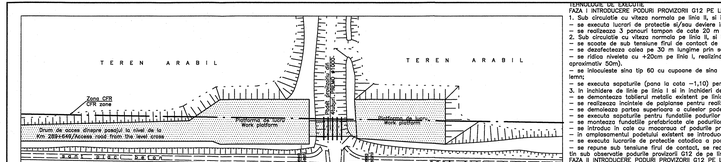


TEHNOLOGIE DE EXECUTIE

FAZA I INTRODUCERE PODURI PROVIZORII G12 PE LINIA I

1. Sub circulatie cu viteza normala pe linia II, si in inchideri succesive de linie (in pauzele de circulatie) pe linia I:
   – se executa lucrari de protectie si/sau devieri instalatii semnalizare si telecomunicatii;
   – se realizeaza 3 ponouri tampon de cate 20 m lungime fiecare si se ostenteleaza cale pe oca 200 ml de o parte si de alta a ponourilor tampon, pe linia I;
2. Sub circulatie cu viteza normala pe linia II, si in inchidere de linie pe linia I:
   – se scoate de sub tensiune firul de contact de pe firul I;
   – se desfasoara calea de 20 m lungime prin scoaterea din cale a ponoului central din dreptul podetului, de pe linia I;
   – se ridica nivletu cu +20cm pe linia I, realizandu-se un palier de 30m (15m de o parte si de alta a axului podetului), care se va racorda la linia existenta cu o declivitate maxima de 5% (pe aproximativ 50m).
   – se inlocuiesta sina tip 60 cu cupoane de sina racordate 60/49, pe ponourile tampon ramase pe linia I, cu ponouri de racordare 49/65 la ambele capete, pe o lungime de cca. 70m pe traverse din lemn;
   – se executa sapaturile (pana la cota –1,10) pentru platforma pe care se vor amplasa podurile provizorii G12 pe firul I;
3. In inchidere de linie pe linia II si in inchideri de linie succesive circulatie de linie (in pauzele de circulatie) pe linia II:
   – se demonteaza tablierul metalic existent pe linia II;
   – se realizeaza inclinele de paplanse pentru realizarea fundatiilor sub linia II;
   – se demoleaza partea superioara a culeelor podului existent ulterente firului I, pana la cota –0,90 de la NST;
   – se montezaza fundatiile prefabricate ale podurilor provizorii G12 pe linia II;
   – se introduc in cale cu macaraua of podurile provizorii G12, pe linia II;
   – in ansamblul podului existent se introduce un podet provizoriu Tip U5 rezemat pe cele doua podeti provizorii tip G12 cale sus;
   – se executa lucrarile de protectie catodica a podurilor provizorii de pe linia II;
   – se scoate de sub tensiune firul de contact, se redeschide circulatia pe linia I, cu restrictie de viteza 30 km/h, in trepte de vitezo de 5 km/h in primele 24 ore, (conform instructiilor cf in vigoare) si se tin sub observatie podurile provizorii G12 de pe linia I pe toate durata de exploatare in cale, cu remedierea eventualelor defecte si aducerea lor in limita admisa de tolerante.

