

**Capot gard protectie**  
Protection fence limit

Capot peron liniile I-II  
Platform limit tracks I-II  
Capot peron liniile III-4  
Platform limit tracks III-4

Peron nou linia I-II/h=+0,55NSS/L=250m/l=6,05m  
New Platform tracks I-II/h=+0,55NSS/L=250m/l=6,05m

Ax linie c.f. - PROIECTAT  
Railway axis

Trotuar/h=+0,00NSS/L=56m/l=2,4m  
Sidewalk/h=+0,00NSS/L=56m/l=2,4m

Ax tercere la nivel pietonal  
Pedestrian cross level axis

**NOTA - RECOMANDARI TEHNOLOGICE:**

- Toate cotele de trasare longitudinale, transversale si verticale ale copertinelor cu ca elemente de referinta: axele liniilor C.F., axa tunelului pietonal si cota +0.00=NSS proiectata a fiecarei linii:
  - axele longitudinale ale fundatiilor stalpilor copertinelor sunt la jumataste distante dintre axele de cale ferata ale liniilor I - II respectiv III - 4 proiectate;
  - transversal, trasarea axelor pentru fundatiile stalpilor copertinelor se va face avand ca reper axa tunelului pietonal. trasarea se va face in situatia, in dreptul fata de aceasta axa;
  - cota de fundare, este data fata de +0.00=NSS proiectat al fiecarei linii in parte, respectiv: pentru copertina la linia I cota de referinta este +0.00=NSS linia I, pentru copertina la linia II cota de referinta este +0.00=NSS linia II, pentru copertina la linia III-4 cota de referinta este +0.00=NSS linia III.
- Trebuie avut in vedere ca alti copertinele (cu fundatii aferente), cit si persoanele nou proiectate, umaresc profilul longitudinal al liniilor cu panta ascendenta (-1.972 ‰).
- Accest plan se va cita corelat cu planul de situatie (amplasment), planurile de suprapunere c.f. ale statiei si planurile de structura ale tunelului si ale peronelor.
- Este importanta corelarea cotelor verticale intre stalpii care se pozitioneaza pe grinzile tunelului (din axele 7 si 8) si stalpii si fundatiile adiacente ale copertinei; astfel incat sa se asigure continuitatea la nivelul superior al grinzilor transversale si panelor, cat si realizarea gabaritului pe intraga lungime a copertinei.
- Nu se vor prinde de elementele structurale ale copertinei alte echipamente sau dispozitive in afara celor prevazute in proiect (pentru orice modificare se va cere avizul proiectantului).
- Pentru pozitionare si detalii stalpi linia de contact, vezi: PLAN DE SITUATIE MONTARI LC, alentat statiei.
- Stalpii liniile de contact stapan copertina in zona invertoilor de policononat (se va face decuparea si etansarea policononatului dupa sectiunea stalpului LC).

**MATERIALE**  
Beton de egalizare : C4/5 - T2/T3 - I 32,5 R/0 - 31  
Beton simplu : C8/10 - T2/T3 - I 32,5 R/0 - 31  
Beton armat : C18/22.5 , C16/20- T3/T4 - I 32,5 R/0 - 16  
Otel beton : PC 52 , OB 37  
Laminat : S235J2G3 (OL 37.2n), S275J2G3 (OL44.2n)  
Buloane de ancorare M30-grupa 6.6

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Capot peron liniile I-II  
Platform limit tracks I-II  
Capot peron liniile III-4  
Platform limit tracks III-4

Peron nou linia III-4/h=+0,38NSS/L=250m/l=6,05m  
New Platform tracks III-4/h=+0,38NSS/L=250m/l=6,05m

Ax linie c.f. - PROIECTAT  
Railway axis

Peron nou linia I/h=+0,55NSS/L=150m/l=3,0-6,00m  
New Platform track I/h=+0,55NSS/L=150m/l=3,0-6,00m

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Buloane de ancorare M30-grupa 6.6

**CARACTERISTICI**  
• **Categoria de importanta:** Conform H.G. 766-ocl 1997 - constructie de importanta normala (C).  
• **Clasa de importanta:** Conform Normativului P100 (proiectarea antisismica), clasa de importanta este III.  
• **Clasa de risc:** Conform OMT 290/2000 - clasa de risc 1A.  
• **Selismic seismic:** Conform Normativului P100-1/2006 : perioada de control (colt) Tc=0,7s și ag=0,12g

