

Iz vsebine

• Uvod	3
• 9. skupščina Združenja asfalterjev Slovenije	4
• Mednarodno sodelovanje: 9. evropski kongres EAPA in Eurobitume	6
• 9. kolokvij o asfaltih in bitumnih	11
• Izobraževanje asfalterskega kadra	14
• Intervju: Dariusz Slotwinski	15
• Intervju: Egbert Beuving	18
• Strokovni prispevki	22
• Proizvodnja in vgrajevanje asfaltnih zmesi v letu 2004	26
• Priporočila za proizvodnjo in vgrajevanje asfaltne zmesi DBM	27
• Delovanje organov ZAS v letu 2004	29
• Tehnična regulativa	32
• Summary	33
• Program dela ZAS za leto 2005	47

Glasilo »Od skupščine do skupščine«
izdaja ZAS,
Združenje asfalterjev Slovenije
Kotnikova ul. 32, 1000 Ljubljana

Uredniški odbor: •
Jožica Cezar
Slovenko Henigman
Branka Čulič

Prevod:
Domen Kavčič

Slike na naslovnici:
Novozgrajeni avtocestni odseki

Foto: Ferucio Hrvatin, arhiv ZAS

Oblikovanje: Robert Mihelčič
Grafična priprava: RM design d.o.o.
Tisk: Rotosi d.o.o.
Naklada: 1.000 izvodov

ISSN 1408-6166

Uvod



Za nami je zanimivo in z dogodki zelo bogato leto. Skupaj s predstavniki ostalih evropskih in drugih držav smo se v velikem številu udeležili evropskega asfalterskega E&E kongresa na Dunaju. Poleg sodelovanja v organizacijskih in tehničnih odborih smo za kongres uspeli organizirati tudi razstavni prostor ZAS-a z osmimi večjimi slovenskimi podjetji.

Aktivno smo sodelovali tudi na domačem že sedmem kongresu o cestah in prometu, ki je ponovno presegal vsa pričakovanja, tako v strokovnem kot organizacijskem pogledu. Preko 700 domačih in tujih udeležencev z nad 150 referati so številke, ki Slovenijo uvrščajo v vrh držav cestno-gradbenih potencialov glede na število prebivalcev.

Leto 2004 je bilo v asfalterstvu bogato tudi po doseženi proizvodnji, ki

se je s skoraj 1,7 mio ton proizvedenih vročih asfaltnih zmesi približala že v preteklosti doseženi najvišji proizvodnji. Močno upamo, da je kakovost proizvedenih in vgrajenih asfaltnih zmesi primerna za naraščajoče klimatske in predvsem prometne obremenitve, ki so se še dodatno povečale po vstopu Slovenije v Evropsko Unijo.

Večje povezanosti Slovenije z EU smo se vseskozi zavedali tudi v ZAS-u, saj trije naši predstavniki sodelujejo v strokovnih odborih (v izvršnem in tehničnem odboru ter v odboru za zdravje, varstvo in okolje) EAPA. Njihova vloga je trenutno še bolj informativna, v prihodnje pa lahko pričakujemo bolj aktivno vlogo in tudi naše prispevke.

V letu 2004 smo se dokončno spopadli tudi s pojavom razpok na plasteh drobirja z bitumenskim mastiksom. Z zahtevnimi zmrzlinjskimi preskusi na Tehnični univerzi Braunschweig v Nemčiji in tudi drugimi številnimi analizami, so bili ugotovljeni vzroki za nastanek poškodb, tako da je lahko asfalterska stroka združeno izdelala »Priporočila za proizvodnjo in vgrajevanje asfaltne zmesi DBM«. Pridobljena izkušnja naj bo opozorilo za v bodoče. Tudi v trenutno najboljše rešitve je treba dvomiti in vseskozi iskati izboljšave in optimume.

O navedenih temah pišejo v tem biltenu prizadevni člani ZAS, Združenja asfalterjev Slovenije, ki ostajajo iz leta v leto v glavnem isti. Ugotavljamo, da se število strokovnjakov v asfalterški branži ne povečuje kot bi bilo potrebno. V zadnjem letu smo se spopadali s

številnimi novimi izzivi kot so certificiranje, standardizacija, nizko temperaturni asfalti, cestogradbeni in polimerni bitumni, itd. Velikokrat smo imeli podobna stališča, včasih pa so se naša mnenja razhajala, tako da številna vprašanja še vedno ostajajo odprta. Nobeno od teh vprašanj ni tako zahtevno, da ga z odprto diskusijo, s sodelovanjem z EAPA in drugimi združenji ne bi mogli rešiti. Prav je, da stopimo še bolj skupaj za boljše asfalte in še boljše ceste.

Vsem, ki ste prispevali k uspešnemu delu ZAS-a v zadnjem letu najlepša hvala.

*Slovenko Henigman
Predsednik*

Introduction

A very rich and eventful year is behind us. Together with a great number of representatives of other European countries and nations from all over the globe we attended E&E, the European asphalt pavement congress in Vienna. Apart from participating in organising and technical committees of the Congress we also managed to set up an exhibition space that featured ZAS and eight major Slovenian companies.

(Continues on page 33)

- Datum: 22. 4. 2004
- Kraj: dvorec Zemono pri Vipavi
- Število udeležencev na okrogli mizi in skupščini: 54

9. skupščina Združenja asfalterjev Slovenije



Starič (CP Ljubljana), Marijan Prešeren (CGP) in Bojana Lukač (CP Maribor). Skupščina ZAS je za člane častnega razsodišča izvolila Olgo Naglič, Mirka Pižeto in dr. Janeza Žmavca.

Predsednik ZAS je podelil posebno priznanje g. Antonu Dremlju za aktivno sodelovanje in zasluge pri delovanju Upravnega odbora ZAS v obdobju od 2000 do 2004.

Na koncu je bil predstavljen še obsežen program dela združenja za leto 2004, pri čemer je bila posebej poudarjena aktivna udeležba ZAS-a na kongresih EAPA na Dunaju in na kongresu o cestah in prometu v Portorožu (v nadaljevanju), ki ga je skupščina potrdila.

22. aprila 2004 je v prijetnem ambientu dvorca Zemono potekala 9. redna skupščina Združenja asfalterjev Slovenije. Na njej je bilo prisotnih 54 rednih članov združenja. Po uvodnem pozdravu je bilo udeležencem skupščine podano poročilo o delu združenja v preteklem letu, finančno poročilo in poročilo nadzornega odbora o pregledu poslovanja, zaključni račun za leto 2004 ter finančni načrt za leto 2005. Vse omenjene dokumente je skupščina ZAS soglasno sprejela.

V nadaljevanju je bila skupščini predlagana dopolnitev Pravil v zvezi s številom članov Upravnega odbora. Izpeljane so bile volitve članov organov ZAS, saj je minilo osem let od ustanovitve združenja. Za predsednika ZAS je bil ponovno izvoljen Slovenko Henigman (DDC svetovanje inženiring), za člane upravnega odbora pa so bili izvoljeni: Janez Bizjak (Petrol),

Aleksander Kerstein (CMCelje), Borut Willenpart (SCT), Mitja Čotar (Primorje), Matija Donko (Pomgrad), Igor

V imenu DDC svetovanje inženiring, d.o.o. je prisotne pozdravil izvršni direktor družbe g. Matija Vilhar, ki je



Volitve članov na skupščini



Delovno predsedstvo strokovnega seminarja

dejal, da DDC vsestransko podpira delovanje združenja. Poudaril je, da so rezultati dela ZAS vidni tudi na naših cestah, čestital za dosežene rezultate in zaželel vse najboljše za vnaprej. V imenu DRC, Družbe za raziskave v cestni in prometni stroki pa je udeležence skupščine pozdravil direktor g. Saša Skulj in čestital za dosežene rezultate. »Biti razpoznaven in spoštovan« je po njegovem mnenju lahko geslo ZAS-a, ki se uresničuje z veliko uspeha. Zahvalil se je tudi za aktivnosti, ki jih ZAS počne v okviru DRC-ja in zaželel dobro sodelovanje z DRC tudi v prihodnje.

Pred skupščino je bil organiziran **strokovni seminar**, ki je bil sestavljen iz dveh delov:

- V prvem so predstavniki družbe Ammann iz Švice, ki je ena vodilnih družb za izdelavo asfaltnih obratov predstavili novosti v zadnjem obdobju. Predstavljena je bila moderna tehnika zgoščevanja ACE, nastanek asfaltnega obrata in tehnologija hladnih asfaltov FOAM Mix/WAM Foam.
- V drugem delu so bile predstavljene

novosti na področju stroke v Sloveniji. V tem sklopu je g. Aljoša Lipovšek iz podjetja SCT osvetlil problematiko litih asfaltov v povezavi z varovanjem okolja in znižanjem temperature vgrajevanja.

G. Aleksander Ljubič, vodja delovne skupine za nizkotemperaturne asfalte pri ZAS je predstavil preskuse, ki so bili v zadnjem obdobju na inštitutu Igmata izvedeni z različnimi dodatki za znižanje temperature. Predstavljene so bile izkušnje z modificiranim bitumnom za znižanje temperature SüBit®VR in dodatki zeolita Aspha-Min®, Sasobit®, Asphaltan® in Romonta®.

Prof. dr. Janez Žmavc je v svojem prispevku seznanil z novo tehnično regulativo na področju asfalterstva (EN) in predstavil nove sisteme potrjevanja skladnosti.

Zaradi pomembnosti tematike, ki je bila obravnavana na strokovnem seminarju je bilo zaključeno, da se v prihodnje nadaljuje s preskusi nizkotemperaturnih asfaltov in se poskuša pridobiti tudi izkušnje in mnenja strokovnjakov iz sosednjih držav.

Jožica Cezar



Kulturni program

3. evropski kongres evropskega asfalterskega združenja EAPA in evropskega bitumenskega združenja Eurobitume na Dunaju

Sodelovanje z asfalterskimi združenji

Predstavniki ZAS so bili v letu 2004 zelo aktivni na mednarodnem prizorišču. Udeleževali so se sestankov in generalne skupščine EAPA (na Dunaju v času kongresa) ter aktivno sodelovali z asfalterskimi združenji sosednjih držav. Trije člani ZAS-a so sodelovali pri pregledu strokovnih prispevkov za 3. evropski kongres EAPA & Eurobitume, maja 2004 na Dunaju, en predstavnik pa je deloval v tehničnem odboru tega kongresa, ki se je v zadnjem letu srečal na večih sestankih. Naloge, za katere smo bili zadolženi, smo uspešno opravili. Predstavnika ZAS sta pričela tudi z aktivnim sodelovanjem v tehničnem odboru in odboru za zdravje, varstvo in okolje pri EAPA.



European Asphalt Pavement Association



Udeleženci na kongresu

V času od 11. do 14. maja 2004 se je 20 udeležencev iz slovenskih gradbenih in inženjerskih podjetij, ki so člani ZAS, Združenja asfalterjev Slovenije, udeležilo 3. evropskega asfalterskega kongresa, ki je potekal na Dunaju. Osnovna tema kongresa je bila posvečena praktičnim rešitvam. Kongres sta uspešno organizirala krovni evropski asfalterski organizaciji EAPA in EUROBITUME. Na

kongresu je bilo registriranih 836 udeležencev in okoli 200 spremljevalcev iz 55. držav vseh kontinentov.

Strokovni del kongresa je bil razdeljen na 8 tehničnih sekcij in sicer:

- Implementacija, inovativne rešitve in transferji tehnologij (1. sekcija)
- Hladni in topli procesi ter recikliranje (2. sekcija)



Jürgen Sturm je novi generalni sekretar EAPA

Evropsko združenje asfalterjev (EAPA) ima novega generalnega sekretarja.

Jürgen Sturm, 37-letni odvetnik iz Nemčije, je prevzel položaj s 1. majem 2005. Jürgen, ki je rojen v Regensburgu na Bavarskem, je študiral pravo in špansko jezikoslovje na univerzah v Passavu in Salamanci. V odvetniško zbornico je bil sprejet v Berlinu v letu 1996, kjer je štiri leta tudi opravljal odvetniško delo.

Svojo kariero je prekinil v letu 2000, ko je vpisal odvetniški magistrerij na univerzi v Aberdeenu in postal magister v evropskem in mednarodnem pravu.

V letu 2001 je Jürgen prevzel položaj generalnega sekretarja v Evropski zvezi rečnih pristanišč (EFIP) v Bruslju, sedaj pa se je pridružil EAPA, ki bo svoj sekretariat v letu 2005 preselila v Bruselj.

- Bitumen in aditivi za zmesi (3. sekcija)
- Varstvo in okolje (4. sekcija)
- Staranje, utrujanje in odpornost pri nizkih temperaturah (5. sekcija)
- Kolesnice in odpornost pri visokih temperaturah (6. sekcija)
- Projektiranje asfaltnih zmesi in lastnosti utrujanja (7. sekcija)
- Ocena lastnosti in prihodnje specifikacije (8. sekcija)

Vloga ZAS na kongresu je bila izrazita, saj je bil predsednik ZAS g. Slovenko Henigman vključen v 10 članski tehnični odbor za pripravo kongresa, 3 člani ZAS (dr. Janez Žmavc, Aleksander Kerstain in Janez Prosen) pa so sodelovali v 120 članskem znanstvenem odboru, ki je opravil pregled in izbor referatov za kongres.

Udeleženci kongresa so prejeli zbornik in CD s prispevki (250 referatov). V nadaljevanju so bili posredovani tudi uradni zaključki kongresa, ki pokrivajo 19 različnih tematskih sklopov (*v nadaljevanju*).

Ob pozornem spremljanju prispevkov smo se udeleženci večkrat zamislili nad omejenimi možnostmi v Sloveniji (tako zaradi opreme kot predvsem zaradi zelo številčno omejenih kadrovskega potenciala), saj so številne raziskave in poskusi, ki jih izvajajo v nekaterih okoljih in državah za nas praktično neizvedljive. Ne glede na to pa bo potrebno bolj združevati razpoložljive kapacitete in zagotoviti simulacijo obremenitev v celotnem temperaturnem območju. V zadnjem času namreč ugotavljamo, da nismo v stanju preveriti utrujanja in odpornosti naših vozišč v nizkem temperaturnem stanju. Poleg tega se na nekaterih naših cestah v zadnjem času močno povečujejo prometne obremenitve, kar je še dodaten razlog za prezgodnji pojav različnih poškodb - razpok in kolesnic - za katere so potrebne temeljite analize.

V času kongresa so slovenska podjetja v organizaciji ZAS, Združenja



Dogajanje na razstavnem prostoru ZAS



Delovni sestanki na razstavnem prostoru ZAS

asfalterjev Slovenije in ob posebni podpori DDC svetovanje inženiring, organizirala **predstavitveni razstavní prostor**. Glavni namen je bil pokazati našo organiziranost in se predstaviti z našimi domačimi aktivnostmi, ki nam lahko koristno pomagajo pri prodoru na tuje trge. Predstavila so se podjetja: DDC, ZAG, IGMAT, SCT, PRIMORJE, Petrol, Pomgrad in CM Celje ter ZAS kot vezni člen. Razstavní prostor je bil vse tri dni kongresa dobro obiskan, zanimanje za slovenska izvajalska podjetja in DDC ter oba laboratorija je bilo zelo veliko.

Kongres EAPA in Eurobitume, ki je bil organiziran v naši sosednji državi Avstriji, je dobro uspel, k uspehu smo po svojih močeh prispevali tudi Slovenci. Najprej s številčno udeležbo, pa tudi z aktivno vlogo pri različnih aktivnostih. Kot na novo pridruženi člani EU smo bili s kolegi drugih pridruženih držav deležni še posebne pozornosti.

Pred kongresom je EAPA, katere polnopravni član od leta 1997 je tudi ZAS, organizirala letno skupščino, na kateri je bil v 7 članski izvršilni odbor

(Executive Committee) izvoljen tudi predsednik ZAS.

Zaključki s 3. kongresa Euroasphalt & Eurobitume (E&E)

1. Uvod

V maju 2004 se je število članic Evropske unije povečalo na 25 držav. Trenutno prihaja 60 do 70 odstotkov zakonodaje iz Bruslja.

Če hočemo od Evrope imeti korist, moramo delovati kot enotna skupnost in ne kot 25 posameznih držav. To velja tudi za raziskave in razvoj na področju asfalta in bitumna.

Za potrebe evropskih standardov moramo v Evropi imeti eno samo preskusno metodo za posamezno karakteristiko. Tako bomo govorili isti jezik pri karakterizaciji materialov v prihodnosti. Če bi pri raziskavah več sodelovali, namesto da vsak zase ponovno izumljamo kolo, bi lahko prihranili mnogo denarja, ali pa bi lahko z razpoložljivimi sredstvi storili več.

Videli smo že nekaj lepih primerov prenosa informacij, ELLPAG-ova študija pa nam je pokazala, kako pomembno je sodelovati in kakšne so prednosti mednarodne izmenjave izkušenj.

2. Zmanjševanje hrupa

Gradnja trajnih manj hrupnih asfaltnih vozišč predstavlja izziv za našo stroko. Trajnost bi bilo treba povečati. Rešiti je treba problem zaglajevanja vozišč. Dvoslojni drenažni asfalt je rešitev, vendar moramo še dalje iskati nove tehnike.

Spoznali smo nove asfaltne zmesi, razvite za Formulo 1.

Razvitih je bilo tudi nekaj tankih in ultratankih asfaltnih slojev za zmanjševanje prometnega hrupa.

3. Reciklaža

Da bi lahko reciklirali ves zbrani odpadni asfalt, potrebujemo večji delež starega asfalta v površinskih slojih. Na to temo se je nanašalo več referatov.

Pritisk družbe k ponovni uporabi in reciklaži raznih materialov z namenom karseda zmanjšati količino odpadkov je začutilo tudi asfaltestvo.

Asfalt je količinsko zelo razširjen proizvod in kot tak privlači druge industrije, da odlagajo svoje odpadke v asfaltestvo. Asfalt pa ni smetišče, temveč visoko razvit proizvod. Lahko se 100-odstotno reciklira in je pravzaprav najbolj recikliran proizvod na svetu. Ta njegov položaj moramo ohraniti.

4. Sodobne tehnike

Uporabljati moramo sodobno tehnologijo, da bi lahko gradili visokokakovostne ceste. Če novih tehnologij ne bomo uvajali, bomo imeli staromodno stroko, še preden bomo ostareli sami.

Videli smo sodobne sisteme krmiljenja strojev, sistem za merjenje sestave in debeline, ki meri naravne gama žarke, in predizdelano cesto z močno zmanjšano hrupnostjo, ki se da hitro vgraditi - razviti kakor preproga in prav tako hitro zamenjati.

To zadnje nam je pokazalo, da dobijo s funkcionalno pogodbo izvajalci priložnost, da poiščejo najboljše rešitve. Z določitvijo funkcionalnih specifikacij bo stroka dobila spodbudo, da išče nove, inovativne rešitve.

5. Funkcionalne pogodbe

S polimeri modificirana veziva lahko izboljšajo zmogljivost asfaltnih vozišč in bi lahko prišla posebej prav za uporabo pri novih funkcionalnih pogodbah.

Funkcionalne pogodbe bi morali začeti uporabljati bolj pogosto.

Zahtevane lastnosti stopnje bi morale biti navedene v ponudbah, gradbenim podjetjem pa bi morala biti dana svoboda, da zadostijo tem zahtevam.

Če damo izvajalcem priložnost, da se v ponudbenem procesu domislijo tehničnih alternativ, bo to spodbudilo zeleni tehnološki napredek v naši stroki.

6. Hladno je »vroče«

Priča smo izboljšavam hladnih in vro-

čih postopkov. Kakovost proizvodov se izboljšuje in ti počasi zavzemajo svoj tržni delež v Evropi.

Trenutno so na voljo sledeče tehnike:

- Vroči asfalt s penjenim bitumnom
- Vroči asfalt
- Nove hladne zmesi: z uporabo emulzij

Ugotovljeno je bilo, da je zmogljivost hladnih zmesi na različnih gradbiščih enaka kot pri vročih zmesih in da so »najmanj tako trajne kakor vroče« tudi v ekstremnih razmerah.

Hladne zmesi lahko prispevajo k večjemu udobju in varnosti delovnega okolja.

Priča smo bili tudi zniževanju temperatur pri mešanju asfalta in asfaltiranju v Nemčiji, ki je posledica uporabe dodatkov. To zniža izločanje CO₂ in porabo energije. Manj bitumenskih hlapov in boljše delovno okolje za asfaltestvo sta tudi pomembni spodbudi za delo.

7. Dodatki za veziva

Uporaba posebnih dodatkov za veziva lahko izboljša lastnosti asfalta.

Videli smo učinek uporabe vlaken in hidriranega apna, polnila, pa tudi asfaltne zmesi, modificirane z gumo.

Pri dodatkih za vezivo moramo vedno upoštevati posledice za okolje in zdravje delavcev, ne le pri proizvodnji in vgrajevanju, temveč tudi pri reciklaži.

8. Staro - novo / enostavno - kompleksno

Med referati, ki so obravnavali sestavo in zmogljivost bitumna, opazimo veliko raznolikost in kompleksnost analitskih metod.

Potrebujemo sodobne preskusne metode za opis in klasifikacijo mehanskih lastnosti s polimeri modificiranega bitumna. Pri tem nam bodo v pomoč izkušnje iz programa SHRP in po njem.

Morda bi morali posvetiti več pozornosti odnosu med bitumnom in zmesjo bitumen-polnilo (mastiks) in odnosu med mastiksom in obnašanjem asfalt-

ne zmesi. Tako bi morda bolje razumeli interakcijo med mastiksom in agregatom.

9. Težave s katranom

Za več evropskih držav predstavlja katran velik problem. Končna rešitev bi bila, da bi ga izločili iz gradbene verige. Potrebujemo hitro metodo odkrivanja katrana in varne postopke ravnanja z njim.

Prikazane so bile nekatere nove metode.

Predstavljeno je bilo več brezkatranskih proizvodov, ki jih lahko uporabljamo za proizvodnjo asfaltnih zmesi, odpornih na kerozin in/ali gorivo.

10. Življenjski cikelus

Skrbi nas vpliv na okolje, ki bi ga lahko imela raba asfaltnih in bitumenskih vozišč skozi njihovo celotno življenjsko dobo.

Analiza življenjskega ciklusa (Life Cycle Analysis) je orodje, ki nam da informacije o vplivu na okolje.

11. Zmanjševanje porabe energije

Energija, ki se porabi za proizvodnjo, gradnjo in vzdrževanje voziščne konstrukcije predstavlja le majhen delček energije, ki jo porabijo vozila skozi celotno življenjsko dobo vozišča. Zato je zmanjšanje energije vozil zelo pomembno. Industrija avtomobilskih gum dela na razvoju gum z zmanjšanim kotalnim trenjem.

Gladke ceste zmanjšajo porabo goriva pri vozilih, zato bi veljalo posvetiti več pozornosti uporabi kotaljenja na raznih asfaltnih površinskih prevlekah, da bi ugotovili, kaj se na tem področju da doseči.

12. Zasnova receptur zmesi

Obstoječe preskusne metode za zasnovane zmesi in postopke zgoščevanja so potrebne izboljšav. Potrebno je izboljšati tudi izbor sestavin bitumenskih zmesi.

Veliko obeta raba racionalnih preskusov in nove digitalne analitske tehnike.