FAZA II INTRODUCERE PODURI PROVIZORII G12 PE LINIA II

1. Sub circulatie cu viteza normala pe linia I, si in inchideri succesive de linie (in pauzele de circulatie) pe linia II:
   – se executa lucrari de protectie si/sau devieri instalatii semnalizare si telecomunicatii;
   – se realizeaza 3 ponouri tampon de cate 20 m lungime fiecare si se ostenteleaza cale pe oca 200 ml de o parte si de alta a ponourilor tampon, pe linia II;
2. Sub circulatie cu viteza normala pe linia I, si in inchidere de linie pe linia II:
   – se scoate de sub tensiune firul de contact de pe firul II;
   – se desfasoara calea de 20 m lungime prin scoaterea din cale a ponoului central din dreptul podetului, de pe linia II;
   – se ridica nivletu cu +20cm pe linia II, realizandu-se un palier de 30m (15m de o parte si de alta a axului podetului), care se va racorda la linia existenta cu o declivitate maxima de 5% (pe aproximativ 50m).
   – se inlocuiesta sina tip 60 cu cupoane de sina racordate 60/49, pe ponourile tampon ramase pe linia II, cu ponouri de racordare 49/65 la ambele capete, pe o lungime de cca. 70m pe traverse din lemn;
   – se executa sapaturile (pana la cota –1,10) pentru platforma pe care se vor amplasa podurile provizorii G12 pe firul II;
3. In inchidere de linie pe linia I si in inchideri de linie succesive circulatie de linie (in pauzele de circulatie) pe linia I:
   – se demoleaza suprastructura din pachete de sine existenta pe linia I;
   – se realizeaza inclinele de paplanse pentru realizarea fundatiilor sub linia I;
   – se demoleaza partea superioara a culeelor podului existent ulterente firului II, pana la cota –0,90 de la NST;
   – se executa sapaturile pentru fundatiile podurilor provizorii G12;
   – se montezaza fundatiile prefabricate ale podurilor provizorii G12 pe linia II;
   – se introduc in cale cu macaraua of podurile provizorii G12, pe linia II;
   – in ansamblul podului existent se introduce un podet provizoriu Tip U5 rezemat pe cele doua podeti provizorii tip G12 cale sus;
   – se executa lucrarile de protectie catodica a podurilor provizorii de pe linia II;
   – se scoate de sub tensiune firul de contact, se redeschide circulatia pe linia I, cu restrictie de viteza 30 km/h, in trepte de vitezo de 5 km/h in primele 24 ore, (conform instructiilor cf in vigoare) si se tin sub observatie podurile provizorii G12 de pe linia I pe toate durata de exploatare in cale, cu remedierea eventualelor defecte si aducerea lor in limita admisa de tolerante.

FAZA III – LUCRARI DE EXECUTIE LA SUPRASTRUCTURI

1. Sub circulatie cu viteza de 15km/h pe ambele linii de circulatie:
   – se executa cele 200 ml de o parte si de alta a axului podetului) cele 4 poduri provizorii tip G12 si o celor 2 podete provizorii tip U5).

EXECUTION TECHNOLOGY PHASE I

PHASE I TO THE TEMPORARY BRIDGE ON TRACK II.

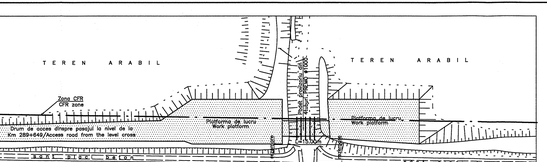
1. Under normal speed traffic on track II, and successive closings (in traffic gaps) on track II:
   – executing the protection and/or deviation works of signaling and telecommunication installation;
   – executing 3 buffer panels of 30 m length each and de–tensioning the track on approx. 200 ml on both sides of the buffer panels, on track I;
2. Under normal traffic on track I, and line closing on track II:
   – cutting out of voltage the contact wire on track I;
   – disassembling the track on 30 m length by taking out the central buffer panels located in front of the culvert, on track I;
   – elevating the line level with +20cm on track I, realizing a 30cm alignement (15m on each other side of the bridge axis), which shall be connected to the existing line with a maximum declivity of 5% (on approx. 50m).
   – replacing the rail type 60 with closure rails 60/49 type, on the connection panels remained on track I, with panels 49/65 at both ends, on aprox. 70m length on wooden sleepers;
   – executing the excavations (down to level –1,10) for the platform of temporary bridges G12 that will be placed on track II;
3. Closing traffic on track I and successive closings (in traffic gaps) on track II
   – dismantling the existing deck on track II;
   – executing the sheeting piles precinct to excute the abutments foundations under track I;
   – demolishing the upper part of the existing abutments afferent to track I, down to the level –0,90 from USL;
   – executing the excavations for the temporary bridges G12 foundations which will be placed on track I;
   – mounting the prefabricated foundations of the temporary bridges G12 on track I;
   – introduce in the track with a crane the temporary bridges G12 on track I;
   – in the existing culvert emplacement a provisory culvert U5 type is placed, which is bearing on both temporary bridges G12 upper track;
   – executing the protection works to the roll on the temporary bridges G12 on track I;
   – reopening the traffic on track I with 30 km/h speed restriction, on 5 km/h levels (acc. to the instructions in force) and keeping under observation the temporary bridges G12 during the entire operation period, by remedying and bringing the eventual deficiencies to the limit allowed by tolerances;

PHASE II PLACING THE TEMPORARY BRIDGE ON TRACK II.

