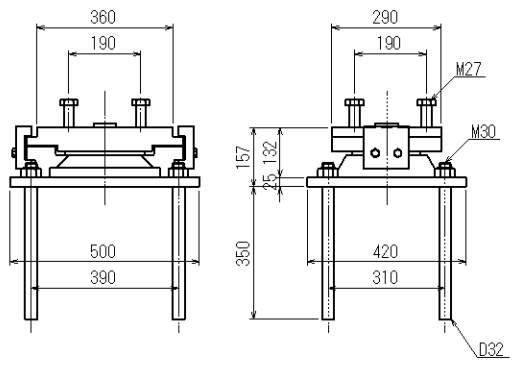
4-BN M22X80(SS400)

RAILING S=1:20

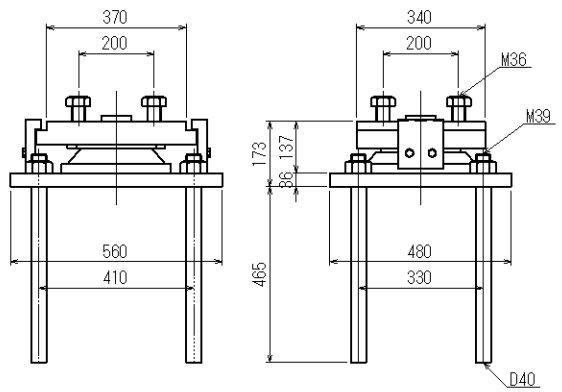


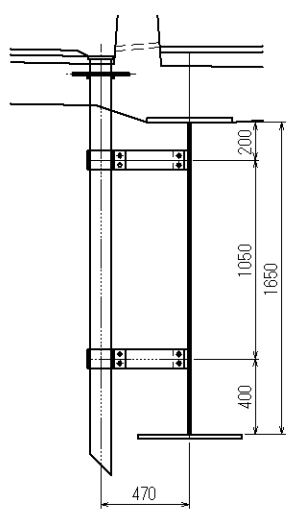
BP-B SHOE S=1:10

MOV.

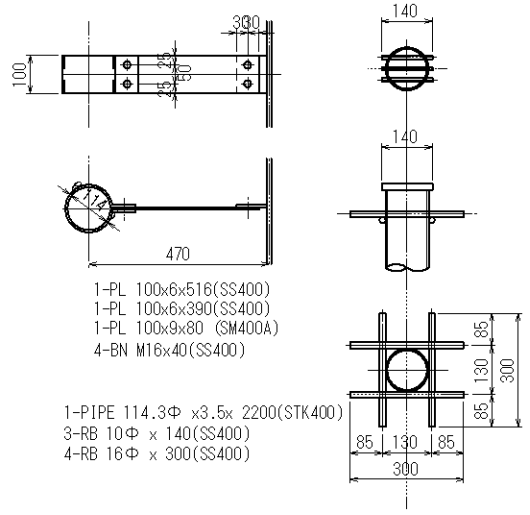


FIX.

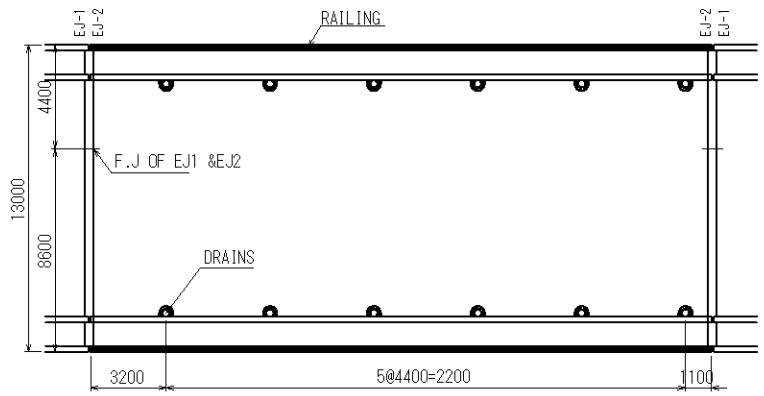




DRAINS S=1:20



MARKING DIAGRAM



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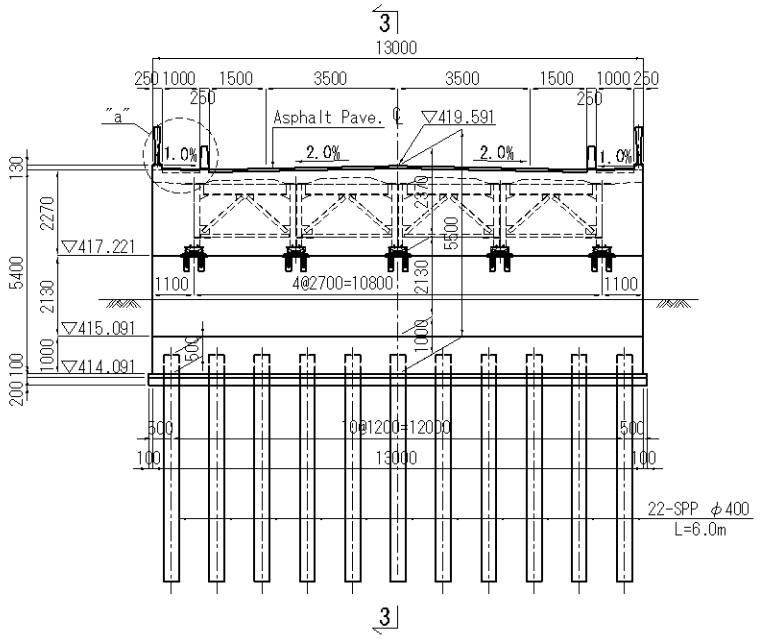
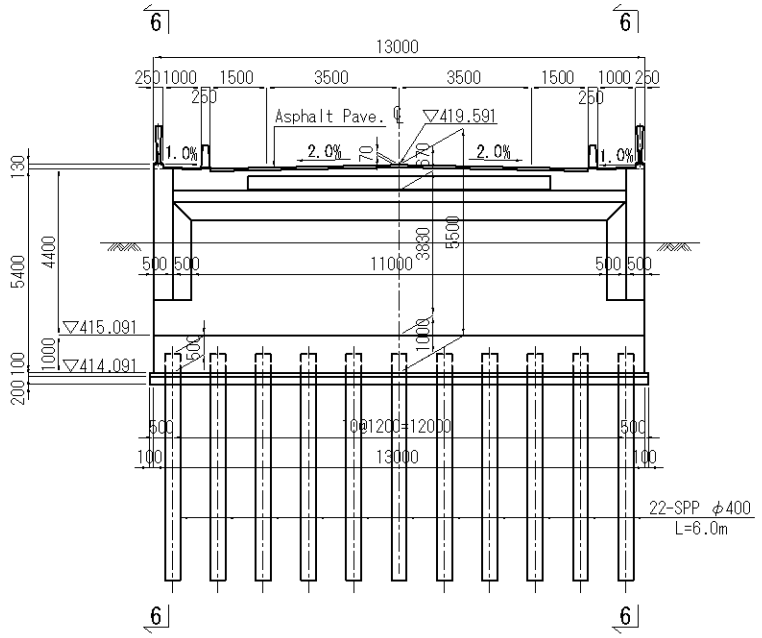
資料6-27

STRUCTURAL DRAWING OF A1 ABUTMENT SCALE 1:100

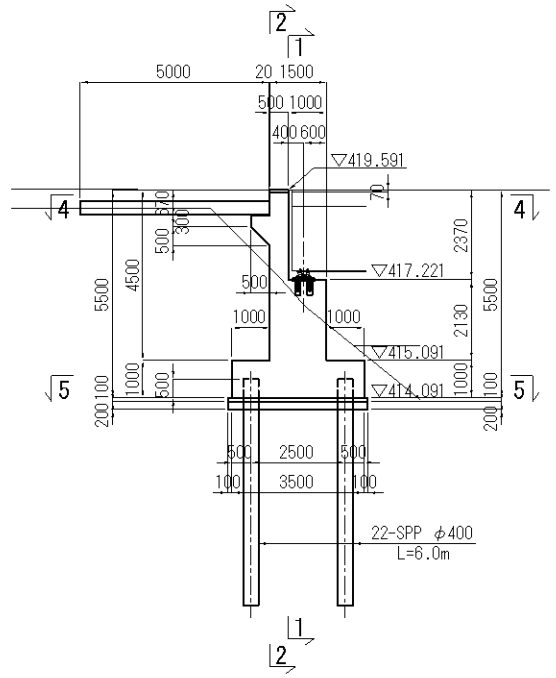
1 - 1



2 - 2



3 - 3



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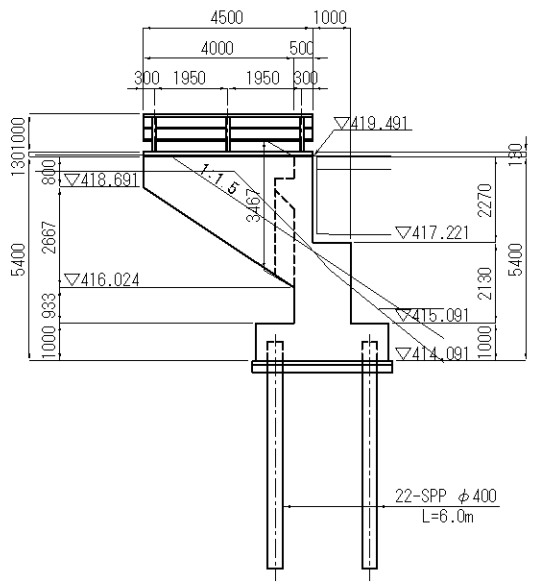

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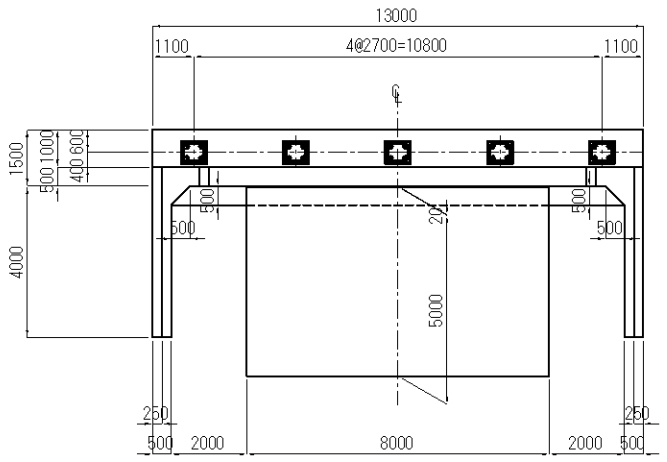

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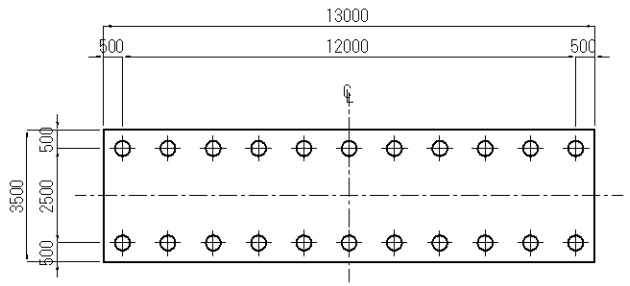
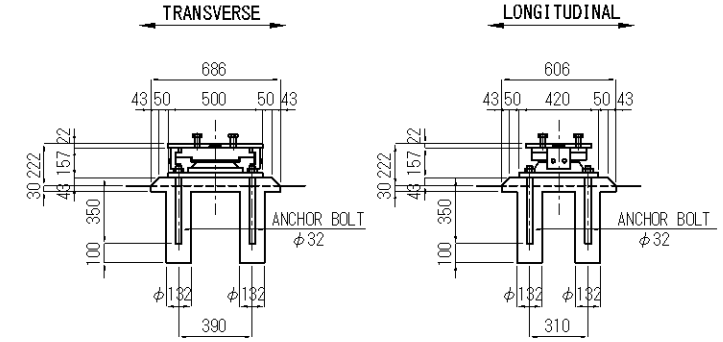
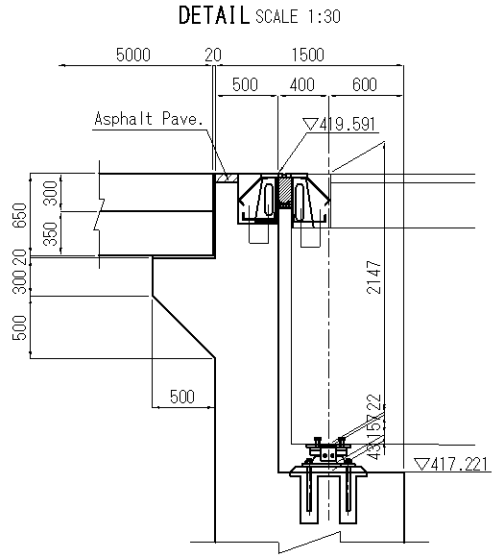


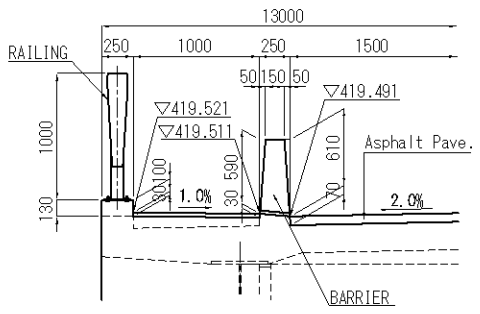
DETAIL SCALE 1:20



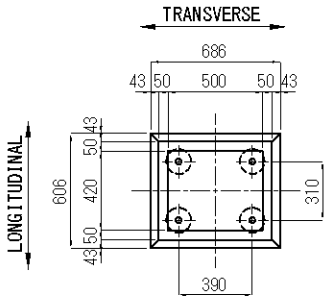
DETAIL SCALE 1:30



DETAIL "a" SCALE 1:30



TRANSVERSE



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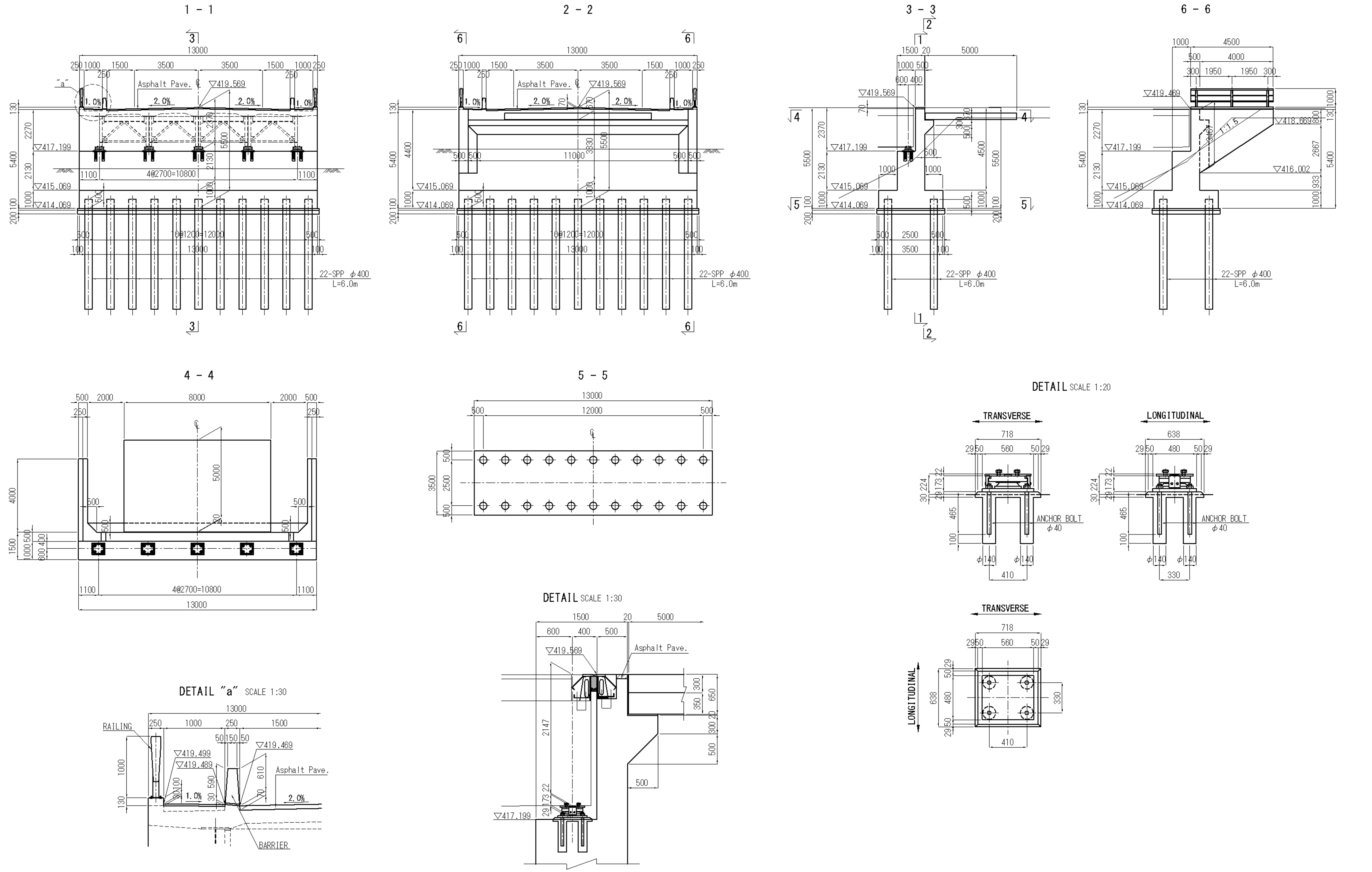
資料6-28

STRUCTURAL DRAWING OF A2 ABUTMENT SCALE 1:100



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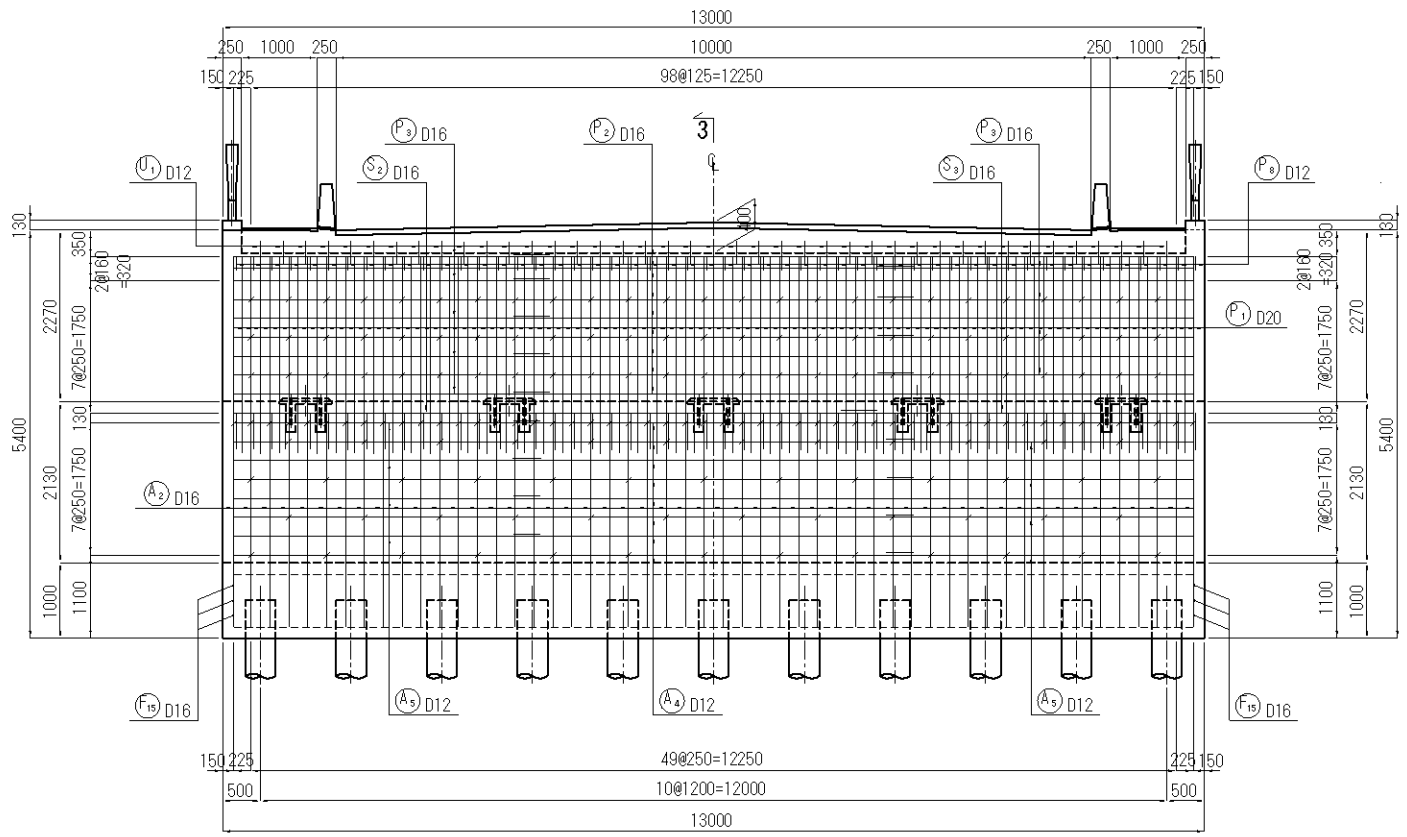
Date : Date :	Date :		DRAWING No: BR2-08	Rv

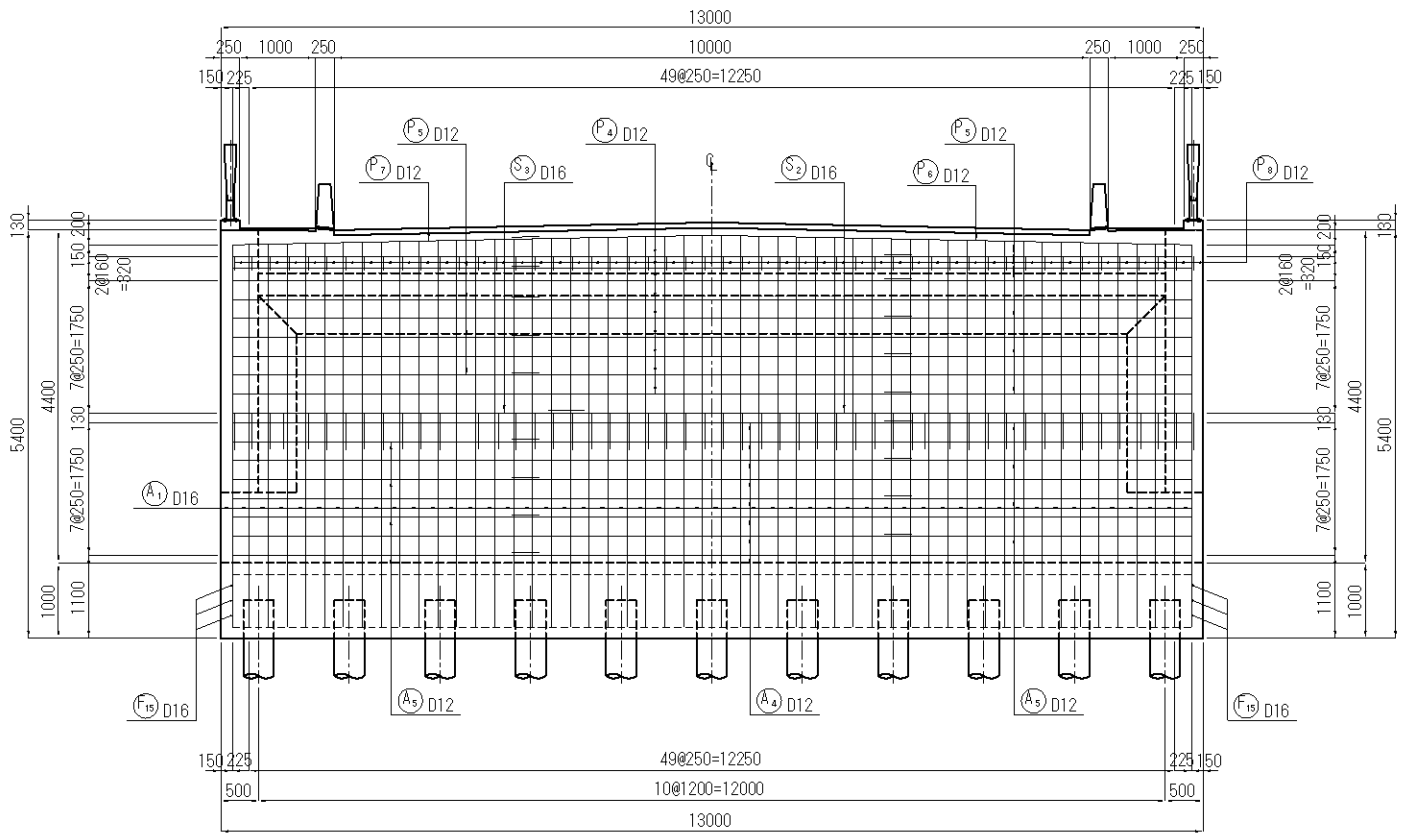
BAR ARRANGEMENT OF A1, A2 ABUTMENT(1) SCALE 1:50