**CONDITII GEOTEHNICE**  
Conform Foraj geotehnic FTE 94, FTE 95, FV 1, FV 2, FV 8, FV 9, FV 10, FV 11, FV 12 - statia VANATORI (date tema: ASTALROM / ITALFER)  
Forajele geotehnice su urmatoarea stratificatie:  
- la suprafata s-a intalnit un strat de umplutura (0.10 - 6.40 m), la in forajele FV 9 si FTE 95 s-a intalnit un strat de pamant vegetal (0.10 - 0.70 m); in forajul FTE 94 s-a scos la iveala:  
- unmasa un complex coeziv format din argila, argila grasă, argila profasă și prof argilos, cafenii, cafenii-galbui, negricioase, plastic consistente ... plastic vartoase, care se dezvolta pana la adancimi de 2.45 - 10.0 m (la baza forajului FV 2). Acest complex lipseste in forajele FV 8, FV 10 si FV 12  
- in continuare, pana la adancimi de 6.00 - 10.0 m (la baza forajului FV 1 si FV 11) s-a interceptat un orizont slab coeziv-necoeziv, cafeniu și cafeniu-galbui, alcatuit din argila nisipoasa, nisip argilos, nisip prolos, nisip prolos cu pietris, nisip cu rar pietris și pietris cu nisip. Acest orizont lipseste in forajul FV 2  
- pana la baza forajului (10.00 m), s-a intalnit un complex marnos alcatuit din argila grasă marnosă, argila marnosă, marna, marna argilosoasa, cenusă. Acest complex nu a fost interceptat in forajele FV 1, FV 2 si FV 11, iar in forajul FTE 94 s-a intalnit un strat de argila profasă, cafeniu-galbui, plastic consistenta.  
Adancime nivel apa subterana : intre - 3.00 și - 8.30 m  
Pantur orizontul coeziv - argile (a), argile grasă (ag), argile profasă (ap), și proful argiloso (pa), cafenii și cafenii-galbui - situat deasupra nivelului apei subterane, pamanturile interceptate se caracterizeaza astfel :  
cu plasticitate mijlocie ... foarte mare  
cu starea de consistenta plastic consistenta ... plastic vartoasa  
cu gradul de umiditate practic saturat  
cu compresibilitate mare ... foarte mare

Pentru traseul c.f. proiectat, pe intraga zona a statiei se executa lucrari de umplutura generala cu grosimi variabile (-1 + 4m).  
Se va realiza fundarea directa a COPERTINELOR pe umplutura generala (platforma de pamant a liniei c.f. - vezi lucrul de infrastructura c.f.), prin intermediul unei pene din balast compactat de 30 cm grosime(cu grad de compactare D > 98% și asigurarea unei p<sub>con</sub> = 1.5 daN/cm²).  
Este absolut necesar confirmarea caracteristicilor terenului de fundare si a gradului de compactare de catre proiectantul geotehnician, dupa executarea sapaturilor / umpluturilor (dupa caz).  
La executarea sapaturilor / umpluturilor, se va realiza un foraj suplimentar, de verificare. In amplasmentul copertinei pentru a se verifica daca informatiile provenite din forajele pentru proiectare sunt corecte. In cazul in care exista eventuale diferente, lucrarile proiectate se vor adapta conform rezultatului acestor studii geotehnice de verificare.

**OBSERVATIE**  
Pozitionarea copertinelor in amplasmentul statiei se va face conform PLAN DE SITUATIE PROPUS statia VANATORI, avand ca reper kilometrajul firului I proiectat.

**CHARACTERISTICS**  
• **Importance category :** According to H.G. 766-ocl 1997 : normal importance construction (C).  
• **Importance class :** According to Norm P100 (anti-seismic design) : importance class III.  
• **Risk class :** According to OMT 290/2000 : risk class 1A.  
• **Seismic conditions :** According to Norm P100-1/2006 : control period (corner) Tc=0,7s and ag=0,12g

