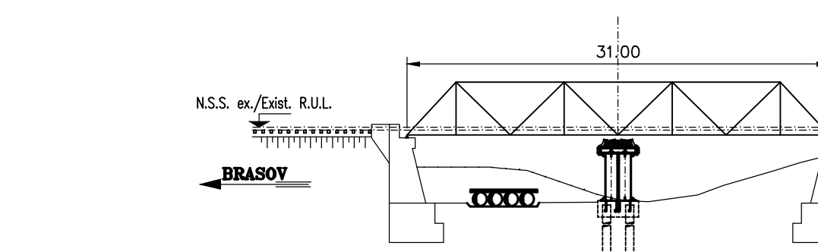
SECTIUNE A-A / A-A SECTION



LUCRARI PRGATITOARE

Circulatie normala pe liniile I si II existente

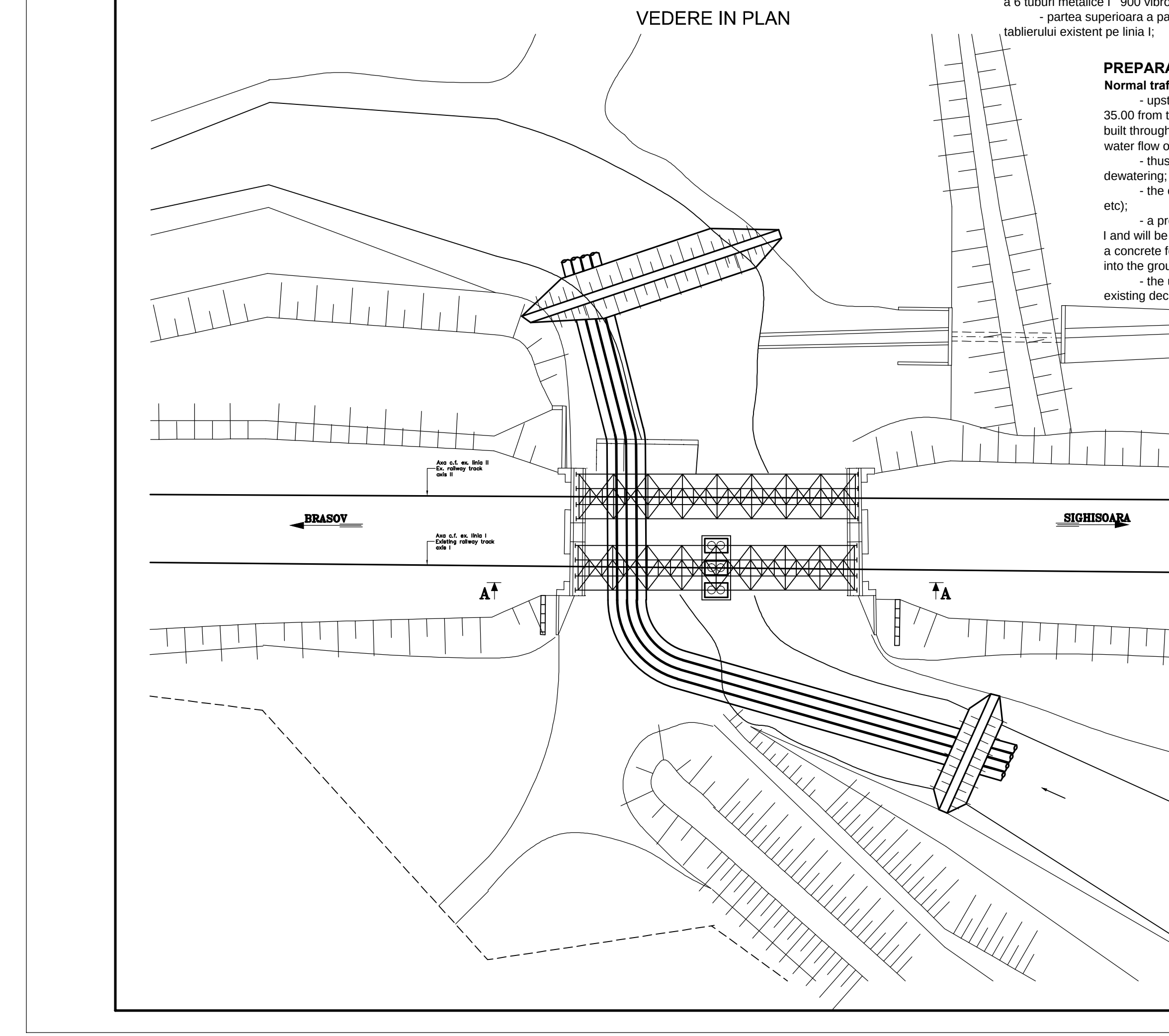
- in amonte si aval de podul existent, la cca 35.00 de axa liniei I existente, se realizeaza doua diguri transversale din pamant, strabatute de min 4 tuburi metalice Ï 1000 mm, ce vor conduce debitul de apa in afara zonei de lucru;
- se evacueaza apa din incinta astfel creata, prin epuismente;
- se demoleaza lucrarile din beton din albie (prag de fund etc);
- se executŁ, in axa liniei I, existente, o palee provizorie, din tuburi metalice fixate cu buloane de scelment pe o fundaŞe de beton, turnata in jurul a 6 tuburi metalice Ï 900 vibroinfipte in teren;
- partea superioara a paleiei se executa atat c©t permite prezenta tablierului existent pe linia I;

PREPARATORY WORKS

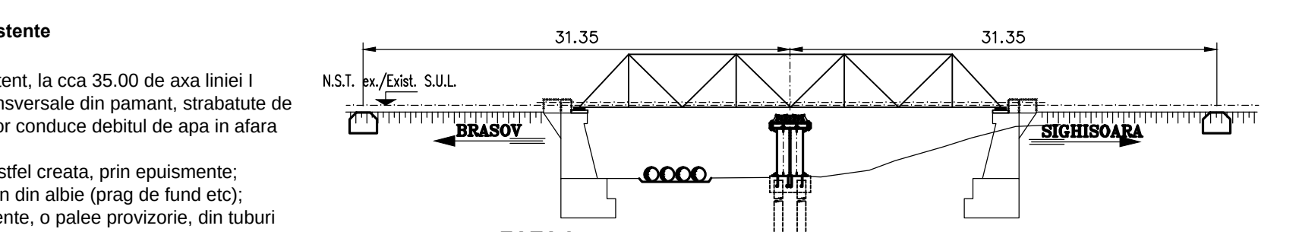
Normal traffic on the existing lines I and II

