REMEDIEREA DEFECTELOR DE TIP DSA – DEFECTE IN STRATUL DE ACOPERIRE AL ARMATUR
RETRIEVAL OF DEFECTS TYPE DSA – DEFECTS IN THE REONFORCEMENT CONCRETE COVER

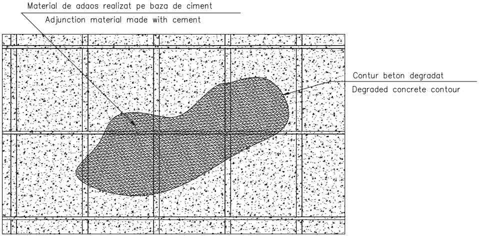

FIG.1 MARCAREA SUPRAFETEI DEGRADATE
MARKING OF THE DEGRADED SURFACE

Tehnologia lucrarilor de reparatie a suprafetelor de beton cu defecte de tip DS, conf. C149–87

1. Se identifica si se marcheaza suprafetele de beton degradat;
2. Se inlatura zonele de beton degradate cu ciocanul de zidar;
3. Se buciardeaza suprafetele adiacente celei degradate pe 10cm stanga dreapta;
4. Se curata cu jet de aer sub presiune;
5. Se aplica stratul deaderenta astfel incat toti poriidin masa betonului existent sa fie inchisi;
6. Se aplica mortarul prin tencuire in straturi de max. 10cm si se preseaza cu mistria;
7. Se protejeaza suprafata contra evaporarii rapide a apei;
8. Se aplica stratul de impermeabilizare si uniformizare a aspectului betonului (aplicarea stratului de impermeabilizare se va face dupa uscarea intregii zone reparate)

CARACTERISTICI TEHNICE ALE MATERIALELOR UTILIZATE:

A. Amorsa:

– Rezistenta la tractiune	>1,5N/mm^2;
– Durata lucrabilitate la 20°C	> 45min;
– Numar staturi necesare	1;
– Temperatuara de aplicare	+5°÷40°C;
– Cantitatea de apa	18%;
– Rezistent la inghet–dezghet;	
– Aplicabil la suport umed;	

B. Material de adaos pe baza de ciment

– Granulatie	0,1÷2,0mm;
– Grosimea stratului aplicat	6÷40mm;
– Rezistenta la tractiune	>1,5N/mm^2;
– Rezistenta la compresiune	>60N/mm^2 la 28zile;
– Rezistenta la tractiune din incovoiere	>6,0N/mm^2;
– Durata lucrabilitate la 20°C	> 45min;
– Temperatuara de aplicare	+5°÷40°C;
– Cantitatea de apa	11%;
– Expansiunea	<0,5%

C. Strat de impermeabilizare:

– Vascozitate la 10°C	cca. 1000–1500MPas;
– Vascozitate la 20°C	cca. 500–700MPas;
– Durata lucrabilitate la 20°C	> 45min;
– Temperatura min. de aplicare pe stratul suport	+10°C

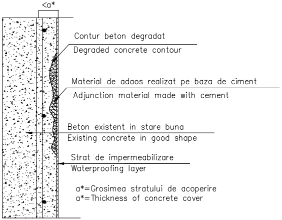

FIG.2 SECTIUNE PRIN SUPRAFATA REPARATA
SECTION THRU THE REPARED SURFACE

Technology of repair works to the concrete areas with type DS, damages, acc. to C149–87:

1. Identifying and marking the damaged concrete areas;
2. Removing the damaged concrete areas by using the brick hammer
3. Granulating the areas adjacent to the damaged one on 10cm left–right side.
4. Cleaning with compressed air stream.
5. Placing on the adherence layer such as to clase all the voids of the existent mass;
6. Placing on the mortar by plasterind in max. 10mm layers and pressing it with trowel.
7. Protecting the area against sudden evaporation of water;
8. Placing on the waterproofing and levelling layer of the concrete surface (the waterproofing layer shall be placed on when the entire repaired area is dried).