13. Trajnost

Trajnost je precej zapleteno področje. Oksidacijsko staranje veziva je glavni problem, pomembna pa je tudi občutljivost na vlago, saj lahko medsebojno vplivata. Upoštevati pa moramo tudi zasnovo receptur.

Terenski podatki manjkajo na več področjih ugotavljanja trajnosti. Upati je, da bo projekt BitVal pomagal zapolniti praznine.

Modificirana veziva kažejo nedvomne prednosti.

14. Staranje

Različna veziva se starajo različno.

Enako velja za vse s polimeri modificirane bitumne. Vsi ti se starajo na različne načine, glede na njihovo sestavo in mikrostrukturo.

Tako je na tem področju enako kot pri ljudeh: téma je zelo zanimiva in opaziti je lep napredek, vsega pa še vedno ne razumemo.

15. Vlaga

Ko govorimo o staranju in občutljivosti na vlago, ne smemo pozabiti na vpliv polnila, debelino filma veziva, vsebnost zračnih por v zmesi in na lastnosti agregata. Tako je bilo ugotovljeno, da je potrebno več raziskav.

16. Obnašanje asfalta in bitumna pri nizkih temperaturah

Več referatov je omenjalo preskus DTT (Direct Tensile Test - direktni natezni preskus) in BBR (Bending Beam Rheometer). Nekateri avtorji menijo, da tehnika DTT daje boljši opis obnašanja pri nizkih temperaturah v primerjavi z BBR.

Drugi avtorji ugotavljajo, da potrebujemo podatke obeh tehnik (DTT in BBR), da lahko razlikujemo med čistim in modificiranim bitumnom, četudi modificirana veziva vsebujejo le 2 % polimerov. Bilo pa je še več drugih mnenj.

Tako smo še vedno zbegani, a na mnogo višji ravni.

17. Obnašanje zmesi pri visokih temperaturah

Preskus WTT (Wheel Tracking Test - preskus tvorjenja kolesnic) se vse pogosteje uporablja za preskušanje odpornosti asfalta proti nastajanju kolesnic pri pomembnejših projektih.

Triosni dinamični preskus in statični tlačni preskus (potrjeni ali nepotrjeni preskusi lezenja) se štejeta za pomembni preskusni metodi za ovrednotenje odpornosti proti trajnemu preoblikovanju asfaltnih zmesi zaradi njune temeljne znanstvene vrednosti in zaradi ekonomskih prednosti v primerjavi s preskusom tvorjenja kolesnic.

Pri izboljšavi odpornosti asfaltnih zmesi proti nastajanju kolesnic vidimo, da tudi dodatki in modifikatorji za veziva igrajo pomembno vlogo.

Obnašanje veziva pri visokih temperaturah

Več referatov je obravnavalo to temo, prišli pa so do zaključka, da so preskusne metode za določanje ZSV (Zero-Shear Viscosity) učinkovite pri čistem bitumnu, pri modificiranem s polimeri pa ne.

Nekateri avtorji so pokazali, da se tem problemom pri bitumnih, modificiranih s polimeri, lahko izognemo tako, da jih preskušamo pri višjih temperaturah. Predlagano je bilo tudi, naj se kot parameter obstojnosti veziva upošteva viskoznost pri nizkofrekvenčnem strigu (low frequency shear viscosity) namesto ZSV.

18. Utrujanje

Videli smo več preskusnih metod, ni pa prišlo do pravega zaključka, katera je najboljša.

Oktobra letos se bo treba odločiti za enotno evropsko preskusno metodo za preskušanje utrujanja, torej nam ostane še nekaj mesecev za razmislek.

19. Kakovost

In nazadnje še dve ne nepomembni opazki glede kakovosti.

Kakovostni postopki bodo prinesli kakovostnejše izvedbe. Boljša pripravljenost, tako naročnikov in izvajalcev,

bo pomagala prihraniti davkoplačevalski denar.

S tem končujem predstavitev svojih kratkih zaključkov.

Na spletni strani www.eecongress.org/moderatorsreport lahko najdete poročila moderatorjev in daljšo različico zaključkov.

Dosegli smo napredek. Če se ozremo 20 let v preteklost, lahko vidimo, kaj vse smo v teh dvajsetih letih dosegli. Pred 20 leti nismo imeli:

- drenažnega asfalta
- dvoslojnega drenažnega asfalta
- skoraj nič DBM
- ultratankih slojev.

Lahko torej zaključim, da smo v zadnjih 20 letih dosegli velik napredek.

Zaključne opombe

V imenu Tehničnega odbora E&E bi se rad zahvalil članom Znanstvenega odbora, moderatorjem in predavateljem. Ne nazadnje bi se rad zahvalil dvema osebama, ki sta opravili veliko dela za Tehnični odbor.

Prva je moja tajnica Samantha, ki ta trenutek še vedno dela v pisarni EAPA v Breukelnu. Tudi druga je dama, ki je opravila veliko dela posebno za Tehnični odbor. To je Helga Eismair, predstavnica Austropa Interconvention.

S pomočjo teh dveh desnih rok mi je bilo za Vas v veliko veselje organizirati tehnične sestanke.

Rad bi poudaril, da moramo pri našem delu misliti evropsko. Ni več smiselno stremeti po lokalnih ali nacionalnih preskusnih metodah. Če bomo govorili različne jezike, se ne bomo razumeli. Če preskusne metode niso enotne, od rezultatov ne bomo imeli vzajemne koristi. Če hočemo postati močna Evropa, moramo združiti svoje moči. S tem, da se bomo izognili podvajanju raziskav, bomo z enakimi proračuni dosegli več.

*Egbert Beuving,
tehnični direktor EAPA in
predsednik tehničnega odbora E&E*

Sodelovanje z DRC, Družbo za raziskave v cestni in prometni stroki, d.o.o.

ZAS je kot družbenik DRC sodeloval pri raznih aktivnostih družbe, in sicer: kot udeleženci smo bili prisotni na strokovnem posvetu »Gradbeni proizvodi pri gradnji cest in drugih objektov, novosti, zahteve za kakovost, tržišče EU« (Gornja Radgona, 7. april 2004), sodelovali smo pri organizaciji 7. kongresa o cestah in prometu (v nadaljevanju).

Predstavnika DRC g. Skulj in g. Vilhar sta se udeleževala prireditve ZAS-a in s svojimi nagovori obogatila naša srečanja.

Poročilo s 7. kongresa o cestah in prometu

V času od 20. do 22. oktobra 2004 je DRC organizirala že 7. kongres o cestah in prometu - več za obnovo in vzdrževanje.

Poleg slovenskih strokovnjakov so na kongresu sodelovali tudi strokovnjaki iz Italije, Avstrije, Madžarske, Nemčije, Hrvaške, Srbije in Črne gore, ki so predstavili stanje in perspektive v svoji državi. ZAS je aktivno sodeloval pri organizaciji celotnega kongresa in koordiniral mednarodni blok vabljenih predavanj.

V sklopu kongresa so bila podeljena tudi priznanja DRC za življenjsko delo



Priznanje DRC prof. dr. Žmavcu

in izreden prispevek pri razvoju slovenske cestne stroke, ki ga je med drugimi prejel naš zvesti »dolgoletni asfaltec« prof. dr. Janez Žmavc.

Najpomembnejši sklepi in priporočila s kongresa, ki zadevajo področje razvoja in kakovosti materialov pri asfaltnih delih:

- **PmB, DBM, nizkotemperaturni asfalti**

Na področju uporabe asfaltnih zmesi se je v zadnjih dveh letih razvoj osredotočil predvsem na še širšo uporabo s polimeri modificiranih asfaltov. Nadaljnji razvoj asfaltnih delih je viden tudi pri izvedbi prvih poskusnih polj za uporabo nizko temperaturnih asfaltov in pri nadaljnjem razvoju uporabe manj hrupnih asfaltnih zmesi drobirjev z bitumenskim mastiksom (DBM) in drenažnih asfaltov, ki se uspešno uporabljajo na vijačnih prehodih na avtocestah. Vse to pomeni velik prispevek k varovanju okolja in izboljšuje prometno varnost.

- **naraščanje prometnih obremenitev in dimenzioniranje voziščnih konstrukcij**

V zadnjih desetih letih smo priča nenehnemu in strmemu porastu prometnih obremenitev. Ta porast je še posebej izrazit po vstopu Slovenije v EU maja 2004, ko se je na nekaterih prometnih smereh delež težkih tovornih vozil povečal za več deset odstotkov.

Načrtovanje oziroma dimenzioniranje voziščnih konstrukcij mora slediti povečanim prometnim obremenitvam pa tudi spremembam klimatskih razmer. Povečane temperature poleti in nizke temperature pozimi pomenijo dodaten izredno neugoden vpliv na trajnost in obstojnost voziščnih konstrukcij, zato je treba zagotoviti čim bolj interdisciplinarni pristop udeležencev, z upoštevanjem vseh pogojev in obremenitev. Poleg projektantov je nujno sodelovanje naročnikov, pro-



Razstavni prostor ZAS na kongresu

metnih planerjev, asfaltnih tehnologov in geoteknikov. Vzpostaviti je potrebno sisteme predhodnih preskusov, s katerimi bo možno simulirati vse obremenitve v voziščno konstrukcijo vgrajenih materialov in plasti.

- **sistemi zagotavljanja kakovosti asfaltnih del**

Sodobna spoznavanja in nove filozofije razumevanja zagotavljanja kakovosti kažejo, da za doseganje zahtevanega nivoja kakovosti proizvoda ni dovolj samo zagotavljanje kvalitete v proizvodnem procesu, temveč tudi v vseh fazah uporabe proizvodov. Ta spoznanja in nova zakonska regulativa (ZGO-1 in ZGpro) zahtevata, da je potrebno v procesu gradnje cest preiti iz obstoječe klasične kontrole kakovosti na sistem zagotavljanja kakovosti in nenehnega izboljševanja v celotnem ciklu uresničitve projekta, tj. od zasnovane in projektiranja preko izvedbe do uporabe in vzdrževanja objekta.

Osnova za nadzor nad kakovostjo gradnje ostaja notranja kontrola, za katero je zadolžen izvajalec del sam. Vendar pa je s predpisi uveljavljena praksa dodatne - zunanje kontrole, ki jo izvaja neodvisna inštitucija. Od inštitucij se tudi v naprej pričakuje pospešeno pridobivanje akreditacij za posamezne preskusne metode, kar bo pogoj za izvajanje del zunanje kontrole kvalitete v bodoče.

9. kolokvij o asfaltih in bitumnih

- Datum: 25. 11. – 26. 11. 2004
- Kraj: Hotel Larix, Kranjska gora
- Število udeležencev: 156 (iz 9 držav)

Združenje asfalterjev Slovenije je pod pokroviteljstvom slovenske energetske družbe Petrol 25. in 26. novembra organiziralo tradicionalni v letošnjem letu poimenovani 9. kolokvij o asfaltih in bitumnih. Tokrat je potekal na novi lokaciji v hotelu Larix v Kranjski gori.

V uvodnem pozdravnem nagovoru je predsednik ZAS Slovenko Henigman izpostavil tematiko kolokvija, ki je bila posvečena tehniki in varovanju okolja ter pojasnil, da smo se odločili za spremembo imena, ker na kolokviju v vseh letih doslej odkar poteka ta prireditev nikoli nismo obravnavali samo bitumnov ampak poleg le-teh tudi asfalte.



Na tehničnih predstavitev podjetij je bilo predstavljeno 10 prispevkov



Slovenko Henigman

Prvi dan srečanja je potekal redni letni sestanek tehničnega odbora - TO ZAS in sestanek predstavnikov Odbora podjetij in družb ZAS, na katerem so bile predstavljene aktivnosti v teko-

čem letu in podane smernice za prihodnje delo. Podano je bilo poročilo o izobraževanju v preteklem letu in predstavljen program za leto 2005. Podrobno je bilo predstavljeno delo tehničnega odbora - TO ZAS, v sklopu katerega so bila izdelana in predstavljena »Priporočila za proizvodnjo in vgrajevanje asfaltne zmesi DBM« (objavljena v tem biltenu) in novosti na področju tehnične regulative. Prav tako je bilo podano poročilo o delu Odbora za zdravje, varstvo in okolje.

Za podjetja, ki aktivno sodelujejo z ZAS, so bile prvi dan srečanja organizirane tehnične in komercialne predstavitve dejavnosti podjetij, njihovih produktov in tehnološkega razvoja na področju bitumenske in asfaltne dejavnosti.

V preddverju dvorane je na razstavnem prostoru svojo dejavnost predstavilo 16 poznanih slovenskih in tujih podjetij in sicer: Asphaltex, CM Celje, CGP,

CP Maribor, Igmtat, IMS AditOil, Interchem, Interchemika, Lespatex, Primorje, Possehl, Ro-tech, Tovarna asfalta Pomurje, SCT, Sika in Vögele.

Po programu je bilo na tehničnih predstavitev predstavljeno 10 prispevkov. S strani predstavnika Zavoda za gradbeništvo dr. Tušar-ja je bil podan pregled in ocena kakovosti bitumnov, ki so bili letošnjem letu uporabljeni v Sloveniji. Ga. Naglič pa je podala rezultate laboratorijskih analiz PmB bitumnov, ki so jih izvedli na Inštitutu Igmtat v Ljubljani. S stanjem na področju hidroizolacij v letu 2004 je prisotne seznanil g. Kavčič iz družbe DDC svetovanje inženiring.

Drugi del predstavitve je bil namenjen podjetjem in predstavitvi dosežkov v zadnjem obdobju. V tem sklopu sta predstavnik podjetja SCT predstavila izvedbo hidroizolacijskih in asfaltnih del na viaduktu Črni kal, ki



Pred slavnostno večerjo je udeležence pozdravil član uprave Petrola g. Jožef Petrovič

je bila zaradi specifičnosti objekta zelo zahtevna.

Na področju nizkotemperaturnih asfaltov je bilo v zadnjem letu izvedenih veliko testiranj. V sklopu T0 - posebne delovne skupine za nizkotemperaturne asfalte - je bilo preiskanih vrsta dodatkov, med njimi tudi »Aspha-min«, ki sta ga predstavila zastopnika podjetja Interchem in Eurovia. V nadaljevanju je bil predstavljen še en dodatek za znižanje temperature asfaltne zmesi »Sasobit« podjetja IMS AditOil.

Podjetje Possehl, ki ima v Sloveniji sigurno največ izkušenj na področju sanacij razpok, je predstavilo uveljavljene postopke in opremo za ta dela. Prav tako so predstavili tehnologijo barvnih asfaltov za uporabo na kolesarskih stezah in pešpoteh.

Posebni sistem dilatacij na premostitvenih objektih s sidrano armaturo in z uporabo asfaltne zmesi »Falcon«, ki prihaja z Japonske in omogoča vgrajevanje na licu mesta so predstavili predstavniki podjetja CMCelje, Interchem in japonskega podjetja Miki. V nadaljevanju je bil predstavljen tudi sistem dilatacij za večje premostitvene objekte »Serviflex«.

Postopke recikliranja asfaltov po hladnem postopku z uporabo emulzij so predstavili predstavniki podjetij Marini in Interchemika.

Pred slavnostno večerjo sta udeležence srečanja pozdravila izvršni direktor Petrol-a g. Jožef Petrovič in predsednik NO ZAS Marjan Makovec. Sledil je kulturni program Andraža Hribarja s skupino in slavnostna večerja.



Slavnostna večerja

Drugi dan se je centralnega dela kolokvija udeležilo 156 strokovnjakov iz devetih držav in sicer Avstrije, Italije, Nemčije, Madžarske, Hrvaške, Srbije, Anglije, Japonske in Slovenije.

V uvodu so nastopili predsednik ZAS g. Henigman, tehnični direktor DARS-a g. Abdon Peklaj, direktor DDC sveto-



Helle Fabiansen

vanje inženiring Metod Di Batista in direktor DRC Saša Skulj.

V strokovnem delu je bilo predstavljenih osem referatov. Helle Fabiansen - predsednica Odbora za zdravje, varstvo in okolje pri EAPA, Evropskem asfalterskem združenju iz Danske, je predstavila predvidevanja asfalterske industrije v prihodnje na področju zdravja, varstva in okolja.

Sledila sta dva referata s področja nizkotemperaturnih asfaltov. Aleksander Ljubič z inštituta Igmata je opisal razvoj postopkov priprav in preskusov nizkotemperaturnih asfaltov v podjetju SCT in Igmata ter prikazal rezultate izvedenih preiskav. Andre Taube iz nemškega asfalterskega združenja pa je predstavil tehnologije, možnosti in omejitve pri uporabi nizkotemperaturnih asfaltov.

Vodja Odbora za varstvo, zdravje in okolje pri ZAS Aleksander Kerstain je podal izhodišča in podlage za ravnanje z gradbenimi odpadki, ki vsebujejo bitumenska veziva z vidika možnih operativnih pristopov ter njihove okoljske, tehnološke in ekonomske vplive na asfaltersko industrijo v Sloveniji.



Pozdravni govor g. Abdon-a Peklaj-a – DARS

Izkušnje pri uporabi hladnih sistemov v Evropi in inovativna sredstva za zlepjenje plasti je predstavil Wolfgang Schönleitner iz Avstrije.

Novosti na področju tehnične regulative pri nas in področje ugotavljanja in potrjevanja skladnosti proizvodnje asfaltnih zmesi je predstavil dr. Marjan Tušar iz Zavoda za gradbeništvo.

Izkušnje pri uporabi dodatkov za nizkotemperaturne asfalte v Nemčiji je v svojem prispevku strnil dr. Wolfgang Garbe.

V zadnjem prispevku, ki sta ga pripravila Mitja Čotar in Zvonko Cotič pa so bile predstavljene praktične izkušnje uporabe DBM, drobirjev z bitumenskim mastiksom, ki jih imajo v



Zvonko Cotič

podjetju Primorje od začetkov proizvodnje do danes.

Kolokvij je bil zaključen s sklepnim govorom predsednika, ki je prisotne povabil na jubilejni 10. kolokvij o asfaltnih bitumnih, ki bo 1.in 2. decembra 2005 v hotelu Larix v Kranjski gori.



Na tehničnih in komercialnih predstavvah v predverju se je predstavilo 11 podjetij

- Datum: 11. 03. 2005
- Kraj: Hotel Mons, Ljubljana
- Število udeležencev: 114

Izobraževanje asfaltskega kadra

5. izobraževanje tehničnega asfaltskega kadra je bilo letos za udeležence iz vseh regij organizirano v Hotelu Mons v Ljubljani. Namenjeno je bilo tehničnemu in inženirskemu kadru.

Pri izboru programa izobraževanja je Sekcija za izobraževanje vodila problematika naraščajočih prometnih obremenitev, razpok na novih voziščih avtocest in do posledično priprave nekaterih novih dokumentov ter sistemov zagotavljanja in potrjevanja skladnosti.

V prvem delu izobraževanja je ga. Olga Naglič - vodja laboratorija za bitumenske materiale z Inštituta Igmat - prisotne seznanila z razvojem na področju bitumnov. Predstavila je nove



daljevanju predstavil Priporočila za projektiranje in proizvodnjo asfaltnih zmesi DBM, ki so bila izdelana s strani Tehničnega odbora pri ZAS in komisije za asfalt pri DARS.

G. Janez Prosen - vodja tehničnega odbora pri ZAS - je v svojem obširnem prispevku pojasnil kaj pomenijo posamezni nivoji skladnosti po evropski

V zadnji zelo pomembni tematiki »Varstvo pri delu v asfalterstvu« je g. Mitja Čotar iz podjetja Primorje predstavil prispevek, ki sta ga pripravila skupaj z g. Marjanom Maroltom iz SCT in je govoril o organizaciji asfaltskih del ter o ureditvi delovnega mesta za varno delo, o osebni zaščitni opremi asfalterjev in o vedno prepogostih nesrečah pri asfaltskem delu.

Izobraževanja se je udeležilo 114 predstavnikov iz 21. cestogradbenih podjetij, ki praktično vsa aktivno sodelujejo z ZAS. Vsi udeleženci so prejeli delovno gradivo s povzetki predavanj, bilten ZAS in potrdilo o udeležbi na izobraževanju ob zaključku.

Veliko število udeležencev in zanimive diskusije ob zaključkih posamez-



metode preiskovanja in usmeritve pri izbiri bitumnov v prihodnje glede na različne pogoje uporabe.

V nadaljevanju je g. Aleksander Ljubič - vodja asfaltnega laboratorija - predstavil zgodovino, področje projektiranja veliko uporabljenih in zelo zahtevnih asfaltnih zmesi DBM, drobirjev z bitumenskim mastiksom, izpostavil je probleme pri vgrajevanju te zmesi v zadnjem obdobju - predvsem zaradi visokih in nizkih temperatur in povečanih prometnih obremenitev - in v na-

Direktivi in Zakonu o gradbenih proizvodih. V razpravi so bili razjasnjeni posamezni detajli pri pridobivanju potrdil - izjav o skladnosti.

Po kratkem odmoru je v drugem delu ga. Julijana Jamnik iz DDC svetovanje inženiring udeležence seznanila s področjem hrupnosti: o nastanku in razvoju hrupa, izsledkih iz raziskovalne naloge o hrupnosti različnih asfaltnih vozniških površin, kaj lahko pričakujemo od posameznih vrst asfaltnih zmesi in kakšni so ukrepi za zmanjšanje hrupa.

nih predavanj kažejo, da so bile teme letošnjega izobraževanja za sodelujoči krog udeležencev potrebne in dobro izbrane. Za uspešno izvedbo projekta izobraževanja velja posebna zahvala vsem predavateljem ter vsem prizadevnim članom Sekcije za izobraževanje, ki so prispevali k uspešni izvedbi izobraževanja.

Jožica Cezar

Intervju: Dariusz Slotwinski

Predsednik EAPA



Gospod Slotwinski ali bi se lahko predstavili. Kaj nam lahko poveste o vaši karieri ?

V letih med 1962 in 1977 sem delal v centralnem laboratoriju in nato v regionalni cestni upravi v Varšavi. Nato me je pot vodila v tujino, kjer sem bil do leta 1998 direktor različnih projektov v Libiji in Iraku. Vodil sem izgradnjo avtocestnih projektov v skupni dolžini okoli 300 km. V obdobju med leti 1998 in 2002 sem bil tehnični direktor nato pa podpredsednik in predsednik največje Poljske cestno-gradbene družbe Dromex. Od leta 2002 sem predsednik družbe Strabag Poljska.

Poleg same profesionalne kariere sem tudi član številnih združenj kot npr. Poljskega cestnega inženirskega združenja, član IRF, predsednik poljskega asfalterskega združenja PAPA in predsednik evropskega asfalterskega združenja EAPA.

Za predsednika EAPA ste bili izvoljeni maja lani, za prihodnji dve leti. Kakšna je situacija v tem združenju in katerim nalogam boste kot predsednik dajali prednost?

Dve prednostni področji delovanja EAPA lahko označim takole:

- zunanje sestoji iz aktivnosti znotraj tehničnih odborov CEN, sodelovanja z Evropsko komisijo in lobiranja v Bruslju v zvezi z zadevami, pomembnimi za asfaltersko stroko
- notranje pa se osredotoča na člane EAPA in medsebojno tehnično pomoč, izmenjavo izkušenj in spodbujanje neposrednega sodelovanja med nacionalnimi združenji.