- upstream and downstream from the existing bridge, at about 35.00 from the axis of existing line I, two transversal earth dams will be built through which min 4 metallic tubes Ï 1000 mm will pass, leading the water flow outside the work area;
- thus the water in the afferent enclosed area will be discharged by dewatering;
- the concrete works in the riverbed will be demolished (bottom sill etc);
- a provisory bent (pile trestle) will be built in the axis of existing line I and will be composed of metallic tubes fastened with anchoring bolts on a concrete foundation, cast around 6 metallic tubes Ï 900 vibro-driven into the ground;
- the upper part of the bent will be built to such an extent as the existing deck on line I allows it;

VEDERE IN PLAN


Axa c.f. ex. linia II Ex. railway track axis II
Axa c.f. ex. linia I Existing railway track axis I
BRASOV
SIGHISOARA
A
A

SECTIUNE B-B / B-B SECTION



FAZA I

În închidere de circulație pe linia I şi circulație cu restrictie de viteza de 30 km/h, pe linia II

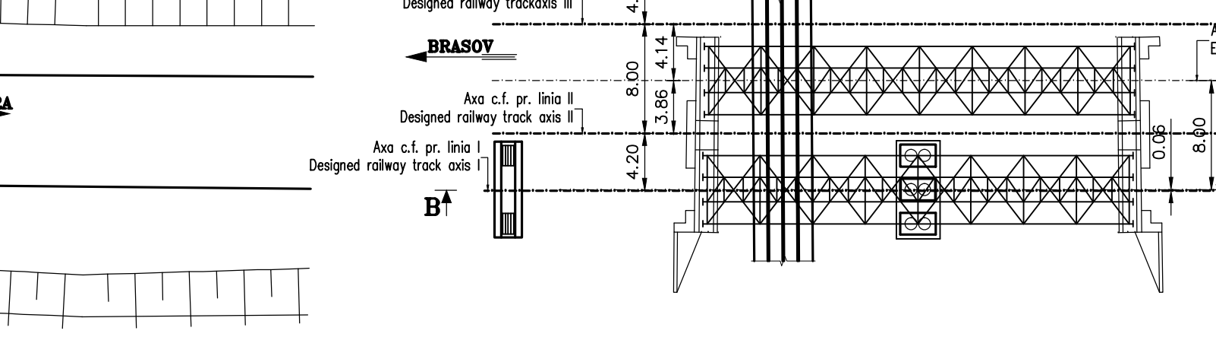
- se scoate de sub tensiune linia de contact aferenta liniei I;
- se demonteazŁ calea pe tronsoanele aferente zonelor de lucru;
- se executa in terasamentul dinspre Brasov si Sighisoara, al liniei I, la 31.35 m de axa paleiei provizorii, sapatura pentru fundatiile pe care vor rezema tablierele existente, in noua pozitie;
- se toarna betonul in fundatiile respective;
- se indeparteaza, pe zona dintre culei si fundatiile din terasament de pe linia I existenta, prisma de piatra sparta;
- se indeparteaza si un strat din terasament, in aceeasi zona, pentru a permite pozarea tablierelor existente, in noul amplasament;
- se demoleaza zidurile de garda si zidurile intoarse ale culeilor existente, aferente liniei I, pana la nivelul banchetei cuzinetilor;
- se ridica tablierul, cu prese, in etape succesive, pana la o cota care sa permita definitivarea reazemelor de pe paleea provizorie, si se aseaza pe calaje din lemn;

STAGE I

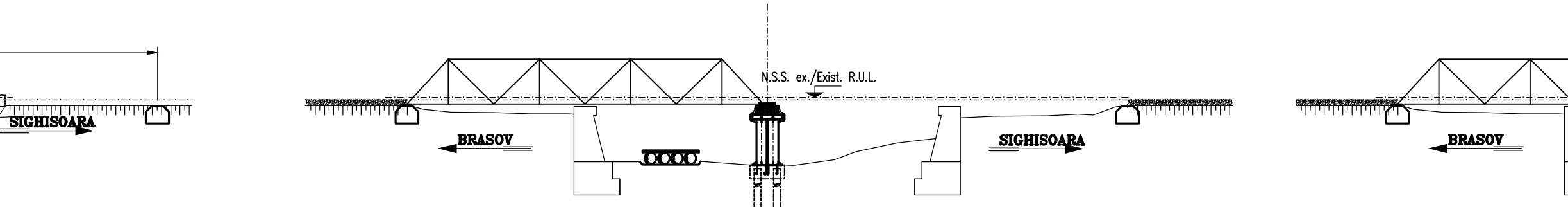
Under traffic closure on line I and traffic with speed restriction of 30km/h on line II

- the contact line of line I will be de-energized;
- the track will be demounted along the sections afferent to the work areas;
- in the embankment from Brasov and Sighisoara, for line I, at 31.35 m from the axis of the provisory bent, excavations will be made for the foundations where the existing decks will rest in the new position;
- the concrete will be cast in the afferent foundations;
- the crushed stone prism will be removed in the area between the abutments and the embankment foundations on the existing line I;
- an embankment layer will be also removed in the same area to allow the existing decks to be laid down in the new location;
- the guard walls and the reverted walls of existing abutments afferent to line I will be demolished up to the level of the bearing box berm;
- the deck will be lifted by press, during successive stages, up to a level where the supports on the provisory bent can be finalized, and will be placed on wood wedges;