ELEVATION

1 - 1

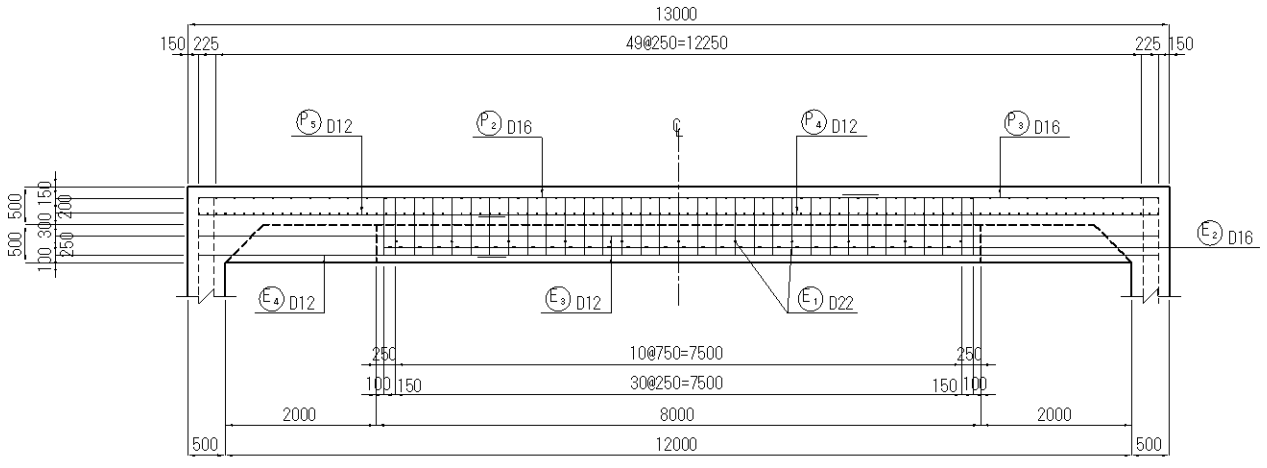


2 - 2

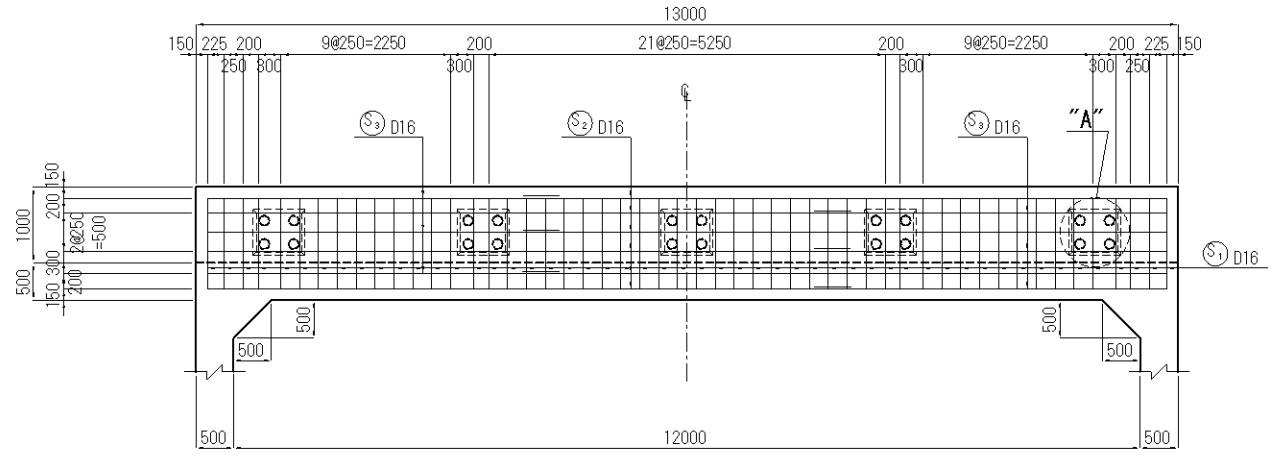


PLAN

4 - 4



5 - 5

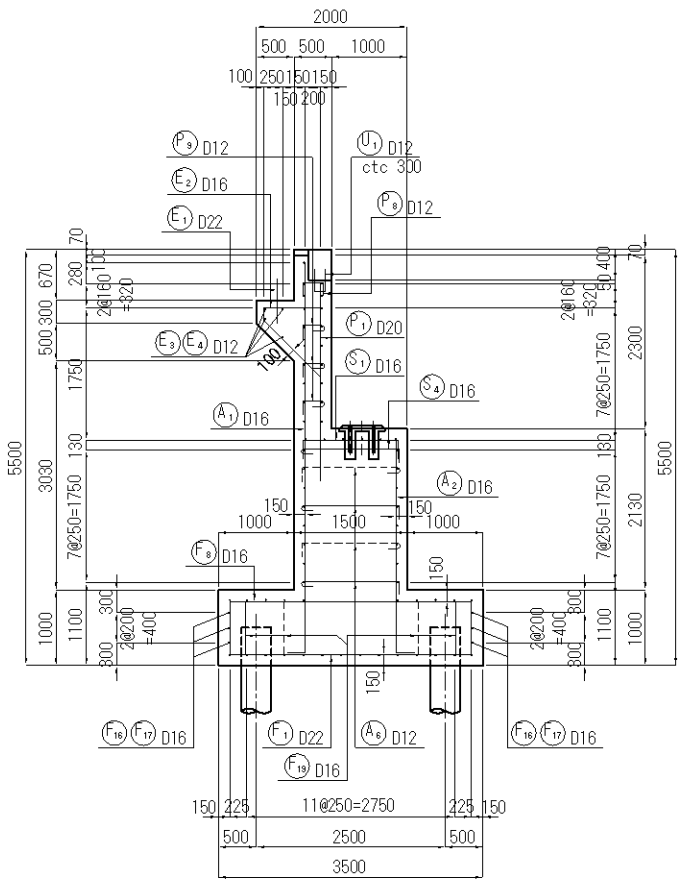


KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : BAR ARRANGEMENT OF A1,A2 ABUTMENT (1)	SCALE : AS SHOWN	DRAWING No: BR2-09	Rv.

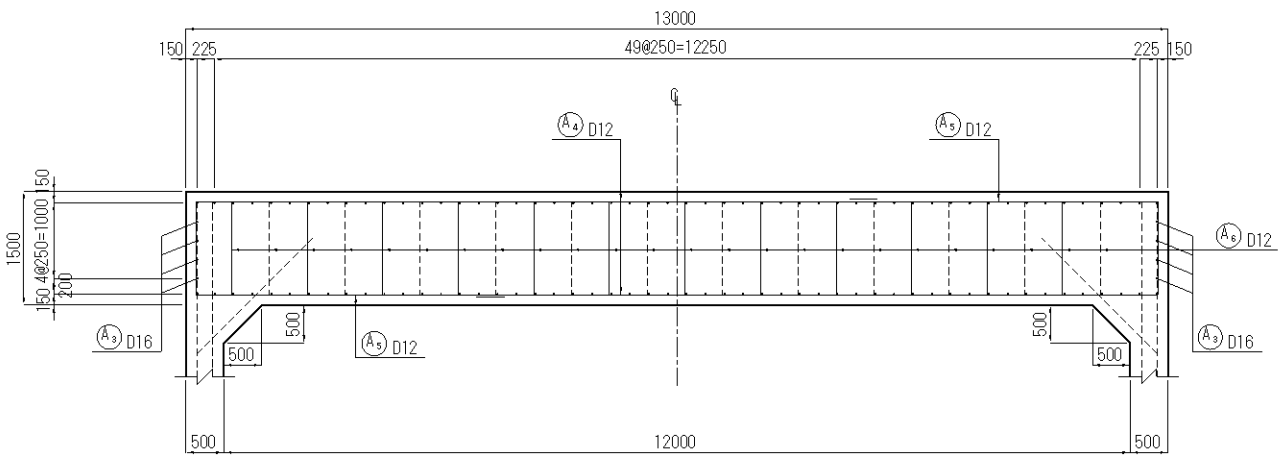
資料6-30

BAR ARRANGEMENT OF A1, A2 ABUTMENT (2) SCALE 1:50

SECTION
3 - 3

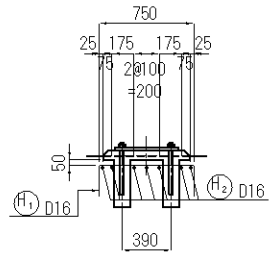


6 - 6

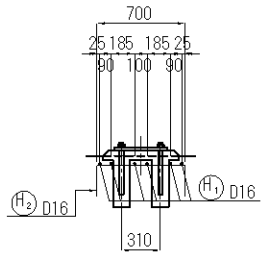


(A1 SIDE)

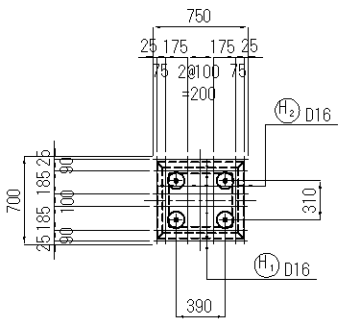
TRANSVERSE



LONGITUDINAL



TRANSVERSE

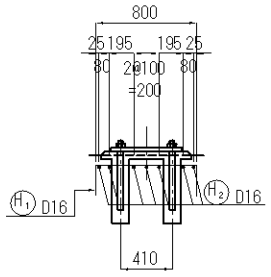


LONGITUDINAL

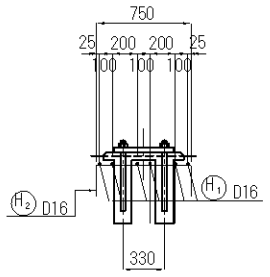
DETAIL "A" SCALE 1:30
(N=5)

(A2 SIDE)

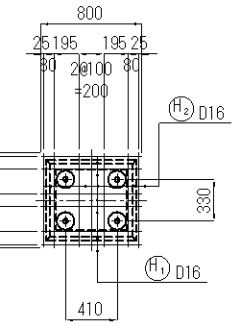
TRANSVERSE



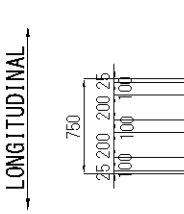
LONGITUDINAL



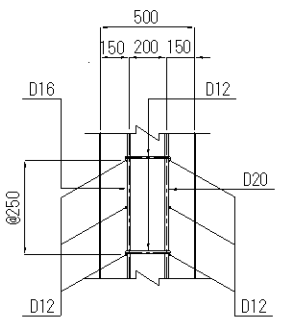
TRANSVERSE



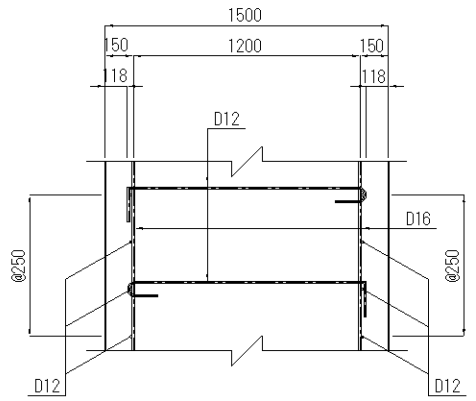
LONGITUDINAL



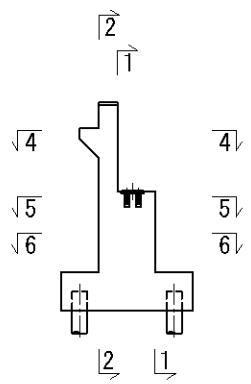
DETAIL SCALE=1:20
(PARAPET)



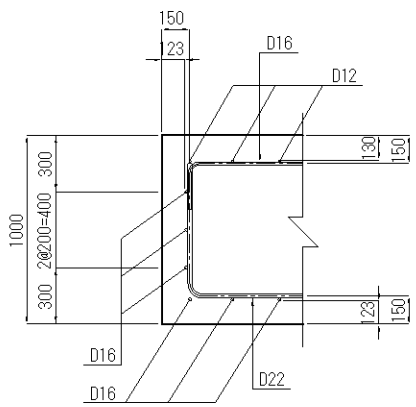
DETAIL SCALE=1:20
(BODY)



MARKING



DETAIL SCALE=1:20
(FOOTING)



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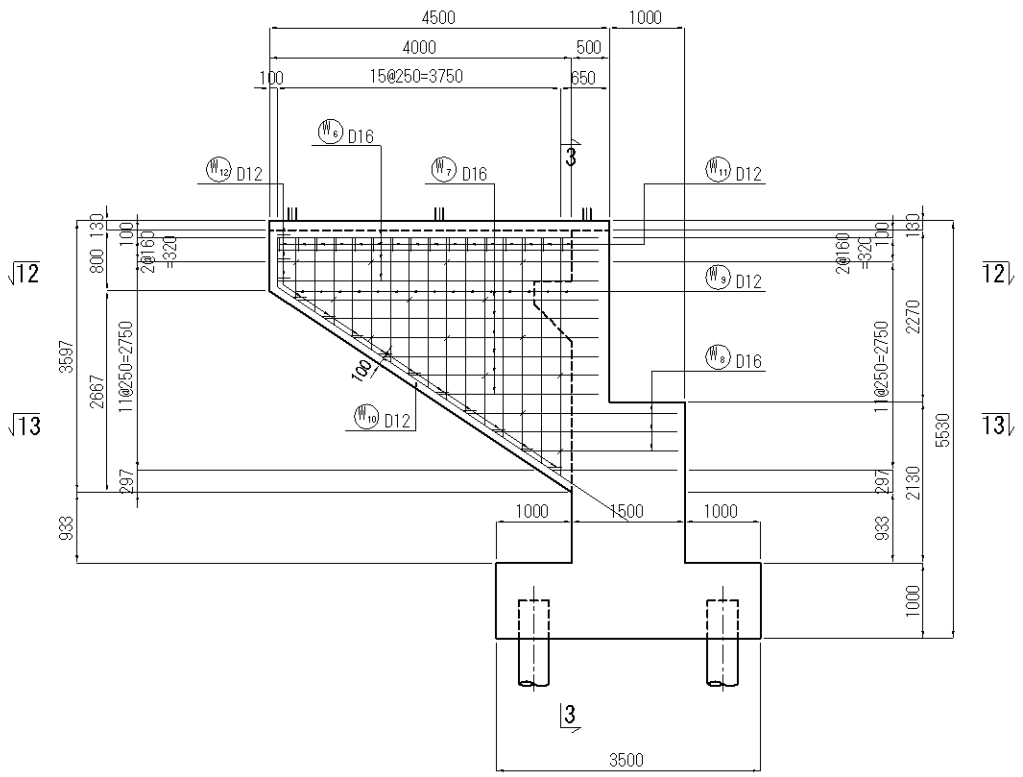
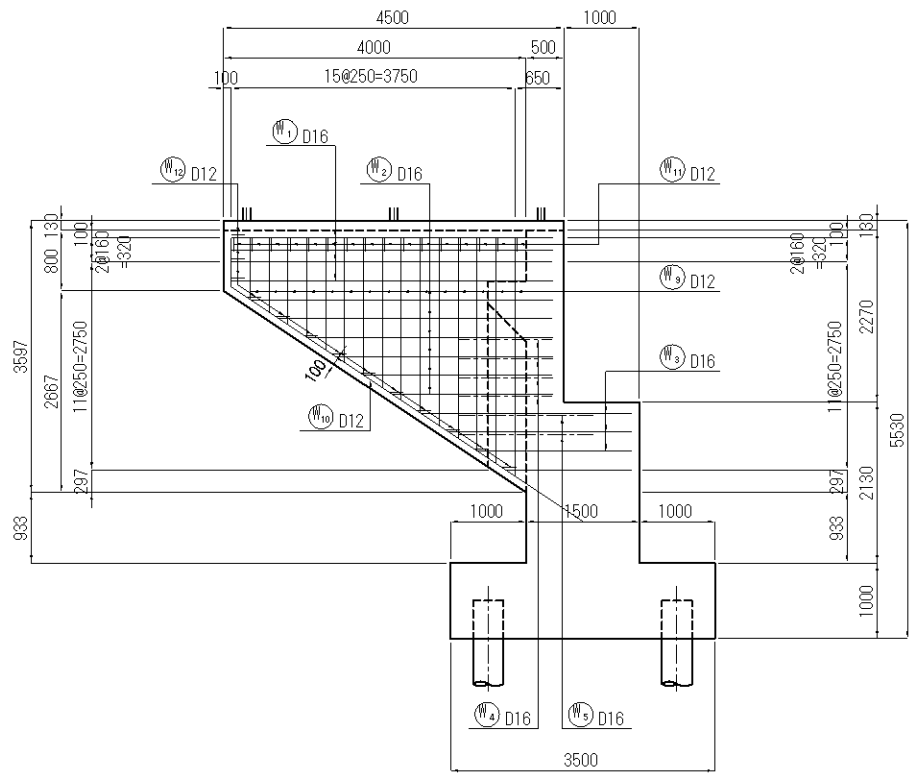
BAR ARRANGEMENT OF A1, A2 ABUTMENT (3) SCALE 1:50

ELEVATION

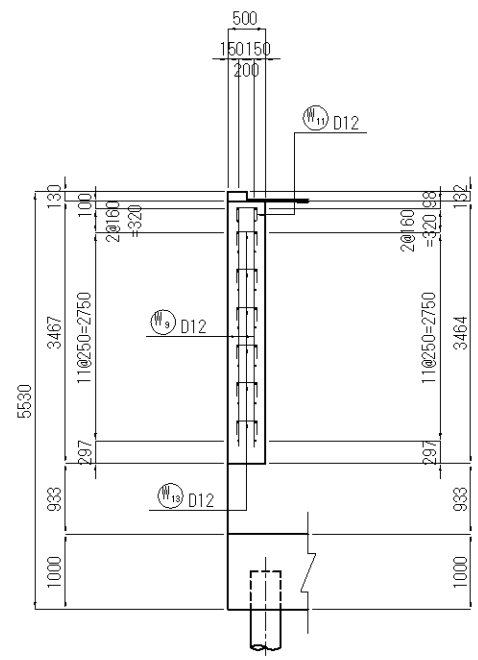
9 - 9



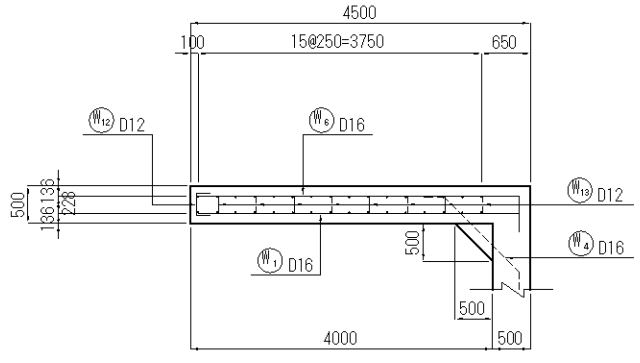
10 - 10



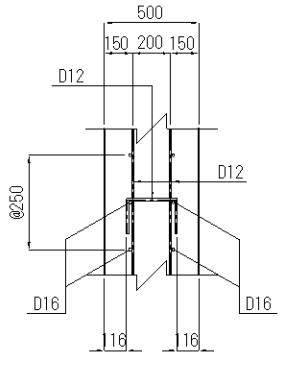
11 - 11



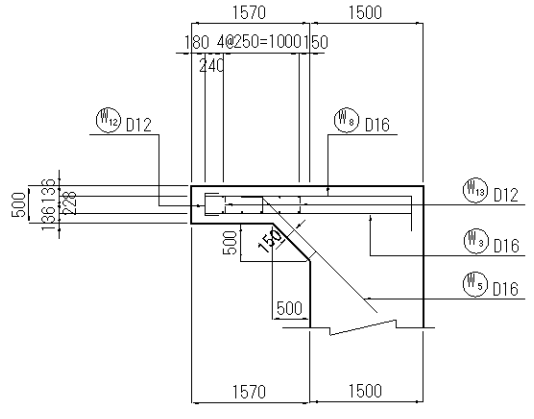
12 - 12



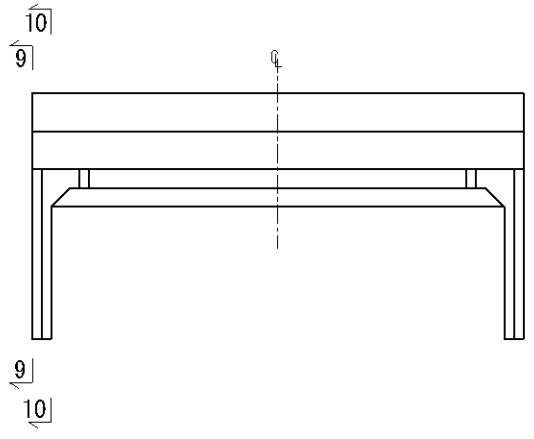
DETAIL SCALE=1:20



13 - 13



MARKING



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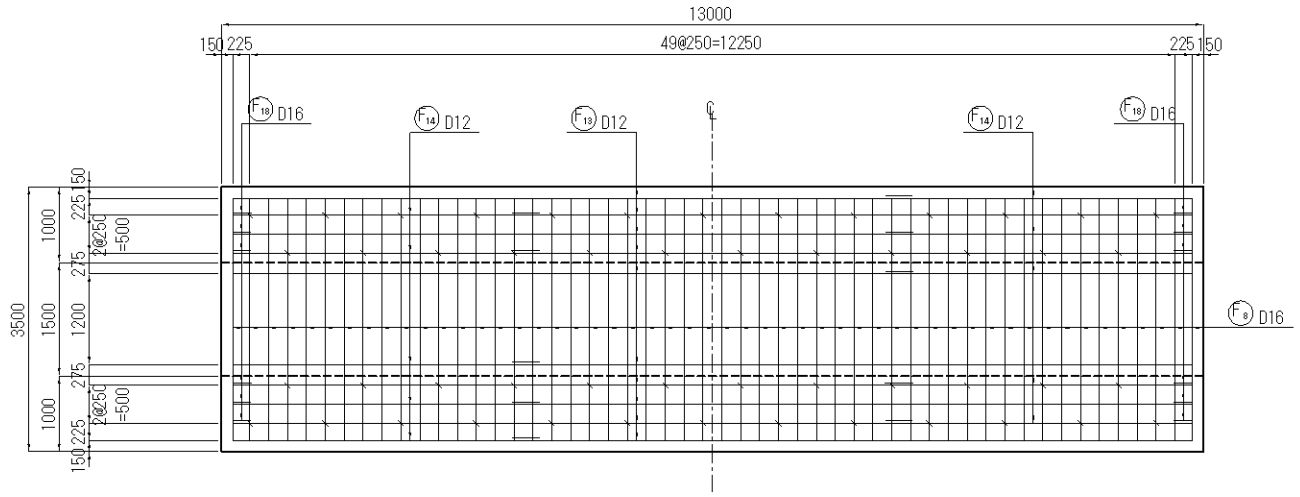
BAR ARRANGEMENT OF A1, A2 ABUTMENT(4) SCALE 1:50

