



**EUROPEAID**  
CO-OPERATION OFFICE

*Review of Railway Rehabilitation  
in Central Asia – Module B*

*(EUROPEAID/116151/C/SV/MULTI)*



**Tender Documents of the rehabilitation measures for the  
Lugovaya - Kyrgyz border railway section (Kazakhstan)**  
**Тендерные документы на восстановительные работы для  
участка Луговая - граница Кыргызстана (Казakhstan)**

**Lot 4.1 - Permanent Way and Civil Works**  
**Лот 4.1 - Верхнее строение пути и строительные работы**

**Section 9 - Drawings**  
**Раздел 9 - Чертежи**

*2004–2005*

**Тендерная Документация по восстановительным работам на участке  
Луговая- граница с Кыргызстаном (Казахстан)**

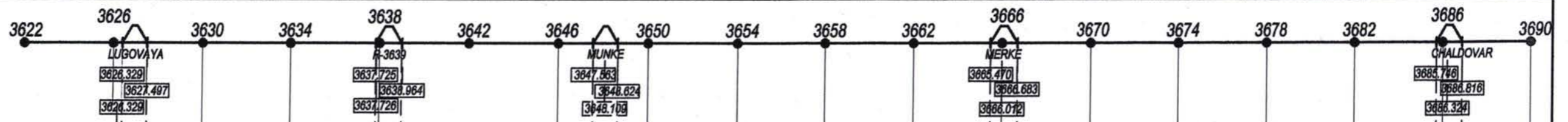
**Лот 4.1 – Общестроительные работы и верхнее строение пути**

**Раздел 9 - Чертежи**

**Перечень Чертежей**

<b>Код</b>	<b>Наименование</b>
L4.1-1	Локализация вмешательств
L4.1-2/1	Типовое сечение выемки
L4.1-2/2	Типовое сечение насыпи
L4.1-3/1	Тип работ 4А-1
L4.1-3/2	Тип работ 4А-2
L4.1-3/3	Тип работ 4А-3
L4.1-4	Типовое сечение с ж/б шпалой
L4.1-5	Методика укладки пути 1 (Европейская)
L4.1-6	Методика укладки пути 2 (Российская)
L4.1-7	Нанесение слоя материала из песчанного гравия
L4.1-8	Горизонтальное построение кривой
L4.1-9	Кривая вхождения
L4.1-10	Промежуточные вставки между участком безстыкового пути и стрелочным переводом.
L4.1-11	Переход между рельсами типа Р65 и Р50
L4.1-12	Стыки Р65, изостыки, болты, гайки, шайбы
L4.1-13	Стыки и изолированные стыки
L4.1-14/1	Железобетонные шпалы
L4.1-14/2	Железобетонные шпалы
L4.1-15	Допуски при сварке рельсов
L4.1-16/1	Железнодорожный переезд
L4.1-16/2	Железнодорожный переезд
L4.1-16/3	Железнодорожный переезд
L4.1-16/4	Железнодорожный переезд
L4.1-16/5	Железнодорожный переезд
L4.1-16/6	Железнодорожный переезд
L4.1-16/7	Железнодорожный переезд
L4.1-16/8	Железнодорожный переезд
L4.1-16/9	Железнодорожный переезд
L4.1-16/10	Железнодорожный переезд
L4.1-16/11	Железнодорожный переезд
L4.1-16/12	Железнодорожный переезд
L4.1-16/13	Железнодорожный переезд
L4.1-16/14	Железнодорожный переезд

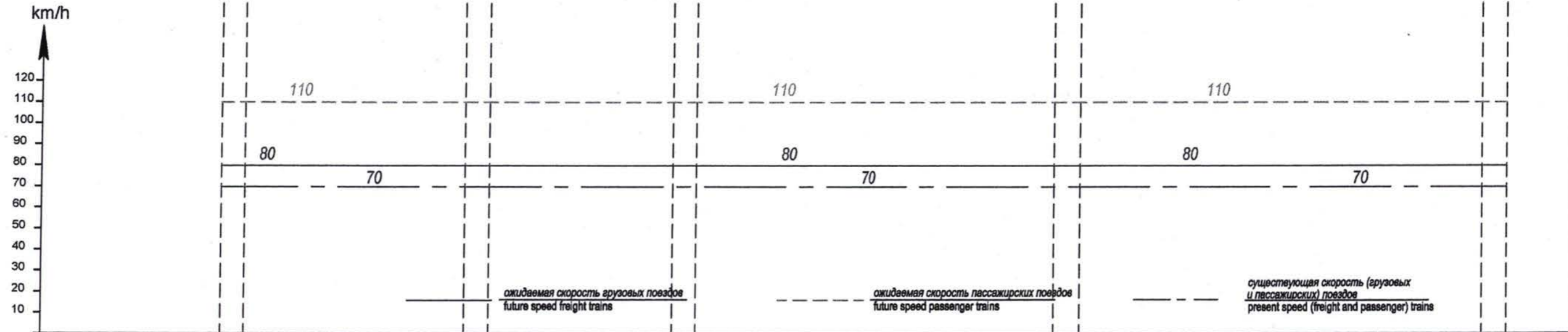
**СХЕМА ПУТИ**  
**LINE SCHEME**



**1 ЭТАП**  
**OPTION 1 WORKS**

1	ДЕМ-Й ПУТЬ LINE DEM.
2	ЗАМЕНА П.П. P. W. REP.
3	СОЕДИНЕНИЕ WELDING
4	ЗАМ.П.П.- РЕЛЬСЫ P. W. REP.- RAILS
5	У.В.В. T. L. A.
6	З.С.П. TURN. REP.
7	З.С.С.Ц S.I.R.C.A
8	З.БЛОКИРОВКИ L.B.R
9	АВТОМАТИКА CCT CONTROL

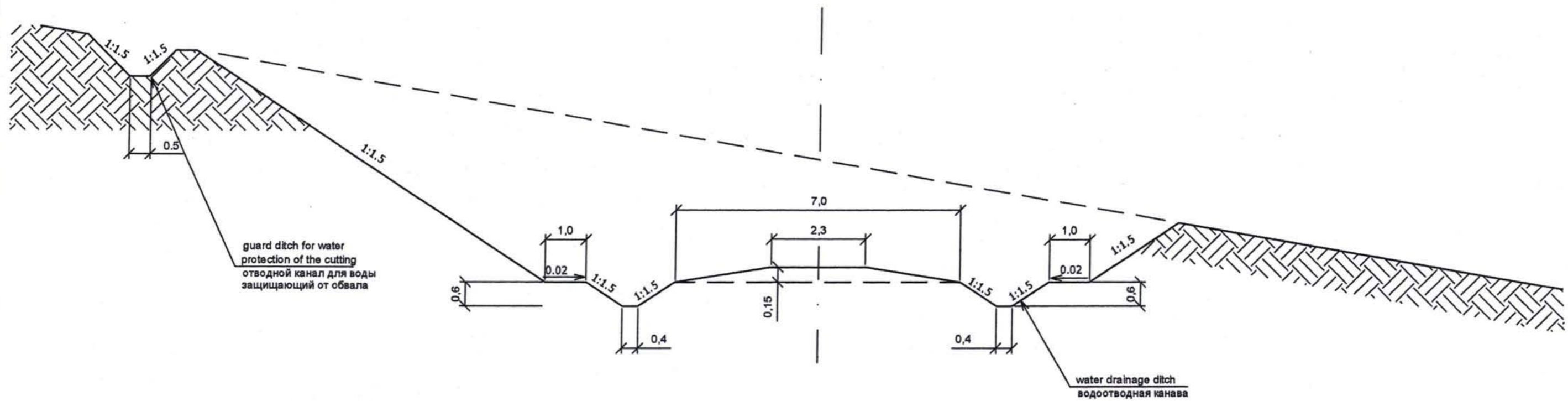
**SPEED PROFILE**  
**СКОРОСТНОЙ ГРАФИК**



- 1 **ДЕМ-Й ПУТЬ** демонтируемый путь  
LINE DEM. line demolition
- 2 **ЗАМЕНА ПУТИ** замена рельсов R65, ж/б шпал, балласта и суббалласта  
P. W. REP. installation of P65 rails, concrete sleepers, ballast, subballast
- 3 **СОЕДИНЕНИЕ** регулировка механического натяжения и сварка рельсов  
WELDING: regulation of mechanical tensions and formation of long welded rail bars
- 4 **ЗАМ.П.П.- РЕЛЬСЫ** замена ж/б шпал, балласта и суббалласта  
P. W. REP.- RAILS installation concrete sleepers, ballast, subballast
- 5 **У.В.В.** уплотнение, выравнивание и подбивка  
T. L. A. tamping, levelling and aligning
- 6 **З.С.П.** замена стрелочных переводов  
TURN. REP. replacement of turnouts

- 7 **З.С.С.Ц** замена станц-ой системы централизации с компьютеризацией  
S.I.R.C.A station interlocking replacement with computer assisted
- 8 **З.БЛОКИРОВКИ** замена блокировки на участке  
L.B.R line block replacement
- 9 **АВТОМАТИКА** ДЦ  
CCT CONTROL CCT control

	<b>Review of Railways Rehabilitation in Central Asia - Module B</b> (EUROPEAID/116151/C/SV/MULTI)		A project implemented by: 					
	Localizations of interventions. Line Lugovaya -Kyrgyz border. Локализация вмешательств. Участок Луговая-Кыргызская граница.							
Plan 1 of 1 (from km 3622 to km 3690)			L4.1-1					
Scale: 1:200000								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:					Referred Tables			



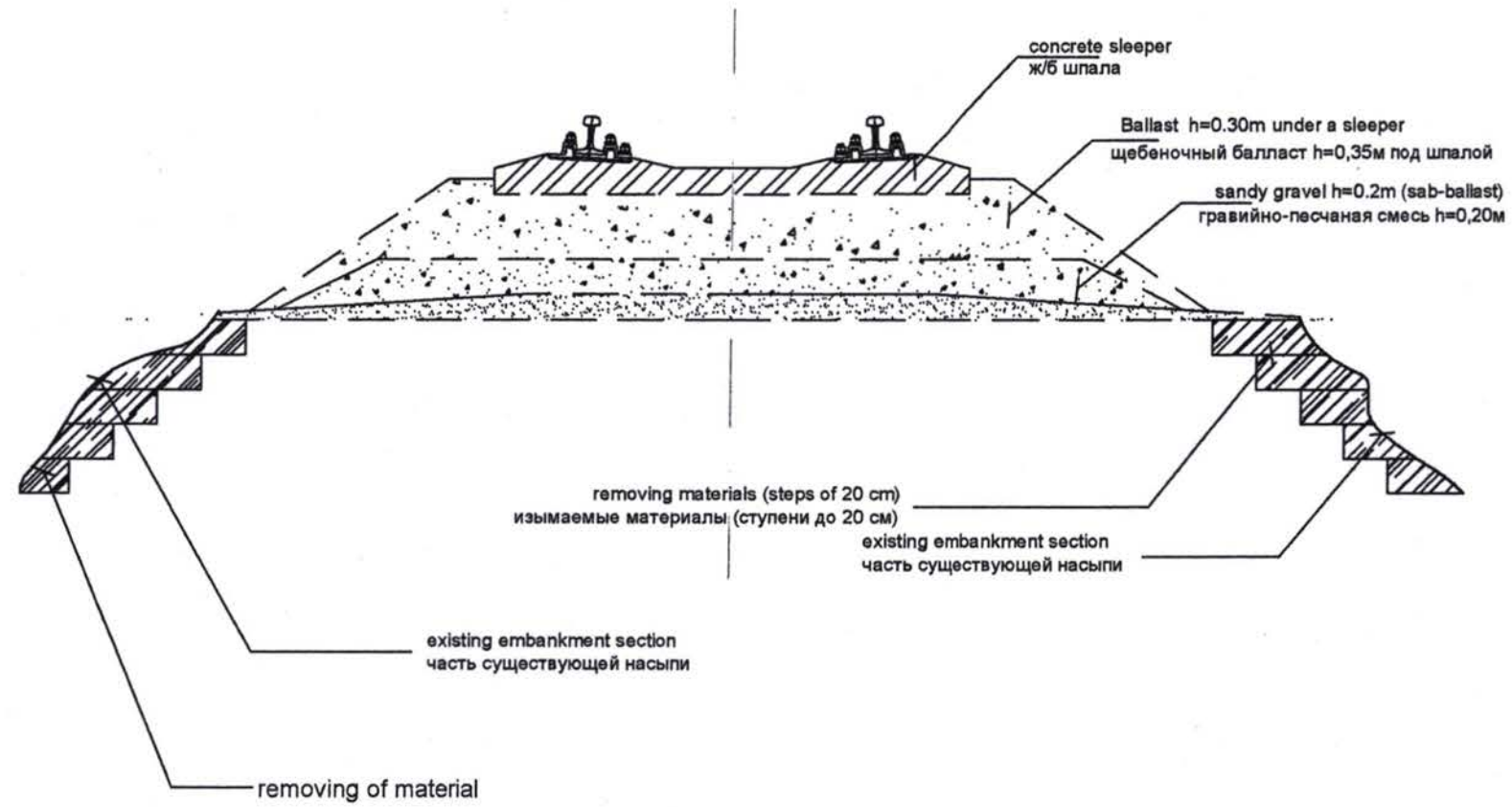
Typical cross section in cut for ditch depth up to 8 m in loess-like soils and a loess, silty loams, fine and powdery sands, semi-rocky breeds and loams.  
 Типовой поперечный профиль выемки глубиной до 8 м в лёссовидных грунтах и лёссе, пылеватых суглинках, мелких и пылеватых песках, полускальных породах и глинах.

		<b>Review of Railways Rehabilitation in Central Asia - Module B (Phase2)</b> (EUROPEAID/116161/C/SV/MULTI)				A project implemented by: 		
TYPICAL DRAWINGS: ALIGNMENT ТИПОВАЯ СХЕМА: ПОДБИВКА								
Typical cutting cross section / Типовое сечение выемки.								<b>L4.1-2/1</b>
<div style="text-align: right;">Scale: 1:100</div>								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File: Referred Tables								



WORK TYPE 4A: WIDENING THE SECTION OF CONCRETE SLEEPER.  
 ТИП РАБОТ 4А: УШИРЕНИЕ УЧАСТКА С ЖЕЛЕЗОБЕТОННЫМИ ШПАЛАМИ.

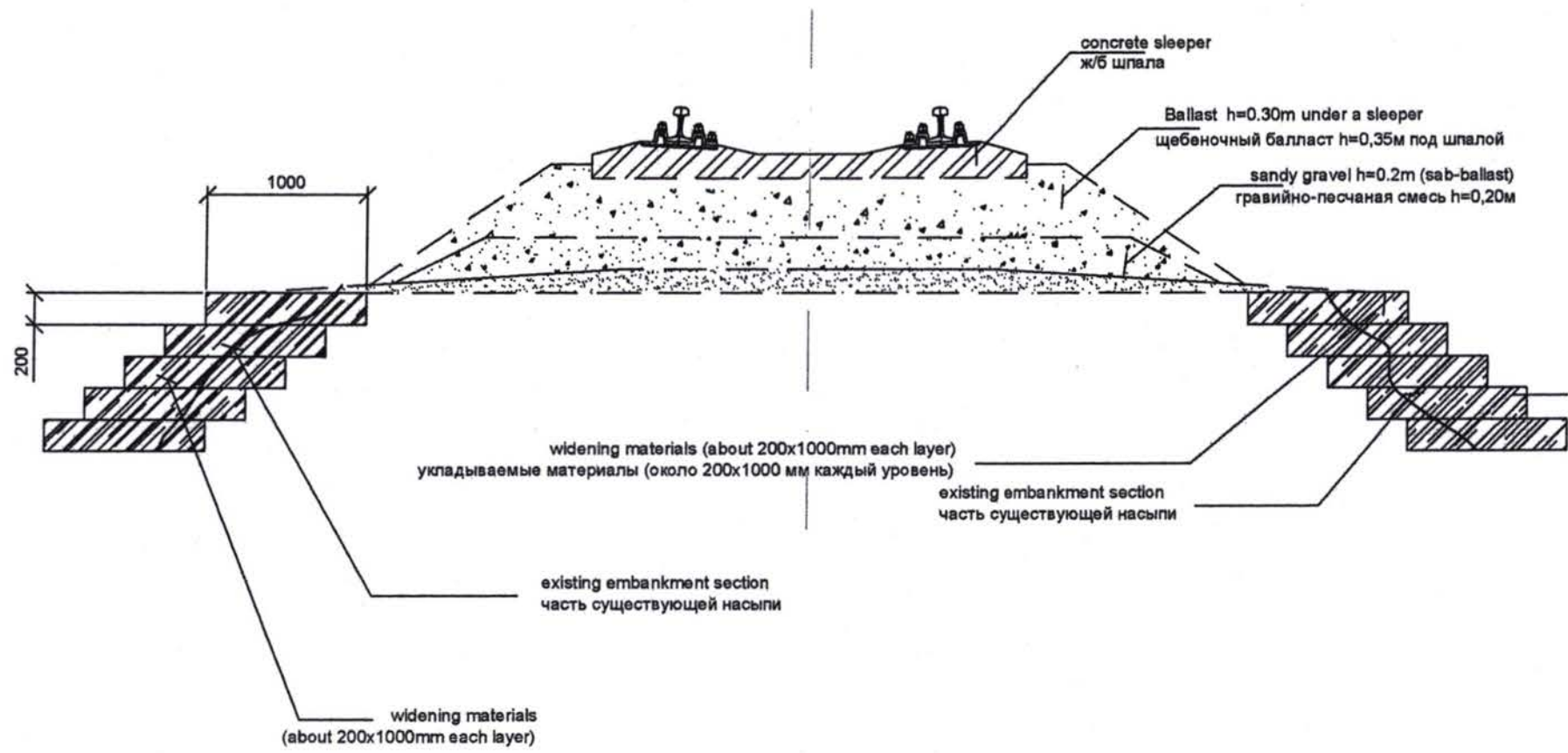
PHASE 1.  
 ФАЗА 1.



		<b>Review of Railways Rehabilitation                  in Central Asia - Module B (Phase2)</b> (EUROPEAID/116161/C/SV/MULTI)				A project implemented by: 		
<b>METHODOLOGY OF EMBANKMENT WIDENING</b> <b>МЕТОДОЛОГИЯ РАСШИРЕНИЯ НАСЫПИ</b>								
TYPICAL DRAWINGS: WORK TYPOLOGY - 4A 1 ТИПОВЫЕ ЧЕРТЕЖИ: ТИП РАБОТ - 4А 1						L4.1-3/1		
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Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:						Referred Tables		

WORK TYPE 4A: WIDENING THE SECTION OF CONCRETE SLEEPER.  
 ТИП РАБОТ 4А: УШИРЕНИЕ УЧАСТКА С ЖЕЛЕЗОБЕТОННЫМИ ШПАЛАМИ.

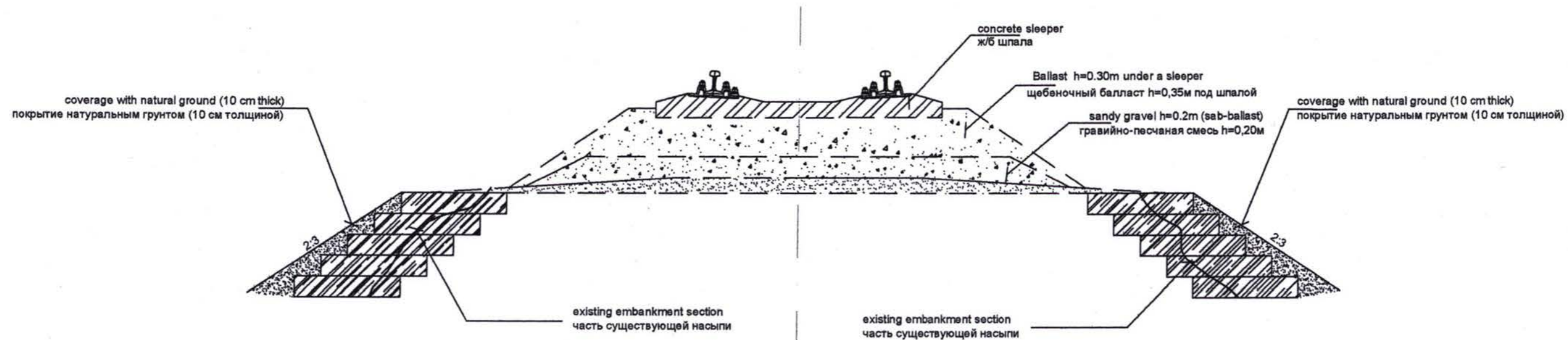
PHASE 2.  
 ФАЗА 2.



		<b>Review of Railways Rehabilitation in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)				A project implemented by: 		
METHODOLOGY OF EMBANKMENT WIDENING МЕТОДОЛОГИЯ РАСШИРЕНИЯ НАСЫПИ								
TYPICAL DRAWINGS: WORK TYPOLOGY - 4A 2 ТИПОВЫЕ ЧЕРТЕЖИ: ТИП РАБОТ - 4А 2						L4.1-3/2		
Scale: 1:40								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:								
Referred Tables								

WORK TYPE 4A: WIDENING THE SECTION OF CONCRETE SLEEPER.  
 ТИП РАБОТ 4А: УШИРЕНИЕ УЧАСТКА С ЖЕЛЕЗОБЕТОННЫМИ ШПАЛАМИ.

PHASE 3.  
 ФАЗА 3.