Lobiranje je bilo doslej omejeno in težavno zaradi velike razdalje med sedežem EAPA in Brusljem. Pričakovati je, da bo preselitev sedeža EAPA v Bruselj precej izboljšala položaj, saj bo omogočila izvajanje praktičnih aktivnosti znotraj Evropske komisije in tudi vplivanje na interpretacijo obstoječe zakonodaje in na nastajajočo novo zakonodaje ter iniciative v zvezi z asfalterstvom.

V novih članicah EU se odpira velikansko tržišče, povezano z razvojem cestne infrastrukture. Menim, da bi morali dati prednost promociji asfaltnih tehnologij s poudarjanjem in dokazovanjem tehničnih in ekonomskih prednosti asfalta v primerjavi z drugimi rešitvami (cement).

To aktivnost bi morala EAPA močno podpreti z zbiranjem in posredovanjem informacij o pozitivnih izkušnjah in najboljših postopkih.

Glavna aktivnost EAPA je usmerjena v probleme, ki se tičejo zdravja, varnosti in okolja. Kakšen pa je vaš pogled na tehnična vprašanja?

Dejstvo, da se osredotočamo na vprašanja zdravja, varnosti in okolja, ni naključje, temveč posledica resnič-

nih potreb in nevarnosti. Zaradi družbenih in ekonomskih razlogov ne smemo dopustiti, da bi asfalt, ki ima bogato in dolgo tradicijo, doživel enako usodo kakor azbest in katran. Da bi preprečili to situacijo, so se pojavile razne iniciative. Tako je tu študija NCC, ki bo ugotovila nevarnost (če ta obstaja), pripravljajo pa se tudi raziskave o znižanju temperature proizvodnje in vgrajevanja MMA in o zmanjšanju emisije hlapov.

Velikega pomena je tudi ekonomski vidik kot posledica zmanjšanja porabe energije pri proizvodnji MMA.

Obstaja zelo tesno sodelovanje med EAPA in CEN. Te dni bo v Pragi sestanek Tehničnega odbora EAPA, kjer bodo glavne točke dnevnega reda posvečene nizkotemperaturnim asfaltom, trajnim voziščnim konstrukcijam, obstojnosti površinskih plasti, zmanjševanju smradu in varnosti.

Tehnični odbor koordinira aktivnosti predstavnikov EAPA v tehničnih komisijah CEN, ki se ukvarjajo s področji voziščnih konstrukcij, MMA in veziv.

Videti je, da je reševanje problemov standardov za asfaltne voziščne konstrukcije v zaostanku v primerjavi s problemi, ki zadevajo toge voziščne konstrukcije. Zato se nam zdi potrebno pospešiti proces priprave standardov in razvoja sistema uvajanja novih standardov. V tem pogledu je potrebno zelo tesno sodelovanje med člani EAPA.

Ste predsednik PAPA, Združenja asfalterjev Poljske. Nam lahko poveste, kaj poljski asfalterji pričakujejo od EAPA?

Zadnji čas je število članov EAPA, ki prihajajo iz Srednje in Vzhodne Evrope, naraslo (in bo verjetno raslo še naprej). Raven kakovosti in obseg cestne

infrastrukture v teh državah se znatno razlikuje od ravni cestne infrastrukture v zahodnoevropskih državah. V zvezi s tem se nam zdi nujno v okviru EAPA ustanoviti določene organizacijske strukture, ki bi podprle pretok praktičnih tehničnih informacij o asfaltnih tehnologijah. To bi omogočilo novim članicam bolje izkoristiti izkušnje, ki jih imajo na tem področju zahodnoevropske države.

Predlagane organizacijske strukture bi bile lahko videti takole:

- krajše tehnične ekskurzije, organizirane za skupine predstavnikov nacionalnih združenj
- tesno sodelovanje in izmenjava izkušenj na področju izvajanja standardov EN (obravnavo dokumentov), posebej tistih, ki se tičejo (vročih) zmesi, ki so trenutno v pripravi.

Poleg tega bi bilo zelo potrebno izdelati praktična tehnološka priporočila za sledeča področja:

- postopki rekonstrukcije in tehnologije posodabljanja asfaltnih voziščnih konstrukcij na mestnih in sekundarnih državnih cestah
- postopki vzdrževanja asfaltnih vozišč sekundarnih državnih cest
- optimalne metode reciklaže asfaltnih voziščnih konstrukcij

Izplačalo bi se premisliti o možnostih priprave/obravnave t.i. »delovnih priporočil«, kratkih smernic (dolgih 1-2 strani), ki bi pokrivala različna področja tehnologije asfaltnih vozišč in bi imela ključno vlogo pri zagotavljanju kakovosti (tehničnih karakteristik in značilnosti rabe) zgrajene voziščne konstrukcije.

Kako vidite razlike med »starimi« in »novimi« evropskimi državami na področju asfaltnih cest?

Stopnja razvoja infrastrukture se precej razlikuje, tako po kakovosti in po obsegu. Različni člani EAPA se bodo najbrž osredotočili na različne aktivnosti združenja. Za »nove« države bosta osrednjega pomena prenos teh-

nologije in tehnična pomoč, za »stare« pa področje zdravja, varnosti in okolja.

V naslednjem obdobju se bo EAPA preselila v Bruselj. Kakšen bo po vaših predvidevanjih vpliv te preselitve?

Od selitve sedeža EAPA v Bruselj si obetamo veliko prednosti. Lobiranje bo postalo veliko lažje in učinkovitejše.

Lobiranje bi se moralo osredotočiti predvsem na Evropsko komisijo in delovati kot glavni komunikacijski kanal med evropskim asfaltnim sektorjem in komisijo.

Očitno je, da EAPA ni dobro poznana med uslužbenci Evropske komisije. Pravzaprav lahko rečemo, da je povsem nepoznana. Prvi korak k partnerstvu je postati znan. Za doseg tega statusa pa je potrebno pošiljati sporočila - in ta morajo biti jasna in natančno definirana.

Če bo EAPA sprejeta za partnerja, se bodo razširile možnosti za prejemanje informacij o predlogih za bodočo evropsko zakonodajo.

Želim vam vse najboljše za prihodnost.

Interview with Dariusz Slotwinski, President of EAPA

Mr. Slotwinski, can you introduce yourself? What can you tell us about your career?

From 1992 to 1997 I worked in a central laboratory and then in the regional road administration in Warsaw. After that my career led me abroad where I had been a manager of various projects in Libya and Iraq until 1998. I led the motorway construction projects in a total length of about 300 km. From 1998 to 2002 I was a technical manager and after that the vice-president and president of Polish road construction company Dromex. Since



2002 I am the president of Strabag Poland company.

You were appointed a president of EAPA in May last year for the next two years. How is the situation in EAPA and what are your priorities as the president?

Two priority fields of EAPA's activity can be described as follows:

- external - consisting in activity within CEN Technical Committees, cooperation with European Commission and lobbying in Brussels for issues important for the asphalt industry.
- internal - aiming at EAPA members and regarding active technical assistance, exchange of experiences and encouraging direct cooperation between the national organizations.

So far the lobbying activity was limited and difficult due to the distance between EAPA office and Brussels. It seems that moving EAPA office to Brussels should improve this situation considerably as it will make it possible to carry on practical activity within European Commission as well as influence the interpretation of the existing legislation and shape of arising new legislation and initiatives concerning the asphalt industry. The huge market connected with the development of road infrastructure is now emerging in new members countries. I think that priority should be given to the promotion of asphalt

technologies through indicating and proving its technical and economic advantages in comparison with the other solutions (cement).

This activity should be strongly supported by EAPA through collecting and distributing information concerning the positive experiences and best practices.

The main activities of EAPA are focused on health, safety and environment matters - how do you see the technical questions?

Focusing on health, safety and environmental issues is not accidental but results from real needs and threats. Due to the social and economic reasons we shouldn't allow asphalt, with its rich and long tradition, to follow the fate of the asbestos and coal tar. Different initiatives have been undertaken to prevent such situation. On one hand we have the NCC Study which are to define the real threat (if exists) and on the other research on lowering production and application temperature of MMA and on reducing the fumes emission are under way.

Also the economic aspect resulting from the reduction of energy consumption of MMA production is of great importance.

There is very close cooperation between EAPA and CEN. These days we have in Prague the meeting of EAPA Technical Committee and the main points of the agenda concern the low-temperature asphalts, perpetual pavements, durability of surface layers, odour reduction and safety issues.

The Technical Committee coordinates the activity of EAPA representatives in CEN Technical Commissions dealing with problems regarding the pavements, MMA and binders.

The issues' concerning standards for asphalt pavements seems to be delayed in comparison with those regarding the rigid pavements. Due to this we consider it necessary to speed up the process of establishing of the standards as well as elaborating the system of implementation of the new standards. In this respect very close

cooperation between EAPA members is necessary.

You are a president of PAPA. What is expected by Polish asphalt industry from EAPA?

The number of EAPA members coming from the Central and Eastern Europe countries has grown lately (and probably will continue to grow). The qualitative and quantitative level of the road infrastructure in these countries differs considerably from the level of the road infrastructure in the countries of Western Europe. In this connection we consider it necessary to create within the framework of EAPA certain organizational structures/forms supporting the flow of practical technical information regarding asphalt pavements technologies. This would allow the new country members to make better use of experience gained in this respect in the countries of Western Europe.

Proposed organizational structures might take the following forms:

- short-term outgoing technical tours organized for the groups consisting of the representatives of the national associations
- close cooperation and exchange of experiences on implementation of EN standards (elaborating the application documents), especially those regarding (hot) mix being now under preparation.

Furthermore very important issue would be to work out practical technological guides regarding the following problems:

- methods of reconstruction and modernization technologies of asphalt pavements on urban and secondary national roads
- methods of maintenance of asphalt pavements on secondary national roads
- optimum methods of asphalt pavements recycling

It would be worthwhile to consider the possibilities of preparing/elaborating so called »work tips« - short one/two pages of guidelines covering different issues on asphalt pavements technologies and having crucial importance for the quality (technical and operational characteristics) of constructed pavement.

How do you see the differences between the »old« and »new« European countries in the asphalt industry?

The stage of infrastructure development differs considerably both in quality as well as in quantity. Different EAPA members might focus on different in the activity of the association. For »new« countries the most important will be the technology transfer and technical assistance, for »old« ones - health, safety and environmental issues.

EAPA will move to Brussels in the next period. What are envisaged impacts of such change of headquarters?

We are expecting many advantages from moving EAPA office to Brussels. The lobbying activity will be much easier and more effective.

The activity »lobbying« should first and foremost be concentrated on lobbying the European Commission and act as the main channel of communications between the European asphalt industry and the Commission.

It is evident that EAPA is not very well known by the employees in the European Commission. As a matter of fact EAPA is unknown. The first step to be a partner is to be known. You need messages - clear and well defined messages - to achieve this status. If EAPA is accepted as a partner the possibilities of obtaining information on proposals for future European legislation will be improved.

I wish you all the best for the future ...

Intervju: Egbert Beuving,

Tehnični direktor EAPA



Koliko let ste že zaposleni pri EAPA in kakšna je bila vaša kariera, preden ste se pridružili združenju?

Zdaj sem pri EAPA že štiri leta. Kar pa se tiče moje službene poti, začniva kar pri začetku. Leta 1980 sem magistriral na Tehnični univerzi v Delftu na Nizozemskem. Študiral sem gradbeništvo, specializiral pa sem se za voziščne konstrukcije. V svoji magistrski nalogi sem se ukvarjal z interpretacijo podatkov, dobljenih z deflektometrom s padajočo utežjo (FWD), v drugem delu naloge pa z vplivom značilnosti cestne površine na varnost vožnje. Še pred magisterijem sem začel delati pri svetovalnem podjetju, ki je spadalo k nizozemskemu izvajalcu HWZ. Podjetje se je imenovalo Netherlands Pavement Consultants (NPC) in že takrat smo pogosto uporabljali FWD za merjenje nosilnosti obstoječih cest. Začel sem kot vodja projekta, kasneje pa sem postal tudi tehnični direktor NPC.

V desetih letih sem spoznal vse vidike svetovanja in začutil sem potrebo po koreniti spremembi. Tedaj sem se pridružil podjetju CROW, Nizozemske-

mu informacijskemu in tehnološkemu centru za promet in infrastrukturo, kot vodja projektov. Tam sem koordiniral nacionalne raziskovalne projekte na področjih cestogradnje, okolja in asfaltnih voziščnih konstrukcij. Postal sem tudi član več evropskih odborov, med drugimi COST Action 336 (Deflektometer s padajočo utežjo), COST Action 337 (Nevezani cestogradbeni materiali) in odbora RILEM za preprečevanje refleksijskega pokanja voziščnih konstrukcij. Bil sem vodja odbora COST Action 336 (Deflektometer s padajočo utežjo), tako da sem delal z ljudmi iz več kot 20 evropskih držav. V mednarodnem sodelovanju sem res užival, zato je bila odločitev, da začnem delati za EAPA (leta 2001), prav lahka.

Nam lahko opišete vaše glavne aktivnosti v združenju?

Na kratko bi lahko rekel, da spodbujam učinkovito rabo asfalta pri gradnji in vzdrževanju cest (v Evropi) in sodelujem v Evropskem odboru za standardizacijo in v več odborih CEN. Delujem torej v številnih odborih, sem npr. tajnik Tehničnega odbora EAPA in Odbora za zdravje, varstvo in okolje (HSE) pri EAPA.

Sem vodja tehničnega odbora CEN TC 227 WG 1 »Bitumenske zmesi«, član CEN TC 336 »Bitumenska veziva za vozišča« in član delovne skupine EOTA »Ultratanke asfaltna in betonske plasti«. Sem tudi moderator ad-hoc skupin »Sprijemnost« in »Sprijemnost - trajnost«. Zastopam tudi asfaltersko stroko v odboru PIARC C 4.3 Road Pavements.

Bil sem član organizacijskega od-

bora tretjega kongresa E&E na Dunaju in vodja tehničnega odbora kongresa E&E leta 2004. Trenutno pripravljamo četrti kongres E&E, ki bo leta 2008. Tu pa so še številne druge aktivnosti, kot so prispevki za publikacije Asphalt in Figures (Asfalt v številkah), EAPA Newsletter (bilten združenja EAPA) in drugo.

Katera od te množice nalog je po vašem najpomembnejša?

Težko vprašanje. Veliko aktivnosti je povezanih in upam, da vidijo člani EAPA vse aktivnosti kot pomembne. Če naj izpostavim štiri najpomembnejše, bi bile to delo v Tehničnem odboru in Odboru za zdravje, varstvo in okolje pri EAPA, CEN TC 227 WG1 in kongres E&E.

Kako vidite razvoj asfalterstva v zadnjem obdobju in v katero smer kaže nadaljnji razvoj?

V preteklosti je asfalterstvo proizvajalo asfaltne zmesi po recepturah, ki so jih zagotavljale cestne uprave, in asfaltiralo ceste glede na njihove zahteve. Odločilni kriterij za cestne uprave je bila najnižja cena. V prihodnosti se bomo obrnili k funkcijskim zahtevam. Tedaj bodo večjo odgovornost nosili proizvajalci asfalta in izvajalci. V tem primeru cena ne bo edino merilo. Zmesi bo projektiral proizvajalec asfalta/izvajalec, ki bo moral vedeti, koliko časa se bo določena plast zadovoljivo obnašala (trajnost) in kakšna so tveganja pri vgrajevanju v določenem letnem času. To pomeni, da bo v prihodnje ocenjevanje tveganja igralo pomembno vlogo. Ko bo izvajalec

odgovoren za dolgoročno obnašanje asfaltne plasti, bo dober nadzor proizvodnje in kakovosti postal pomemben za podjetje samo. To bo asfalterstvu dalo nove izzive in proizvodnja visokokakovostnih zmesi/plasti bo postala veliko bolj zanimiva. Pomembna bo tako cena, kakor tudi kakovost. Dobro podjetje bo imelo več priložnosti izkazati se pred drugimi.

Ste aktiven član CEN. Kdaj lahko pričakujemo končne verzije evropskih standardov?

Osnutki standardov za bitumenske zmesi so že pripravljene za predložitev v potrditev. Uradno glasovanje se bo začelo z začetkom maja, končalo pa v začetku julija 2005. Če bo vse potekalo po načrtu, bo datum, ko bodo standardi na voljo (datum začetka veljavnosti), 1. april 2006. Datum, od katerega se bodo standardi dali rabiti (datum začetka uporabnosti), pa bo 1. januar 2007. Datum, od katerega bodo te standarde morali rabiti vsi, bo 1. januar 2008. Takrat se bodo morali neusklajeni standardi umakniti (datum preklica).

Kakšne spremembe bodo prinesli evropski standardi? Kako bodo vplivali na asfalterško stroko?

Novi evropski standardi bodo seveda prinesli mnoge spremembe. Njihov vpliv bo različen v raznih evropskih državah, kar je odvisno od njihovega obstoječega sistema. Začetni preskusi in nadzor proizvodnje bodo odslej potekali v skladu s standardi. Pravzaprav so bili standardi napisani za proizvajalce asfalta. Ti bodo morali prijaviti karakteristike proizvodov, ki jih bodo proizvajali oz. jih morejo proizvajati.

Cilj Evropske komisije je svobodno tržišče znotraj EU. Za doseg tega cilja bodo morali biti proizvodi označeni (CE) in ravno zato Evropska komisija pospešuje standardizacijo.

Jasno je, da je uvoz in izvoz vročih zmesi med državami omejen, če asfaltni obrat ni blizu meje. Je pa za asfalterstvo izjemno pomembno, da ima evropske standarde, saj bomo tako govorili skupen jezik, imeli skupen sistem, skupne standarde in preskusne metode. Lahko bomo izmenjavali izkušnje in informacije. Skupaj bomo lahko delali na prihodnosti, za prihodnje generacije.

Prav tako bo podjetjem (izvajalcem in svetovalcem), ki delujejo v različnih državah, olajšana komunikacija. Evropske standarde bodo v prihodnosti lahko uporabljale tudi druge, neevropske države, kar bo evropskim državam olajšalo delo v tujini.

Kako ocenjujete razvoj znotraj novih članic EU? Tam je večja pozornost veljala tehničnemu področju, kakor pa problemom varovanja okolja. Kako to razlagate?

Različne države imajo različne navade, pravila, postopke projektiranja in izkušnje. V »starih« članicah EU se je okoljskim problemom posvečala večja pozornost, ker so njihova cestna omrežja skoraj gotova in se je pozornost preselila z gradnje novih cest k vzdrževanju in ekologiji. V državah, ki so še na stopnji razvoja in šele izgrajujejo svoje (potrebno) cestno omrežje, pa gre seveda večja pozornost cestogradnji in manjša okolju. Vendar bo tudi tu prišlo do premika k vzdrževanju in ekologiji, ko bo gradnja cest zaključena.

Bi EAPA morala zastaviti različne prednostne naloge starim in novim članicam?

Seznam prioritet EAPA bi moral ločevati med nalogami, katerim naj dajejo prednost stare, in tistimi, ki naj jim posvetijo večjo pozornost nove članice. Seveda pa je tudi veliko takih, ki so pomembne za oboje. Menim, da (stroga) razmejitev med tema skupina-

ma držav ni potrebna. Izogniti bi se morali ločevanju članic na dvojce.

G. Egbert, v Sloveniji ste bili že večkrat. Kakšno je vaše mnenje o naši državi?

Slovenija je sijajna dežela. Pokrajina je resnično lepa in ljudje so prijazni in gostoljubni. Slovenci ste zagreti za inovacije in napredek. Na področjih, kjer ste še v fazi razvoja, trdo delate na posodobitvi. Nedavno smo imeli srečanje Odbora za zdravje, varstvo in okolje EAPA v Sloveniji in že zdaj se veselim, da bom spet prišel decembra, na 10. kolokvij ZAS.

Nasvidenje torej na 10. kolokviu o asfaltih in bitumnih in hvala za pogovor.

Interview with Egbert Beuing, Technical Director of EAPA

How many years have you been employed by EAPA and what was your career like before joining EAPA?

I've been working four years for EAPA now. Concerning my career, let's start at the beginning. In 1980 I received my Master of Science degree at the Technical University of Delft in the Netherlands. I studied civil engineering and my specialisation was pavement engineering. My Master Thesis was dealing with the »Interpretation of Falling Weight Deflectometer (FWD) data« and the second part dealt with the influence of road (surface) characteristics on the traffic safety. Already before receiving my degree I started to work for a consultancy company that was belonging to the Dutch contractor HWZ. The consultancy was called Netherlands Pavement Consultants (NPC) and at that

time we already used a FWD frequently to measure the bearing capacity of existing roads. I started as project manager and later on I became the Technical Manager of NPC.

After 10 years I had seen all the aspects of the consultancy and I felt the need for a real change. Then I joined CROW, the Dutch Information and Technology Centre for Transport and Infrastructure as a project manager. There I co-ordinated National research activities in the area of road construction, environmental issues and asphalt pavements. I also became member of several European Committees, such as COST-Actions 336 (Falling weight Deflectometer), COST Action 337 (Unbound road materials) and the RILEM Committee on Preventing Reflective Cracking in Pavements. I was chairman of COST Action 336 'Falling Weight Deflectometer' and so I worked together with people of more than 20 Europe countries. I really enjoyed working internationally. So the decision to start to work for the European Asphalt Pavement Association (in 2001) was an easy one.

Could you describe your main activities in the Association?

In short you could say that I promote the effective use of asphalt in the construction and maintenance of roads (in Europe) and I participate in European Standardisation in several CEN committees. So I am working in a lot of committees. To give some examples: I am the secretary of the EAPA Technical Committee and the EAPA HSE Committee.

I am the chairman of CEN TC 227 WG 1 'Bituminous Mixtures' and member of CEN TC 336 'Bituminous binders' and CEN TC 336 WG 1 'Bituminous binders for paving' and member of the EOTA Working Group Ultra-Thin-Layer-Asphalt-Concrete. Then I am moderator of the industry Ad-hoc Group Adhesion and chairman of the CEN Ad-hoc Group Adhesion - Durability. I also

represent the asphalt industry in PIARC committee C 4.3 Road Pavements.

I was member of the Organising Committee of the 3rd E&E Congress in Vienna and chairman of the Technical Committee of the E&E Congress 2004. Now we are working on the 4th E&E Congress 2008. There also a lot of other activities like for instance Asphalt in Figures, EAPA Newsletter, etc.

Which of those numerous tasks is in your opinion the most important?

That is a difficult question. A lot of activities are related and I hope all the activities are regarded as important by the EAPA members. If I should mention the 4 most important ones I would mention the EAPA TC and HSE committee, CEN TC227 WG1 and the E&E Congress.

How do you see the development of the asphalt industry in the last period and in which direction we can anticipate it's steps in the future?

In the past the asphalt industry produced asphalt mixes according to the mix formulations supplied by the road authorities and they paved the asphalt roads according to the requirements of the road authorities. The lowest price was the decisive criteria used by the road authorities. In the future we will go to functional requirements. Then more responsibility will go to the asphalt producer and the asphalt contractor. In this way it is not only the price that is important. The asphalt producer/ contractor will design the mixes and he should know how long a certain layer will perform well (so how long it will last) and how much risk one will have if it will be applied in a certain period of the year. This means that risk assessment will be important in the future. So when the contractor is responsible for the asphalt layer for a

long period, a good production control and quality control will be important for the company itself. This will give the asphalt industry new challenges and producing high quality asphalt mixes/ layers will become much more interesting. Then the price and the quality are both essential. A good company has more possibilities to distinguish himself from the others.

