

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 EUROPEANĂ  
EUROPEAN UNION FINANCED PROJECT



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

CLIENT / CLIENT



CONSULTANT / CONSULTANT

		Data Date	Semnătură Signature
Aprobat Approved	Șef proiect Project manager	R. Liuzza	
Aprobat Approved	Coordonator Secțiune 1 Section 1 Coordinator	C. Gambelli	
Verificat Checked	Tunel Expert Tunnel Expert	C. Gambelli	
Intocmit Elaborated	Proiectant Designer	P. Amodio	

SUBCONSULTANT / SUBCONSULTANT

Aprobat Approved	Responsabil Subconsultant Subconsultant Responsible		
Intocmit Elaborated	Proiectant Designer		
Reabilitarea liniei de cale ferată Brașov - Simeria, parte componentă a coridorului IV Pan European, pentru circulația trenurilor cu viteză maximă de 160 km/h. Section 1 Brasov - Sighisoara			<b>Project/Project</b> 2004/RO16/P/PA/003
Rehabilitation of the railway line Brașov - Simeria, component Part of the IV Pan-European Corridor, for the trains circulation with maximum speed of 160 km/h. Section 1 Brasov - Sighisoara			Faza / Phase: P.Th. / T.D.

Denumire desen / Drawing Title : **TUNNEL/TUNELUL ORMENIS**

GENERAL DOCUMENTS/DOCUMENTE GENERALE

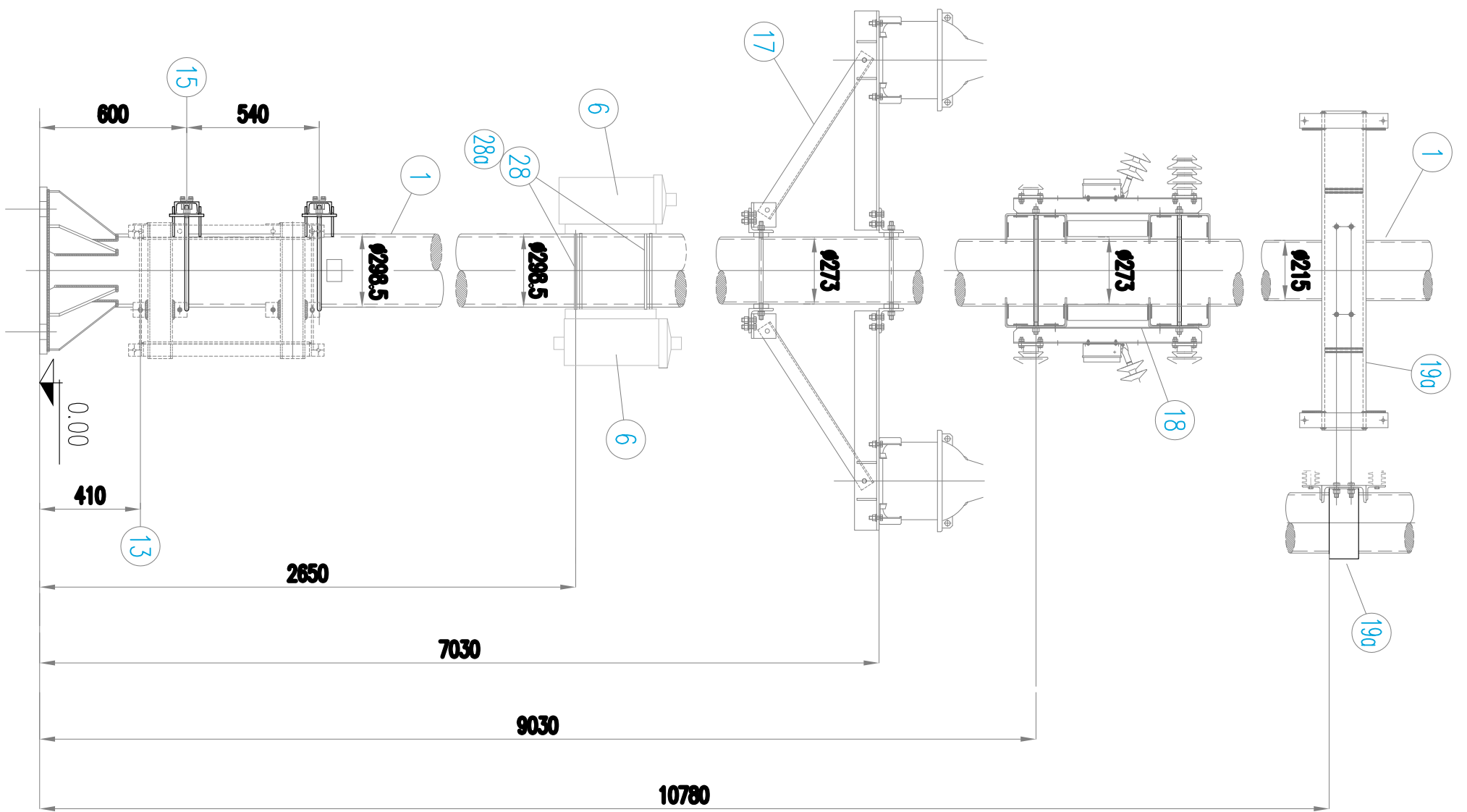
Electric traction systems/Sistem de tracțiune electrice