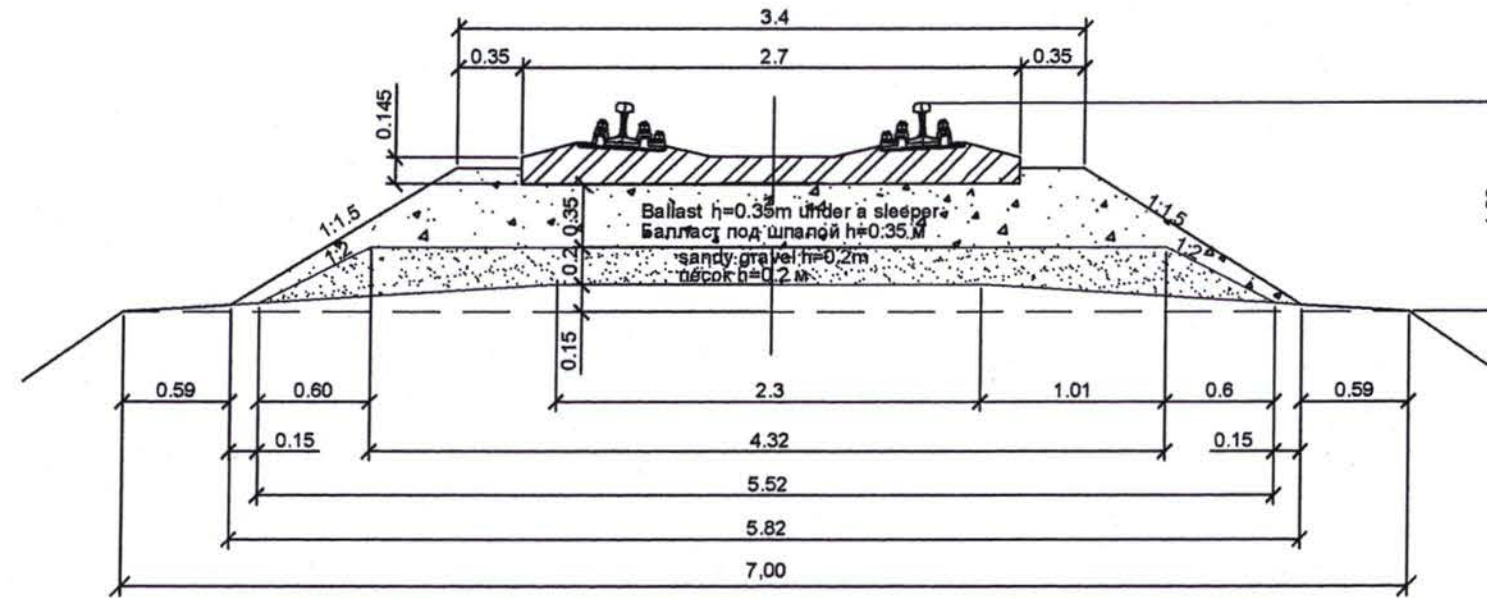


		<b>Review of Railways Rehabilitation in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)				A project implemented by: 		
<b>METHODOLOGY OF EMBANKMENT WIDENING</b> <b>МЕТОДОЛОГИЯ РАСШИРЕНИЯ НАСЫПИ</b>								
TYPICAL DRAWINGS: WORK TYPOLOGY - 4A 2 ТИПОВЫЕ ЧЕРТЕЖИ: ТИП РАБОТ - 4А 2						L4.1-3/3		
Scale: 1:40								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:						Referred Tables		

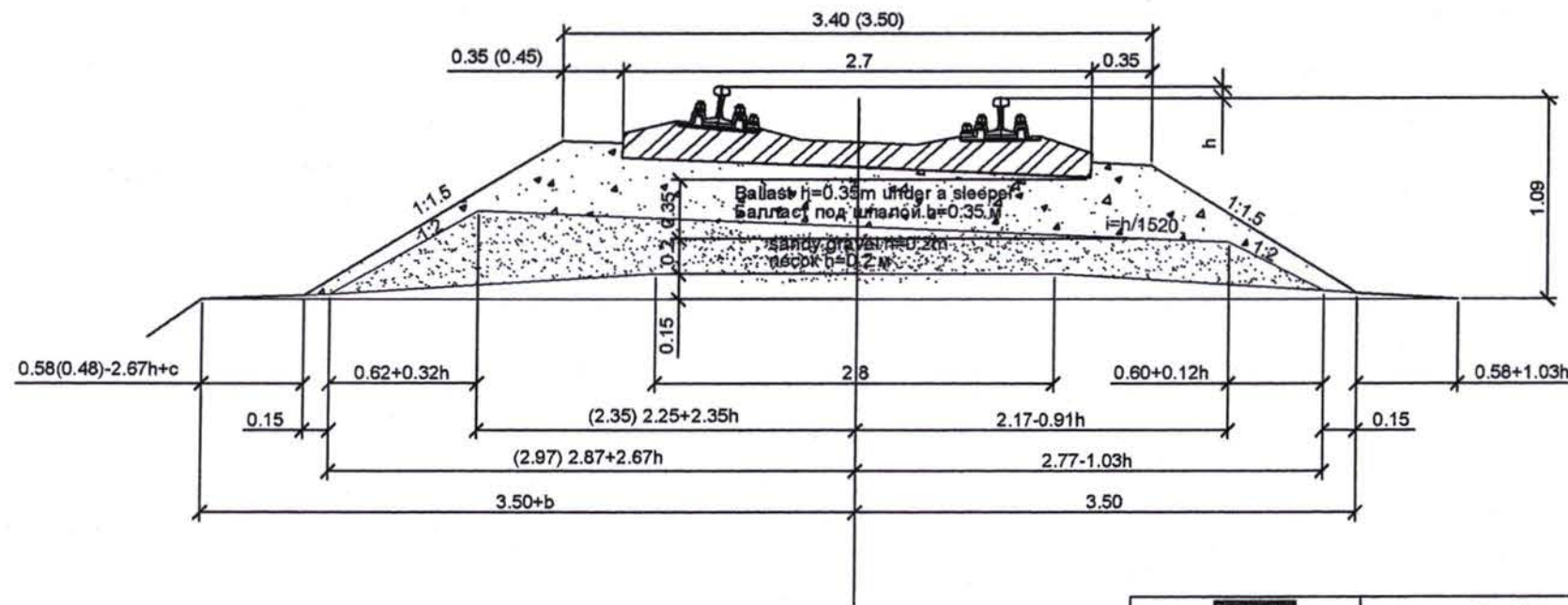


**Typical Cross Section**  
**Типы верхнего строения пути**

Single track - Straight section - Pre-stressed concrete sleeper - formation width 7,0 m  
 На прямых участках пути (шпалы ж/б) при ширине зем.полотна 7,0 м



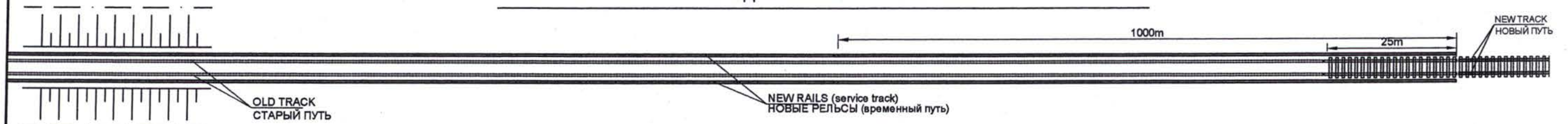
Single track - Curved section - Pre-stressed concrete sleeper - formation width 7,0 m  
 На кривых участках пути (шпалы ж/б) при ширине зем.полотна 7,0 м



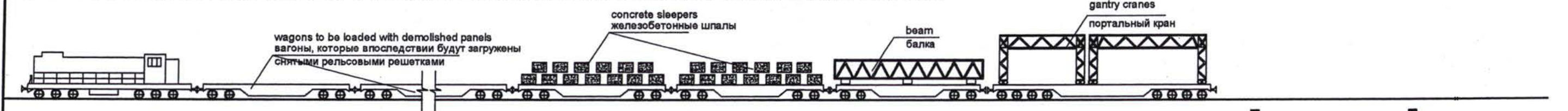
NOTE	УСЛОВНЫЕ ОБОЗНАЧЕНИЯ
h- cant of an eminence of an exterior rail in curves b-size of formation broadening c-size of ballast section broadening	h-величина возвышения наружного рельса в кривых, b-величина уширения земляного полотна c-величина уширения балластной призмы
In brackets sizes are resulted at R<600m	В скобках приведены величины при R<600.

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TYPICAL DRAWINGS: ALIGNMENT ТИПОВАЯ СХЕМА: ПОДБИВКА								
Typical cross section with pre-stressed concrete sleeper (Типовое сечение с ж/б шпалой).		<b>L4.1-4</b>						
Scale: 1:40								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:			Referred Tables					

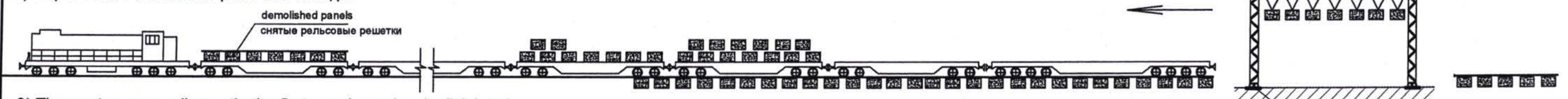
METHODOLOGY 1 FOR TRACK REPLACEMENT  
МЕТОДИКА 1 ПО ЗАМЕНЕ ПУТИ



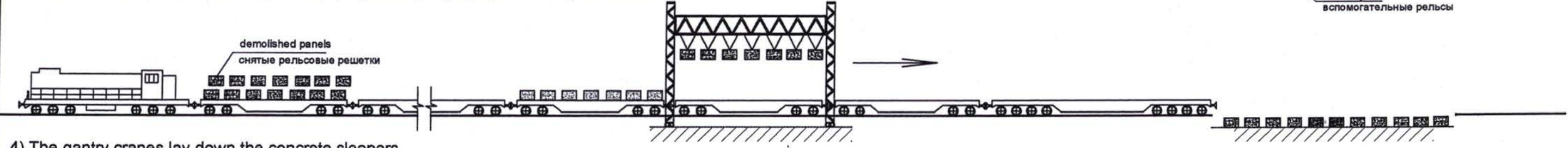
- 1) New rails are laid down along track to be first used as service track for gantry cranes.  
1) Новые рельсы уложены вдоль пути, который изначально используется как временный путь для порталных кранов.



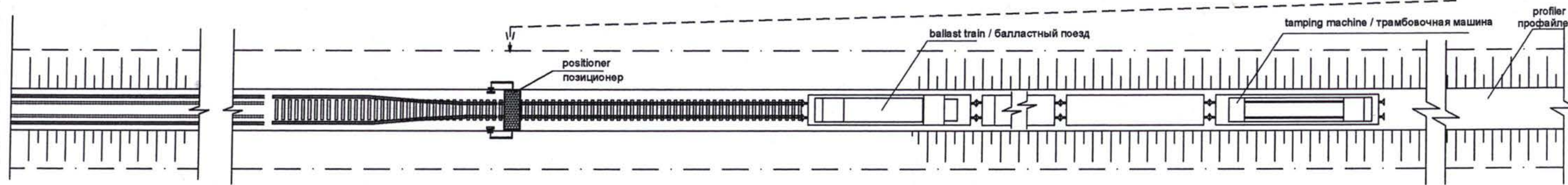
- 2) Normal composition of work train.  
2) Нормальное состояние рабочего поезда.



- 3) The gantry cranes dismantle the first panel, previously disjointed.  
3) Портальные краны демонтируют первую решетку, предварительно расстыкованную.



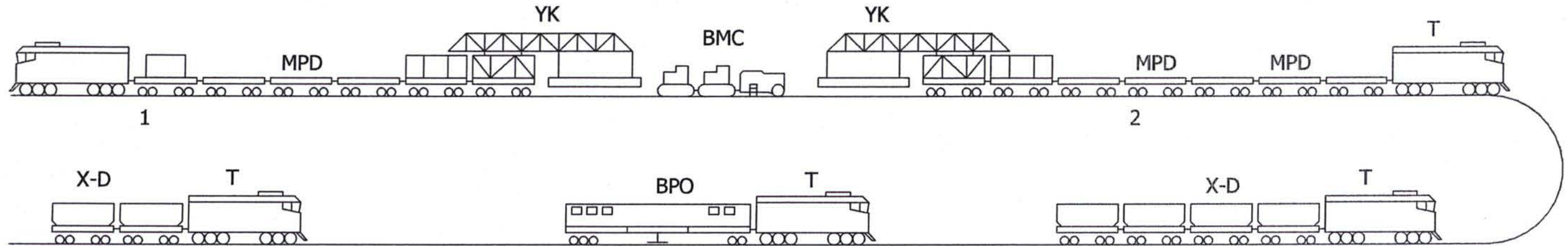
- 4) The gantry cranes lay down the concrete sleepers  
4) Портальные краны укладывают железобетонные шпалы



- 5) The positioner put the auxiliary rails on the concrete sleepers to form the new track.  
5) Позиционер укладывает вспомогательные рельсы на железобетонные шпалы для формирования нового пути.




	<b>Review of Railways Rehabilitation in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)		A project implemented by: 					
	PERMANENT WAY ВЕРХНЕЕ СТРОЕНИЕ ПУТИ							
Methodology for track construction 1 (european) - Методика укладки пути 1 (Европейская)			<b>L4.1-5</b>					
Scale: 1:40				Authorized				
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
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Plasement of machines at work in free periods at capital repeer of track.  
 Расстановка машин при работе в "окно" на капитальном ремонте пути.



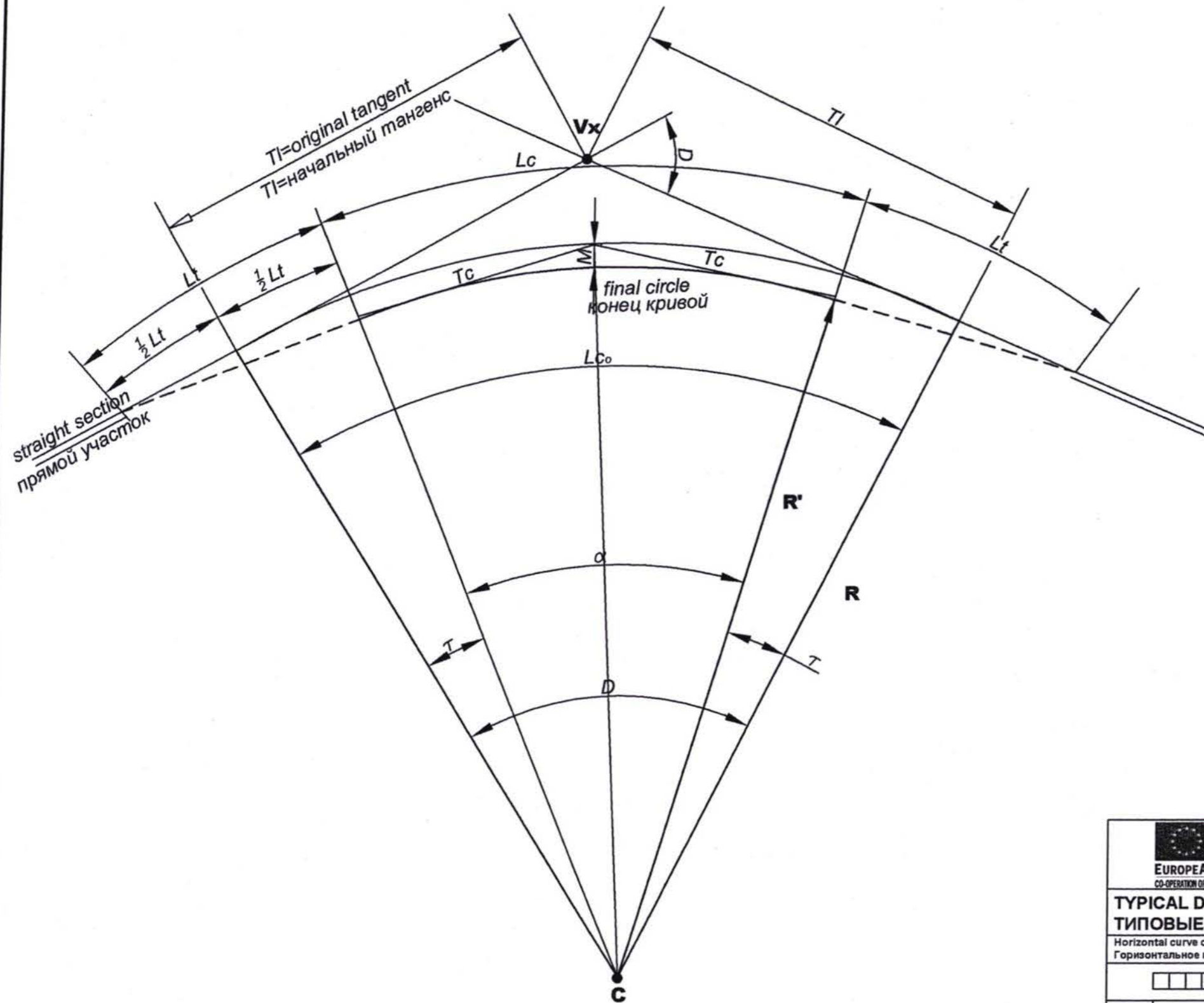
1 - dismantling (distributor) train; 2 - packing (laying) train; T - diesel locomotive;  
 MPD - motor platform; YK - laying crane; BMC - balast dearer; XD - hopper-batcher;  
 BPO - liner-tamper supfaser.

1 - разборочный поезд; 2 - укладочный поезд; Т - тепловоз; MPD - моторная  
 платформа; YK - укладочный кран; BMC - балластоочистительная машина; XD -  
 хоппер-дозатор; BPO - выправочно-подбивочно-отделочная машина .

		<b>Review of Railways Rehabilitation                  in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)				A project implemented by: 		
PERMANENT WAY ВЕРХНЕЕ СТРОЕНИЕ ПУТИ								
Methodology for track construction 2 (russian) - Методика укладки пути 2 (Российская)								<b>L4.1-6</b>
								Scale:
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:						Referred Tables		



**HORIZONTAL ALIGNMENT: CURVE ELEMENTS**  
**ГОРИЗОНТАЛЬНОЕ ВЫРАВНИВАНИЕ: ЭЛЕМЕНТЫ КРИВОЙ**



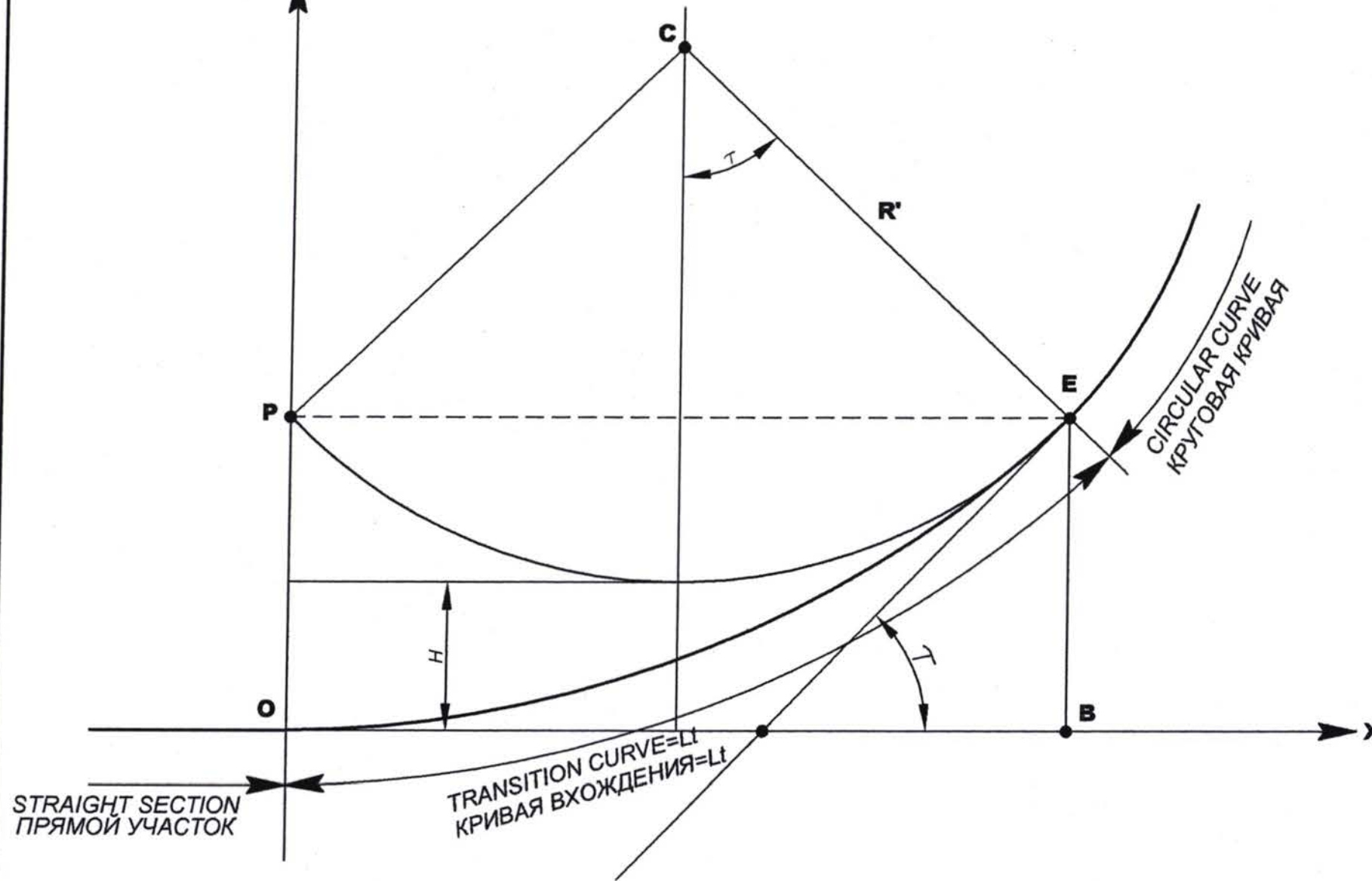
**M**=difference between original and final circle  
**M**=разница между началом и концом кривой  
**L<sub>t</sub>**=transition curve length  
**L<sub>t</sub>**=длина кривой вхождений  
**L<sub>c</sub>**=final circle length  
**L<sub>c</sub>**=длина конечной кривой  
**L<sub>co</sub>**=original circle length  
**L<sub>co</sub>**=длина начальной кривой  
**D**=deflection angle  
**D**=угол отклонения  
**T**=deflection angle of the transition curve  
**T**=угол отклонения кривой вхождения  
**α**=deflection angle of the final circle  
**α**=угол отклонения конечной кривой  
**α**= $D-2T$   
**R'**= $R-M$   
**L<sub>c</sub>**= $R \times \alpha$   
**T<sub>c</sub>**= $R \times \text{Tou} (\alpha/2)$   
**T<sub>c</sub>**=конечный тангенс кривой  
**R**=original radius  
**R**=первоначальный радиус  
**R'**=final radius  
**R'**=конечный радиус  
**C**=centre of the curve  
**C**=центр кривой

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<b>TYPICAL DRAWINGS</b> <b>ТИПОВЫЕ ЧЕРТЕЖИ</b>								
Horizontal curve construction Горизонтальное построение кривой					<b>L4.1-8</b>			
Scale: -								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:							Referred Tables	

**HORIZONTAL ALIGNMENT: TRANSITION CURVE LENGTH**  
**ГОРИЗОНТАЛЬНОЕ ВЫРАВНИВАНИЕ: ДЛИНА КРИВОЙ ВХОЖДЕНИЯ**

**LEGEND**  
**УСЛОВНЫЕ ОБОЗНАЧЕНИЯ**

R'=final radius  
 R'=конечный радиус  
 M=difference between original and final radius  
 M=разница между начальным и конечным радиусом  
 T=deflection angle of the clotoid  
 T=угол отклонения от клотоида  
 C=centre of the curve  
 C=центр кривой  
 PE=X  
 EB=Y  
 Lt=transition curve length  
 Lt=длина кривой вхождения



**FIXED PARAMETERS**  
**ПОСТОЯННЫЕ ПАРАМЕТРЫ**

$Q_{mc}=0.55-0.6 \text{ m/s}^2$   
 C=variation of  $Q_{mc}=0.15-0.25 \text{ m/s}^3$

**CALCULATION FORMULAS**  
**РАСЧЕТНЫЕ ФОРМУЛЫ**



$$L_t = \frac{V_{\max} \times Q_{mc}}{3,6 \times C}$$

$$T \text{ (rad)} = \frac{L_t}{2R}$$

$$Q_{mc} \text{ (not compensated acceleration)} = \frac{V_{\max}^2}{12.96 \times R} - \frac{h}{162}$$