TECHNICAL SPECIFICATION OF THE USED MATERIALS:

A. Primer:

– Stretching resistance	>1,5N/mm^2;
– Time before hardening at 20°C	> 45min;
– Number of necessary layer	1;
– Applying temperature	+5°÷40°C;
– Quantity of water	18%;
– Frost cleftness resistance	
– Applicable on wet surfaces	

B. Adjunction material made with cement:

– Granulosity	0,1÷2,0mm;
– Thickness of the layer	6÷40mm;
– Stretching resistance	>1,5N/mm;
– Compression resistence	>60N/mm^2 la 28zile;
– Stretching resistance from bending	>6,0N/mm^2;
– Time before hardening at 20°C	> 45min;
– Applying temperature	+5°÷40°C;
– Quantity of water	11%;
– Expansion	<0,5%

C. Waterproofing layer:

– Viscosity at 10°C	cca. 1000–1500MPas;
– Viscosity at 20°C	cca. 500–700MPas;
– Time before hardening at 20°C	> 45min;
– Minimal temperature for applying support layer	+10°C

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B. Amorsa:
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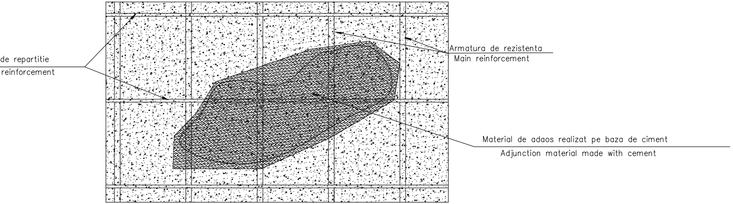

FIG.3 VEDERE LATERALA A SUPRAFETELOR CU ARMATURI NECORODATE
LATERAL VIEW OF SURFACES WITH UNACTED UPON REINFORCEMENT

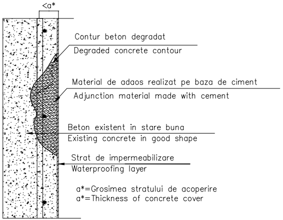

FIG.4 SECTIUNE PRIN SUPRAFATE CU ARMATURI CORESPUNZAT
SECTION THRU THE SURFACES WITH ADEQUATE REINFORCE

Tehnologia lucrarilor de reparatie a suprafetelor de beton cu defecte de tip DASR, conf. C149-87(fig.5 si fig.6), cazul armaturilor cu sectiune corespunzatoare:

1. Se identifica si se marcheaza suprafetele de beton degradat;
2. Se repereaza si se marcheaza pozitia armaturilor (pentru evitarea deteriorarii acesteia pe durata realizarii lucrarilor de inlaturare a betonului degradat).
3. Se inlatura betonul degradat prin spituire si se creeaza un contur regulat al zonei degradate.
4. Se inlatura praful rezultat cu jet de aer sub presiune;
5. Se curata armaturile pana la luciul metalic.
6. Se curata intreaga suorafata degradata cu jet de aer sub presiune.
7. Se aplica stratul de protectie anticoroziv pe armaturi.
8. Se uda suprafata de beton pana la saturatie;
9. Se aplica stratul amorsa care va asigura legatura cu betonul existent.
10. Se aplica mortarul prin tencuire.
11. Se netezeste suprafata reparata.
12. Se protejeaza suprafata contra evaporarii rapide a apei;
13. Se aplica statul de impermeabilizare si uniformizare a aspectului betonului (acest strat se va aplica la final pe intreaga suprafata de beton vizibila, dupa realizarea lucrarilor de reparatii).

Technology of repair works to the concrete areas with type DASR, damages, acc. to C149-87(fig.5 and fig.6), case with adequante section of reinforcement:

1. Identifying and marking the damaged concrete areas;
2. Finding and marking the reinforcements position (in order to avoid deterioration during the execution of the concrete removal works).
3. Removing the damaged concrete by chiseling abd creating a regular perimeter of the damaged area.
4. Clearing the entire surface with compressed air stream;
5. Rubbing off thr rust from reinforcements to the iron glance.
6.
7. Laying on the anti corrosion protection layer on reinforcements.
8. Wetting the area to saturation.
9. Placing on the adherence layer such as to close all the voids of the existent mass.
10. Placing on the mortar by plastering.
11. Smoothing the repaired area.
12.Protecting the area against sudden evaporation of water;
13. Placing on the waterproofing and levelling layer of the concrete surface (this layer shall be placed on finally on the entire visible concrete area after executing the repairs works)