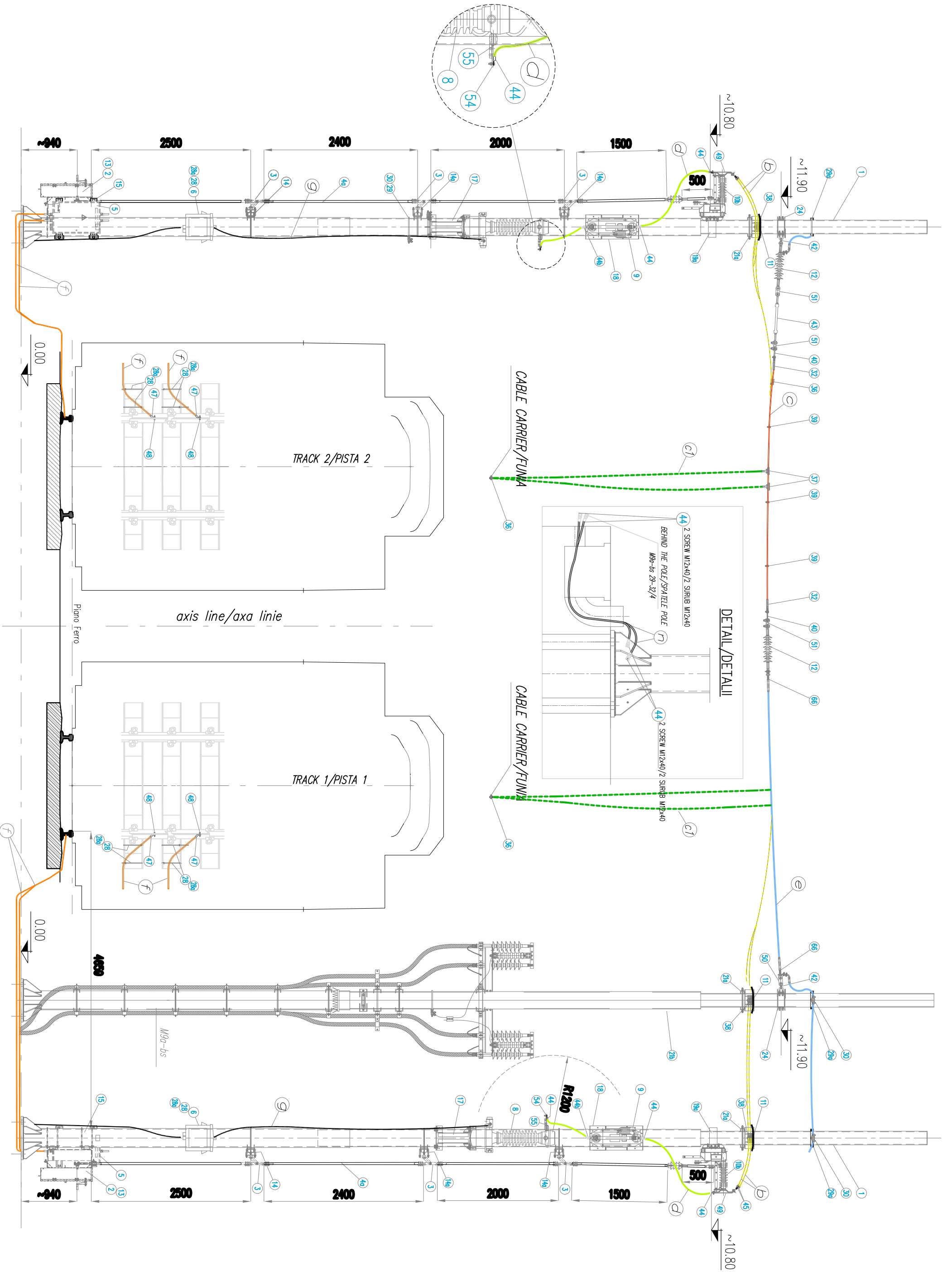
MATS - Type of installation/MATS - tipe de instalație