VEDERE IN PLAN


Axa c.f. pr. linia IV Designed railway track axis IV
Axa c.f. pr. linia III Designed railway trackaxis III
Axa c.f. ex. linia II Ex. railway track axis II
Axa c.f. pr. linia II Designed railway track axis II
Axa c.f. pr. linia I Designed railway track axis I
Axa c.f. ex. linia I Existing railway track axis I
BRASOV
SIGHISOARA
4.20
4.14
3.86
8.00
0.86
8.00
4.20
B
B

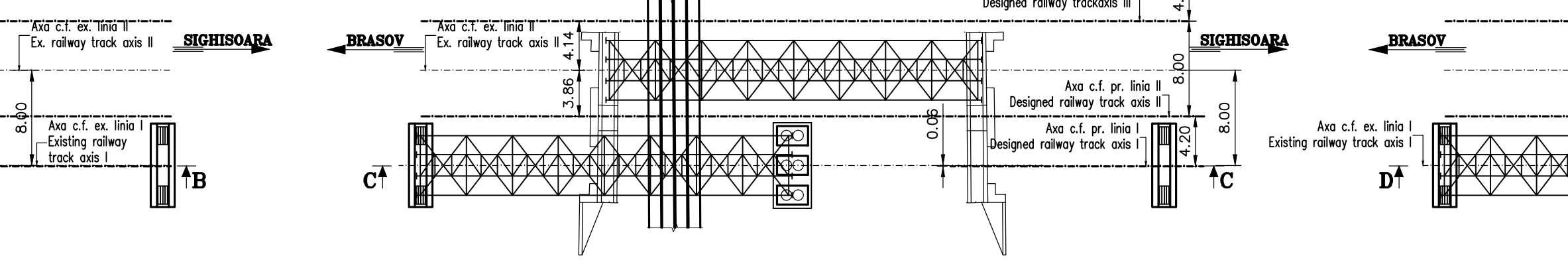
SECTIUNE C-C / C-C SECTION



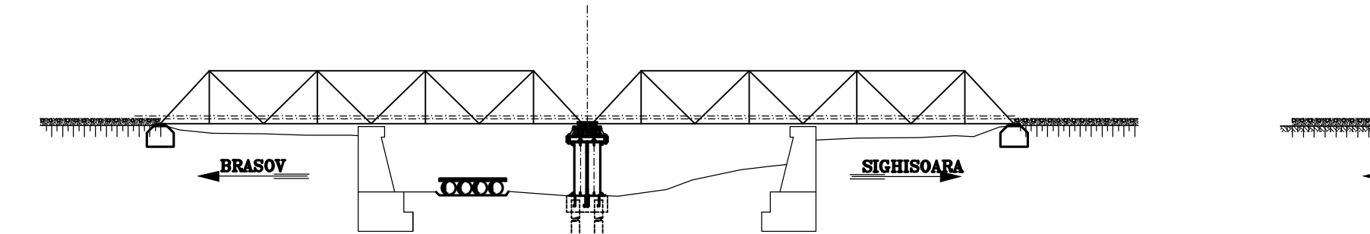
- se amenajeazŁ partea superioarŁ a paleiei provizorii ´n vederea rezemŁrii tablierelor in noua pozitie (se completeaza stivele de traverse, se definitiveaza injuguirea grinzilor Peine);
- tablierul de pe linia I, asezat provizoriu pe calaje, se translateaza in noul amplasament, cu un capat rezemat pe fundatia executata in terasamentul dinspre Brasov si cu celalalt capat rezemat pe paleea provizorie executata in axul podului existent;

- the upper part of the provisory bent will be arranged so that the decks can rest in the new position (the stacks of sleepers will be completed, the fixing frame device of Peine beams will be finalized);
- the temporarily wedged deck on line I will be shifted in the new location, with one end resting on the foundation in the embankment from Brasov while the other one will rest on the provisory bent made in the axis of existing bridge;

VEDERE IN PLAN


Axa c.f. pr. linia IV Designed railway track axis IV
Axa c.f. pr. linia III Designed railway trackaxis III
Axa c.f. ex. linia II Ex. railway track axis II
Axa c.f. pr. linia II Designed railway track axis II
Axa c.f. pr. linia I Designed railway track axis I
BRASOV
SIGHISOARA
4.20
4.14
3.86
8.00
0.86
8.00
4.20
C
C

SECTIUNE D-D / D-D SECTION



FAZA II

În închidere totala de circulație (liniile I şi II)

- se scoate de sub tensiune si se demonteaza linia de contact aferenta liniei II;
- se amenajeaza prisma de piatra sparta aferenta liniei II existente, in vederea asezarii provizorii si a manevrarii tablierului existent pe linia II;
- se muta tablierul de pe linia II, in continuarea celui de pe linia I, cu un capat rezemat pe fundatia executata in terasament si cu celalalt capat rezemat pe paleea provizorie executata in axul podului existent, in doua etape-intai se scoate de pe reazeme si se aduce pe calaje din lemn, in axa liniei II, dupa care, se aduce si se aseaza pe un alt rand de calaje, in axa liniei I dupa care se translateaza in continuarea tablierului de pe linia I;
- se asigurŁ protecŞa catodicŁ a tablierelor in noul amplasament;
- se repune sub tensiune linia de contact aferenta liniei I existente;

- se redeschide circulația pe linia I, cu restricție de viteză de 30 km/h, în trepte de 5km/h, în primele 24 de ore.

Tablierele, si in special reazemele lor, realizate din stive de babe, se vor ține sub observație pe toată durata exploatării, şi se vor remedia defectele apărute, dacă este cazul.