1. Under normal speed traffic on track I, and successive closings (in traffic gaps) on track II:
   – executing the protection and/or deviation works of signaling and telecommunication installation;
   – executing 3 buffer panels of 30 m length each and de–tensioning the track on approx. 200 ml on both sides of the buffer panels, on track II;
2. Under normal traffic on track I, and line closing on track II:
   – cutting out of voltage the contact wire on track II;
   – disassembling the track on 30 m length by taking out the central buffer panels located in front of the culvert, on track II;
   – elevating the line level with +20cm on track II, realizing a 30cm alignement (15m on each other side of the bridge axis), which shall be connected to the existing line with a maximum declivity of 5% (on approx. 50m).
   – replacing the rail type 60 with closure rails 60/49 type, on the connection panels remained on track II, with panels 49/65 at both ends, on aprox. 70m length on wooden sleepers;
   – executing the excavations (down to level –1,10) for the platform of temporary bridges G12 that will be placed on track II;
3. Closing traffic on track II and successive closings (in traffic gaps) on track I
   – dismantling the existing deck on track I;
   – executing the sheeting piles precinct to excute the abutments foundations under track II;
   – demolishing the upper part of the existing abutments afferent to track II, down to the level –0,90 from USL;
   – executing the excavations for the temporary bridges G12 foundations which will be placed on track II;
   – mounting the prefabricated foundations of the temporary bridges G12 on track II;
   – introduce in the track with a crane the temporary bridges G12 on track II;
   – in the existing culvert emplacement a provisory culvert U5 type is placed, which is bearing on both temporary bridges G12 upper track;
   – executing the protection works to the roll on the temporary bridges G12 on track II;
   – reopening the traffic on track II with 30 km/h speed restriction, on 5 km/h levels (acc. to the instructions in force) and keeping under observation the temporary bridges G12 during the entire operation period, by remedying and bringing the eventual deficiencies to the limit allowed by tolerances;

PHASE III WORKS EXECUTED AT BRIDGE UNDER PROTECTION OF G12 TEMPORARY BRIDGES;

3. Under traffic speed restriction of 15Km/h on both tracks (under protection of 4 temporary bridges G12 type end of the 2 temporary culverts U5 type).
   – executing the digging for the new abutments, with mechanical sheeting piles support;
   – abutments execution up to the level of cushions bench and executing the inverted walls;



FAZA V – Lucrari ce se executa in albie (sub circulatie).

– se demoleaza podetul existent;
– se executa sapaturile pentru cele 2 contraforturi;
– se calibreaza albia amonte si aval;
– se betoneaza albia pe 60m amonte si aval;
– se decolmateaza albia in aval pana la emisar si pe cca. 800m in amonte.

PHASE V – Works executed in the riverbed (under traffic).

– demolishing the existing culvert;
– executing the embankment connections;
– calibration of the upstream and downstream bed;
– concreting the riverbed on 60m upstream and downstream;
– unsilting the downstream riverbed down to the emissary and upstream on aprox. 800m.