Codificare / Codification System	Scara / Scale	LOT	Nr. / No
<b>EA5101C10LXTS10050040</b>	-		-

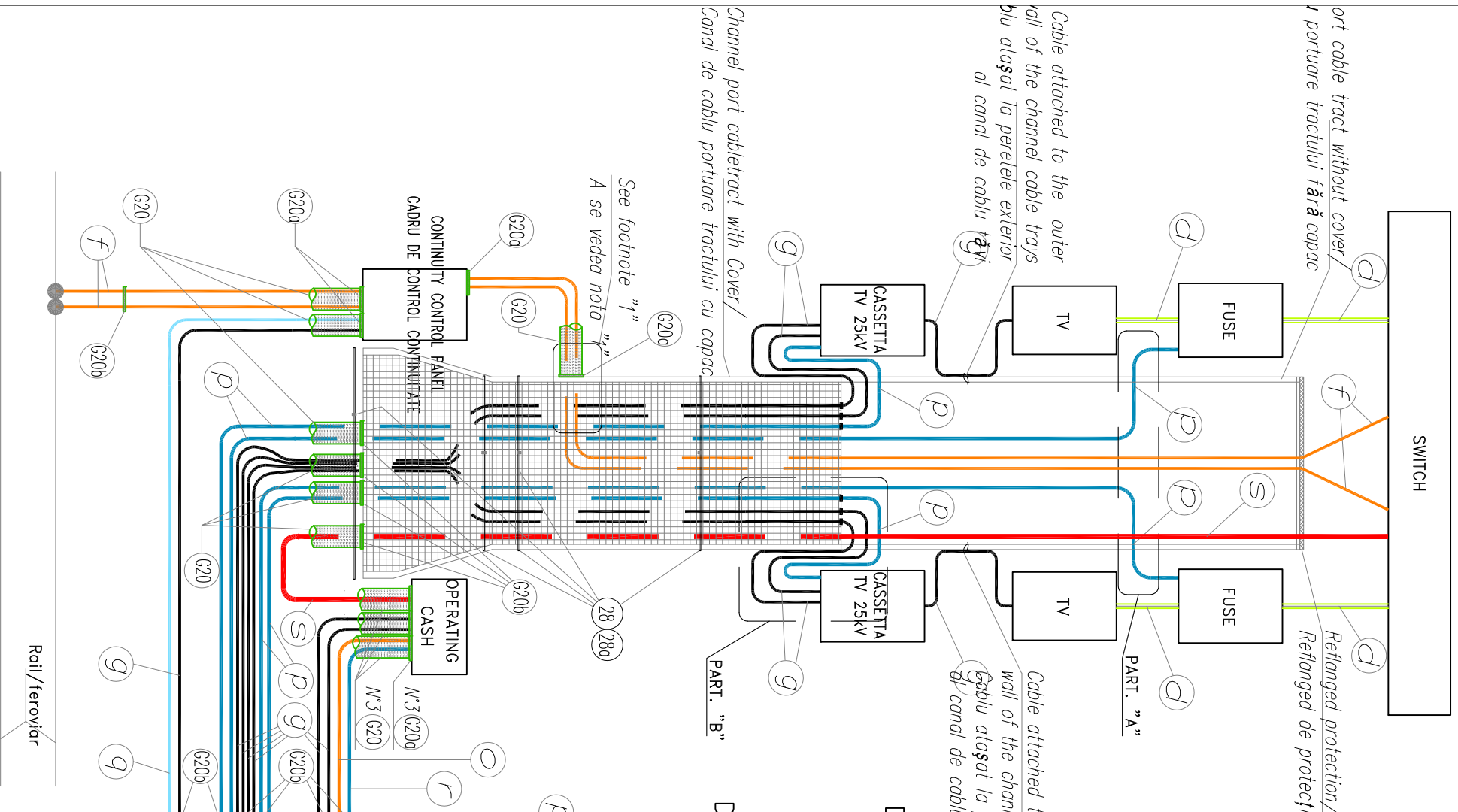
POS/ POT.	DESCRIPTION / DESCRIERE
1	Pole type M90-bs/Polui tip M90-bs
2	Fund of maneuver "UM90" for single-double pole breakers 25kV/3kV / Numerar de operare "UM90" pentru un singur-bi polar sport 25kV/3kV
3	Section breakers for vertical referrais for single-double pole breakers / Rompitratii pentru referraii verticale pentru un singur-bi polar sport
4a	Complexes for vertical referrais for single-double pole breakers type "2"/ Complexe pentru referraii verticale pentru un singur-bi polar sport tip "2"
5	Quality control panel / cadrul de control al calitatii
6	box 25 kV / cutie 25kV
8	Voltage transformer 25 kv (ARTECHE) complete with clamp terminal / Transformator de tensiune 25 kv (ARTECHE) complet cu terminale clemo
9	Base fuse holder and fuse / Siguranta titular de baza si sigurante
10b	Bipolar disconnecter of ground for areas 25 kV / Bipolar deconectarea pentru zone de teren 25 kV
11	Insulators for suspension feeders / Izolatoare pentru ferme de suspendare
12	Isolator and isolation of mooring ropes / Izolator si izolarea de cabluri de acostare
13	Support structure for box of maneuver "UM90" for single-double pole breakers on pole M90-bs/M9c-bs Type "AR3" / Structura de sprijn pentru numeor din exploatare "UM90" pentru un singur-bi polar sport la pol M90-bs/M9c-bs Tip "AR3"
14	Support structure for section breakers for vertical referrais for box of maneuver "UM90" for single-double pole breakers on pole M90-bs/M9c-bs 0298 Type "AR3" / Structura de sprijn pentru rompitratia pentru numeor din exploatare "UM90" pentru un singur-bi polar sport la pol M90-bs/M9c-bs 0298 Tip "AR3"
14a	Support structure for section breakers for vertical referrais for box of maneuver "UM90" for single-double pole breakers on pole M90-bs/M9c-bs 0274 Type "AR4" / Structura de sprijn pentru rompitratia pentru numeor din exploatare "UM90" pentru un singur-bi polar sport la pol M90-bs/M9c-bs 0274 Tip "AR4"
15	Support structure for quality control panel on pole M90-bs/M9c-bs 0298 Type "C3" / Structura de sprijn pentru cadru de control al calitatii la pol M90-bs/M9c-bs 0298 Tip "C3"
17	Support structure for two voltage transformers on pole M90-bs/M9c-bs 0273/298.5 Type "T3" / Structura de sprijn pentru doua transformatoare de tensiune la pol M90-bs/M9c-bs 0273/298.5 Tip "T3"
18	Support structure for two fuses on pole M 0273 Type "F1" / Structura de sprijn pentru doua sigurante la pol M 0273 Tip "F1"