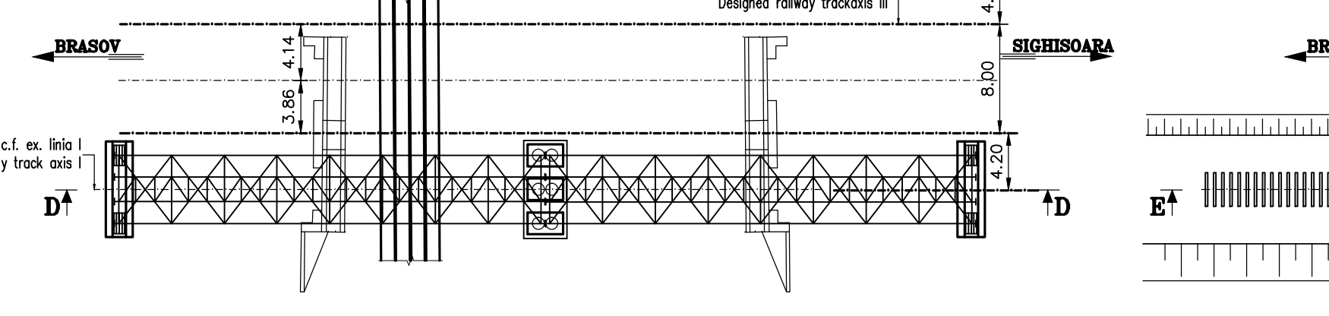
STAGE II

Under complete traffic closure (lines I and II)

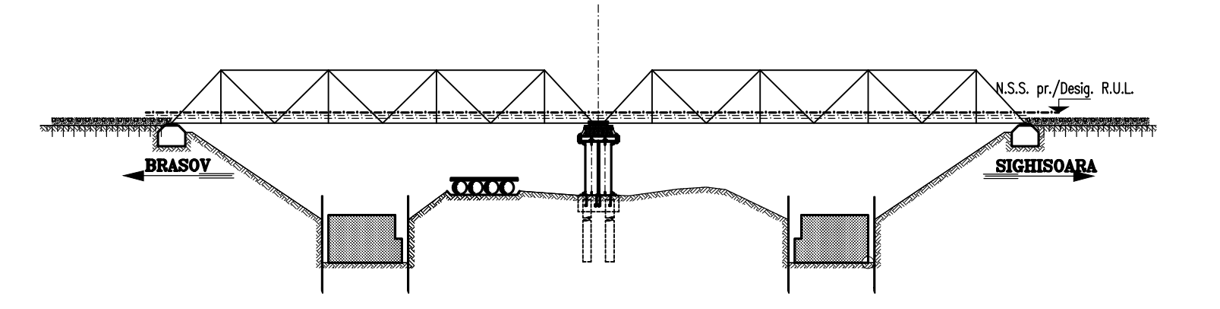
- the contact line of line II will be de-energized and demounted;
- the crushed stone prism afferent to the existing line II will be arranged to place temporarily and to handle the existing deck on line II;
- the deck on line II will be shifted as an extension of the deck on line I, one end resting on the foundation in the embankment while the other one rests on the provisory bent in the axis of existing bridge, in two stages - at first the deck will be removed from its supports and placed on wood wedges in the axis of line II, then the deck will be placed on other wedges in the axis of line I and then it will be shifted as an extension of the deck on line I;
- the cathode protection will be ensured for the decks in the new location;
- the contact line of the existing line I will be put under voltage again;
- the traffic will be reopened on line I, with speed restriction of 30km/h and speed steps of 5km/h within the first 24 hours.

The decks, especially the supports, composed of stacks of bollards, will be always under control during the operation and the faults will be repaired, if the case.

VEDERE IN PLAN


Axa c.f. pr. linia IV Designed railway track axis IV
Axa c.f. pr. linia III Designed railway trackaxis III
Axa c.f. ex. linia I Existing railway track axis I
BRASOV
SIGHISOARA
4.14
3.86
4.20
8.00
4.20
D
D

SECTIUNE E-E / E-E SECTION



FAZA III

Circulatie inchisa pe linia II, existenta, si circulatie cu restrictie de viteza de 30 km/h pe linia I

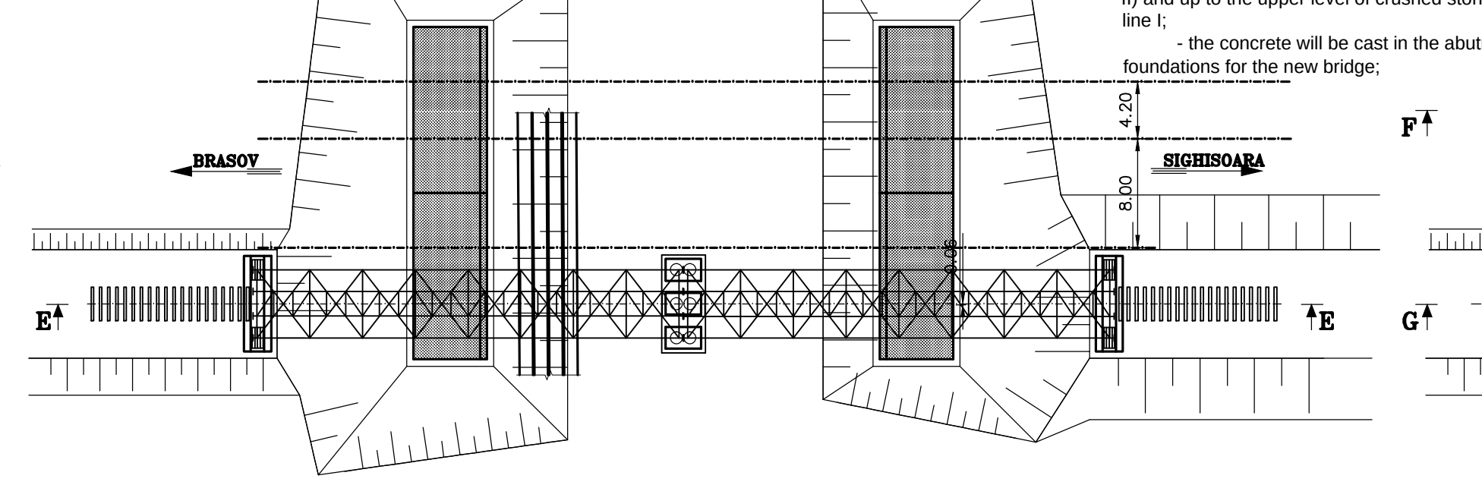
- se demoleaza integral culeile existente;
- se evacueaza terasamentul de sub linia II existenta, pana la nivelul terenului natural, cu asigurarea integritatii terasamentului de sub linia I, in circulatie;
- se executa sapatura necesara realizarii fundatiilor culeilor pentru podul nou, cu sprijiniri, pana la partea superioara a fundatiilor si la taluz de 2:3 pana la terenul natural (la linia II) si pana la nivelul superior al prismei de piatra sparta, la linia I;
- se toarna betonul in fundatiile culeilor aferente podului nou;