TEHNICE ALE MATERIALELOR UTILIZATE:

protectie anticoroziv

nta la tractiune	>1,5N/mm;
lucrabilitate la 20°C	> 45min;
staturi necesare	2;
atuara de aplicare	+5°÷40°C;
tea de apa	16%;

nta la tractiune	>1,5N/mm²;
lucrabilitate la 20°C	> 45min;
staturi necesare	1;
atuara de aplicare	+5°÷40°C;
tea de apa	18%;
nt la inghet-dezghet;	
l la suport umed;	

C. Material de adaos pe baza de ciment

– Dimensiunea agregatelor	0,1÷2,0mm;
– Grosimea stratului aplicat	6÷40mm;
– Rezistenta la tractiune	>1,5N/mm²;
– Rezistenta la compresiune	>60N/mm² la 28zile;
– Rezistenta la tractiune din incovoiere	>6,0N/mm²;
– Durata lucrabilitate la 20°C	> 45min;
– Temperatuara de aplicare	+5°÷40°C;
– Cantitatea de apa	11%;
– Expansiunea	<0,5%

D. Strat de impermeabilizare:

– Vascozitate la 10°C	cca. 1000-1500MPas;
– Vascozitate la 20°C	cca. 500-700MPas;
– Durata lucrabilitate la 20°C	> 45min;
– Temperatura min. de aplicare pe stratul suport	+10°C

TECHNICAL SPECIFICATION OF THE USED MATERIALS:

A. Anticorrosive material protection

– Stretching resistance	>1,5N/mm;
– Time before hardening at 20°C	> 45min;
– Number of necessary layer	2;
– Applying temperature	+5°÷40°C;
– Quantity of water	16%;

B. Primer:

– Stretching resistance	>1,5N/mm²;
– Time before hardening at 20°C	> 45min;
– Number of necessary layer	1;
– Applying temperature	+5°÷40°C;
– Quantity of water	18%;
– Frost cleftness resistance	
– Applicable on wet surfaces	

C. Adjunction material made with cement:

– Granulosity	0,1÷2,0mm;
– Thickness of the layer	6÷40mm;
– Stretching resistance	>1,5N/mm;
– Compression resistence	>60N/mm² la 28zile;
– Stretching resistance from bending	>6,0N/mm²;
– Time before hardening at 20°C	> 45min;
– Applying temperature	+5°÷40°C;
– Quantity of water	11%;
– Expansion	<0,5%

D. Waterproofing layer:

– Viscosity at 10°C	cca. 1000-1500MPas;
– Viscosity at 20°C	cca. 500-700MPas;
– Time before hardening at 20°C	> 45min;
– Minimal temperature for applying support layer	+10°C

REMEDIEREA DEFECTELOR DE TIP DASR - DEFECTE DE ADANCIME SI SUPRAFATA REDUSA
RETRIEVAL OF DEFECTS TYPE DASR - DEFECTS WITH REDUSED SURFACE AND DEPTH

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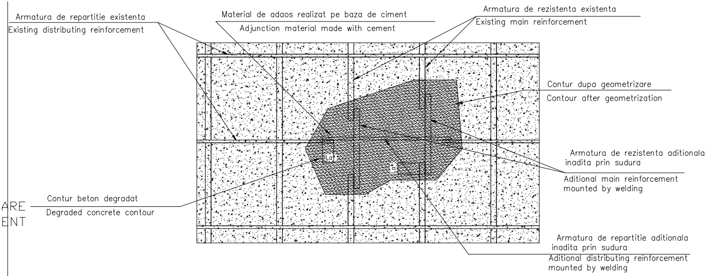

FIG.5 VEDERE LATERALA A SUPRAFETELOR CU ARMATURI ADITIONALE INADITE PRIN SUDURA
LATERAL VIEW OF SURFACES WITH THE ADITIONAL REINFORCEMENT MOUNTED BY WELDING

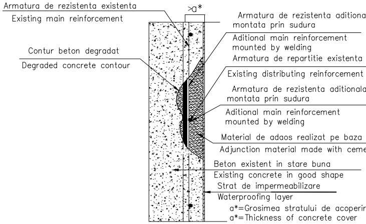

FIG.6 SECTIUNE PRIN SUPRAFETE CU MONTAREA ARM
SECTION THRU THE SURFACES WITH THE ADITIONAL R

Tehnologia lucrarilor de reparatie a suprafetelor de beton cu defecte de tip DASR, conf. C149-87(fig.5 si fig.6), cazul armaturilor cu sectiune necorespunzatoare si montarii unor armaturi aditionale prin sudura:

1. Se identifica si se marcheaza suprafetele de beton degradate;
2. Se repereaza si se marcheaza pozitia armaturilor (pentru evitarea deteriorarii acesteia pe durata realizarii lucrarilor de inlaturare a betonului degradat).
3. Se inlatura betonul degradat prin spituire si se creeaza un contur regulat al zonei degradate.
4. Se inlatura praful rezultat cu jet de aer sub presiune;
5. Se curata armaturile de stratul corodat pana la luciul metalic.
6. Se taie armaturile cu sectiune necorespunzatoare.
7. Se monteaza armaturile aditionale inadite prin sudura. Functie de tipul si diametrul barelor se va stabili lungimea cordoanelor de sudura conf. C28-85.
8. Se curata intreaga suorafata degradata cu jet de aer sub presiune.
9. Se aplica stratul de protectie anticoroziv pe armaturi.
10. Se uda suprafata de beton pana la saturatie;
11. Se aplica stratul amorsa care va asigura legatura cu betonul existent.
12. Se aplica mortarul prin tencuire.
13. Se netezeste suprafata reparata.
14. Se protejeaza suprafata contra evaporarii rapide a apei;
15. Se aplica statul de impermeabilizare si uniformizare a aspectului betonului (acest strat se va aplica la final pe intreaga suprafata de beton vizibila, dupa realizarea lucrarilor de reparatii).

Technology of repair works to the concrete areas with type DASR, damages, ac
C149-87(fig.5 and fig.6), case with improper section of reinforcement and mou
reinforcement by welding :

1. Identifying and marking the damaged concrete areas;
2. Finding and marking the reinforcements position (in order to avoid deteriorat
execution of the concrete removal works).
3. Removing the damaged concrete by chiseling abd creating a regular perimete
damaged area.
4. Clearing the entire surface with compressed air stream;
5. Rubbing off thr rust from reinforcements to the iron glance.
6. Cutting the reinforcements with improper section.
7. Mounting the additional reinforcement by welding. depending by the length ar
bars will be set the lenght of the welding seam in according with C25-85.
8. Cleaning the entire surface with compressed air stream.
9. Laying on the anti corrosion protection layer on reinforcements.
10. Wetting the area to saturation.
11. Placing on the adherence layer such as to close all the voids of the existe
12. Placing on the mortar by plastering.
13. Smoothing the repaired area.
14.Protecting the area against sudden evaporation of water;
15. Placing on the waterproofing and levelling layer of the concrete surface (thi
placed on finally on the entire visible concrete area after executing the repairs

CARACTERISTICI TEHNICE ALE MATERIALELOR UTILIZATE:

A. Material de protectie anticoroziv

- Rezistenta la tractiune	>1,5N/mm;
- Durata lucrabilitate la 20°C	> 45min;
- Numar staturi necesare	2;
- Temperatuara de aplicare	+5°÷40°C;
- Cantitatea de apa	16%;

B. Amorsa:

- Rezistenta la tractiune	>1,5N/mm^2;
- Durata lucrabilitate la 20°C	> 45min;
- Numar staturi necesare	1;
- Temperatuara de aplicare	+5°÷40°C;
- Cantitatea de apa	18%;
- Rezistent la inghet-dezghet;	
- Aplicabil la suport umed;	

C. Material de adaos pe baza de ciment

- Dimensiunea agregatelor	0,1÷2,0mm;
- Grosimea stratului aplicat	6÷40mm;
- Rezistenta la tractiune	>1,5N/mm^2;
- Rezistenta la compresiune	>60N/mm^2 la 28zile;
- Rezistenta la tractiune din incovoiere	>6,0N/mm^2;
- Durata lucrabilitate la 20°C	> 45min;
- Temperatuara de aplicare	+5°÷40°C;
- Cantitatea de apa	11%;
- Expansiunea	<0,5%

D. Strat de impermeabilizare:

- Vascozitate la 10°C	cca. 1000-1500MPas;
- Vascozitate la 20°C	cca. 500-700MPas;
- Durata lucrabilitate la 20°C	> 45min;
- Temperatura min. de aplicare pe stratul suport	+10°C