19a	Support structure for bipolar disconnecter of ground 25 kV on pole M90-bs/M9c-bs 0215 Type "S4" / Structura de sprijn pentru Bipolar deconectarea pentru zone de teren 25 kV la pol M90-bs/M9c-bs 0215 Tip "S4"
21a	Structure for suspension feeders on pole M90-bs/M9c-bs 0215 Type "3" / Structura pentru ferme de suspendare la pol M90-bs/M9c-bs 0215 Tip "3"
21b	Structure for suspension feeders on pole M90-bs/M9c-bs 0273 Type "5" / Structura pentru ferme de suspendare la pol M90-bs/M9c-bs 0273 Tip "5"
24	Cross for mooring binato power on pole M90 0215 / Crucea de amarrare Binato putere la pol M90 0215
28	Stainless steel tape 9.5 UE (Type T1) ASI 201 (lg=24x~1,3m) / Banda din otel inoxidabil 9.5 UE (Tip T1) ASI 201 (lg=24x~1,3m)
28a	Staples for tape 9.5 (Type G) ASI 304 / Capse pentru banda 9.5 UE (Tip T1) ASI 201 (lg=24x~1,3m)
29	Attack of the rope of soil to the pole tube 0273 / Atac de corda de teren la polul tubului 0273
29a	Attack of the rope of soil to the pole tube 0215 / Atac de corda de teren la polul tubului 0215
30	Clamp suspension the rope of soil / Clamp suspendarea corda de teren
32	Anchoring grip of compression rope of 155 mm <sup>2</sup> (reduced shoot) / Maner de ancorare de comprese corda 155mm <sup>2</sup> (redusa troge)
34	Two-wire rope clamp for aluminum alloy 015,75 mm / Doua fire clemo pentru corda din alioji de aluminiu 015,75 mm
35	Bimetallic connection terminal with 3 screws between the copper rope 155 mmq and rope 307.7 mmq / terminalul de conectare bimetalic cu 3 suruburi între corda de cupru 155 MMQ si frânghie MMQ 307.7
36	Anchoring grip between the rope 155 mmq and rope 120 mmq / Prindere ancorare între corda MMQ 155 si 120 frânghie MMQ
37	Branch terminal rope rope 155 mmq (016,2) and rope 120 mmq (016,1) / Compartiment clasificatorului terminale de frânghie 155 MMQ (016, 2) si frânghie 120 MMQ (016, 1)
38	Suspension clamp for 3 ropes 85mmq complete with post (used with two ropes 014) / Suspensie clemo pentru 3 cabluri 85mmq complet cu post (folositi cu doua frânghii 014)
39	Terminal spacer to 2 155 mmq ropes / Spacer Terminal la 2 155 mmq frânghii
40	Power rocker for mooring / Rocker putere pentru acostare
42	Carrier for mooring M20-24/65-S / Carrier pentru acostare M20-24/65-S
43	Tensioner M20 / Tensioner M20
44	A cable lug hole (85/95 mmq type 19-A2 M12 or C195V12 (Also applies to rope 011,5 mmq) / lug corda o gaura (tip 85/95 mm 19-A2 M12 sau C195V12 (De asemenea, se aplica la corda 011,5 mmq)