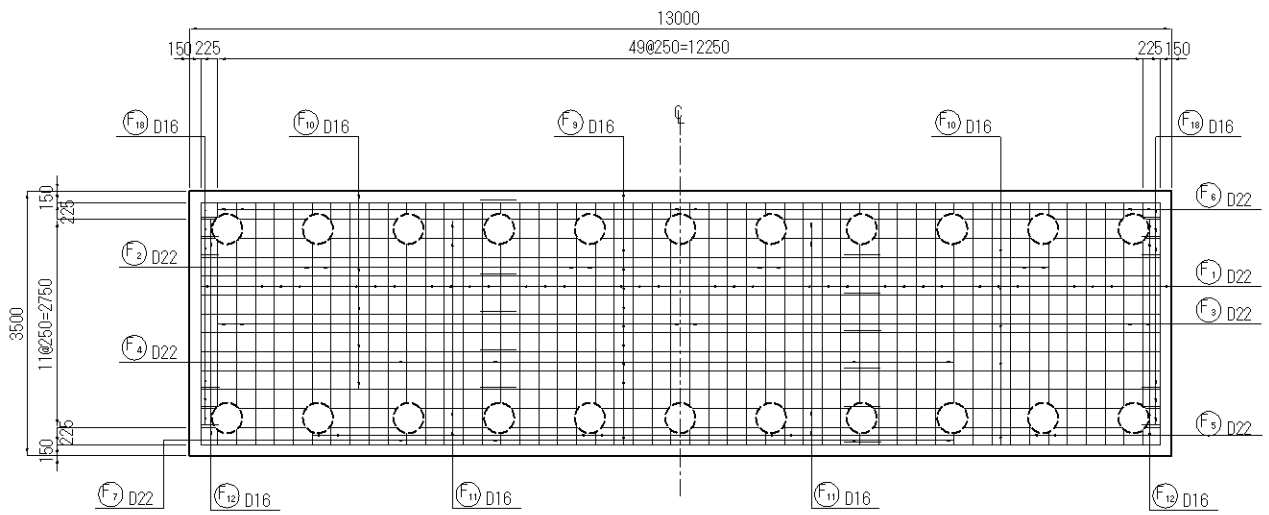
ELEVATION

PLAN

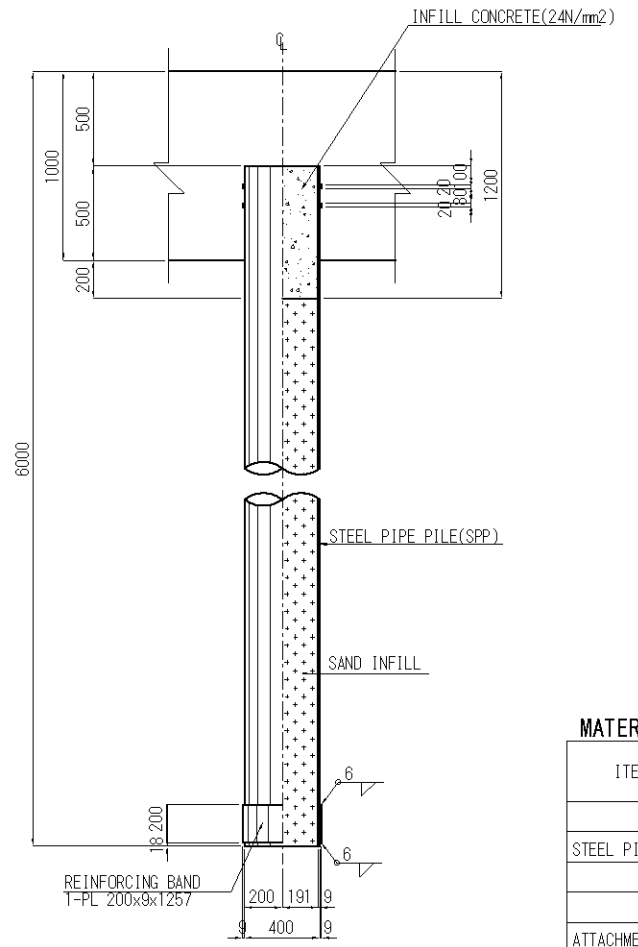
7 - 7



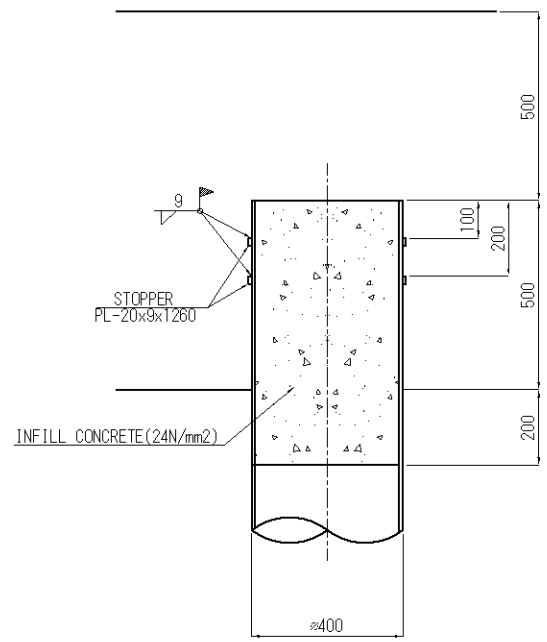
8 - 8



GENERAL ARRANGEMENT OF PILES SCALE 1:20



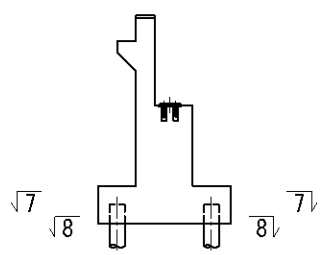
DETAIL OF TOP PILE SCALE 1:10



MATERIAL LIST

ITEM	MARK	MATERIAL	SIZE	LENGTH (mm)	QUANTITY (No)	UNIT WT. (kg/m)	WT/PC. (kg)	WEIGHT (kg)	REMARKS
STEEL PIPE PILE	SPP	SKK400	φ400x9	6000	22	86.8	521	11462	
							SUBTOTAL =	11462 kg	
ATTACHMENT PARTS PER ONE PILE									
STOPPER	PL	SS400	20 x 9	1260	2	1.41	1.78	4	
REINFORCING BAND	PL	SS400	200 x 9	1257	1	14.1	17.72	18	
							SUBTOTAL =	22 kg	
							TOTAL 22 x 22 =	484 kg	
						TOTAL	11462 kg + 484 kg =	11946 kg	

MARKING

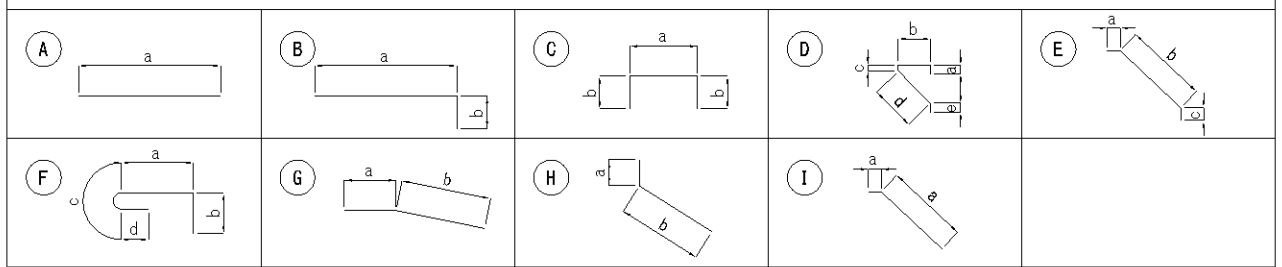


資料6-33

KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : BAR ARRANGEMENT OF A1,A2 ABUTMENT (4)	SCALE : AS SHOWN	DRAWING No: BR2-12 Rv.

BAR ARRANGEMENT OF A1, A2 ABUTMENT (5) SCALE 1:50

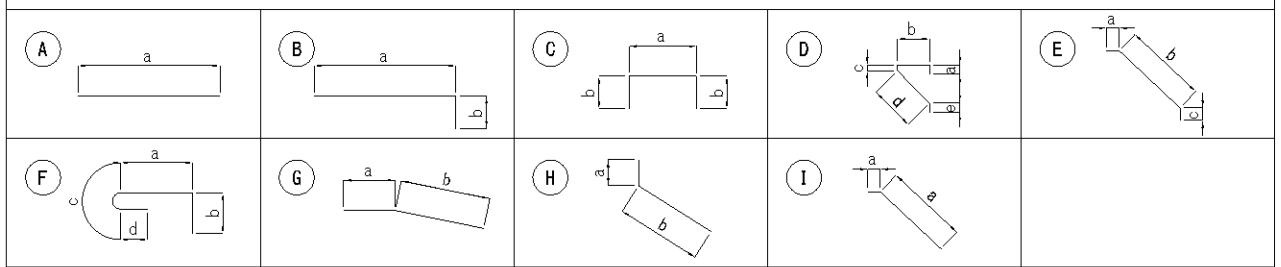
BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	BAR SIZE	SPACING c.t.c(mm)	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	LENGTH (mm)	NO. OF BARS	UNIT WT. (kg/m)	WEIGHT (kg)	REMARKS
PARAPET	P1	D20	AS SHOWN	A	2600					2600	103	2.466	660	
	P2	D16	AS SHOWN	A	9000					9000	9	1.578	128	
	P3	D16	AS SHOWN	A	4180					4180	9	1.578	59	
	P4	D12	AS SHOWN	A	9000					9000	8	0.888	64	
	P5	D12	AS SHOWN	A	4060					4060	8	0.888	29	
	P6	D12	AS SHOWN	G	2649	6351				9000	1	0.888	8	
	P7	D12	AS SHOWN	A	4062					4070	1	0.888	4	
	P8	D12	AS SHOWN	C	250	180				610	52	0.888	28	
	P9	D12	AS SHOWN	F	222	180	113	120		640	75	0.888	43	
	E1	D22	AS SHOWN	A	600					600	11	2.984	20	
	E2	D16	AS SHOWN	D	240	750	159	1061	240	2490	33	1.578	130	
	E3	D12	AS SHOWN	A	9000					9000	4	0.888	32	
	E4	D12	AS SHOWN	A	4060					4060	4	0.888	14	
	U1	D12	AS SHOWN	C	150	300				750	41	0.888	27	
												SUBTOTAL	= 1246 kg	
BODY	A1	D16	AS SHOWN	B	5178 ~5053	240				5360	52	1.578	440	
	A2	D16	AS SHOWN	B	2830	240				3070	52	1.578	252	
	A3	D16	AS SHOWN	B	2830	240				3070	8	1.578	39	
	A4	D12	AS SHOWN	A	9000					9000	16	0.888	128	
	A5	D12	AS SHOWN	A	4060					4060	16	0.888	58	
	A6	D12	AS SHOWN	F	1416	180	113	120		1630	50	0.888	72	
	S1	D16	AS SHOWN	C	1200	480				2160	52	1.578	177	
	S2	D16	AS SHOWN	B	8520	480				9000	6	1.578	85	
	S3	D16	AS SHOWN	B	4660	480				5140	6	1.578	49	
	S4	D16	AS SHOWN	F	1208	240	151	128		1730	52	1.578	142	
	H1	D16	AS SHOWN	C	750	240				1230	30	1.578	58	A1 SIDE
	H2	D16	AS SHOWN	C	700	240				1180	35	1.578	65	A1 SIDE
		D16	AS SHOWN	C	800	240				1280	30	1.578	61	A2 SIDE
		D16	AS SHOWN	C	750	240				1230	30	1.578	58	A2 SIDE
											A1 SIDE	SUBTOTAL	= 1565 kg	
											A2 SIDE	SUBTOTAL	= 1561 kg	
FOOTING	F1	D22	AS SHOWN	C	3200	700				4600	34	2.984	467	
	F2	D22	AS SHOWN	A	3206 ~2129					2670	8	2.984	64	
	F3	D22	AS SHOWN	A	2188					2190	6	2.984	39	
	F4	D22	AS SHOWN	A	2100					2100	4	2.984	25	
	F5	D22	AS SHOWN	B	700	253 ~165				910	16	2.984	43	
	F6	D22	AS SHOWN	B	700	194				900	12	2.984	32	
	F7	D22	AS SHOWN	B	700	150				850	8	2.984	20	
	F8	D16	AS SHOWN	C	3200	240				3680	52	1.578	302	
	F9	D16	AS SHOWN	A	9000					9000	10	1.578	142	
	F10	D16	AS SHOWN	A	4180					4180	10	1.578	66	
	F11	D16	AS SHOWN	A	888					890	20	1.578	28	

BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	BAR SIZE	SPACING c.t.c(mm)	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	LENGTH (mm)	NO. OF BARS	UNIT WT. (kg/m)	WEIGHT (kg)	REMARKS
FOOTING	F12	D16	AS SHOWN	B	240	190				430	8	1.578	5	
	F13	D12	AS SHOWN	A	9000					9000	10	0.888	80	
	F14	D12	AS SHOWN	A	4060					4060	10	0.888	36	
	F15	D16	AS SHOWN	C	3538	240				4020	6	1.578	38	
	F16	D16	AS SHOWN	B	8760	240				9000	6	1.578	85	
	F17	D16	AS SHOWN	B	4458	240				4700	6	1.578	44	
	F18	D16	AS SHOWN	C	700	240				1180	12	1.578	22	
	F19	D16	AS SHOWN	F	687	240	151	128		1210	50	1.578	95	
												SUBTOTAL	= 1633 kg	
WING WALL	W1	D16	AS SHOWN	B	4250	240				4490	4	1.578	28	
	W2	D16	AS SHOWN	B	3990 ~2115	240				3300	6	1.578	31	
	W3	D16	AS SHOWN	B	2790 ~1665	240				2470	3	1.578	12	
	W4	D16	AS SHOWN	E	240	1397	240			1880	4	1.578	12	
	W5	D16	AS SHOWN	B	240	2160				2400	2	1.578	8	
	W6	D16	AS SHOWN	B	4250	240				4490	4	1.578	28	
	W7	D16	AS SHOWN	B	3990 ~2115	240				3300	6	1.578	31	
	W8	D16	AS SHOWN	B	2790 ~1665	240				2470	3	1.578	12	
	W9	D12	AS SHOWN	A	813 ~3146					1980	30	0.888	53	
	W10	D12	AS SHOWN	H	646	5589				6240	2	0.888	11	
	W11	D12	AS SHOWN	C	250	180				610	16	0.888	9	
	W12	D12	AS SHOWN	C	228	180				590	13	0.888	7	
	W13	D12	AS SHOWN	C	256	180				620	14	0.888	8	
												SUBTOTAL	= 250 kg	
												TOTAL 250 x 2	= 500 kg	

A1 SIDE TOTAL 1246 kg + 1565 kg + 1633 kg + 500 kg = 4944 kg

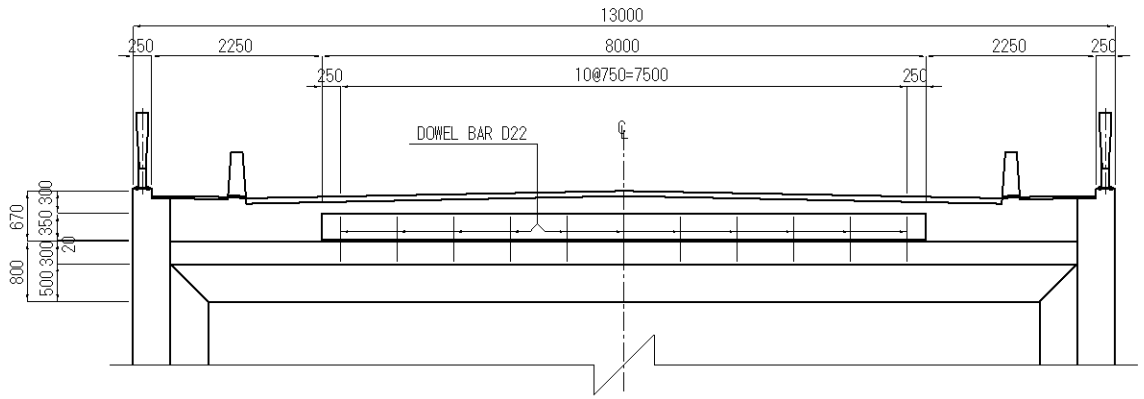
A2 SIDE TOTAL 1246 kg + 1561 kg + 1633 kg + 500 kg = 4940 kg

資料6-34

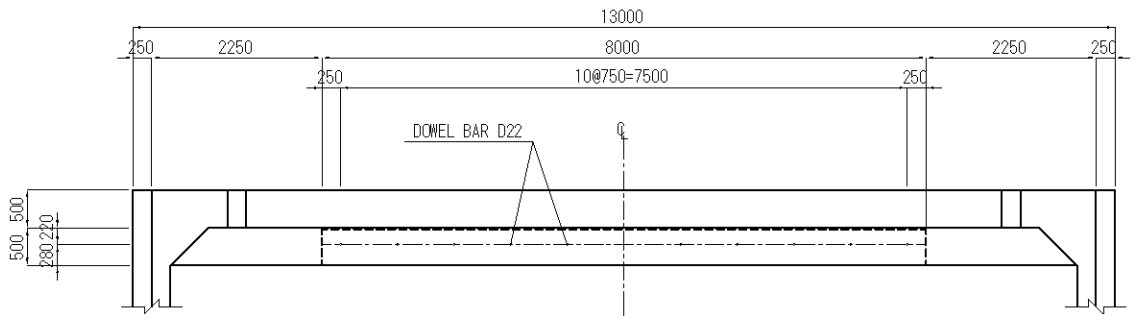
KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : BAR ARRANGEMENT OF A1,A2 ABUTMENT (5)	SCALE : AS SHOWN	DRAWING No: BR2-13 Rv.

BAR ARRANGEMENT OF A1, A2 APPROACH SLAB SCALE 1:50

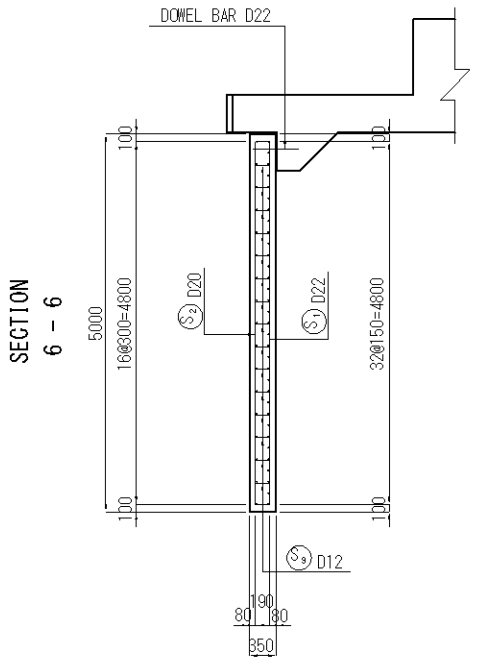
ELEVATION
1 - 1



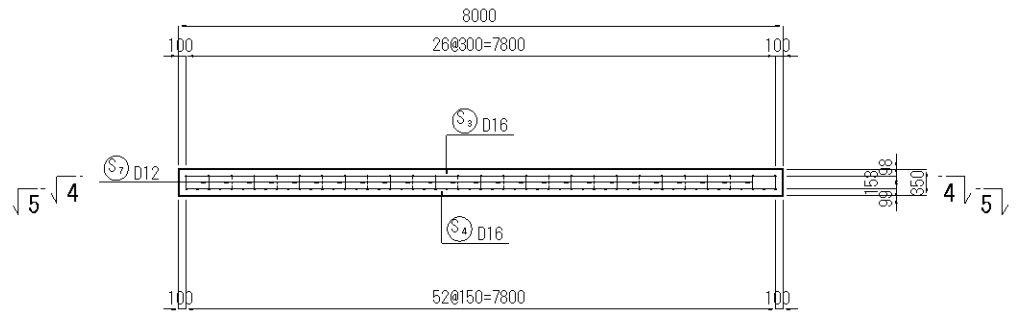
PLAN
2 - 2



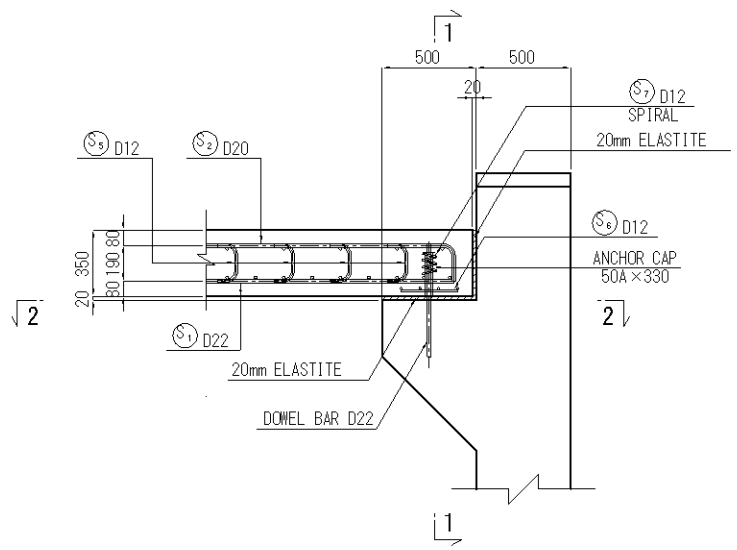
SECTION
6 - 6



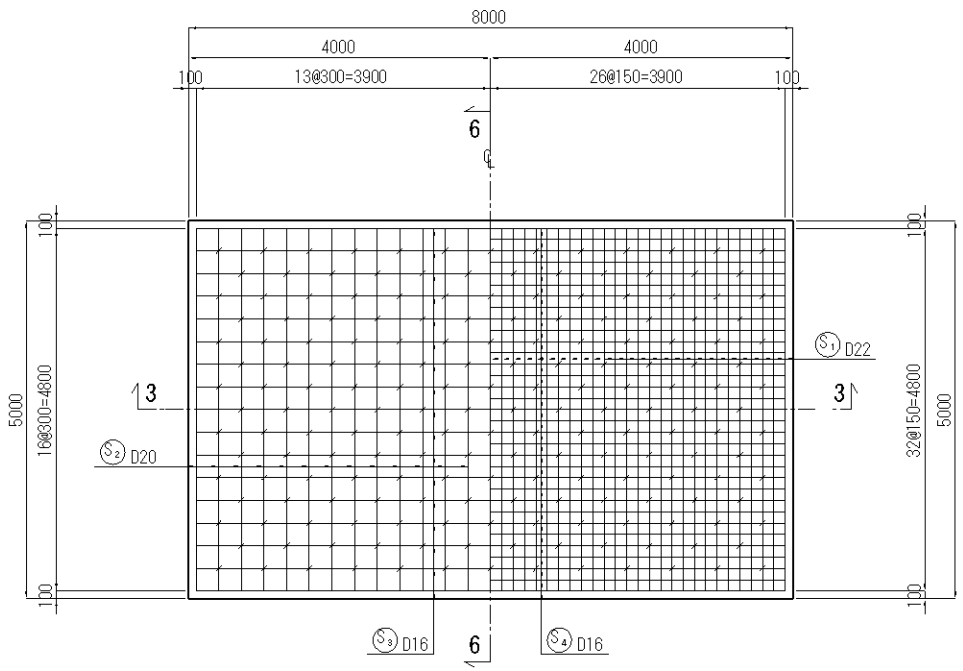
ELEVATION
3 - 3



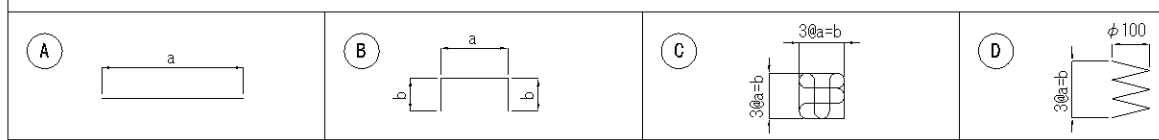
DETAIL SCALE=1:20



PLAN
4 - 4 5 - 5



BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	BAR SIZE	SPACING c.t.c(mm)	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	LENGTH (mm)	NO. OF BARS	UNIT WT. (kg/m)	WEIGHT (kg)	REMARKS
APPROACH SLAB	S1	D22	AS SHOWN	A	4800					4800	53	2.984	759	
	S2	D20	AS SHOWN	B	4800	190				5180	27	2.466	345	
	S3	D16	AS SHOWN	B	7800	153				8110	17	1.578	218	
	S4	D16	AS SHOWN	A	7800					7800	33	1.578	406	
	S5	D12	AS SHOWN	B	181	100				390	188	0.888	65	
	S6	D12	AS SHOWN	C	100	300				1370	22	0.888	27	
	S7	D12	AS SHOWN	D	50	150				960	11	0.888	9	
												TOTAL	= 1829 kg	

KATAHIRA & ENGINEERS INTERNATIONAL
Designed by : Date :
Checked by : Date :

MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN
Approved by : Date :

THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)

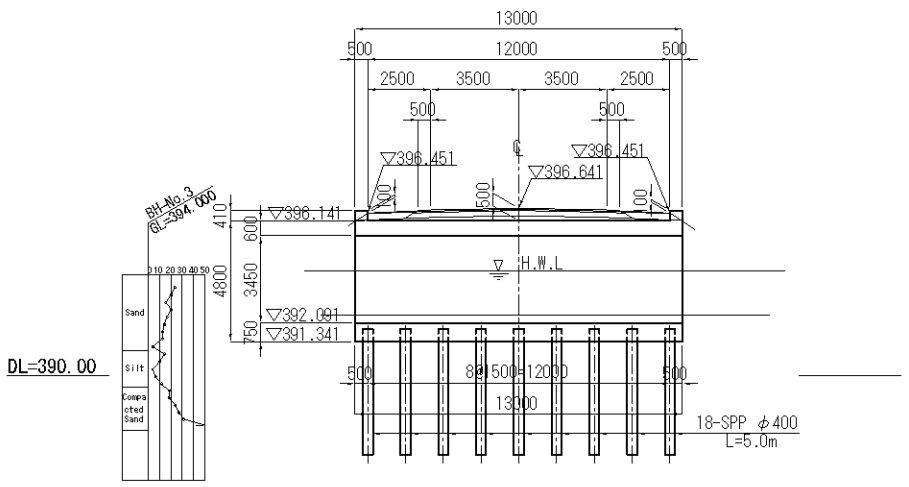
TITLE : BAR ARRANGEMENT OF A1,A2 APPROACH SLAB

SCALE : AS SHOWN

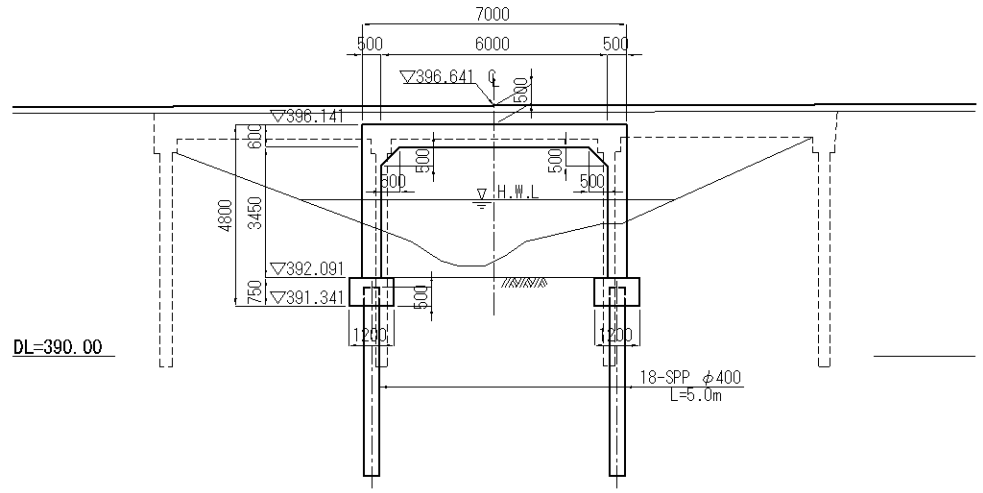
DRAWING No: BR2-14 Rv.