You are active member of CEN. When can we expect the final versions of the European standards?

The draft standards for Bituminous Mixtures are ready now for Formal Vote. The Formal Vote procedure will start in the beginning of May and will finish in the beginning of July 2005. When everything goes according to plan, the date that the standards are available (Date of Availability) will be 1 April 2006. The date that the standards can be used (Date of Applicability) will be 1 January 2007. The date everybody has to use them will be 1 January 2008. Then conflicting standards should be withdrawn (Date of Withdrawal).

What changes will the European standards bring? How will this influence the industry?

The new European standards will clearly lead to several changes. The influence will be different in the different European countries. It depends on their present system. We will have Initial Type Testing and Factory Production Control according to the standards. In fact the standards are written for the asphalt producers. The asphalt producers have to declare the characteristics of their products they will or can produce.

The goal of the European Commission is to have a free market in the European community. So to have a free trade of goods the products will have to be CE-marked. For this reason the

European Commission stimulates European standardisation

Of course we do not export a lot of hot mix from one country to another except the asphalt plant is close to a boarder. It is however very important for the asphalt industry to have European Standards. When we have European standards we will speak the same language, we will use the same system, the same standards and the same test methods. We can exchange experience and information. Together we can work on the future; the next generation.

Also for the companies (contractors and consultants) that work in different countries it will be easier to communicate. The European standards may also be used in other countries (outside Europe) in the future. In this way it will be easier for European countries to work abroad.

How do you estimate the development in the new EU member states? There was more attention devoted to technical issues than to environmental ones. How do you explain that?

Different countries have different habits, rules, design procedures and experiences. In the »old« EU member states environmental issues have be-



come more important because their road networks are almost finished and the attention moves from building new roads to maintenance and paying more attention to environmental issues. In countries that are in the development phase and that are building their (essential) road network now, more attention goes to the road construction and less to the environment. When the road construction is finished the attention will move to maintenance and environment too.

Should EAPA set different priorities for »old« and »new« member states?

In the EAPA's list of priorities there should be items that are important for the »old« member states and items that are important for the »new« member states. Of course there are also a lot of items that are important for both. In my opinion we should not ma-

ke a (clear) distinction between these two types of countries. We should avoid having two groups of members.

Mr. Egbert, you have been to Slovenia several times. What is your opinion about Slovenia?

Slovenia is a great country. The landscape is really beautiful and the people are very friendly and hospitable. The Slovenians are eager to innovate and to come forward. In the areas where they are in the »development stage« they are working very hard to catch up. Recently we had an EAPA Health, Safety and Environment Committee meeting in Slovenia and I am looking forward to come to Slovenia again in December when ZAS organises the 10th Colloquium.



See you at the 10th Colloquium on Asphalt and Bitumen and thank you.

Obrabne plasti za zmanjšanje hrupa motornih vozil na cestah

Varovanje okolja postaja vse bolj potreba človeštva na Zemlji. Široka javnost ocenjuje hrup v splošnem kot izrazito nadlogo. Pri tem je hrup prometa na cestah na visokem mestu. Reševanje tega problema zahteva celovito obravnavo možnosti za preprečitev nastanka hrupa kot tudi za zaščito pred njim. To je predvsem pomembno za zagotovitev primarne kakovosti življenja v naseljih v bližini bolj obremenjenih cest.

Značilnosti vozne površine, ki vplivata na hrup, sta predvsem hrapavost in votlavost. Razvoj teži k

- hrapavosti vozne površine, ki povzroča čim manjše vzbujanje pnevmatik v nihanje in čim manjši šum zračnih tokov v profilu pnevmatike in
- izdelavi votlavih obrabnih plasti, ki hrup absorbirajo.

Ko skušamo ustvariti tišje obrabne plasti se moramo zavedati, da s tem ne smemo poslabšati osnovnih lastnosti obrabnih plasti.

Hrapavost

Mikrohrapavost je potrebna za zagotovitev primerne trenja med pnevmatiko in vozno površino, ne povzroča pa večjega hrupa, ker ne vzbuja večjega nihanja pnevmatike zaradi vtiskanja zrn. Na grobo hrapavi vozni površini je vtiskanje hrap v pnevmatiko intenzivnejše, zato je hrup kotaljenja večji.

Iz navedenega izhaja, da do sovalovi na vozni površini do določene dolžine potrebni, večji pa nezaželeni. Optimum leži v območju makroteksture, to je vozne površine z razmiki med konicami zrn približno 1 do 10 mm, ki

jo je mogoče zagotoviti z zmesmi skeletne sestave, ki vsebujejo zrna do približno enake velikosti 8 oziroma 11 mm, torej asfaltna zmes za obrabno plast naj bi vsebovala kamnita zrna drobirja, velika do 11 mm.

Votlavost

Votlave obrabne plasti, pri katerih segajo votline v globino, ali pa so povezane celo skozi vso plast, so bile v nastanku namenjene predvsem povečanju varnosti vožnje. Z njimi je odpravljeno zastajanje vode na vozni površini, pnevmatike vodo lažje in hitreje odrinejo z območja naleganja na vozni površini, nastajanje pršca za vozili je skoraj onemogočeno, zmanjšano je bleščanje svetlobe luči vozil. Poleg izboljšanja varnosti vožnje so votlave obrabne plasti v veliki meri sposobne tudi zmanjšati hrup, ki ga povzročajo motorna vozila = absorpcija.

Prednosti in pomanjkljivosti votlavih in grobohrapavih obrabnih plasti



Votlava plast



Grobohrapava plast

Grobohrapave obrabne plasti povzročajo v mokrem vremenu pršec za vozilom, hrup kotaljenja je velik, zrna so

izpostavljeni večjemu zaglajevanju, povečan je odpor kotaljenja, kar povzroča večjo porabo goriva, povečana je tudi obraba pnevmatik.

Votlava obrabna plast ima veliko boljše sposobnost dreniranja, kar zmanjšuje pršec za vozilom, hrup kotaljenja je bistveno manjši zaradi absorptivnega učinka plasti, zaglajevanje je manjše in tudi odpor kotaljenja je manjši.

Seveda imajo votlave plasti tudi svoje pomanjkljivosti, ki se kažejo v

- pogojih uporabe pozimi (potrebna je dvakrat večja količina soli za posipanje, posip z drobirjem ni dovoljen zaradi nevarnosti zapolnitve votlin),
- potrebi po rednem čiščenju votlin v obrabni plasti z vodnim curkom pod primernim pritiskom za zagotavljanje odvajanja padavinske vode skozi obrabno plast in
- pomanjkljivem odvajanju vode ob robu votlave obrabne plasti, ki lahko povzroči zamrznitev vode v votlinah in posledično porušitev.

Primerno drenažno sposobnost je potrebno zagotoviti s čim večjim prostorskim deležem votlin (približno 20 % V/V). Le to se da zagotoviti z enozrnatimi sestavami zmesi, ki pa iz tehničnih in gospodarskih razlogov niso primerne. Primeren delež votlin lahko zagotovimo tudi z izpadlo zrnastostjo v sicer enakomerno sestavljeni zmesi kamnitih zrn. Tako je lahko preprečiti, da prostih votlin, ki jih ustvarijo večja zrna, ne bi zapolnila zrna naslednje manjše zrnastosti.

Ker se pri takšni votlavi, izrazito skeletni sestavi asfaltna zmesi, v zmesi kamnitih zrn zelo zmanjša število sti-

kov med zrnji, to pogojuje, da imajo kamnita zrna v zmesi veliko trdnost robov in konic, vendar tudi čim večjo ostrino površine na prelomnih ploskvah.

Votlavost pogojuje dve značilni obremenitvi veziva: večja oksidacija ter povečane natezne napetosti in večje strižne sile na robovih in konicah zrn. Za prevzem teh dodatnih obremenitev je potrebno kakovostno vezivo (vmešanje ustreznih polimerov in elastomerov v standardizirani cestogradbeni bitumen) in povečanje debeline filma bitumenskega veziva, ki obvlada zrna.

Obrabne plasti za zmanjšanje hrupa

Če povzamemo do sedaj povedano, je potrebno za doseg manj hrupnih asfaltnih plasti zagotoviti primerno makrohrapavost in votlavost obrabne plasti, ki bo hkrati zagotavljala tudi varnost prometa in trajnost obrabne plasti.

Največjo vsebnost votlin imajo asfaltne **zmesi drenažnega asfalta (DA)**.

Bistveno manjšo vsebnost votlin, vendar za zmanjšanje hrupa še vedno zelo ugodno teksturo, imajo obrabne plasti, zgrajene iz asfaltne zmesi **drobirja z bitumenskim mastiksom (DBM)**. Predvsem je DBM bolj odporen proti preoblikovanju, bolj trajen ter lažji za vzdrževanje in vgrajevanje.

Raziskave ravni hrupa na obrabnih plasteh za zmanjšanje hrupa

Da bi ugotovili, katera vrsta asfaltnih zmesi, uveljavljena za obrabne plasti v naši praksi, ustvarja najmanjši hrup kotaljenja in ali značilnosti pri nas že uveljavljenih vrst asfaltnih zmesi za obrabne plasti kažejo drugačne medsebojne odnose kot v inozemstvu, je bila leta 2002 v sklopu razvojno raziskovalnih nalog DARS izvršena temeljna raziskava z naslovom »Vplivi vrste asfaltne zmesi na hrupnost« (izvajalec ZAG, Zavod za gradbeništvo Slovenije). S podobnimi merilnimi postopki so bile na 30 odsekih preskuše-

ne značilne lastnosti v obrabne plasti vgrajenih asfaltnih zmesi

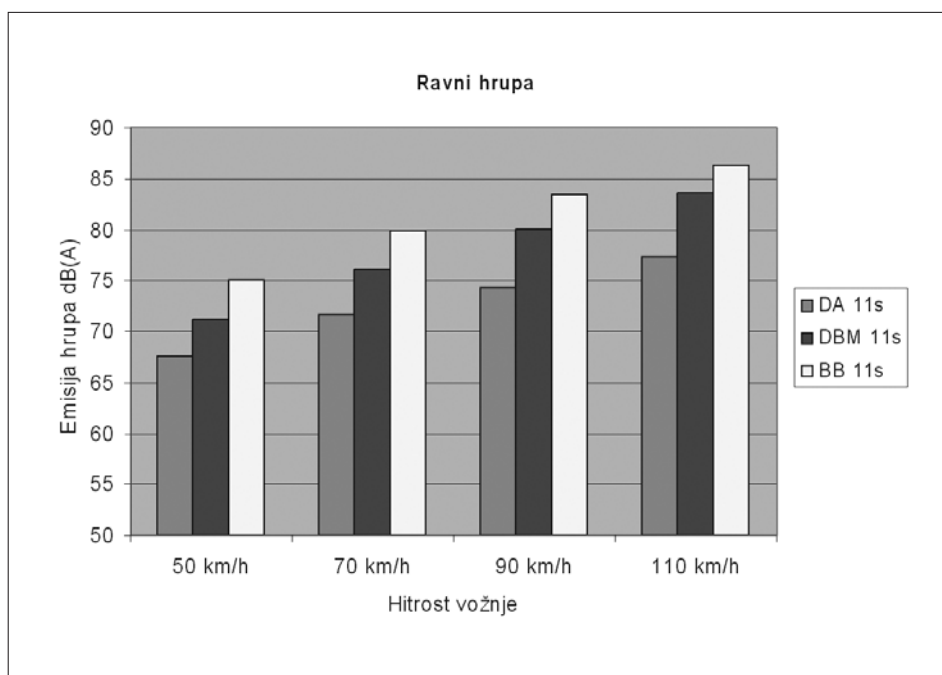
- drenažnega asfalta DA 11s,
- drobirja z bitumenskim mastiksom DBM 11s in DBM 8s ter
- bitumenskega betona BB 11s, BB 8s, BB 11 in BB 8.

Rezultati so za DA 11s, DBM 11s in BB 11s za različne vozne hitrosti prikazani na diagramu.

- TSC 06.413: 2003 Vezane asfaltne obrabne plasti, Drenažni asfalti
- TSC 06.412: 2001 Vezane obrabne in zaporne plasti, Drobir z bitumenskim mastiksom.

Zaključek

Zmanjšanje hrupa za 3 dB(A), ki ga lahko zagotovimo že z uporabo drobirjev z bitumenskim mastiksom, pomeni



Izvršene meritve hrupa kotaljenja so pokazale, da nastane pri vseh hitrostih vozil najmanjši hrup na obrabni plasti iz drenažnega asfalta DA 11s, na vseh drugih preskušanih vrstah obrabnih plasti (DBM, BB) pa za do 8 dB(A) večji hrup.

Emisija hrupa obrabne plasti drobirja z bitumenskim mastiksom v absolutnem iznosu je do približno 3 dB(A) manjša od emisije hrupa obrabne plasti BB.

Podobni rezultati so poznani tudi iz inozemskih strokovnih publikacij, kar zagotavlja, da so osnove, uveljavljene v naši veljavni tehnični regulativi, povsem primerne za zagotovitev želenega stanja obrabnih plasti v pogledu hrupa kotaljenja. Ta tehnična regulativa so Tehnične specifikacije za ceste:

- zmanjšanje prometa za 50 % ali
- zmanjšanje hrupa za 50 % ali
- podvojitve oddaljenosti od izvora hrupa.

Še večje zmanjšanje hrupa pa dosežemo z uporabo drenažnega asfalta.

Julijana Jamnik

Varstvo pri delu v asfalterstvu

Gradnja objektov je dejavnost, ki predstavlja celo vrsto neponovljivih po-stopkov in nepredvidljivih dogodkov, zato je zagotavljanje varnega dela v gradbeništvu zahtevna naloga. Delovna mesta v gradbeništvu niso stalna, temveč se delovno okolje na gradbiščih neprestano spreminja (napredovanje del, vremenski pogoji). Gradbinci smo tako izpostavljeni številnim nevarnostim in tveganjem, ki jih je pred pričetkom del težko ali celo nemogoče predvideti.

V Sloveniji je letno v gradbeništvu registriranih med 2500 in 3000 poškodb pri delu, kar pomeni, da se poškoduje skoraj vsah dvajseti delavec. Delež zaposlenih v gradbeništvu je 7,5 % vseh delovno aktivnih v Sloveniji, poškodovanih v tej panogi pa je med 13 in 14 % vseh pri delu poškodovanih. Poškodbe so torej dvakrat pogostejše, kot bi jih pričakovali glede na delež gradbeništva v gospodarski strukturi.

Poškodbe pri delu predstavljajo tudi velik strošek v poslovanju podjetij. To se odraža kot izguba delovnega časa poškodovanih delavcev, plačilo nadomestila za odsotnost pri delu do 30 dni (100% nadomestilo) ter kot odškodninski zahtevki poškodovanih delavcev, ki so v zadnjem času vedno pogostejši.

Najpogostejše nesreče, ki se pojavljajo v asfalterstvu so:

- zdrsi, padci pri sestopu s strojev,
- zdrsi, padci na gradbišču (jaški, ovire),
- udarci in dotiki z mehanizacijo,
- stiski pri manipulaciji z bremenami (nakladanje, razkladanje),

- opekline z vročim asfaltom in vročimi predmeti in
- prometne nesreče.

Pri tem si vsi sodelujoči pri izvedbi del zastavljamo enako vprašanje: »Kako zmanjšati število poškodb?« Izkušnje kažejo, da je to mogoče učinkovito storiti z:

- uporabo osebnih varovanih sredstev,
- ustrezno organizacijo del in ureditvijo delovnega mesta,
- izobraževanjem in poučevanjem delavcev,
- rednimi zdravstvenimi pregledi.

Osebnna varovalna sredstva

Delovna obleka mora pokrivati celotno dolžino rok in nog in biti ustrezne velikosti, da omogoča prosto gibanje. V poletnih mesecih se uporaba delovne obleke ne sme opuščati.

Zaščitni čevlji v asfalterstvu morajo biti odporni na visoke temperature in toplotno izolirani ter imeti ustrezne karakteristike za delo-hojo po vročem asfaltu. Čevlje je potrebno vzdrževati skladno s priloženimi navodili.

Zaščitne rokavice, najboljše so usnjene, ki imajo boljšo toplotno izolativnost. Segati morajo čez rokav. Asfalterja varujejo predvsem pred dotiki vroče asfaltne zmesi.

Odsevni telovnik je izredno učinkovito varovalno sredstvo. Zelo poveča vidnost delavcev. Uporaba je obvezna pri delu v prometnih zaporah in v slabši vidljivosti.



Odsevni telovnik - zelo poveča vidnost delavcev

Čelada, njena uporaba je obvezna na gradbiščih kjer ostaja možnost padca bremen z višine (delo pod žerjavi, mostovi, nadvozi...).

Organizacija del in ureditev delovnega mesta

Ovire in prepreke

Na gradbiščih se pojavlja veliko ovir in preprek, ki so potencialna mesta za nastanek poškodb. Odprtine in jaške je potrebno pokriti z ustreznim pokro-

vom. Na objektih mora biti postavljena varovalna ograja.

Ureditev gradbišča

Promet na gradbiščih je nepredvidljiv in ni reguliran (prečkanja, ustavljanje, vožnja v različne smeri). Na gradbišču morajo biti označene transportne poti s strani vodstva gradbišča, vozna in delovna površina morata biti jasno ločeni. Stroji in kamioni morajo biti opremljeni z zvočnim signalom za vzvratno vožnjo. Če hočemo zagotavljati varno delo je potrebno preprečiti dostop nezaposlenim. Uporaba mobilnih telefonov je moteč dejavnik na gradbišču, še posebno pri upravljalcih gradbene mehanizacije.

Organizacija del v asfalterski skupini

Vsak delavec v skupini mora imeti svojo nalogo in svoje delovno mesto. V skupini mora biti zadolžen delavec za sprejem kamiona in njegovo usmerjanje na finišer. Delavci se ne smejo zadrževati pred finišerjem, če ni to nujno potrebno. Kamioni morajo biti opremljeni s signalom za vzvratno vožnjo.

Delo v prometnih zaporah

Izredno zahtevno za zagotavljanje varnosti. Delavci in stroji imajo omejeno območje gibanja, zato je potrebna stalna koncentracija delavcev in vednje kje poteka promet. Prometna zapora mora biti postavljena skladno z elaboratom in dovoljenjem. Delovna površina mora biti ločena od prometne s smerniki in mora zagotavljati min. 60 cm varnostne razdalje do odvijajočega prometa. Pri projektiranju in izdajanju dovoljenj za zaporo cest je potrebno

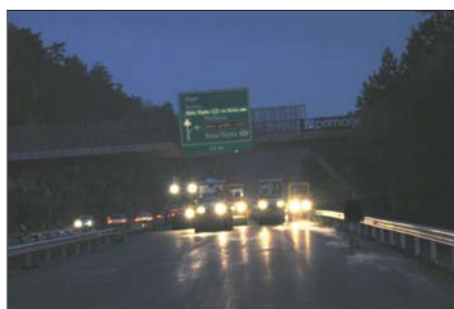


V prometnih zaporah imajo delavci in stroji omejeno območje gibanja

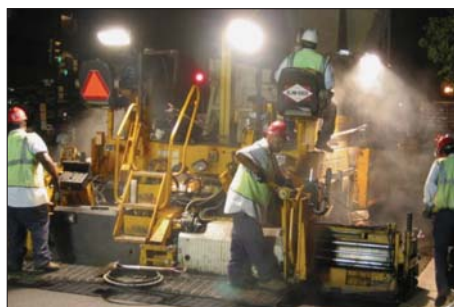
upoštevati tudi vidik varnosti delavcev in ne samo varnost in propustnost prometa.

Delo v nočnem času

V zadnjem času je na izvajalce vedno večji pritisk za izvajanje del v nočnem času. V nočnem času je problem vidljivost, ne samo delovne ekipe ampak tudi prometne signalizacije (smernikov, prometnih znakov). Območje del je v nočnem času omejeno z dosegom luči, zato morajo delavci poznati plan del. Delovna površina mora biti ustrezno osvetljena, svetloba pa mora padati čimbolj pravokotno na površino za finišerjem in tako da ne ovira prometa.



Območje del je v nočnem času omejeno z dosegom luči



Nočno delo je primerno le psihofizično sposobnejše delavce. Vsa mehanizacija mora imeti luči in delavci morajo biti oblečeni v odsevne telovnike.

Posebni primeri zaščite-meritve z radioaktivno sondo

Z radioaktivno sondo lahko rokuje le izkušen delavec. Pri sebi mora imeti dozimeter, ki meri sevanje. V območju meritev je razen delavca, ki izvaja meritve, prepovedano zadrževanje ljudi. Delavec s sondo mora biti dobro viden. Sonde se ne sme puščati brez nadzora na gradbišču. Stroji (valjarji) ne smejo prihajati v območje meritev.

Posebni primeri zaščite-prečrpavanje bitumna

Pri prečrpavanju bitumna je potrebno poleg telesa zaščititi tudi obrazni del s ščitnikom oz. vizirjem. Cev za prečrpavanje bitumna mora biti dolga minimalno 4 m, tako da ni ostrih lomov cevi. Cev je potrebno redno kontrolirati. Ventili, črpalke in instalacije morajo biti jasno označene. Izdelana morajo biti navodila s točnim postopkom prečrpavanja bitumna.

Poleg uporabe osebnih zaščitnih sredstev ter ustrezne organizacije in urejenega delovnega mesta, je pomembno, da stalno poteka izobraževanje in usposabljanje delavcev z vidika varstva pri delu. S strani vodij pa se mora vršiti stalen pritisk za uporabo pridobljenega znanja v praksi. Delavce se mora opozarjati ob kršitvah varnostnih mer.

Na koncu je potrebno poudariti, da moramo doseči večjo zavest, da so delavci za svoje zdravje najprej in največ odgovorni sami.

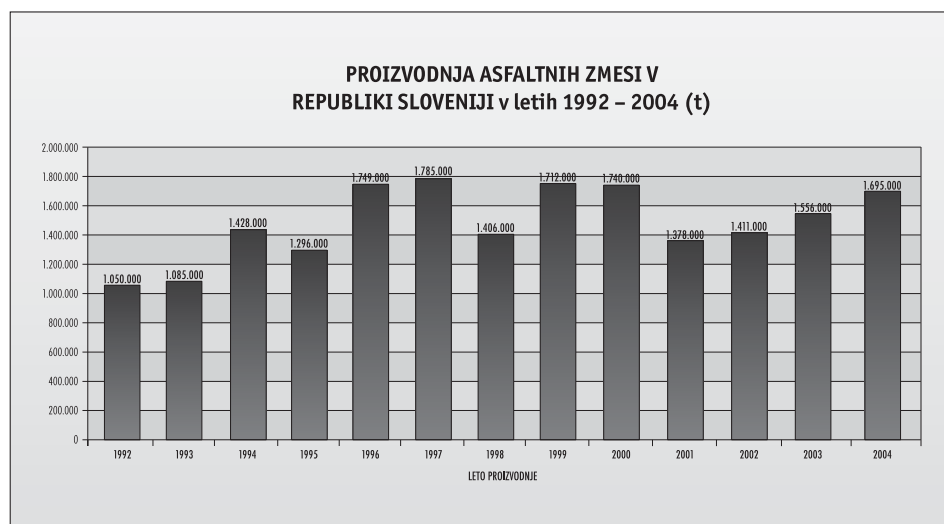
Mitja ČOTAR
Marjan MAROLT

Proizvodnja in vgrajevanje asfaltnih zmesi v letu 2004

V letu 2004 smo v Sloveniji proizvedli skoraj 1.7 mio ton vročih asfaltnih zmesi. Poleg tega je bilo iz Hrvaške uvoženih še 58.000 ton zmesi, kar pomeni, da je bilo vgrajenih nekaj manj kot 1.8 mio ton asfaltnih zmesi.