44b	Compression Lug Shank long to string Cu 95mmq, 012, 6 C195V10 V208-L (used onfuse down) / Lug Comprese Shank mult timp pentru a corda cu 95mmq 012, 6 C195V10 V208-L (sigurante folositi pe partea de jos)
45	Cu lugs for copper rope diameter: 14 mm T146/lug corda Cu pentru corda cupru diametru: 14 mm T146
47	Lug 45 ° for railway use M12 screw and cable sheathing to the east. 0 21.4 int. 0 14.5 (use of rail and disconnectors) / Lug 45 ° pentru utilizare feroviare cu surub M12 si cablu invelisul pentru est. 0 21.4 int. 0 14.5 (utilizarea transportului feroviar si separatora)
48	Electrical connections to the rails /Conexiunile electrice la sinele
49	Connection in Cu Type "1"/Conexiune in Cu Tip "1"
50	simple plate/simplo placa
51	Double plate Type "1" L=90 /Dublu placa Tip "1" L=90
52	Channel cable bracket to the pole tube 0 Type 273 "S15-273"/placuta de Canal de cablu la poli de tubul 0 Tip 273 "S15-273"
52a	Channel cable bracket to the pole tube 0 298.5 Type "S15-298"/placuta de Canal de cablu la poli de tubul 0 298.5 Tip "S15-298"
54	Cu bar type "2"/Cu bara de tip "2"
55	Bimetallic plate – type "3"/Placa bimetalice – de tip "3"
58	Mounting hardware between cable channels and shelf type "AC15-1"/bulcane de montare între canale prin cablu si raft de tip "CA15-1"
59	Joining System Type of cable channels "G1" /sistem de jonctiune de canale prin cablu "G1"
60a	Channel Cable Type "SF-C15" (with lid and side hole on the channel)/Canal de cablu de tip "SF-C15" (cu gaura copoc si lateral pe canalul)
61	Channel type cable "C15-1" (lg = 2500)/Canal de cablu de tip "C15-1" (lg = 2500)
61b	Channel type cable "C15-1" (lg = 1500)/Canal de cablu de tip "C15-1" (lg = 1500)
62	Reduction type "C15-R"/Reducer Tip "C15-R"
63	Reflanged protection "RP15-1"/Reflanged de protectie "RP15-1"
66	Grip with threaded fork for anchoring conductors aluminum alloy 0 15.75 mm/Efortul cu filet furculita pentru conductori alioji de aluminiu sârma 0 15,75 mm
G12a	Clamps for fixing cables Thomas & Betts type T1242MX /cleme pentru fixarea cablurilor Thomas & Betts tip T1242MX
G20	Flexible metal sheath ("Conduit" 050,5 int. 058,5est.)/Flexibile din metal teaca ("Conduit" 050,5 int. 058,5est.)
	Brass fitting (for flexible metallic protective sheath "Conduit" 0 50.5 int. 0 58.5 east.)/
	Montaji alama (pentru metalic flexibili de protectie teaca "Conduit" 0 50.5 int 0 58.5 est..)
G20a	Brass nut (for metal protective sheath flexible "Conduit" 0 50.5 int. 0 58.5 east.)/
	Pulfita din alama (pentru montaua de protectie din metal flexibili "Conduit" 0 50.5 int 0 58.5 est..)
	Gasket material "Guarnita" (for connection type CMMF50M63)/Garnitura materiale "Guarnita" (tip de conexiune pentru CMMF50M63)
G20b	Bushing terminal metal (metal protective sheath for flexible "Conduit" 0 50.5 int. 0 58.5 east.)/
	Terminale de metal Bucsa(monta de protectie din metal pentru flexibile "Conduit" 0 50.5 int 0 58.5 est..)





