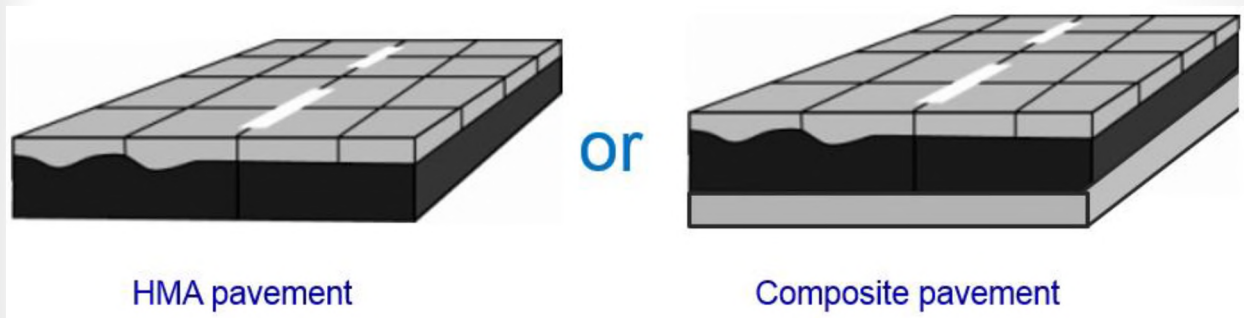# TECHNICAL NOTE

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University of Pittsburgh

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Cwvj qtu<
LOO "Xcpf gpdquwej g
U0'Ucej u
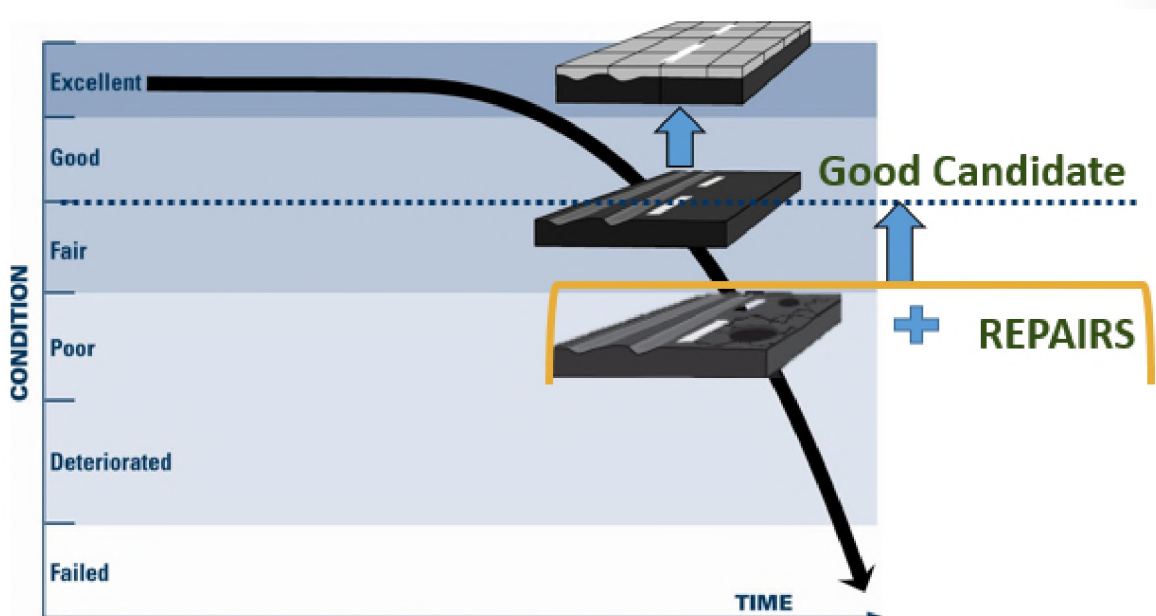
Cwi wuv'4235

30'Kpvtqfwevkqp

Dqpf gf "eqpetgvg'qxgtnc{u'qh'curj cnv'*DEQC+'r cxgo gpvu'ctg'v{rkecn{'dgw ggp'5''vq'8''kpej gu'\vj kem0' Vj g'dqpf "dgw ggp'\j g''curj cnv'cpf "\j g''eqpetgvg''ku'etkvkecn'\q''gpuwtg'\j cv'\j cv'\j g''r cxgo gpv'dgj cxgu'' cu''qpg''uvtwewtg.''gur ecen{''hqt''xgt{''\j kp''eqpetgvg''qxgtnc{u0'Vj ku''o qpqnkj ke''dgj cxkqt''tguwnu''kp'' tgfwegf "uvtguugu''cpf "f ghngevkqpu0'Vj g''r wr qug''qh''\j g''DEQC''ku''\q''kpetgcug''\j g''uvtwewtcn'ecr ceks{.'' gnko kpcvg''uwthceg'f ghgevu''cpf 1qt'ko r tqxg''uwthceg''htkevkqp.''pqkug.''cpf ''tkf gcdknks{''qh''\j g''gzkuvkpi '' curj cnv'r cxgo gpv0'Vj g''qxgtnc{''ecp''dg''r ncegf ''qp''cp''gzkuvkpi ''curj cnv'r cxgo gpv'qt''c''eqo r qukg'' r cxgo gpv'*curj cnv'qp''vqr ''qh''eqpetgvg+.''cu''uj qy p''kp''Hki wtg''30