STAGE III

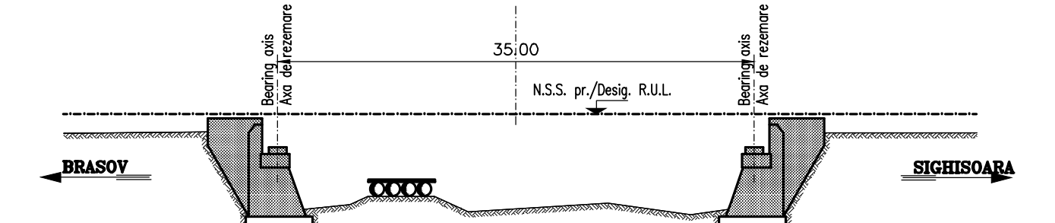
Under traffic closure on the existing line II and traffic with speed restriction of 30km/h on line I

- the existing abutments will be completely demolished;
- the embankment under the existing line II will be removed up to the natural ground level, ensuring the integrity of embankment under line I in traffic conditions;
- the required excavation with propping will be carried out to enable the construction of the abutment foundations for the new bridge up to the upper part of foundations and 2:3 slope up to the natural ground (line II) and up to the upper level of crushed stone prism at line I;
- the concrete will be cast in the abutment foundations for the new bridge;

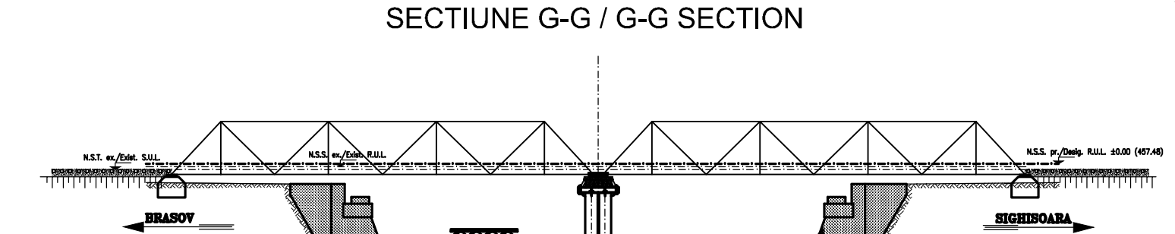
VEDERE IN PLAN



SECTIUNE F-F / F-F SECTION



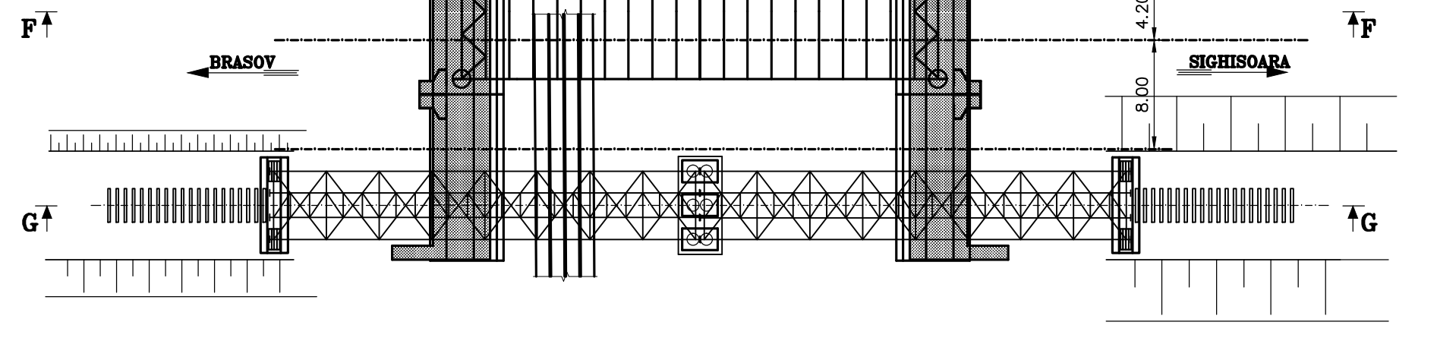
SECTIUNE G-G / G-G SECTION



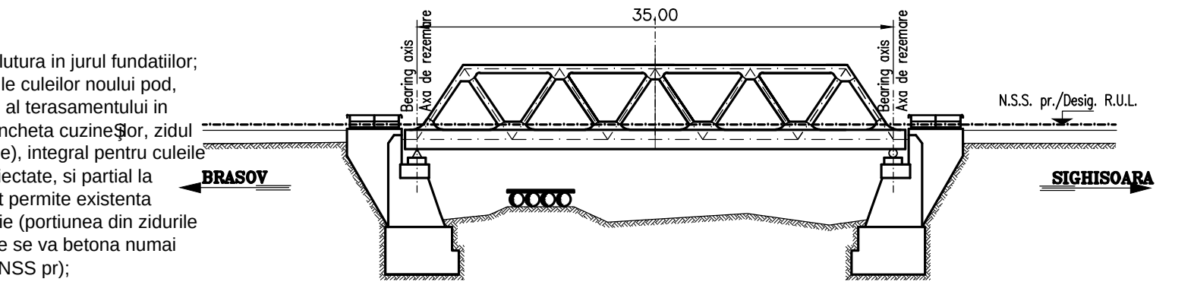
- se realizeazŁ umplutura in jurul fundatiilor;
- se executŁ elevaŞile culeilor noului pod, corespunzator noului profil al terasamentului in zona podului (cuzineŞi, bancheta cuzineŞlor, zidul de gardŁ κi zidurile ´ntoarse), integral pentru culeile aferente liniilor III si IV proiectate, si partial la culeile liniilor I si II, atat cat permite existenta tablierelor aflate in circulatie (portiunea din zidurile de garda aflata sub tabliere se va betona numai pana la cota -1.50 fata de NSS pr);
- se realizeazŁ umplutura din spatele si ´n jurul culeilor noi, corespunzŁtor profilului terasamentului proiectat ´n zona podului (in straturi succesive, bine compactate, conform caietului de sarcini), avandu-se in vedere cota corectiei albiei sub pod si adiacent acestuia;
- se executa drenul din spatele culeilor;
- se executŁ, in axul culeilor aferente liniilor III si IV, o schela, in vederea montajului tablierului metalic;
- se monteazŁ tablierul pentru liniile proiectate III si IV;