FAZA IV– TEHNOLOGIA DE EXECUTIE A SUPRASTRUCTURI

1. In inchidere de circulatie pe linia I si circulatie cu restrictie de viteza de 15km/h pe linia II:
   – se scoate de sub tensiune firul de contact de pe firul I;
   – se demontezaza calea de pe podurile provizorii tip G12 de pe firul I;
   – se scot din cale, cu macaraua podetii provizorii U5, podurile provizorii G12 si fundatiile prefabricate de pe firul I;
   – se montezaza grinzile metalice pe amplasamentul definitiv pe linia I, prin fixarea acestora cu distantieri si tije de stringere;
   – pe talpa inferioara a grinzii metalice se pozaeza, pe un strat de mastic bituminos aplicat la cald, dalele prefabricate autoportante, iar rosturile se vor mata cu mortar de ciment M100;
   – montezarea schelei autoportante se realizeaza prin elemente metalice de rezistenta profil tip U18 avand lungimea de 7200mm, solidarizate de grinzile metalice cu tiranti verticali M20, prin intermediul unei corniere L80x80x10;
   –the rail type 60 with closure rails 60/49 type, on the connection panels remained on track I, with panels 49/65 at both ends, on aprox. 70m length on wooden sleepers;
   – se montezaza armatura conform planului de armare a suprastructurii POB precum si "paharele" pentru pozarea parapetului metalic conform planului P10;
   –betonarea se va face in doua faze: de la centru spre margini conform schemei prezentate mai sus. Betonarea se va face in flux continu fara o ae lase rasturi de betonare;
   –dupa atingerea rezistentei la decofrare a betonului (min.0,5Rcb), suprastructura se decofreaza; se va completa prin betonare si zidurile de garda
   eferente liniei I
   – se realizeaza hidroizolatia pe suprastructura si rosturile intre oceasta si culee;
   – se realizeaza apa armata cu plase sudate tip STNB 17G0283 cu ochiuri 100x100x6,
   – se montezaza parapetul metalic conform planului P10, fixarea acestuia facindu–se prin sudura electric manuala cu electrozi SUPERBAZ.
   – se reface terasamentul in zona podului.
   – se reface calea cu sina tip 60, la cota proiectata (N.S.T.existent+70cm);
2. Se redeschide circulatia pe linia I cu restrictie de viteza de 50km/h.
3. In inchidere de circulatie pe linia II si circulatie cu restrictie de viteza de 50km/h pe linia I:
   – se scoate de sub tensiune firul de contact de pe firul II;
   – se demontezaza calea de pe podurile provizorii tip G12 de pe firul II;
   – se scot din cale, cu macaraua cf: podetul provizoriu U5, podurile provizorii G12 si fundatiile prefabricate de pe firul II;
   Suprastructura se va executa pe o inaltime de circa 25cm de axul definitiv al podului, inapre exterior dupa care se va ripa in amplasamentul definitiv.
   – se montezaza grinzile metalice pe amplasamentul definitiv prin fixarea acestora cu distantieri si tije de stringere;
   – pe talpa inferioara a grinzii metalice se pozaeza, pe un strat de mastic bituminos aplicat la cald, dalele prefabricate autoportante, iar rosturile se vor mata cu mortar de ciment M100;
   – se montezaza schela autoportante in vederea betonarii, ovind elemente de rezistenta montate in dreptul consolei de tratuar la max. 0,75m interax, iar pe latura din axul podului la max. 1,50m interax;
   –cofrarea se va face cu panouri TEGO sprijinite pe dulapi orizontali si verticali (10x2,5cm);
   –sustinerea schelei autoportante se realizeaza prin elemente metalice de rezistenta profil tip U18 avand lungimea de 7200mm, solidarizate de grinzile metalice cu tiranti verticali M20, prin intermediul unei corniere L80x80x10;
   –the reinforcement is mounted according to the superstructure reinforcement plan P08 and also the devices for metallic hardroll acc.to plan P10;
   –concreting is realised in two phases from centre to margins according to the up presented schedule. Concreting shall be done continuously without concrete joints;
   –after achieving the concrete resistence at shuttering removal (min.0,5Rcb) the shuttering are removed from superstructure;
   –in the same time with superstructure execution the guarding walls afferent to track I shall be filled out by concreting;
   –waterproofing on superstructure and the joints between it and abutments is complied;
   –realising the waterproofing covering, reinforced with welded net STNB 17G0283 mesh 100x100x6;
   –the metallic handrail is mounted acc. to plan P10, fixing it by manually electric welding with SUPERBAZ electrodes.
   –renewing embankment in bridge area.
   –mounting the rail 60 type on bridge, at projected level (existing U.S.L.+70cm);
2. Traffic reopening on both tracks, respecting the norms in force regarding returning to normal speed.
3. Closing traffic on track II and speed traffic of 50km/h restriction on track I:
   – cutting out of voltage the contact wire on track II;
   – dismantling the track from the temporary bridges G12, on track II;
   –temporary bridges G12, U5 and provisory foundations afferent to track II are taking out of track.
   Superstructure shall be executed in temporary position, at 25cm from final bridge axis, from outside to inside after then it shall be shifted in final emplacement.
   –mounting the metallic girders in final emplacement, by fixing with spacers and clamping bars;
   –placing the self–supporting slabs on the lower part of the metallic girder, on the bottom, using mastic hot painted, and joints will be filled with M100 cement mortar;
   –the self–supporting scaffold is mounted for concreting, having resistance frames mounted in front of sidewalk cantilever at max. 0.75m interax, and on the side from bridge axis at max. 1.50m interax;
   –shuttering shall be realised with TEGO panels, sustained on horizontal and vertical boards (10x2,5cm);
   –sustaining of self–supporting scaffold is carried out by resistence metallic elements U18 type, 7200mm length, which are fixed with the metallic girders by verticale hanging ties M20, using a corner–cornier L80x80x10;
   –the reinforcement is mounted according to the superstructure reinforcement plan P08 and also the devices
   for metallic hardroll acc.to plan P10;
   –concreting is realised in two phases from centre to margins according to the up presented schedule. Concreting shall be done continuously without concrete joints;
   –after achieving the concrete resistence at shuttering removal (min.0,5Rcb) the shuttering are removed from superstructure;
   –in the same time with superstructure execution the guarding walls afferent to track II shall be filled out by concreting;
   –waterproofing on superstructure and the joints between it and abutments is complied;
   –realising the waterproofing covering, reinforced with welded net STNB 17G0283 mesh 100x100x6;
   –the metallic handrail is mounted acc. to plan P10, fixing it by manually electric welding with SUPERBAZ electrodes.
   –renewing embankment in bridge area.
   –covering the longitudinal joint between decks with expansion joint type TW60/130 acc. to P11;
   –mounting the rail 60 type on bridge, at projected level (existing U.S.L.+70cm), filling out ballast layer;
4. Traffic reopening on both tracks, respecting the norms in force regarding returning to normal speed.