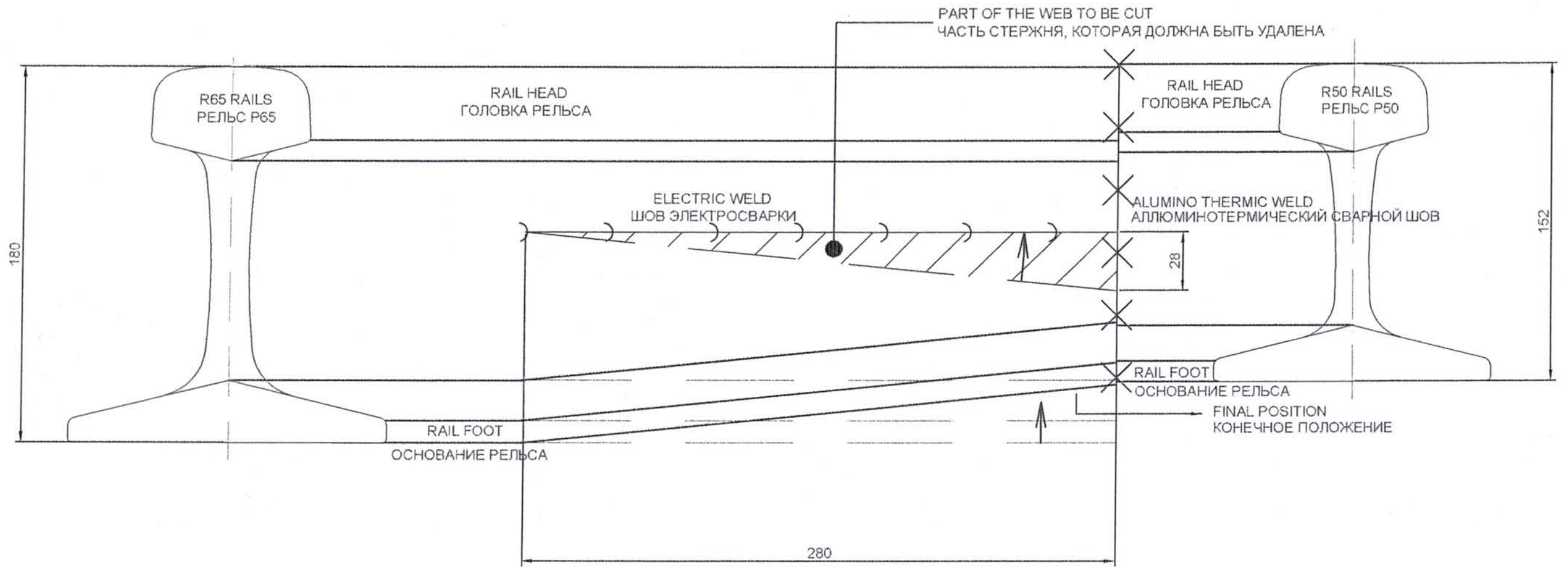
$$Q_{mc} \text{ (некомпенсированное ускорение)} = \frac{V_{\max}^2}{12.96 \times R} - \frac{h}{162}$$

$V_{\max}$  - maximum speed in km/h  
 $V_{\max}$  - максимальная скорость в км/ч  
 R - curve radius in m  
 R - радиус кривой в м  
 h - superelevation (cant) in mm  
 h - превышение (скос) в мм

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<b>TYPICAL DRAWINGS</b> <b>ТИПОВЫЕ ЧЕРТЕЖИ</b>			<b>L4.1-9</b>
Transition curve Кривая вхождения			Scale: -
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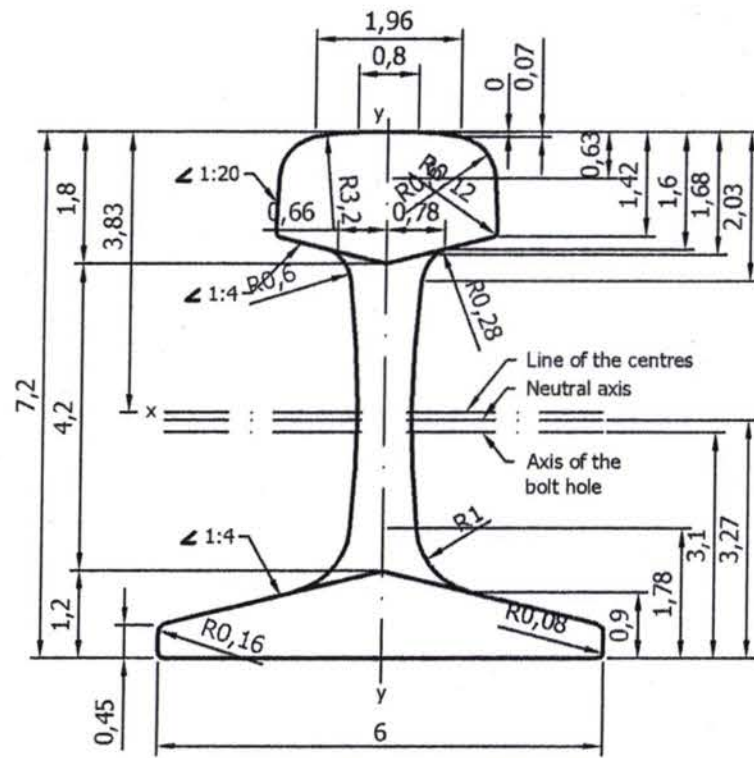
TRANSITION BETWEEN R65 AND R50 RAILS  
 ПЕРЕХОД МЕЖДУ РЕЛЬСАМИ ТИПА Р65 И Р50



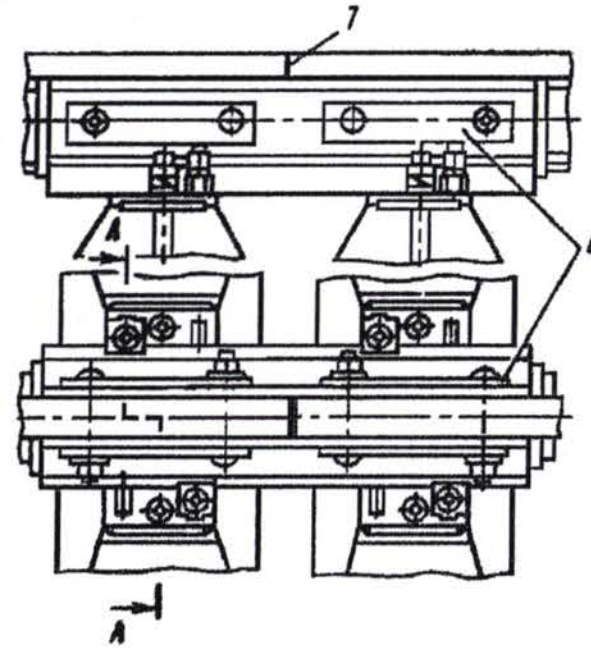
		<b>Review of Railways Rehabilitation                  in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)			A project implemented by: 	
TYPICAL DRAWINGS: PERMANENT WAY. ТИПОВОЙ ЧЕРТЕЖ: ВЕРХНЕЕ СТРОЕНИЕ ПУТИ						
Transition between R65 and R50 rails - Переход между рельсами типа Р65 и Р50					<b>L4.1-11</b>	
Scale: 1:2						
Rev.	Description	Designed	Date	Verified	Date	Approved
File: Referred Tables						



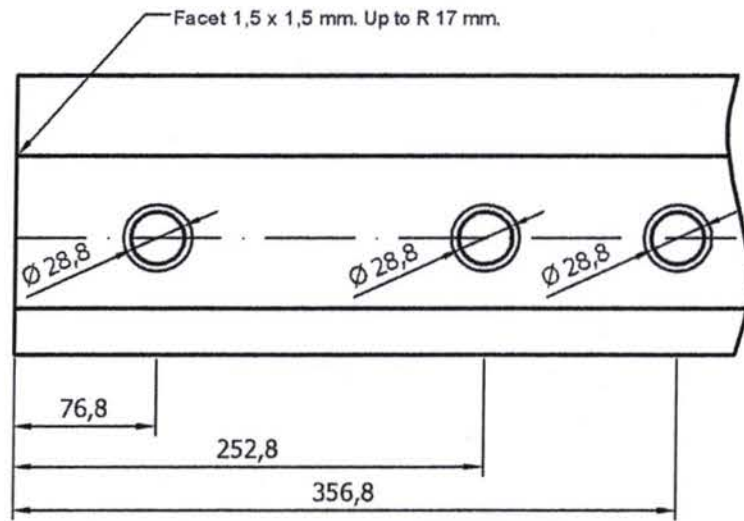
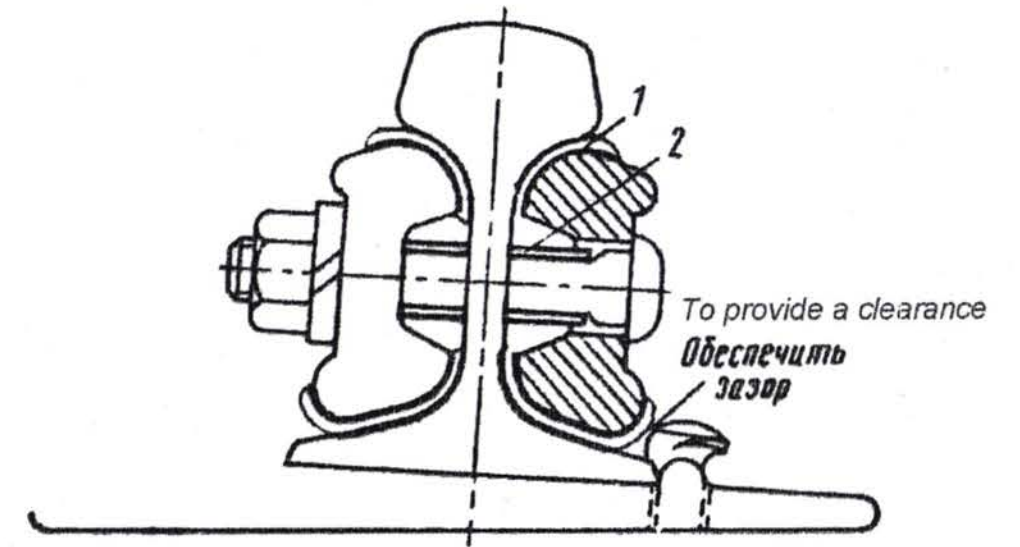
R 65



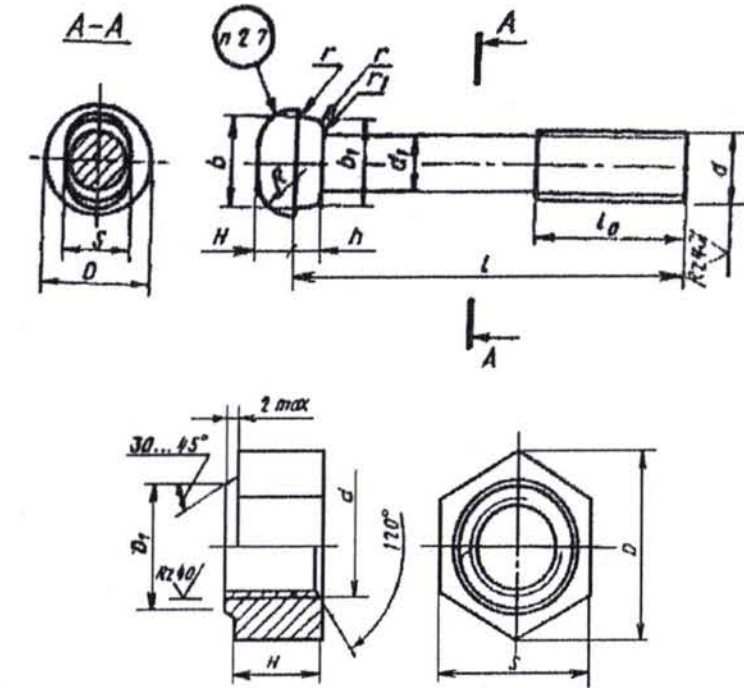
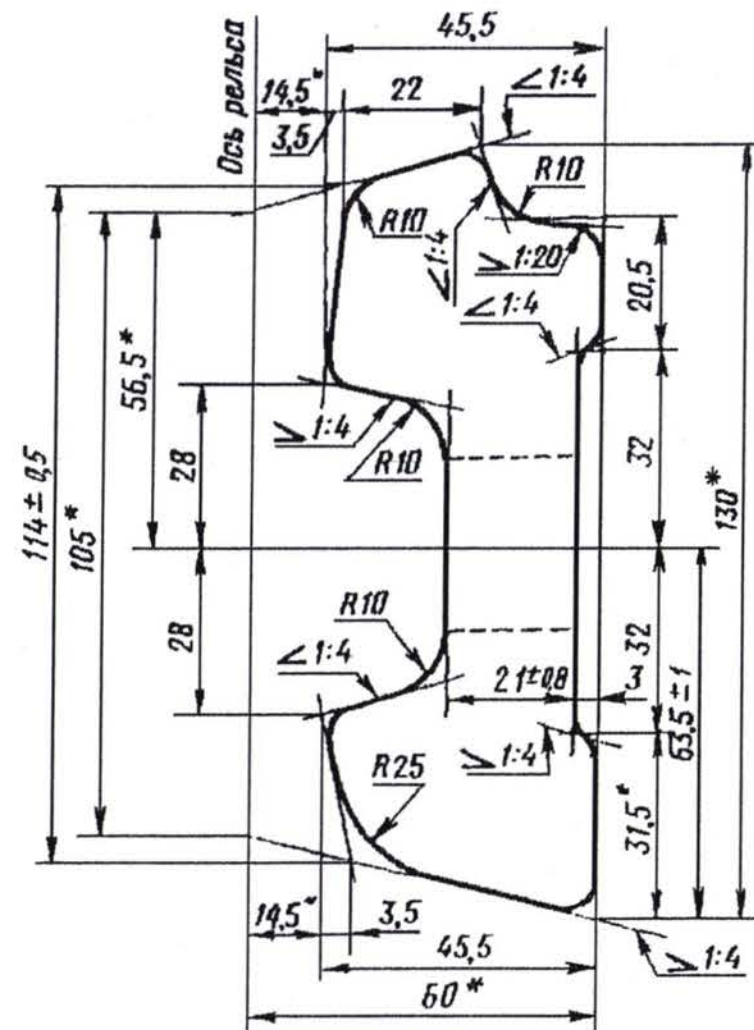
JOINT



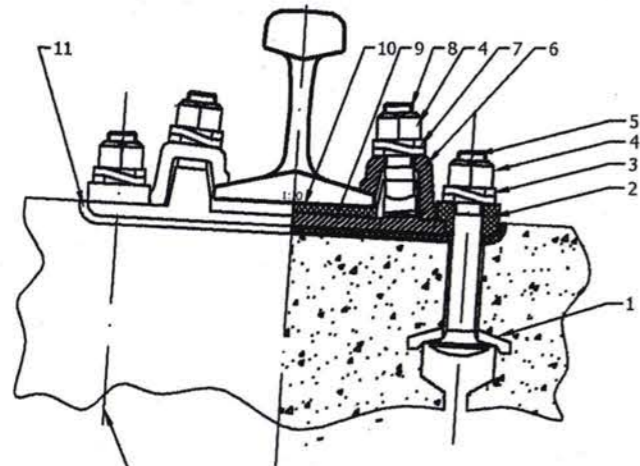
INSULATED JOINT



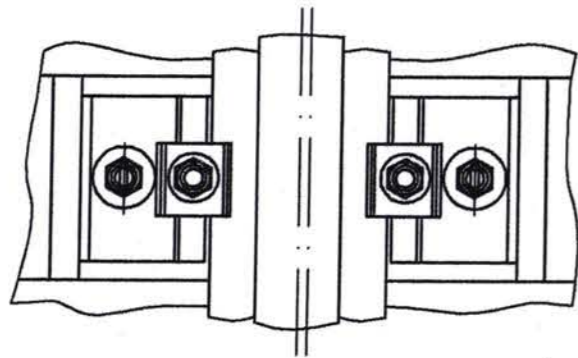
Cross profiles of standard rails (R65)



		Review of Railways Rehabilitation in Central Asia - Module B (Phase2) (EUROPEAID/116151/C/SV/MULTI)				A project implemented by: 	
TYPICAL DRAWINGS: PERMANENT WAY. ТИПОВОЙ ЧЕРТЕЖ: ВЕРХНЕЕ СТРОЕНИЕ ПУТИ							
P65 rail - joints, insulated joints, bolts, nuts, washers - Стыки Р65, изостыки, болты, гайки, шайбы							L4.1-12
Scale: 1:2							
Rev.	Description	Designed	Date	Verified	Date	Approved	Authorized
File:				Referred Tables			

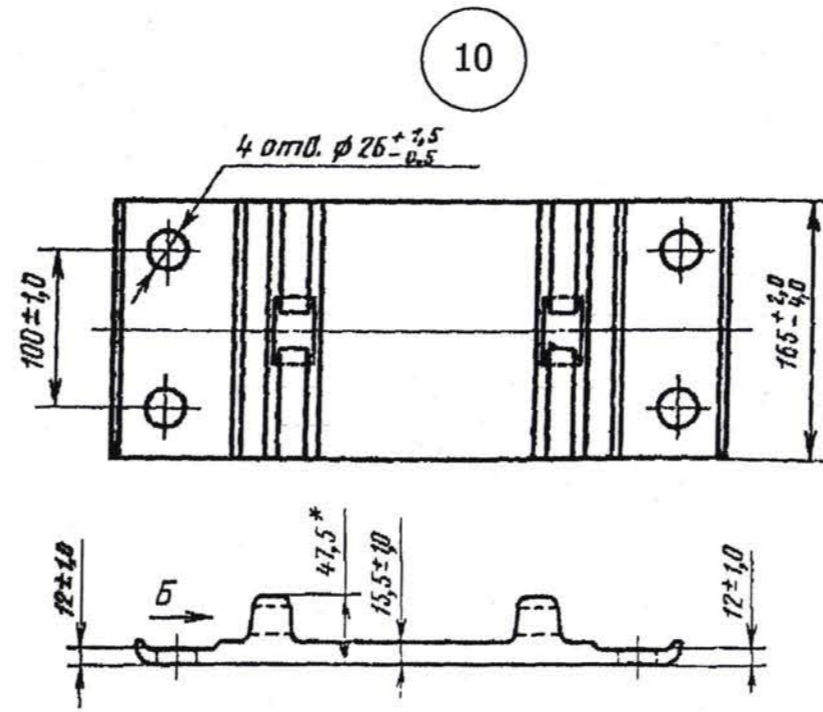
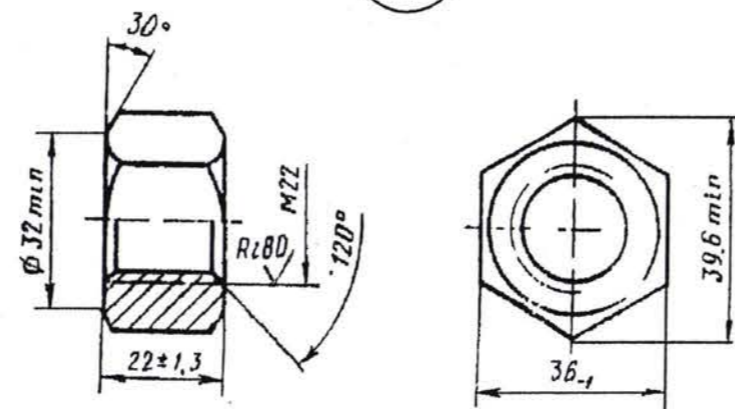
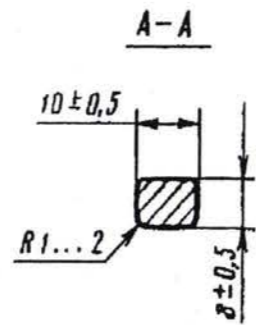
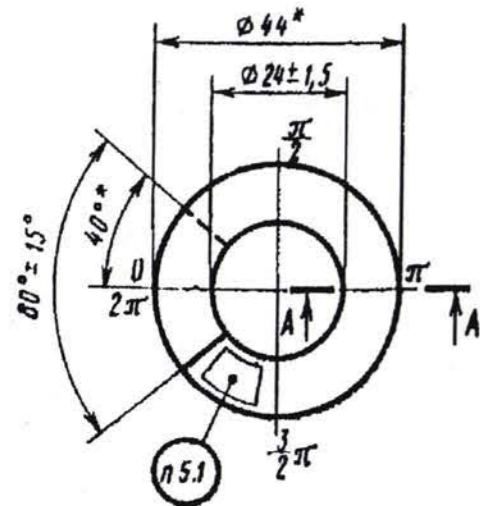
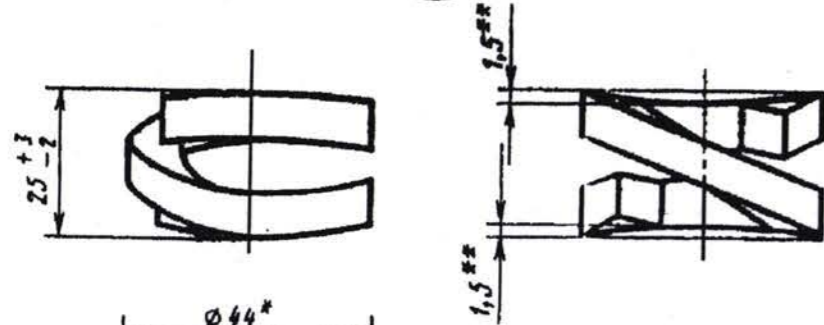


Separate fastening

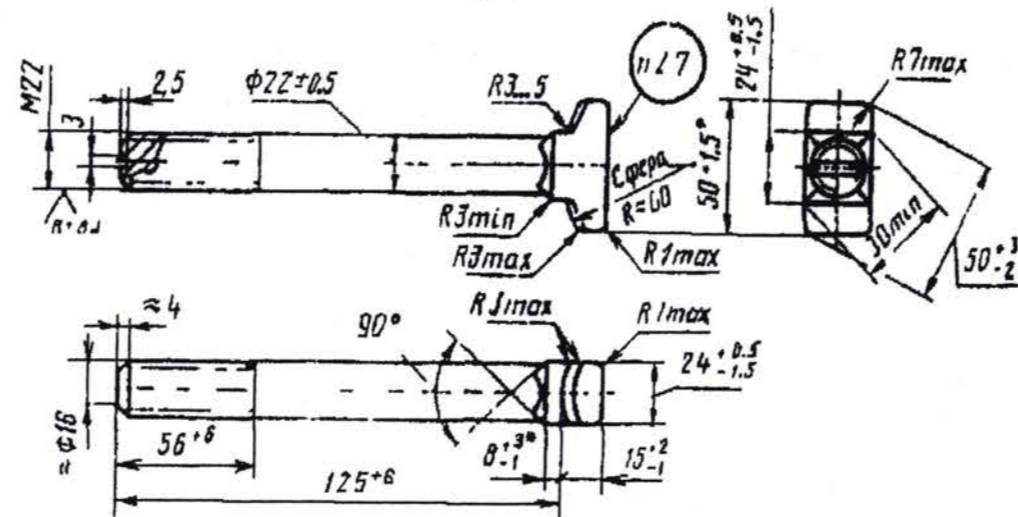


1-basic washer; 2-insulating bush; 3,7- coil-double spring collar; 4-screw nut; 5-mortgage bolt; 6-the terminal clamp rigid; 8-clamp bolt; 9-laying under base of rail; 10-metal laying; 11-laying under the baseplate.