Hki wtg''30Rcxgo gpv'\{r gu''uwkecdng''hqt ''DEQCu0

40'Uwkecdng'Ecpf kf cvgu

DEQCu''ctg''c''i qqf ''tgj cdkncvkqp''cnvgtpcvkxg''hqt''r cxgo gpvu''\j cv'ctg''ewttgpvn{''kp''i qqf ''vq''hckt '' uvtwewtcn'eqpfkkqp.''cu''uj qy p''kp''Hki wtg''4.''dw''uvtwewtcn{''kpuwhhkekgpv''\q''ecrt{''\j g''r tqlgevgf ''hwwtg'' vtchhke0'Kh''\j g''eqpfkkqp''qh''\j g''J O C''r cxgo gpv'ecp''dg''ko r tqxgf ''\q''hckt ''qt''i qqf ''eqpfkkqp''y kj ''c'' tgcuqpcdng''co qwpv'qh''tgr ckt.''\j ku''ku''cnuq''c''i qqf ''ecpf kf cvg''hqt''c''DEQC.''cu''uj qy p''kp

Adapted from CP Tech Center Overlay Guide

Hki wtg''40Uwkecdng'J O C'r cxgo gpv'eqpf kkqpu''hqt ''c ''DEQC0

Hki wtg"40'DEQCu'ctg"cnuq'kf gcn'kp'j gcxkn{ "vtchhkemgf "ctgcu'yj cv'ctg"uwuegr vkdng"vq"ej tqpke"twwkpi "cu" y gm" cu" J O Cu" y kyj " qyj gt" hwpevkqpcn' f kuvtguugu" *g0 0' nquu" qh" htkevkqp." pqkug." gve0+0' Vj g" ej ctcevgtkuvkeu'qh'i qqf "cpf "r qqt'DEQC"ecpf kfcvgu'ctg"r tqxkfgf "kp'Vcdng"30

Vcdng'30Ej ctcevgtkuvkeu'qh'c'i qqf 'cpf 'r qqt'DEQC'ecpf kfcvgu0

I QQF 'ECPF KF CVG	RQQT 'ECPF KF CVG
Uvcdng'uwr r qtv'eqpf kvkqpu'*Nqecnk{ gf 'y gcm' ctgc'ecp'dg'uvtgpi yj gpgf +	Uki pkhkecpv'uvtwewtcn'f gvgtkqtcvkqp
Uwthceg'f kuvtguugu	Uvtkr r kpi "qh'nqy gt"J O C"nc{ gtu
Vgo r gtcwtg"etcemkpi	Rqqt'f tckpci g
O kpko wo "qh'5"vq'6"kpej gu'qh'J O C'tgo ckpkpi " chvgt"o knkpi	Kpcf gs wcvg"qt"wpgxgp"uwr r qtv'eqpf kvkqpu

Uqo g'qh'yj g'f kuvtguugu'yj cv'ecp'dg'cf f tguugf "y kyj "c"DEQC'ctg"r tqxkfgf "kp'Hki wtg'50'O cp{ 'qh'yj g" uwthceg"f kuvtguugu"knwuvtcvgf "kp'Hki wtg'5"ctg"v{ r kecn{ "tgo qxgf "f wtkpi "yj g"o knkpi "r tqeguu'f qpg" r tkqt"vq"yj g'r ncego gpv'qh'cp'qxgtnc{ 0
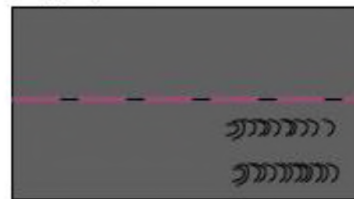
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Vj g"hqny ej ctv'kp'Hki wtg"6"ku'c'vqqn'f gxgnqr gf "d{ "yj g"P cvkqpcn'Eqpetgvg"Rcxgo gpv'Vgej pqnqi {" Egpvgt"*ERVgej "Egpvgt+'yj cv'ecp'dg'wugf "hqt'f gvgto kpkpi "kh'c"DEQC"ku'c'i qqf "tgj cdknkvcvkqp" cnvgtpcvkxg"hqt'c'f kuvtguugf "J O C'r cxgo gpv.'y kyj "eqpukfgtcvkqp'vq'yj g'ej ctcevgtkuvkeu'nkuvgf "kp'Vcdng" 30

```
                         Asphalt Pavement Condition


   Good or Better            Fair or Better            Deteriorated or Better

   Structurally and          Structurally and          Exhibits measureable to
   materially sound but      materially sound but       significant surface
   in need of increased      has surface distress       distresses such as
   structural capacity,      such as rutting,           severe rutting, shoving,
   improved rideability,     shoving, slippage, or      slippage, thermal
   or removal of surface     thermal cracking           cracking, and some
   defects                                              structural distresses


                 Can spot surface repairs and/or spot
                 structural repairs cost-effectively solve any
                 deficiencies, bringing the pavement to the        NO    Consider other
                 "Good Condition" before the overlay is        ───────►  Rehabilitation
                 constructed?                                             Alternative

                            and/or

                 Can milling the surface remove surface
                 deficiencies, cost-effectively, bringing the
                 pavement to the "Good Condition" and
                 enhancing potential bonding before the
                 overlay is constructed.


                           YES


   Can a bonded concrete overlay cost-                NO
   effectively meet future traffic loads      ◄──────────────
   and design life requirements.


            YES


      Design Bonded
      Concrete Overlay
```

Hki wtg'60Hmqy ej ctv'hqt 'f gvgto kpkpi 'kh'c 'DEQC'ku'c'l qqf 'tgj cd'crvgtpcvkxg']3_0