GENERAL VIEW OF No.3 PORTAL RAHMEN BRIDGE

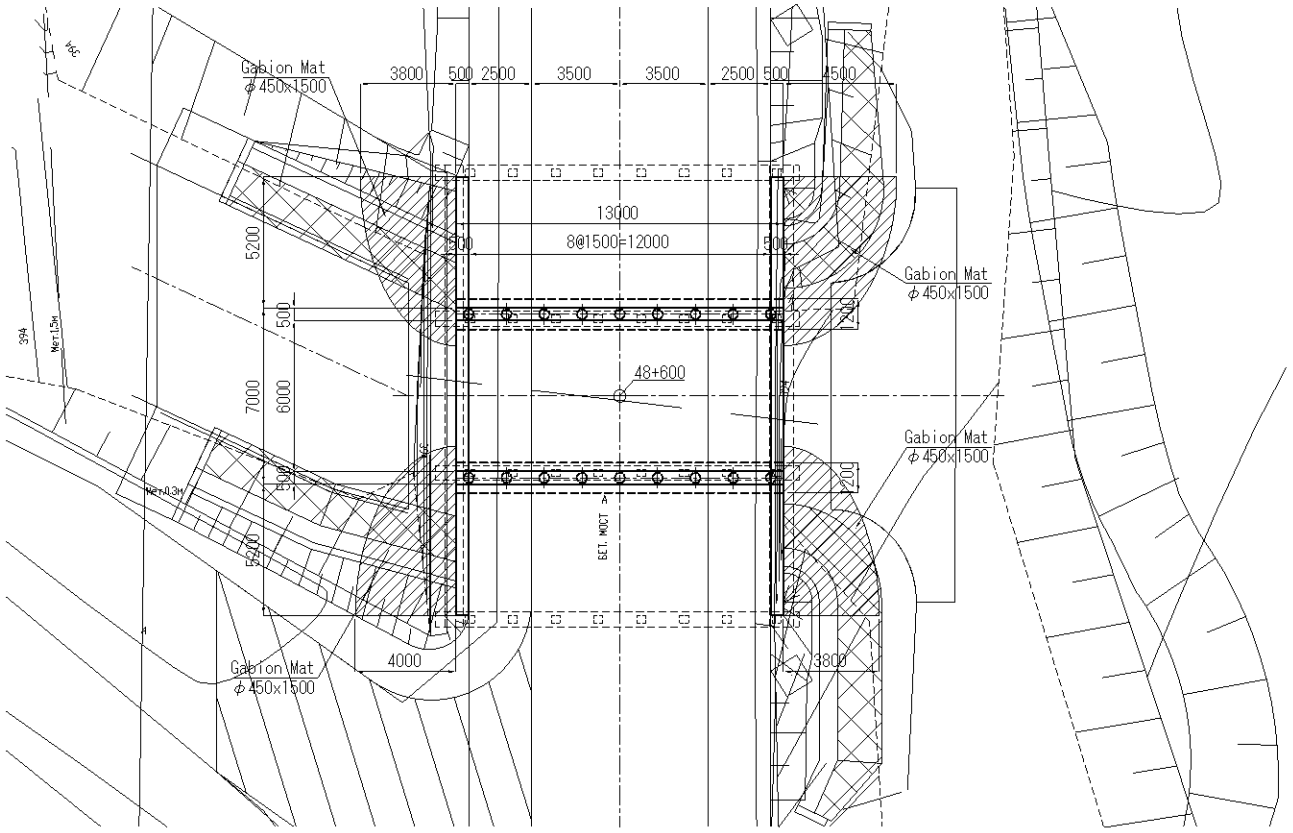
ELEVATION S=1:300



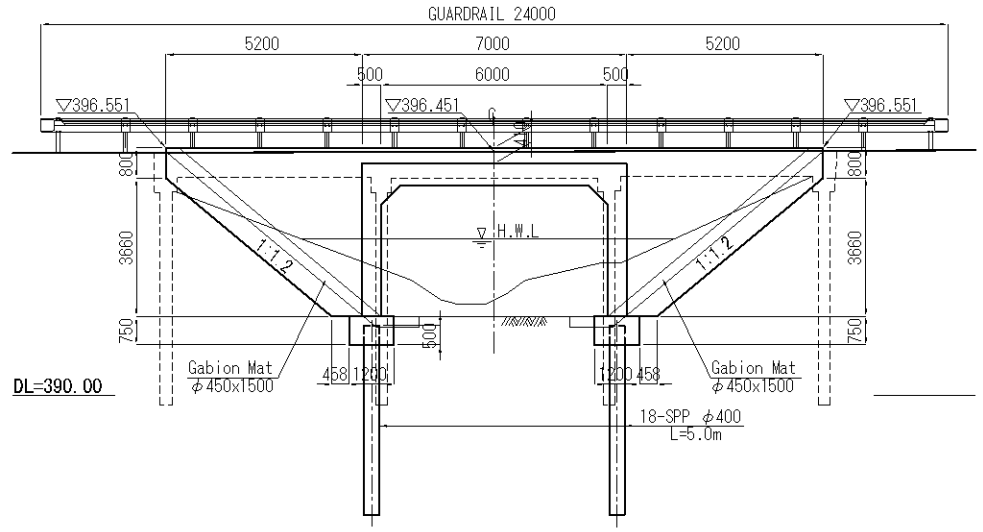
PORTAL RAHMEN S=1:200



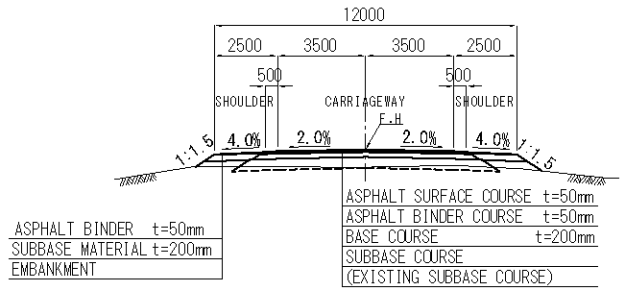
PLAN S=1:300



WING S=1:200



GENERAL SECTION S=1:300



DESIGN CRITERIA

CONSTRUCTION WIDTH	INSIDE WIDTH(B)	B=6.00m
	CLEARANCE (H)	H=3.45m
VERTICAL LOAD	EARTH PRESSURE	LOADING SOIL
	LIVE LOAD	B-LIVE LOAD
HORIZONTAL LOAD	EARTH PRESSURE	AT REST
	COEFFICIENT	Ka=0.5
UNIT WEIGHT	BACKFILLING SOIL	18.0KN/m³
	REINFORCE CONCRETE	24.5KN/m³
IMPACT		i=0.3

MATERIAL STRENGTH

CONCRETE (24N/mm2)	DESIGN STRENGTH	σck=24N/mm²
	ALLOWABLE COMPRE. STRESS	σca= 8N/mm²
	ALLOWABLE SHEAR STRESS	τa=0.23N/mm²
	ALLOWABLE BONDING STRESS	τo=1.6N/mm²
REINRORCE BAR (SD295)	YIELD STRENGTH	fy=295N/mm²
	ALLOWABLE TENSILE STRESS	σsa=180N/mm²
STEEL PIPE PILE (SKK400)	YIELD STRENGTH	fy=235N/mm²
	ALLOWABLE TENSILE STRESS	σsa=140N/mm²

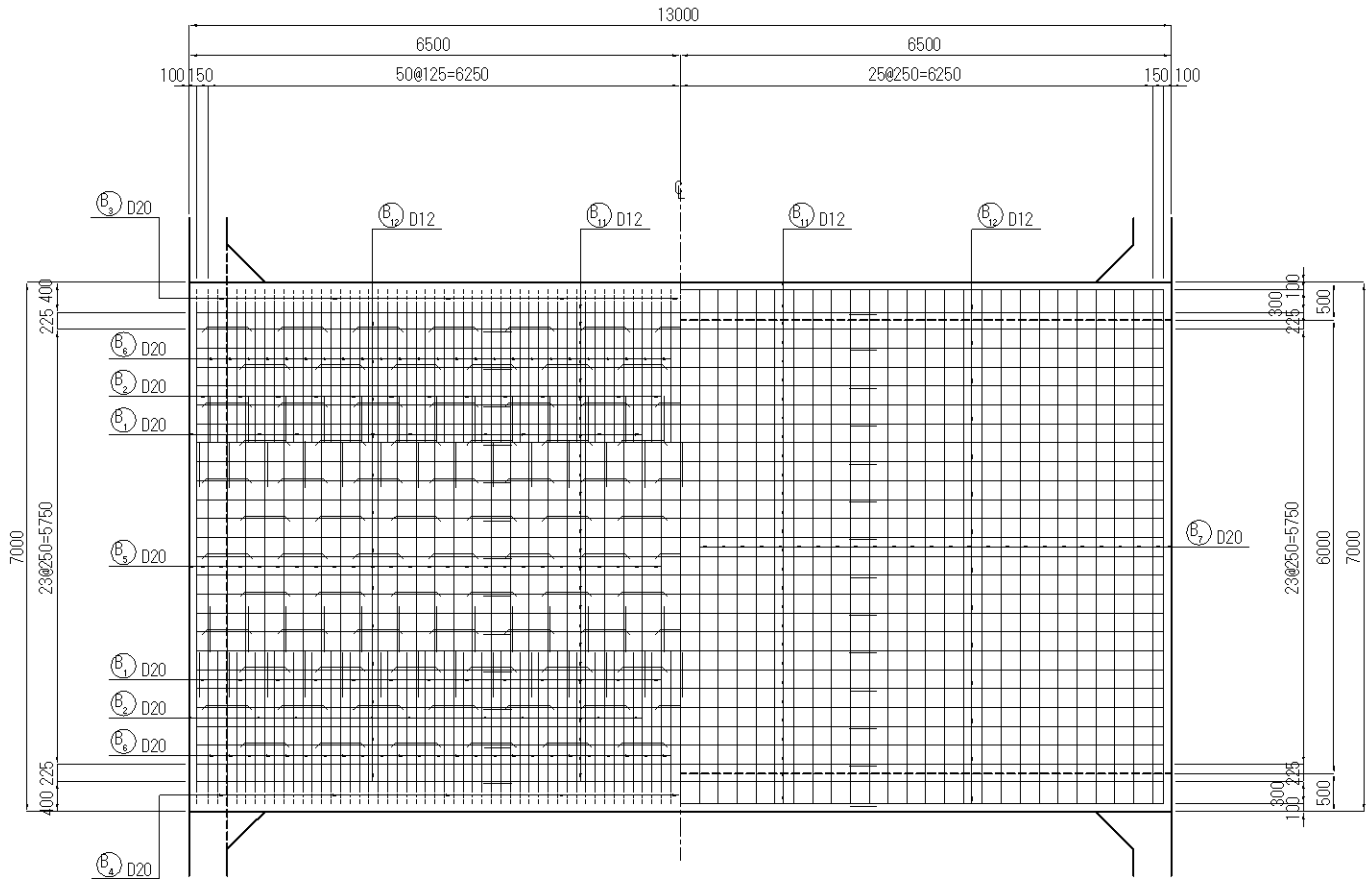
資料6-36

KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : GENERAL VIEW OF NO.3 PORTAL RAHMEN BRIDGE	SCALE : AS SHOWN	DRAWING No: BR3-01 Rv.

BAR ARRANGEMENT OF PORTAL RAHMEN BRIDGE(1) SCALE 1:50

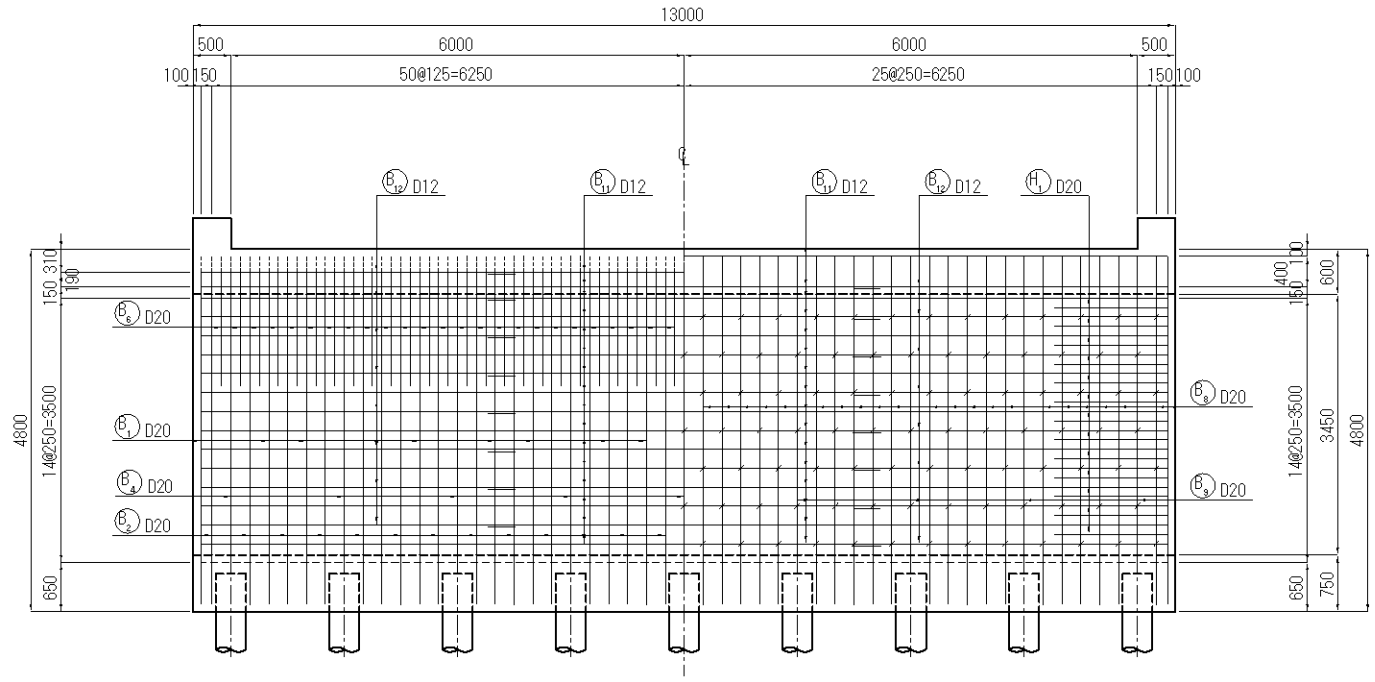
ELEVATION

1 - 1



2 - 2

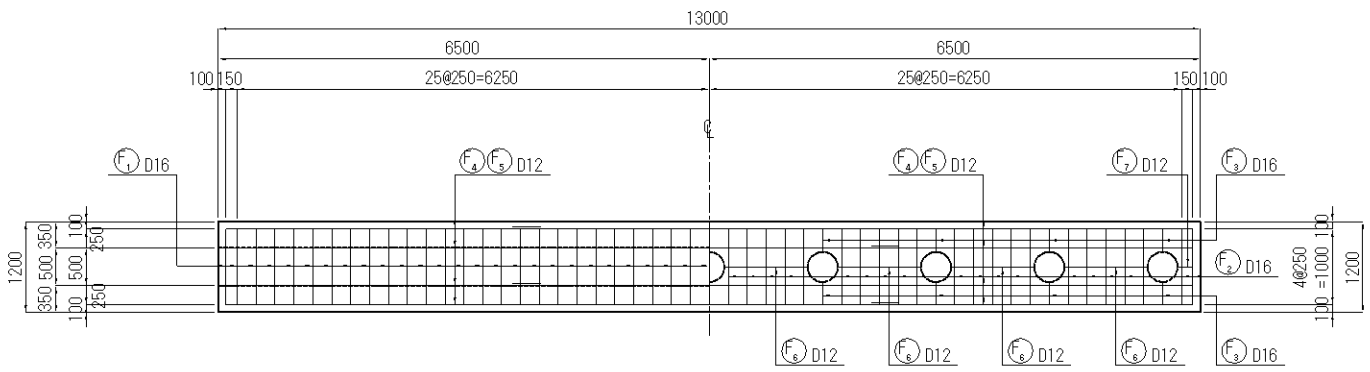
4 - 4



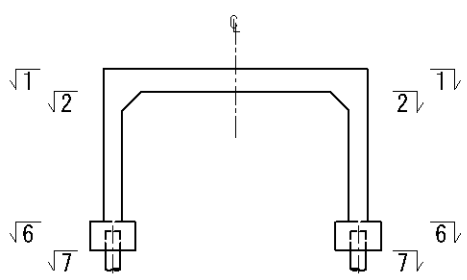
5 - 5

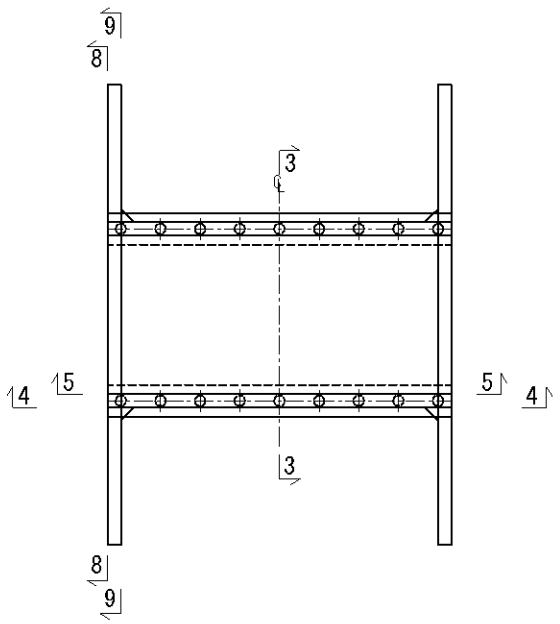
PLAN

6 - 6



7 - 7



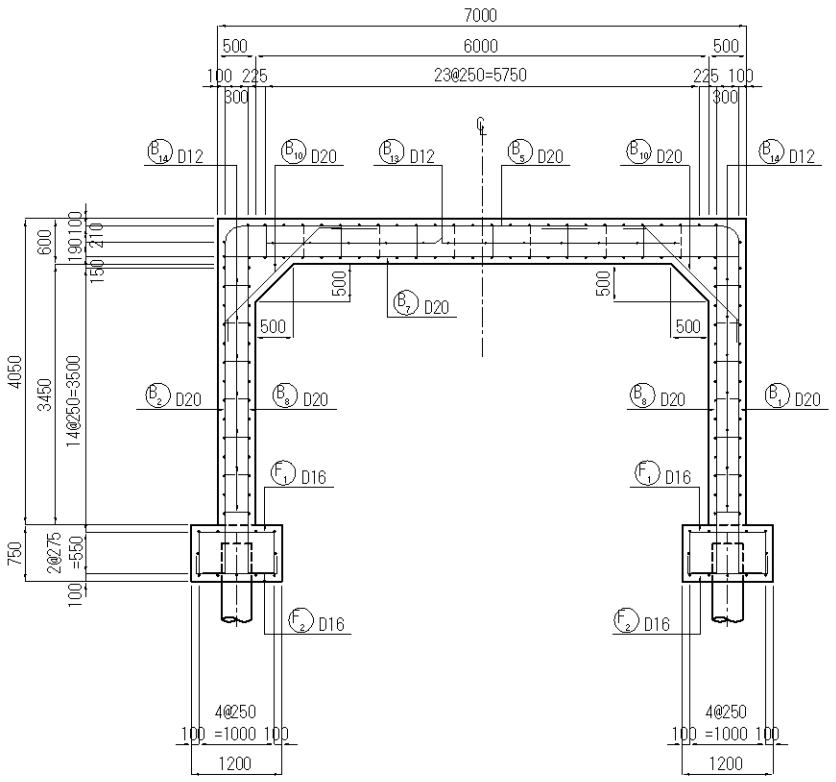


KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : BAR ARRANGEMENT OF NO.3 PORTAL RAHMEN BRIDGE(1)	SCALE : 1/50	DRAWING No: BR3-02 Rv.

