



Tehnička oprema za puteve

*Technical
Road
Equipment*

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Čelične zaštitne ograde za putne saobraćajnice (branicí)

Savremene putne saobraćajnice za motorna vozila omogućuju postizanje većih brzina, mirnu i udobnu vožnju, a istovremeno pružaju visok stepen bezbjednosti za vozila koja se kreću tim saobraćajnicama.

Jedan od elemenata bezbjednosti u Putnom saobraćaju je adekvatno i po projektu postavljena čelična zaštitna ograda. Čeličnu zaštitnu ogradu trebalo bi postaviti na svim opasnim mjestima na saobraćajnici, tako da ona svojim oblikom i spoljnim izgledom bude element optičkog vođenja, pogotovo ako se u čeličnu zaštitnu ogradu ugrade

svjetlosna reflektujuća tijela.

Svrha čelične zaštitne ograde je da zadrži skrenuto vozilo i spriječi nekontrolisanu putanju vozila, a radi svoje elastičnosti, da bitno umanjí posljedice nezgode.



STEEL GUARD-RAILS FOR ROADS

Modern highways facilitate smooth and comfortable driving at higher speeds, while at the same time providing a high level of safety for drivers.

Properly installed steel guard-rails are an important safety element in road traffic. Such guard-rails should be installed at all dangerous spots along a road. With their shape and outer appearance they become an optical guiding element, especially if steel guard-rails are fitted with reflecting lights.

The purpose of steel guard-rails is to stop the deflected vehicle and prevent uncontrolled path of the vehicle. In addition, it greatly reduces the force of impact owing to its flexibility.

Tehnički opis

Elementi čeličnih zaštitnih ograda za Putne saobraćajnice, a obuhvaćeni ovim katalogom, rezultat su prakse i nastojanja da se dođe do jedinstvenog tipa čelične zaštitne ograde.

Postavljanje čelične zaštitne ograde je jednostavno i brzo. Konstrukcija i sistem spajanja sastavnih elemenata omogućuju da troškovi održavanja (zamjena i

popravak) budu niski, a istovremeno sve operacije jednostavne i brzo izvodljive.

U Republici Hrvatskoj prihvaćen je (odabran) jedinstven tip elemenata čeline zaštitne ograde za putne saobraćajnice po njemačkom standardu RAL-RG 620 tip B, koji je jednako vrijedan kao i tip A, ali je znatno lakši, a samim tim znatno je jeftiniji.

Sistem RAL-RG 620 se koristi ili kopira sa manjin modifikacijama u više zapadno-evropskih zemalja. Osnovna prednost

ovog sistema da je njegov studijski razvoj izvršen uz praktična ispitivanja (probe), time se postiglo da je mekan kod slabih kliznih naleta, naginjući se, a nepropusljiv kod naleta kamiona i vozila sa velikim točkovima.

Radi nepredviđenog načina opterećenja na čeličnu zaštitnu ogradu za putne saobraćajnice, profil zaštitne ograde ima osobinu da pretrpi plastične deformacije bez loma ili djeluje u okviru granica elastičnosti.



Technical Description

Elements of steel guard-rails for roads, which are incorporated in this brochure, are the result of practical knowledge and efforts to design a unique type of steel guard-rails.

Steel guard-rails are installed easily and quickly. The design and system of linking component parts allows the costs of maintenance (exchange and repair) to be kept low, while all operations are simple and easy to perform.

In Croatia a single type of elements of steel guard-rails has been adopted in accordance with the German Standard RAL-RG 620 Type B, which is equally

valuable as Type A, except for being far lighter and therefore also more cost effective.

The RAL-RG 620 system is used or copied with slight modifications in a number of West European countries. The chief advantage of this system lies in the fact that it has been developed through practical testing. As a result, the guard-rail is flexible in weak, sliding collisions, and impenetrable in collisions with trucks or other vehicles with large wheels.

Because of unpredictable loading of steel guard-rails which are installed along roads, the guard-rail sections are capable to sustain plastic deformations without breaking or to act within elasticity limits.

Proizvodnja

Dijelovi čelične zaštitne ograde proizvode se prema:

- prijedlogu standarda HRN U.S4.108,
- "Tehnička oprema javnih putova" ZAŠTITNE OGRADE, ČELIČNE - tip "B". Oblik i mjere; 1978.,te
- "Opštim tehničkim uslovima za radove na putevima", - RSIZ za puteve Hrvatske - knjiga II 1989.

Manufacture

Segments of steel guard-rails are manufactured in compliance with:

- the proposed standard HRN U.S4.108,
- Technical Equipment for Public Roads " STEEL GUARD-RAILS – Type "B". Shape and Dimensions; 1978, and
- General Technical Conditions for Road Work, - RSIZ for Roads in Croatia - Vol. II, 1989.

Materijal

Osnovni materijali za izradu zaštitne ograde su: čelični limovi, trake i profili iz konstrukcijskih čelika HRN C.BO.500/1989, kvalitete Č.0362 i Č.0363, ili DIN EN 10025 kvalitete S235 JR i S235JRG2.

Zavrtnjevi klase čvrstoće 4.6 ili 5.8, HRN M.B1.023, navrtke klase čvrstoće 5 ili 8, HRN M.B1.028 ili DIN 267.

Material

Guard-rails are manufactured from the following basic materials: steel sheets, bands and structural steel sections HNR C.BO.500/1989, quality Č.0362 and Č.0363, or DIN EN 10025 quality S235 JR and S235JRG2.

Bolts 4.6 or 5.8, HRN M.B1.023, nuts 5 or 8, HRN M.B1.028 or DIN 267.



Zaštita od korozije

Anti-corrosive Treatment

Osnovni nazivi

Zaštitna ograda - tehnički je osmišljena konstrukcija čija je svrha da spriječi isključivo vozila s određenog pravca ili skretanje s planuma saobraćajnice, odnosno da prihvati i zadrži vozila skrenuta sa vozne trake.

Branik - profilisana traka od čeličnog toplovaljanog lima odgovarajućih mehaničkih osobina određene dužine, koji prilikom udara vozila svojom deformacijom smanjuje posljedice udara.

Izvodi se kao ravni, kosi i savijeni prema krivini saobraćajnice (konkavan i konveksan).

Odstojnik - čvrsti element određenog profila i mjera, čija je svrha ostvarenje čvrste veze između branika i stuba ili drugog oslonca.

Stub - nosač odstojnika i/ili branika, izrađen od mehanički otpornog materijala, određenog profila i dužine koji osigurava nošenje branika u određenoj poziciji i djeluje zajedno s odstojnikom (kad ga ima)

Definitions

Guard-rail is a technically designed structure whose main purpose consists in preventing the vehicle from sliding off the designated track or deflecting from the surface of the road, i.e. to receive and stop the vehicles deflected from the lane.

Rail - a profiled band made of hot rolled steel sheet of appropriate mechanical characteristics and specific length, which through deformation reduces the consequences of car impact. It is manufactured in three different shapes: flat, inclined or curved according to the road curvature (concave or convex).

Spacer - a solid element of specific shape and size whose purpose is to

Vrši se u skladu sa "Opštim tehničkim uslovima za radove na putevima", postupkom toplog pocinčavanja prema normama ASTM A-123, HRN C. A6. 030 ili prema BS 729.