50' Rtg/Fguki p'Cevkxkvkgu

Qpeg"kv"ku"fgvgrokpgf"kpfgf "vjcv'vj g"DEQC"ku"c"i qqf "tgjcd"cnvgrpcvkxg."vjgtg"ctg"ugxgtcn'rtg/fguki p" cevkxkvkgu"vjcv'uj qwf "dg"r gthqro gf "rtkqr"vq"fguki pkpi "vj g"qxgrnc0'Vj gug"cevkxkvkgu"ctg"fguetkdgf " dgnqy 0

K0' I cyj gt 'J kuqrkecn'Tgeqrf u'hqr 'Gzkuvkpi 'Rcxgo gpv
J kuqrkecn'tgeqrfu'vjcv'uj qwf "dg"i cyj gtgf "kpenwfg"vj g"hqmqy kpi <

  Qtki kpcn'fguki p."eqpuvtwevkqp."cpf "o cvgrkcn'vguvkpi "tgeqrfu
  Vtchke'fcvc
  Rgthqro cpeg"fcvc
  Rtgxkqwu"o ckpvgpcpeg"cpf "tgr ckr'tgeqrfu

KK0' Ukvg'Xkukv
Vj g"ukvg"xkukv'uj qwf "kpenwfg"vj g"hqmqy kpi <

   Eqpfwev"c"fkuvtguu"uwtxg{"fqewo gpvkpi "vj g"v{rg."ugxgrkv{."cpf "s wcpvkv{"hqr"gcej "fkuvtguu" qdugrxgf 0'Vj ku'kphqro cvkqp'ecp'dg'qdvckpgf "hrqo "vj g'Pcvkqpcn'Eqpetgvg'Rcxgo gpv'Vgej pqmi {" Egpvgr"*ER'Vgej "Egpvgr+'I wkfg'vq"Eqpetgvg'Qxgrnc{u"]3_0
  Fgvgro kpcvkqp"qh'o kpko wo "xgrvkecn'engctcpeg'cpf "ukj v'cpf "i rcfg'tguvtkevkqpu
  Kfgpvkhkecvkqp"qh'frckpci g'kuuwgu'cpf "uj qwfgr"eqpfkvkqp
  Kfgpvkh{"nqecvkqpu'hqr"eqtkpi

KKK0' Eqtkpi 'cpf 'O cvgrkcn'Uco rrkpi
Eqtkpi "ku'j ki j n{'tgeqo o gpfgf "hqr"vj g"hqmqy kpi "tgcuqpu<

  Guvcdrkuj kpi "vj g"fgr vj "cpf "ugxgrkv{"qh'fkuvtguugu'kp"vj g"curj cnv
  Fgvgro kpkpi "vj g"vj kempguu"qh'vj g"curj cnv'nc{gr"cu"y gm'cu"vj g"nqecvkqp'cpf "fgr vj "qh'vj g"rkhvu'kp" vj g"curj cnv
  Fgvgro kpg'kh'vj gr'ku'vj g"uvtkr r kpi "y kvj kp"qr"cv'vj g"dqwqo "qh'vj g"J O C"nc{gru
  O cvgrkcn'ej ctcevgrk| cvkqp

KX0' Hcmkpi 'Y gki j v'Fghngevkqp gvgr '*HY F+'Vguvkpi '*qr vkqpcn+

HY F "vguvkpi "ku'pqv'guugpvkcn'dwv."kh'r tghgrrgf ."ecp"dg"wugf "hqr"guvcdrkuj kpi "vj g"gncuvke"o qfwnwu"qh" vj g"nc{gru"<u>dgpgcvj</u> "vj g"curj cn0'Vj g"guvko cvgf "o qfwnk'y kn'dg"wugf "vq"guvcdrkuj "vj g"eqo r qukvg" o qfwnwu"qh'uwdi rcfg"tgcevkqp"*m/xcnwg+'kp"vj g"fguki p"r tqegfwtg0'Vj g"nc{gr'o qfwnk'ecp'cnuq"dg" guvko cvgf "dcugf "qp"eqrrgncvkqpu'y kvj "qvj gr"hpqy p"qr"o gcuwtgf "o cvgrkcn'r tqr grvkgu"*g0 0'EDT."T/ xcnwg."gve0+0'Vj g"qxgrc{"vj kempguu"ku'pqv'xgr{"ugpukvkxg"vq"vj g"m/xcnwg."cpf "vj grghqrg"cp"guvko cvg" qh'vj g"gncuvke"o qfwnk'hqr"gcej "nc{gr"dcugf "qp"eqrrgncvkqpu'ku'uwhhkekgpv0'Kp"vj g'DEQC/O G'fguki p" r tqegfwtg."vj g"gncuvke"o qfwnwu"qh'vj g"J O C"nc{gr"ku"guvcdrkuj gf "dcugf "qp"vj g"r gregpv'hcvki wg" etcemkpi ."cpf "vj grghqrg"fqgu"pqv'pggf "vq"dg"guvcdrkuj gf "y kvj "HY F "fcvc0'O qrg"kphqro cvkqp" r tqxkfkpi "i wkfcpeg"qp'HY F "vguvkpi "cpf "tguwnu'ecp'dg"hqwpf "kp"vj g'DEQC/O G"vj gqr{"o cpwcn']5_0