- the filling will be carried out around the foundations;
- the elevations of abutments for the new bridge will be built according to the new embankment profile in the bridge area (bearing boxes, berm of bearing boxes, guard wall and reverted walls) - completely for the abutments afferent to the designed lines III and IV and partially for the abutments of lines I and II - to such an extent as the decks under traffic allow it (the section of guard walls under the decks will be concreted only up to -1.50 level from the RUL);
- the filling will be made behind and around the new abutments according to the designed embankment profile in the bridge area (in well compacted successive layers according to the Technical Specifications), taking into consideration the riverbed correction level under the bridge and in the adjacent area;
- the drain will be built behind the abutments;
- a scaffold will be erected in the axis of abutments for lines III and IV to mount the metallic deck;
- the deck will be mounted for the designed lines III and IV;

VEDERE IN PLAN



SECTIUNE H-H / H-H SECTION

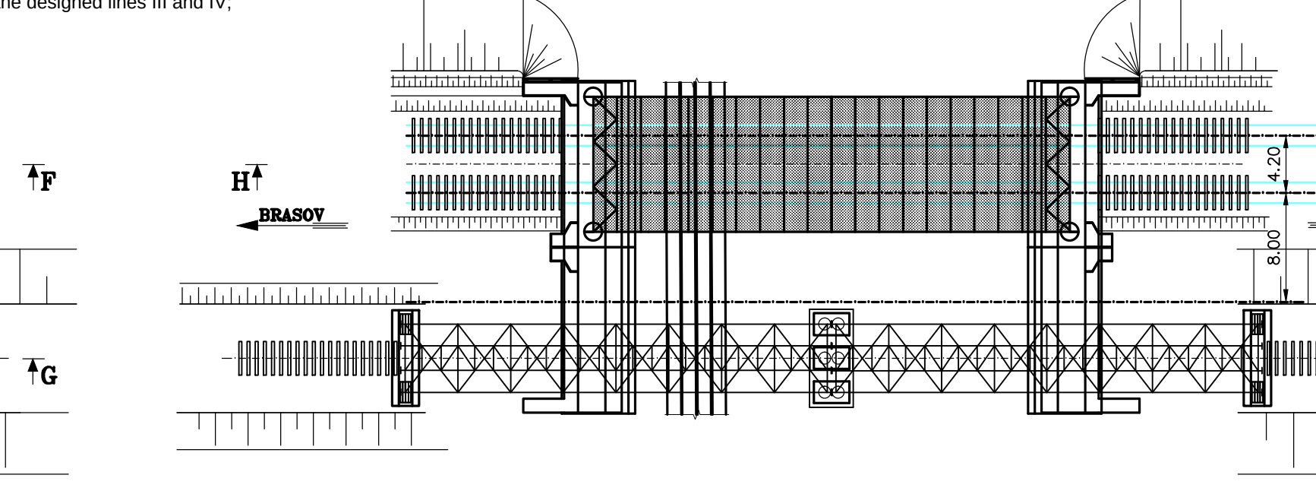


- dupa montare, noul tablier se aseaza pe reazemele definitive;
- se cofreazŁ si se betoneazŁ cuva de beton armat;
- se cofreaza si se betoneaza timpanele si trotuarele aferente culeilor liniilor III si IV;
- se monteaza parapetele metalice la trotuarele zidurilor intoarse la aceleasi culei;
- dupŁ ce betonul din cuva a ajuns la rezistenŞa de 100kg/cm ^{2},dar nu mai devreme de 7 zile de la turnare, se trece la echiparea tablierului (betonul de pantŁ, hidroizolaŞa κi betonul de protecŞe al acesteia, prisma de piatrŁ spartŁ, traverse, sine,etc.)
- se executa lucrarile necesare pentru racordarea podului la teren;
-´n paralel, se executŁ, p©nŁ la pod, lucrŁrile de terasamente, suprastructura a caii si linie de contact, ale noilor linii proiectate III si IV;
- se racordeazŁ calea de pe pod cu calea de pe terasamentul nou proiectat si se monteaza contrasinele;
- se executa scara de acces pe terasament;
- se continua lucrarile de amenajare si protectie a albiei;

- se deschide circulația cu restrictie de viteza de 30 Km/h, pe liniile III si IV proiectate, în trepte de viteză, conform instrucțiilor de cale ferată în vigoare;

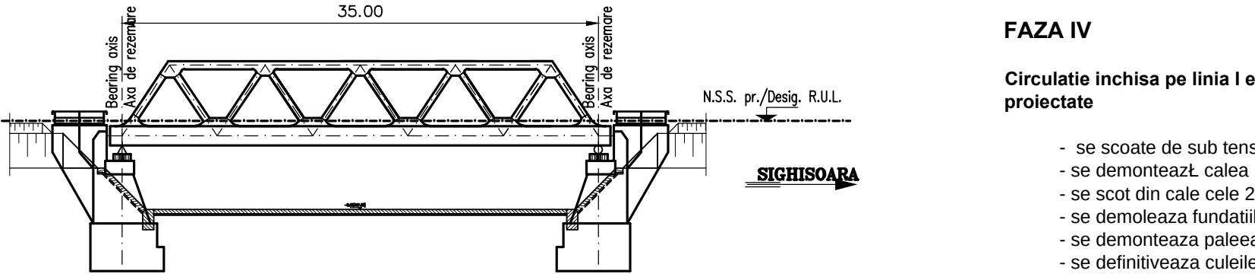
- after mounting, the new deck will rest on the final supports;
- the reinforced concrete box will be molded and concreted;
- the tympana and the sidewalks related to the abutments of lines III and IV will be molded and concreted;
- the metallic parapets will be mounted for the sidewalks of the reverted walls at the same abutments;
- when the concrete in the concrete box reached 100kg/cm ^{2} resistance, but no earlier than 7 days from casting, the deck will be equipped (slope concrete, waterproofing and protection concrete, crushed stone prism, sleepers, rails, etc.)
- the required works will be carried out to connect the bridge to the ground;
- at the same time, the embankment, superstructure and contact line works for the new designed lines III and IV will be carried out up to the bridge;
- the track on the bridge will be connected to the track on the new designed embankment and the guard rails will be mounted;
- the access stair on the embankment will be built;
- the arrangement and protection works for the riverbed will continue;