Debljina sloja (prevlake) cinka 80-160 µm, zavisno o pojedinim dijelovima ograde.

Corrosion Protection is provided in accordance with "General Technical Conditions for Road Work" through hot dip galvanized according to the following standards: ASTM A-123, HRN C. A6. 030 or BS 729.

Thickness of zinc coat ranges between 80-160 µm, depending on individual rail part.



Završni elementi - posebno oblikovani branici i dijelovi koji se nalaze na početku, odnosno završetku zaštitne ograde, sa ciljem da umanje posljedice nalijetanja vozila na ogradu.

Traka - plosnata čelična traka određenog profila i mjera koja sa spoljne strane povezuje stubiće preko odstojnika, te na taj način ostvaruje zatezni pojasnik (lanac).

Demontažni pojasnik - dio zaštitne ograde u razdjelnoj traci koji se, u slučaju potrebe - preusmjerenja saobraćaja - može lako i brzo demontirati.

establish a solid link between the rail and the post or some other support.

Post - supports the spacer and/or rail; it is made of mechanically resistant material of specific profile and length for supporting the rail in a specific position. It acts in conjunction with the spacer (if provided).

Endings - rails and elements of special shape which are placed at the beginning and end of the guard-rail in order to reduce the force of impact of vehicles colliding with the guard-rail.

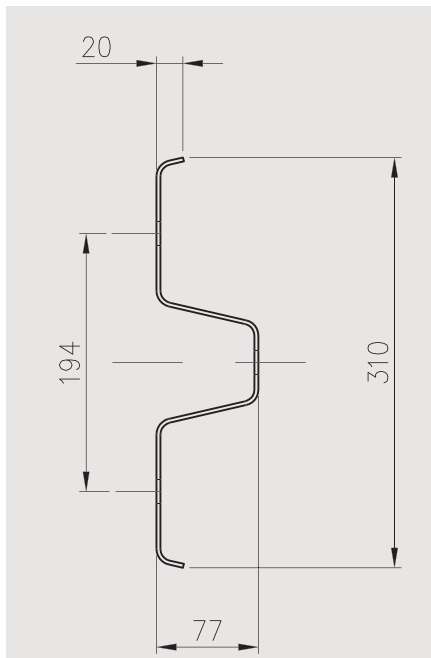
Band - a flat steel band of specific profile and size which connects the posts via spacers on the outer side thus creating a tension belt (chain).

Demountable Belt - part of the guard-rail in the middle strip which can be eas-



ily and quickly demounted in case of diversion of traffic.

Branik profil "B" Profile "B" Rail



Klasifikacija ograda

Čelične zaštitne ograde svrstane su u četiri osnovna tipa:

- jednostrana distantna ograda (JDO)
- dvostrana distantna ograda (DDO)
- jednostrana ograda (JO)
- dvostrana ograda (DO)

Classification of Guard-rails

Steel guard-rails can be divided into the following four basic types:

- One-sided spaced barrier (JDO)
- Double-sided spaced barrier (DDO)
- One-sided barrier (JO)
- Double-sided barrier (DO)

Osnovne tehničke karakteristike

- visina ugradnje 0,75 m
- razmak stubova 1,333; 2 i 4 m
- širina ograde 0,20; 0,35; 0,50 i 0,80 m
- nagib branika 6°

Main Technical Features

- Height of installation 0.75 m
- Distance between posts 1.333 m; 2 m and 4 m
- Rail width 0.20 m; 0.35 m; 0.50 m, and 0.80 m
- Slope of rail 6°



Osnovne tehničke karakteristike, tip i vrsta ograde, mjere ugradnje - postavljanja i druge specifičnosti za određenu putnu saobraćajnicu, u pravilu su određena IZVEDBENIM PROJEKTOM, za svaku pojedinu dionicu (stacionažu) i objekte.

Main technical features, type and kind of guard-rail, installation sizes and other specifications for a particular road are defined within the CONSTRUCTION PROJECT separately for each section or facility.

Jednostrana ograda (JO)

direktno na stubove koji se nalaze na međusobnom razmaku od 4 m.

Jednostrana ograda (JO) predviđena je za zadržavanje vozila s jedne strane.

Postavlja se uz rub vozne trake otvorene dionice puta, a u pravilu samo kad na bankini nema dovoljno mjesta za postavljanje jednostrane distantne ograde (JDO).

(JO) sastoji se od branika i podupirača pričvršćenih

One-sided Barrier (JO)

One-sided barrier (JO) consists of the rail and

supporters which are fastened directly to posts placed at a 4-meter distance.

One-sided barrier (JO) is intended for stopping the vehicles on one side.

Dvostrana ograda (DO)

međusobno s podupiračima pričvršćeni na U-spojnicom-kapom na stubove, koji se nalaze na međusobnom razmaku od 2 m.

Dvostrana ograda (DO) predviđena je za zadržavanje vozila s obje strane.

Dvostrana ograda (DO) postavlja se u razdjelnom pojasu, između dvije vozne trake suprotnih smjerova, čija je širina 1,8 m i manja.

Dvostrana ograda (DO) sastoji se od dva branika koji su

Double-sided barrier (DO) consists of two rails

which are fastened to U-connectors by means of supports, with caps connecting them to posts placed at distance of 2 m from each other.

Double-sided Barrier (DO)

Jednostrana distantna ograda (JDO)

Jednostrana distantna ograda postavlja se:

- svagdje gdje je potrebna povećana zaštita,

- na rubovima kolovoza otvorene dionice puta i
- u svim slučajevima gdje bi skretanje vozila sa vozne trake izazvalo opasnost na drugoj saobraćajnoj površini (putevi, željezničke pruge, pješačke ili biciklističke staze, vodene površine, nadvožnjaci, petlje i dr.)

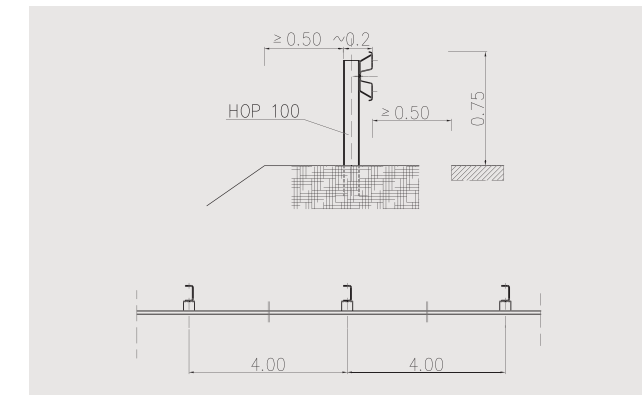
Ova ograda postavlja se u međupojasu, ako je nagib između suprotnih voznih traka veći od 12%.

Jednostrana distantna ograda (JDO), postavlja se na nadvožnjacima ili mostovima na već pripremljene ubetonirane ankerne ploče u objektu T - zavrtnjima, odnosno u rupe bušene u betonu čeličnim ankerima (tiplovima).