Dqpf gf "Eqpetgvg'Qxgrnc{u'qh'Curj cnv'Rcxgo gpvu'*DEQC+

60'   Fguki p'Eqpulfgtcvkqpu

Vj g''j kempguu''qh''j g''qxgtrc{''ecp''dg''f gvgto kpgf ''wukpi ''j g''DEQC/O G''f guki p''r tqegf wtg''cpf ''ecp''dg'' ceeguugf ''cv''www.engineering.ukedu/VcpfgpdqurjgIDEQC/O G0'Ugxgtcn'qvj gt''hcevqtu''o wuv''dg'' eqpukfgtgf ''kp''j g''f guki p''r tqeguu0'Vj gug''hcevqtu''cmqpi ''y kj ''eqpukfgtcvkqpu'j cv''uj qwrf ''dg''o cf g'' y j kng''cf f tguukpi ''gcej ''qh''j gug''hcevqtu''kp''j g''f guki p''r tqeguu''ctg'r tqxkf gf ''dgmy 0

Lqkpv'f guki p

C''us wctu''Lqkpv'r cwgtp''uj qwrf ''dg''wugf ''y kj ''r cpgn'uk| gu''tcpi kpi ''dgwy ggp'5''vq'': ''hggv.''vq''tgf weg''ewtnkpi '' cpf ''y ctr kpi ''uvtguugu0'Y j gp''ugngevkpi ''j g''uncd''uk| g.''kh''cv'cm'r quukdng.''cxqkf ''uncd''uk| gu''j cv''tgswnv'kp'' nqpi kwf kpcn'lqkpwu'pgct ''j g''y j ggn'r cy 0'Vj g''uncd''uk| gu''uj qwrf ''dg''guvcdnkuj gf ''dcugf ''qp''eqo o qp'keu0'' Y j kng''j kempguu''tgf wevkqp''ku'r quukdng'y kj ''uo cmgt''uncdu.''o qtg''ucy kpi ''cpf ''ugcnkpi ''ku'tgswktgf .''f wg'' vq''j g''kpetgcug''kp''nkpgcn'hggv''qh''lqkpwu0'Qvj gt''r tqlgev''ur gekhke''eqpf kvkqpu''o ki j v''cnuq''f kevcvg''j g'' r cpgn'uk| g0'Kf ''xgtvkecn''engctcpeg''kuuwgu''gzkuv''c''uo cmgt''uncd''uk| g''uj qwrf ''dg''eqpukfgtgf ''vq''tgf weg'' y j g''f guki p''j kempguu0'Qp''y j g''qy gt''j cpf .''kh''c''y kem'o knkpi ''f gr y j ''ku'tgswktgf ''vq''tgo qxg''uwthceg'' f kuvtguu.''ncti gt''uncd''uk| gu''ecp''dg''ceeqo o qf cvgf ''y j gp''y j g''gzkuvkpi ''r cxgo gpv'gngxcvkqp''o wuv''dg'' o ckpvckpgf 0

Fqy gn'c'pf 'Vkg'dct u

Vj g''wug''qh''vkg''dctu''cpf ''f qy gn'dctu''ku'v{r kecm{''pqv''pgeguuct{''y j gp''y j g''r cpgn'uk| gu''ctg''uo cm0'' J qy gxgt.''y j g''wug''qh''f qy gn'dctu''cpf ''vkg''dctu''ecp''dg''eqpukfgtgf ''hqt''j gcxkn{ ''vtchhkemgf ''tqcf y c{u'' y j gp''y j g''qxgtrc{ ''j kempguu''ku'8''kpej gu''qt'i tgcvgt0

Ucy kpi 'c'pf 'ugcnkpi

Lqkpwu'uj qwrf ''dg''ucy gf ''vq''c''f gr y j ''qh'315''y j g''j kempguu''qh''y j g''qxgtrc{ 0'Kf ''ku'tgeqo o gpf gf ''y j cv''y j g'' lqkpwu'dg''ugcngf ''hqt''qxgtrc{ u'nguu''y j cp'7''kpej gu''y j kem0'C'31: ''vq'' ''tgugtxqkt''ecp''dg''ucy gf ''cpf ''ugcngf '' y kj ''cp''cur j cn'ugcncpv0'Vj g''uweeguu''qh''xgt{ ''y j kp''qxgtrc{ u'tgnkgu''qp''y j g''dqpf ''dgwy ggp''y j g''J O C'' cpf ''y j g''qxgtrc{ .''vq''cmqy ''y j g''r cxgo gpv'vq''ecct{ ''y j g''nqcf ''cu'c''o qpqnkj ke''uvtwevwtg0'Cmqy kpi ''y cvgt'' vq''kphknvtcvg''kpvq''cp''wpugcngf ''lqkpv'ecp''eqpvkdwg''vq''uvkr r kpi ''cpf ''tcxgnkpi ''qh''y j g''J O C.''cpf '' y j gtghqtg''f gi tcf cvkqp''qh''y j g''dqpf ''dgwy ggp''y j g''wy q''nc{ gtu0

Hkdgt 'kp'eqpetgvg'o kzwwtg

Vj g''wug''qh''hkdgtu''ecp''dg''eqpukfgtgf ''hqt''qxgtrc{ u'6''kpej gu''y j kem'qt''nguu0'Qpn{ ''uvtwewwtcn'i tcf g'' hkdgtu''uj qwrf ''dg''eqpukfgtgf .''y j kej ''ko r tqxg''y j g''vqwi j pguu''cpf ''r quv/etcemkpi ''dgj cxkqt''qh''y j g'' eqpetgvg0'Vj g''uvtwewwtcn'hkdgt''ej qugp''uj qwrf ''r tqxkf g''c''tgukf wcn'uvtgpi y j ''qh'42''r gtegpv'qt''o qtg0'' Kf uwhhkekgpv'gxkf gpeg''gzkuvu''cv''y j ku''vko g''vq''uwr r qtv'wukpi ''hkdgt''tgkphqtegf ''eqpetgvg''kp''DEQCu'hqt'' y j g''r wtr qug''qh'kpetgcukpi ''y j g''r cpgn'uk| g0