B		
A		
	Date / Data	Modificare / Modification / Revision

BENEFICIAR / BENEFICIARY: ROMANIAN RAILWAY NATIONAL COMPANY

AUTORITATEA IMPLEMENTARII / IMPLEMENTING AUTHORITY: Ministerul Transportului / Ministry of Transports

AUTORITATEA CONTRACTANTA / CONTRACTING AUTHORITY: Ministerul Economiei si Finantelor Oficiul de Plati si Contructare Phare / Ministry of Economy and Finances Phare Payments &Contracting Office

Contract / Contract: 1999/000-000

Proiect finantat de UNUNEA EUROPEANA / Project financed by EUROPEAN UNION

POS Transport 2007- 2013

Faza / Phase: PTH+DE PTH+DD

prontec CONSIS PROIECT

Indicator Designed	Ing.Nicoleta FLORIAN	Scara / Scale : 1:500	PORTOFOLIU DE PROIECTE PHARE CES 2005 / PHARE CES 2005 PROJECTS PORTFOLIO LOT 1
Verificat / Checked	Ing.Viorel ALDESCU	Data / Date : 05.2009	Asistenta tehnica pentru pregatirea unor lucrari de reabilitare pentru tunelurl si podurl de calle ferate Technical assistance for preparing rehabilitation works required by railway tunnels and bridges
Sef echipa Team leader	Ing. Stelian Vara-Oros		Demumire desen / Drawing Title : Sucursala RCF / Railway district IASI; Linia cf 500/Railway line 500 Ploiesti-Vicsani POD BRIDGE km 290+190 TEHNOLOGIE EXECUTIE / EXECUTION TECHNOLOGY

Document / Drawing Code: PT 18 — 14