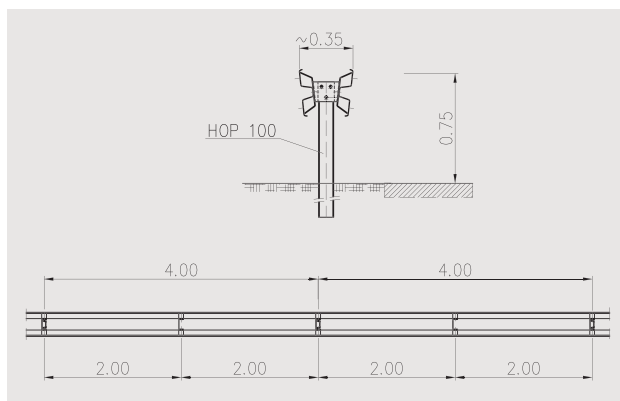
One-sided Spaced Barrier (JDO)

One-sided spaced barrier (JDO) is installed:

- in places which require increased protection;
- along the edge of the roadway on open road stretches, and
- in all cases where deflection of vehicles from the roadway could result in a dangerous situation on some other traffic sur-

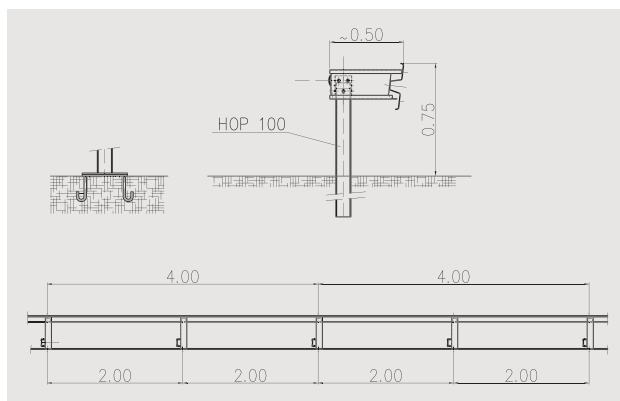


It is installed along the edge of the roadway on open road stretches, and only in those cases when there is not sufficient room on the edge for installing one-sided spaced barriers (JDO).



Double-sided barrier (DO) is intended for stopping vehicles on both sides.

It is installed in the middle strip, usually 1.8 m wide or less, between two opposite direction roadways.



face (road, railway track, footpath or cycle path, waterway, overpass, interchange, etc.).

This type of guard-rail is installed in the middle strip, if the slope between opposite direction roadways is greater than 12%.

One-sided spaced barrier (JDO) is installed on overpasses or bridges on pre-fabricated anchor plates cemented in the bridge by means of T-bolts, or in holes drilled in concrete by means of steel screw anchors.

Dvostrana distantna ograda (DDO)

Dvostrana distantna ograda (DDO) sastoji se od dva branika međusobno povezana odstojnikom na razmaku od 2 m, i spojnicom (kapom) pričvršćena na stubove u sredini, na međusobnom razmaku od 4 m.

Dvostrana distantna ograda predviđena je za zadržavanje vozila i sprečavanje gaženja (prelaza) ograde pri naletu najtežih vozila, s obje strane, smatra se najsigurnijom zaštitnom ogradom.

Double-sided Spaced Barrier (DDO)

Double-sided spaced barrier (DDO) consists of two rails which are interconnected by means of spacers placed at a distance of 2 m, and fastened to posts in the middle by means of couplings (caps) at a distance of 4 m.

Double-sided spaced barrier is intended for stopping vehicles and preventing the barrier from being crushed (crossed) in collision with heaviest vehicles, on both

Dvostrana distantna ograda (DDO) postavlja se u razdjelnoj traci, u zelenom međupojasu, ili međupojas na objektima čija je širina veća od 1,8 m.

Ako je širina razdjelne trake međupojasa 1,8 do 2,8 m, postavlja se dvostrana distantna ograda na stubove s razmakom od 2 m.

Dvostrana distantna ograda na objektu (DDO) postavlja se na stubove sa stubom koji se pričvršćuju na već ubetonirane ankerne ploče u objektu T-

sides, and is regarded as the safest type of guard-rail.

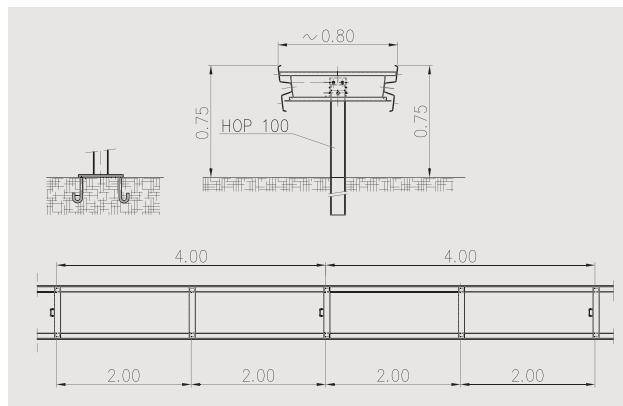
Double-sided spaced barrier (DDO) is installed in the middle strip, in the grassy belt, or middle strip of bridges that are wider than 1.8 m.

If the width of the middle strip is 1.8-2.8 m, the double-sided spaced barrier is installed on posts at a distance of 2 m.

Double-sided spaced barrier (DDO) on bridges or overpasses is installed on posts which are fastened to anchor

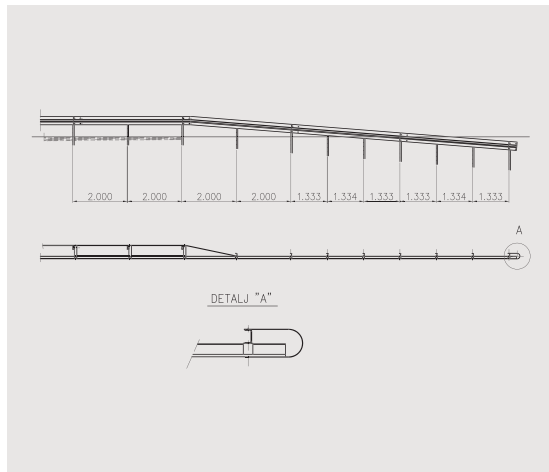
zavrtnjima, odnosno u rupe bušene u betonu, čeličnim ankerima (tiplima).

Ako je u okviru zaštitne ograde opasna prepreka tada se, obilazeći prepreku, ova ograda razdvaja u jednostranu distantnu ogradu (JDO) sa razmakom stubova od 1,333 m i 2 m.



plates concreted in the bridge by means of T-bolts, or are fastened to holes drilled in concrete by means of steel screw anchors.

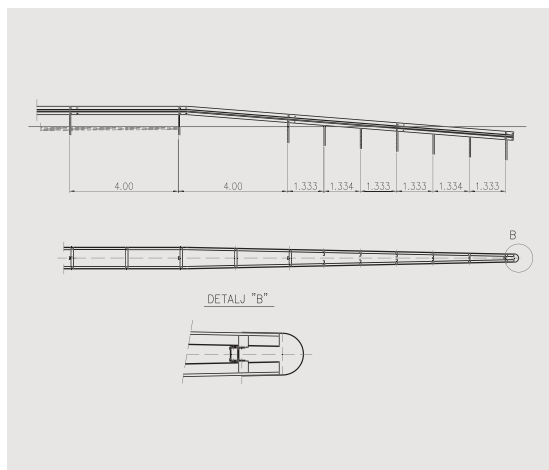
If within the guard-rail there is a dangerous obstacle, the guard-rail circumvents the obstacle by being divided into a one-sided spaced barrier (JDO) with posts placed at a distance of 1.333 m and 2 m.