資料6-37

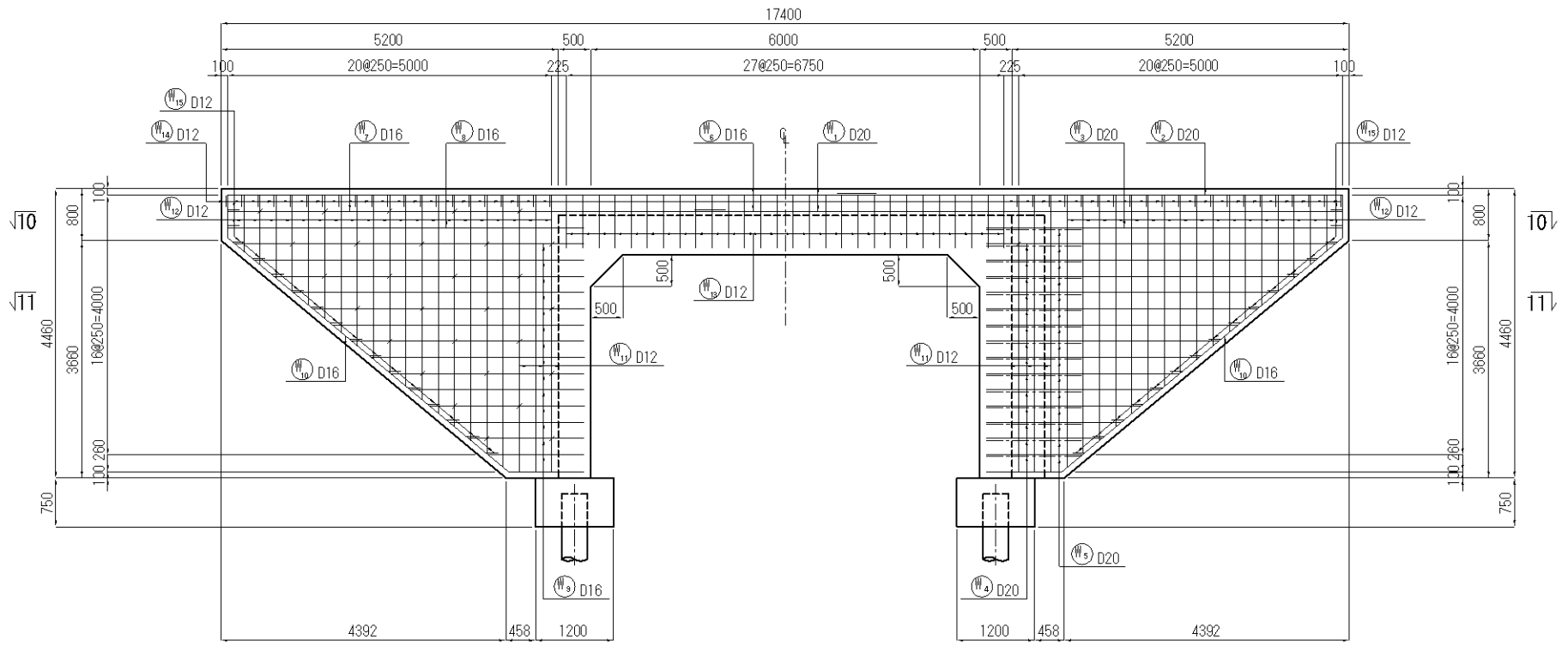
BAR ARRANGEMENT OF NO.3 PORTAL RAHMEN BRIDGE (2) SCALE 1:50

SECTION
3 - 3

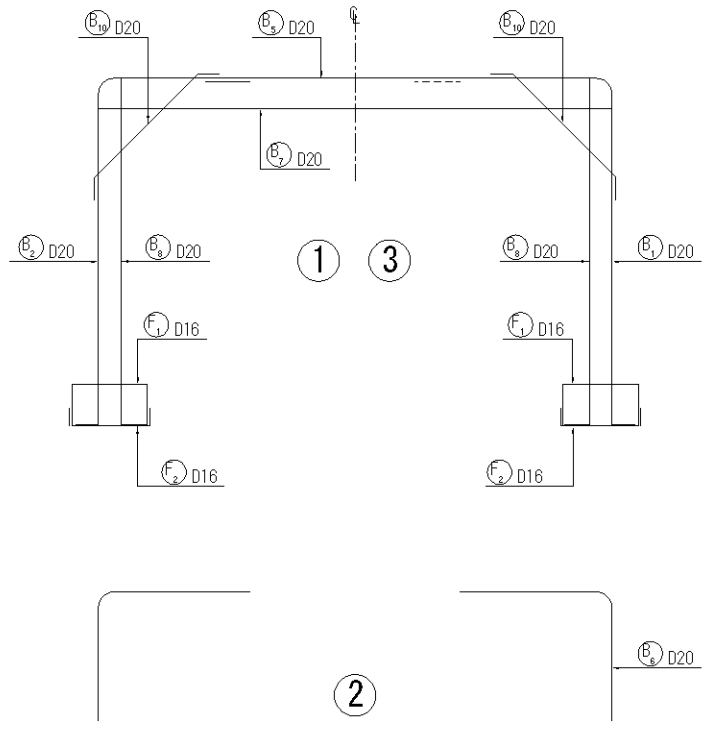


ELEVATION

8 - 8

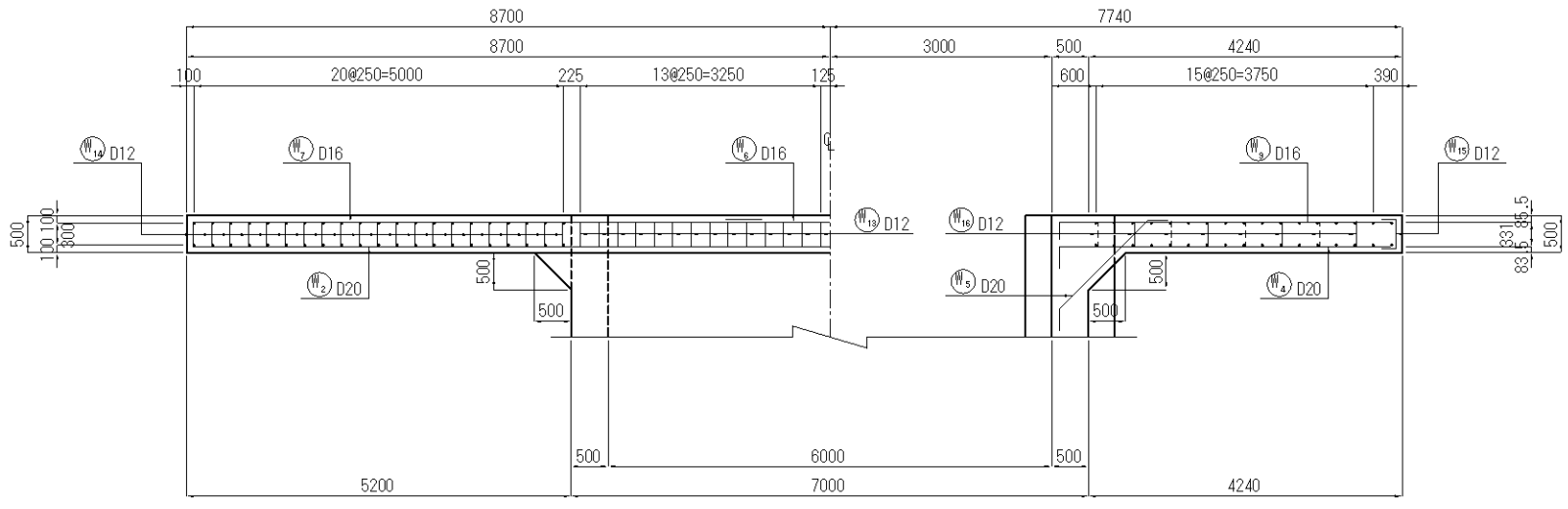


9 - 9



10 - 10

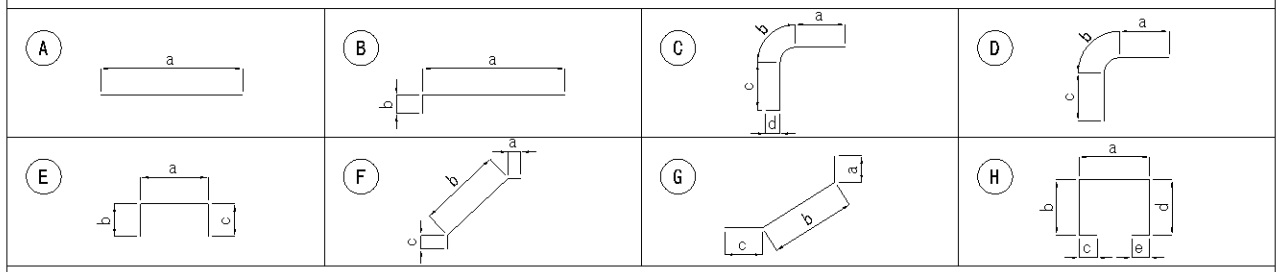
11 - 11



KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : BAR ARRANGEMENT OF NO.3 PORTAL RAHMEN BRIDGE(2)	SCALE : 1/50	DRAWING No: BR3-03 Rv.

BAR ARRANGEMENT OF NO.3 PORTAL RAHMEN BRIDGE (3) SCALE 1:50

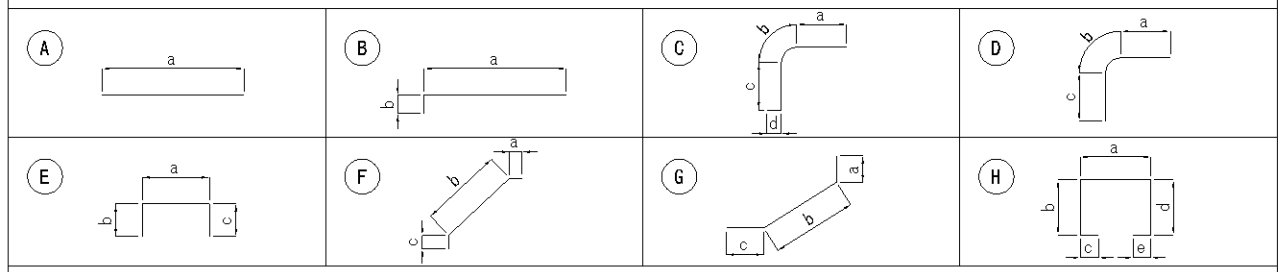
BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	BAR SIZE	SPACING ctc(mm)	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	LENGTH (mm)	NO. OF BARS	UNIT WT. (kg/m)	WEIGHT (kg)	REMARKS
BODY	B1	D20	AS SHOWN	C	2400	330	4372	300		9590	44	2.466	1041	
	B2	D20	AS SHOWN	C	1800	330	4372	300		7410	44	2.466	804	
	B3	D20	AS SHOWN	D	2400	330	3990			8900	9	2.466	198	
	B4	D20	AS SHOWN	D	1800	330	3990			6720	9	2.466	149	
	B5	D20	AS SHOWN	A	3380					3380	53	2.466	442	
	B6	D20	AS SHOWN	D	1800	330	1500			3630	100	2.466	895	
	B7	D20	AS SHOWN	A	6800					6800	53	2.466	889	
	B8	D20	AS SHOWN	B	4582	300				4890	88	2.466	1061	
	B9	D20	AS SHOWN	A	4200					4200	18	2.466	186	
	B10	D20	AS SHOWN	F	300	1780	300			2380	106	2.466	622	
	B11	D12	AS SHOWN	A	9000					9000	80	0.888	639	
	B12	D12	AS SHOWN	A	4260					4260	80	0.888	303	
	B13	D12	AS SHOWN	H	532	432	180	432	180	1760	150	0.888	234	
	B14	D12	AS SHOWN	E	332	180	180			700	358	0.888	223	
	H1	D20	AS SHOWN	B	1500	300				1800	56	2.466	249	
												SUBTOTAL	= 7935 kg	
FOOTING	F1	D16	AS SHOWN	E	1000	550	550			2100	106	1.578	351	
	F2	D16	AS SHOWN	E	1000	240	240			1480	88	1.578	206	
	F3	D16	AS SHOWN	B	300	240				540	36	1.578	31	
	F4	D12	AS SHOWN	A	9000					9000	20	0.888	160	
	F5	D12	AS SHOWN	A	4260					4260	20	0.888	76	
	F6	D12	AS SHOWN	A	1100					1100	16	0.888	16	
	F7	D12	AS SHOWN	B	200	180				380	4	0.888	1	
												SUBTOTAL	= 841 kg	
WING WALL	W1	D20	AS SHOWN	A	10000					10000	2	2.466	49	
	W2	D20	AS SHOWN	A	7800					7800	2	2.466	38	
	W3	D20	AS SHOWN	B	5500	300				5800	2	2.466	29	
	W4	D20	AS SHOWN	B	5384 ~1484	300				3740	28	2.466	258	
	W5	D20	AS SHOWN	F	300	1681	300			2290	30	2.466	169	
	W6	D16	AS SHOWN	A	10000					10000	2	1.578	32	
	W7	D16	AS SHOWN	A	7680					7680	2	1.578	24	
	W8	D16	AS SHOWN	B	5500	240				5740	2	1.578	18	
	W9	D16	AS SHOWN	B	5384 ~1484	240				3680	28	1.578	163	
	W10	D16	AS SHOWN	G	653	5634	1172			7460	4	1.578	47	
	W11	D12	AS SHOWN	A	4260					4260	12	0.888	45	
	W12	D12	AS SHOWN	A	4195 ~861					2530	68	0.888	153	
	W13	D16	AS SHOWN	E	300	810	810			1920	28	1.578	85	

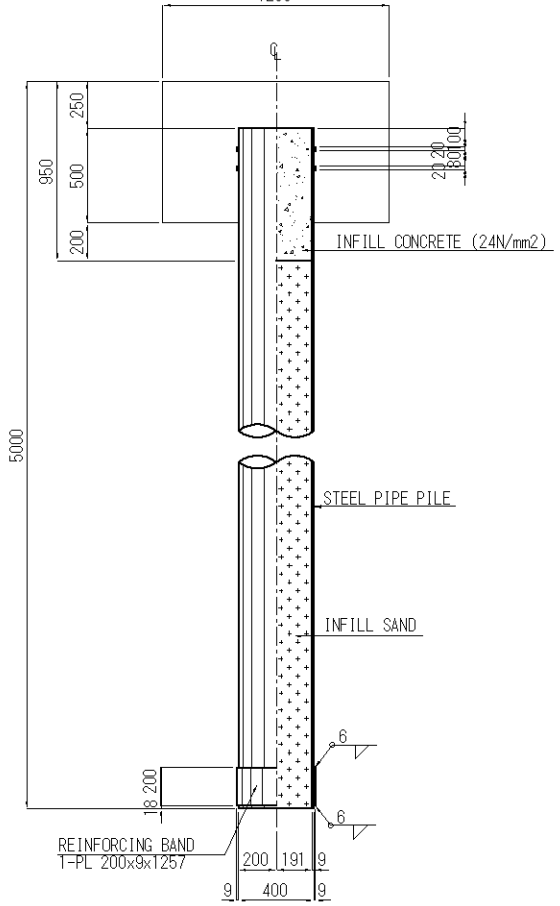
BAR BENDING DIAGRAM



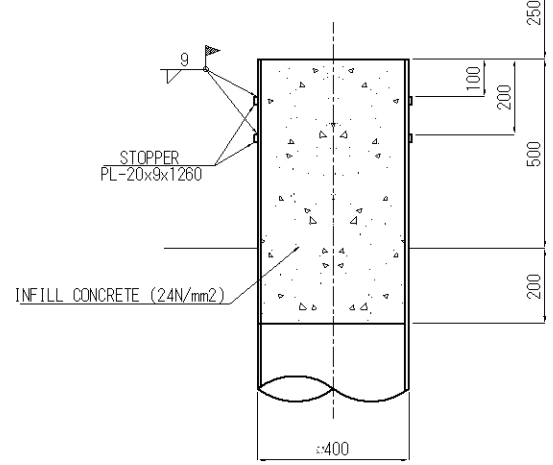
SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	BAR SIZE	SPACING ctc(mm)	BAR SHAPE	DIMENSIONS (mm) OUT TO OUT a	b	c	d	e	LENGTH (mm)	NO. OF BARS	UNIT WT. (kg/m)	WEIGHT (kg)	REMARKS
WING WALL	W14	D12	AS SHOWN	E	300	180	180			660	42	0.888	25	
	W15	D12	AS SHOWN	E	331	180	180			700	32	0.888	20	
	W16	D12	AS SHOWN	E	361	180	180			730	56	0.888	36	
												SUBTOTAL	= 1191 kg	
												TOTAL 1191 x 2	= 2382 kg	
												GRAND TOTAL 7935 kg + 841 kg + 2382 kg	= 11158 kg	

GENERAL ARRANGEMENT OF PILES SCALE 1:20



DETAIL OF TOP PILE SCALE 1:10



MATERIAL LIST

ITEM	MARK	MATERIAL	SIZE	LENGTH (mm)	QUANTITY (No)	UNIT WT (kg/m)	WT/PC. (kg)	WEIGHT (kg)	REMARKS
STEEL PIPE PILE	SPP	SKK400	φ400x9	5000	18	86.8	434	7812	
							SUBTOTAL	= 7812 kg	
ATTACHMENT PARTS PER ONE PILE									
STOPPER	PL	SS400	20 x 9	1260	2	1.41	1.78	4	
REINFORCING BAND	PL	SS400	200 x 9	1257	1	14.1	17.72	18	
							SUBTOTAL	= 22 kg	
							TOTAL 22 x 18	= 396 kg	
							GRAND TOTAL 7812 kg + 396 kg	= 8208 kg	

資料6-39

KATAHIRA & ENGINEERS INTERNATIONAL
Designed by : Date :
Checked by : Date :

MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN
Approved by : Date :

THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)

TITLE : BAR ARRANGEMENT OF NO.3 PORTAL RAHMEN BRIDGE (3)

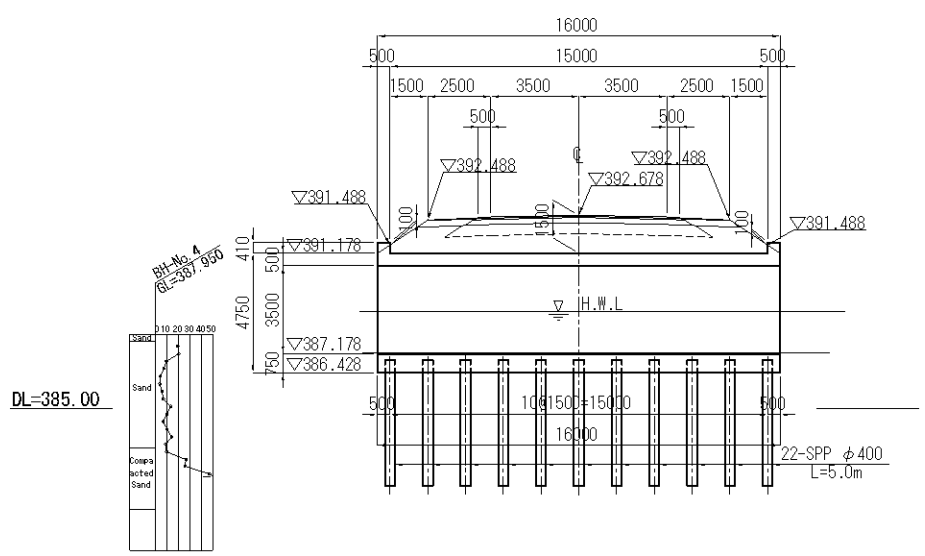
SCALE : 1/50

DRAWING No: BR3-04

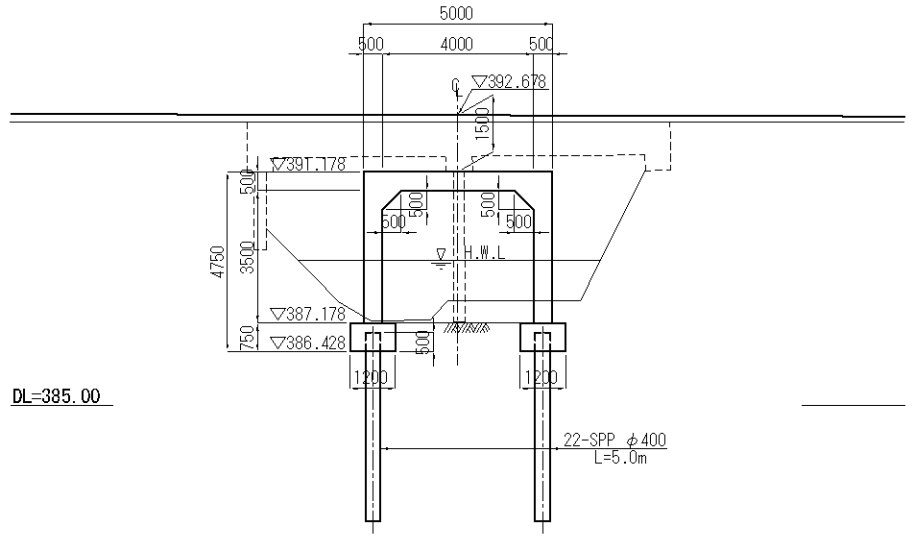
Rv.

GENERAL VIEW OF No.4 PORTAL RAHMEN BRIDGE

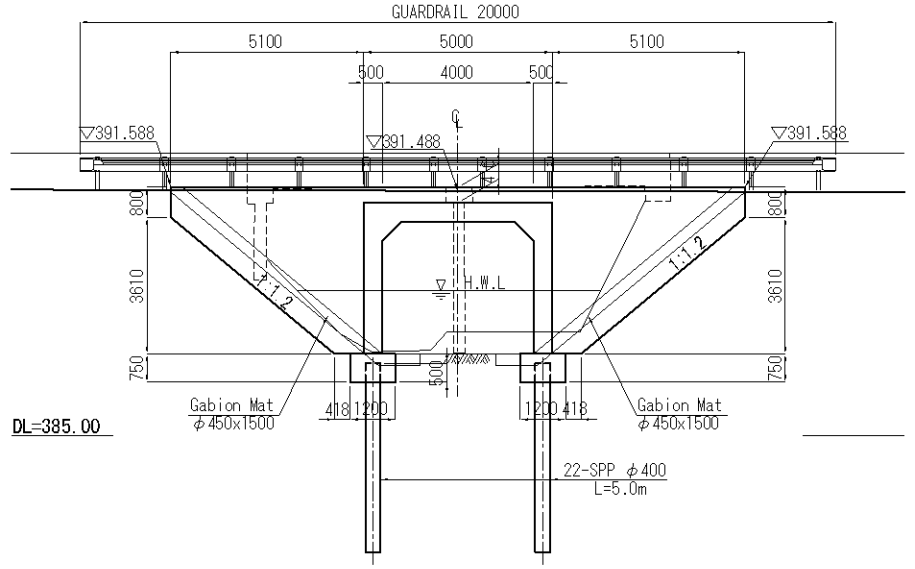
ELEVATION S=1:300



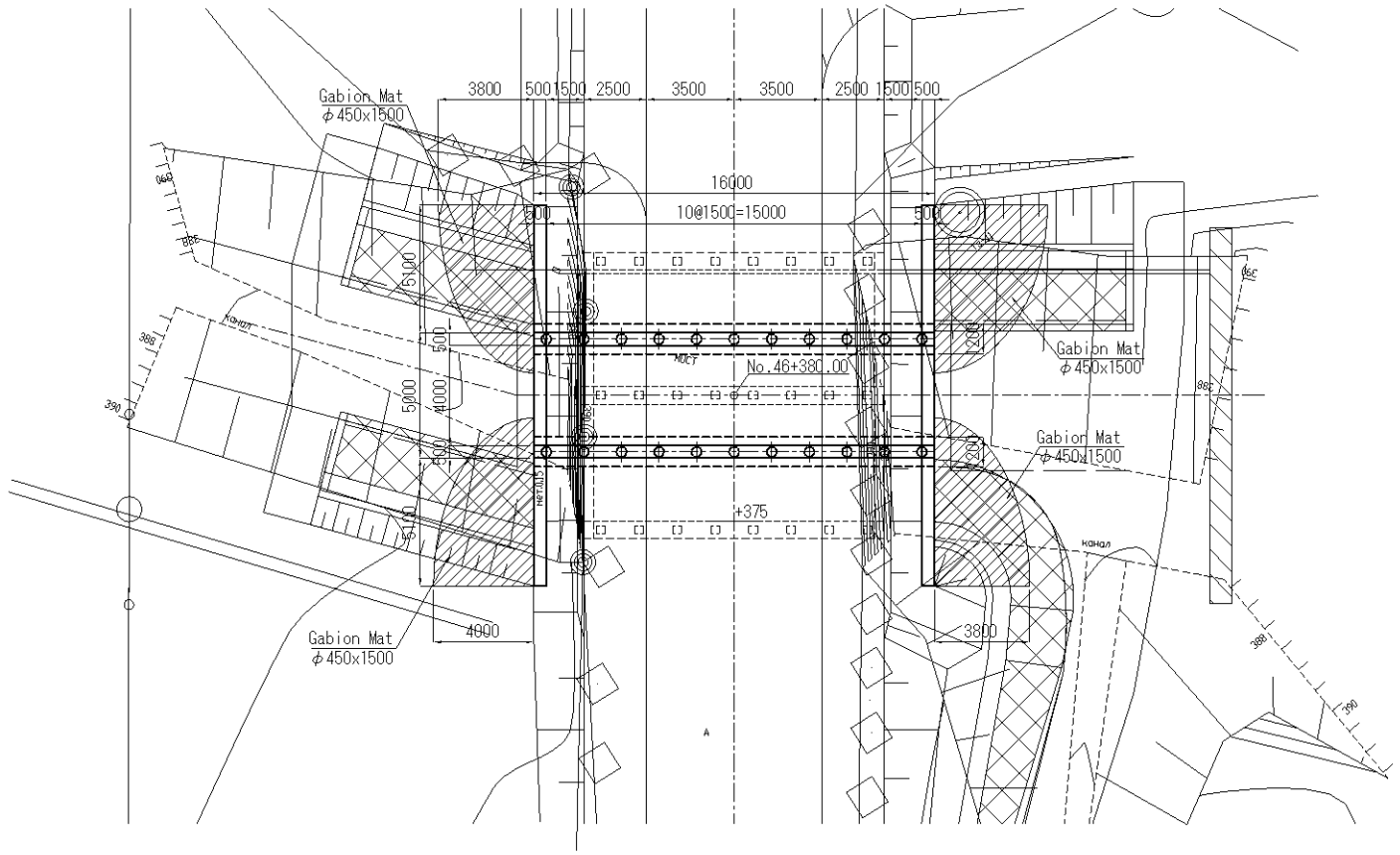
PORTAL RAMEN S=1:200



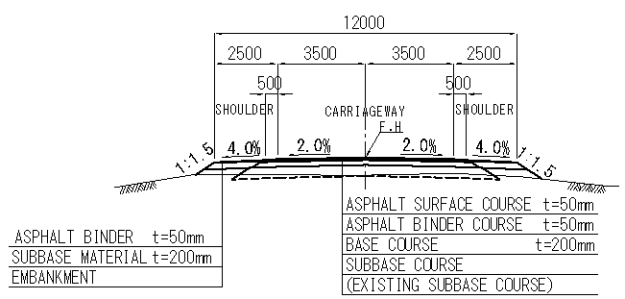
WING S=1:200



PLAN S=1:300



GENERAL SECTION S=1:300



DESIGN CRITERIA

CONSTRUCTION WIDTH	INSIDE WIDTH(B)	B=4.00m
	CLEARANCE (H)	H=3.50m
VERTICAL LOAD	EARTH PRESSURE	LOADING SOIL
	LIVE LOAD	B-LIVE LOAD
HORIZONTAL LOAD	EARTH PRESSURE	AT REST
	COEFFICIENT	Ka=0.5
UNIT WEIGHT	BACKFILLING SOIL	18.0kN/m³
	REINRORCE CONCRETE	24.5kN/m³
IMPACT		i=0.3