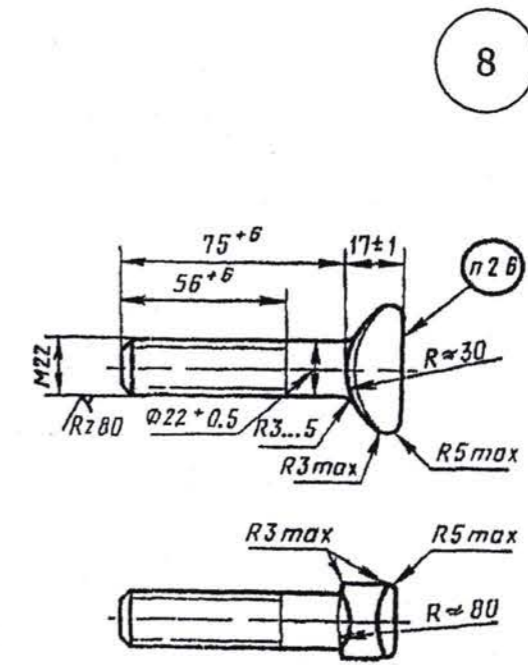
3,7



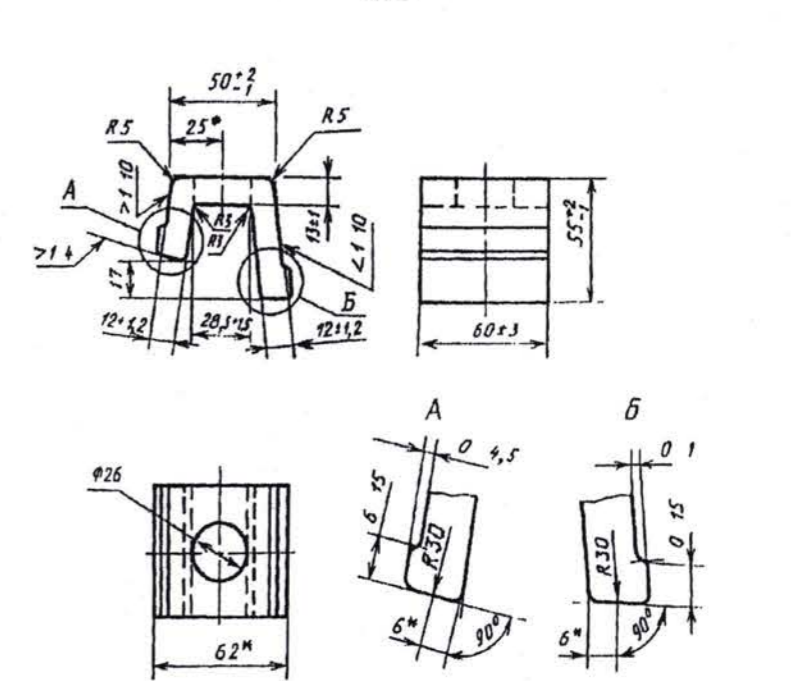
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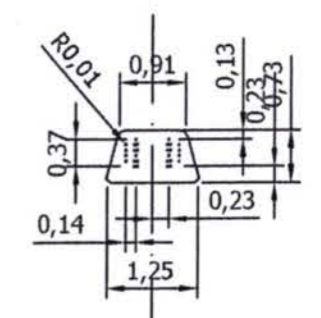
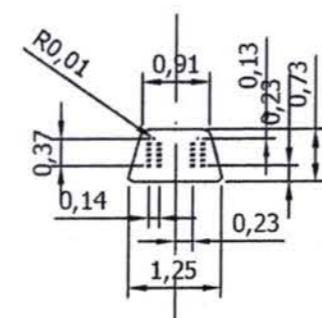
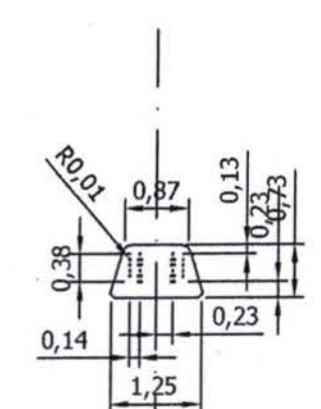
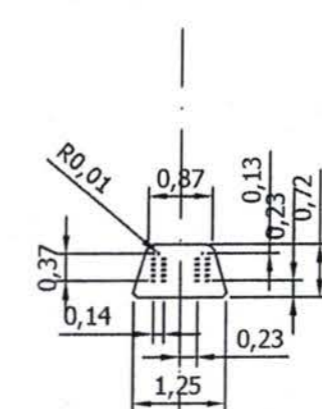
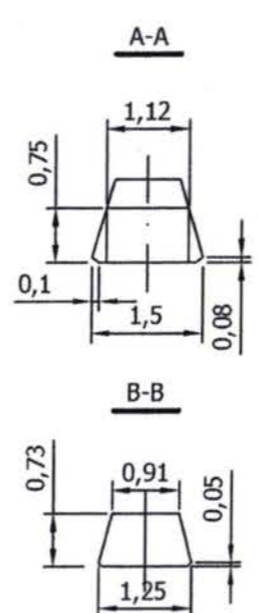
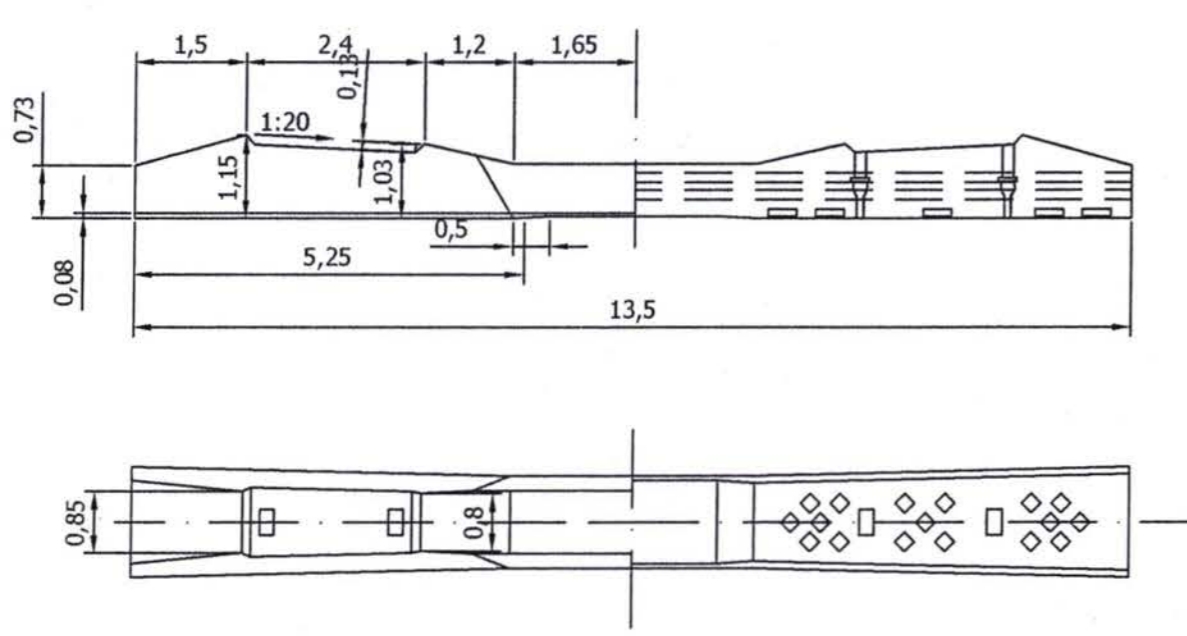
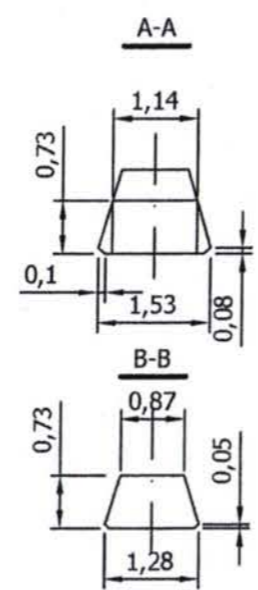
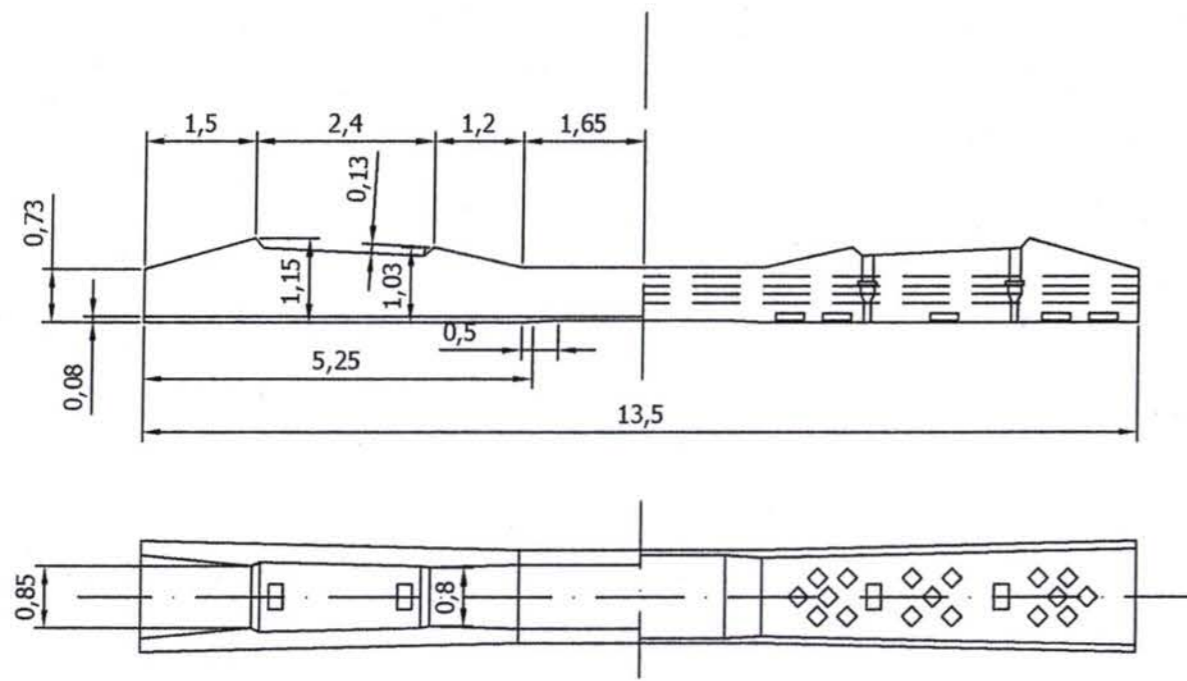
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6



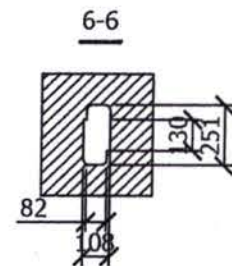
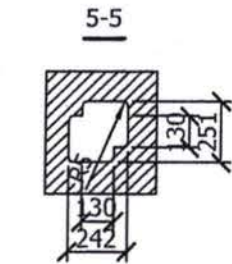
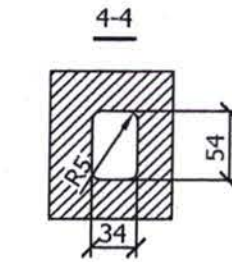
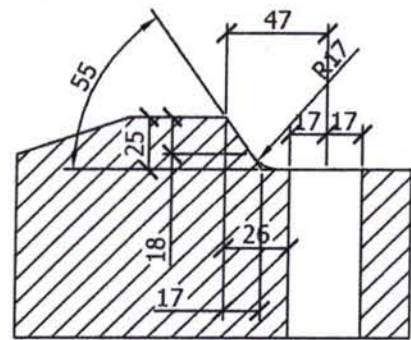
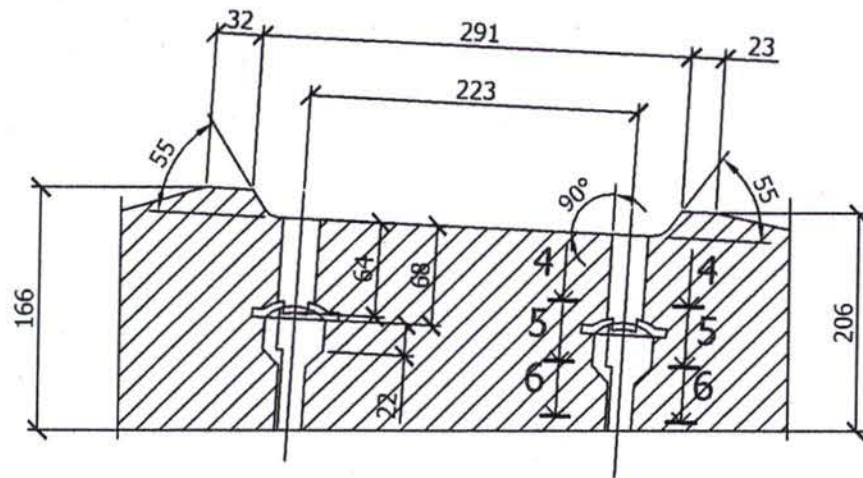
		<b>Review of Railways Rehabilitation in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)				A project implemented by: 		
TYPICAL DRAWINGS: PERMANENT WAY. ТИПОВОЙ ЧЕРТЕЖ: ВЕРХНЕЕ СТРОЕНИЕ ПУТИ								
Fastening and insulated fastenings - Стыки и изолированные стыки								<b>L4.1-13</b>
Scale: 1:2								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File: Referred Tables								



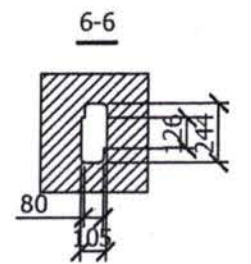
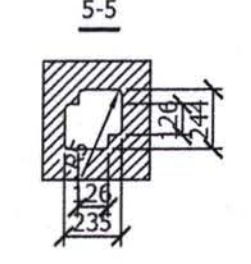
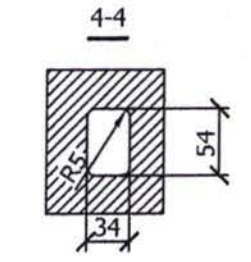
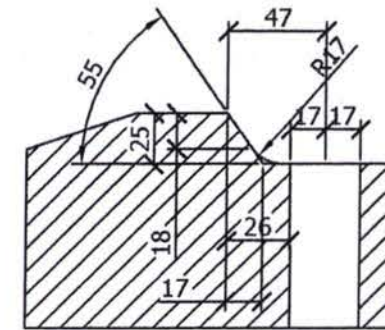
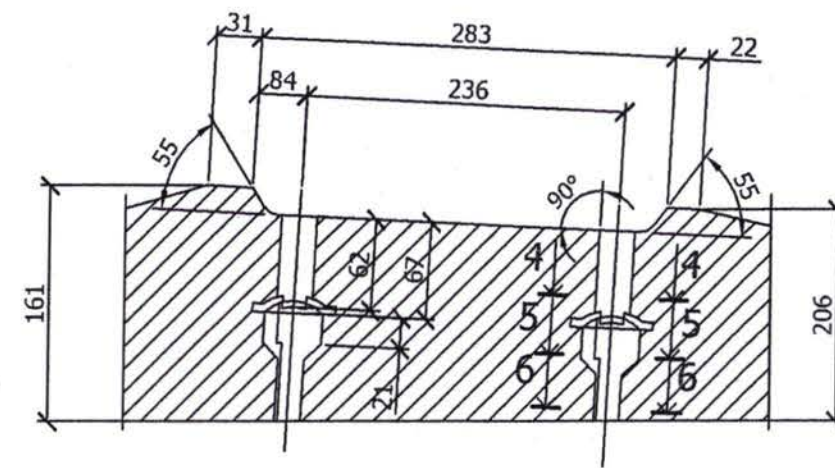
Design of ferroconcrete sleepers  
 a - such as C-73-1; b - such as C-73-2; c - cross sections and reinforcing of sleepers C-73-1; d - cross sections and reinforcing of sleepers such as C-73-2.

		<b>Review of Railways Rehabilitation in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)				A project implemented by: 		
TYPICAL DRAWINGS: PERMANENT WAY. ТИПОВОЙ ЧЕРТЕЖ: ВЕРХНЕЕ СТРОЕНИЕ ПУТИ								
Reinforced concrete sleepers - Железобетонные шпалы								<b>L4.1-14/1</b>
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Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File: _____ Referred Tables								

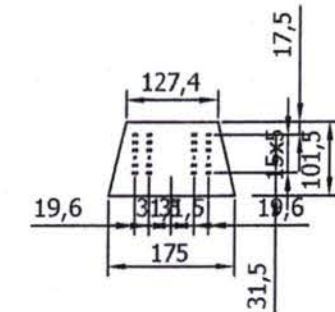
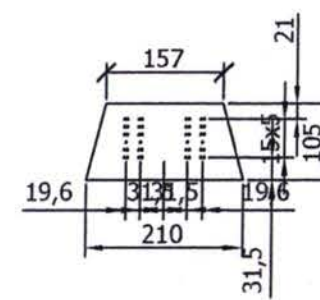
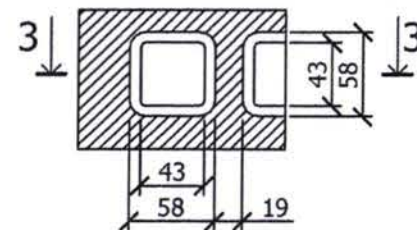
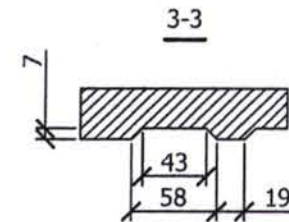
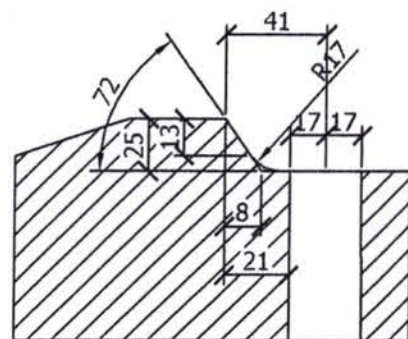
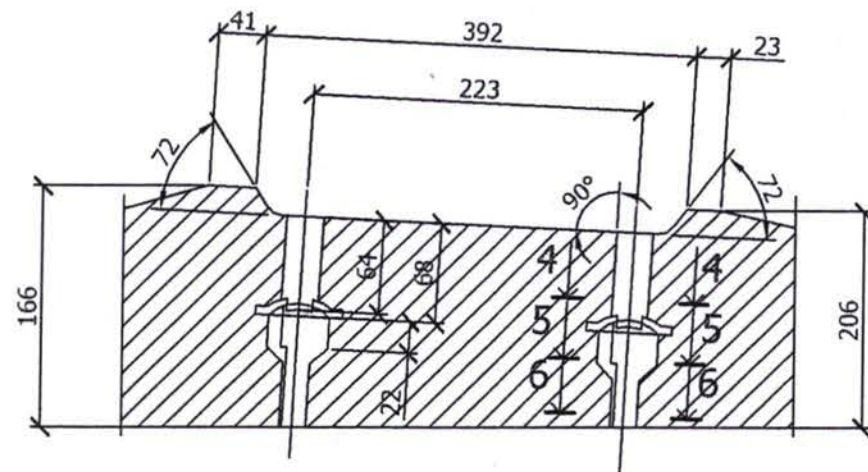
Under rail part of the sleeper S1-1



Under rail part of the sleeper S2-1



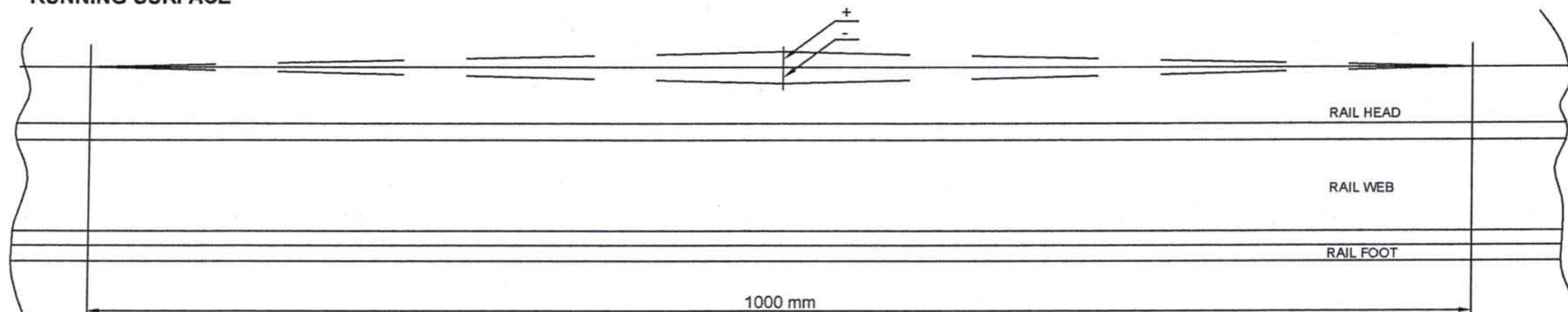
Under rail part of the sleeper S1-2



		<b>Review of Railways Rehabilitation in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)				A project implemented by: 			
TYPICAL DRAWINGS: PERMANENT WAY. ТИПОВОЙ ЧЕРТЕЖ: ВЕРХНЕЕ СТРОЕНИЕ ПУТИ									
Reinforced concrete sleepers - Железобетонные шпалы								<b>L4.1-14/2</b>	
Scale: 1:2									
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized	
File: Referred Tables									

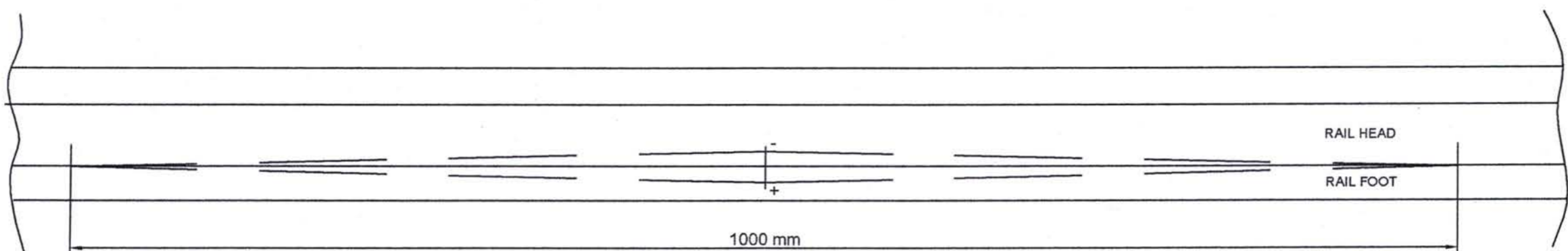
# TOLERANCE FOR RAIL WELDING ДОПУСКИ ПРИ СВАРКЕ РЕЛЬСОВ

## RUNNING SURFACE



- + Up to 0,3 mm
- Up to 0,5 mm (70% min. of the welds for each line section).
- Up to 0,8 mm (30% max. of the welds for each line section).