TECHNICAL SPECIFICATION OF THE USED MATERIALS:

A. Anticorrosive material protection

- Stretching resistance	>1,5N/mm;
- Time before hardening at 20°C	> 45min;
- Number of necessary layer	2;
- Applying temperature	+5°÷40°C;
- Quantity of water	16%;

B. Primer:

- Stretching resistance	>1,5N/mm^2;
- Time before hardening at 20°C	> 45min;
- Number of necessary layer	1;
- Applying temperature	+5°÷40°C;
- Quantity of water	18%;
- Frost cleftness resistance	
- Applicable on wet surfaces	

C. Adjunction material made
- Granulosity
- Thickness of the laye
- Stretching resistance
- Compression resistenc
- Stretching resistance
- Time before hardenin
- Applying temperature
- Quantity of water
- Expansion

D. Waterproofing layer:
- Viscosity at 10°C
- Viscosity at 20°C
- Time before hardenin
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FIG.8 SECTIUNE
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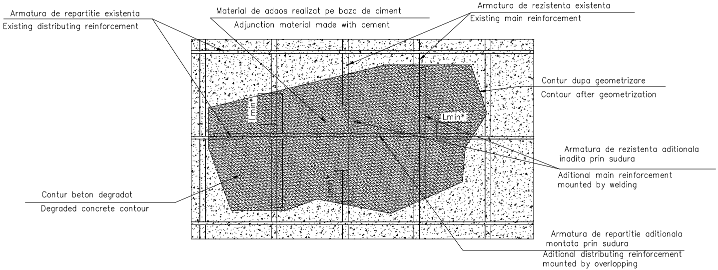

MATURII ADITIONALE PRIN SUDURA
EINFORCEMENT MOUNTED BY WELDING

FIG.7 VEDERE LATERALA A SUPRAFETELOR CU ARMATURI ADITIONALE INADITE PRIN SUPRAPU
LATERAL VIEW OF SURFACES WITH THE ADITIONAL REINFORCEMENT MOUNTED BY OVERLA

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r 6÷40mm;
>1,5N/mm;
ce >60N/mm^2 la 28zile;
from bending >6,0N/mm^2;
g at 20°C > 45min;
+5°÷40°C;
11%;
<0,5%

cca. 1000–1500MPas;
cca. 500–700MPas;
g at 20°C > 45min;
for applying +10°C

Tehnologia lucrarilor de reparatie a suprafetelor de beton cu defecte de tip DASR, conf. C149–87(fig.7 si fig.8), cazul armaturilor cu sectiune necorespunzatoare si montarii unor armaturi aditionale prin suprapunere:

1. Se identifica si se marcheaza suprafetele de beton degradate;
2. Se repereaza si se marcheaza pozitia armaturilor (pentru evitarea deteriorarii acesteia pe durata realizarii lucrarilor de inlaturare a betonului degradat).
3. Se inlatura betonul degradat prin spituire si se creeaza un contur regulat al zonei degradate.
4. Se inlatura praful rezultat cu jet de aer sub presiune;
5. Se curata armaturile de stratul corodat pana la luciul metalic.
6. Se taie armaturile cu sectiune necorespunzatoare.
7. Se inadesc armaturile aditionale prin suprapunere.
8. Se aplica stratul de protectie anticoroziv pe armaturi.
9. Se uda suprafata de beton pana la saturatie;
10. Se aplica stratul amorsa care va asigura legatura cu betonul existent.
11. Se aplica mortarul prin tencuire.
12. Se netezeste suprafata reparata.
13. Se protejeaza suprafata contra evaporarii rapide a apei;
14. Se aplica statul de impermeabilizare si uniformizare a aspectului betonului (acest strat se va aplica la final pe intreaga suprafata de beton vizibila, dupa realizarea lucrarilor de reparatii).