Završeci ograde

Završni elementi na otvorenim dionicama puteva, na početku i na kraju, izvode se kosim spuštanjem branika dužine 12 m, poniranjem, ukopavanjem i ankerisanjem u tlo, sa polukruglim završnim elementom na visini 5 cm od nivoa tla.

Tamo gdje se ne može izvesti kosi završetak, ograda se završava polukruglim završnim elementima.



Guard-rail Endings

Endings which are installed at the beginning and end of guard-rails on open road sections consist of a 12-meter-long inclined rail section, which is sunk, dug in or anchored in the ground, with a semi-circular ending placed 5 cm above the ground.

In cases where it is not possible to execute inclined endings, the guard-rail ends in semi-circular endings.

Demontažni prelazi

Na mjestima prekida razdjelne trake (međupojasa), za slučaj potrebe preusmjerenja saobraćaja, postavlja se demontažni prelaz s dilatacionim branikom, i to u pravilu svaka 3 km.

Branici se na odstoynik i stubove učvršćuju pomoću svornjaka i zateznih klinova, koji se u slučaju potrebe mogu brzo i jednos-

Demountable Belt

At a point of interruption of the middle strip, demountable belts with dilatation rails are installed, usually at a distance of 3 km, in case there is a need to divert traffic.

Rails are fastened to spacers and posts by means of bolts and wedges which, if required, can be quickly and easily disassem-

bled by driving the wedges out.

Posts with spacers are mounted in holes made of steel tubes which are cemented in the roadway.

Inclined demountable ending (DO&DDO) is 4 m long. The lowered end of the rail has a special shape and is fastened to the post with a plate installed in the concrete foundation.

Demountable belt is made with two dilatation connections.

Demountable belt is made with two dilatation connections.

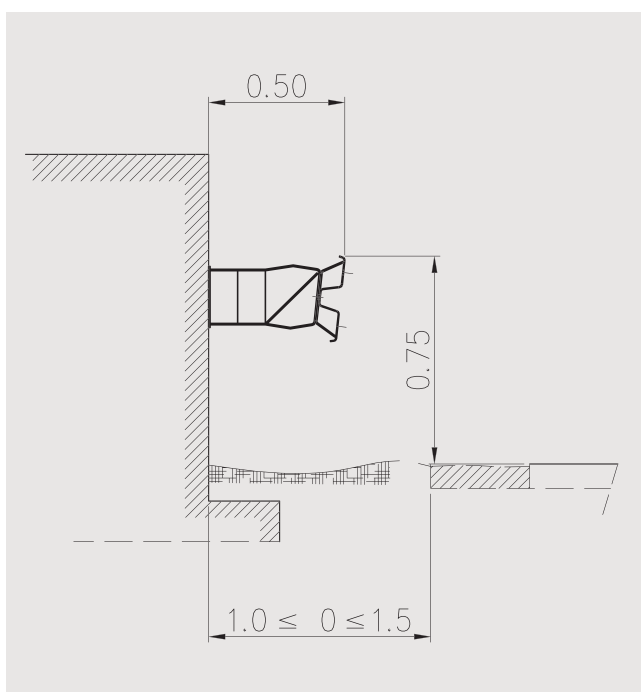
Demountable belt is made with two dilatation connections.

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Dilatacija

Na svim objektima na mjestu dilatacije, čelična zaštitna ograda izvodi se s dilatacionim spojem kojeg je "DI" određen projektom, ("DI" = dužina dilatacije).

Dilatation

At points of dilatation the steel guard-rail on all roads, overpasses and bridges features a dilatation connection, with "DI" (length of dilatation) defined by project.

Ugradnja - pričvršćenje ograde na zid

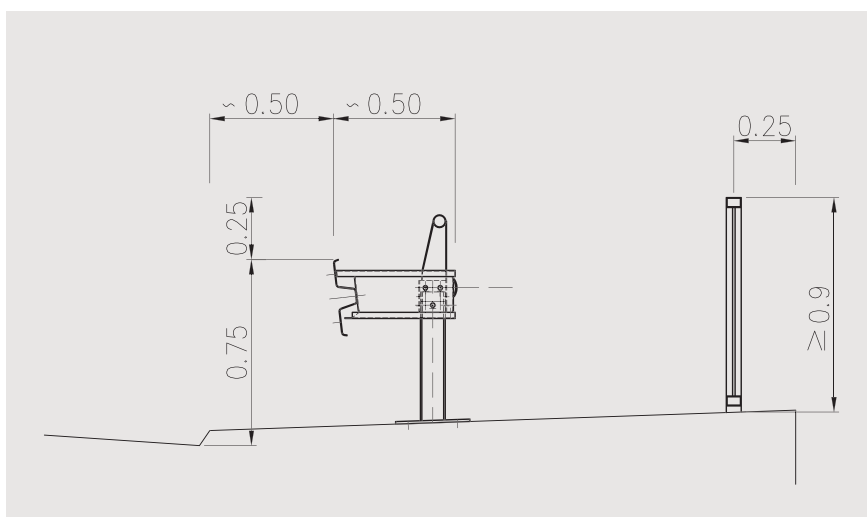
Zaštitna ograda na zidu pričvršćuje se na zidni odstoynik pomoću čeličnih ankernih zavrtnjeva (čeličnih tipli).

Installation of Wall Guard-rails

Wall guard-rail is fastened to the wall spacer by means of steel anchor bolts (screw anchors).

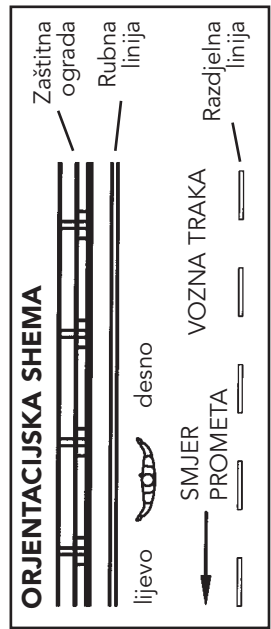
Dodatak - rukohvat na zaštitnoj ogradi na objektima

Nalazi se na mostovima i drugim objektima u naseljima, gdje postoje pješačka ili biciklistička staza, na tim mjestima postavlja se dodatak ograde s rukohvatima.



Additional Handrails on Guard-rails on Roads, Overpasses and Bridges

Handrails on guard-rail are provided on bridges and other structures in residential areas, where there are footpaths or cycle paths.