MATERIAL STRENGTH

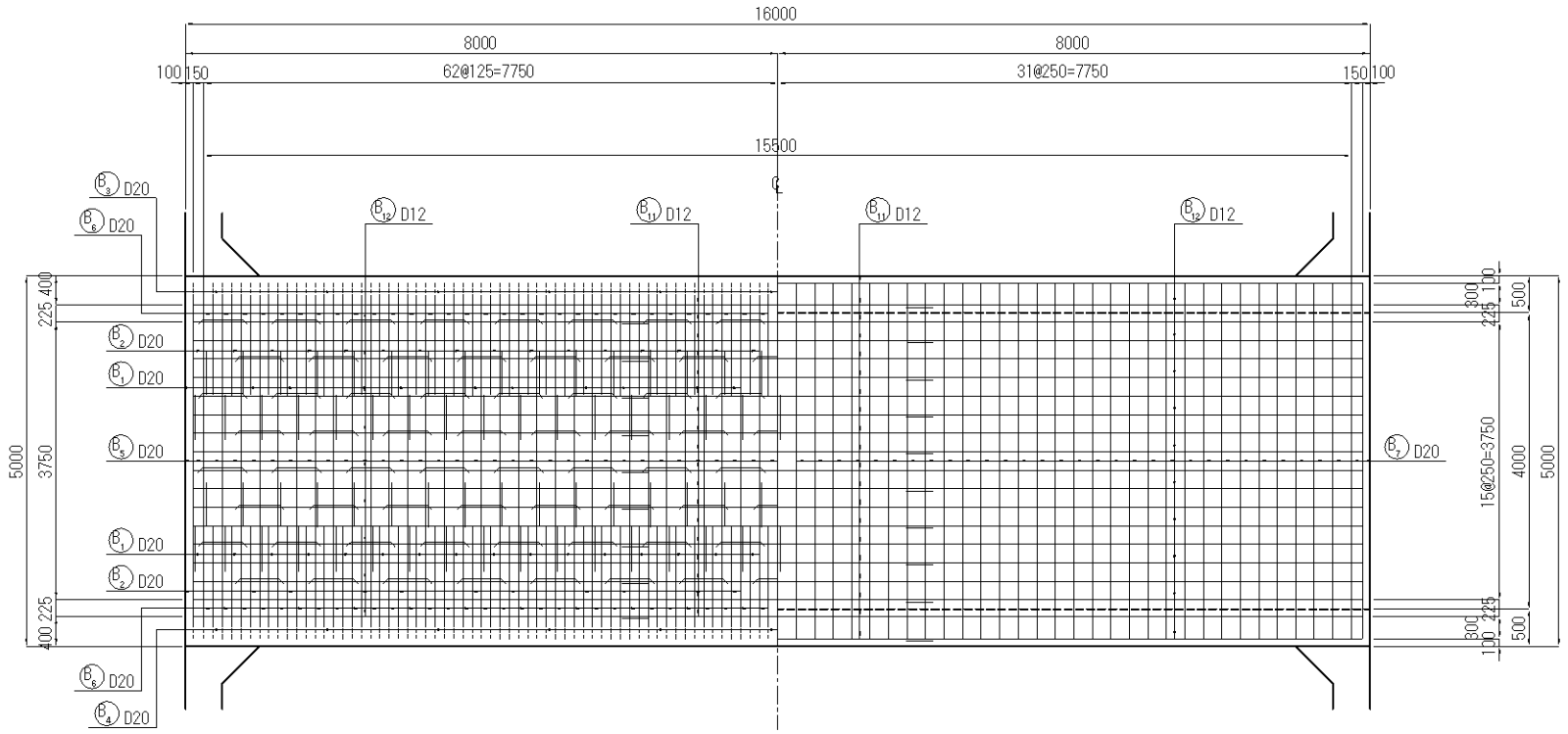
CONCRETE (24N/mm2)	DESING STRENGTH	σck=24N/mm²
	ALLOWABLE COMPRE. STRESS	σca= 8N/mm²
	ALLOWABLE SHEAR STRESS	τa=0.23N/mm²
	ALLOWABLE BONDING STRESS	τo=1.6N/mm²
REINRORCE BAR (SD295)	YIELD STRENGTH	fy=295N/mm²
	ALLOWABLE TENSILE STRESS	σsa=180N/mm²
STEEL PIPE PILE (SKK400)	YIELD STRENGTH	fy=235N/mm²
	ALLOWABLE TENSILE STRESS	σsa=140N/mm²

KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : GENERAL VIEW OF NO.4 PORTAL RAHMEN BRIDGE	SCALE : AS SHOWN	DRAWING No: BR4-01 Rv.

BAR ARRANGEMENT OF NO.4 PORTAL RAHMEN BRIDGE (1) SCALE 1:50

ELEVATION

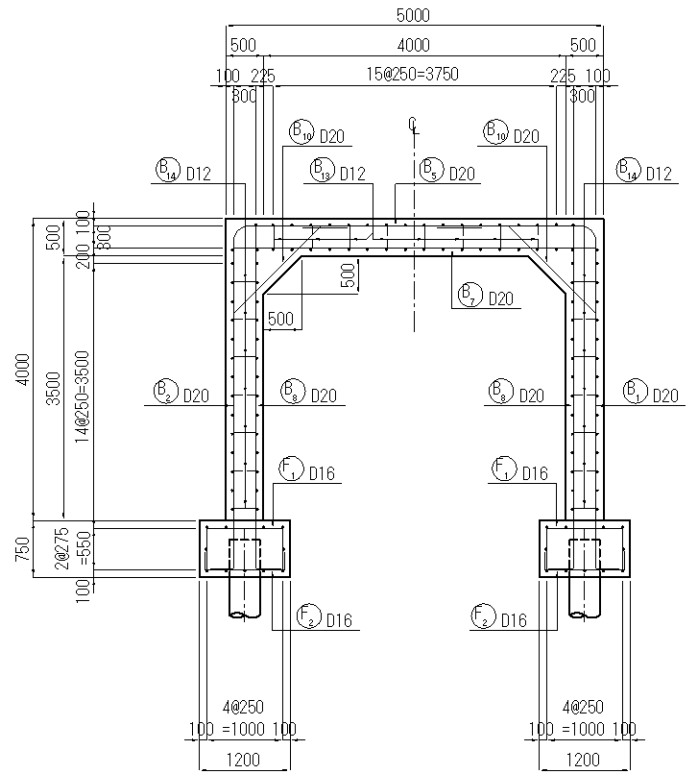
1 - 1



2 - 2

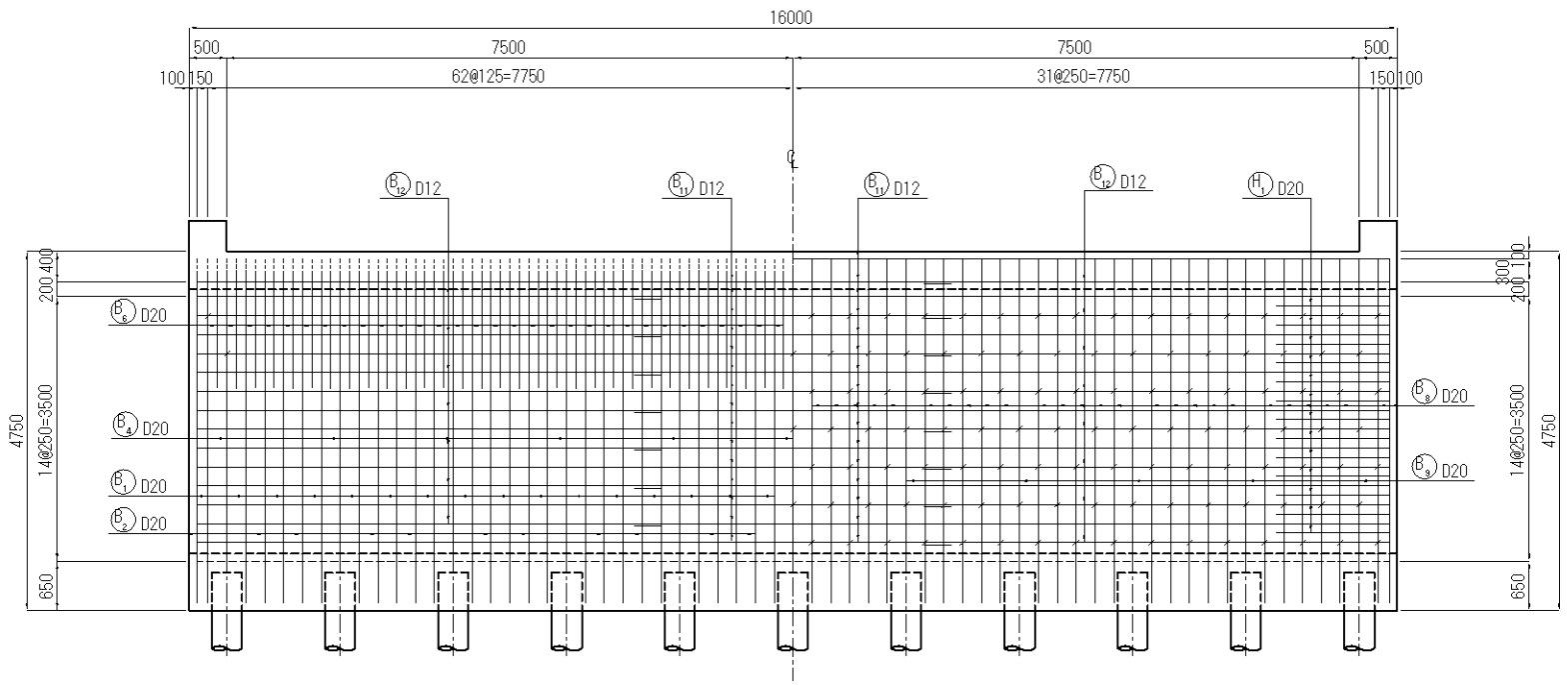
SECTION

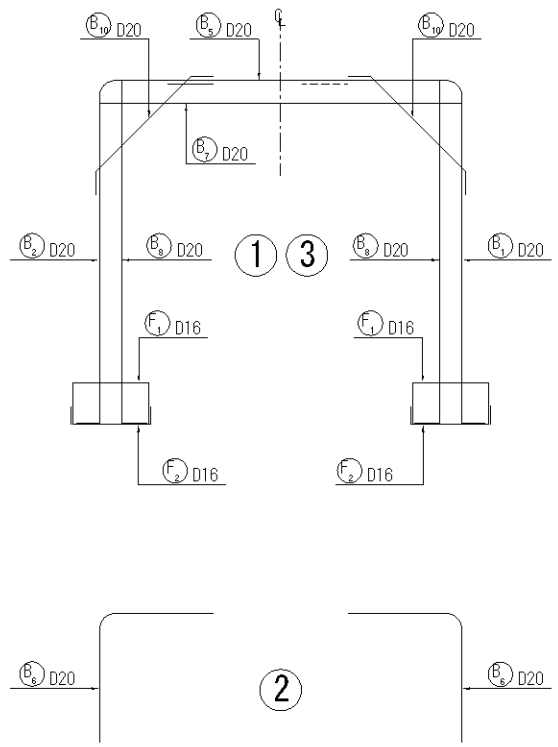
3 - 3



4 - 4

5 - 5





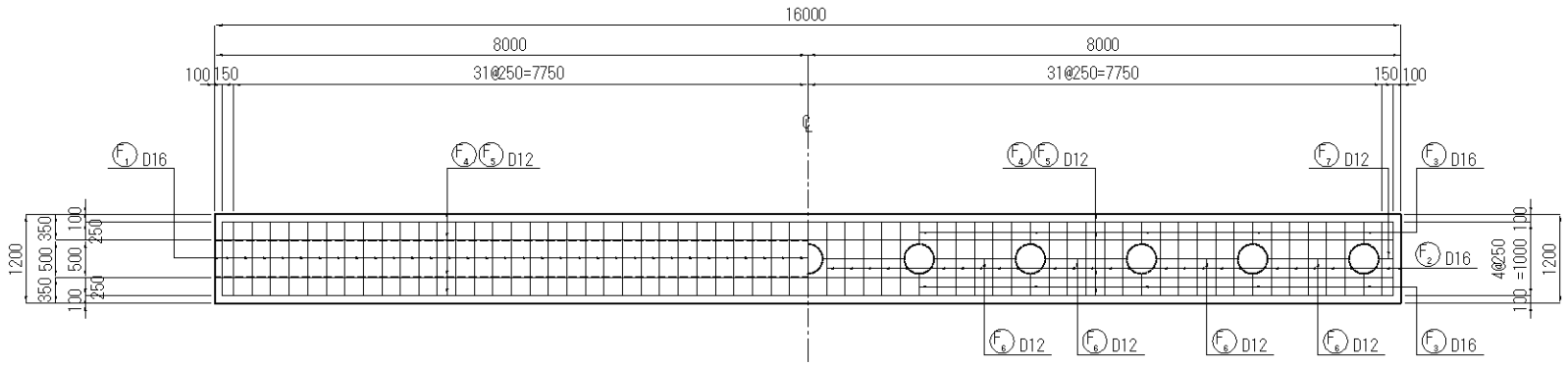
KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : BAR ARRANGMENT OF NO.4 PORTAL RAHMEN BRIDGE (1)	SCALE : 1/50	DRAWING No: BR04-02	Rv.

資料6-41

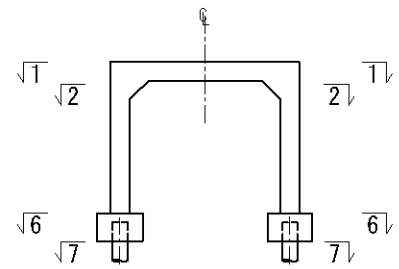
BAR ARRANGEMENT OF NO.4 PORTAL RAHMEN BRIDGE (2) SCALE 1:50

PLAN

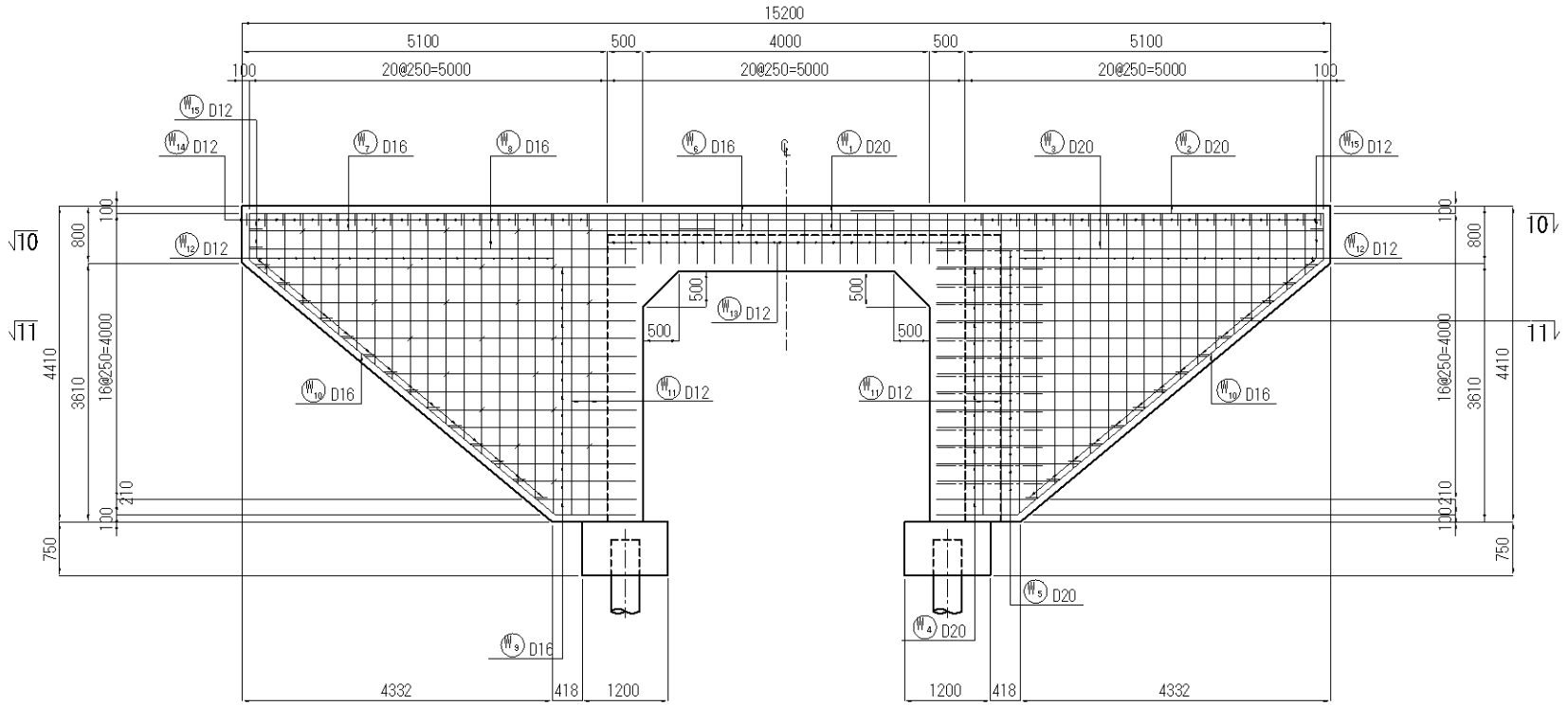
6 - 6 7 - 7

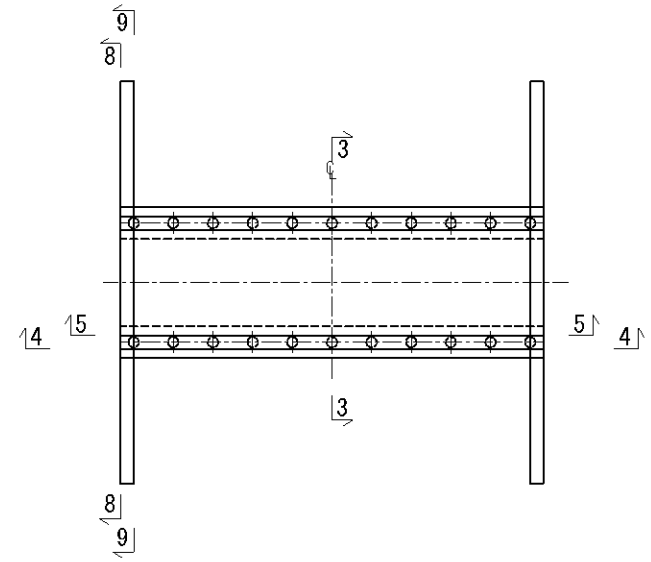


MARKING

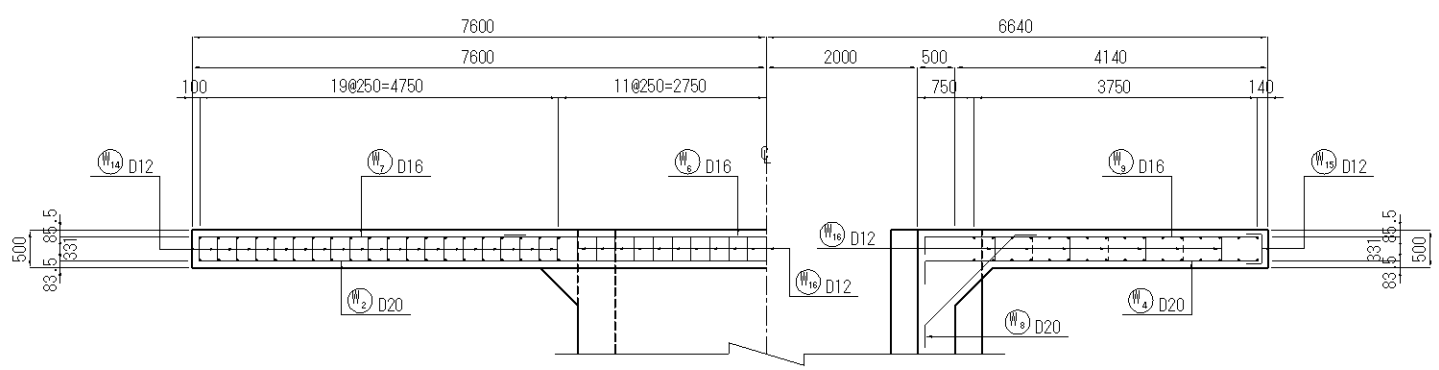


8 - 8 9 - 9





10 - 10 11 - 11

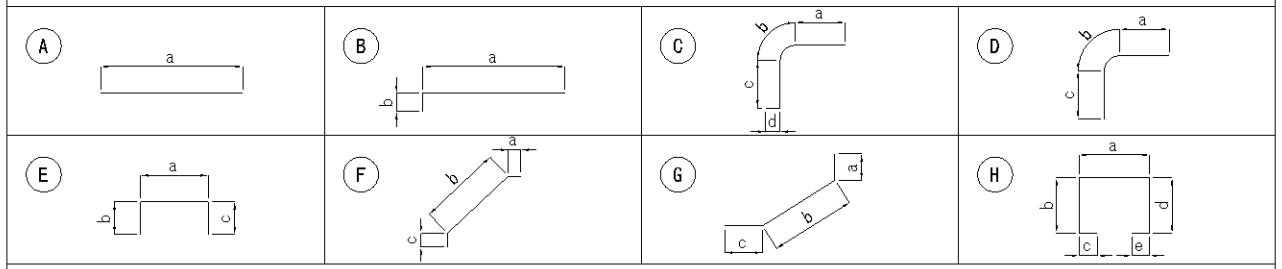


KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : BAR ARRANGMENT OF NO.4 PORTAL RAHMEN BRIDGE (2)	SCALE : 1/50	DRAWING No: BR4-03 Rv.