CARACTERISTICI TEHNICE ALE MATERIALELOR UTILIZATE:

A. Material de protectie anticoroziv
- Rezistenta la tractiune >1,5N/mm;
- Durata lucrabilitate la 20°C > 45min;
- Numar staturi necesare 2;
- Temperatuara de aplicare +5°÷40°C;
- Cantitatea de apa 16%;

B. Amorsa:
- Rezistenta la tractiune >1,5N/mm^2;
- Durata lucrabilitate la 20°C > 45min;
- Numar staturi necesare 1;
- Temperatuara de aplicare +5°÷40°C;
- Cantitatea de apa 18%;
- Rezistent la inghet–dezghet;
- Aplicabil la suport umed;

C. Material de adaos pe baza de ciment
- Dimensiunea agregatelor 0,1÷2,0mm;
- Grosimea stratului aplicat 6÷40mm;
- Rezistenta la tractiune >1,5N/mm^2;
- Rezistenta la compresiune >60N/mm^2 la 28zile;
- Rezistenta la tractiune din incovoiere >6,0N/mm^2;
- Durata lucrabilitate la 20°C > 45min;
- Temperatuara de aplicare +5°÷40°C;
- Cantitatea de apa 11%;
- Expansiunea <0,5%

C. Strat de impermeabilizare:
- Vascozitate la 10°C cca. 1000–1500MPas;
- Vascozitate la 20°C cca. 500–700MPas;
- Durata lucrabilitate la 20°C > 45min;
- Temperatura min. de aplicare +10°C
pe stratul suport

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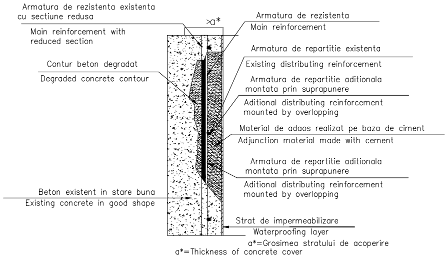
PRIN SUPRAFETE CU INADIREA ARMATURII ADITIONALE PRIN SUPRAPUNERE
E SURFACES WITH THE ADITIONAL REINFORCEMENT MOUNTED OVERLAPING



UNERE
APING

Technology of repair works to the concrete areas with type DASR, damages, acc. to C149-87(fig.5 and fig.6), case with improper section of reinforcement and mouting the additional reinforcement by overlapping:

1. Identifying and marking the damaged concrete areas;
2. Finding and marking the reinforcements position (in order to avoid deterioration during the execution of the concrete removal works).
3. Removing the damaged concrete by chiseling abd creating a regular perimeter of the damaged area.
4. Clearing the entire surface with compressed air stream;
5. Rubbing off thr rust from reinforcements to the iron glance.
6. Cutting the reinforcements with improper section.
7. Mounting the additional reinforcement by welding. depending by the length and diameter of bars will be set the lenght of the welding seam in according with C25-85.
8. Laying on the anti corrosion protection layer on reinforcements.
9. Wetting the area to saturation.
10. Placing on the adherence layer such as to close all the voids of the existent mass.
11. Placing on the mortar by plastering.
12. Smoothing the repaired area.
13. Protecting the area against sudden evaporation of water;
14. Placing on the waterproofing and levelling layer of the concrete surface (this layer shall be placed on finally on the entire visible concrete area after executing the repairs works)

CHNICAL SPECIFICATION OF THE USED MATERIALS:

Anticorrosive material protection

– Stretching resistance	>1,5N/mm;
– Time before hardening at 20°C	> 45min;
– Number of necessary layer	2;
– Applying temperature	+5°÷40°C;
– Quantity of water	16%;

Primer:

– Stretching resistance	>1,5N/mm^2;
– Time before hardening at 20°C	> 45min;
– Number of necessary layer	1;
– Applying temperature	+5°÷40°C;
– Quantity of water	18%;
– Frost cleftness resistance	
– Applicable on wet surfaces	

C. Adjunction material made with cement:

– Granulosity	0,1÷2,0mm;
– Thickness of the layer	6÷40mm;
– Stretching resistance	>1,5N/mm;
– Compression resistence	>60N/mm^2 la 28zile;
– Stretching resistance from bending	>6,0N/mm^2;
– Time before hardening at 20°C	> 45min;
– Applying temperature	+5°÷40°C;
– Quantity of water	11%;
– Expansion	<0,5%

D. Waterproofing layer:

– Viscosity at 10°C	cca. 1000–1500MPas;
– Viscosity at 20°C	cca. 500–700MPas;
– Time before hardening at 20°C	> 45min;
– Minimal temperature for applying support layer	+10°C

NOTA
In cazul in care pentru suprafetele ce contin armaturi cu sectiuni necorespunzatoare reduse prin coroziune si nu este posibil montarea armaturilor aditionale prin suprapunere, (lungimea barei existente pe zona suprafetei degradate este mai mica decat dublul lungimii minime de ancoraj), atunci ele se vor inadi prin sudura la ambele capete conf. C28-85.