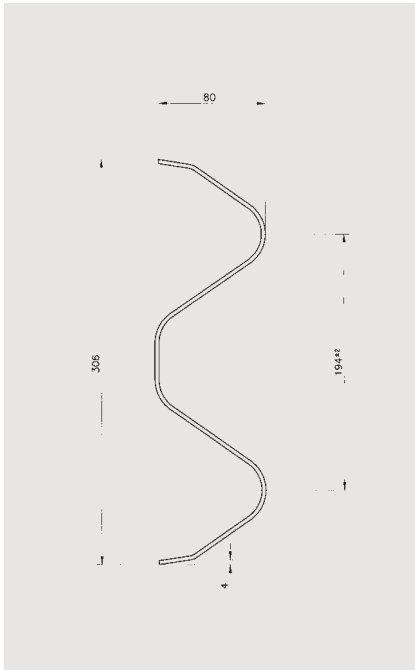
Redni broj	Naziv ograde	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1.	JEDNOSTRANA DISTANTNA OGRADA NA TRASI, RAZMAK STUPOVA 2 m		1								2	2	2		2							2	4	4	3								4	4	25
2.	JEDNOSTRANA DISTANTNA OGRADA NA TRASI, RAZMAK STUPOVA 4 m		1					1		1	1	1	1		2	2						1	2	10	3								4	4	18
3.	JEDNOSTRANA DISTANTNA OGRADA NA OBJEKTU, RAZMAK STUPOVA 1,333 m			1				3		3	3	3	3	3	3	3						3	6	18	5							12*	12*	4	34
4.	JEDNOSTRANA DISTANTNA OGRADA NA OBJEKTU, RAZMAK STUPOVA 2 m							2		2	2	2	2	2	2	2						2	4	14	3							8*	8*	4	27
5.	DVOSTRANA DISTANTNA OGRADA NA TRASI, RAZMAK STUPOVA 4 m								2		1	1	1									4	2	19								4	4	31	
6.	DVOSTRANA DISTANTNA OGRADA NA TRASI, RAZMAK STUPOVA 2 m								2		2	2	2									4	4	22								4	4	35	
7.	DVOSTRANA DISTANTNA OGRADA NA OBJEKTU, RAZMAK STUPOVA 4 m								2		1	1	1									4	2	19							4*	4*	4	33	
8.	DVOSTRANA DISTANTNA OGRADA NA OBJEKTU, RAZMAK STUPOVA 2 m								2		2	2	2									4	4	22							8*	8*	4	40	
9.	JEDNOSTRANA OGRADA NA TRASI, RAZMAK STUPOVA 4m											1	1									1	7								4	4	16		
10.	DVOSTRANA OGRADA NA TRASI, RAZMAK STUPOVA 2 m									2	2	4	2									4	4	22							4	4	33		
11.	DILETACIJA JEDNOSTRANE DISTANTNE OGRADE -80,160 (i 320)										3	3	3									3	6	18	11	11					12*	12*	4	34	
12.	DILETACIJA DVOSTRANE DISTANTNE OGRADE -80,160 (i 320)										3	3	3									6	6	27	12	12					12*	12*	4	48	
13.	KOSI UKOPANI ZAVRŠETAK JEDNOSTRANE DISTANTNE OGRADE, L-12 M							1	2		2	7	9			2	1					9	4	38	4								12	27,74	
14.	KOSI UKOPANI ZAVRŠETAK DVOSTRANE DISTANTNE OGRADE, L-12 M							2	3	1	2	12	13			2	1					18	4	68									12	46,08	
15.	KOSI UKOPANI ZAVRŠETAK JEDNOSTRANE OGRADE, L-12 M							1			8	8	8				1					8	32										12	24,40	
16.	KOSI UKOPANI ZAVRŠETAK DVOSTRANE OGRADE, L-12 M							2		9	9	18	9				1					18	18	89									12	48,78	
17.	POLUOKRUGLI ZAVRŠETAK ZA JEDNOSTRANU DISTANTNU OGRADU										1	1	1										2	9									komplet	38,23	
18.	POLUOKRUGLI ZAVRŠETAK ZA DVOSTRANU DISTANTNU OGRADU										1	1	1										2	13									komplet	46,93	
19.	POLUOKRUGLI ZAVRŠETAK ZA JEDNOSTRANU OGRADU										1	1	1										2	6									komplet	28,12	
20.	POLUOKRUGLI ZAVRŠETAK ZA DVOSTRANU OGRADU										1	1	1										2	13									komplet	34,88	
21.	JEDNOSTRANA DISTANTNA OGRADA NA ZIDU, RAZMAK ODSTOJNIKA 1,333 m																																	komplet	34,88

*za ugradnju bez sidrene ploče

*kad je sidrena ploča sa zavarenim vijcima

4) Isporučuje se i prema posebnom zahtjevu

2) Isporučuje se i prema posebnom zahtjevu



Branik profil "A"

Dalekovod proizvodi i isporučuje i branik profila "A", dužine 4300 mm i 4318 mm, te ostale dijelove standardne zaštitne ograde, koja se ugrađuju na saobraćajnicama u europskim zemljama.

Po posebnoj narudžbi i crtežima izrađujemo i branike surogate profila "A" i profila "B", te druge dijelove zaštitnih ograda (za održavanje postojećih ograda).

Profile "A" rail

Dalekovod also manufactures and supplies Profile "A" rails in lengths 4300 mm and 4318 mm, as well as other elements of standard guard-rail which is installed on roads throughout Europe.

As per special order and drawings we can also supply substitutes of profile "A" and profile "B", including other elements of guard-rails (for maintenance of the existing guard-rails).

Ograde na objektima i zaštitne mreže na nadvožnjacima

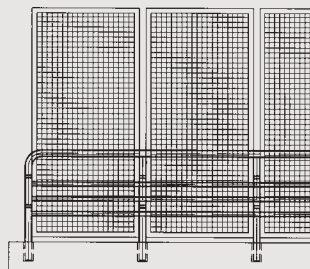
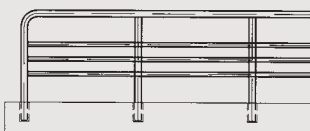
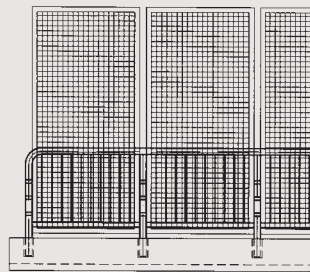
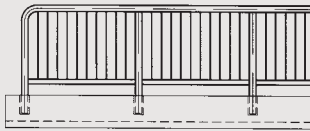
Prema projektnim rješenjima proizvodimo - isporučujemo i ugrađujemo čelične ograde na mostovima, viaduktima, nadvožnjacima i drugim objektima i čelične zaštitne mreže na nadvožnjacima.

Ograde mogu biti s vertikalnim ispunama i s horizontalnim ispunama - prečkama.

Bridge Railings and Protective Overpass Nets

According to project solutions we manufacture, supply, and install steel railings on bridges, viaducts, overpasses and other structures, as well as protective steel nets on overpasses.

Railings can be either with vertical or horizontal bars.



Stubovi za zaštitne žičane ograde

Uz autoput postavlja se zaštitna žičana ograda kojom se štiti površina autoputa (zemljište autoputa) od nepoželjnog ulaza - prelaza životinja i divljači.

Takva ograda postavlja se na HOP-C stubove:

Nosivi stub	HOP-C 60x40x15	. 2200 m
	HOP-C 60x40x15	. 2600 m
Zatezni stub	HOP-C 60x40x15	. 2200 m
	HOP-C 60x40x15	. 2600 m
Kosnik (podpora)	HOP-C 60x40x15	. 2200 m
	HOP-C 60x40x15	. 2600 m

Prema projektu isporučujemo i stubove drugih profila, zatezne zavrtnje, kao i sve vrste vrata u ogradi za ulaz na planum autoputa.