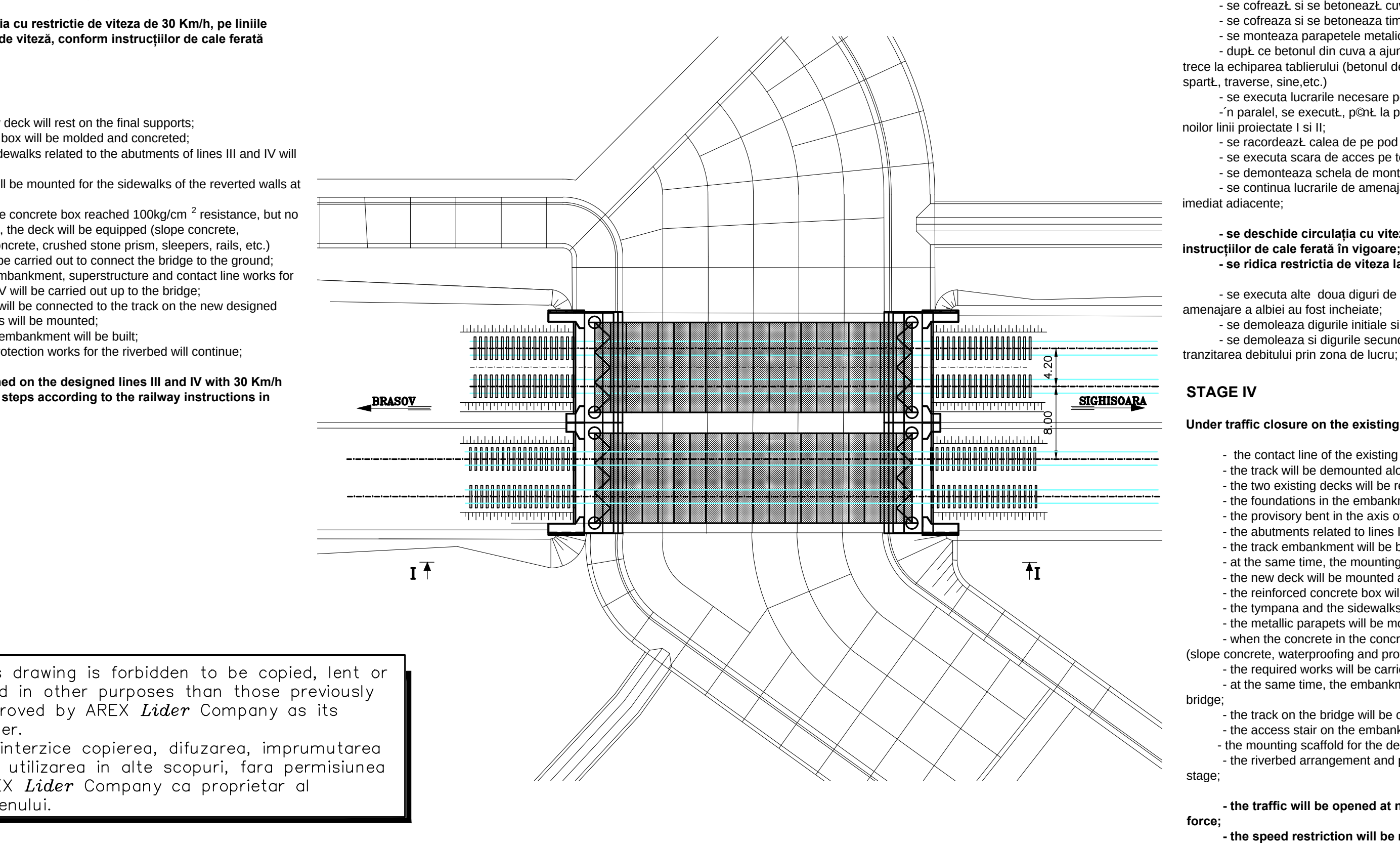
- the traffic will be opened on the designed lines III and IV with 30 Km/h speed restriction, with speed steps according to the railway instructions in force;



This drawing is forbidden to be copied, lent or used in other purposes than those previously approved by AREX *Lider* Company as its owner.
Se interzice copierea, difuzarea, imprumutarea sau utilizarea in alte scopuri, fara permisiunea AREX *Lider* Company ca proprietar al desenului.

SECTIUNE I-I / I-I SECTION





FAZA IV

Circulatie inchisa pe linia I existenta si circulatie cu restrictie de viteza de 30 km/h pe liniile III si IV proiectate