# CABLE DIAGRAM/SCHEMA CABLU



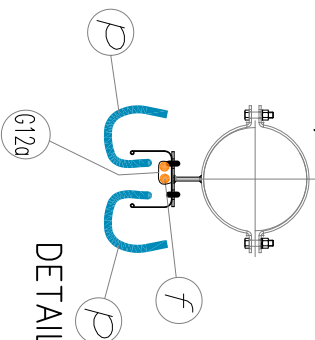
## LEGENDA:

- b** Copper rope/coarda cupru sect: 120mm Ø14mm
- c** Copper rope/coarda cupru sect: 155mm Ø16,1mm
- cl** Copper rope/coarda cupru sect: 155mm Ø16,2mm
- d** Copper rope/coarda cupru sect: 95 mm
- e** Rope made of aluminium alloy/Coarda din aliaj de aluminiu sect: 147,10mm Ø15,75mm
- f** Cable/cablu FG7M sect: 120mm (0,6/1 kV)
- g** Cable/cablu 2x4 mm FG10(O)H1M1M1 (0,6/1kV)
- n** Rope/coarda Ø11,5 mm in galvanized steel/otel galvanizat. (19x2,3) S = 78,94 mm
- o** Cable/cablu 2x10 mm FG10(O)H1M1M1 (0,6/1kV)
- p** Cable/cablu 5x1,5 mm FG10(O)H1M1M1 (0,6/1kV)
- q** Cable/cablu 12x1,5 mm FG10(O)H1M1M1 (0,6/1kV)
- r** Cable/cablu 19x1,5 mm FG10(O)H1M1M1 (0,6/1kV)
- s** Cable/cablu 24x1,5 mm FG100H1M1 (0,6/1kV)