Za proizvedene zmesi je bilo porabljenih približno 1,45 mio ton karbonatnih in 0,2 mio ton silikatnih zmesi kamnitih zrn in okoli 80.000 ton bitumenskih veziv. Od tega je bilo vgrajenih 67.500 ton cestogradbenih bitumnov, 10.000 ton s polimeri modificiranih bitumnov in 2.100 ton z naravnimi asfaldi modificiranih bitumnov. Delež porabe modificiranih bitumnov glede na porabo vseh bitumnov, se glede na leto 2003 ni bistveno spremenil.

V letu 2004 je bilo v Sloveniji proizvedenih in vgrajenih 104.700 ton drobirja z bitumenskim mastiksom.



Po podatkih proizvajalcev je bilo vgrajenih okoli 100.000 m² površinskih in tankoslojnih prevlek, kar predstavlja povečanje obsega (20 %) glede na predhodno leto. Zalitih pa je bilo 396.000 m³ razpok.



Priporočila za proizvodnjo in vgrajevanje asfaltne zmesi DBM

**Komisija za asfalt pri DARS
in TO ZAS**

V letu 2003 so bile na nekaterih asfalt-
nih površinah na avtocestah, ki so bile
izvajane predvsem v obdobju 1999-
2000, ugotovljene poškodbe v obliki
razpok. Nenavadne poškodbe so zahte-
vale hitro in učinkovito ukrepanje.

Za razjasnitev vzrokov so bili vklju-
čeni vsi razpoložljivi domači in nekaj
ouveljavljenih tujih strokovnjakov. Od-
vzeti so bili številni asfaltni vzorci,
opravljene so bile analize proizvedenih
in vgrajenih zmesi DBM, o problematiki
so razpravljale pristojne komisije in
strokovni odbori. Za ugotovitev vzro-
kov so bili izdelani številni dokumenti,
na osnovi katerih so izdelana ta pri-
poročila, s katerimi želimo preprečiti,
da bi se morebitne pomanjkljivosti, ki
so povzročile poškodbe, ponovile.

Priporočila so zasnovana na nasled-
njih dokumentih:

- Vpliv nizkih temperatur na trajnost
asfaltnih zmesi, RRN, IGMAT, 2004
- Strokovno mnenje o vzrokih za pred-
časen nastanek poškodb asfaltnih
utrditev voziščnih konstrukcij na
posameznih odsekih AC, ZAG, 2004
- Raziskave na TU Braunschweig, In-
stitut für Straßenwesen, Univ. Prof.
Dr. - Ing. Rolf Leutner, 2003 in 2004
- Strokovno mnenje Dipl.-Ing.
Lotharja Drüschnerja, NMW in
- Mnenja članov Komisije za asfalt pri
DARS in Tehničnega odbora pri ZAS.

Z navedenimi priporočili se podajajo
predlogi za čim bolj varno projektira-
nje in proizvodnjo asfaltne zmesi DBM.
Skladno s temi priporočili bodo dopol-
njene tudi veljavne tehnične specifi-
kacije.

A. PROJEKTIRANJE ASFALTNE ZMESI DBM

1. Posebno pozornost je treba posve-
titi izbiri vhodnih materialov (bi-
tumnov, kamene moke in zmesi zrn)
in zasledovanju enakomerne kako-
vosti.
2. Delež bitumna v predhodni sestavi
naj bo naslednji:
 - DBM 8 in DBM 8s: najmanj 6,8 m.-%
 - DBM 11 in DBM 11s: najmanj 6,3
m.-%.
3. Pri vseh asfaltnih zmesih DBM je
potrebno projektirati optimalno ko-
ličino votlin v zbiti kamni zmesi
Marshallovega preskušanca tako, da
je tudi ob najmanjši zahtevani vseb-

nosti bitumna dosežena zahtevana
vrednost stopnje zapolnjenosti
(najmanj 75 V.-% in največ 90 V.-%
za težko in težjo P0) votlin kamene
zmesi z bitumnom (razpredelnica).
V osnovi mora biti projektiranje
asfaltne zmesi tudi matematično
dokazljivo na osnovi tehnične speci-
fikacije TSC 06.730 Predhodna
sestava asfaltne zmesi.

4. Mejna področja zapolnjenosti z bi-
tumnom in delež celokupnih votlin v
zmesi - razpredelnica 1
5. Skrajna mejna področja zapolnje-
nosti z bitumnom in delež celokup-
nih votlin v zmesi - razpredelnica 2
6. Mejna področja zgoščenosti in delež
votlin v plasti - razpredelnica 3.

Lastnost bitumenske zmesi	Enota mere	Skupina prometne obremenitve	
		izredno težka in težka	srednja in lahka
-vsebnost celokupnih votlin spodnja meja zgornja meja	V.-%	2,5 4,5	2 4
-zapolnjenost votlin v zmesi kamnitih zrn z bitumnom spodnja meja zgornja meja	%	75 90	80 90

Razpredelnica 1: Mejne vrednosti zapolnjenosti z bitumnom in delež votlin

Lastnost bitumenske zmesi	Enota mere	Skupina prometne obremenitve	
		izredno težka in težka	srednja in lahka
-vsebnost celokupnih votlin spodnja meja zgornja meja	V.-%	1 6	1 5
-zapolnjenost votlin v zmesi kamnitih zrn z bitumnom spodnja meja zgornja meja	%	70 95	75 95

Razpredelnica 2: Skrajne mejne vrednosti zapolnjenosti z bitumnom in delež votlin

Lastnost bitumske plasti	Enota mere	Skupina prometne obremenitve	
		izredno težka in težka	srednja in lahka
vsebnost celokupnih votlin zgoščenost plasti	V.-% %	3 - 6 >97	2 - 5 >97

Razpredelnica 3: Mejna področja zgoščenosti in delež prostih votlin v plasti

7. Dovoljeno odstopanje vsebnosti bitumna v zmesi DBM sme v povprečju najmanj 5. asfaltnih vzorcev od recepturno določene vrednosti odstopati navzdol za največ 0,1 (m.-%), pri posameznem vzorcu pa za največ 0,3 (m.-%).
8. Za proizvodnjo asfaltne zmesi DBM je priporočljivo uporabiti le tujo kameno moko. V primeru uporabe kamene moke pridobljene z odprševanjem pri proizvodnji asfaltne zmesi (lastna kamena moka) je potrebno s preskusom po EN 13179-1 ($\Delta P\&K$) dokazati uporabnost.
9. Projektirano območje votlavosti asfaltnih zmesi v predhodni sestavi in zapolnjenost z bitumnom je potrebno opredeliti smiselno, glede na namen uporabe v območju mejnih vrednosti, kar je prikazano tudi grafično na sliki 1 za težko in zelo

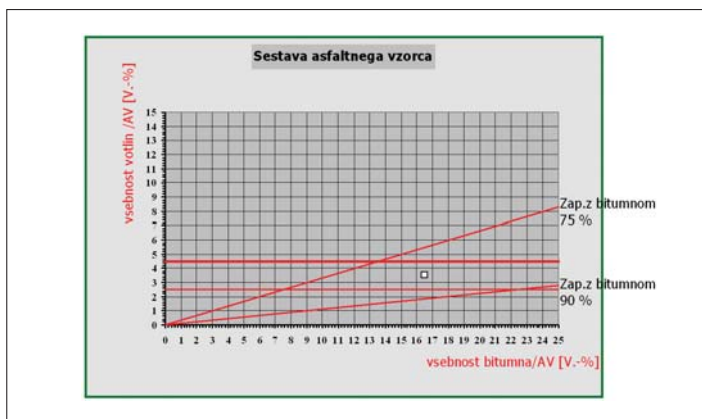
shallovi preskušancev je treba v odnosu na ekviviskozno temperaturo v primeru uporabe s polimeri modificiranih bitumnov absolutno znižati za 10 °C, pri čemer je lahko najvišja temperatura za zgoščanje največ 165 °C.

B. PROIZVODNJA in TRANSPORT ASFALTNE ZMESI DBM

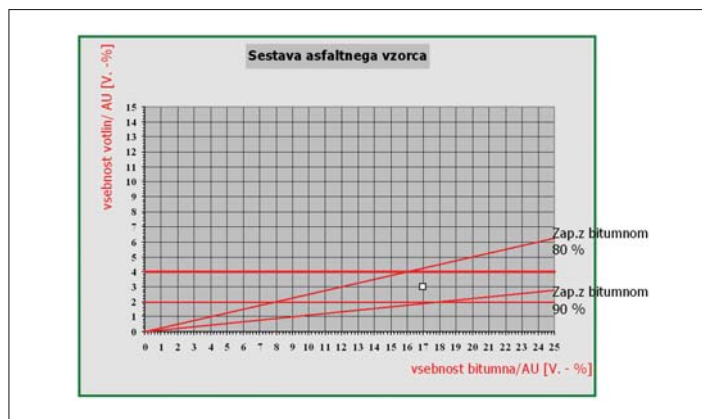
1. Temperatura proizvodnje asfaltnih zmesi DBM je odvisna od vrste uporabljenega bitumna, vendar naj ne bo v nobenem primeru višja kot 175°C.
2. Transportiranje asfaltne zmesi DBM mora biti omejeno z največjo razdaljo prevoza 100 km oziroma najdaljšim časom prevoza 2 uri, pod pogojem, da je za prevoz vroče

C. IZVEDBA PREDHODNIH STANDARDIZIRANIH IN NESTANDARDIZIRANIH PRESKUSOV

1. V tehničnih pogojih za PmB je treba predpisati preiskavo sile pri duktilnosti po evropskem standardu EN 13589 (Force ductility) in predpisati vrednost energije raztezanja.
2. Projektirano območje votlavosti asfaltnih zmesi v predhodni sestavi je potrebno smiselno opredeliti - izračunati.
3. Za asfaltne zmesi, ki se uporabljajo na cestah obremenjenih s težko in težjo prometno obremenitvijo je potrebno zagotoviti preskuse v celotnem temperaturnem območju. Priporoča se izvedba naslednjih preskusov:
 - preverjanje odpornosti asfaltnih zmesi pri nizkih in visokih temperaturah,
 - ugotavljanje koeficienta zgoščanja po Arandu,
 - preverjanje zlepljenosti po Leutnerju,
 - ugotavljanje sposobnosti utrujanja asfaltne zmesi (plasti) v čim bolj širokem temperaturnem območju,



Slika 1: projekt sestave za pogoje težke in izredno težke prometne obremenitve



Slika 2: projekt sestave za pogoje srednje in lahke prometne obremenitve

- težko prometno obremenitev) in na sliki 2 za srednjo in lahko prometno obremenitev.
10. Razlika v zmečišču po PK med vhodnim in ekstrahiranim bitumnom je lahko največ 10 °C.
11. Temperaturo za zgoščanje Mar-

asfaltne zmesi uporabljeno vozilo s termo-kesonom.

3. Priporoča se izvedbo čim več preskusnih polj z nizkotemperaturnimi asfalti, s čimer bodo lahko ustvarjeni pogoji za širšo uporabo dodatkov za nizkotemperaturne asfalte.

- preverjanje vrednosti togosti DBM v predhodni sestavi po prEN 12697-26 v območju temperatur od 20 °C do 0 °C (npr. pri 20 °C vrednost za togostni modul cca. 1500 - 3000 Mpa).

Delovanje organov ZAS v letu 2004

Upravni odbor (UO)



Od zadnje redne skupščine, ko je bil izvoljen Upravni odbor v novi sestavi, je bilo organiziranih šest sej, ki so bile vse sklepčne, 61 sprejetih sklepov pa je bilo v glavnem realiziranih. Nekatere naloge, ki jih je sprejel Upravni odbor, potekajo preko daljšega časovnega obdobja (npr. sestanki z upravami večjih proizvajalcev asfaltov, organizacija 10. kolokvija o asfaltih in bitumnih itd.).

Poleg 9. članov UO ZAS so se posameznih sej udeleževali tudi drugi vabljeni člani ZAS, med katerimi so bili prisotni predvsem predsednik NO g. Marjan Makovec, koordinatorica ga. Jožica Cezar in vodja TO ZAS g. Janez Prosen.

Tehnični odbor (TO)

Iz večletnega programa dela tehničnega odbora Združenja asfalterjev Slovenije (TO ZAS), ki je bil zasnovan v letu 2003, so bile za delo v letu 2004 opredeljene naslednje glavne aktivnosti:

- področje tehnične regulative
- področje surovin za proizvodnjo asfalta
- področje asfaltnih zmesi.

Osnova za opredelitev teh aktivnosti, predvsem tehnične regulative je bila situacija, da smo bili pred vstopom v EU. Intenzivnost dela na urejanju tehničnih specifikacij in obravnavo predpisov je nujna za nedvoumno delo na asfaltnem področju. Z vstopom v EU se je pokazala obveza po novih postopkih certificiranja po evropski direktivi (CPD), predvsem za vhodne surovine (agregat), zelo pa se je povečala skrb v smislu varovanja zdravja in okolja pri asfaltnih delih, kar vodi k pospešenemu uvajanju dodatkov za nizkotemperaturne asfalte. Ob intenzivnem izvajanju gradnje številnih odsekov novih avtocest je delo tehničnega odbora vezano na stalno obravnavo in aktivnosti pri projektih sestav asfaltnih zmesi in spremljanju stanja asfaltnih zmesi in plasti.

V letu 2004 se je TO ZAS sestal trikrat in sicer, marca, septembra in novembra, kar je skladno s programom v številčno kar obsežnem tehničnem odboru ZAS-a, ki je opredeljen za petletno obdobje. Med sestanki so bila organizirana srečanja delovnih skupin, predvsem skupine za »standarde«, ki se je trudila z urejanjem tehnične regulative (standardi SIST EN, prEN-I, TSC-ji, PTP - SCS dodatki ipd..). To področje je kompleksno in zahtevno. Pokazalo se je, kako potrebno je postopno uvajanje novih metod in postopkov preiskav saj neposrednega preskoka na nove SIST EN standarde ni moč izvesti. Glede na to bodo aktivnosti v nadalje še potrebne.

Tehnični odbor se je angažiral na področju medlaboratorijskega dela, kjer se je izoblikovalo mnenje, da je potrebno, čim prej smiselno pristopiti k izvedbi primerjav na laboratorijsko

pripravljenih enovitih vzorcih, kjer se v čim večji meri izognemo eventualni razliki zaradi »napake odvzema vzorca izza finišeja«. TO ZAS je obravnaval in zasnoval delo na področju nizkotemperaturnih asfaltov, ustanovil je delovno skupino, ki je zbrala razpoložljive spodbudne podatke. Prva testiranja so stekla, predvsem na pobudo podjetij, pri čemer preliminarni podatki preiskav narekujejo podrobnejšo analizo v nadalje.

Velik del aktivnosti je TO ZAS namenil analizi stanja asfaltnih plasti, predvsem vplivu nizkih temperatur na trajnost asfaltnih zmesi. Pri tem je v povezavi s komisijo za asfalt pri DARS, katere člani so praktično tudi člani TO ZAS pripravil in sprejel »*Priporočila za proizvodnjo in vgrajevanje asfaltnih zmesi DBM*«, ki so v celoti objavljena v tem biltenu. Tu se je pokazala potreba po sodelovanju s strokovnjaki, ki preiskujejo zmesi na nizkih temperaturah in po sistematičnem ovrednotenju obstoječih podatkov z namenom optimiziranja projektov asfaltnih zmesi DBM.

Tehnični odbor je obravnaval tudi potrebo oziroma zahtevo po presoji notranje kontrole proizvodnje na asfaltnih obratih, podobno kot jo narekuje evropska direktiva (CPD). Te aktivnosti so še v teku in se bodo obravnavale tudi v bodoče.

V letu 2004 se je tehnični odbor preko vodje TO seznanil tudi z aktivnostmi dela TC EAPA. Pri tem je potrebno aktivno nadaljevati sodelovanje, saj je prva skrb TC EAPA poenotenje in sodelovanje pri izdelavi dobrih standardov, pri izdaji potrebnih in koristnih tehničnih podlag za področje asfalta ter sodelovanje in povezovanje

s sorodnimi združenji s ciljem priprav potrebnih simpozijev, kongresov ipd.

Vsem sodelujočim pri našem delu, se lepo zahvaljujem, z upanjem na uspešno sodelovanje tudi v bodoče.

Janez Prosen

Odbor za varstvo, zdravje in okolje (ZVO)

Odbor za zdravje, varstvo, okolje se je od zadnje skupščine sestal na 3 sestankih, na katerih je nadaljeval delo, ki je bilo zastavljeno po programu dela za leto 2003 in dopolnitvi 2004. ZVO je obravnaval tekočo problematiko s področja varstva zdravja in okolja. Vodja odbora se je v mesecu aprilu udeležil sestanka odbora HSE pri EAPA v Breukelenu in članom odbora posredoval informacije o delu HSE.

V septembru 2004 je bil razširjen sestanek odbora ZVO z vodji služb za varstvo pri delu podjetij vključenih v ZAS, kjer so bile definirane skupne aktivnosti za v prihodnje.

14. in 15. aprila je odbor HSE zasedal v Sloveniji, gostitelj je bilo podjetje CMCelje.

Aleksander Kerstein

Sestanek odbora EAPE za zdravje, varstvo pri delu in varovanje okolja v Sloveniji

V četrtek 14. in v petek 15. aprila 2005 je bil redni sestanek odbora EAPA za zdravje, varstvo in okolje (HSE), v katerem sodeluje tudi predstavnik ZAS, g. Aleksander Kerstein, ki je obenem tudi vodja Odbora za zdravje, varstvo in okolje pri ZAS. Tokrat je bil sestanek prvič organiziran v Sloveniji, v prostorih družbe Ceste mostovi Celje v Veliki Pirešici. Sestanka se je udeležilo 11



Sestanek odbora EAPE za HSE



Na ogledu asfaltne obrata CMC v Veliki Pirešici

članov odbora, ki ga vodi ga. Helle Fabiansen iz Danske.

V četrtek popoldne je g. Aleksander Kerstein s sodelavci članom odbora predstavil program in konkretne aktivnosti družbe Ceste mostovi Celje na področju zdravja, varstva pri delu in varovanja okolja. Po uvodni predstavitvi je sledil praktičen prikaz in ogled

novega centra za zbiranje in predelavo gradbenih odpadkov, s poudarkom na pripravi za ponovno uporabo betonov in asfaltov kot sekundarnih agregatov ter kratkim prikazom delovanja sistema za hladno reciklažo asfaltov na asfaltni bazi. Člane odbora so zelo zanimala posamezne konkretne rešitve na področju, kjer delujejo v okviru evropskega asfaltnega združenja,

kot je nižanje temperature, zmanjševanje potreb po energiji in zmanjševanje vseh vrst emisij, predvsem pa emisij toplogrednih plinov. Nad predstavljenimi praktičnimi rešitvami so bili vsi člani odbora vidno navdušeni.

V petek dopoldne je imel odbor svoje redno zasedanje, na katerem so obravnavali rezultate IARC-ove študije, usmeritve v nove tehnologije za varovanje zdravja in varstva okolja z nižanjem temperatur pri proizvodnji in vgrajevanju, zaščito delavcev pred UV žarčenjem in ostale aktualne teme.

Zvonimir Britovšek

Sekcija za izobraževanje - SI

Po generalnem programu izobraževanja je vsako leto predvideno izobraževanje asfalterkega kadra in sicer izmenično tehničnega asfalterkega kadra (inženirjev in tehnikov) in usposabljanje operativnega asfalterkega kadra (delovodje, strojniki, vodje vgrajevanja...). Tako je bilo v letošnjem letu organizirano 5. regijsko izobraževanje in usposabljanje asfalterkega kadra. Podrobno poročilo o izobraževanju je podano v *rubriki Izoobraževanje*.

Detajlni vsebinski plan za izvedbo vseh aktivnosti pripravlja SI za tekoče leto sproti. Pri izbiri tematike izobraževanj se prilagajamo potrebam in trenutnim razmeram v asfalterstvu, kar pomeni, da skušamo udeležence sproti seznanjati z novostmi in problemi, ki se pojavljajo pri proizvodnji in vgrajevanju asfaltnih zmesi ter zagotavljanju kvalitete asfaltnih del, tehnični regulativi, varstvu okolja in zdravju delavcev v asfalterstvu.

Velik poudarek dajemo praktičnem prikazu (na poligonu, ali v laboratoriju...), zato se predvsem na usposabljanjih operativnega kadra poslužujemo izobraževanja v obliki delavnic - to je majhnih skupin, kjer so velike mož-

nosti reševanja praktičnih primerov, izmenjave mnenj in prilagajanja zanimanju udeležencev. Povabljeni predavatelji so navadno strokovnjaki iz asfalterke sredine, ki tudi sodelujejo pri pripravi gradiva in tematiko predstavijo.

Sekcija za izobraževanje se je v celotni sestavi sestala na enem sestanku, medtem, ko smo se posamezniki SI v času organizacije izobraževanja sestajali po potrebi.

Upam in želim si, da bo SI tudi v prihodnje izpolnila vaša pričakovanja in da bo izobraževanje asfalterkega kadra tudi v prihodnje uspešno. Vaše pobude, mnenja in pripravljenost na sodelovanje so pri tem zelo dobrodošla.

Jožica Cezar

Sekcija za hidroizolacije

Sekcija za hidroizolacije, ki združuje predstavnike slovenskih proizvajalcev hidroizolacijskih materialov, zastopnike tujih proizvajalcev, predstavnike izvajalcev del, Inženirja in inštitutov, se je v času od zadnje skupščine sestala dvakrat.

V preteklem letu je bila izpeljana krožna analiza o meritvah obstojnosti lepilne mase na nizke temperature. Člani sekcije spremljamo in smo seznanjeni s sprejemanjem novih evropskih standardov s področja hidroizolacij.

Delo sekcije je pozitivno sprejeto med člani in drugimi strokovnjaki, zato program dela sekcije ostaja tudi za naslednje obdobje nepremenjen.

Vsem, ki sodelujete pri delu sekcije in podpirate naše aktivnosti se zahvaljujem za opravljeno delo in si želim uspešnega sodelovanja tudi v bodoče.

Olga Naglič

Nadzorni odbor (NO)

Nadzorni odbor v sestavi predsednik - Marjan Makovec in član - Franc Gole (član - Bojan Dapčević se je opravičil in podal pisni predlog), se je sestel pred zadnjo sejo upravnega odbora, pregledal dokumentacijo in podal pozitivno mnenje na pregledani zaključni račun za leto 2004, ki ga bo sprejemala letošnja skupščina ZAS.



Tehnična regulativa

Direkcija Republike Slovenije za ceste je v program priprave in dopolnitev obstoječe tehnične regulative v letu 2004 vključila tehnični specifikaciji

- TSC 06.751 Meritve in preiskave, Preskus zgostljivosti bituminiziranih zmesi ter
- TSC 06.753 Meritve in preiskave, Preskus zlepljenosti asfaltnih plasti.