BAR ARRANGEMENT OF NO.4 PORTAL RAHMEN BRIDGE (3) SCALE 1:50

ELEVATION

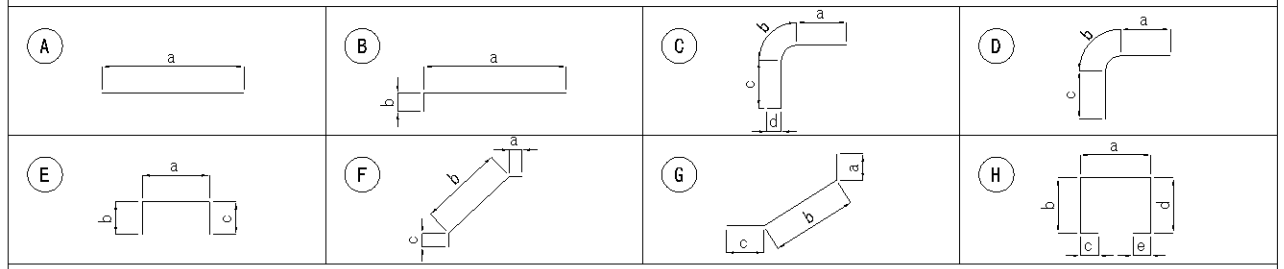
BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	BAR SIZE	SPACING ctc(mm)	BAR SHAPE	DIMENSIONS (mm)OUT TO OUT a	b	c	d	e	LENGTH (mm)	NO. OF BARS	UNIT WT. (kg/m)	WEIGHT (kg)	REMARKS
BODY	B1	D20	AS SHOWN	C	1900	330	4322	300		6860	54	2.466	914	
	B2	D20	AS SHOWN	C	1300	330	4322	300		6260	54	2.466	834	
	B3	D20	AS SHOWN	D	1900	330	3790			6020	11	2.466	163	
	B4	D20	AS SHOWN	D	1300	330	3790			5420	11	2.466	147	
	B5	D20	AS SHOWN	A	2380					2380	65	2.466	381	
	B6	D20	AS SHOWN	D	1300	330	1500			3130	124	2.466	957	
	B7	D20	AS SHOWN	A	4800					4800	65	2.466	769	
	B8	D20	AS SHOWN	B	4532	300				4840	108	2.466	1289	
	B9	D20	AS SHOWN	A	4150					4150	18	2.466	184	
	B10	D20	AS SHOWN	F	300	1638	300			2240	130	2.466	718	
	B11	D12	AS SHOWN	A	10000					10000	94	0.888	835	
	B12	D12	AS SHOWN	A	6160					6160	94	0.888	514	
	B13	D12	AS SHOWN	H	532	432	180	432	180	1760	124	0.888	194	
	B14	D12	AS SHOWN	E	332	180	180			700	442	0.888	275	
	H1	D20	AS SHOWN	B	1500	300				1800	52	2.466	231	
												SUBTOTAL = 8405 kg		
FOOTING	F1	D16	AS SHOWN	E	1000	550	550			2100	108	1.578	358	
	F2	D16	AS SHOWN	E	1000	240	240			1480	130	1.578	304	
	F3	D16	AS SHOWN	B	300	240				540	44	1.578	37	
	F4	D12	AS SHOWN	A	10000					10000	20	0.888	178	
	F5	D12	AS SHOWN	A	6160					6160	20	0.888	109	
	F6	D12	AS SHOWN	A	1100					1100	20	0.888	20	
	F7	D12	AS SHOWN	B	200	180				380	4	0.888	1	
												SUBTOTAL = 1007 kg		
WING WALL	W1	D20	AS SHOWN	A	9000					9000	2	2.466	44	
	W2	D20	AS SHOWN	A	6600					6600	2	2.466	33	
	W3	D20	AS SHOWN	B	5400	300				5700	2	2.466	28	
	W4	D20	AS SHOWN	B	5284 ~1384	300				3640	28	2.466	251	
	W5	D20	AS SHOWN	F	300	1660	300			2260	28	2.466	156	
	W6	D16	AS SHOWN	A	9000					9000	2	1.578	28	
	W7	D16	AS SHOWN	A	6480					6480	2	1.578	20	
	W8	D16	AS SHOWN	B	5400	240				5640	2	1.578	18	
	W9	D16	AS SHOWN	B	5284 ~1384	240				3580	28	1.578	158	
	W10	D16	AS SHOWN	G	692	5556	1132			7380	4	1.578	47	
	W11	D12	AS SHOWN	A	4210					4210	8	0.888	30	
	W12	D12	AS SHOWN	A	4195 ~861					2530	68	0.888	153	
	W13	D12	AS SHOWN	E	300	710	710			1720	21	0.888	32	

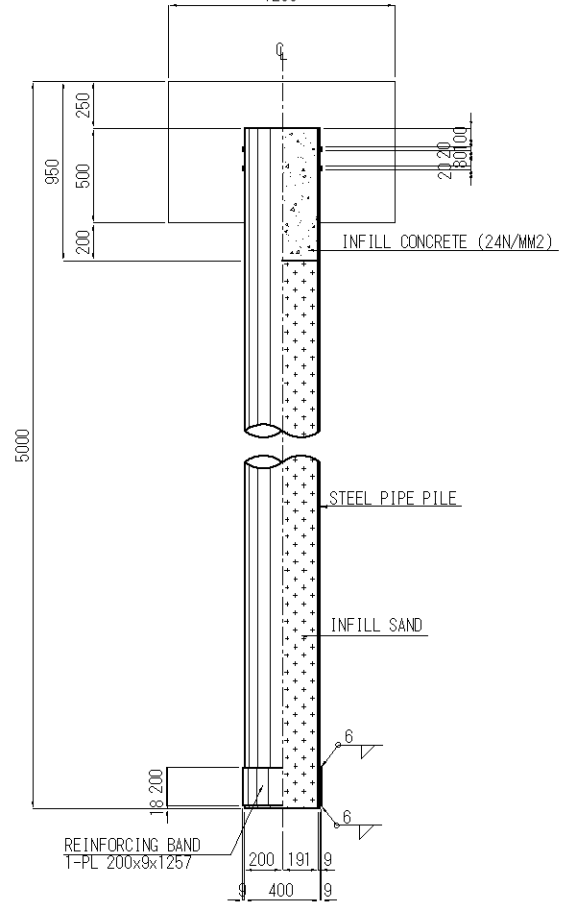
BAR BENDING DIAGRAM



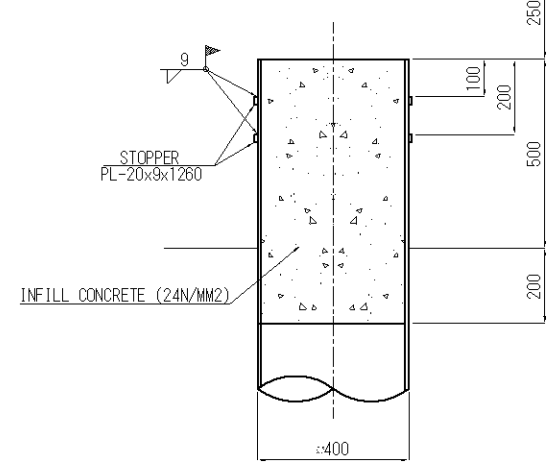
SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	BAR SIZE	SPACING ctc(mm)	BAR SHAPE	DIMENSIONS (mm)OUT TO OUT a	b	c	d	e	LENGTH (mm)	NO. OF BARS	UNIT WT. (kg/m)	WEIGHT (kg)	REMARKS
WING WALL	W14	D12	AS SHOWN	E	300	180	180			660	40	0.888	23	
	W15	D12	AS SHOWN	E	331	180	180			700	32	0.888	20	
	W16	D12	AS SHOWN	E	361	180	180			730	50	0.888	32	
												SUBTOTAL = 1073 kg		
												TOTAL 1073 x 2 = 2146 kg		
												GRAND TOTAL 8405 kg + 1007 kg + 2146 kg = 11558 kg		

GENERAL ARRANGEMENT OF PILES SCALE 1:20



DETAIL OF TOP PILE SCALE 1:10



MATERIAL LIST

ITEM	MARK	MATERIAL	SIZE	LENGTH (mm)	QUANTITY (No)	UNIT WT (kg/m)	WT/PC. (kg)	WEIGHT (kg)	REMARKS
STEEL PIPE PILE	SPP	SKK400	φ400x9	5000	22	86.8	434	9548	
							SUBTOTAL =	9548 kg	
ATTACHMENT PARTS PER ONE PILE									
STOPPER	PL	SS400	20 x 9	1260	2	1.41	1.78	4	
REINFORCING BAND	PL	SS400	200 x 9	1257	1	14.1	17.72	18	
							SUBTOTAL =	22 kg	
							TOTAL 22 x 18 =	396 kg	
							GRAND TOTAL	9548 kg + 396 kg =	9944 kg

資料6-43

KATAHIRA & ENGINEERS INTERNATIONAL
Designed by : Date :
Checked by : Date :

MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN
Approved by : Date :

THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)

TITLE : BAR ARRANGMENT OF NO.4 PORTAL RAHMEN BRIDGE (3)

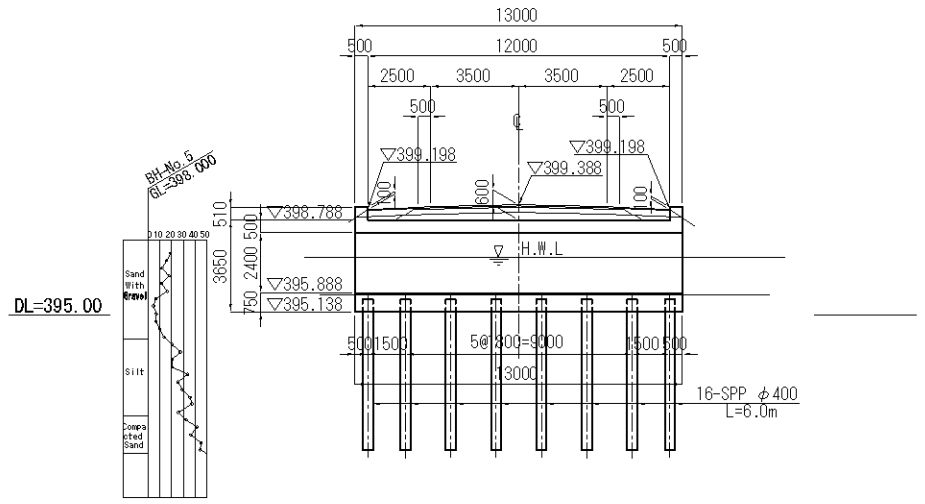
SCALE : 1/50

DRAWING No: BR4-04

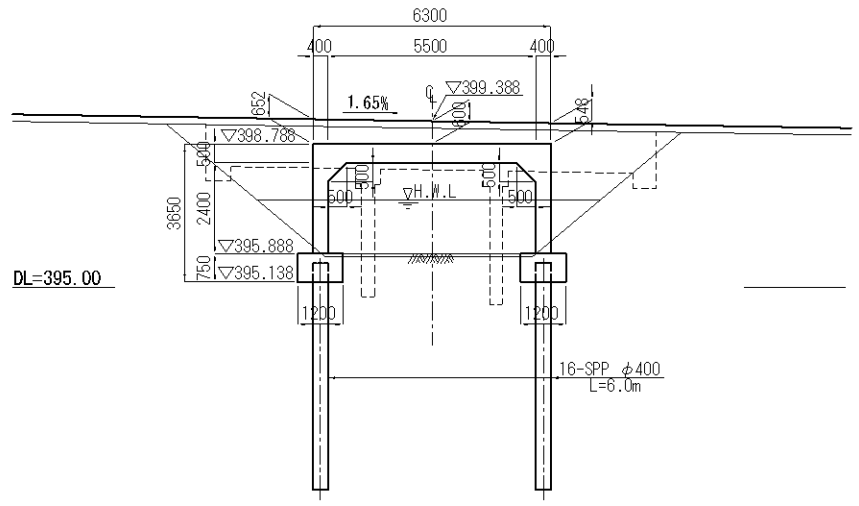
Rv.

GENERAL VIEW OF No.5 PORTAL RAHMEN BRIDGE

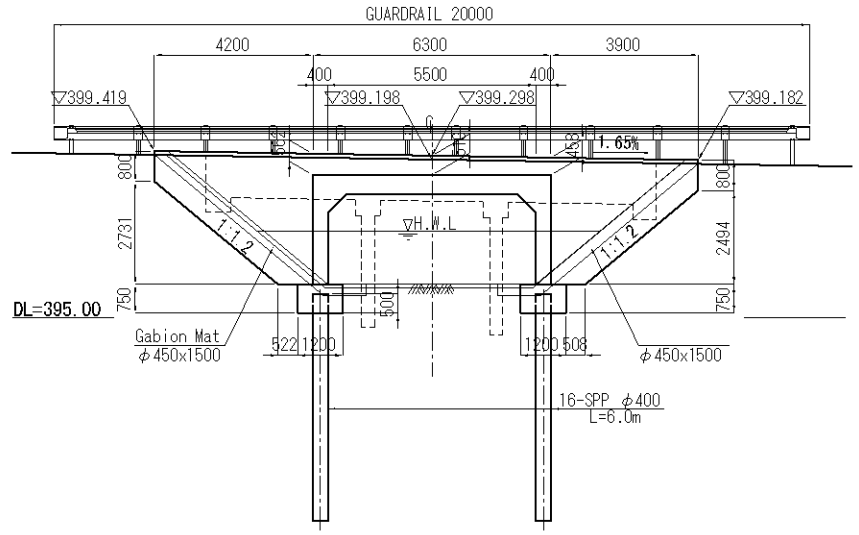
ELEVATION S=1:300



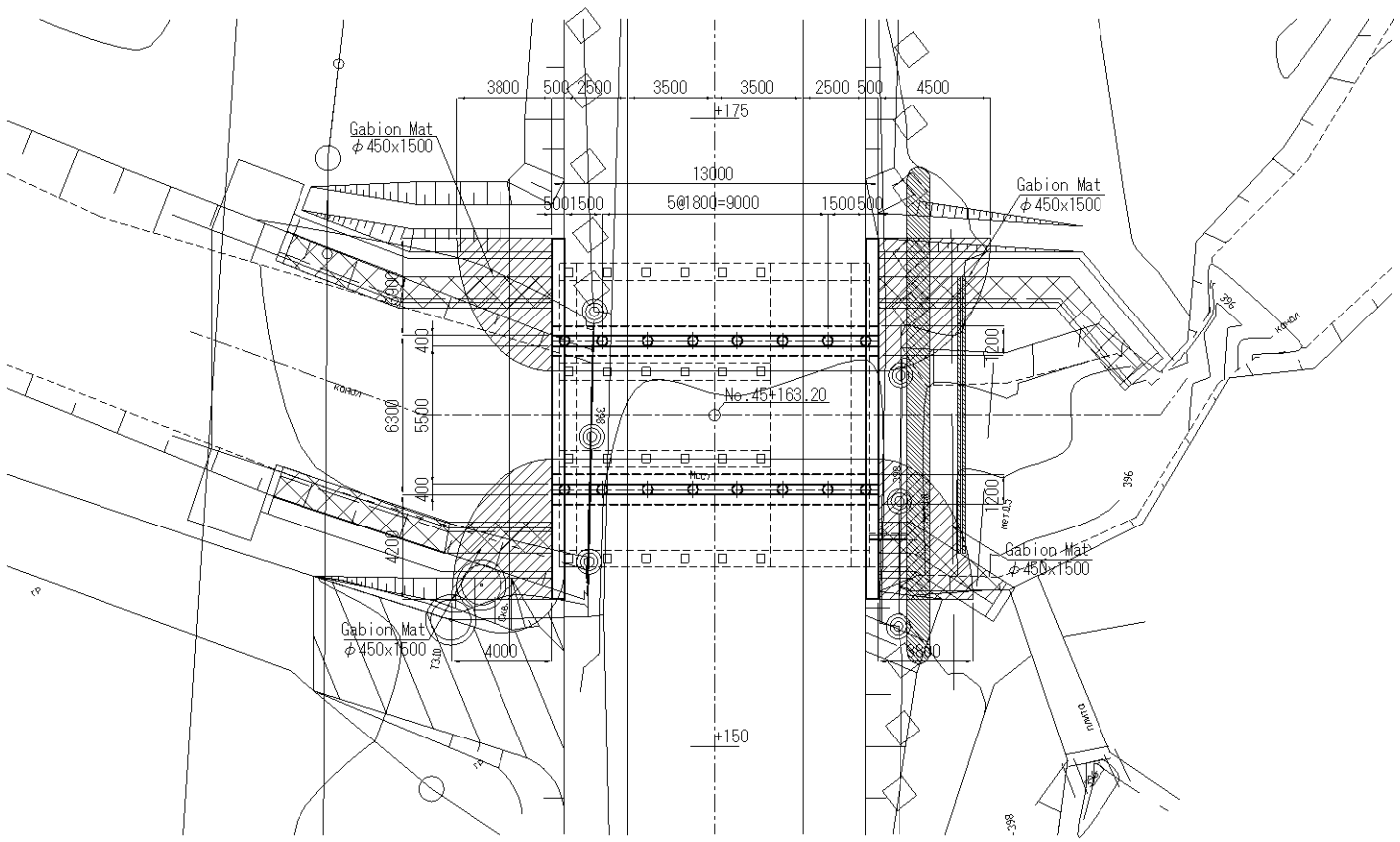
PORTAL RAHMEN S=1:200



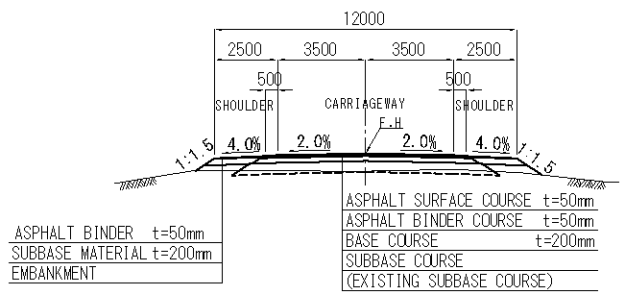
WING S=1:200



PLAN S=1:300



GENERAL SECTION S=1:300



DESIGN CRITERIA

CONSTRUCTION WIDTH	INSIDE WIDTH(B)	B=5.50m
	CLEARANCE (H)	H=2.40m
VERTICAL LOAD	EARTH PRESSURE	LOADING SOIL
	LIVE LOAD	B-LIVE LOAD
HORIZONTAL LOAD	EARTH PRESSURE	AT REST
	COEFFICIENT	Ka=0.5
UNIT WEIGHT	BACKFILLING SOIL	18.0kN/m^3
	REINRORCE CONCRETE	24.5kN/m^3
IMPACT		i=0.3

MATERIAL STRENGTH

CONCRETE (24N/mm2)	DESING STRENGTH	σck=24N/mm^2
	ALLOWABLE COMPRE. STRESS	σca= 8N/mm^2
	ALLOWABLE SHEARING STRESS	τa=0.23N/mm^2
	ALLOWABLE ADHESIVE STRESS	τo=1.6N/mm^2
REINRORCE BAR (SD295)	YIELD STRENGTH	fy=295N/mm^2
	ALLOWABLE TENSILE STRESS	σsa=180N/mm^2
STEEL PIPE PILE (SKK400)	YIELD STRENGTH	fy=235N/mm^2
	ALLOWABLE TENSILE STRESS	σsa=140N/mm^2

KATAHIRA & ENGINEERS INTERNATIONAL
Designed by : Date :
Checked by : Date :

MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN
Approved by : Date :

THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)

TITLE : GENERAL VIEW OF NO. 5 PORTAL RAHMEN BRIDGE

SCALE : AS SHOWN

DRAWING No: BR5-01

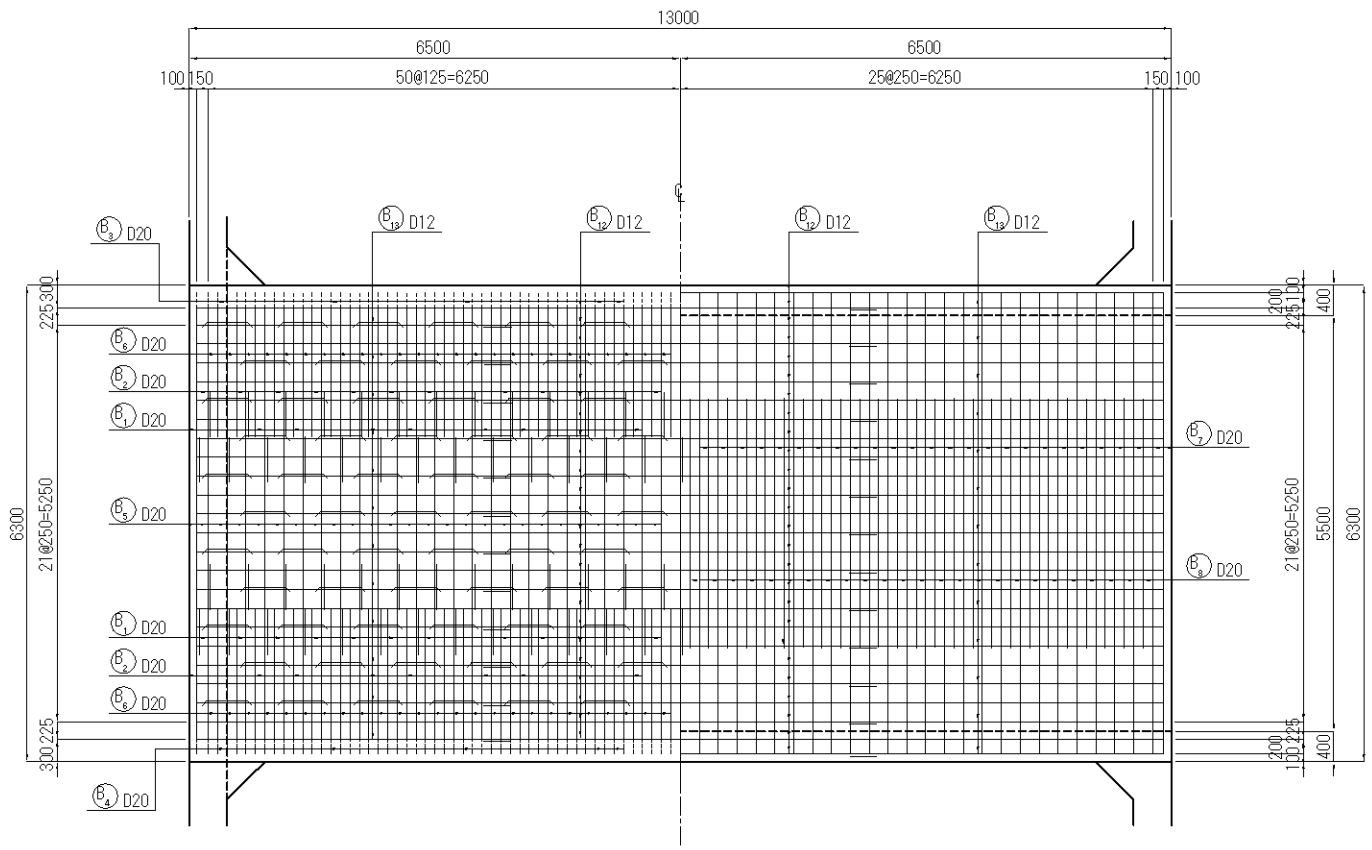
Rv.