## INNER SURFACE OF THE RAIL HEAD



- + Up to 0,3 mm
- Up to 1,0 mm

## EXPANTION GAPS

35 & 36.5 m. RAILS	
TEMPERATURE RANGE (-°C)	GAP (mm).
6.0 to 15.5	14
16.0 to 20.5	12
21.0 to 25.0	10
25.5 to 30.0	8
30.5 to 34.5	6
35.0 to 39.5	4
40.0 to 44.5	2
45.0 to 54.0	0

24 m. RAILS	
TEMPERATURE RANGE (-°C)	GAP (mm).
0.0 to 7.0	12
7.5 to 14.5	10
15.0 to 21.0	8
21.5 to 28.0	6
28.5 to 34.5	4
35.0 to 41.5	2
42.0 to 52.0	0

12 m. RAILS	
TEMPERATURE RANGE (-°C)	GAP (mm).
- 4.0 to 5.0	8
5.0 to 20.0	6
20.5 to 34.5	4
35.0 to 49.5	2
50.0 to 56.0	0



**Review of Railways Rehabilitation  
in Central Asia - Module B (Phase2)**  
(EUROPEAID/116151/C/SV/MULTI)

A project implemented by:



TOLERANCE FOR RAIL WELDING  
ДОПУСКИ ПРИ СВАРКЕ РЕЛЬСОВ

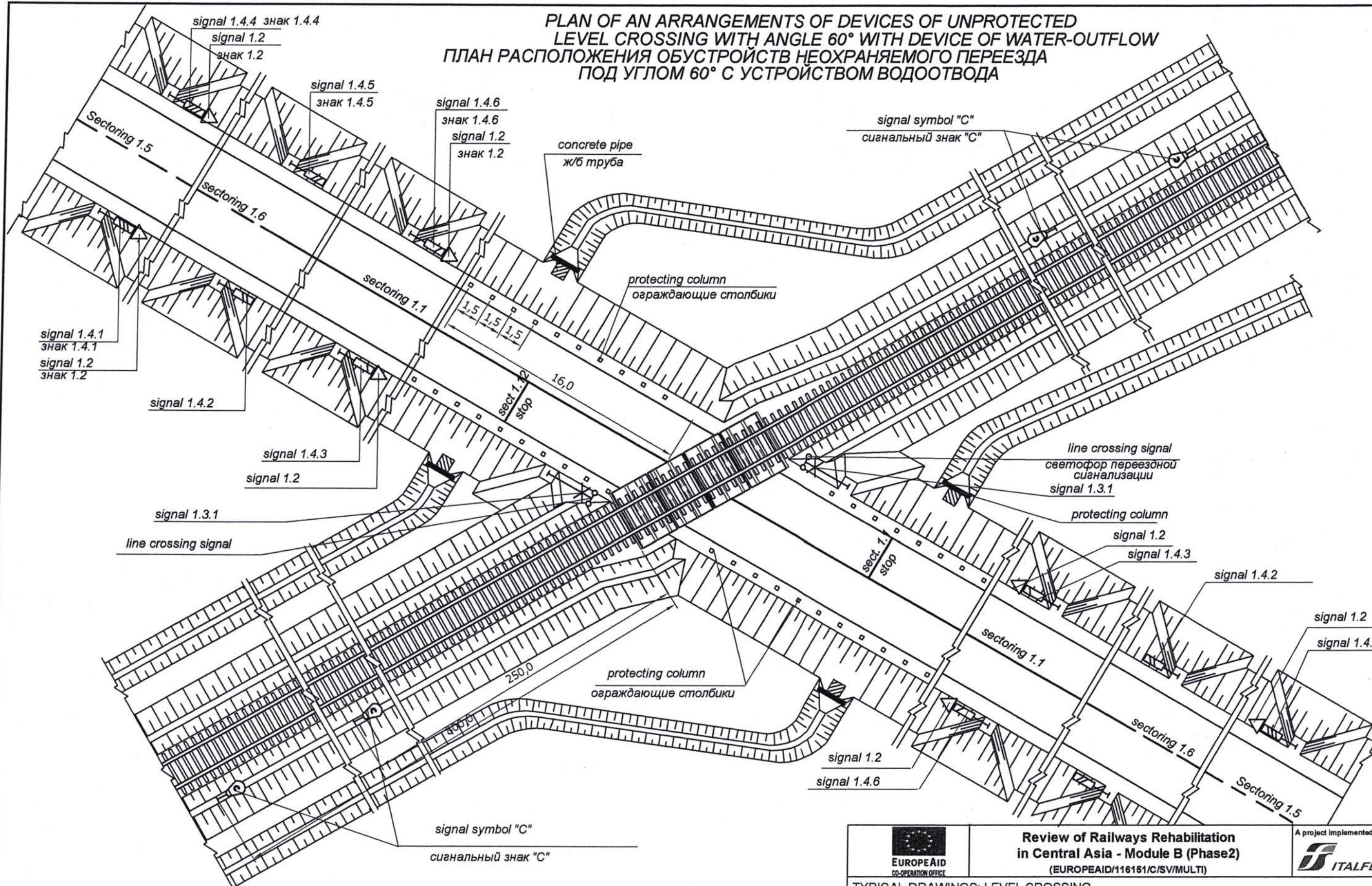
**L4.1-15**



Scale: 1:2

Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized

File: Referred Tables

PLAN OF AN ARRANGEMENTS OF DEVICES OF UNPROTECTED  
LEVEL CROSSING WITH ANGLE 60° WITH DEVICE OF WATER-OUTFLOW  
ПЛАН РАСПОЛОЖЕНИЯ ОБУСТРОЙСТВ НЕОХРАНЯЕМОГО ПЕРЕЕЗДА  
ПОД УГЛОМ 60° С УСТРОЙСТВОМ ВОДООТВОДА



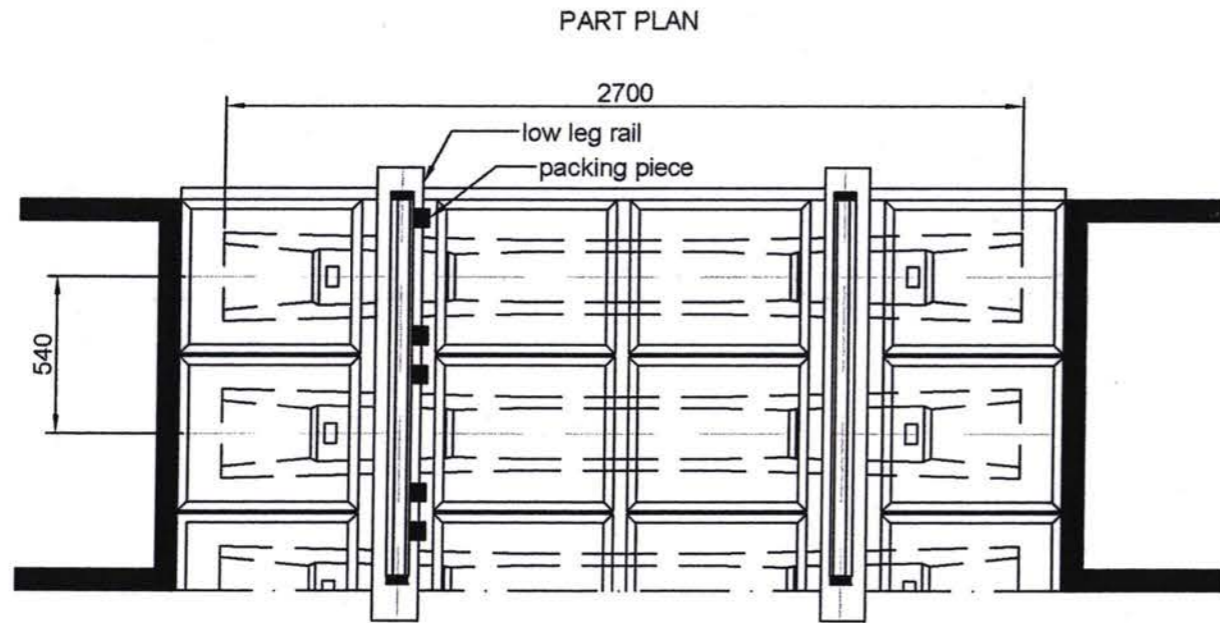
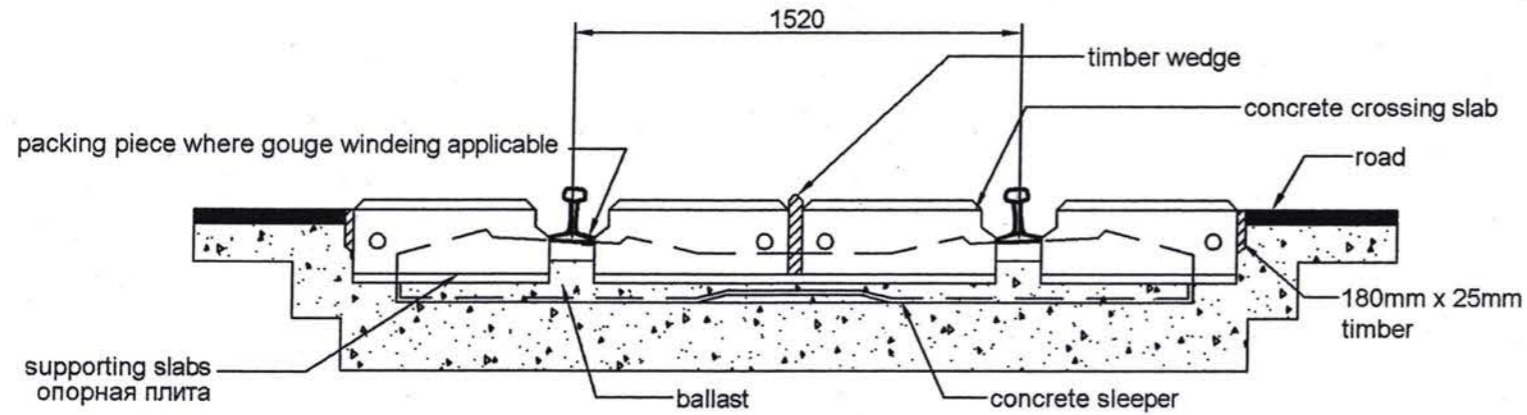
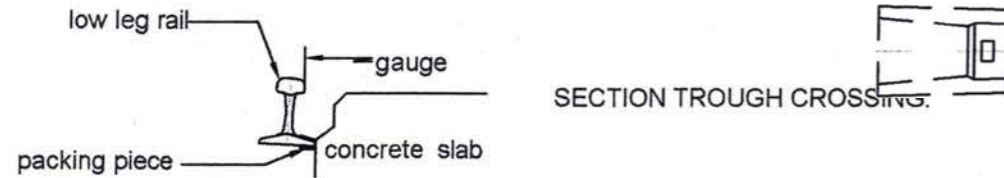

**Review of Railways Rehabilitation in Central Asia - Module B (Phase2)**  
 (EUROPEAID/116161/C/SV/MULTI)
 
 A project implemented by:  


TYPICAL DRAWINGS: LEVEL CROSSING  
 ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД

								<b>L4.1-16/1</b>
								Scale: WS
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized

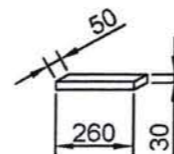
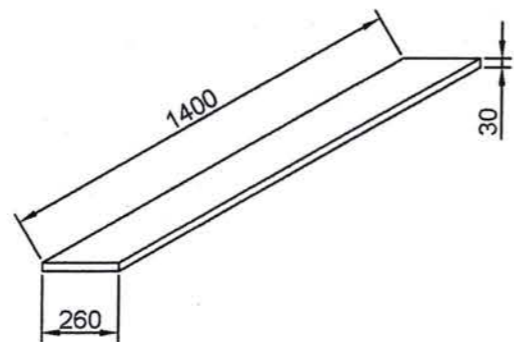
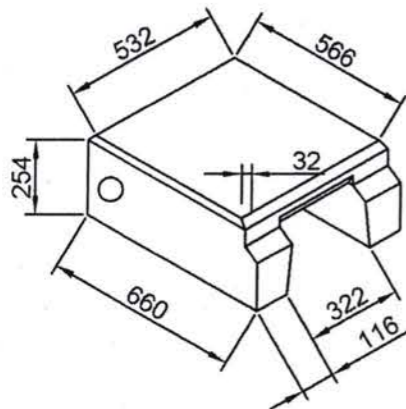
File: Referred Tables

LEVEL CROSSING: CONCRETE SLABS.



CONCRETE CROSSING SLAB

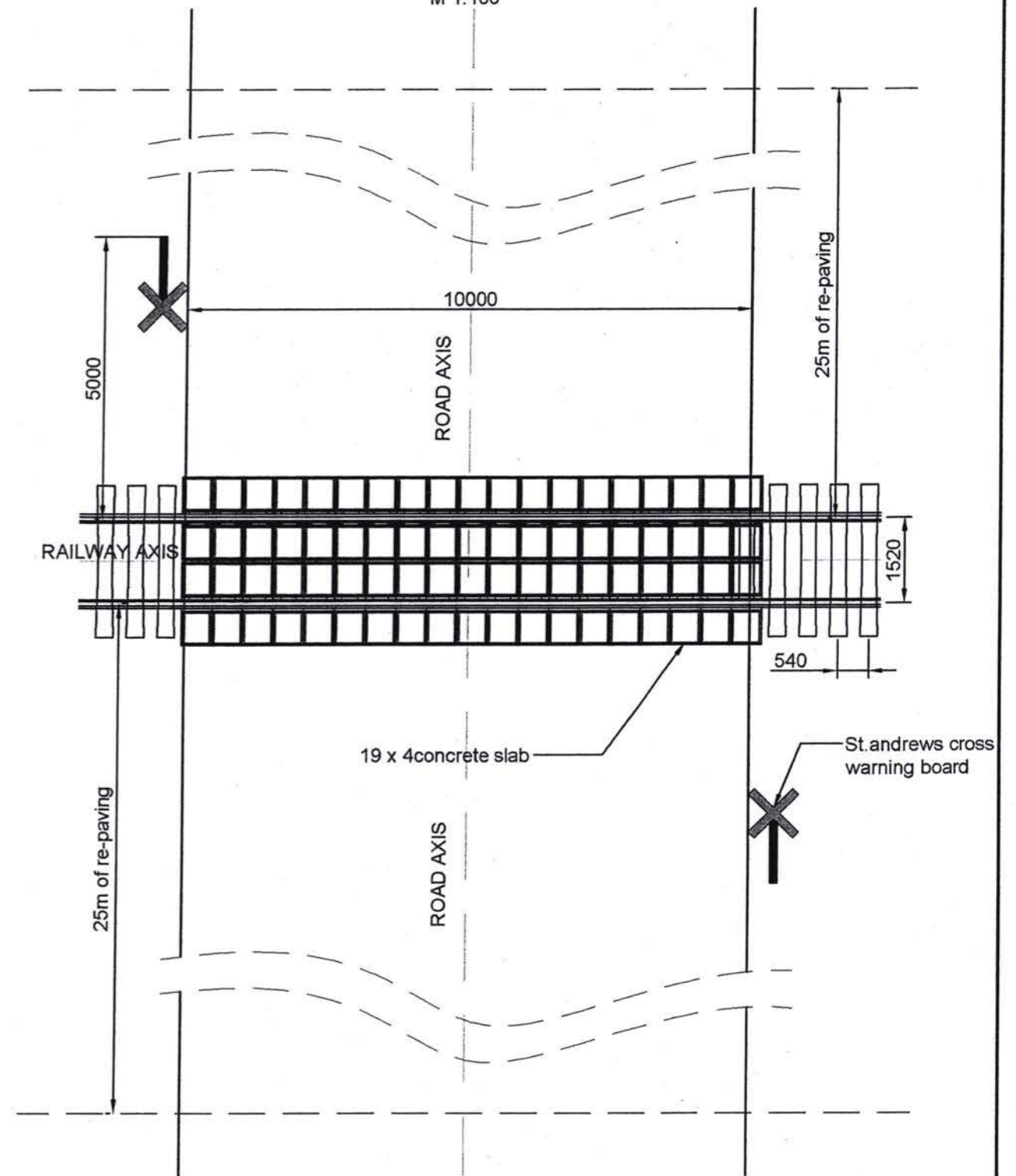
SUPPORTING SLABS



reinforced by two welded mesh size 60 x 60 mm Ø 3mm

SITUATION PLAN

M 1:100



		<b>Review of Railways Rehabilitation in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)				A project implemented by: 		
TYPICAL DRAWINGS: LEVEL CROSSING ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД								
DETAILS. ДЕТАЛИЗАЦИЯ							<b>L4.1-16/2</b>	
Scale: 1:25								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:							Referred Tables	

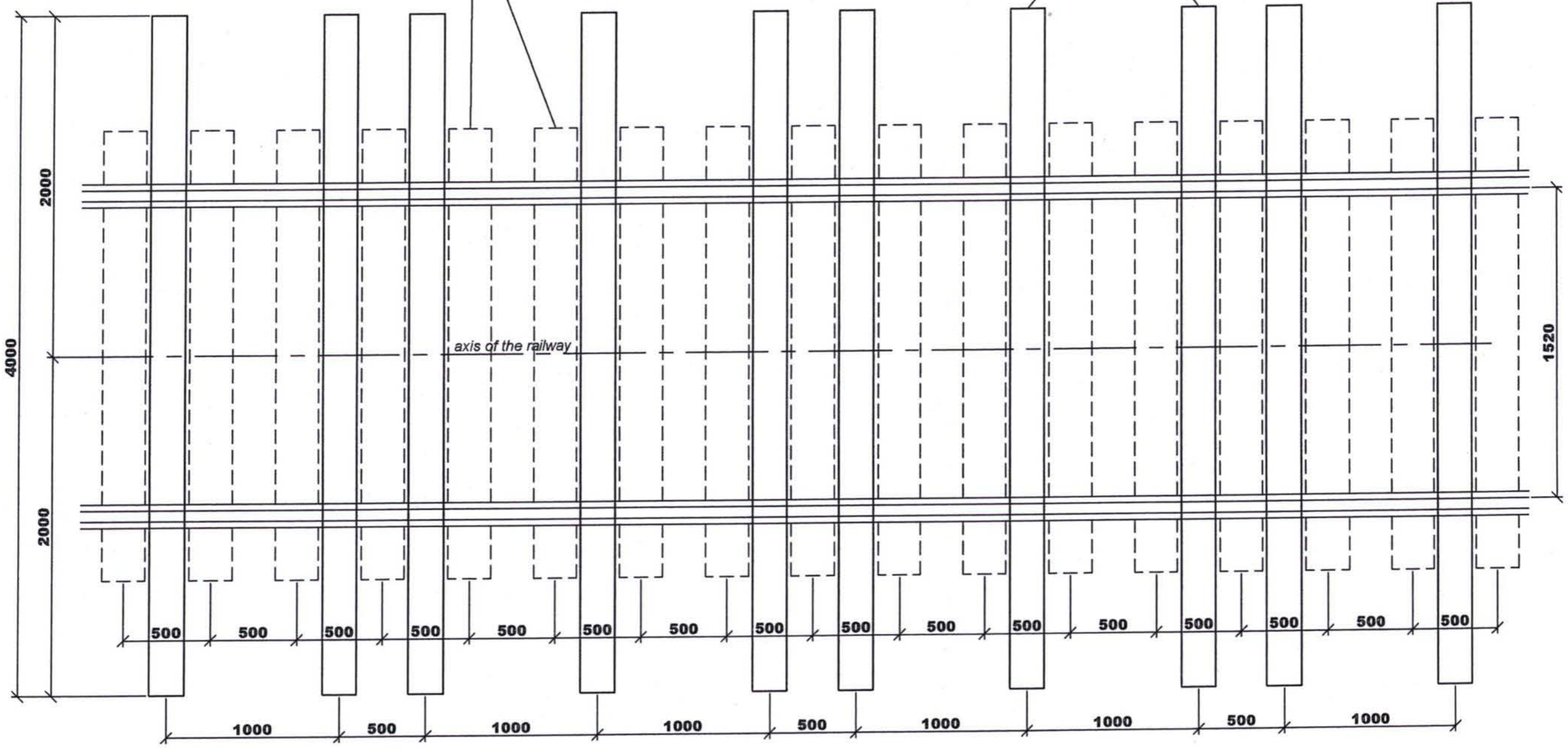




PLAN  
M 1:25

Longitudinal sleepers  
4000x180x180 (L-1)

Concrete sleepers  
for the longitudinal sleepers

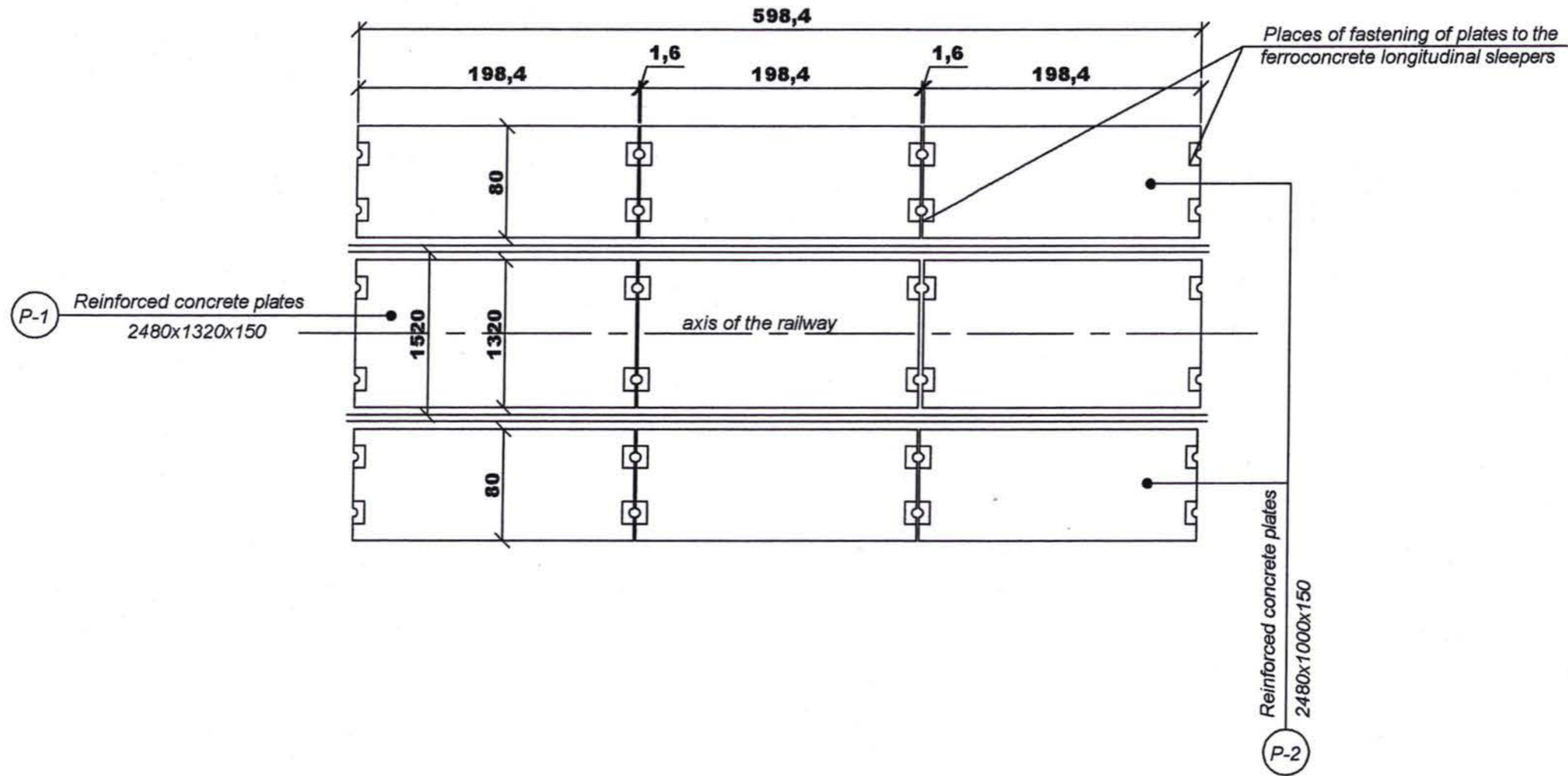


NOTE

1. Before apportioning of plates the sleepers should be apportioned under the given drawing along the way with tolerances in that and other party no more than 10 mm.
2. The orthographic epure of apportion of longitudinal sleepers on crossings under an angle 60 degrees is analogous instanced. Number of longitudinal sleepers and their volumes for crossings under an angle of 90 grades and 60 grades (single-line or double-line) are instanced on a sheet 1 IS-1.

