

Original Interstate 94 (Westbound)

Weigh In Motion	2013 Diamond Grinding 964-969				2013 Dowel Replacement 970-982				2017 Spall Repairs 94001-94010				2017 Hot Mix Asphalt Overlays of Concrete 983-995												2017 Spall Repairs 94011-94015											
	23	22	21	20	19	18	17	16	215	115	114-914	613	12	72	73	71	70	96	162	160	9	8	7	806	706	606	506	805	705	605	505	4	3	2	1	open

Mainline Interstate 94 (Westbound)

2016 HMA Performance Testing Test Sections (tied to NCAT)								Maintain Roadways	Whitetopping Bonded Concrete Overlay of Asphalt								Recycled PCC	1993 PCC	SHRP-II Composite Pavements				White-topping Fiber Reinforced Concrete				
23	22	21	20	19	18	17	16	215	115	914	814	714	614	514	414	314	214	114	613	12	72	73	71	70	96	162	160
5" HMA PG 64E-34	5" HMA PG 58H-34	5" HMA PG 58H-34	5" HMA PG 52S-34	5" HMA PG 64S-22	5" HMA PG 64S-22	5" HMA PG 64S-22	5" HMA PG 64S-22	1.5" HMA 2.25" WM 58-34	MicroSurface 2.6" WM 58-34	6" PCC 6' x 6' Astro Turf Driving LN 1" Dowels	6" PCC 6' x 6' Astro Turf Driving LN No Dowels	6" PCC 6' x 6' Astro Turf Driving LN 1" Dowels	6" PCC 12L' x 6W' Astro Turf Driving LN Plate Dowels	6" PCC 6' x 6' Astro Turf Driving LN 1" Dowels	6" PCC 6' x 6' Astro Turf Driving LN No Dowels	6" PCC 6' x 6' Astro Turf Driving LN 1" Dowels	6" PCC 6' x 6' Astro Turf Driving LN No Dowels	7.5" Recycled PCC 15'Lx12'W 1.25" dowel	9.5" PCC 15'Lx12'W 1.25" dowel	3" PCC 15'Lx12'W 1.25" dowel	3" PCC 15'Lx12'W 1.25" dowel	3" PCC 15'Lx12'W 1.25" dowel	3" 64-34 Saw/Seal	6" Fiber Reinf. PCC 2011 Traditional Grind	4" Fiber Reinf. PCC Trans Broom	5" Fiber Reinf. PCC Trans Broom	
Low LTC Potential 15% RAP HMA 12" Class 8	High LTC Potential 20% RAP UMS PG Binder + anti-strip 12" Class 6	Med LTC Potential 20% RAP Typical Mix 12" Class 6	Med/High LTC 30% RAP 12" Class 6	Med LTC Potential 20% RAP 3% Air-Voids 12" Class 6	Med LTC Potential 20% RAP 12" Class 6	High LTC Potential 10% RAP 5% RAS 12" Class 5	High LTC Potential 20% RAP 5% RAS 12" Class 6	11" 64-22 1993 HMA Clay	11" 64-22 1993 HMA Clay	8" 58-28 93HMA Clay	8" 58-28 93HMA Clay	7.5" 58-28 93HMA Clay	7" 58-28 93HMA Clay	7" 58-28 93HMA Clay	6" 58-28 93HMA Clay	6" 58-28 93HMA Clay	5" 58-28 93 HMA Clay	15'Lx12'W 1.25" dowel 2.5" C1	15'Lx12'W 1.25" dowel Trans Tined	6" PCC Low Cost Clay	6" PCC Low Cost Clay	6" PCC Recycle Clay	6" PCC Recycle Clay	7" 58-28 93HMA Clay	7" 58-28 93HMA Clay	6" 58-28 93HMA Clay	
12" Class 3	12" Class 3	12" Class 3	12" Class 3	12" Class 3	12" Class 3	12" Class 3	12" Class 3	M-Mill .75" Overlay 1.5" (2 0.75" lifts, 4.75 mm PG 58V-34)	M-Mill .375" Micro surface CQS-1P 0.375"									6" Class 5 Clay Neoprene Sealed	6" Class 5 Clay	8" Class 7 Clay	8" Class 7 Clay	8" Class 7 Clay	8" Class 7 Clay	5'x6'W Polypro Fibers 25pcy	20% RSR 6'x6'W	20% RSR 6'x6'W	
7" Select Gran Clay Sept 16 500	7" Select Gran Clay Sept 16 500	7" Select Gran Clay Sept 16 500	7" Select Gran Clay Sept 16 500	7" Select Gran Clay Sept 16 500	7" Select Gran Clay Sept 16 500	7" Select Gran Clay Sept 16 500	7" Select Gran Clay Sept 16 500	2017 287.5	2017 285	Oct 08 102	Oct 08 24	Oct 08 24	Oct 08 109	Oct 08 36	Oct 08 31	Oct 08 136	Oct 08 24	Oct 08 81	Jul 13 512	Jun 93 499	May 10 469	May 10 210	May 10 267	May 10 480	Oct 97 177	Jul 13 449	Jul 13 449