**GEOTECHNICAL CONDITIONS**  
According to: Geo-technical drills FTE 94, FTE 95, FV 1, FV 2, FV 8, FV 9, FV 10, FV 11, FV 12 -VANATORI station (subject data: ASTALROM / ITALFER)  
The geo-technical drills have the following ground stratification:  
- a filling layer was found at the surface (0.10 - 6.40 m), a vegetal soil layer (0.10 - 0.70 m) was detected in the drills FV 9 and FTE 95; these are not present in the drill FTE 94  
- a cohesive complex made of brownish, brownish-yellowish, blackish heavy-bodied ... hard clay, fat clay, silty clay and clayey silt was detected up to 2.45 - 10.0 m depths (at the base of drill FV 2). This complex is not present in the drills FV 8, FV 10 and FV 12  
- then a slightly cohesive - non-cohesive horizon was found up to 6.00 - 10.0 m depths (at the base of drills FV 1 and FV 11), being made of brownish and brownish-yellowish sandy clay, clayey sand, silty sand, silty sand with gravel, sand with rare gravel and gravel with sand. This horizon is not present in the drill FV 2  
- a loamy complex made of gray fat loamy clay, loamy clay, marl, clayey marl was detected up to the base of drills (10.00 m). This complex was not found out in the drills FV 1, FV 2 and FV 11; a brownish-yellowish heavy-bodied silty clay layer was found in the drill FTE 94.  
Depth of underground water level: between - 3.00 and - 8.30 m  
For the cohesive horizon - brownish and brownish-yellowish clays (a), fat clays (ag), fat clays (ap) and clayey silts (pa) - placed above the underground water level, the soils are characterized as follows :  
heavy-bodied ... hard consistency  
saturated humidity degree  
high ... very high compressibility

For the designed railway route in the entire station area, general filling works will be carried out with variable thickness (-1 + 4m).  
The CANOPIES will be directly founded on the general filling (earth sub-grade of railway lines - see railway infrastructure works), on a 30cm thick compacted ballast cushion (compaction degree D > 98% with p<sub>con</sub> = 1.5 daN/cm²).  
It is absolutely necessary that the geo-technical designer confirms the characteristics of the foundation ground and compaction degree, after carrying out the excavations / fillings (depending on the case).  
During the excavation / filling works, one supplementary checking borehole will be made in the canopies location to see if the information from the borehole for the design stage are correct. In case there are any differences, the designed works shall be adapted based on the results of these checking geo-technical studies.

**NOTE - TECHNOLOGICAL RECOMMENDATIONS:**

- All longitudinal, transversal and vertical levels of the canopy have as a reference: the railway axis, the axis of the pedestrian tunnel and the R.U.L. designed = ± 0.00 level of the rail (for each one):
  - the longitudinal axis of the canopy poles is at the half distance between the railway axis of designed lines I - II, respectively III - 4;
  - the axis of the passengers tunnel shall be used as a guide mark when lining the canopy; the axis of the canopy poles; the lines shall be made from 6 m left and 6 m to right given the above-mentioned axis;
  - the foundation level refers to +0.00=R.U.L. designed for each one, respectively: for canopy to line I, the reference level is +0.00=R.U.L. line I, for canopy to lines II-4, the reference level is +0.00=R.U.L. line II; for canopy to lines III-4, the reference level is +0.00=R.U.L. line III.
- It is important that both the three canopy (with corresponding foundations) as well as new platforms, follow the longitudinal profile of the new designed lines, with upward slope (-1.972 ‰) from the X end towards the Y end of the station.
- This plan shall be read in correlation with: site layout plan, the drawings for railway station superstructure, and the structural drawings of the tunnel, and of the platforms.
- It is important to ensure the compliance of the vertical levels between the canopy poles resting on the tunnel beams (axis 7 and 8) and the adjacent poles (and corresponding foundations) of the canopy. So, it will be ensured the continued level of transversal beams and purlins, and of the clearance for the entire canopy.
- No other equipment or device, apart those foreseen in the project, shall be attached to the structural elements of the canopy.
- For positioning and details of contact line poles, see: LAYOUT MOUNTING PLAN LC afferent to the station.
- The contact line poles shall be placed through the canopy in the central area of the polycarbonate covering (the polycarbonate will be cut off and sealed around the LC pole section).

**MATERIALS**  
Leveling concrete : C4/5 - T2/T3 - I 32,5 R/0 - 31  
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Steel concrete : PC 52 , OB 37  
Laminated : S235J2G3 (OL 37.2n), S275J2G3 (OL44.2n)  
Anchoring bolts M30 , resistance group 6.6

**Capot gard protectie**  
Protection fence limit

Capot peron linia I  
Platform limit track I  
Capot peron linia I  
Platform limit track I

Peron nou linia I/h=+0,55NSS/L=150m/l=3,0-6,00m  
New Platform track I/h=+0,55NSS/L=150m/l=3,0-6,00m

Ax linie c.f. - PROIECTAT  
Railway axis

Peron nou linia I/h=+0,55NSS/L=150m/l=3,0-6,00m  
New Platform track I/h=+0,55NSS/L=150m/l=3,0-6,00m