	<b>Review of Railways Rehabilitation in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)	A project implemented by: 						
<b>TYPICAL DRAWINGS: LEVEL CROSSING</b> <b>ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД</b>								
<b>DETAILS. ДЕТАЛИЗАЦИЯ</b>		<b>L4.1-16/4</b>						
Scale: 1:25								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:								Referred Tables

PLAN  
M 1:50

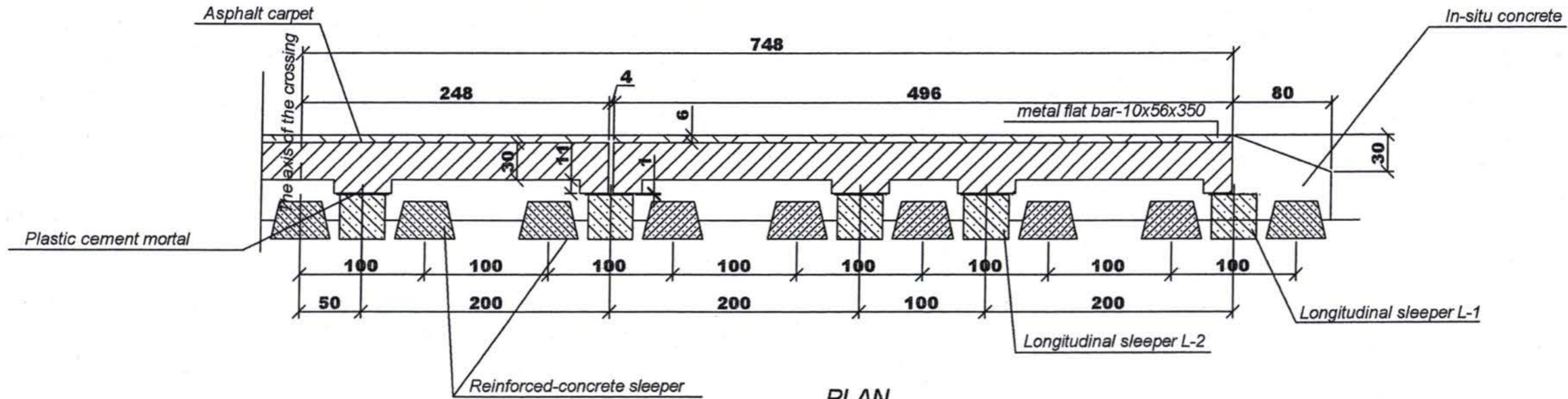


NOTE

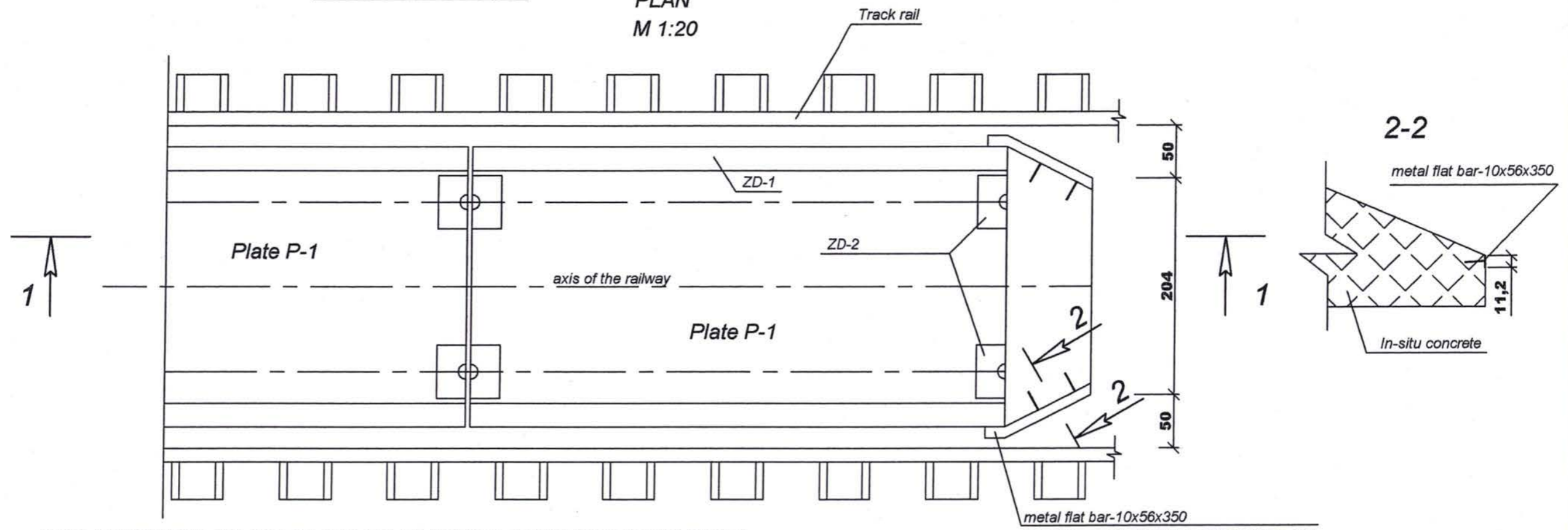
1. Asphalt carpet and ferroconcrete longitudinal sleepers are not shown.
2. Sizes on the drawing are given in mm.

		<b>Review of Railways Rehabilitation in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)				A project implemented by: 		
<b>TYPICAL DRAWINGS: LEVEL CROSSING</b> <b>ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД</b>								
<b>DETAILS. ДЕТАЛИЗАЦИЯ</b>						<b>L4.1-16/5</b>		
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:							Referred Tables	

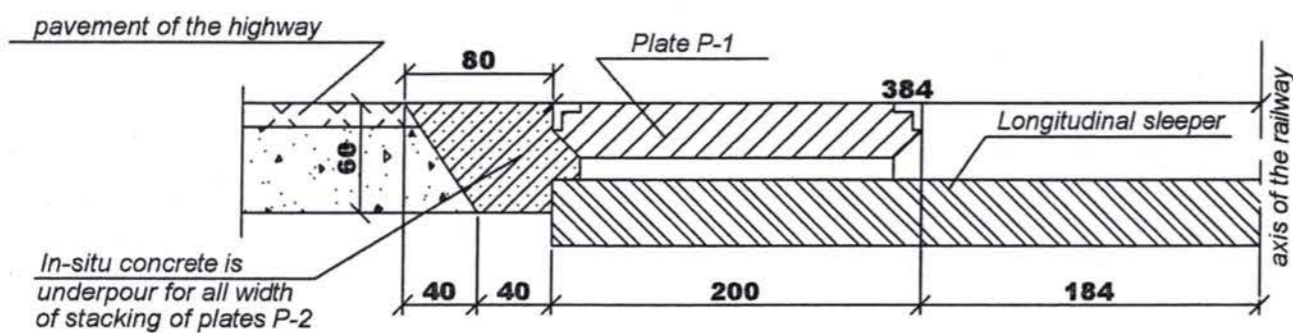
THE ASSEMBLY OF COUPLING OF PLATES P-1 WITH THE SUPERSTRUCTURE OF THE WAY



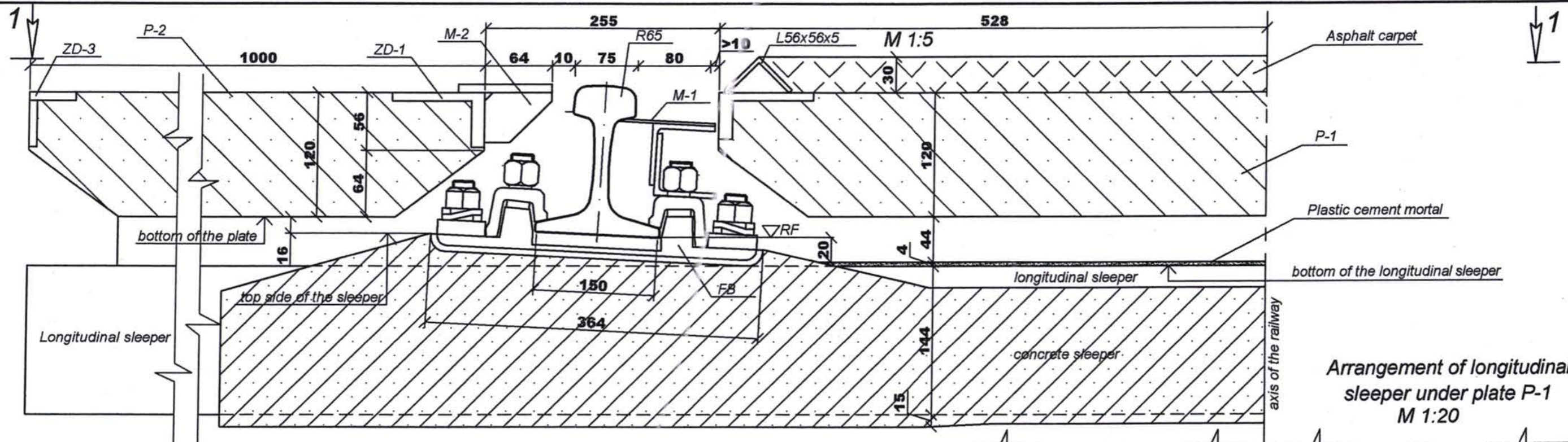
PLAN  
M 1:20



THE ASSEMBLY OF COUPLING OF PLATES P-1 WITH THE MAIN ROAD

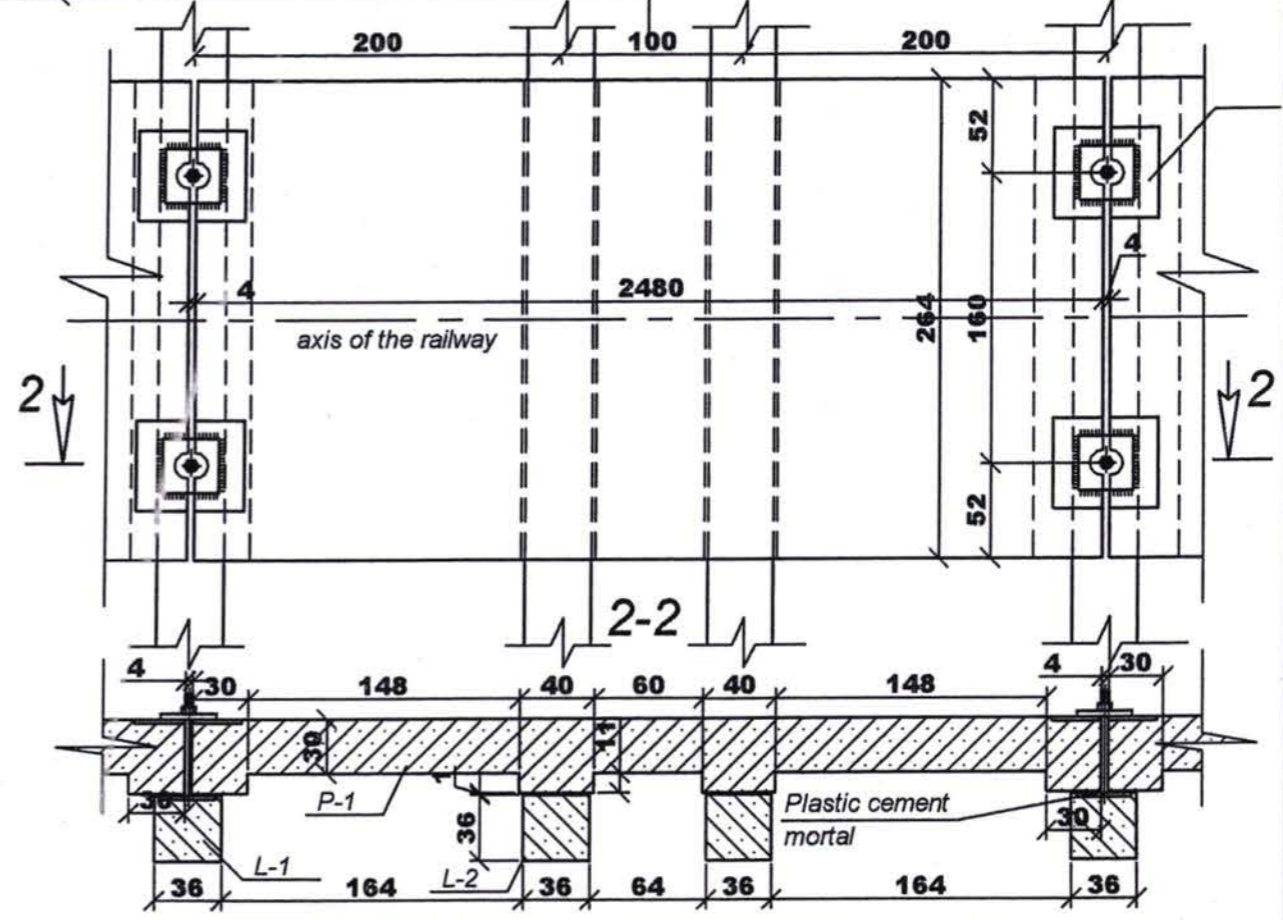
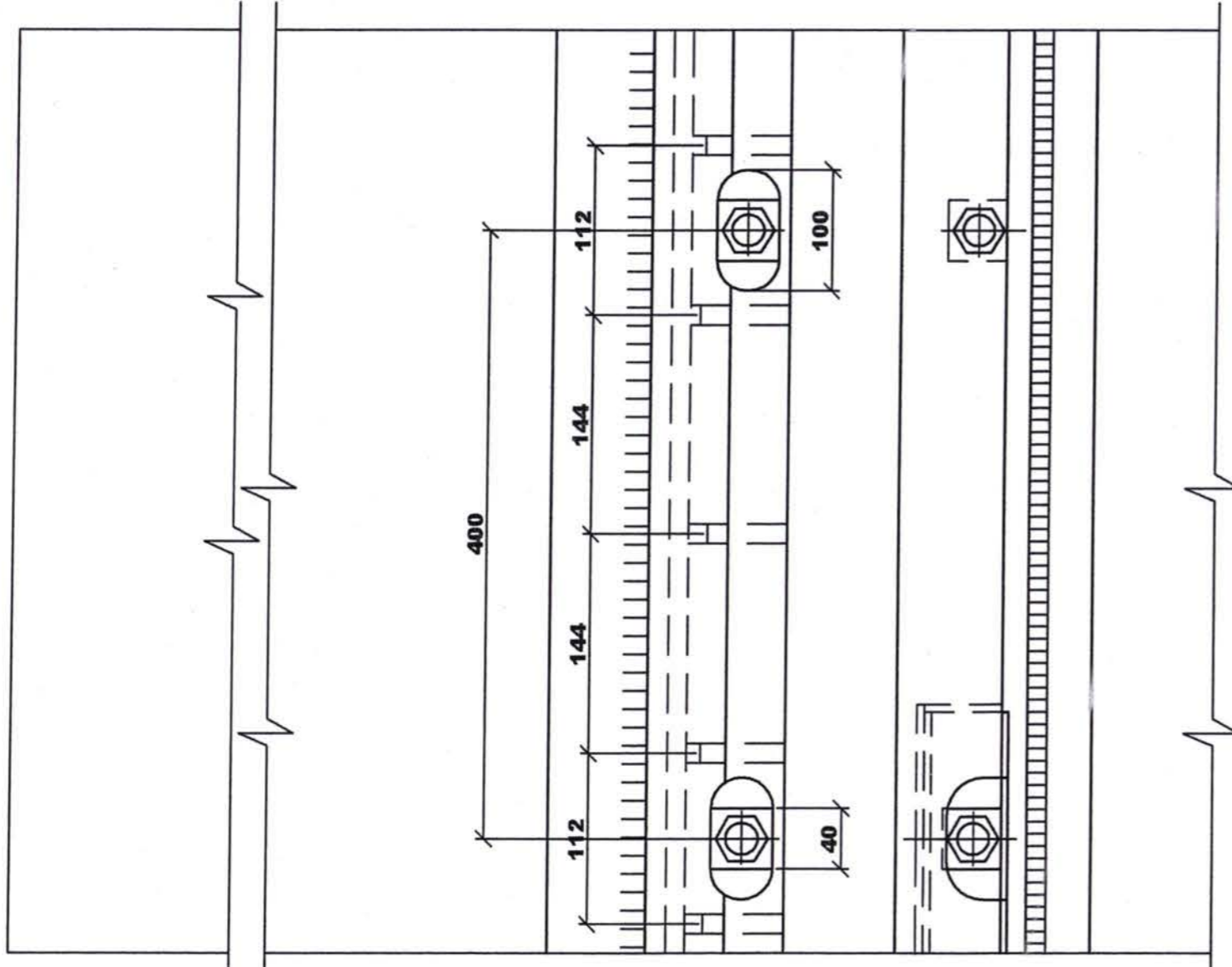


	Review of Railways Rehabilitation in Central Asia - Module B (Phase2) (EUROPEAID/116161/C/SV/MULTI)		A project implemented by: 					
	TYPICAL DRAWINGS: LEVEL CROSSING ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД							
DETAILS. ДЕТАЛИЗАЦИЯ			L4.1-16/6					
Scale: 1:20								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:					Referred Tables			

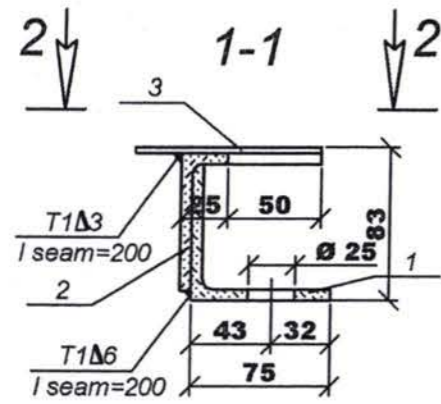


Arrangement of longitudinal sleeper under plate P-1  
M 1:20

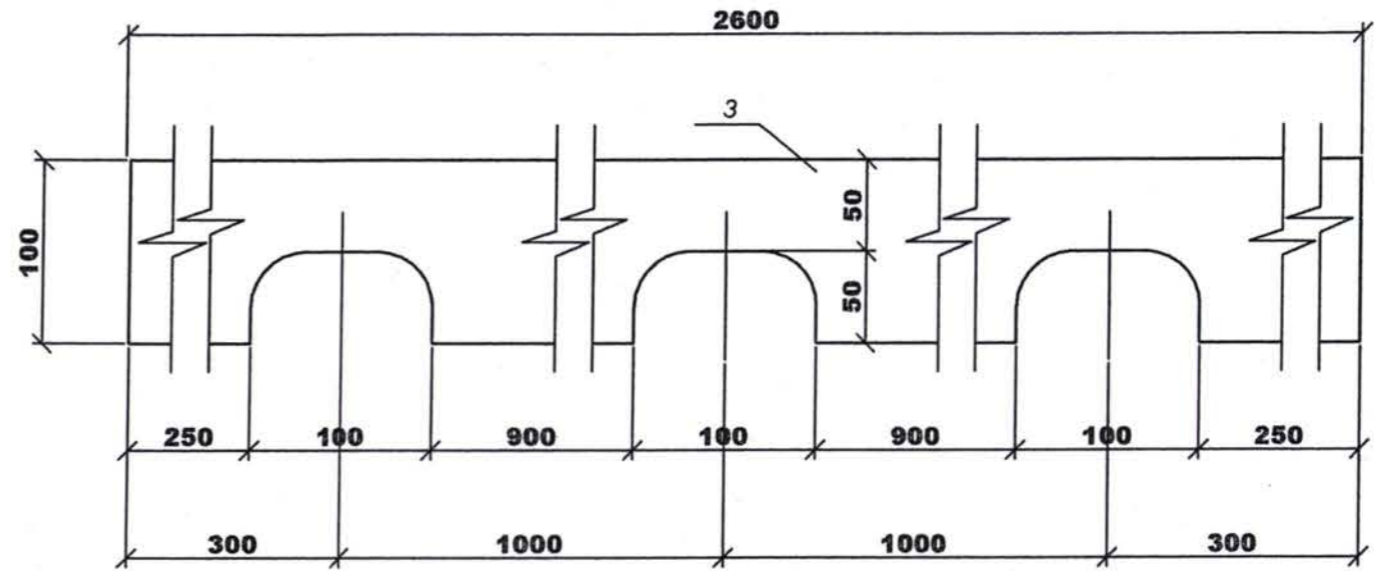
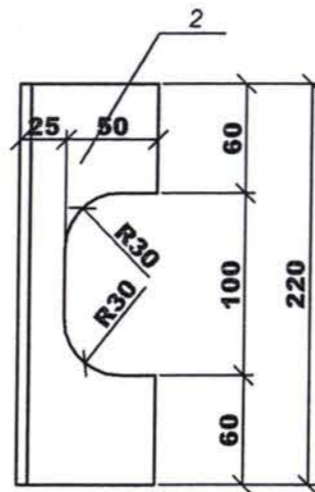
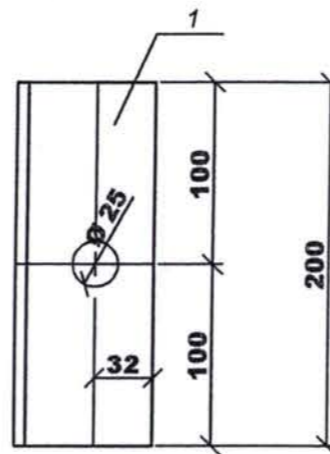
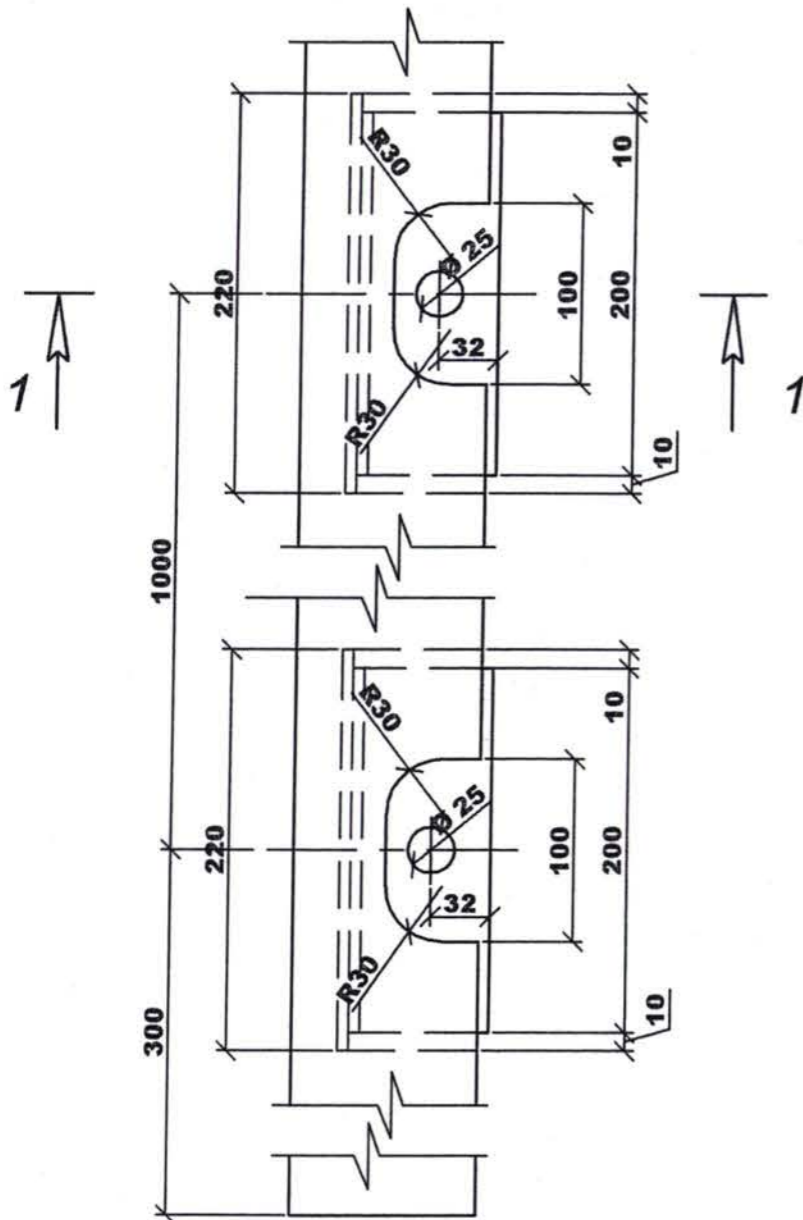
1-1 (rails, the terminal bolts are not shown)  
M 1:5



		<b>Review of Railways Rehabilitation in Central Asia - Module B (Phase2)</b> (EUROPEAID/116151/C/SV/MULTI)			A project implemented by: 	
<b>TYPICAL DRAWINGS: LEVEL CROSSING</b> <b>ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД</b>						
<b>DETAILS. ДЕТАЛИЗАЦИЯ</b>					<b>L4.1-16/7</b>	
Scale: 1:20, 1:5						
Rev.	Description	Designed	Date	Verified	Date	Approved
File: _____ Referred Tables						



2-2



THE SPECIFICATION OF METAL ON THE POSTAGE M-1. kg.