Uqog g"JOC'r cxgogpvu"oki j v'tgswktg'r tg/qxgtnc{ "tgrcktu'r tkqt"vq"vjg'r ncego gpv'qh'vjg'DEQC0'C" rkuv'qh'vjg'f kuvtguugu'vjcv'uj qwf "dg'tgrcktgf "ctg'r tqxkf gf "kp"Vcdng"40"cmqpi "y kj "uwi i guvgf "tgrcktu0 Cml'hwnl'cpf "r ctvkcn'f gr yj "r cvej kpi "uj qwf "dg'eqo r ngygf "chvgt"o knkpi 0'Y j gp"r cvej kpi "ku'tgswktgf ." eqpetgvg'uj qwf "dg'wugf ."cu'pgy "curj cn'f qgu'pqv'dqpf "y gm'y kj "eqpetgvg'qxgtnc{u0Chvgt"o knkpi ." yj g'r cvej "ecp"dg'r ncegf "ekj gt"d{ "uugrh'qt"o qpqrkj kecm{ "y kj "yj g'qxgtnc{0C"ugr ctcvg'r cpgn'uj qwf " dg"etcvgf "qxgt"yj g'nqecvkqp"qh'yj g'eqpetgvg'r cvej ."vq"mggr "kv'ugr ctcvg'htqo "pgctd{ "curj cn'yj cv' r tqxkf gu'f khhgtgpv'wpf gtn{kpi "uwr r qtv'eqpf kkqpu0

Vcdng'40Fkuvtguugu'vq'dg'tgrcktgf 'r tkqt 'vq'vjg'r ncego gpv'qh'vjg'qxgtnc{0

JOC'FKUVTGUU	RQUUKDNG'TGRCKT
Twwkpi "@4"kp	O knkpi
Eqttwgcvkqpu'("unkr r ci g	O knkpi
Vtcpuxgtug'etcemkpi	Engcp"cpf "hknl'qt"ncecn{ gf 'f gdqpf kpi
J ki j "qt"o gf 0ugxgtkv{ "hcvki wg" etcemkpi	Hwnf gr yj "eqpetgvg'r cvej
Rqvj qng	Hwnf gr yj "eqpetgvg'r cvej

Tgrckt 'qh'Vtcpuxgtug'Etcemu

Vj gtg"ctg"y q"o gyj qf u"cxckncdng"hqt"tgrcktkpi "vtcpuxgtug"etcemu'r tkqt"vq"yj g'r ncego gpv'qh'yj g' qxgtnc{."dcugf "qp"yj g'ugxgtkv{"qh'yj g'etcem0'Kh'yj g'etcem'y kf yj "ku'i tgcvgt'yj cp"yj g'o czko wo " ci i tgi cvg"uk| g"kp"yj g'eqpetgvg'qxgtnc{."yj gp"yj g'etcem'o wuv'dg'hkmgf "r tkqt"vq"r cxkpi 0'Vj ku'y km' r tgxgpv"kpvgtnqemkpi "qt"õmg{kpi ö"qh'yj g'qxgtnc{ "kpvq"yj g'JOC0'Vj g'etcem'ecp"dg'hkmgf "y kj "cp" go wuukqp."c'umwtt{ "qt"ucpf "r tkqt"vq"r ncekpi "yj g'qxgtnc{0
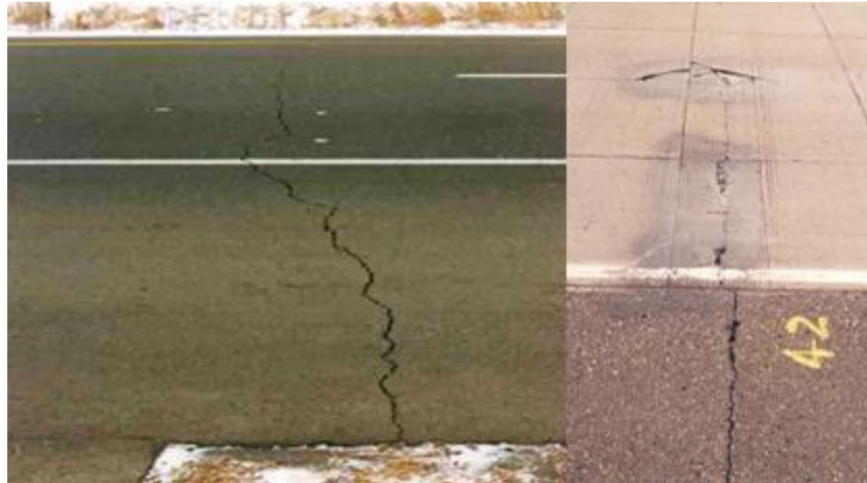
Kh'yj g'etcem'y kf yj "ku'nguu'yj cp"yj g'o czko wo "ci i tgi cvg"uk| g"kp"yj g'qxgtnc{ "cpf "kv'ku'c'y qtmkpi "etcem" kv'ku'r quukdng"yj cv'yj g'etcem'o c{ "tghngev'yj tqwi j "kpvq"yj g'qxgtnc{0C"tghngevkqp"etcem'j cu'yj g'r qvgpvkcn' vq"f gxgnqr "kp"yj g'qxgtnc{ "kh'yj g'hngz wtcn'uvkhhpguu'qh'yj g'eqpetgvg'ku'nguu'yj cp"yj g'hngz wtcn'uvkhhpguu' qh'yj g'curj cn."cu'uggp"kp"Hki wtg"70'Vj g'hngz wtcn'uvkhhpguu."F ."ku'f ghkpgf "kp"Gs wcvkqp"30