Ax tercere la nivel pietonal  
Pedestrian cross level axis

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  - the axis of the passengers tunnel shall be used as a guide mark when lining the canopy; the axis of the canopy poles; the lines shall be made from 6 m left and 6 m to right given the above-mentioned axis;
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Capot peron linia I-II  
Platform limit tracks I-II  
Capot peron linia I-II  
Platform limit tracks I-II

Peron nou linia I-II/h=+0,55NSS/L=159m/l=6,05m  
New Canopy tracks I-II/L=159m

Ax linie c.f. - PROIECTAT  
Railway axis

Peron nou linia I-II/h=+0,55NSS/L=159m/l=6,05m  
New Canopy tracks I-II/L=159m

Ax tercere la nivel pietonal  
Pedestrian cross level axis

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New Platform tracks III-4/h=+0,38NSS/L=250m/l=6,05m

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- No other equipment or device, apart those foreseen in the project, shall be attached to the structural elements of the canopy.
- For positioning and details of contact line poles, see: LAYOUT MOUNTING PLAN LC afferent to the station.
- The contact line poles shall be placed through the canopy in the central area of the polycarbonate covering (the polycarbonate will be cut off and sealed around the LC pole section).

**MATERIALS**  
Leveling concrete : C4/5 - T2/T3 - I 32,5 R/0 - 31  
Plain concrete : C8/10 - T2/T3 - I 32,5 R/0 - 31  
Reinforced concrete : C18/22.5 , C16/20- T3/T4 - I 32,5 R/0 - 16  
Steel concrete : PC 52 , OB 37  
Laminated : S235J2G3 (OL 37.2n), S275J2G3 (OL44.2n)  
Anchoring bolts M30 , resistance group 6.6

**Capot gard protectie**  
Protection fence limit

Capot peron linia I-II  
Platform limit tracks I-II  
Capot peron linia I-II  
Platform limit tracks I-II

Peron nou linia I-II/h=+0,55NSS/L=159m/l=6,05m  
New Canopy tracks I-II/L=159m

Ax linie c.f. - PROIECTAT  
Railway axis

Peron nou linia I-II/h=+0,55NSS/L=159m/l=6,05m  
New Canopy tracks I-II/L=159m

Ax tercere la nivel pietonal  
Pedestrian cross level axis

**NOTE - TECHNOLOGICAL RECOMMENDATIONS:**

- All longitudinal, transversal and vertical levels of the canopy have as a reference: the railway axis, the axis of the pedestrian tunnel and the R.U.L. designed = ± 0.00 level of the rail (for each one):
  - the longitudinal axis of the canopy poles is at the half distance between the railway axis of designed lines I - II, respectively III - 4;
  - the axis of the passengers tunnel shall be used as a guide mark when lining the canopy; the axis of the canopy poles; the lines shall be made from 6 m left and 6 m to right given the above-mentioned axis;
  - the foundation level refers to +0.00=R.U.L. designed for each one, respectively: for canopy to line I, the reference level is +0.00=R.U.L. line I, for canopy to lines II-4, the reference level is +0.00=R.U.L. line II; for canopy to lines III-4, the reference level is +0.00=R.U.L. line III.
- It is important that both the three canopy (with corresponding foundations) as well as new platforms, follow the longitudinal profile of the new designed lines, with upward slope (-1.972 ‰) from the X end towards the Y end of the station.
- This plan shall be read in correlation with: site layout plan, the drawings for railway station superstructure, and the structural drawings of the tunnel, and of the platforms.
- It is important to ensure the compliance of the vertical levels between the canopy poles resting on the tunnel beams (axis 7 and 8) and the adjacent poles (and corresponding foundations) of the canopy. So, it will be ensured the continued level of transversal beams and purlins, and of the clearance for the entire canopy.
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# PLAN FUNDATII COPERTINE CANOPY FOUNDATION PLAN

scara 1:250 scale 1:250

D					
C					
B					
A					
Index	Date	Modificari	Proiectant	Approbat Consultant	Approbat CFR
Index	Date	Modificari	Proiectant	Approbat Consultant	Approbat CFR
				<b>PROIECT FINANAT DE UNIUNEA EUROPEANA / EUROPEAN UNION FINANCED PROJECT</b>	
<b>GUVERNUL ROMANIEI / ROMANIAN GOVERNMENT</b>		<b>CFR</b>		<b>C.N.C.F. "C.F.R." - S.A.</b>	
<b>CLIENT / CLIENT</b>					