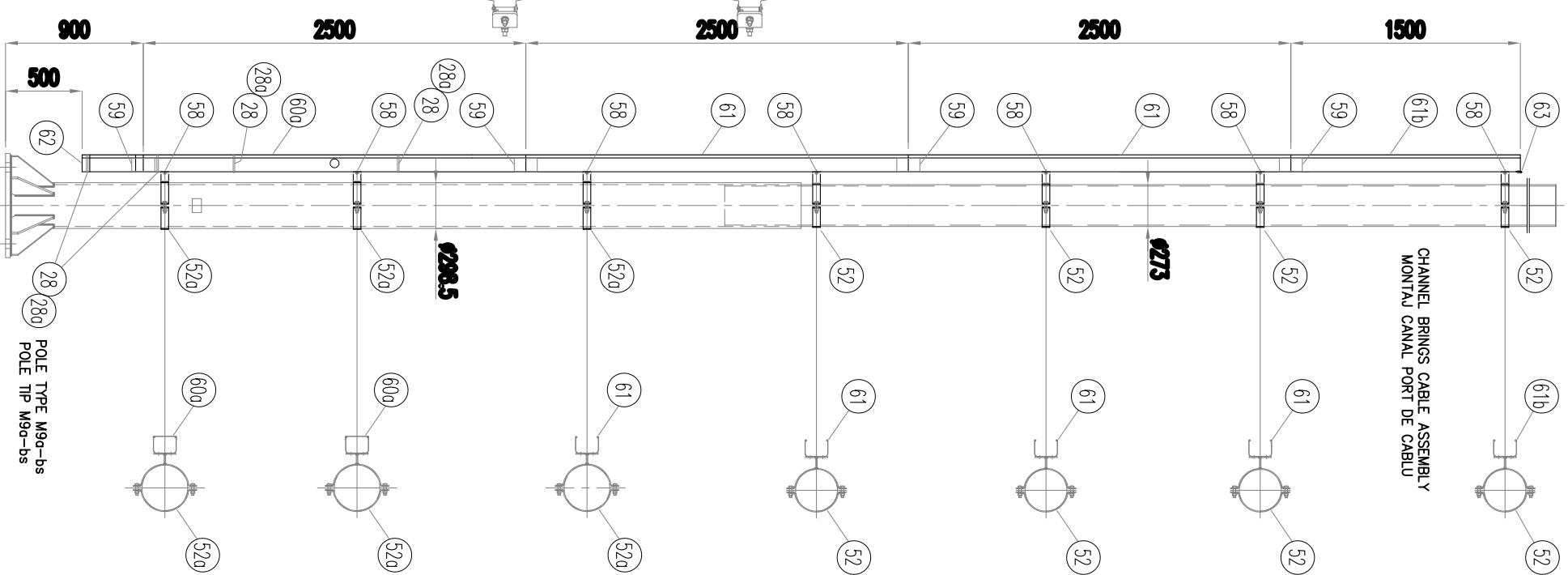
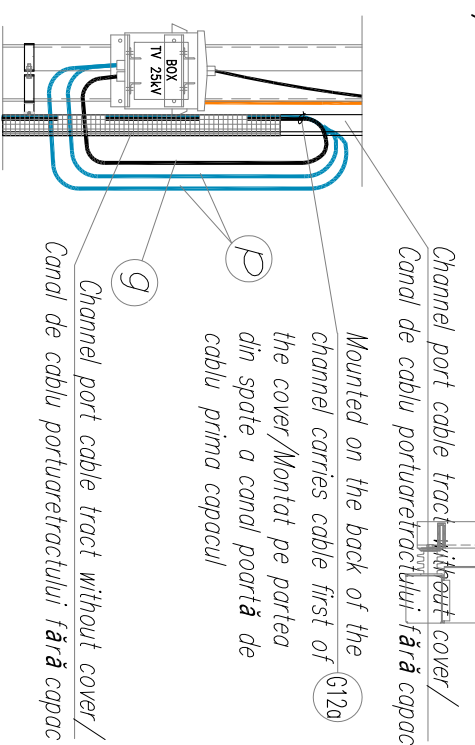
## DETAIL OF ASSEMBLY/DETALII DE MONTAJ

The Channel leads cables is mounted on the opposite side of the isolator/Canal cablurile este montate pe latura opusă a izolatorului!

### DETAIL/DETALII "A"



### DETAIL/DETALII "B"



--	--	--	--	--	--	--	--	--	--