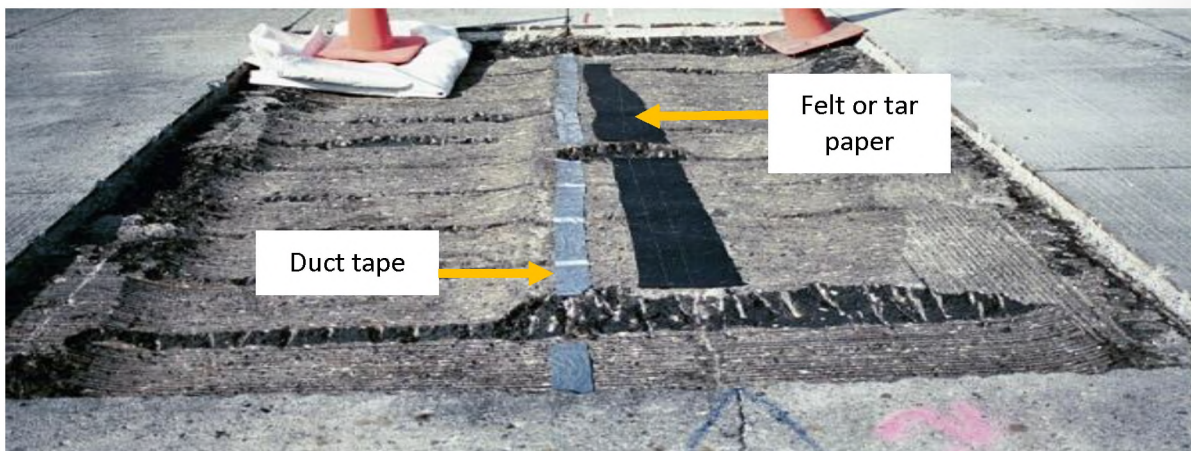$$u \quad t\,f\,f \quad ss \qquad \frac{\cdot}{\cdot} \quad \cdot \quad \cdot \qquad (Gs\,03)$$

G'ku'yj g'gncuvke'o qf wmu'qh'yj g'o cvgtkcn'j ku'yj g'yj kempguu'qh'yj g'nc{gt"cpf " ku'yj g'Rqkuuqpøu'tcvkq0' C'ncecn{ gf "ctgc'cmqpi "yj g'etcem'uj qwf "dg'f gdqpf gf ."kh'yj gtg'ku'r qvgpvkcn'hqt'tghngevkxg'etcemkpi "vq" qeewt0'Vj g'f gdqpf kpi "o cvgtkcn'ku'r ncegf "qxgt"yj g'etcem'qp"vqr "qh'yj g'curj cn'cpf "ecp"eqpukuv'qh'

cp{ "vj kp"o cvgtkcn'vj cv'y qwf "dtgcm'vj g"dqpf ."uwej "cu'f wev'vcr g"qt "tqqhkpi "r cr gt ."cu'uj qy p"kp"Hki wtg" 80'Qpn{ "etcemu'kf gpvkhkcdng "cu'o clqt "y qtmkpi "tcpuxgtug"etcemu"uj qwf "tgegkxg"uwej "vtgcvo gpv0'Kp" eqnf gt "eno cvgu."uqo g'nqy gt 'r gtegpvci g'qh'tghgevkxg"etcemkpi "kp'vj g"DEQC"uj qwf "dg"gzr gevgf 0

Hki wtg'70Vtcpuxgtug'etcemkp'vj g'J O C'*nghv+'tghgevkpi 'wr 'kpvq'vj g'DEQC'*tki j v+0

Felt or tar paper

Duct tape

Hki wtg'80Rtg/qxgtnc{ 'tgr cktu'cpf 'o gcuwtgu'vcmgp'vq'tgf weg'tghgevkxg'etcemkpi 0

80' Eqpuvtwevkqp

Vj g'eqpuvtwevkqp'qh'c'DEQC "ku'ceeqo r nkuj gf "vj tqwi j "vj g'hqnnqy kpi "uvgr u0

K)' O knkpi '*Ugg'Hki wtg'90+

O knkpi "qh'vj g'gzkuvkpi "J O C"ku"qr vkqpcn'dw'j ki j n{ 'tgeqo o gpf gf "hqt "xgt{ 'vj kp'DEQCu0' O knkpi "gpj cpegu'vj g"dqpf "dgw ggp'vj g"eqpetgvg"cpf "cur j cn'y j kej "ku'gur gekcn{ "etkkkecn'vq" vj g'r gthqto cpeg'qh'vj kp'eqpetgvg'qxgtnc{ u0

Y j gp''r quukdng.''vt{''vq''ngcxg''cp''kpej ''qh'J O C''dgyy ggp''vj g''J O C''uwthceg''cpf ''vj g''pgctguv'
curj cn'hkhv.''uq''vj cv'f gdqpf kpi ''ku'wpnkmgn{''dgyy ggp''vj g''nkhvu0