Pogodbi za izdelavo navedenih tehničnih specifikacij sta bili sklenjeni z ZAS, Združenjem asfalterjev Slovenije.

- z vrtljivim zgoščevalnikom - giratorjem in
- z vibracijskim zgoščevalnikom.

Ker je v Sloveniji večina potrebne opreme za preskušanje z udarnim zgoščevalnikom že na razpolago in postopek že v uvajanju, so v TSC 06.751 podrobno opredeljene osnove za ta postopek, ki omogoča preskus zgostljivosti bituminizirane zmesi (z zrni do 32 mm).

Potek povečanja prostorninske mase

bituminizirane zmesi v odvisnosti od vložnega dela (zgoščevalnega dela pri preskusu oziroma poznejše prometne obremenitve), ki ga je mogoče opredeliti z odporom proti zgostitvi, je mogoče določiti s preskusom v laboratoriju, ovrednotiti pa na osnovi spremembe prostorninske mase (gostote) ali debeline plasti = preskušanca po Marshallu. Pri preskusu zgostljivosti je torej mogoče ugotoviti tudi največjo dosegljivo prostorninsko maso bituminizirane zmesi.

V TSC 06.751 je podrobno opredeljena oprema za pripravo preskušancev, postopek izvedbe preskusa in izvrednotenje rezultatov.

TSC 06.753 meritve in preiskave, Preskus zlepljenosti asfaltnih plasti (po Leutnerju)

Največja strižna sila in premik, ki pri tem nastane v ravnini striga, ter največja odtržna sila so odvisni

- od vplivov na zaklinjenje: teksture površine plasti, globine hrapavosti, največjega zrna v vgrajeni zmesi/mešanici, vsebnosti votlin, zgoščenosti plasti in stanja površine podlage in
- od vplivov na zlepljenost plasti: adhezije, kohezije, vsebnosti malte v zmesi/mešanici, vrste in količine pobrizganega veziva in stanja površine podlage.

Pri bituminiziranih zmesih v asfaltnih plasteh, ki sta zlepljeni, pa ni pomembna samo vpliv lastnosti bituminiziranih zmesi, ampak tudi robni pogoji mejnih površin: zglajenost, homogenost, čistost, vlažnost. Povezanost asfaltnih plasti torej ni odvisna samo od lastnosti materiala, ampak je kompleksna značilnost.

Za kvalitativno določitev povezanosti asfaltnih plasti sta v dosegljivi obstoječi tehnični regulativi opredeljena dva postopka:

- preskus strižne sile v odvisnosti od premika v ravnini striga in
- preskus odtržne sile.

Za preskus je treba uporabiti jedra bituminiziranih zmesi (s premerom 150 oziroma 100 mm), ki ne smejo biti poškodovana niti kakorkoli prizadeta povezanost asfaltnih plasti. Zato je v TSC 06.753 podrobno opredeljen po

stopok za odvzem jeder bituminiziranih plasti iz krovnih plasti voziščnih konstrukcij in izvedbo preskusa. Osnove za izvrednotenje rezultatov preskusa pa omogočajo presojo kakovosti = zlepljenosti asfaltnih plasti.

prof. dr. Janez Žmavc



TSC 06.751 meritve in preiskave, Preskus zgostljivosti bituminiziranih zmesi (po Arandu)

Trajnost sodobnih vozišč z asfaltno krovnostjo je v veliki meri odvisna od zgoščenosti vgrajenih plasti bituminiziranih zmesi. Zato je treba pri vgrajevanju doseči tolikšno zgoščenost bituminiziranih zmesi, da je naknadna zgostitev pod prometom v čim večji meri izključena. Da bi ugotovili to mejno vrednost zgoščenosti, potrebujemo primeren postopek. V dosegljivi obstoječi tehnični regulativi so opredeljeni postopki

- z udarnim zgoščevalnikom - napravo po Marshallu,

Summary



From Assembly to Assembly

(from page 3)

INTRODUCTION

We also actively participated in the 7th Slovenian Congress on Roads and Traffic, which has once again exceeded all expectations, be it in the level of technical expertise or in the organisational respect. Over 700 domestic and foreign participants, who presented over 150 papers, are figures which place Slovenia among the top countries as regards road construction potential in view of its population.

2004 was an abundant year for the asphalt pavement industry in terms of production as well. With almost 1,7 million tonnes of hot asphalt mixtures produced we approached production peak set in the past. It is our sincere hope that the quality of produced and laid asphalt mixtures is suited to accommodate increasing climatic and especially traffic loads, which have further increased after Slovenia's joining the European Union.

A stronger connection with Europe has been felt throughout in the Slovenian Asphalt Pavement Association as well, as three of our members have been participating in professional committees at EAPA - in the Executive and Technical Committees and in the HSE Committee. At present their roles are mainly of informative nature, but we can expect a more active role in the future.

In 2004 we eventually got a grasp of crack formation in SMA courses. By utilising demanding freeze/thaw tests at Braunschweig Technical University of Germany and numerous other analyses the causes of damage were pinpointed. Thus asphalt pavement professionals were able to jointly prepare the so called »Recommendations for production and laying of SMA asphalt mixtures«. This experience should serve as a valuable lesson for the future. Even though current solutions may seem optimal there should always remain a shadow of doubt - we should strive for improvement at all times.

The subjects I have mentioned above are dealt with in this volume by diligent members of staff of ZAS, the Slovenian Asphalt Pavement Association, most of whom have remained the same through the years. It has come to our attention that the number of professional experts in the asphalt pavement industry has not been increasing, which is a cause of concern. In the past year we faced many new challenges, such as certification, standardisation, low temperature asphalts, road bitumens and polymer modified bitumens, and the like. Many times we agreed on certain issues, while there were still matters in which no consensus could be reached, which means that many issues have remained unresolved. None of these issues are as demanding so as not to be resolvable by means of an open discussion, with the participation of EAPA and other associations. We should not hesitate to join forces even more so as to be able to produce better asphalts and superior roads.

I would like to sincerely thank everyone who contributed to what has turned out to be a successful year for ZAS.

Slovenko Henigman, President

Date: April 22, 2004

Venue: Zemono Manor House near Vipava

Number of participants at round table & assembly: 54

9TH ASSEMBLY OF SLOVENIAN ASPHALT PAVEMENT ASSOCIATION

On April 22, 2004 the 9th regular Assembly of the Slovenian Asphalt Pavement Association (ZAS) took place in the pleasant atmosphere of Zemono Mansion. At the Assembly 54 regular members of the Association were present. After the preliminary address the participants were given an account of the work done by the Association in the past year. Also, the financial report, Supervising Committee business report, final account for 2004, and finance plan for 2005 were presented. All of these documents were unanimously adopted by the ZAS Assembly.

Further on, a proposal of supplementation of the Regulations regarding the number of members of the Managing Committee was submitted to the Assembly. Election of members of ZAS bodies was also carried out, as 8 years had passed since the establishment of the Association. Slovenko Henigman of DDC Counselling&Engineering was re-elected President of ZAS, while the following were elected members of the Executive Committee: Janez Bizjak (Petrol), Aleksander Kerstein (CMCelje), Borut Willenpart (SCT), Mitja Čotar (Primorje), Matija Donko (Pomgrad), Igor Starič (CP Ljubljana), Marijan Prešeren (CGP), and Bojana Lukač (CP Maribor). ZAS Assembly also elected Olga Naglič, Mirko Pižeta and Dr. Janez Žmavc as members of arbitration court of honour.

President of ZAS presented Mr. Anton Dremelj with a special acknowledgement for his active participation and for his merits regarding the work of ZAS Managing Committee in the period from 2000 - 2004.

In conclusion an extensive work programme of the Association for the year 2004 was presented, emphasising active participation of ZAS at the EAPA Congress in Vienna and at the Congress on Roads and Traffic in Portorož (for details see below); it was adopted by the Assembly.

On behalf of DDC Counselling&Engineering participants were addressed by the Executive Director of the Company, Mr. Matija Vilhar, who emphasised their all-round support to the Association. He stressed that results of the work done by ZAS were evident in the condition of Slovenian roads, congratulated on these results, and wished the Association all the best for the future. On behalf of DRC (the Slovenian Road and Traffic Research Society), participants were addressed by its Chairman Mr. Saša Skulj, who also commended the achieved results. »To be recognised and respected« could, in his opinion, be the motto of ZAS, as this is being accomplished with great success. He also expressed his gratitude for the work done by ZAS in the framework of DRC and his hope for successful collaboration in the future as well.

Preceding the Assembly, a **professional seminar** was held, which consisted of two parts:

- In the first part representatives of Ammann Company of Switzerland, which is one of the foremost producers of asphalt plants, presented recent inventions in the field. Presentations of a modern method of compaction (ACE), asphalt plant construction, and FOAM Mix/WAM Foam cold-mix asphalt technology were given.
- In the second part recent inventions in the field of asphalt pavement in Slovenia were presented. Mr. Aljoša Lipovšek of SCT highlighted issues regarding gussasphalt in connection with environmental preservation and lowering of laying temperature. Mr. Aleksander Ljubič, head of the task force in charge of low-temperature asphalts at ZAS, gave an account of tests using various additives for facilitating lowering of temperature which had been recently performed at Iqmat institute. Experience with modified bitumen for lowering of temperature SüBit®VR and with zeolite additives AsphaMin®, Sasobit®, Asphaltan® and Romonta® was presented. In his paper, Prof. Dr. Janez Žmavc presented the new technical regulations in the field of asphalt pavement (EN) and new attestation of conformity systems.

Due to importance of the subject discussed at the seminar it was resolved that testing of low temperature asphalts should be continued and that we should strive to obtain knowledge and experience also from experts from neighbouring countries.

INTERNATIONAL COLLABORATION

COLLABORATION WITH OTHER ASPHALT PAVEMENT ASSOCIATIONS

In 2004, ZAS representatives were highly active in the international arena. They attended EAPA meetings and the EAPA General Assembly (held in Vienna in the time of the Congress) and actively collaborated with asphalt pavement associations from neighbouring countries. Three members of ZAS participated in editing of technical papers for the 3rd European EAPA & Eurobitume Congress held in May 2004 in Vienna, while one member was active in the Technical Committee of the Congress; he attended several sessions in the past year.

Thus it can be said that the tasks we were in charge of were successfully performed. Also worth mentioning is the fact that two ZAS representatives have begun to actively participate in the Technical and HSE Committees at EAPA.

Jürgen Sturm is new EAPA Secretary General

The European Asphalt Pavement Association (EAPA) has a new Secretary General.

Jürgen Sturm, a 37-year old lawyer from Germany was take up the position from 1 May 2005. Jürgen, who is a native from Regensburg in Bavaria studied Law and Spanish Philology at the Universities of Passau and Salamanca. He was admitted to become a member of the Bar in Berlin in 1996 and practiced Law in Berlin and Brandenburg for four years.

He interrupted his career in 2000 to enrol in a Master of Laws program of the University of Aberdeen and holds a LL.M. in European and International Law.

In 2001 Jürgen took up the position as Secretary General of the European Federation of inland Ports (EFIP) in Brussels, before now joining EAPA, who will move its Secretariat to Brussels still in 2005.

3rd EUROPEAN CONGRESS of EAPA, European Asphalt Pavement Association, and Eurobitume, European Bitumen Association, Vienna

In the period from May 11-14, 2004, 20 members of Slovenian civil engineering and engineering companies, members of ZAS, the Slovenian Asphalt Pavement Association, participated in the 3rd European asphalt pavement congress, held in Vienna. The focal point of the congress was dedicated to practical solutions. The congress was successfully realised by two European asphalt pavement umbrella organisations, namely EAPA and Euro-

bitume. The congress was attended by 836 registered participants and by some 200 guests from 55 countries from all continents.

The professional part of the congress was divided into 8 technical sessions, namely:

- Implementation, innovative solutions and transfer of technology (session 1)
- Cold / warm processes and recycling (session 2)
- Bitumen and mixture additives (session 3)
- Safety and environment (session 4)
- Ageing, durability and low temperature performance (session 5)
- Rutting and high temperature performance (session 6)
- Mixture design and fatigue performance (session 7)
- Performance assessment and future specifications (session 8)

ZAS played a distinct role in the Congress, as its President Mr. Slovenko Henigman had been included into the Technical Committee in charge of organisation of the congress, while 3 other members of ZAS (Dr. Janez Žmavc, Aleksander Kerstein, Janez Prosen) participated in the 120 strong Professional Committee, which reviewed and selected papers to be read at the congress.

The participants were given a collection of papers (also on CD), containing 250 items. Official conclusions of the congress were also given, covering 19 different topics (*see below*).

The Slovenian participants, who followed presentations of papers attentively, could not help but be reminded and think with regret of the limited possibilities of test performance in Slovenia because of lack of equipment and mainly due to extreme shortage of staff; many tests and examinations performed in some areas and countries are practically impossible to perform in Slovenia. Disregarding that we shall have to try to join together the available resources and ensure a simulation of loading in the entire temperature area. Lately we have become aware of our inability to examine low temperature fatigue and resistance of pavement surfaces in Slovenia. Adding to that, on some of our roads we have recently been experiencing heavy increase of traffic loading which is an additional cause of early cracking and rutting, among other damage. This is in need of a thorough analysis.

During the Congress the Slovenian enterprises, led by ZAS, the Slovenian Asphalt Pavement Association, and aided by DDC Consulting&Engineering, organised a joint presentation of the association. Their main aim was to present the organisation of the Slovenian enterprises and introduce their activities in the

country, which can be of aid in our breakthrough in foreign markets. The following enterprises were presented: DDC, ZAG, IGMAT, SCT, Primorje, Petrol, Pomgrad, CM Celje, as well as ZAS as their connecting link. The exhibition space was well visited during whole 3 days of the congress and there was great interest shown by visitors in the Slovenian enterprises, DDC, and both laboratories.

The EAPA and Eurobitume congress, taking place in the neighbouring Austria, was a great success in which the Slovenian delegation also contributed to the best of its ability. That was done above all by our strong attendance, as well as by actively participating in various activities that took place. As newly joined members of the EU we (together with our colleagues from other new member states) received extra special attention.

Prior to the congress, EAPA, of which ZAS has been a regular member since 1997, organised an annual assembly, at which the President of ZAS was elected member of a 7 strong Executive Committee.

CONCLUSIONS OF THE 3RD EURASPHALT AND EUROBITUME CONGRESS, HELD 12 - 14 MAY 2004 IN VIENNA BY EGBERT BEUVING, CHAIRMAN OF THE E&E 2004 TECHNICAL COMMITTEE

1 - Introduction

Since two weeks the European Community increased up to 25 countries. At this moment 60 to 70 percent of the legislation is coming from Brussels.

To benefit from Europe we should act as one community and not as 25 individual countries. That also applies for the area of research and development in the asphalt and bitumen sector.

We have to have one test method for one characteristic in Europe for the European Standards. This also means that we will all speak one language in terms of material characterisation in the future.

When we would work together more in research, instead of reinventing the wheel, we could save a lot of money. Or we could do more with the amount of money.

We already saw some nice examples of information transfer and the ELLPAG-study showed us the importance of cooperation and the advantages of international exchange of experience.

2 - Noise Reduction

Building long lasting noise reducing asphalt pavements is a challenge for the industry. The lifetime of good performance should be increased. The clogging of the pavement needs to be solved.

Double-layered porous asphalt is a solution, but we should keep looking for new techniques.

We saw new asphalt mixes that have been developed for Formula 1.

Also several very thin and ultra thin asphalt layers have been developed to reduce the traffic noise.

3 - Recycling

To be able to recycle all reclaimed asphalt we need higher proportions of reclaimed asphalt in surface layers. Several papers addressed this item.

The society's pressure to reuse and recycle all the possible materials and to minimize landfill has also created pressure on the asphalt industry.

Asphalt as a volume product attracts other industries to put wastes into asphalt. Asphalt is not a dumping area but an advanced product. It is 100 % recyclable and it is actually the most recycled product in the world. And we should keep that position.

4 - Modern Techniques

We should use high tech to get high quality roads. If we do not implement the new technologies we will have an old fashioned industry before we are old.

We saw modern machine guidance systems, a system to measure composition and thickness measuring natural gamma rays and a prefabricated road with a high noise reduction, that can be quickly un-rolled as a carpet and replaced.

The last one showed that by using a functional contract, the contractors have the opportunity to come up with their best solutions. By defining functional specifications the industry will be stimulated to come up with new innovative solutions.

5 - Performance contracts

Polymer modified binders can enhance the performance of asphalt pavements and may be especially valuable for use in new performance contracts.

Functional contracting should become a common instrument.

Performance levels should be set in bids and the construction companies should get the freedom to comply with these requirements.

By giving the contractors the opportunity to come up with technical alternatives in the bidding process it will encourage technological progress we need in our industry.

6 - Cold is hot

Cold and warm techniques are becoming better. The quality of these products is increasing and will take their market share in Europe.

Several techniques are available now:

- WAM Foam Asphalt
- Warm asphalt
- New cold mixes: Using emulsions.

The performance of cold mixes on the different job sites was found to be the same as for hot mixes and »at least as durable as that of hot mix« also under extreme conditions.

Cold mixes can improve the comfort and safety of the workers environment.

We also saw the reduction of asphalt mixing temperatures and paving temperatures in Germany by using additives. This lowers CO₂ production and the energy consumption. Having less bitumen fumes and a better working environment for the asphalt workers have also been important driving forces for the work.

7 - Binder additives

The use of special binder additives can improve the asphalt properties.

We saw the effect of the use of fibres and hydrated lime, filler material as well as rubber modified asphalt mixtures.

When we look at additives for the binder we always should take into account the consequences for the environment and the workers health, not only in the production and laying stage but also in the recycling stage.

8 - Old - new / simple - complex

When we look at the papers referring to the composition and performance of bitumen we see a great diversity and complexity of the analytical techniques used.

We need modern test methods for the description and classification of the mechanical properties of polymer modified bitumen.

SHRP and post SHRP experiences will help us in that.

Perhaps we should look more at the relation between bitumen and the bitumen-filler mix (the mastic) and the relation between the mastic and the asphalt mix behaviour.

Knowing this it might be easier to get more insight in the interaction between mastic and the aggregate.

9 - Tar is tricky

In several European countries tar is a big

problem. The final solution is to take it away from the building chain. We need a fast method to detect tar and then safe procedures to handle the problem.

Some new methods were shown.

Several new non-tar containing products were shown that can be used to produce kerosene and / or fuel resistant asphalt mixes.

10 - Life Cycle

We care about the possible impact of the use of asphalt and of bituminous pavements on the environment during the whole lifespan.

The Life Cycle Analysis is a tool that gives information on this environmental impact.

11 - Energy Reduction

The energy used for production, construction and maintenance of the pavement is only a small fraction of the energy used by the traffic during the lifetime of the pavement.

So energy reduction of the traffic is therefore very important. The tire industry is working on reducing the rolling resistance.

Smooth roads reduce fuel consumption of the traffic and the rolling resistance of the different asphalt surface layers could need more attention to see what we could achieve in that area.

12 - Mixture Design

Existing test methods for mixture design and the compaction methods need an improvement of the accuracy. The selection of the components of a bituminous mixture needs to be improved too.

The use of rational tests and the new digital analyse techniques seem to be a very promising way.

13 -Durability

Durability is fairly complicated. The binder oxidative ageing is the main issue, but also the moisture sensitivity is important and they can both interact. And then we also have to take the mix design into account.

Field area are still lacking in a number of durability areas. Hopefully the BitVal project help.

Modified binders clearly show the advantages;

14 - Ageing

Different binders are ageing differently.

The same applies for all PmB's. They all age in different ways, according to their composition and microstructure.

So it is here the same as for humans: a very interesting subject with good progress being made but we do not understand everything yet.

15 - Moisture

When we speak about ageing and moisture sensitivity we should not forget the influence of the filler, the film thickness of the binder, the air void content of the mix and the nature of the aggregate. So they concluded more research is needed.

16 - Low temperature behaviour of asphalt and bitumen

Several papers point to Direct Tensile Test (DTT) and Bending Beam Rheometer (BBR).

Some authors have the opinion that the Direct Tension Test technique gives a better description of the low temperature behaviour compared to Bending Beam Rheometer.

Other authors conclude that data from both BBR and DTT are necessary to distinguish between pure and modified bitumen even if the modified binders only contain 2 % polymer and there were more and other opinions.

So we are confused but at a much higher level.

17 - High temperature performance mix

The Wheel Tracking Test is becoming frequently used for important projects to test the resistance against rutting.

The Tri-axial Repeated Loading Test or Static Loading Compression Test (confined or unconfined creep tests) are seen as important test methods for the evaluation of the resistance to permanent deformation of asphalt mixtures, because of their fundamental scientific value as well as economical advantages in comparison to Wheel Tracking Test.

For improving the rutting resistance we see that mixture additives and binder modifiers play an important role too.

High temperature performance of binder

Several papers addressed this subject and they come to the conclusion that the test methods to determine ZSV work rather well for pure bitumen, but not for PmB's.

Some authors showed that these problems for PmB's can be avoided by testing at higher temperatures. It was also suggested to use a low frequency shear viscosity as a binder performance parameter in stead of the zero shear viscosity.

18 - Fatigue performance

We saw several methods but no real conclusion telling us which method is the best one.

In October this year we have to decide on one European Test method for fatigue testing. So we have some months left to think about it.

19 - Quality

Last but not least two quality related remarks.

Good quality processes will lead to a higher quality work. Better preparation by both customers and contractors will help saving the tax payers' money.

This concludes the short conclusions I made.

On the website www.eecongress.org/moderatorsreport you will find the moderators report and a longer version of my conclusions.

We made progress. When you go back 20 years from now you can see what we achieved in the last 20 years. 20 years ago we had:

- No porous asphalt
- No double layered porous asphalt
- Hardly any SMA
- No ultra thin layers

So we made a lot of progress the last 20 years.

Closing remarks

On behalf of the E&E TC I would like to thank the members of the Scientific Committee, the moderators and the speakers. Last but not least I would like to thank two persons that did a lot of work for the Technical Committee.

The first one is my secretary Samantha, who is still working at this moment in the EAPA office in Breukelen. The second one is also a lady who did a lot of work especially for the Technical Committee. That is Helga Eismair of Austropa Interconvention.

With those two right hands it was great to serve you by organising the technical sessions.

Lady and Gentleman, I used the words European flowers in stead of Dutch flowers or Austrian flowers, to underline that we should think European in our work. I does not make any sense anymore to strive for local test methods or national test methods. If we all speak different languages we won't understand each other.

In case of different test methods other people can't use your results.

If we want to become a strong Europe we should join forces. By avoiding duplicating research we can achieve more having the same budgets.

COLLABORATION WITH DRC, SLOVENIAN ROAD AND TRAFFIC RESEARCH SOCIETY

As associate of DRC, ZAS have participated in a number of activities of the Society. Our representatives took part in the professional conference entitled »Civil engineering products used in construction of roads and other structures: Innovations, quality requirements, the EU market«, which was held in Gornja Radgona on April 7, 2004. We also participated in the organisation of the 7th Congress on Roads and Traffic (see below).

Representatives of DRC, Mr. Skulj and Mr. Vilhar, attended ZAS events and enriched our meetings through their speeches.