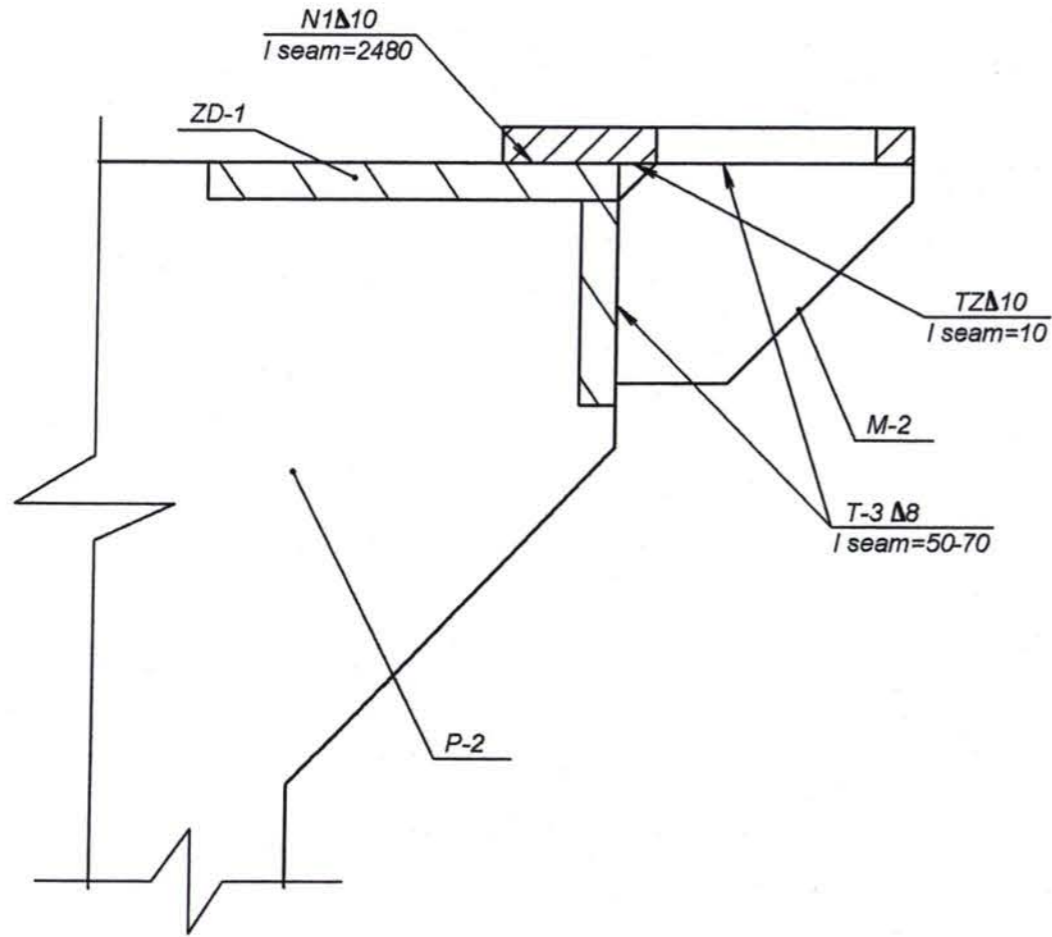
postage	pos.	appellation	profile mm	length mm	item	mass		mark of steel
						per unit	total	
M-1	1	L-steel	L75x6	200	3	1,38	4,13	St3ps
	2	L-steel	L75x6	220	3	1,52	4,55	St3ps
	3	Plate	_3x100	2600	1	6,12	6,12	St3ps
	Total on the postage M-1						9,02	14,8
On the weld seams 0.5%							0,07	

- Sizes on the drawing are given in mm.
- Electric welding is carried out by electrodes E-42A in accordance with GOST 9467-75

		Review of Railways Rehabilitation in Central Asia - Module B (Phase2) (EUROPEAID/116151/C/SV/MULTI)				A project implemented by: 		
<b>TYPICAL DRAWINGS: LEVEL CROSSING</b> <b>ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД</b>								
<b>DETAILS. ДЕТАЛИЗАЦИЯ</b>						<b>L4.1-16/8</b>		
Scale: 1:4								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File: Referred Tables								

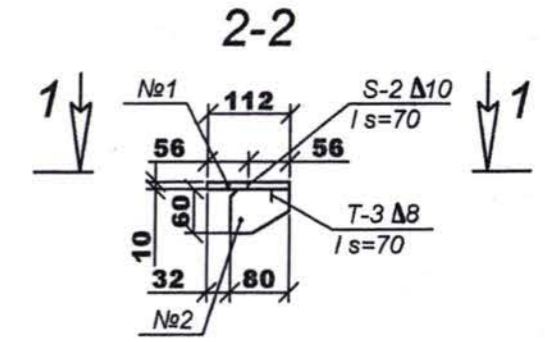
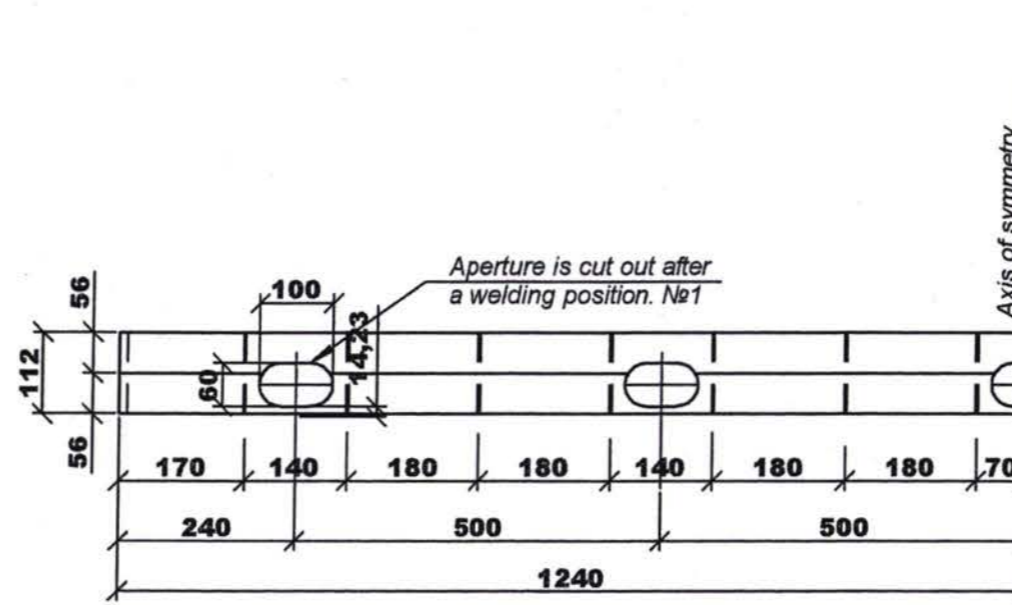
ATTACHMENT POINT OF POSTAGE M-2 TO PLATE P-2

M 1:2

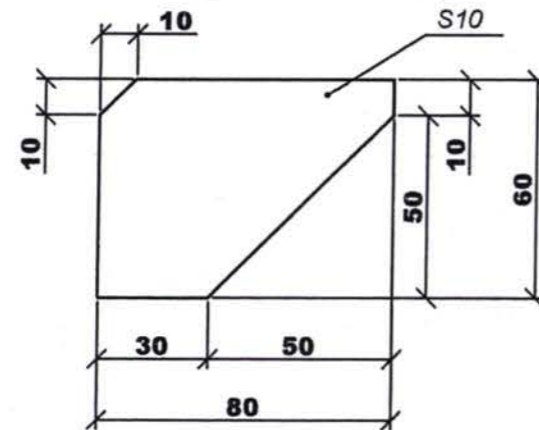


POSTAGE M-2

M 1:10



position 2



postage	pos.	appellation	profile mm	length mm	items	mass		steel grade
						per unit	total	
M-2	1	Purlin	-10x56	2480	2	1,1	2,2	St3ps
	2	Stiffening plate	-10x60	80	16	0,4	6,4	St3ps
	Total on the postage M-2							28,4
On the weld seams 0.5%							0,02	

1. Sizes on the drawing are given in mm.

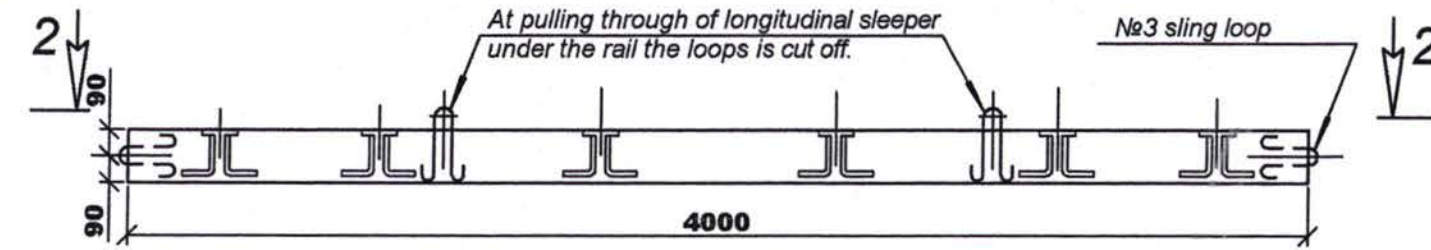
2. Electric welding is carried out by electrodes E-42A in accordance with GOST 9467-75

		Review of Railways Rehabilitation in Central Asia - Module B (Phase2) (EUROPEAID/116151/C/SV/MULTI)			A project implemented by: 			
<b>TYPICAL DRAWINGS: LEVEL CROSSING</b> <b>ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД</b>								
<b>DETAILS. ДЕТАЛИЗАЦИЯ</b>					<b>L4.1-16/9</b>			
[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]								
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:							Referred Tables	

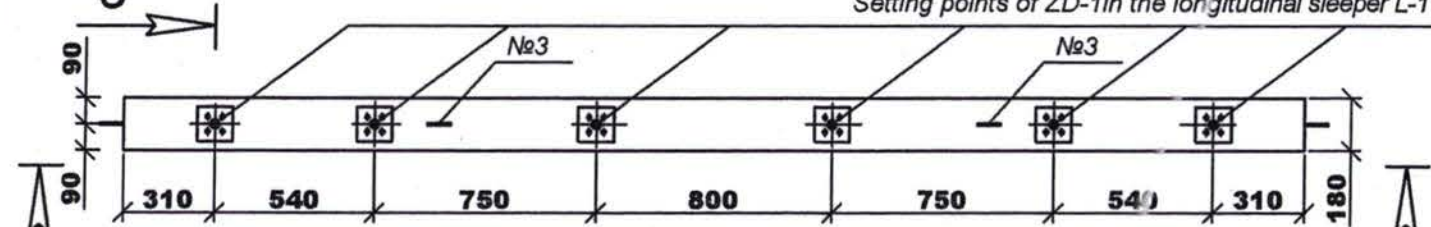
The shuttering drawing of blocks L-1 (L-2)

M 1:25

1-1

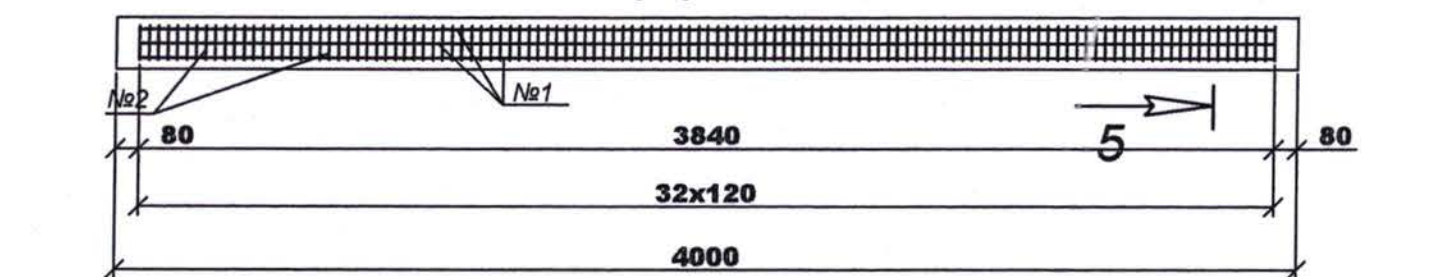


2-2



Reinforce drawing (ZD-4; №3 are not shown)

4-4



List of the details

model	assembling	position	Sketch	diameter and class of the armature	length mm	items
L-1(L-2)	single rods	1		Ø20AVI	3960	8
		2		Ø10AI	580	33
		3	look note	Ø8AI	714	4
L-1	ZD-4 (6 items)	4	look note	-20x120	120	6
		5	look note	Ø16AIII	250	24

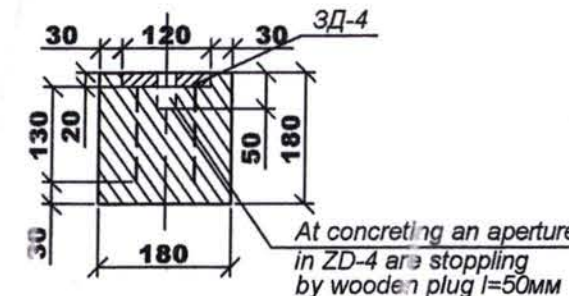
The specification of collapsible structures

model	appellation	appellation	items	volume m3	mass 1 piece ton	Class of beton
L-1	longitudinal sleeper	particularly	1	0,13	0,33	V30
L-2	longitudinal sleeper	particularly	1	0,13	0,33	V30

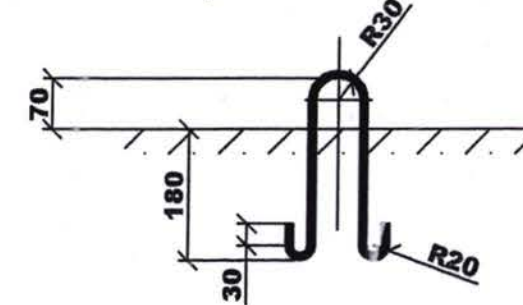
- ZD-4 are established only in block L-1
- Sizes on the drawing are given in mm.
- Electric welding is carried out by electrodes E-42A in accordance with GOST 9467-75

3-3

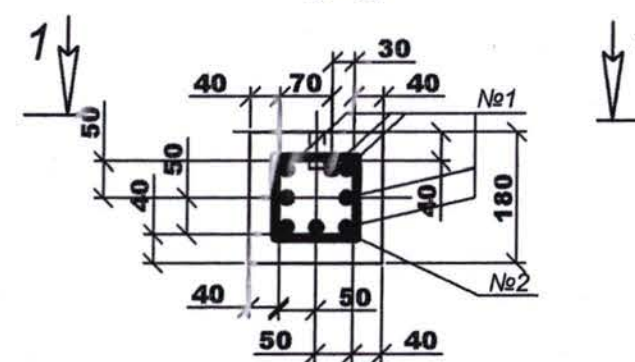
M 1:10



position №3



5-5

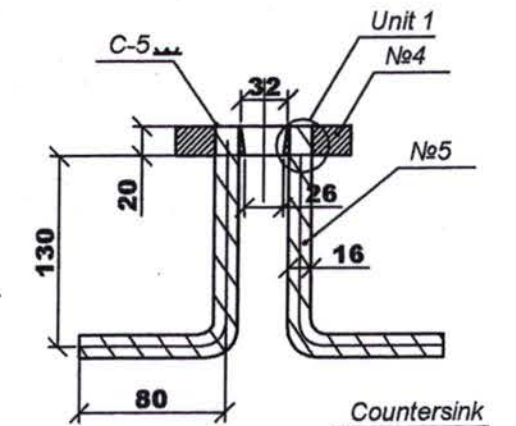


List of the charge of steel on element, kg

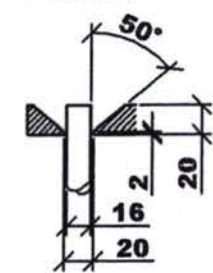
model of element	Armature			Embedded items				sum total kg	
	GOST5781-82;380-88*						rolled metal St3ps		
	AI		total	AIII		total	GOST535-88		
	Ø 8	Ø 10	total	Ø 20	Ø 16	total	20x120	total	
L-1	1,14	11,81	12,95	78,13	9,47	87,6	13,57	13,57	114,12
L-2	1,14	11,81	12,95	78,13	-	78,2	-	-	92,0

ZD-4

M 1:5

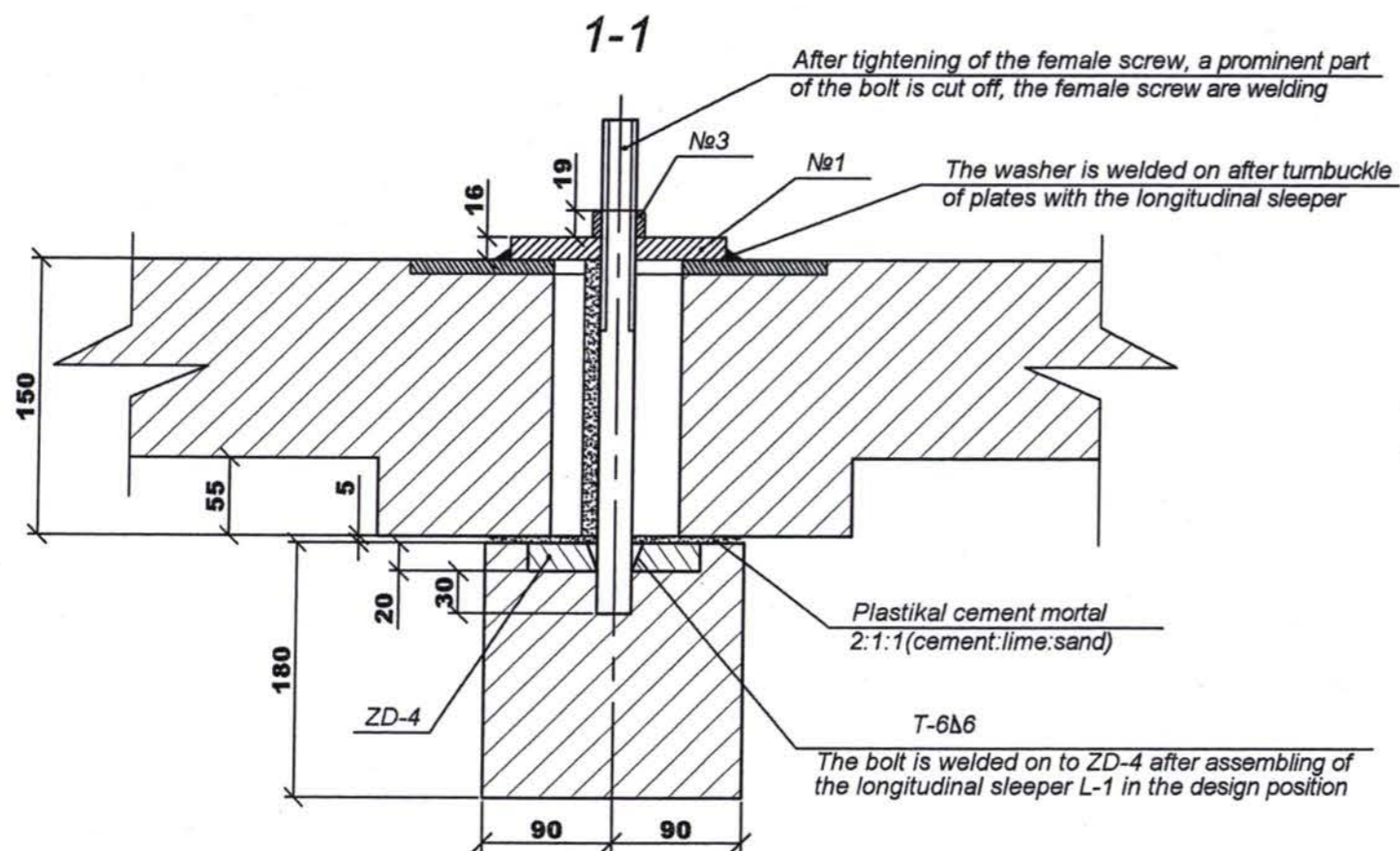
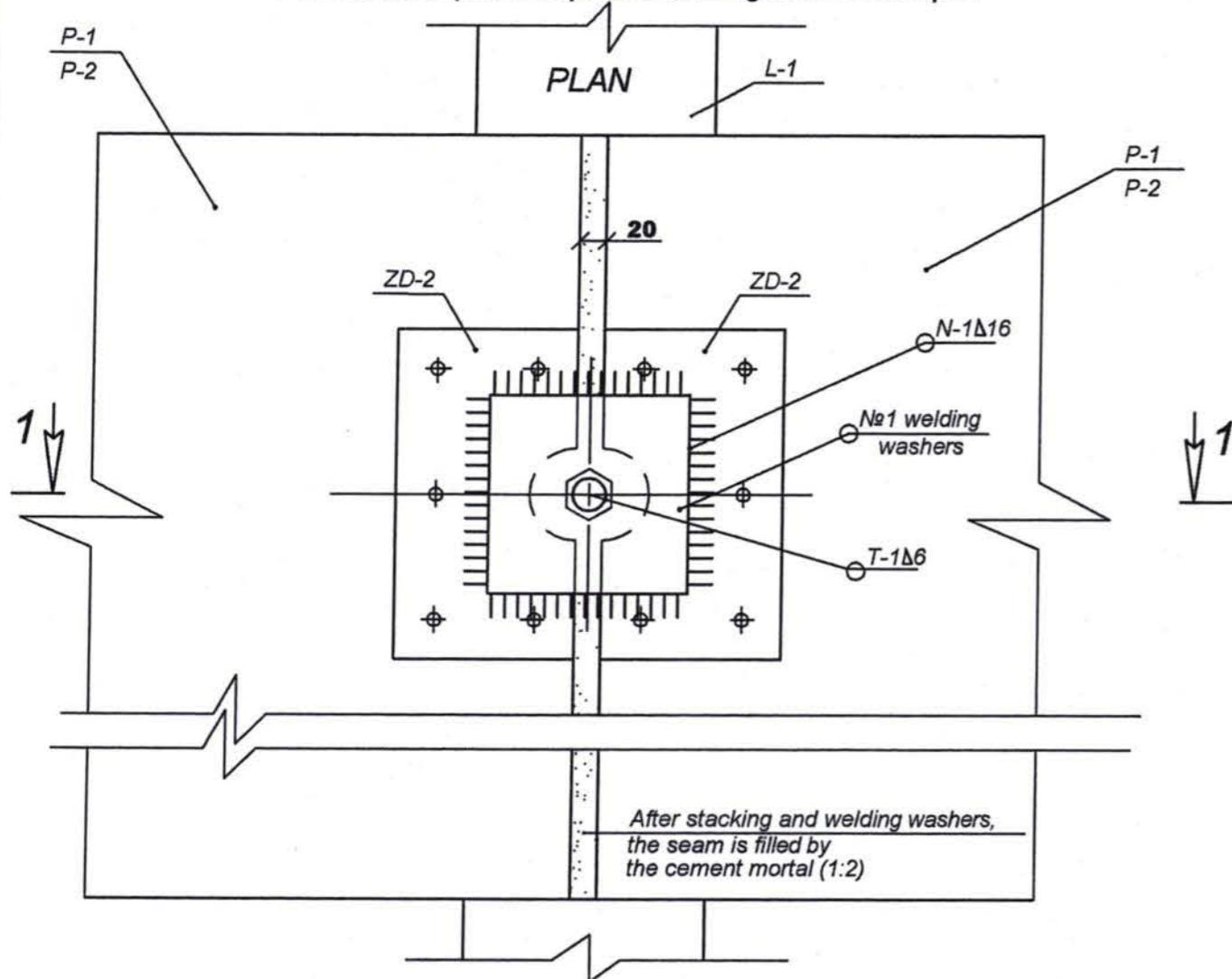