- se scoate de sub tensiune linia de contact aferenta liniei I existente;
- se demonteazŁ calea pe tronsoanele aferente zonelor de lucru;
- se scot din cale cele 2 tabliere existente si se transporta in depozit;
- se demoleaza fundatiile din terasament, pe care au rezemat cele doua tabliere;
- se demonteaza paleea provizorie din axul podului existent;
- se definitiveaza culeile aferente liniilor I si II, in zonele in care lucrul nu a fost posibil datorita prezentei tablierelor pe care se circula;
- se executa terasamentul caii, in spatele culeilor noi, corespunzŁtor profilului terasamentului proiectat ´n zona podului;
- in paralel cu aceste lucrari, se executa, in axa culeilor aferente liniilor I si II, schela de montaj pentru noul tablier;
- se monteza noul tablier si se pozitioneaza pe reazemele definitive;
- se cofreazŁ si se betoneazŁ cuva de beton armat;
- se cofreaza si se betoneaza timpanele si trotuarele aferente culeilor liniilor I si II;
- se monteaza parapetele metalice la trotuarele zidurilor intoarse;
- dupŁ ce betonul din cuva a ajuns la rezistenŞa de 100kg/cm ^{2},dar nu mai devreme de 7 zile de la turnare, se trece la echiparea tablierului (betonul de pantŁ, hidroizolaŞa κi betonul de protecŞe al acesteia, prisma de piatrŁ spartŁ, traverse, sine,etc.)
- se executa lucrarile necesare pentru racordarea podului la teren;
-´n paralel, se executŁ, p©nŁ la pod, lucrŁrile de terasamente, suprastructura a caii si linie de contact, ale noilor linii proiectate I si II;
- se racordeazŁ calea de pe pod cu calea de pe terasamentul nou proiectat si se monteaza contrasinele;
- se executa scara de acces pe terasament;
- se demonteaza schela de montaj a tablierului;
- se continua lucrarile de amenajare si protectie a albiei, in aceasta faza putandu-se lucra sub pod si zonele imediat adiacente;

- se deschide circulația cu viteza normala pe liniile I si II proiectate, în trepte de viteză, conform instrucțiilor de cale ferată în vigoare;
- se ridica restrictia de viteza la circulatia pe liniile III siIV;

- se executa alte doua diguri de pamant, in interiorul incintei existente, in zone in care lucrarile de protectie si amenajare a albiei au fost incheiate;
- se demoleaza digurile initiale si se completeaza protectia si pe amplasamentul acestora;
- se demoleaza si digurile secundare si se scot din amplasament tuburile metalice care au asigurat tranzitarea debitului prin zona de lucru;

STAGE IV

Under traffic closure on the existing line I and traffic with speed restriction of 30km/h on the designed lines III and IV

- the contact line of the existing line I will be de-energized;
- the track will be demounted along the sections afferent to the work areas;
- the two existing decks will be removed from the track and transported to the storage place;
- the foundations in the embankment on which the two decks rested will be demolished;
- the provisory bent in the axis of the existing bridge will be demounted;
- the abutments related to lines I and II will be finalized in the areas where the works could not be performed due to the decks under traffic;
- the track embankment will be built behind the new abutments according to the designed embankment profile in the bridge area;
- at the same time, the mounting scaffold for the new deck will be erected in the abutment axis afferent to lines I and II;
- the new deck will be mounted and positioned in the final supports;
- the reinforced concrete box will be molded and concreted;
- the tympana and the sidewalks related to the abutments of lines I and II will be molded and concreted;
- the metallic parapets will be mounted for the sidewalks of the reverted walls;
- when the concrete in the concrete box reached 100kg/cm2 resistance, but no earlier than 7 days from casting, the deck will be equipped (slope concrete, waterproofing and protection concrete, crushed stone prism, sleepers, rails, etc.)
- the required works will be carried out to connect the bridge to the ground;
- at the same time, the embankment, superstructure and contact line works for the new designed lines I and II will be carried out up to the bridge;
- the track on the bridge will be connected to the track on the new designed embankment and the guard rails will be mounted;
- the access stair on the embankment will be built;
- the mounting scaffold for the deck will be dismantled;
- the riverbed arrangement and protection works will continue, the works under the bridge and in the adjacent areas being possible during this stage;

- the traffic will be opened at normal speed on the designed lines I and II, with speed steps according to the railway instructions in force;
- the speed restriction will be removed from lines III and IV;

- other two earth dams will be built inside the existing enclosed area where the riverbed arrangement and protection works are already completed;
- the initial dams will be demolished and the protection works will be also completed in this location;
- the secondary dams will be also demolished and the metallic tubes ensuring the water flow transit in the work area will be removed from this location.

D					
C					
B					
A					
Indice Index	Data Date	Modificare Modification/Revision	Proiectant Designer	Aprobat Consultant Approved Consultant	Aprobat CFR Approved CFR

GUVERNUL ROMANIEI
ROMANIAN GOVERNMENT

PROIECT FINANȚAT DE UNIUNEA EURO
EUROPEAN UNION FINANCED PR

CLIENT / CLIENT

C.N.C.F. "C.F.R." - S.A.

ITALFERR
GRUPPO FERROVIE DELLO STATO
Joint Venture leader

Scott Wilson

OBERMEYER
PLANEN + BERATEN GmbH

TECNIC
Consulting Engineers

CONSULTANT / CONSULTANT			Data Date	SemnŁturŁ Signature
Aprobat Approved	ķef proiect Project manager	R. Liuzza		
Aprobat Approved	Coordonator SecŞune 1 Section 1 Coordinator	C. Gambelli		
Verificat Checked	Expert Cheie Checking Expert	V.Kallidromitis		

SUBCONTRACTANT / SUBCONTRACTOR

AREX

Aprobat Approved	Responsabil Subconsultant Subconsultant Responsible	A. Dinulescu Stanciu	11.2011	
Ċtocmit Elaborated	Proiectant Designer	Vasile Stirbu	11.2011	

Reabilitarea liniei de cale ferata Brakov - Simeria, parte componentŁ a coridorului IV Pan European, pentru circulaŞa trenurilor cu viteza maximŁ de 160 km/h, **Tronsonul : Braşov - Sighişoara** Rehabilitation of the railway line Braşov - Simeria, component Part of the IV Pan-European Corridor, for the trains circulation with maximum speed of 160 km/h, **Section : Braşov - Sighişoara**	*Proiect/Project* *2004/RO/16/P/PA/003* Faza / Phase: P.Th. / T.D.

Denumire desen / Drawing Title :

POD - KM 233+918.686 / BRIDGE KM 233+918.686
PROCES TEHNOLOGIC / SEQUENCE OF OPERATIONS

Codificare / Codification System	Scara / Scale 1:500	LOT / LOT	Nr. / No 01 / 01

E A 5 1 | 0 1 | C | 1 2 | D X | P V | 0 2 5 | 0 | 0 0 5 | 0

2107x297=.63mp