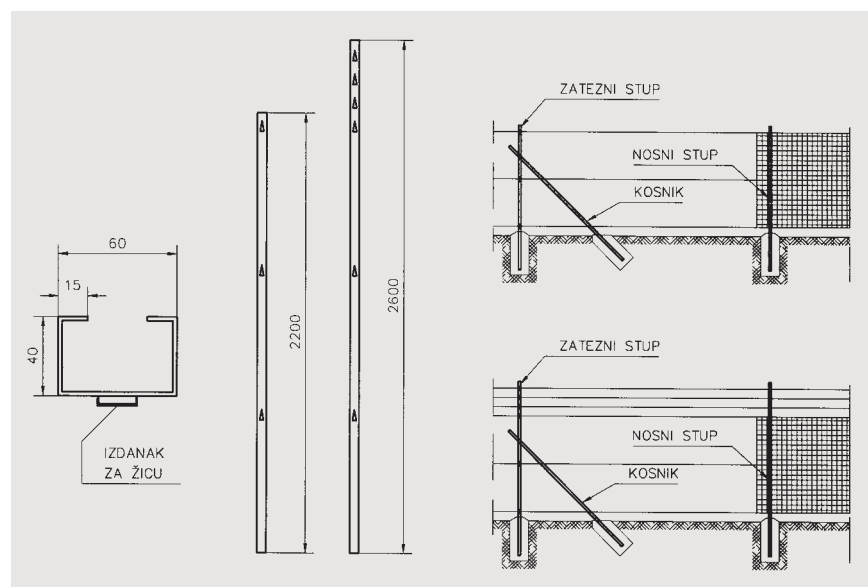
Posts for Protective Wire Fences

Protective wire fences are put up along motorways in order to protect the road surface from undesirable access, i.e. to keep away animals, game, etc, thus ensuring traffic safety.

Protective wire fences are installed on HOP-C posts:

Suspension Pole	HOP-C 60x40x15	. 2200 m
	HOP-C 60x40x15	. 2600 m
Tension Pole	HOP-C 60x40x15	. 2200 m
	HOP-C 60x40x15	. 2600 m
Brace	HOP-C 60x40x15	. 2200 m
	HOP-C 60x40x15	. 2600 m

As per special project we also supply posts of other profiles, tension screws, as well as different types of fence gates for entering the road surface.



Barijere za zaštitu od buke na saobraćajnicama

U programu za saobraćajnice autoputeva Dalekovod isporučuje i barijere za zaštitu okoline od buke. Zaštitni elementi su spolja obloženi visokovrijednim praškastim slojem u kvalitetu fasade. Prema projektu izvode se boje iz palete RAL ili SIKKENS, da se izbjegne refleksija velikih površina. Zaštitne kasete se mogu izrađivati iz performiranog aluminijskog lima.

Višestruka primjena svih elemenata za zaštitu od buke može se kombinovati sa drugim sistemima za zaštitu, kao što su staklene ograde i prostorne rešetke.

Lagane Al kasete daju optimalnu zaštitu od buke na cestama, mostovima, prugama i ostalim objektima.

Primjenom niza tehničkih i fizikalnih komponenata kao i načina bojenja, svi elementi imaju visoku apsorpciju i dobro se uklapaju u okolinu.

Treba istaći da se ispunjavaju sljedeći zahtjevi:

- specifične osobine materijala

Uz autoputeve postavlja se zaštitna žičana ograda kojom se štiti površina

autoputa (zemljište uz autoput) od nepoželjnog ulaza - prelaza životinja i divljači.

- akustičko zaklanjanje i estetika
- ekonomičnost i lagana montaža
- dugotrajna otpornost na starenje
- prilagođavanje lokalnim uslovima
- nema održavanja i može se popravljati.



Noise Barriers for Roads

The road equipment range of products of Dalekovod includes noise barriers. On the outside the protective elements are coated in high-quality polyethylene powder in the same quality as the facade. According to project colours from the RAL or SIKKENS spectrum are used, in order to avoid reflection of large surfaces. Protective elements can

be made from preformed aluminium sheet.

Owing to their multiple application, all elements of noise protection can be combined with other protection systems, such as glass fences or space rails.

Light Al panels provide optimum noise protection on roads, bridges, tracks, and other structures.

Thanks to application of a series of technical and physical components, all elements feature high absorption and are

harmoniously fitted in with the environment.

The noise barriers meet the following requirements:

- Specific characteristics of material
- Acoustic shielding and attractive design
- Cost-efficient and easy mounting
- Long wear resistance
- Adaptation to local conditions
- The noise barriers are maintenance-free and can be repaired

Akustične osobine

Izmjerene vrijednosti prigušenja i apsorpcije zvuka odgovaraju zahtjevima HRN standarda.

HRN EN 1793-2:1997, HRN EN 1793-3:1997,
HRN EN 1794-1:1998, HRN EN 1794-2:1998

Acoustic Features

The measured values of acoustical attenuation and absorption comply with requirements of the HRN standards.

HRN EN 1793-2:1997, HRN EN 1793-3:1997,
HRN EN 1794-1:1998, HRN EN 1794-2:1998

Tehnički opis

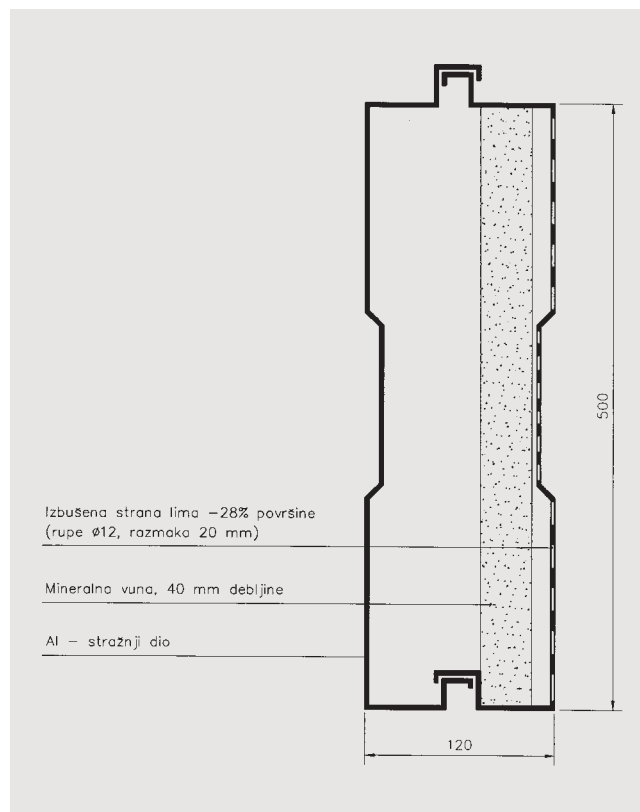
Apsorpcioni dio zaštitnog elementa izveden je od ploče mineralne vune, debljine 40 mm i spec. težine 100 kg/m³. Smjesa za ploče se hemijski obrađuje, oblaže se staklom i na taj način čine proizvod otporan na ultravioletne zrake i atmosferske uticaje.

Nosač apsorpcionog materijala je kasetna za zvučnu zaštitu. Izvedena je sa jedne strane sa rupičastom stijenom - prema izvoru buke. Čeonni dio kasete je izveden s elastičnim gumenim uloškom koji dimenzionalno odgovara za dosjed u profil HE160. Ovaj način dosjeda osigurava najbolju zvučnu zaštitu kompletnog zida u odnosu na okolinu. Kompletan sistem zaštitne ograde s elastičnim konstrukcionim elementima - elastičnim preklapanjem prednje i zadnje strane kasete, nanosom polietilenskog praha, daju potpunu stabilnost na uticaj vjetrova - snijega i čine ovaj način zaštite dobrim rješenjem.