資料6-44

BAR ARRANGEMENT OF NO.5 PORTAL RAHMEN BRIDGE (1) SCALE 1:50

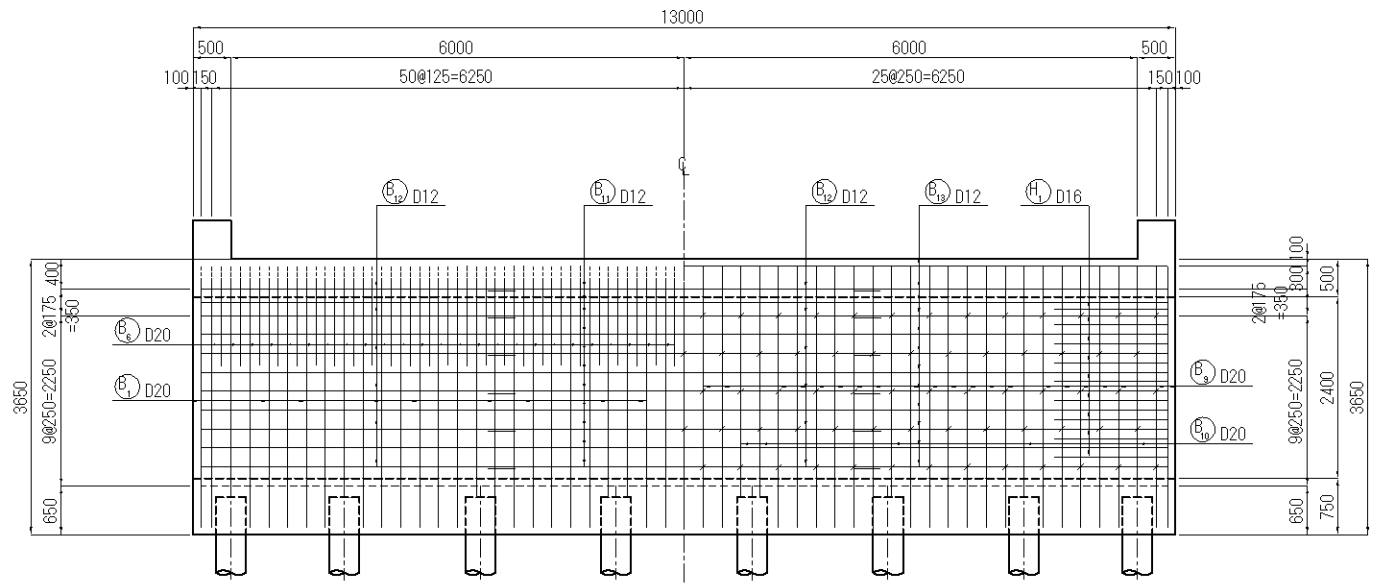
ELEVATION

1 - 1



2 - 2

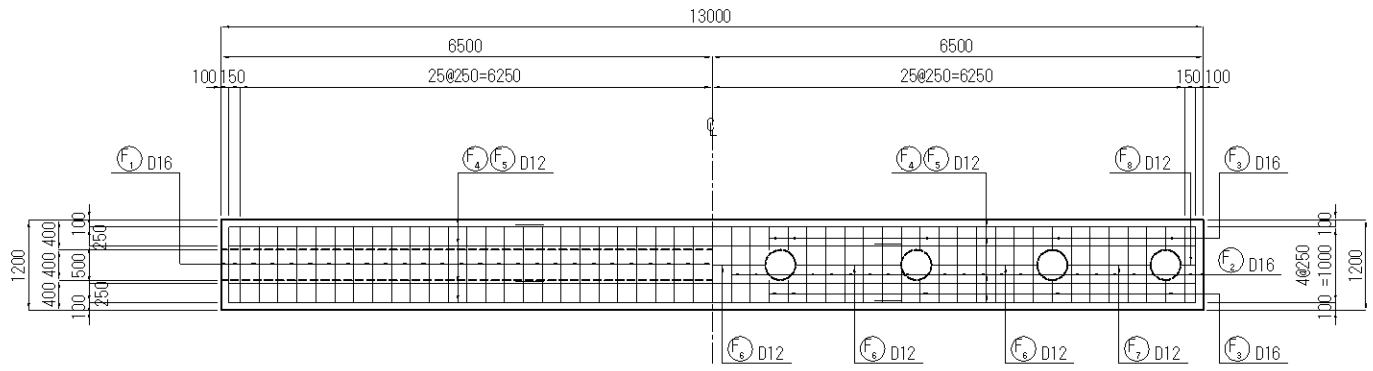
4 - 4



5 - 5

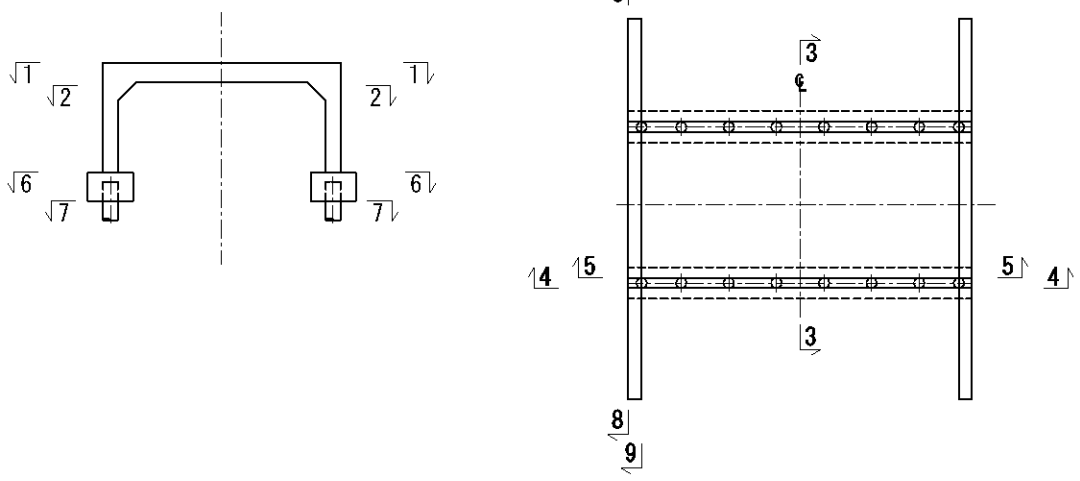
PLAN

6 - 6



7 - 7

MARKING



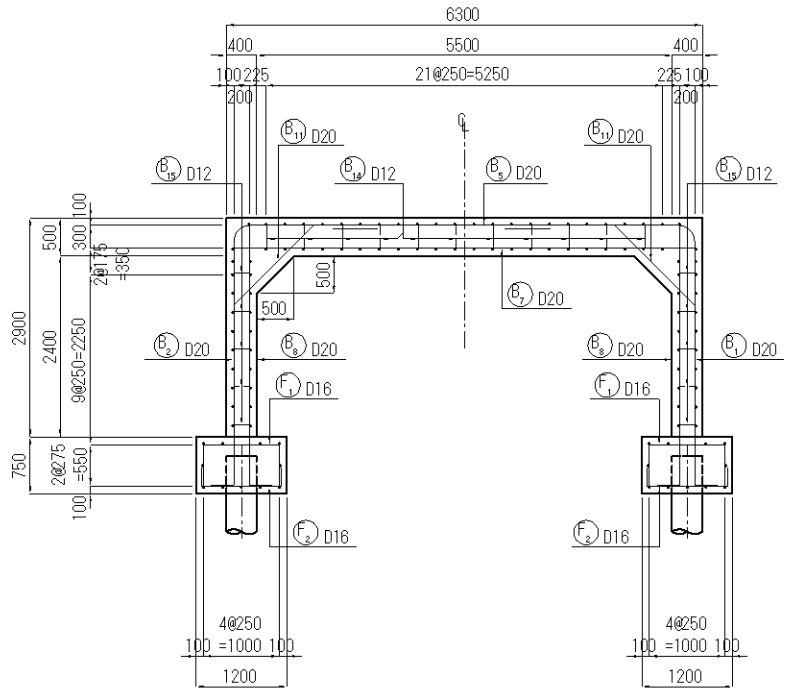
KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : BAR ARRANGMENT OF NO.5 PORTAL RAHMEN BRIDGE (1)	SCALE : 1/50	DRAWING No: BR5-02	Rv.

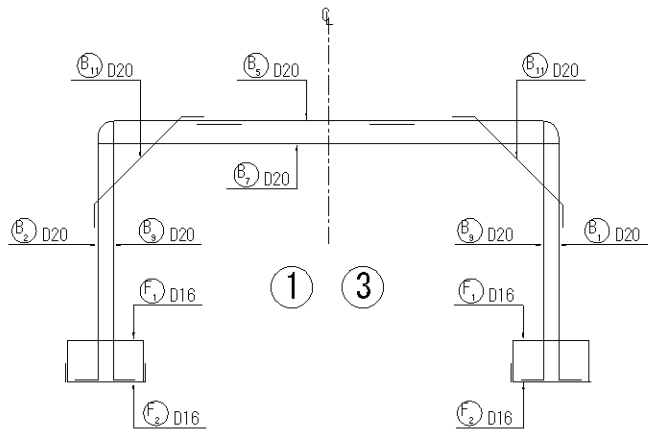
BAR ARRANGEMENT OF NO.5 PORTAL RAHMEN BRIDGE (2)

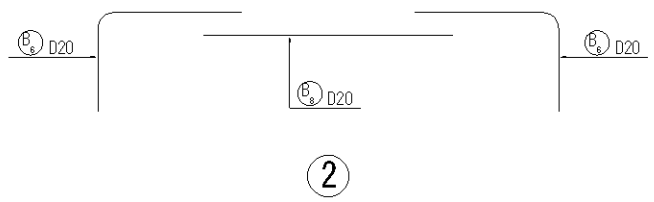
SCALE 1:50

SECTION

3 - 3

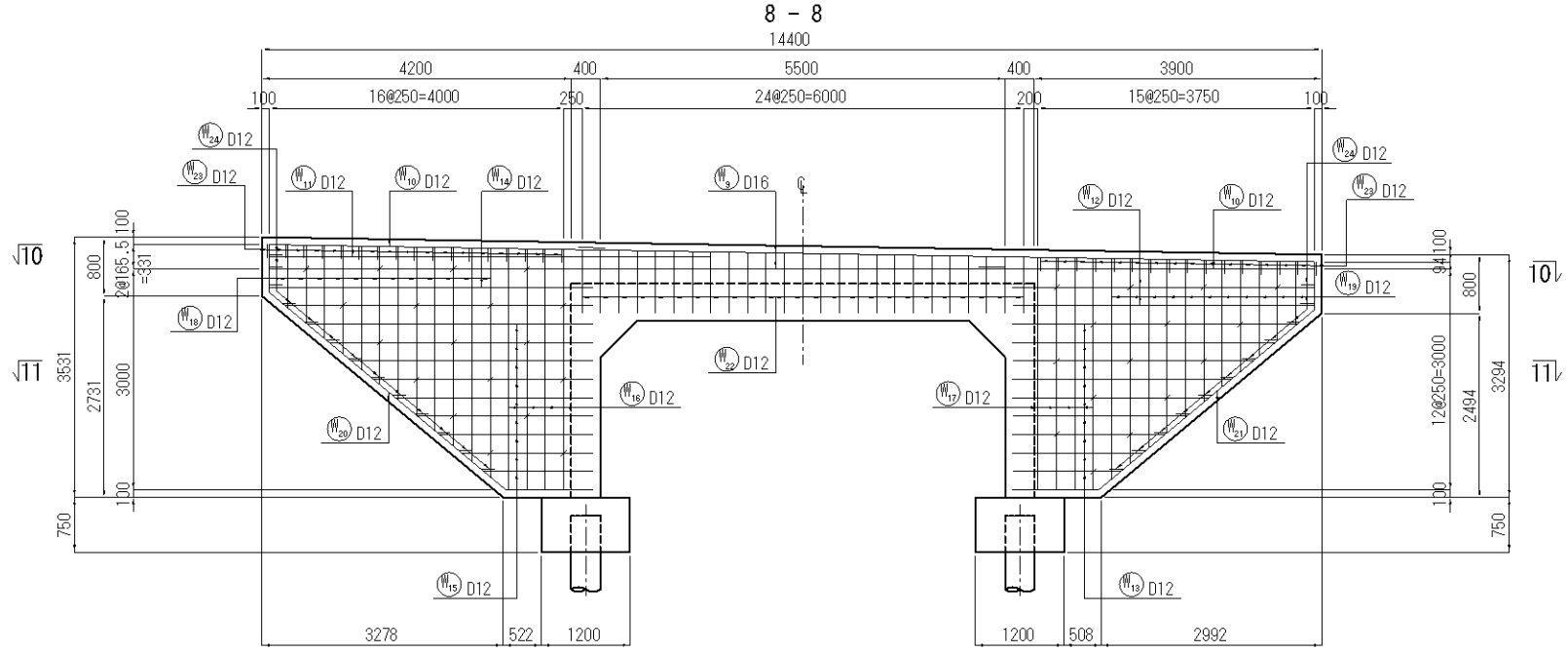




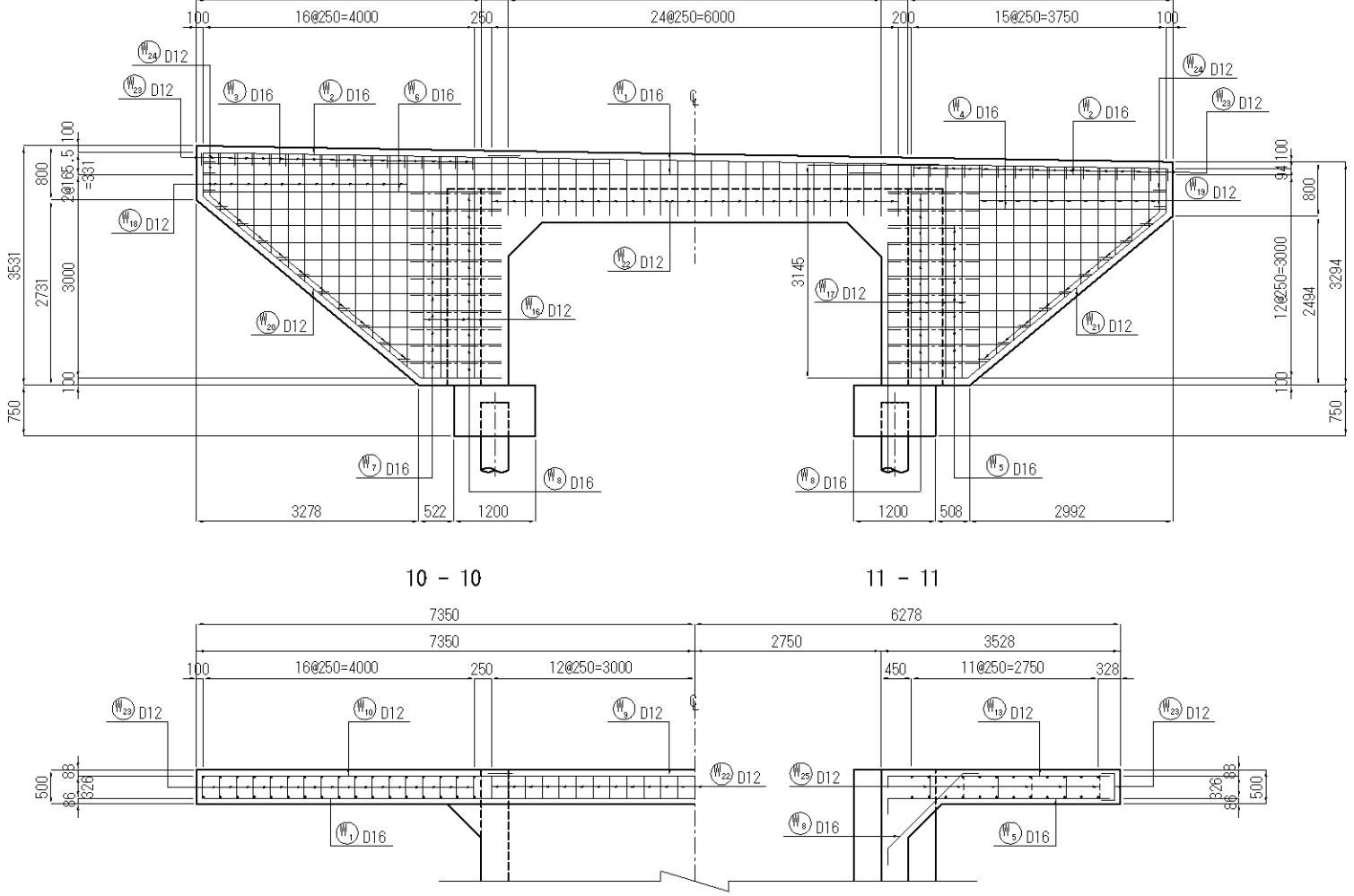


ELEVATION

8 - 8



9 - 9



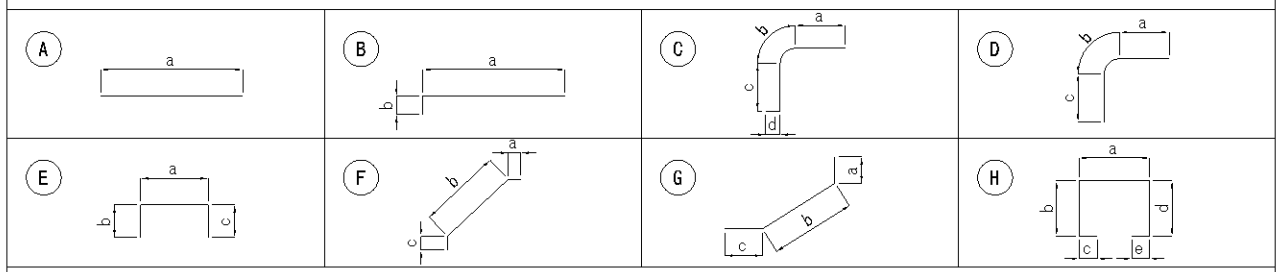
10 - 10

11 - 11

KATAHIRA & ENGINEERS INTERNATIONAL Designed by : Date : Checked by : Date :	MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN Approved by : Date :	THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)	TITLE : BAR ARRANGMENT OF NO.5 PORTAL RAHMEN BRIDGE (2)	SCALE : 1/50	DRAWING No: BR5-03 Rv.

BAR ARRANGEMENT OF NO.5 PORTAL RAHMEN BRIDGE (3) SCALE 1:50

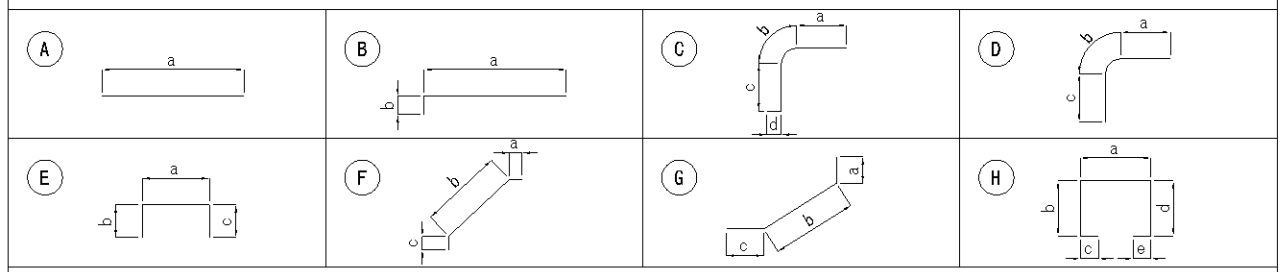
BAR BENDING DIAGRAM



SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	BAR SIZE	SPACING ctc(mm)	BAR SHAPE	DIMENSIONS (mm)OUT TO OUT a	b	c	d	e	LENGTH (mm)	NO. OF BARS	UNIT WT. (kg/m)	WEIGHT (kg)	REMARKS
BODY	B1	D20	AS SHOWN	C	2300	330	3222	300		6160	43	2.466	653	
	B2	D20	AS SHOWN	C	1700	330	3222	300		5560	43	2.466	590	
	B3	D20	AS SHOWN	D	2300	330	2840			5470	10	2.466	135	
	B4	D20	AS SHOWN	D	1700	330	2840			4870	10	2.466	120	
	B5	D20	AS SHOWN	A	2880					2880	53	2.466	376	
	B6	D20	AS SHOWN	D	1700	330	1100			3130	100	2.466	772	
	B7	D20	AS SHOWN	A	6100					6100	53	2.466	797	
	B8	D20	AS SHOWN	A	3300					3300	50	2.466	407	
	B9	D20	AS SHOWN	B	3432	300				3740	86	2.466	793	
	B10	D20	AS SHOWN	A	3050					3050	20	2.466	150	
	B11	D20	AS SHOWN	F	300	1497	300			2100	106	2.466	549	
	B12	D12	AS SHOWN	A	9000					9000	88	0.888	703	
	B13	D12	AS SHOWN	A	4260					4260	88	0.888	333	
	B14	D12	AS SHOWN	H	532	432	180	432	180	1760	138	0.888	216	
	B15	D12	AS SHOWN	E	332	180	180			700	256	0.888	159	
	H1	D20	AS SHOWN	B	1500	240				1740	36	2.466	154	
												SUBTOTAL	= 6907 kg	
FOOTING	F1	D16	AS SHOWN	E	1000	550	550			2100	106	1.578	351	
	F2	D16	AS SHOWN	E	1000	240	240			1480	86	1.578	201	
	F3	D16	AS SHOWN	B	300	240				540	40	1.578	34	
	F4	D12	AS SHOWN	A	9000					9000	20	0.888	160	
	F5	D12	AS SHOWN	A	4260					4260	20	0.888	76	
	F6	D12	AS SHOWN	A	1400					1400	10	0.888	12	
	F7	D12	AS SHOWN	B	1100					1100	4	0.888	4	
	F7	D12	AS SHOWN	B	200	180				380	4	0.888	1	
												SUBTOTAL	= 839 kg	
WING WALL	W1	D16	AS SHOWN	A	10000					10000	2	1.578	32	
	W2	D16	AS SHOWN	A	4682					4690	2	1.578	15	
	W3	D16	AS SHOWN	A	6000					6000	1	1.578	9	
	W4	D16	AS SHOWN	B	4100	240				4340	2	1.578	14	
	W5	D16	AS SHOWN	B	3871 ~1471	240				2920	9	1.578	41	
	W6	D16	AS SHOWN	B	4400	240				4640	1	1.578	7	
	W7	D16	AS SHOWN	B	4156 ~1486	240				3080	10	1.578	49	
	W8	D16	AS SHOWN	F	240	1518	240			2000	22	1.578	69	
	W9	D12	AS SHOWN	A	10000					10000	2	0.888	18	
	W10	D12	AS SHOWN	A	4562					4570	2	0.888	8	
	W11	D12	AS SHOWN	A	6000					6000	1	0.888	5	
	W12	D12	AS SHOWN	B	4100	180				4280	2	0.888	8	
	W13	D12	AS SHOWN	B	3871 ~1471	180				2860	9	0.888	23	

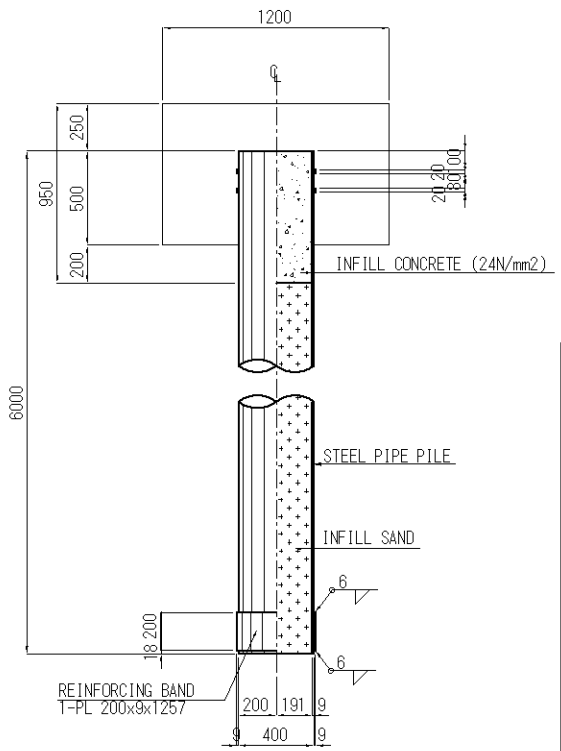
BAR BENDING DIAGRAM



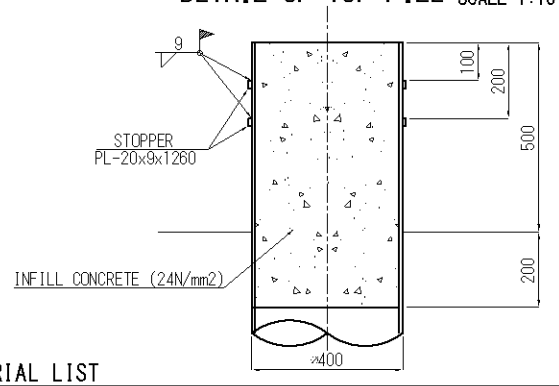
SCHEDULE OF REINFORCEMENT

LOCATION	BAR MARK	BAR SIZE	SPACING ctc(mm)	BAR SHAPE	DIMENSIONS (mm)OUT TO OUT a	b	c	d	e	LENGTH (mm)	NO. OF BARS	UNIT WT. (kg/m)	WEIGHT (kg)	REMARKS
WING WALL	W14	D12	AS SHOWN	B	4400	180				4580	1	0.888	4	
	W15	D12	AS SHOWN	B	4186 ~1436	180				3020	10	0.888	27	
	W16	D12	AS SHOWN	A	3264					3270	8	0.888	23	
	W17	D12	AS SHOWN	A	3145					3150	8	0.888	22	
	W18	D12	AS SHOWN	A	3102 ~856					1980	24	0.888	42	
	W19	D12	AS SHOWN	A	2992 ~867					1930	22	0.888	38	
	W20	D12	AS SHOWN	G	652	4183	1186			6030	2	0.888	11	
	W21	D12	AS SHOWN	G	655	3812	1171			5640	2	0.888	10	
	W22	D16	AS SHOWN	E	300	859 ~760	859 ~760			1920	25	1.578	76	
	W23	D12	AS SHOWN	E	300	180	180			660	33	0.888	19	
	W24	D12	AS SHOWN	E	326	180	180			690	24	0.888	15	
	W25	D12	AS SHOWN	E	354	180	180			720	33	0.888	21	
												SUBTOTAL	= 606 kg	
												TOTAL 606 x 2	= 1212 kg	
												GRAND TOTAL	6907 kg + 839 kg + 1212 kg = 8958 kg	

GENERAL ARRANGEMENT OF PILES SCALE 1:20



DETAIL OF TOP PILE SCALE 1:10



MATERIAL LIST

ITEM	MARK	MATERIAL	SIZE	LENGTH (mm)	QUANTITY(No)	UNIT WT. (kg/m)	WT/PC. (kg)	WEIGHT (kg)	REMARKS
STEEL PIPE PILE	SPP	SKK400	φ400x9	6000	16	86.8	521	8336	
							SUBTOTAL	= 8336 kg	
ATTACHMENT PARTS PER ONE PILE									
STOPPER	PL	SS400	20 x 9	1260	2	1.41	1.78	4	
REINFORCING BAND	PL	SS400	200 x 9	1257	1	14.1	17.72	18	
							SUBTOTAL	= 22 kg	
							TOTAL 22 x 18	= 396 kg	
							GRAN TOTAL	8336 kg + 396 kg = 8732 kg	

KATAHIRA & ENGINEERS INTERNATIONAL
Designed by : Date :
Checked by : Date :

MINISTRY OF TRANSPORT OF THE REPUBLIC OF TAJIKISTAN
Approved by : Date :

THE PROJECT FOR REHABILITATION OF KURGAN TYUBE - DUSTI ROAD (PHASE-2)

TITLE : BAR ARRANGMENT OF NO.5 PORTAL RAHMEN BRIDGE (3)

SCALE : 1/50

DRAWING No: BR5-04 Rv.

資料6-47