REPORT FROM THE 7TH CONGRESS ON ROADS & TRAFFIC

From 20-22 October, 2004, the DRC organised the 7th Congress on Roads and Traffic, focussing on renovation and maintenance.

Beside Slovenian experts, the Congress was attended by professionals from Italy, Austria, Hungary, Germany, Croatia, and Serbia and Montenegro, who presented circumstances and perspectives in their own countries. ZAS was active in the organisation of the entire congress and in the co-ordination of international lectures.

In the framework of the congress lifetime achievement awards and awards for outstanding contribution in the development of Slovenian road construction industry were given. Among the recipients was our own loyal Prof. Dr. Janez Žmavc.

Principal conclusions and recommendations of the Congress regarding the field of development and quality of materials in asphalt pavement:

- PmB, SMA, low temperature asphalts**
In the field of application of asphalt mixtures the development in the past two years focussed mainly on expanded use of polymer modified asphalts. Headway of the asphalt pavement industry is also evident in the execution of the first test fields for use of low temperature asphalts and in further popularisation of low-noise SMA asphalt mixtures and porous asphalts, which have been successfully applied in motorway double twist areas. All this can be seen as a significant contribution to environmental protection and improvement of traffic safety.
- Increased traffic loading and pavement design**
During the last decade we have witnessed a

constant sharp increase of traffic loading. This has become especially evident since Slovenia joined the EU in May 2004 when in some directions the proportion of heavy vehicles increased several tens per cent.

Pavement design has to keep pace with the increase of traffic loading as well as changes of climatic conditions. Higher summer temperatures and low winter temperatures have an additional and extremely unfavourable effect on durability of pavements; therefore, an interdisciplinary method including all participants that takes into account various different conditions and loadings is essential. It is thus vital that - beside designers - customers, traffic planners, asphalt pavement technologists, and geotechnicians also be part of the process. Initial testing systems must be established, which will allow simulation of all different loadings to which materials and layers of a pavement are subjected to.

- Systems of assurance of quality of asphalt pavement works**

Recent findings and new understanding of quality assurance show that in order to attain the required level of quality of a product it is not sufficient only to assure the quality in the production process but also in all stages of product application. These realisations, as well as new legal regulations (ZGO-1 and ZGPro) demand that in the process of road construction we make a shift from the existing traditional quality control to a system of quality assurance and constant improvement throughout the cycle of product realisation, i.e. from the original idea and design through execution to use and maintenance of a structure.

The basis for the control of quality of construction remains internal quality control, which the contractors themselves are in charge of. The regulations, however, stipulate the practice of additional - third party control, performed by an independent institution. The institutions in question are urged to obtain accreditation for individual test methods as this will become requisite for performing third party control in the future.

Date: **November 25&26, 2004**

Venue: **Hotel Larix, Kranjska Gora**

Number of Participants: **156, from 9 countries**

9TH COLLOQUIUM ON ASPHALT AND BITUMEN

The Slovenian Asphalt Pavement Association (ZAS), under the sponsorship of Petrol, Slovenian Energy Company, organised a traditional 9th Colloquium, renamed this year to include

both asphalt and bitumen. It was held on November 25&26, in a different venue, namely Larix Hotel in Kranjska Gora.

In his preliminary address the President of ZAS Slovenko Henigman revealed the topic of the Colloquium, dedicated this year to techniques and environmental protection, and explained the reasons for its renaming. It was said that ever since its outset the Colloquium never dealt only with bitumen, but with asphalts as well.

On the first day of the Colloquium a regular annual meeting of ZAS Technical Committee and a meeting of ZAS Enterprises Committee were held, at which the activities of the current year as well as guidelines for future work were presented. A report on educational conferences held in the past year was given, and a programme of further education of asphalt pavement staff in 2005 was presented. The work of ZAS Technical Committee was presented in detail; this included preparation and presentation of »Recommendations for production and laying of SMA asphalt mixtures« (*published within this volume*) and novelties in the field of technical regulations. A report on the work of the HSE Committee was also given.

For enterprises that actively collaborate with ZAS, technical and commercial presentations of the fields of activity of individual enterprises, their products, and technological development in the fields of asphalt and bitumen were organised on the first day of the Colloquium.

In the lobby of the conference hall a presentation of 16 established domestic and foreign enterprises took place, namely: Asfaltex, CM Celje, CGP, CP Maribor, Igmat, IMS AditOil, Interchem, Interchemika, Lespatex, Primorje, Possehl, Ro-tech, Tovarna asfalta Pomurje (Pomurje Asphalt Plant), SCT, Sika, and Vögele.

Following the programme, 10 papers were presented in the technical sessions. Dr. Tušar of the Slovenian National Building and Civil Engineering Institute (ZAG) gave an overview and an evaluation of the quality of bitumen used in Slovenia within this year, while Ms. Naglič offered the results of laboratory analyses of polymer modified bitumens performed at Igmat institute in Ljubljana. Also, Mr. Kavčič of DDC Consulting&Engineering explained to the participants the state of waterproofing in 2004.

The second part of the presentation was intended for the enterprises to present their recent achievements. Within this framework representatives of SCT presented the execution of waterproofing and asphalt pavement works

on Črni Kal viaduct, which was an exceptionally difficult undertaking due to the specific nature of the structure.

In the field of low temperature asphalts a great number of tests were performed during the past year. Within the Technical Committee's special task force in charge of low temperature asphalts, a series of additives were tested, including »Aspha-min«, presented by representatives of Interchem and Eurovia companies. Further on, a different additive for lowering the temperature of asphalt mixtures was presented - »Sasobit« by IMS AditOil.

Possehl company, which has the most experience in the field of reparation of cracks in Slovenia, presented the established procedures and equipment required in the field. Also, technology of pigmented asphalts for use in bicycle lanes and footpaths was presented.

A special bridge expansion joint system which utilises anchoring reinforcement and »Falcon« asphalt mixture, which comes from Japan, that enables in situ laying was presented by representatives of CMCelje, Interchem, and Miki company of Japan. Also, expansion joint system for large bridges »Serviflex« was presented later on.

Methods of cold method asphalt recycling using emulsions were presented by representatives of Marini and Interchemika companies.

Prior to a gala dinner party the participants of the Colloquium were addressed by Executive Director of Petrol Mr. Jožef Petrovič and a representative of ZAS Supervising Committee Mr. Marjan Makovec. There followed entertainment programme featuring singer Andraž Hribar and his band, and the dinner party.

On the second day, the central part of the Colloquium was attended by 156 professional experts from 9 countries, namely Austria, Italy, Germany, Hungary, Croatia, Serbia, the United Kingdom, Japan, and Slovenia.

Preliminary speeches were given by President of ZAS Mr. Henigman, Technical Director of DARS Mr. Abdon Peklaj, Chairman of DDC Consulting&Engineering Metod Di Batista, and Chairman of DRC Saša Skulj.

Eight papers were presented in the technical part. Ms. Helle Fabiansen from Denmark, Chair of EAPA HSE Committee, presented forecasts for the field of health, safety and environment in the asphalt pavement industry the future.

There followed two papers dealing with low temperature asphalts. Aleksander Ljubič of Igmtat institute described the development of preparation and test methods used for low

temperature asphalts by SCT and Igmtat and provided results of the performed tests. Andre Taube of the German Asphalt Pavement Association presented technologies, possibilities and restrictions in the use of low temperature asphalts.

Chair of ZAS Health, Safety, and Environment Committee, Aleksander Kerstein, presented guidelines and basics for treatment of construction waste containing bituminous binders, from the viewpoint of possible operational methods, and their environmental, technological and economic influences on the asphalt pavement industry in Slovenia.

Experience in the use of cold systems in Europe and innovative agents for adhesion of layers were presented by Wolfgang Schönleitner from Austria.

Innovations in the field of technical regulations in Slovenia and the field of assessment and attestation of conformity of asphalt mixture production were presented by Dr. Marjan Tušar of the National Building and Civil Engineering Institute.

Experience in the use of low temperature asphalt additives in Germany was summarised in his paper by Dr. Wolfgang Garbe.

In the concluding paper, prepared by Mitja Čotar and Zvonko Cotič, practical experience in the use of SMA from the beginning of their production in Primorje company was presented.

The Colloquium concluded with the closing address, given by the President, who kindly invited the participants to attend the next Colloquium, which sees its 10th anniversary this year. It is set to take place on December 1&2, 2005, in Kranjska Gora's Hotel Larix.

Date: March 11, 2005

Venue: Hotel Mons, Ljubljana

Number of participants: 114 (of 125 applied)

EDUCATION OF ASPHALT PAVEMENT STAFF

This year's 5th joint educational conference for asphalt pavement staff from all regions took place in Hotel Mons in Ljubljana. It was aimed at technical and engineering staff.

In preparation of the programme of education, the Educational Section was led by the hot issues of increased traffic loading and cracking of newly constructed motorway pavements, which also resulted in several new documents and systems of assurance and attestation of conformity.

In the first part of the conference Ms. Olga Naglič, head of laboratory for bituminous materials at Igmtat institute, acquainted the participants with recent developments in the bitumen field. She presented new test methods and guidelines for bitumen selection in the future, depending on different application conditions.

Further on, Mr. Aleksander Ljubič, head of the asphalt laboratory, presented the history and the field of design of broadly used but extremely demanding SMA asphalt mixtures. He highlighted the problems recently encountered in application of these mixtures - mainly due to high and low temperatures and increased traffic loading - and presented the Recommendations for design and production of SMA asphalt mixtures prepared by the ZAS Technical Committee and the DARS Asphalt Committee.

Mr. Janez Prosen, Head of ZAS Technical Committee, explained in his extensive paper the meaning of individual conformity levels in the EU Construction Products Directive. In discussion, some details on acquisition of certificates - declarations of conformity were explained.

In the second part, following a short break, Ms. Julijana Jamnik of DDC Consulting&Engineering acquainted the participants with some facts regarding the field of noise: its origin and development, findings from a research project on noise levels in various asphalt pavements, noise level predictions for individual asphalt mixtures, and noise reduction measures.

In conclusion, a crucial topic of »Occupational safety in asphalt pavement« was brought up by Mr. Mitja Čotar of Primorje. Assisted by Mr. Marjan Marolt of SCT he talked about organisation of asphalt pavement work and the arrangement of a safe workplace, about personal protective equipment for asphalt pavement workers, as well as of a regrettably high accident count in the asphalt pavement industry.

The conference was attended by 114 participants from 21 road construction companies, most of which actively collaborate with ZAS. All participants were handed out working material including lecture abstracts, ZAS bulletin, and a certificate of attendance at the conclusion of the conference.

A large attendance and compelling discussions which followed individual lectures are an indication that the topics of this year's conference were important to the participants and appropriately chosen. A special acknowledgement for the success of the project of education goes to all lecturers and all hard-

working members of the Educational Section, who contributed in the organisation of the conference.

Technical papers

WEARING COURSES FOR REDUCTION OF MOTOR VEHICLE NOISE ON ROADS

Environmental preservation has become an essential task for humanity. The general public has come to perceive noise as an extreme nuisance, and road traffic noise ranks highly among various types of noise. A solution to the problem demands exhaustive discussion of possibilities of noise prevention as well as noise protection. This is vital for ensuring basic quality of life in communities close to heavily loaded roads.

The main pavement characteristics which influence noise are roughness and porosity. Development is aimed at:

- such roughness of pavement that diminishes oscillation of pneumatic tyres and that produces little air current noise in the tyres
- production of porous wearing courses which absorb noise.

In the effort to create wearing courses that generate less noise, however, we must be careful not to affect the quality of basic characteristics of wearing courses.

Roughness

Micro roughness is necessary for ensuring appropriate friction between the tyre and the pavement, and it does not generate much noise as it does not have a great effect on oscillation of the tyre, due to grain penetration. On macro-rough pavements surfaces grain penetration is more intense which results in a higher intensity of noise.

Therefore undulations of certain length are required in a pavement surface, while longer ones are undesirable. The optimum lies in the range of macrotexture, i.e. pavement with grain angle spacing of about 1 to 10 mm, which can be achieved by using skeleton particle distribution that contain grains of roughly equal maximum size (8 or 11 mm). In other words, asphalt mixtures used for wearing courses should not contain crushed stone particles larger than 11 mm.

Porosity

Porous wearing courses with voids that extend far into the depth of the structure, or even extend through the entire layer, were originally intended mainly for improvement of drive safety. They prevent water stagnation on the pavement, and tyres are able to push stagnant

water more easily and quicker from the areas of stagnation. Thus spraying behind vehicles is almost eliminated, while vehicle headlight reflection is reduced. Beside improved traffic safety, porous wearing courses are able to largely reduce the noise generated by motor vehicles through absorption.

Advantages and disadvantages of porous and macro-rough wearing courses



porous course surface



macro-rough course surface

Macro-rough wearing courses in wet weather cause spraying behind vehicles, rolling noise level is high, grains are more subjected to trowelling, rolling resistance is increased which increases fuel consumption, and wearing of tyres is more pronounced.

Porous wearing courses have a higher draining capability which decreases spraying behind vehicles, rolling noise is significantly less pronounced due to absorptive effects of the course, trowelling and rolling resistance are slighter.

Of course, porous courses are not without drawbacks, as seen in:

- conditions of use during winter (twice as much salt is needed for spreading; crushed aggregate sprinkling is not allowed due to danger of clogging of voids),
- the need for regular cleaning of wearing course voids with water under appropriate pressure to ensure draining of precipitation water through the wearing course, and
- inadequate draining along the edges of a porous wearing course, which can cause water to freeze inside the voids and thus result in a collapse of the structure.

Adequate draining ability has to be ensured with a high volume voids ratio (approx. 20% V/V). This can be done by using uniform particle distribution mixtures, which, however, are unsuitable due to technical and economic reasons. The desired void ratio can also be attained by discontinuous grading, in an otherwise homogenous composition of aggregate. Thus it can be easily prevented that residual voids, created by large grains, are filled with grains of the next lower grade.

Because in a porous, distinctively skeletal composition of asphalt mixture, contact bet-

ween aggregate particles is very limited, it is requisite that particles in the mixture possess strong edges and angles, while also having a sharp plane surface.

As a consequence of porosity, the binder is put under two characteristic pressures: higher oxidation, and higher tensile stress and stronger shearing forces on grain edges and angles. To be able to take on these additional loads a quality binder is required (addition of appropriate polymers and elastomers to standard road bitumen), as well as a thicker film of bituminous binder enveloping the grains.

Wearing courses for noise reduction

To summarise, in order to attain asphalt courses that generate less noise, appropriate macro roughness and porosity of wearing course must be ensured, which will at the same time ensure traffic safety and durability of wearing course.

The largest void ratio is found in **porous asphalt mixtures (PA)**.

A much smaller void content is found in wearing courses of **SMA asphalt mixtures**, which still have a favourable texture for noise reduction. Above all, SMA possesses a greater resistance to deformation, is more durable, and is maintained and laid more easily.

Studies of noise level in wearing courses for noise reduction

In order to establish which type of asphalt mixture commonly used for wearing courses in Slovenia generates least rolling noise, and to see whether the characteristics of the types of asphalt mixtures used for wearing courses exhibit different interactions in Slovenia than abroad, a basic study entitled »Effects of type of asphalt mixture on noise« was performed (by ZAG, the National Building and Civil Engineering Institute) in 2002, in the framework of developmental and research projects at DARS. Similar measuring methods were used on 30 sections to test characteristics of asphalt mixtures used in wearing courses, namely:

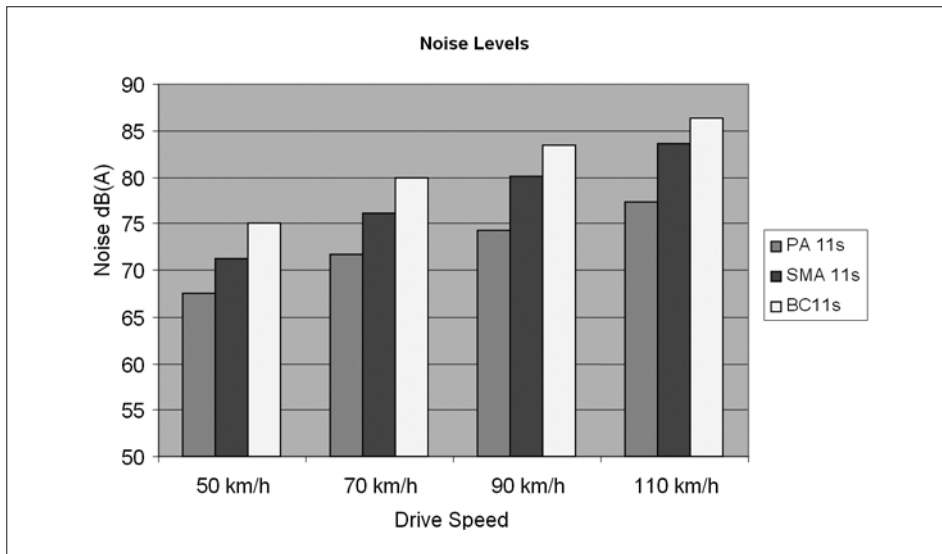
- porous asphalt (PA) 11s,
- SMA 11s and SMA 8s, and
- bituminous concrete (BC) 11s and 8s, BC 11 and BC 8.

The results for porous asphalt 11s, SMA 11s, and bituminous concrete 11s at different drive speeds are given in the figure below.

The performed measurements of rolling noise showed that at all drive speeds least noise is generated on porous asphalt wearing courses (PA 11s), while noise levels on all other tested types of wearing courses (SMA, BC) are up to 8 dB(A) higher.

Noise generated on all SMA wearing courses is up to approx. 3 dB(A) lower than that on wearing courses using bituminous concrete.

As similar results have been published in foreign technical literature, this is seen as



confirmation that the foundations on which current Slovenian technical regulations stand are fully suitable for attaining the desired condition of wearing courses as regards rolling noise. The technical regulations mentioned are the following Technical Specifications for Roads:

- TSC 06.413: 2003 Bound Asphalt Wearing Courses, Porous Asphalt
- TSC 06.412: 2001 Bound Wearing Courses, SMA

Conclusion

Noise reduction of 3 dB(A), which can be attained just by using SMA, equals:

- a 50% traffic flow reduction or
- a 50% noise reduction or
- doubling the distance from the source of noise.

Further noise reduction can be achieved by using porous asphalt.

OCCUPATIONAL SAFETY IN ASPHALT PAVEMENT INDUSTRY

As civil engineering is an industry comprising of a series of unrepeatable procedures and unpredictable occurrences, ensuring occupational safety is a demanding task. Workplace in civil engineering is not fixed: working environment in a construction site changes constantly as the work progresses, and even due to changing weather conditions. Thus workers are exposed to numerous dangers and risks that are difficult, or even impossible, to predict prior to commencement of construction.

In Slovenia, between 2500 and 3000 injuries at work are reported annually in civil engineer-

ing, which means that almost one in twenty workers is injured. The percentage of civil engineering workers among the active population in Slovenia is 7,5 %, while the portion of injured workers in civil engineering amounts to between 13 and 14 per cent of all injured workers. This means that there is an incidence rate twice as high as would be expected from the percentage of civil engineering workers in the economic structure of the country.

Occupational injuries also represent a great financial burden to civil engineering companies. This is manifested as loss of working time of injured workers, payment of indemnity for absence from work of up to 30 days (a 100% financial compensation), and indemnity claims by injured workers, which have lately risen in number.

Accidents and injuries with highest occurrence rate in the asphalt pavement industry are the following:

- slips and falls when dismounting machines
- slips and falls on construction sites (shafts, obstacles)
- blows etc. due to contact with machinery
- compression injuries in handling cargo (loading, unloading)
- burns caused by hot asphalt and hot objects
- traffic accidents.

The question that all parties concerned have been posing ourselves is how incidence of these accidents and injuries can be reduced. Experience suggests that this can be effectively achieved by:

- using personal protective equipment
- proper organisation of work and workplace layout
- educating and instructing the workers
- regular health checks.

Personal protective equipment

Work clothing (overalls) must cover the entire length of arms and legs and must be of appropriate size so as to enable free movement. It must be worn all year round, including the summer months.

Protective footwear used in the asphalt pavement industry must be resistant to high temperatures and thermo-insulated, and must have characteristics suitable for use (work, walking) on hot asphalt. Footwear must be maintained according to provided instructions.

Protective gloves which provide sufficient thermo-insulation must be used; leather gloves are preferred. They must cover the sleeves. These are mainly intended for protection of workers against contact with hot asphalt mixture.

Reflective vest provides extremely efficient protection as it improves worker's visibility. Its use is compulsory when working on closed roads and in low visibility conditions.



Reflective vests greatly improve workers' visibility

Helmet. Its use is compulsory on construction sites with a danger of cargo falling from above (work under cranes, bridges, viaducts, etc.).

Organisation of work and workplace layout

Obstacles and obstructions

Many obstacles and obstructions which have the potential of causing injuries are found in construction sites. Manholes and shafts must be properly covered. A protective fence must be set up around structures.

Construction site layout

Traffic through construction sites is unpredictable and is not regulated (crossing, stopping, driving in different directions). Transportation lanes must be marked by construction site management, and workplaces must be clearly separated from traffic areas. Machines and lorries must be equipped with a sound signal indicating backing. To be able to secure safe working conditions trespassing must be prevented. Use of mobile telephones also counts as a disturbing factor on a construction site, especially inconvenient to machine operators.

Work organisation in an asphalt pavement work group

Each worker in a group must have their individual task and workplace. A worker must be in charge of receiving lorries and directing them to the paver. Workers must keep away from the paver unless required. Lorries must be equipped with a sound signal indicating backing.

Work on road closures

It is extremely demanding to ensure work safety in these conditions. Workers and machines move in restricted areas, therefore workers need to be constantly focussed on their work and aware of areas of traffic flow. Road closure is set up according to expert report and permit. Signalisation must be used to separate the workplace from traffic areas and a min. 60 cm safety distance from traffic flow must be observed. In designing and issuing of permits for road closures safety of workers must also be taken into account.

Night-work

Recently contractors have been facing increasing pressures to execute work during night-time. Here a major issue is visibility, not only that of workers but also of traffic signalisation (indicators, road & traffic signs). Working area during night-time is limited by the range of lighting; therefore workers must be familiar with the work plan. Workplace must be adequately illuminated; the direction of light must be perpendicular to the area behind the paver and must not obstruct traffic. Night-work is suitable only for workers with high psycho-physical abilities. All machinery must be equipped with lighting and workers must wear reflective vests.



During road closures movement of workers and machines is restricted

Special cases of protection: measurement using nuclear gauge

Only experienced workers are allowed to handle nuclear gauges. They must be equipped with radiation dosimeters. Persons not involved in the measuring procedure must keep away from the area of measurement. The worker handling a nuclear gauge must be clearly visible. Gauges must not be left unattended in the construction site. Machines (rollers) must be kept away from the area of measurement.



Night-time work area is limited by the range of lighting

Special cases of protection: bitumen pumping

In bitumen pumping not only the body but also the face must be protected with a visor. Tube for bitumen pumping must be at least 4 m long so as to avoid sharp twists and turns of the tube. The tube must be examined regularly. Valves, pumps and installations must be clearly marked. Precise instructions for the procedure of bitumen pumping must be provided.

Beside the use of personal protective equipment, and proper organisation of work and workplace layout, it is essential that workers are educated and trained in work safety on a regular basis. On the other hand, foremen must make sure that gained knowledge and awareness is applied in practice. They are required to warn workers upon violations of safety measures.