Technical Description

The absorptive part of the protective element is made of 40-mm mineral-wool plates with specific gravity of 100 kg/m³. The compound for production of mineral-wool plates is chemically processed and covered with glass, which makes the product resistant to UV-rays and atmospheric influences.

The absorbent material is contained in sound-proof panels which on one side feature a perforated wall - noise source



side. The front part of panel has an elastic rubber insert corresponding in size to the fit of HE 160 profile. This kind of fit ensures the best noise protection of the entire wall in relation to the environment.

The complete protective fence system with elastic structural elements - elastic overlapping of the front and rear side of panel, application of polyethylene powder, results in full stability against the influence of wind and snow, making this type of noise barrier a very good solution.

Transparentni paneli od akrilnog stakla (za zaštitu od buke)

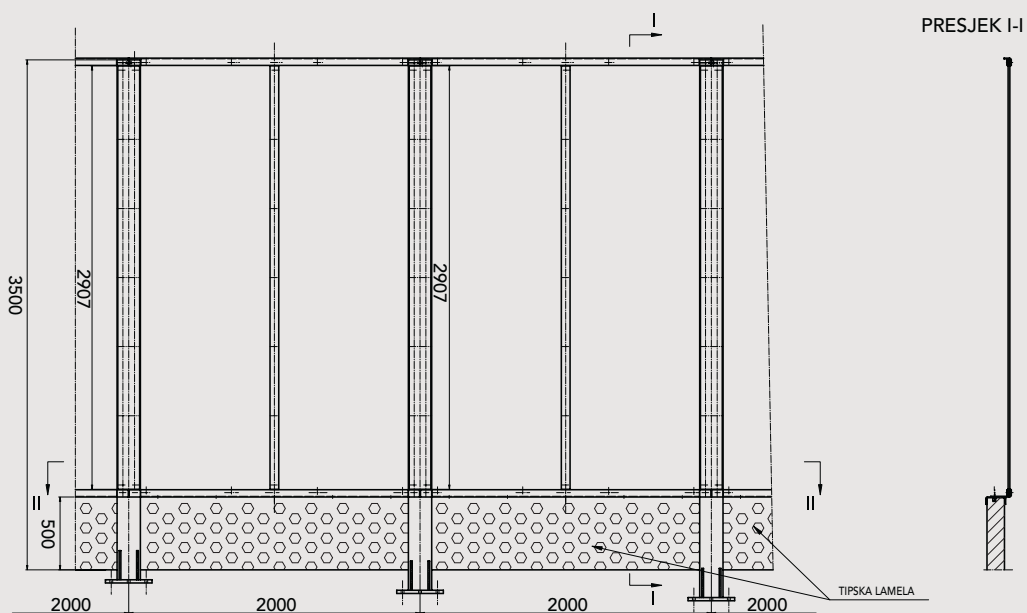
Panovi imaju praktičnu i estetsku vrijednost. Uklapaju se u okolinu, te vozačima omogućuju pogled van planuma autoputa. Kako se ugrađuju nadomak samih naselja djeluju kao otvoreni prozor s pogledom.

Postavljene barijere izrađene od akrilnog stakla udovoljavaju u cijelini normama za zaštitu od buke.

Prema potrebi Dalekovod može isporučiti barijere, projektovane od akrilnog stakla debljine 12 mm. Akrilno staklo je učvršćeno u postojećem aluminijskom okviru, koji se ugrađuje u profile postavljene na razmaku od 2 m.

Transparentne ploče su od lijevanog akrilnog stakla, a veličina ploča obzirom na temperaturni rad, odabrana je prema preporuci proizvođača.

Transparentne ploče su nehrđajućim zavrtnjima pomoću aluminijske letvice pričvršćene za aluminijski okvir koji se izvodi u zavarenoj izvedbi.



PRESJEK II-II





Transparent panels made of acryl glass (for noise protection)

Panels have practical and aesthetical value. They fit well into the environment and make it possible for the drivers to have a view outside the motorway plateau. As they are installed next to the housing settlements they act as an open window with a view. The installed barriers made of acryl glass comply fully with the noise protection standards.

As required, Dalekovod can deliver barriers made of 12 mm thick acryl glass. Acryl glass is fastened into the existing aluminium frame, which is then fitted into the profiles that are set up at a distance of 2m.

Transparent plates are made of fused acryl glass, and the plate size depending on the working temperature is chosen according to the recommendation of the manufacturer.

Transparent plates are fastened to the aluminium frame, in the welded version, with stainless bolts by means of aluminium laths.

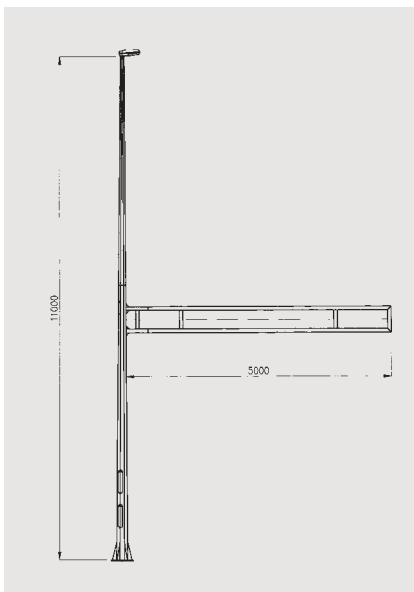
Nosači saobraćajne signalizacije i putokaza

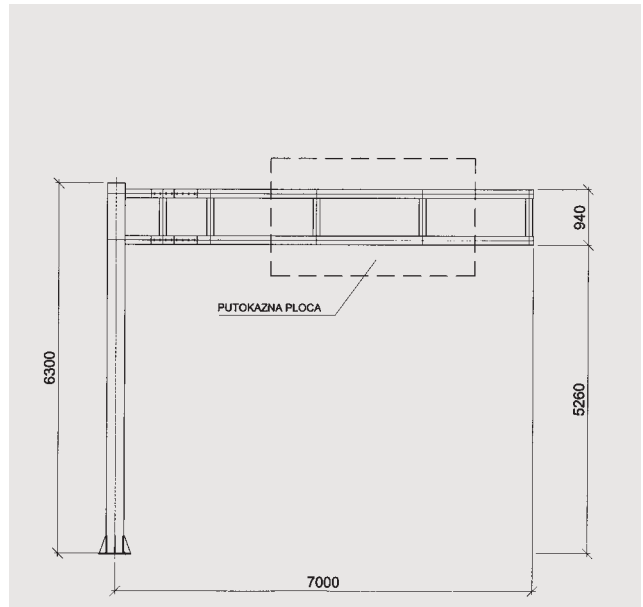
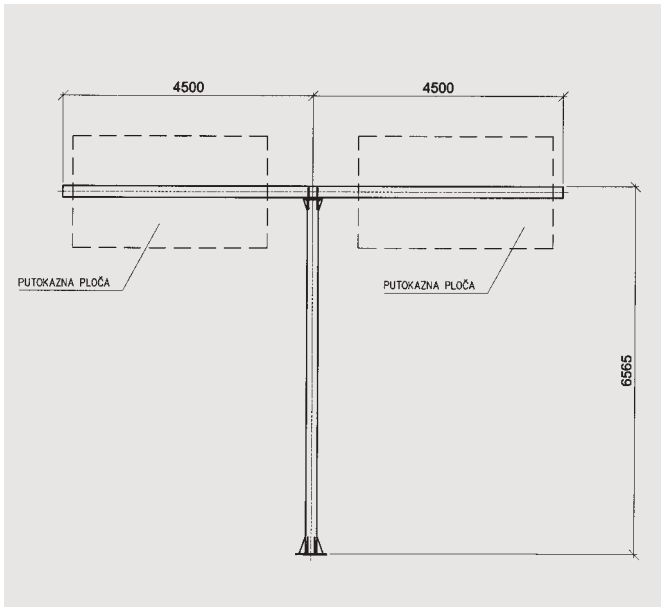
Izgradnja novih saobraćajnica zahtijeva u svemu drugi pristup, napose kada je riječ o ukupnoj bezbjednosti vozila koja se kreću tim saobraćajnicama. Različite vrste portala koji na potrebnim mjestima u cijelosti ili djelomično nadsvoduju profil saobraćajnice, omogućuju da se saobraćajna signalizacija (različiti saobraćajni znakovi - svjetleći ili reflektivni, određeni putokazi) uoči s veće udaljenosti, što je svakako doprinos ukupnoj bezbjednosti saobraćaja koji se odvija na saobraćajnicama koje su opremljene modernom signalizacijom.