Unit 1



	Review of Railways Rehabilitation in Central Asia - Module B (Phase2) (EUROPEAID/116151/C/SV/MULTI)		A project implemented by: 						
	TYPICAL DRAWINGS: LEVEL CROSSING ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД								
DETAILS. ДЕТАЛИЗАЦИЯ			L4.1-16/10						
Scale: 1:25;10:5									
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized	
File:					Referred Tables				

Attachment point of plates to longitudinal sleeper



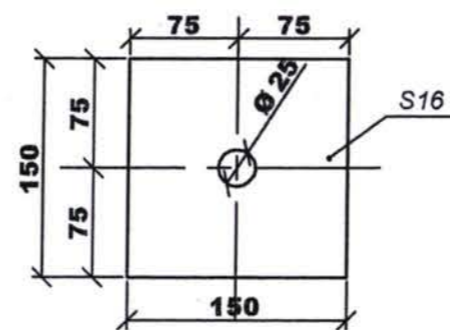
THE SPECIFICATION OF METAL ON THE JOINT, kg.

pos.	appellation	profile mm	length mm	items	mass		mark of steel
					per unit	total	
1	floating washer	_16x150	150	2	2,83	5,7	St3ps
2	bolt	M24	3500	2	1,42	2,9	St3ps
3	female screw	M24	-	2	0,11	0,3	St3ps
Total on the joint						8,9	
On the weld seams 0.5%						0,05	

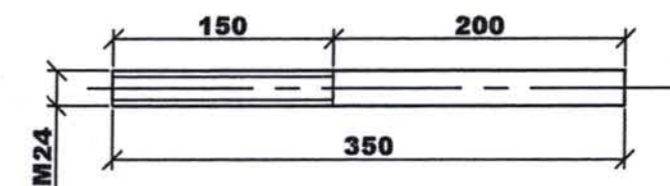
THE LIST OF AMOUNTS OF WORKS ON THE JOINT

№№	appellation	unit	mass		NOTE
			P1+P1	P2+P2	
1	CEMENT MORTAL	m2	0,006	0,004	
2	PLASTIC CEMENT MORTAL	m3	0,003	0,002	

position №1



position №2



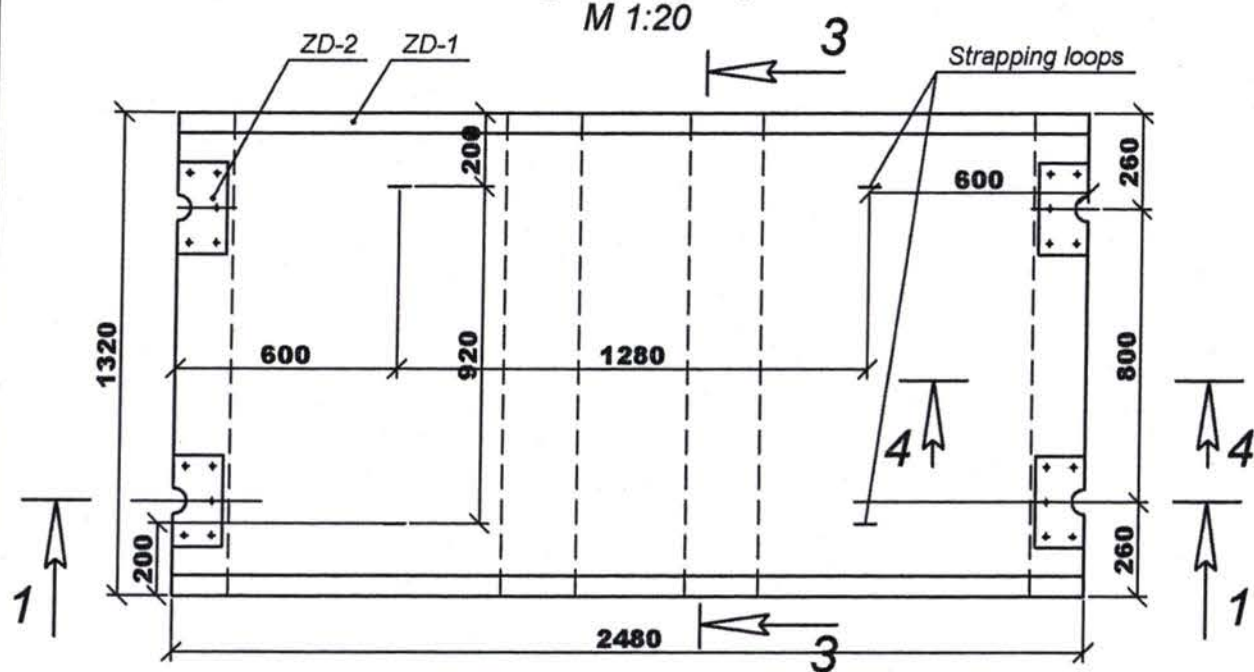
- Sizes on the drawing are given in mm.
- Electric welding is carried out by electrodes E-42A in accordance with GOST 9467-75

	Review of Railways Rehabilitation in Central Asia - Module B (Phase2) (EUROPEAID/116151/C/SV/MULTI)	A project implemented by: 
<b>TYPICAL DRAWINGS: LEVEL CROSSING</b> <b>ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД</b>		
<b>DETAILS. ДЕТАЛИЗАЦИЯ</b>		<b>L4.1-16/11</b>
Rev.	Description	Designed Date Verified Date Approved Date Authorized
File:	Referred Tables	

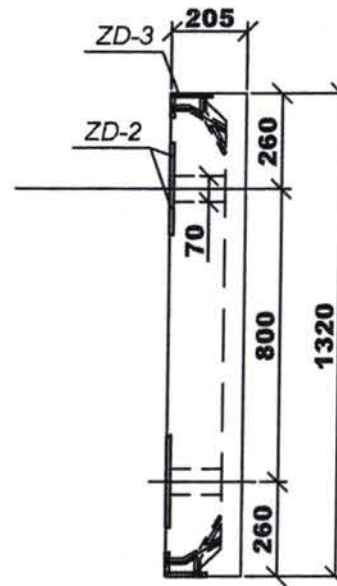


The shuttering drawing of plate P-1

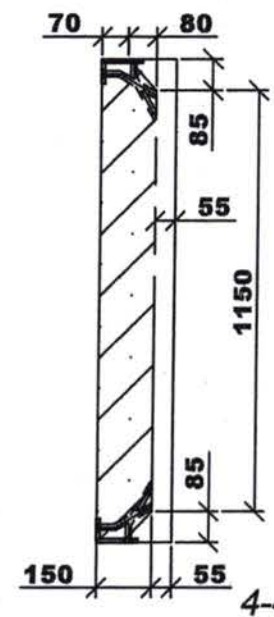
M 1:20



2-2



3-3



The list of details on the plate

model	pos.	Sketch	diameter and class of the armature	length mm	quantity pieces
ZD-1 (2 pieces)	1		Ø16AlI	170	52
	2	look note	-10x56	2480	6
ZD-4 (6 pieces)	3		Ø16AlI	180	20
	4	look note	-10x135	250	4
	5	look note	Ø10Al	550	4

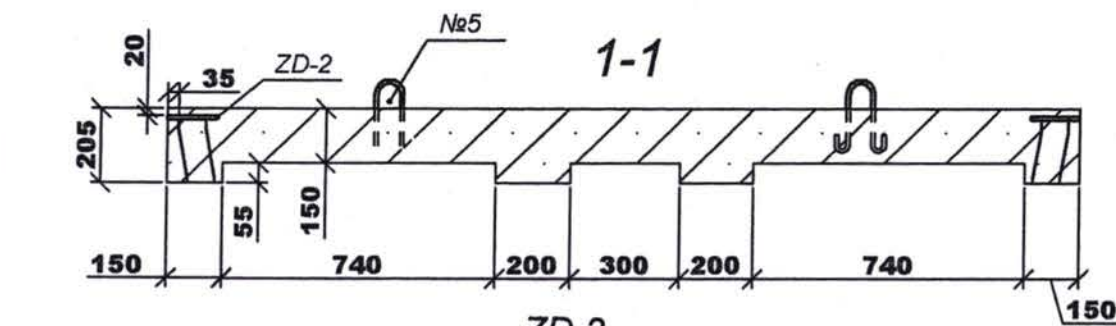
The list of the consumption of steel on the plate

Model of element	embedded parts			The over-all consumption kg
	type of armature	steel grade		
P-1	Al	St 3ps		97,7
	All	GOST 535-88		
	GOST 5781-82	GOST 535-88		
	Ø 10	-10x56	-10x135	total
	Ø 16	65,4	10,6	76,0

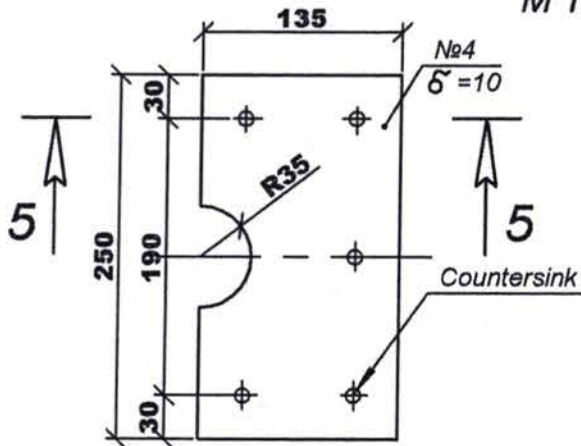
The specification of monolithic constructions

model	designation	appellation	items	volume m3	mass 1 piece ton	Class of beton
P-1	particularly	average plate	1	0,13	0,33	B30

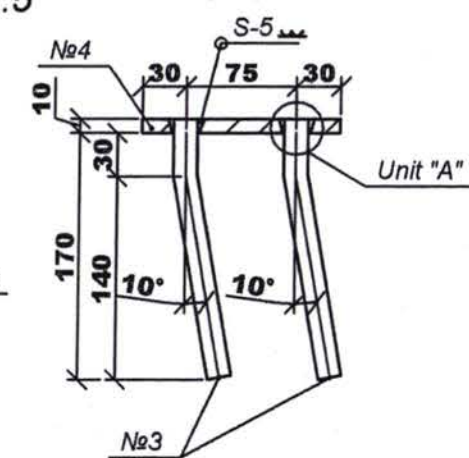
1. Reinforcement of plate P-1 look the drawing 2
2. Sizes on the drawing are given in mm.
3. Electric welding is carried out by electrodes E-42A in accordance with GOST 9467-75



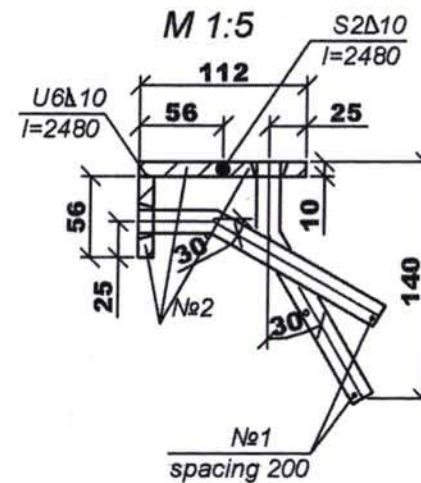
ZD-2  
M 1:5



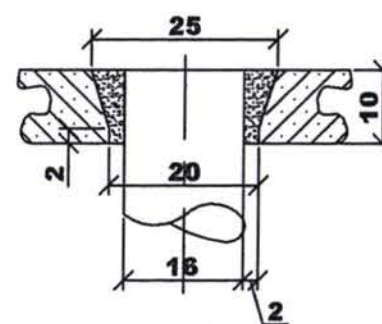
5-5



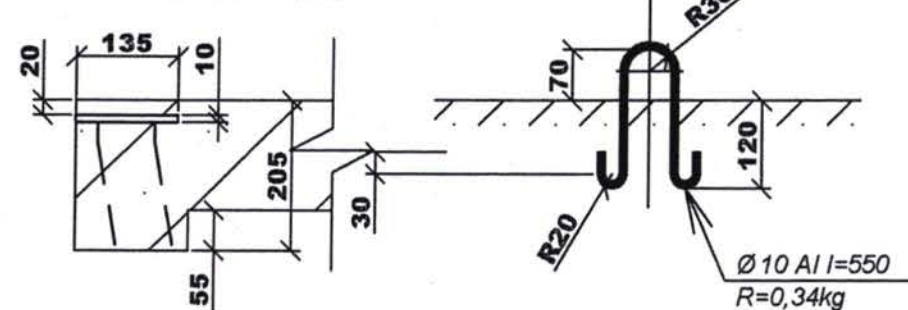
ZD-1  
M 1:5



Unit "A"  
M 1:1



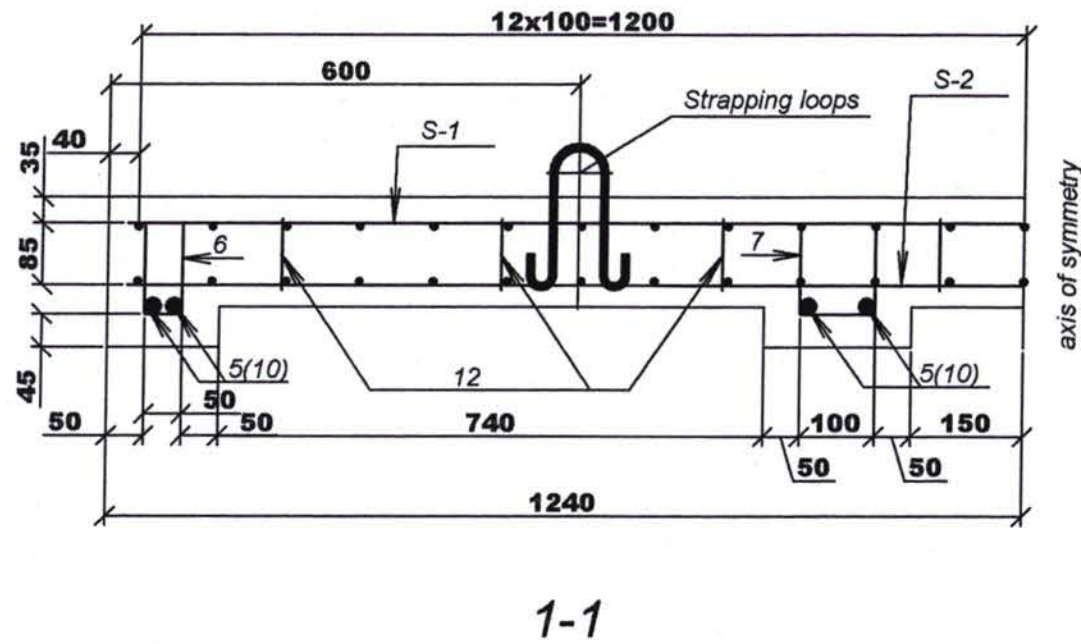
POSITION OF ZD-2 IN THE PLATE



	Review of Railways Rehabilitation in Central Asia - Module B (Phase2) (EUROPEAID/116161/C/SV/MULTI)	A project implemented by: 
<b>TYPICAL DRAWINGS: LEVEL CROSSING</b> <b>ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД</b>		
<b>DETAILS. ДЕТАЛИЗАЦИЯ</b>		<b>L4.1-16/12</b>
Scale: 1:20,5,10		
Rev.	Description	Designed Date Verified Date Approved Date Authorized
File: Referred Tables		



The reinforcement drawing of plate P-1; P-2  
M 1:10

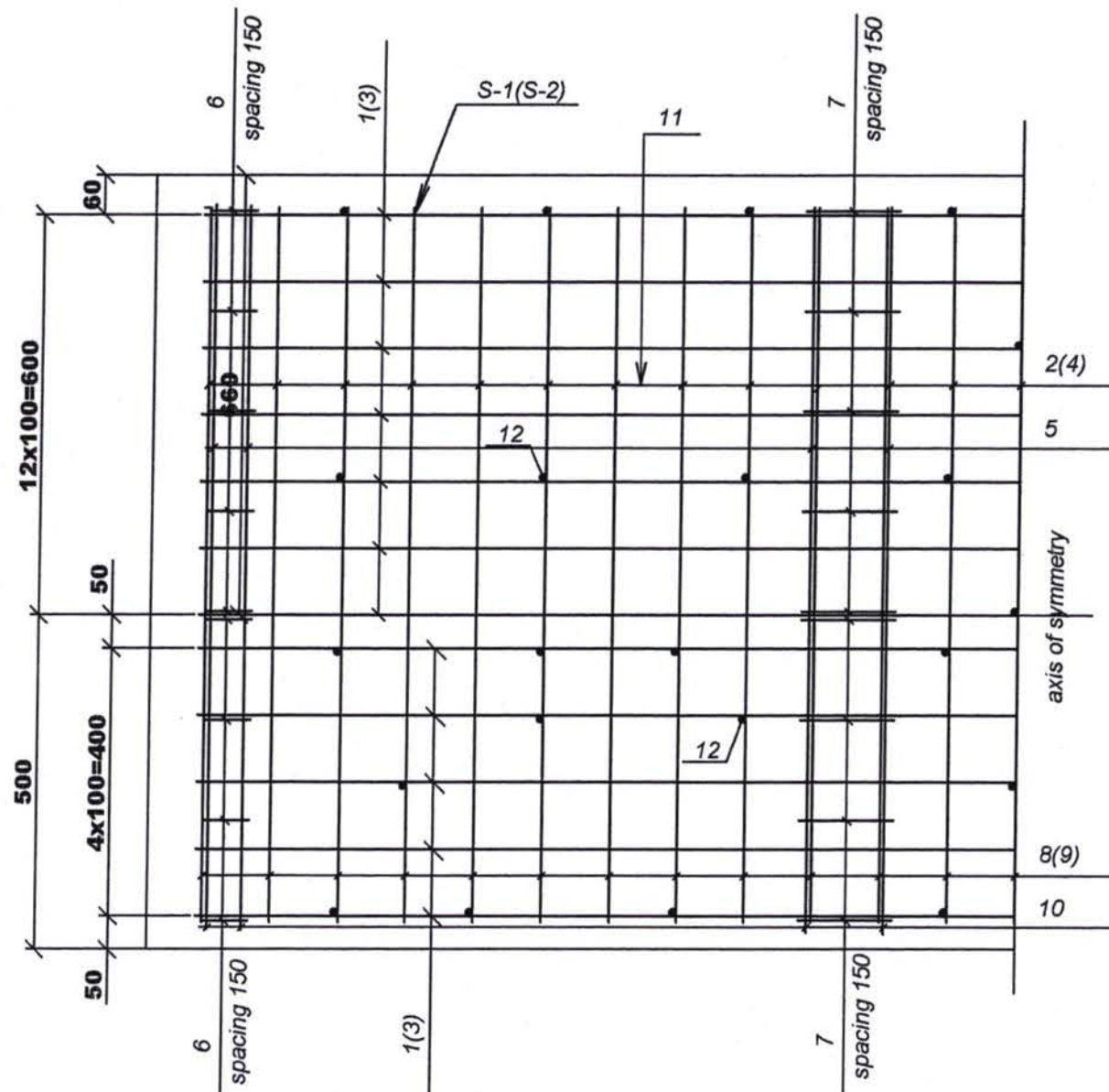


The list of details

model	pos.		Sketch	diameter and class of the armature	P-1		P-2	
	P-1	P-2			length mm	quantity pieces	length mm	quantity pieces
S-1	1	1		Ø10AI	2450	13	2450	10
	2	8		Ø10AI	1290	25	970	25
S-2	3	3		Ø12AIII	2450	13	2450	10
	4	9		Ø12AIII	1290	25	970	25
single rod	5	10		Ø22AIII	1290	8	970	8
yokes	6	6		Ø10AI	520	18	520	14
	7	7		Ø10AI	620	18	620	14
	11	11		Ø10AI	550	4	550	4
	12	12		Ø10AI	90	24	90	24

The list of the consumption of steel on the plate

Model of element	Reinforcement wares					sum total kg
	GOST5781-82;380-88*					
	Type of armature					
	AI		AIII			
	Ø 10	total	Ø 12	Ø 22	total	
P-1	55,0	55,0	56,92	30,8	87,72	142,72
P-2	43,0	43,0	43,3	23,3	66,5	109,5



1. The smooth hot-rolled rod armature of class AI steel grade St3ps, periodic profile of class AIII steel grade 25G2S on GOST380-88 \*, 5781-82.
2. Sizes on the drawing are given in mm.
3. To work together with drawings 4 and 5.
4. Design of the strapping loops see the drawing - 1.

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<b>TYPICAL DRAWINGS: LEVEL CROSSING</b> <b>ТИПОВЫЕ ЧЕРТЕЖИ: ЖЕЛЕЗНОДОРОЖНЫЙ ПЕРЕЕЗД</b>								
<b>DETAILS. ДЕТАЛИЗАЦИЯ</b>		<b>L4.1-16/14</b>						
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		Scale: 1:5						
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorized
File:		Referred Tables						