Ej cpi gu''kp'i tcf g''tgswktgo gpu''qt''vj g''etquu'unqr g''uj qwf ''dg''o cf g''d{''cf lwuvkpi ''vj g''eqpetgvg"
qxgtnc{''vj kempguu.''tcvj gt''vj cp''yj gp''o knkpi ''cetquu'nkhvu''kp''vj g''curj cn.''yj kej ''ecp''dg''
f gvtko gpvcn'vq''c''i qqf ''dqpf 0

Vj g''f gr vj ''qh''o knkpi ''ku'guvcdnkuj gf ''dcugf ''qp''vj g''vj kempguu''qh''vj g''qxgtnc{''cpf ''vj g''hqnqy kpi <
~ÁVj g''f gr vj ''pggf gf ''vq''tgo qxg''uwthceg''f kuvqtvkqpu''i tgcvgt''vj cp''4''kpej gu
~ÁVj kempguu''tgswktgf ''vq''o cvej ''ewtd''qt''gzkuvkpi ''uvtwevwtg''gngxcvkqpu
~ÁVj kempguu''tgswktgf ''vq''o ggv''o kpko wo ''xgtvkecn'engctcpeg''tgswktgo gpvu

Hki wtg''90Curj cnv'o knkpi ''qr gtcvkqp''cpf ''vj g''J O C''uwthceg''chvgt''o knkpi 0

KK0'''Uwthceg'Engcpkpi

Dghqtg''r ncekpi ''vj g''qxgtnc{.''vj g''curj cn'uwthceg''pggf u''vq''dg''engcpgf ''vq''gpuwtg''r tqr gt''dqpf kpi 0'
Engcpkpi ''ku'v{r kecn{''ceeqo r nkuj gf ''d{''uy ggr kpi ''vj g''uwthceg''qt''wukpi ''eqo r tguugf ''ckt0

KKK0''O knv'uwthceg

Kv'ku''ko r gtcvkxg''vj cv'vj g''gzkuvkpi ''curj cn'vgo r gtcvwtg''dg''o ckpvckpgf ''cv'c''vgo r gtcvwtg''dgnqy ''342''
ᵃH'y j gp''r ncekpi ''vj g''eqpetgvg''qxgtnc{''vq''f getgcug''vj g''r qvgpvkcn'qh'hcuv'ugv'uj tkpmci g''etcemkpi 0'
Vj g''uwthceg''ecp''dg''o knvgf ''y kj ''y cvgt''vq''tgf weg''vj g''vgo r gtcvwtg''qh'vj g''curj cn0

O knkpi ''vj g''uwthceg''y kn'dtkpi ''vj g''uwthceg''qh'vj g''J O C''wr ''vq''c''ucuwtcvgf ''uwthceg''ft{''eqpf kvkqp.''
uq''vj cv'kv'ku''pqv'r wnkpi ''o qkuwtg''htqo ''vj g''eqpetgvg''o kzwtg0

Y cvgt''uj qwf ''pqv'dg''r wf f ngf ''qp''vj g''uwthceg''y j gp''r ncekpi ''vj g''qxgtnc{.''qt''nqecnk| gf ''j ki j ''y cvgt''
vq''ego gpvkvkqwu'tcvkqu.''cpf ''vj gtghqtg''tgf wegf ''dqpf ''uvtgpi vj u''ecp''f gxgnqr ''cv'vj g''kpvgthceg0

Dqpf gf ''Eqpetgvg''Qxgtnc{u''qh'Curj cn'Rcxgo gpvu''*DEQC+

;

KX0'Rnceg'cpf 'Hkpkuj 'eqpetgvg

" Vj g"qxgtnc{ "ecp"dg"r nceg"y kj "c"unkr/hqto "r cxgt."wukpi "hqto u"qt."cv"vko gu."vj tqwi j "c"m kcpf "
hkm o gj qf ."cu"uj qy p"kp"Hki wtg": 0"O qtg"kphqto cvkqp"qp"vj g"m kcpf "hkm o gj qf "ecp"dg"hqwpf "
kp"vj g"DEQC"Tgj cdknkvcvkqp"Uvtcvgi kgu"Vgej "P qvg"]6_0

" Ki "utwewtcn"hkdgtu"ctg"wugf "kp"vj g"o kz."gpuwtg"vj cv"vj g{"ctg"wpkhqto n{"fkuvtkdwvgf "vj tqwi j qww"
vj g"eqpetgvg"fwtkpi "r ncego gpv0

Hki wtg": 0Rncekpi 'cpf 'Hkpkuj kpi 'kp 'vj g'DEQC0

X0Ewtkpi

" Ewtkpi "ku"etkvkecn"hqt"dqpf gf "tguwthcekpi "r tqlgevu"dgecwug"vj gkt"j ki j "uwthceg"ctgcÎvq/xqnwo g"
tcvkq"o cngu"vj go "o qtg"uwuegr vkdng"vq"tcr kf "o qkuwtg"nquu0

" Y j gp"cv'cm'r quukdng."c"ewtg"ecrv'uj qwnf "dg"wugf "qxgt"kpuwtg"c"wpkhqto "fkuvtkdwvkqp"cetquu"vj g"
r cxgo gpv"uwthceg0Ugg"Hki wtg"; 0

" Ecwkqp"uj qwnf "dg"vcmgp"pqv"vq"qr kl"ewtkpi "eqo r qwpf "qpvq"cp"ctgc"qh"vj g"J O C"{gv"vq"dg"
tguwthcegf ."dgecwug"kv'y km'fgvgt"dqpf kpi "dgvy ggp"vj g"vy q"nc{gtu"]3_0