Portali na prometnicama su čelične konstrukcije, koje se izrađuju od vruće valjanih limova i profila, kvaliteta prema važećim standardima i propisima. Dimenzije pojedinih profila i limova zavise o vrsti saobraćajne signalizacije

koja se na njih postavlja, širini saobraćajnice koju moraju premostiti, podneblju u kojem se ugrađuju (određene zone djelovanja vjetera, pojava snijega i leda), te eventualnim posebnim zahtjevima investitora.

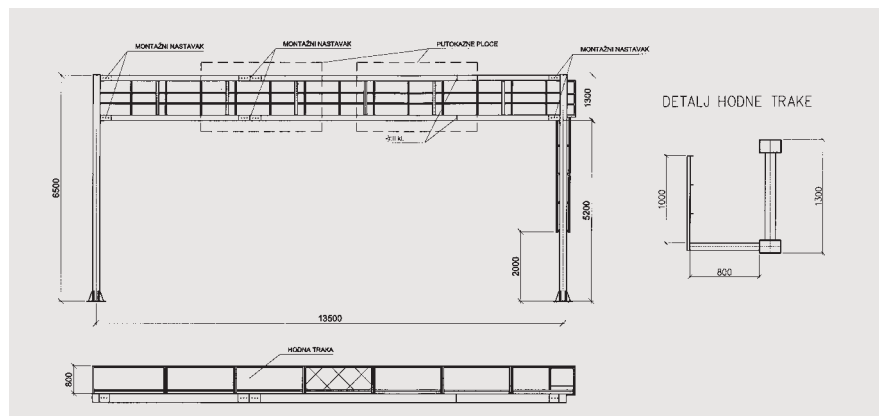
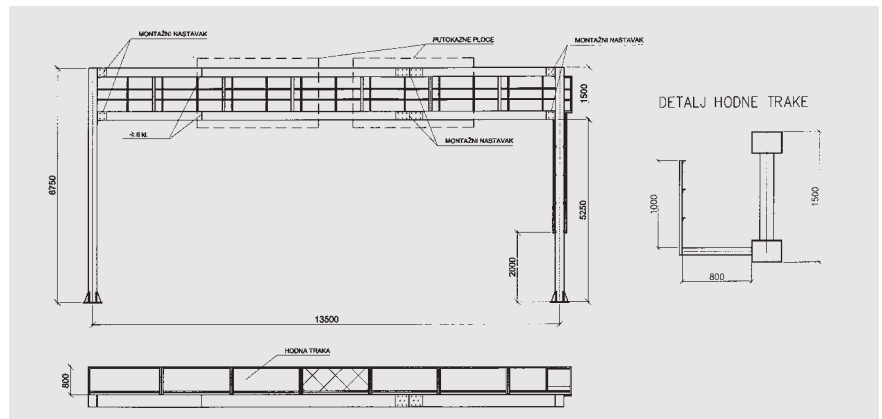




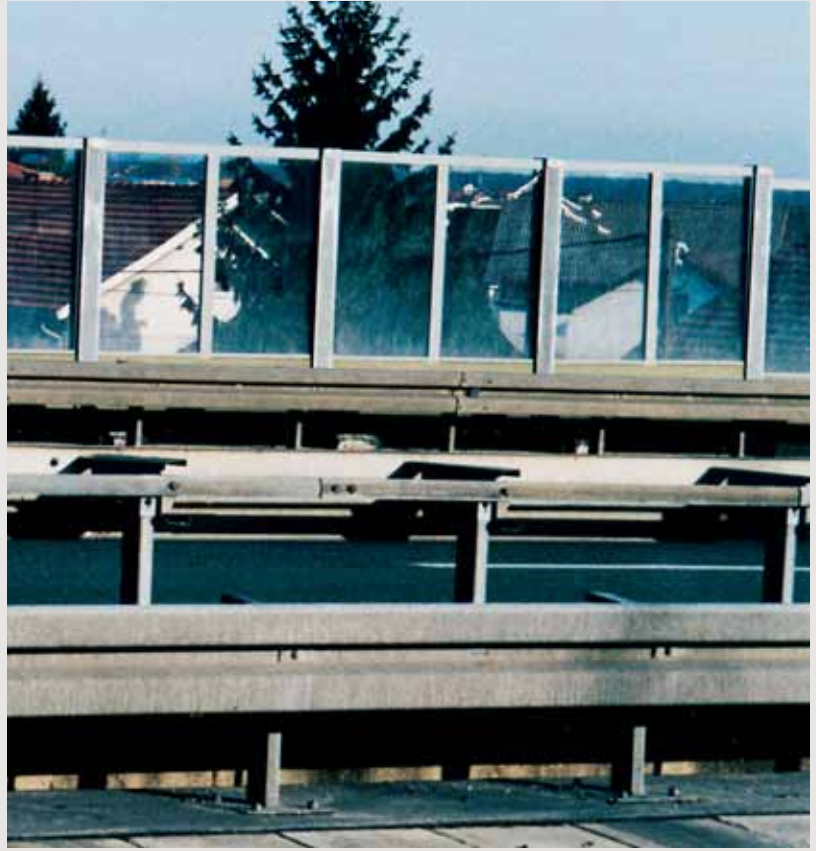
Supports for Traffic Signs and Guide Posts

Construction of new roads requires a different approach to be adopted, notably when overall security of drivers using the roads is concerned. Different types of portals which fully or partially overarch the road at places where guidance is required make the road signs (various traffic signs - illuminating or reflex, guide posts) visible from a greater distance, thus greatly contributing to the overall security of traffic on roads which are equipped with modern signalling devices.

Road portals are steel structures that are made of hot rolled sheets and sections complying with the applicable standards and regulations. Sizes of particular sections and sheets depend on the type of road signals they carry, the road width that needs to be spanned, the climate in which they are being put up (areas exposed to wind, occurrence of snow and ice), and special requirements of investors, if any.



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