NOTE
If is not possible to mount the additional reinforcement by overlapping for surfaces which are containing improper section of reinforcement reduced by corrosion (lenghth of the existing bar is smaller then double of minimum length of the bar to be allow anchoring) then the mounting will be mode by welding on both ends acc. to C28-85.

NOTA
1. La executie se vor respecta cu strictete prevederile din "Normativ pentru producerea betonului si executarea lucrarilor din beton, beton armat si beton precomprimat. Partea 1: Producerea betonului",indicativ NE 012/1-2007 si "Normativ pentru producerea betonului si executarea lucrarilor din beton, beton armat si beton precomprimat. Partea 2: Executarea lucrarilor din beton",indicativ NE 012/2-2010, din "Instructiunile tehnice privind procedeele de remediere a defectelor pentru elementele de beton si beton armat" indicativ C149-87, din "Normativul pentru verificarea calitatii si receptia lucrarilor de constructii aferente" indicativ C56-85, si a Caietului de Sarcini.
2. Daca in timpul lucrarilor se vor constata anumite neconcordante intre datele avute in vedere la proiectare si situatia de pe teren, va fi convocat proiectantul pentru adaptarea proiectului la noua situatie.

NOTE
1. There will be strictly respected the prevision from "Practice code for the concrete production and works execution, reinforced and pre-stressed concrete. Part 1: Practice code for concrete production" – NE012/1-2007 and "Practice code for the concrete production and works execution, reinforced and pre-stressed concrete. Part 2: The execution of concrete works" – NE012/2-2010 "Technicall instructions regarding remedial procedures of plain concrete and reinforced concrete" ind. C149-87, from "Normative for quality checking and works reception for afferent construction" ind. C56-85 and Technical Specifications of this project.
2. If unconformities between the designed data and the site situation are found out during works execution, the designer will be convened to adjust the design according to the new situation.

1. Conform H.G.766/1997 lucrarea se incadreaza in categoria "B" a constructiilor de importanta deosebita.
2. Proiectul va fi verificat de verificatori atestati MLPAT la exigentele A.4, B.2 si D.2.

1. Complying with H.G. 766/1997 this structure belongs to category "B" of impirtance.
2. The project will be verified at A.4, B.2 and D.2 requirements.

D					
C					
B					
A	12.2011	Revizia 1 1 Revision	Ioan Rentea		
Indice Index	Data Date	Modificare Modification/Revision	Proiectant Designer	Aprobat Consultant Approved Consultant	Aprobat CFR Approved CFR

GUVERNUL ROMANIEI
ROMANIAN GOVERNMENT

PROIECT FINANŢAT DE UNIUNEA EUROPEANĂ
EUROPEAN UNION FINANCED PROJECT

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	Semnătură Signature
Aprobat Approved	Şef proiect Project manager	R. Liuzza		
Aprobat Approved	Coordonator Secţiune 1 Section 1 Coordinator	C. Gambelli		
Verificat Checked	Expert Cheie Key Expert	V.Kallidromitis		

SUBCONTRACTANT / SUBCONTRACTOR

AREX Lider COMPANY

Aprobat Approved	Responsabil Subconsultant Subconsultant Responsible	A. Dinulescu Stanciu	10.2011	
Întocmit Elaborated	Proiectant Designer	Ioan Rentea	10.2011	

Reabilitarea liniei de cale ferata Braşov - Simeria, parte componentă a coridorului IV Pan European, pentru circulaţia trenurilor cu viteza maximă 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 : Interval Statia Sighisoara

Pod km. 281+066.156 - Remedierea defectelor de suprafata si adancime redusa la betoane
Bridge km. 281+066.156 - Correct the defects of depth and small size in concrete

Codificare / Codification System	Scara / Scale 1:100	LOT / LOT	Nr. / No

E A 5 1 | 0 1 | E | 0 1 | B B | P V | 0 4 | 6 | X | 0 0 5 | 1

2050/297