" Ewtkpi "eqo r qwpf "uj qwnf "dg"ur tc{gf "qp"cm'gzr qugf "gf i gu."cu"y gm'cu"vj g"uwthceg"qh'vj g"qxgtnc{."
cu"uj qy p"kp"Hki wtg"; 0

Hki wtg';0Crrnecvkqp'qh'c'ewtkpi 'eqorqwpf0

XK0Ucykpi 'cpf 'Ugcnkpi 'Lqkpvu

- Lqkpvu'uj qwnf 'dg'ucygf ''vq'315''vj g'f gr vj 'qh'vj g'qxgtnc{0

- Lqkpvu'uj qwnf 'dg'engcpgf 'cpf 'ugcngf 'cu'swkenn{'cu'r quukdng'vq'r tgxgpv'wpeqpvtqngf ''etcemkpi 0 Ugg'Hki wtg'320

- C '31: ''vq '' kpej 'y kf g'tgugtxqkt'ku'uwhhkekgpv'kh'cp'cur j cnv'ugcncpv'ku'vq'dg'wugf 0Dcemgt 'tqf '' uj qwnf ''pqv'dg'wugf ''hqt ''vj gug'pcttqy '‑lqkpv'y kf wj u0

Hki wtg'320Ucykpi 'cpf 'ugcnkpi 'lqkpvu0

XKK0Qr gpkpi 'vq 'vtchhe

`Vj g'o quv'ko r qtcpv'hcevqt 'kp 'f gvgto kpkpi 'y j gp'vq'qr gp'c 'DEQC 'vq 'vtchhke'ku'vj g'eqpetgvg'' uvtgpi wj 0Vj g'o kpko wo ''eqpetgvg'qr gpkpi ''uvtgpi wj 'ku'tgncvgf 'vq'vj g'nqcf 'ectt{kpi 'ecr cekv{'cpf '' ecp'cnuq'r tqxkf g'cp'uki p'qh'vj g'dqpf 'uvtgpi wj 0

- Fkuvtguu"y km'f gxgmqr "swkemm{ "kh'vj g"uvtwewwtg"ku'mqcf gf "dghqtg"vj g"dqpf "dgw ggp"vj g"J O C"cpf " qxgtnc{ "j cu'j cf "vko g"vq"hwm{ "f gxgmqr gf 0'O gcuwtkpi "vj g"uvtgpi wj "*eqo r tguukxg"qt"hngzwtcn+"qt" vj g"wug"qh'o cwtkv{ "o gcuwtgo gpv'dghqtg"qr gpkpi "vq "vtchhke"y km'j grr "vq "eqphkto "vj cv'uwhhkekgpv' eqpetgvg"uvtgpi wj "j cu'f gxgmqr gf "vq"gpuwtg"c'i qqf "dqpf 0

- O qtg"f gvckngf "kphqto cvkqp"cpf "tgeqo o gpf cvkqpu"kp"tgi ctf u"vq"qr gpkpi "vj g"qxgtnc{ "vq"vtchhke" ecp"dg"qdvckpgf "htqo "vj g"P cvkqpcn'Eqpetgvg"Rcxgo gpv'Vgej pqmqi { "Egpvgt"*'ER'Vgej "Egpvgt+" I wkf g"vq 'Eqpetgvg 'Qxgtnc{ u']3_0

Cempqy ngf i o gpwu

Vj g"cwvj qtu"y qwnf "rkmg"vq"vj cpm'vj g"Kqy c."Mcpucu."O kppguqvc."O kuuqwtk'O kuukuukr r k'P gy "[qtm" Uqwvj "F cmqvc."P qtvj "Ectqrkpc."Rgppu{ nxcpkc."cpf "Vgzcu'F gr ctvo gpvu"qh'Vtcpur qtvcvkqp0'Vj gug" uvcvgu"ctg"cm'r ctvkekr cvkpi "kp"vj g"HJ Y C'Rqqngf "Hwpf "Uwf { 'VRH'7/387'wpf gt"y j kej "vj ku'y qtm'y cu" r gthqto gf 0

Tghgt gpegu

30' P cvkqpcn'Eqpetgvg"Rcxgo gpv'Vgej pqmqi { "Egpvgt0'*I wkf g"vq 'Eqpetgvg 'Qxgtnc{ u<'Uwuvckpcdng" Uqnwvkqpu'hqt "Tguwthcekpi "cpf "Tgj cdkrkvcvkpi "Gzkuvkpi "Rcxgo gpu0'*4pf "Gf kvkqp."Ugr vgo dgt" 422: 0

40' HJ Y C0' *Fkuvtguu "Kf gpvkhkecvkqp "O cpwcn' hqt " vj g" Nqpi /Vgto " Rcxgo gpv'Rgthqto cpeg" Rtqi tco 0'*Hqwtvj "Tgxkugf 'Gf kvkqp."42250'HJ Y C/TF /25/2530'Y cuj kpi vqp."F E0

50' Nk"\ 0"P 0"F whcmc."H0'O w."cpf "L0'O 0'Xcpf gpdquuej g0'*DEQC/O G'Vj gqt{ "o cpwcn0'HJ Y C" Rqqngf "Hwpf "uwf { ."VRH'7/387."Cwi wuv'42350

60' Xcpf gpdquuej g." L0'O 0'cpf " U0' Uccej u0'*Tgj cdkrkvcvkqp "Uvtcvgi kgu"hqt "Dqpf gf "Eqpetgvg" Qxgtnc{ u'qh'Curj cn'Rcxgo gpu0'HJ Y C'Rqqngf "Hwpf "uwf { ."VRH'7/387."Cwi wuv'42350

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