In conclusion we have to call upon the fact that it is workers themselves who are primarily responsible for their own well-being.

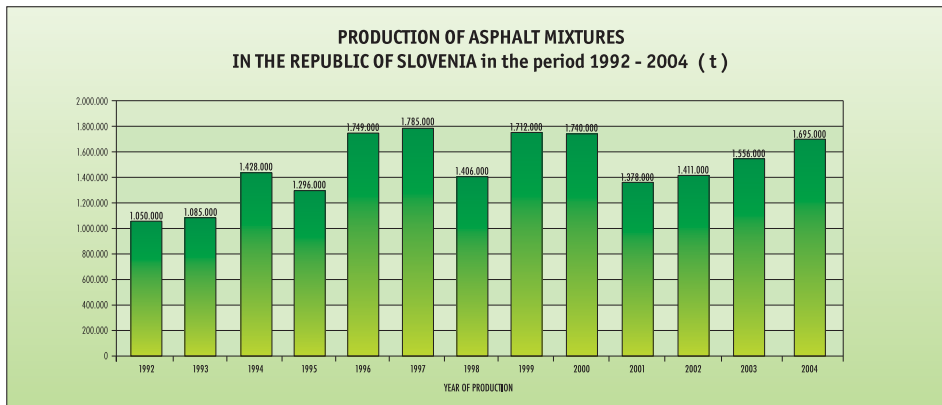


PRODUCTION AND LAYING OF ASPHALT MIXTURES IN 2004

In the year 2004, close to 1,7 million tonnes of hot asphalt mixtures were produced. Apart from that 58.000 tonnes of mixtures were imported from Croatia, which means that almost 1,8 million tonnes of asphalt mixtures were laid in all.

In the mixtures produced, approximately 1,45 million tonnes of carbonate aggregate mixtures, 0,2 million tonnes of silicate aggregate mixtures, and about 80.000 tonnes of bituminous binders were used. The portion of laid road bitumens amounted to 67.500 tonnes, while the portions of polymer modified bitumens and natural asphalt modified bitumens totalled 10.000 tonnes and 2.100 tonnes, respectively. The portion of modified bitumens in the entire bitumen consumption did not change significantly compared to 2003.

104.700 tonnes of SMA were produced and laid in Slovenia in 2004.



According to the manufacturers approximately 100.000 m² of surface dressings and thin overlays were laid, which represents a 20% increase of the previous year's total. Also, 396.000 m³ of cracks were sealed in 2004.

**DARS Asphalt Commission and ZAS Technical Committee:
RECOMMENDATIONS FOR PRODUCTION AND LAYING OF SMA ASPHALT MIXTURES**

In 2003, on some motorway asphalt surfaces, laid mainly in the period from 1999-2000, damage in the form of cracks was discovered. Unusual damage required fast and efficient measures.

To establish the causes every available domestic expert was consulted as well as some noted foreigners. A number of asphalt samples were taken, analyses of produced and laid SMA mixtures performed, and the issue was discussed by the responsible commissions and technical committees. In order to pinpoint the causes numerous documents were prepared; these form the basis of the recommendations in question. Their aim is to prevent reoccurrence of eventual deficiencies that were the cause of the damage.

The Recommendations are based on the following documents:

- Effect of low temperatures on durability of asphalt mixtures, RRN, IGMAT, 2004
- Expert statement on causes of early damage on asphalt reinforcements of pavements on individual motorway sections, ZAG, 2004
- Investigations performed at Braunschweig Technical University, Institut für Straßenwesen, Univ. Prof. Dr. - Eng. Rolf Leutner, 2003 & 2004
- Expert statement by Eng. Lothar Drüschner, NMW
- Statements by members of the Asphalt Commission at DARS and the Technical Committee at ZAS.

The Recommendations offer suggestions on safety of design and production of SMA asphalt mixtures. The current technical specifications will also be supplemented in accordance with these Recommendations.

A. SMA ASPHALT MIXTURE DESIGN

1. Special attention should be paid to selection of income materials (bitumen, stone dust, aggregate) and to maintaining constant quality.
2. The portions of bitumen in JMF should be as follows:
 - SMA 8 and SMA 8s: min. 6,8 m.-%
 - SMA 11 and SMA 11s: min. 6,3 m.-%
3. With all SMA asphalt mixtures the optimum void ratio in the compacted stone mixture of Marshall test specimen must be designed in a way that even at the minimal required bitumen content the required value of fill-up of bituminous aggregate voids (min. 75 V.-% and max. 90 V.-% for heavy and extremely heavy traffic loads) is attained (see chart below). Design of asphalt mixture has to be based on mathematical calculations according to TSC 06.730 JMF of Asphalt Mixtures technical specification.
4. For limit values of bitumen fill-up and total voids ratio in mixture see Chart 1.

5. For extreme limit values of bitumen fill-up and total voids ratio in mixture see Chart 2.
6. For limit values of compaction and void ratio in course see Chart 3.
7. The allowable downward deviation of bitumen content in SMA mixture from the value determined by the formula must not exceed 0,1 (m.-%) in an average of at least 5 asphalt samples, and not exceed 0,3 (m.-%) in an individual sample.
8. For production of SMA asphalt mixtures only outside stone dust is recommended. If using stone dust obtained from dedusting in the process of asphalt mixture production (own stone dust), its suitability has to be tested according to EN 13179-1 (ΔP&K).
9. The designed range of porosity of asphalt mixtures in JMF and bitumen fill-up have to be determined according to use within the scope of limit values. This is shown in the diagrams in Figure 1 (for heavy and extremely heavy traffic loads) and Figure 2 (medium and light traffic loads).
10. The difference in R&B softening point between the values of income bitumen and that of extracted bitumen must not exceed 10 °C.
11. If using polymer modified bitumen, the temperature of Marshall test specimen compaction has to be 10 °C lower than the equiviscosity temperature, while the maximum compaction temperature must not exceed 165 °C.

B. PRODUCTION AND TRANSPORTATION OF SMA ASPHALT MIXTURES

1. Temperature of production of SMA asphalt mixtures depends on the type of bitumen used; it must never, however, exceed 175 °C.
2. Transportation distance of SMA asphalt mixtures must be limited to 100 km and time

Characteristic of bituminous mixture	Unit	Traffic load	
		extremely heavy and heavy	medium and light
-total voids ratio lower limit upper limit	V.-%	2,5 4,5	2 4
-void fill-up in aggregate & bitumen mixture lower limit upper limit	%	75 90	80 90

Chart 1: Limit values of bitumen fill-up and void ratio

Characteristic of bituminous mixture	Unit	Traffic load	
		extremely heavy and heavy	medium and light
-total voids ratio lower limit upper limit	V.-%	1 6	1 5
-void fill-up in aggregate & bitumen mixture lower limit upper limit	%	70 95	75 95

Chart 2: Extreme limit values of bitumen fill-up and voids ratio

Characteristic of bituminous course	Unit	Traffic load	
		extremely heavy and heavy	medium and light
total voids ratio	V.-%	3 - 6	2 - 5
compaction of course		>97	>97

Chart 3: Chart 3: Limit values of compaction and void ratio in course

ACTIVITIES OF THE SLOVENIAN ASPHALT PAVEMENT ASSOCIATION BODIES IN 2004-2005 PERIOD

Executive Committee (EC)

Since the last regular assembly when the new Executive Committee was elected its members met on 6 sessions, all of which had a quorum. In all, 61 resolutions were passed and mostly realised. Some of the tasks confirmed by the Executive Committee run over longer periods of time (e.g. meetings with managements of major asphalt producers, organisation of the 10th Colloquium on Asphalt and Bitumen, etc.).

Beside the 9 members of EC ZAS the meetings were attended by invited members of ZAS, mainly Chair of the Supervising Committee Mr. Marjan Makovec, Coordinator Ms. Jožica Cezar, and Chair of ZAS Technical Committee Mr. Janez Prosen.

TECHNICAL COMMITTEE (TC)

A long-term work programme of the ZAS Technical Committee, confirmed in 2003, designates the following main fields of activity for 2004:

- technical regulations
- raw materials used in asphalt production
- asphalt mixtures.

The criterion upon which these fields of activity (especially so the field of technical regulations) had been designated was the imminent membership of Slovenia in the EU. Intensive work in the field of technical specifications and discussion on regulations are essential for quality of work in the field of asphalt pavement. With Slovenia's joining the EU it has become our obligation to adopt new procedures of certification according to the European Directive (CPD), above all for income materials (aggregate), while issues regarding occupational and environmental health in the asphalt pavement industry have come to the forefront, resulting in advanced introduction of

needed for transportation must not exceed 2 hours, provided that a thermo caisson vehicle is used for transportation of hot asphalt mixture.

3. It is recommended that as many low temperature asphalt test fields as possible are set up. This will create conditions for wider use of low temperature asphalt additives.

C. PERFORMANCE OF STANDARDISED AND UNSTANDARDISED INITIAL TESTS

1. In the technical conditions for polymer modified bitumen, testing of ductility force according to the EU standard EN 13589 (Force ductility) must be instructed and the value of expansion energy determined.
2. The porosity range of asphalt mixtures in the JMF design has to be calculated.

3. For those asphalt mixtures which are used on roads with extremely heavy and heavy traffic loading, tests have to be performed within the entire temperature range. It is recommended that the following tests be performed:

- high and low temperature performance of asphalt mixtures
- determination of compaction (Arand method)
- examination of adhesion (Leutner method)
- determination of fatigue capacity of asphalt mixture (course) within a broad temperature scope
- examination of rigidity of SMA in JMF according to prEN 12697-26 in the temperature scope of 20 °C to 0 °C (e.g. at 20 °C, the value for rigidity modulus should be approx. 1500 - 3000 MPa).

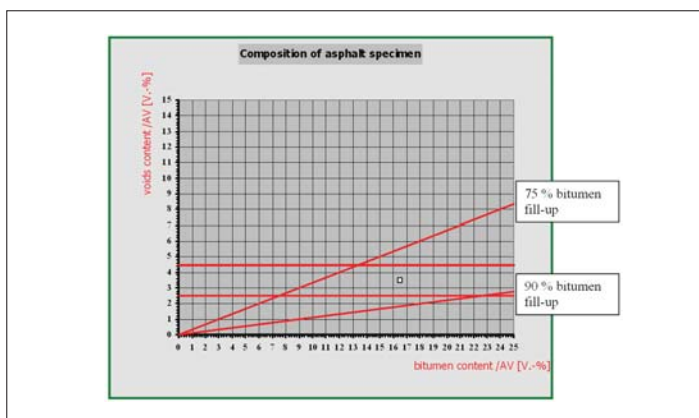


Figure 1: Mix proportion design for heavy and extremely heavy traffic loads

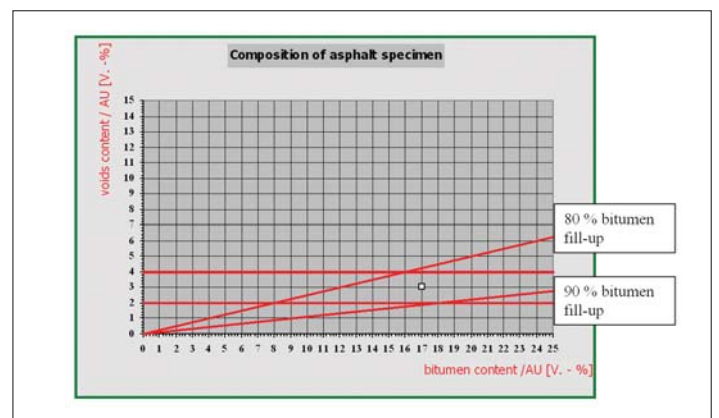


Figure 2: Mix proportion design for medium and light traffic loads

low temperature asphalt additives. Due to the intensity of construction of numerous new motorway sections the work of the Technical Committee has been centred on constant deliberation and activity in the field of design of asphalt mixture composition, as well as on monitoring the condition of asphalt mixtures and courses.

In 2004, members of the Committee met on three occasions in March, September, and November, respectively. This is in accordance with the 5-year period work programme of the considerably large Committee. In the periods between the sessions, meetings of task forces were organised - notably those of the task force in charge of standards, which actively worked on preparation of technical regulations (SIST EN standards, prEN, TSC, PTP - SCS Additives, etc.). This is a complex and demanding field. It has become evident just how vital it is that introduction of new testing methods and procedures is not rushed as a direct shift to the new SIST EN standards is impossible to perform. Thus further activity in the field is imperative.

The TC were also actively engaged in the field of inter-laboratory work. An opinion has formed that a comparison of uniform test samples prepared by laboratories should be done as soon as possible. Thus eventual discrepancies due to »fault in sampling from behind paver« can be avoided to a high degree. The Committee discussed and planned the work in the field of low temperature asphalts and created a task force which gathered encouraging information. First tests have already commenced, mainly due to initiative from the companies. The initial results of these tests are in demand of further detailed analysis.

A large share of activities of the Committee was dedicated to analysis of the condition of asphalt courses, focussing mainly on the effect of low temperatures on durability of asphalt mixtures. In cooperation with the Asphalt Commission at DARS, whose members are also members of TC ZAS, they prepared and adopted the »Recommendations for Production and Laying of SMA Asphalt Mixtures«, published in their entirety within this bulletin. Here a need for collaboration with technical experts who test low temperature mixtures emerged, as well as a demand for a systematic evaluation of existing data with the aim of optimising SMA asphalt mixture design.

The Technical Committee also discussed the need, or rather requirement for assessment of autocontrol execution within asphalt plants, as stipulated in the corresponding European Directive (CPD). Activities in this field are currently being performed and will continue to be addressed in the future.

In 2004 the Committee was acquainted, through its Chair, with the work done by the EAPA Technical Committee. Within this respect active collaboration must continue as EAPA TC's main concerns lie in unification and cooperation in preparation of good standards, in publication of required and convenient technical foundations in the asphalt field, and in collaboration with related associations in organisation of symposia, congresses, and the like.

I would like to thank all who took part in our work and wish for our future collaboration to be as successful.

HEALTH, SAFETY AND ENVIRONMENT COMMITTEE (HSE)

The HSE Committee members met on 3 occasions since the last Assembly, where its mission and activities continued in accordance with the work programme for 2003 and its supplementation in 2004. The Committee discussed current issues in the fields of occupational health & safety and environmental protection. Chair of the Committee took part in the EAPA HSE Committee meeting in Breukelen, where he presented the work of ZAS ZVO Committee.

In September 2004 a joint meeting of the HSE Committee and heads of occupational safety task forces of ZAS member enterprises was held, where common future activities were laid out.

On April 14&15 the EAPA HSE Committee met in Slovenia, hosted by CM Celje.

EAPA HEALTH, SAFETY AND ENVIRONMENT COMMITTEE MEETING IN SLOVENIA

On Thursday and Friday 14th and 15th of April the regular meeting of EAPA Health, safety and environment (HSE) committee was held, in which as representative of ZAS active member Mr. Aleksander Kerstein works and who is at the same time also the leader of the Health, safety and environment committee of ZAS. The meeting for the first time took place in Slovenia, in the place of production division of the firm Ceste mostovi Celje in Velika Pirešica. Eleven members of the committee, who was led by Mrs. Helle Fabiansen from Denmark, came to Slovenia.

On Thursday afternoon Mr. Aleksander Kerstein with his colleagues presented to the Committee members the production program and activities of the firm Ceste mostovi Celje on the field of health, safety and environment

protection. After the introduction the practical presentation and the visit of the new center for the collection and recycling of construction and demolition waste in the quarry Velika Pirešica followed. The preparation and reuse of concrete and asphalt as secondary aggregates was pointed out. After visiting the waste collection center in the quarry the short presentation of the cold recycling system on the asphalt plant took place. The members of the HSE committee were interested for the individual solutions on their field of activities in EAPA, e.g. decreasing of temperature, decrease of energy consumption needs, decreasing of all kinds of emissions, especially the emissions of green house gasses. The members of the HSE committee were enraptured with presented practical solutions.

On the Friday morning the regular meeting of the HSE committee took place, on which the results of IARC study were observed, activities towards new technologies for health and environment protection with decreasing of asphalt production temperatures, protection of workers against UV radiation and other actual themes.

EDUCATIONAL SECTION (ES)

According to the general plan of education there is an educational conference for asphalt pavement staff scheduled for each year, namely alternately for technical workers (engineers and technicians) and for training of operational staff (foremen, engine operators, lay-down foremen, etc.). Thus this year the 5th regional education and training of asphalt pavement staff was organised. For details see under *Education of asphalt pavement staff*.

A detailed plan of contents of all activities is prepared by the Section separately for each year. In topic selection for the Conference we keep step with the requirements and current conditions in the asphalt pavement industry. This means that we try to update participants on innovations and new issues in production and laying of asphalt mixtures, quality assurance in asphalt pavement works, technical regulations, and occupational and environmental health issues regarding the asphalt pavement industry, as they arise.

Because strong emphasis is given to practical demonstrations (on test fields, in laboratories, etc.), we have been employing workshop-style education as small groups of people offer greater possibilities for solving practical issues, exchange of opinions, and of adaptation to particular interests of participants.

Invited lecturers are usually asphalt pavement experts who participate in preparation of material and who present topics as well.

I wish and hope that your expectations are met by the ES in the future as well and that education of asphalt pavement staff will continue on its way of success. All suggestions, comments, as well as readiness for participation will be warmly welcomed.

WATERPROOFING SECTION

The Waterproofing Section comprises of Slovenian manufacturers of waterproofing materials, representatives of foreign manufacturers, representatives of contractors, the Engineer, and institutes. Since the last Assembly they met on two occasions.

In the past year a circular analysis of measurements of low temperature performance of adhesive was performed. Members of the section follow and are acquainted with adoption of new EU standards in the field of waterproofing.

The work of the Section has been positively acclaimed by its members and other experts. Therefore its work programme for the following term will remain unchanged.

I would like to thank all who have participated in the activities of the Section for the done work, hoping for our future collaboration to be as successful.

SUPERVISING COMMITTEE

The Supervising Committee, consisting of Marjan Makovec (Chair) and Franc Gole (member) (another member, Bojan Dapčević, who was excused, handed in a written proposition), met before the last Managing Committee session, where they reviewed the documentation and gave a favourable opinion on the reviewed final account for 2004, which is to be advanced for confirmation at this year's ZAS Assembly.

TECHNICAL REGULATIONS

The Directorate of the Republic of Slovenia for Roads has included in the programme of preparation and supplementation of the existing technical regulations in 2004 the following 2 technical specifications:

- TSC 06.751 Measurements and Tests, Compactibility of bituminous mixtures
- TSC 06.753 Measurements and Tests, Adhesion of asphalt courses.

The contracts for preparation of the above technical specifications have been signed with ZAS, the Slovenian Asphalt Pavement Association.

TSC 06.751 Measurements and Tests, Compactibility of bituminous mixtures, Arand method

Durability of modern asphalt pavements depends largely on compaction of bituminous mixture courses. Therefore adequate compaction of bituminous mixtures must be attained during lay-down so as to preclude subsequent compaction due to traffic. In order to establish this limit value of compaction a suitable method is required. In the technical literature available, the following methods are defined:

- Marshall compactor method
- gyratory compactor method
- vibratory compactor method.

Because of availability of the Marshall method equipment in Slovenia and because the method is already in the process of introduction, TSC 06.751 provides detailed instructions for this method, which enables testing of compactibility of bituminous mixtures (containing particles of up to 32 mm).

The process of increase of bulk density of bituminous mixture with regard to work input (compaction during testing and subsequent traffic loading, respectively), which can be defined in terms of resistance to compaction, can be determined by laboratory testing and assessed on the basis of change in bulk density (density) or thickness of course (i.e. Marshall test specimen). With compactibility testing, therefore, maximum attainable bulk density can also be determined.

TSC 06.751 specifies equipment for preparation of test specimens, the testing procedure, and evaluation of results.

TSC 06.753 Measurements and Tests, Adhesion of asphalt courses, Leutner method

Maximum shearing force and the resulting shift parallel to the shear, and maximum pull-off force depend on:

- particle connection conditions: texture of course surface, roughness depth, maximum grain size in laid mixture/mix, void ratio, compaction of courses, foundation surface, and
- factors that influence adhesion of courses: adhesion, cohesion, mortar ratio in mixture/mix, type and quantity of binder used, and foundation surface condition.

With bituminous mixtures in adhered asphalt courses not only the properties of bituminous mixtures are a factor to be considered; the condition of adjoining areas has to be taken into account as well: smoothness, homogeneity, purity, moisture. Layer connection, therefore, does not depend only on the characteristics of materials - it is a complex phenomenon.

The existing technical literature available specifies two methods of determination of asphalt layer connection:

- testing of shearing force with regard to shift parallel to the shear
- pull-off force test.

For these tests bituminous mixture cores are used (measuring 150 mm or 100 mm in diameter) that must be undamaged and their asphalt layer connection must not be affected in any way. Therefore TSC 06.753 also specifies in detail the procedure of bituminous layer core sampling from pavements and the performance of the test, while the bases for evaluation of results enable quality assessment of adhesion of asphalt courses.

PROFESSIONAL MEETINGS IN 2005

- December 1-2, 2005: 10th Colloquium on Asphalt and Bitumen, Hotel Larix, Kranjska Gora, Slovenia (ZAS)

WORK PROGRAMME FOR THE YEAR 2005

1. General activities

- Co-ordination in the field of asphalt pavement in Slovenia
- Collaboration with related domestic and foreign organisations (EAPA, DRC, DAV, Gestrata, etc.)
- Ensuring funds needed for the activities of the Association
- Managing all the bodies of the Association

2. Organisation of professional meetings and educational conferences

- A round table or a professional meeting
- 10th Colloquium on Asphalt and Bitumen (Kranjska Gora, Hotel Larix, December 1-2, 2005)
- Regional Educational Conference of asphalt pavement staff

3. Preparation of technical regulations for

- Certification of asphalt mixtures

4. Preparation of material for

- the Educational Conference
- »From Assembly to Assembly« bulletin
- »Collection of papers for the 10th Colloquium on Asphalt and Bitumen«

5. Preparation of technical literature (2003 - 2005)

- »Asfalt 6« (Low Temperature Asphalts)

Program dela ZAS za leto 2005

1. Splošne naloge

- koordiniranje asfaltske dejavnosti v Sloveniji,
- sodelovanje s sorodnimi organizacijami doma in v tujini (EAPA, DRC, DAV, Gestrata in ostalimi),
- zagotavljanje sredstev za delovanje združenja,
- vodenje vseh organov združenja.

2. Organiziranje strokovnih srečanj in izobraževanj

- okrogla miza oziroma strokovno srečanje,
- 10. kolokvij o asfaltih in bitumnih (Kranjska gora, 1. - 2. december 2005),
- regijsko izobraževanje in usposabljanje operativnega asfaltskega kadra.

3. Priprava tehnične regulative

- certificiranje asfaltnih zmesi.

4. Priprava gradiv za

- izobraževanje,
- bilten »Od skupščine do skupščine« in
- »Zbornik referatov za 10. kolokvij o asfaltih in bitumnih«.

5. Priprava strokovne literature (2003 – 2005)

- »Asfalt 6« Nizkotemperaturni asfalti.

Strokovna srečanja v letu 2005:

- 1. - 2. december 2005:
10. kolokvij o asfaltih in bitumnih,
hotel LARIX, Kranjska gora,
Slovenija (ZAS)