Original 5-Year PCC			Fiber Reinforced PCC				Fiber Reinforced PCC Overlay		Unbonded PCC Overlay of PCC		Stabilized Full Depth Reclamation			Maintain Roadways	
9	8*	7	806	706	606	506	805	705	605	505	4	3	2	201	101
7.5" PCC	7.5" PCC	7.5" PCC	5" Fiber Reinf. PCC (High) Astro Turf	5" Fiber Reinf. PCC (Enhanced) Astro Turf	5" Fiber Reinf. PCC (Standard) Astro Turf	5" PCC Control No Fibers Astro Turf	5" PCC Fibers Unsealed No Dowels Astro Turf	5" PCC Fibers Unsealed No Dowels Astro Turf	5" PCC No Dowels Trans Broom	5" PCC No Dowels Trans Broom	1" 64-34 2" 64-34	1" TBWC 2" 64-34	1" TBWC 2" 64-34	Microsurface	1.5" 101
2008 Ultimate Grind	2007 Traditional Grind	2007 Innovative Grind					Geotextile	Geotextile	Geotextile	Geotextile	8" FDR + EE	6" FDR + EE	6" FDR + EE	6" 58-28 75 blow	5.5" 58-28 75 blow
4"PSAB	4"PSAB	4"PSAB	11" Class 5Q	11" Class 5Q	11" Class 5Q	11" Class 5Q	7.5" cracked Jts '93 PCC	7.5" '93 PCC	7.5" '93 PCC	7.5" cracked '93 PCC		2" FDR			
3"CI 4	3"CI 4	3"CI 4					3"CI 4	3"CI 4	3"CI 4	3"CI 4		2"CI 5	6" FDR	33" Class 4	33" Class 4
Clay	Clay	Clay	8" Class 5	8" Class 5	8" Class 5	8" Class 5	27" Class-3	27" Class-3	27" Class-3	27" Class-3	9" FDR + Fly Ash	33" Class 3			
15'Lx14'W 15'Lx13'W	15'Lx14'W 15'Lx13'W	20'Lx14'W 20'Lx13'W 1" dowel	Clay	Clay	Clay	Clay	Clay Driving Ln: 12'Lx6'W, 12'Lx8'W Passing Ln: 12'Lx6'W	Clay Driving Ln: 12'Lx14'W Passing Ln: 12'Lx13'W	Clay Driving Ln: 6'Lx7'W Passing Ln: 6'Lx6.5'W RCC Shlds	Clay Driving Ln: 6'Lx7'W Passing Ln: 6'Lx6.5'W RCC Shlds	Clay	Clay	Clay	Clay Mill 0.375" CQS-1P 0.375" 2 lifts	Clay M-Mill 0.75" 0.75" 4.75mm PG 58V-34
Sep 92	Sep 92	Sep 92	2017	2017	2017	2017	2017	2017	Sep 11	Sep 11	Oct 08	Oct 08	Oct 08	2017	2017
500	500	499	135	135	135	134	117	133	146	153	500	454	500	231	231
26	29	46					0	0	0	0	75	156	60		

Original WB (All Cells)	9.5" PCC 12"x27" JTS 1.25" Dowel
5" Class 5 Base	
Clay	2013 Diamond Grind Driving Lane unless noted
1973	See Below

Mainline Westbound - ESALS per Year				Year	Original Westbound - ESALS per Year			
Driving Lane		Passing Lane			Driving Lane		Passing Lane	
Flexible	Rigid	Flexible	Rigid		Flexible	Rigid	Flexible	Rigid
263,499	395,956	67,082	104,717	1994 *	37,388	56,183	9,518	9,518
579,931	877,886	176,791	276,724	1995	61,508	93,109	18,751	18,751
532,911	808,851	159,421	248,394	1996	176,345	267,656	52,754	52,754
415,828	632,244	110,144	173,507	1997	306,921	466,656	81,296	81,296
542,037	821,696	163,020	254,847	1998	157,057	238,089	47,236	47,236
641,264	967,499	186,017	289,248	1999	165,844	250,215	48,108	48,108
672,845	1,015,504	178,090	272,328	2000	200,422	302,491	53,048	53,048
712,973	1,077,422	191,675	291,229	2001	169,180	255,660	45,482	45,482
712,316	1,077,750	185,766	282,422	2002	163,089	246,758	42,532	42,532
692,453	1,042,991	190,299	288,709	2003	182,098	274,281	50,044	50,044
434,937	656,611	111,581	169,923	2004	469,534	708,841	120,456	120,456
812,340	1,222,622	215,201	325,195	2005	182,640	274,885	48,384	48,384
713,038	1,075,755	184,544	280,287	2006	261,714	394,847	67,735	67,735
759,904	1,142,266	188,653	285,853	2007	152,481	229,204	37,855	37,855
209,337	318,084	46,074	70,208	2008	671,325	1,020,062	147,755	147,755
773,095	1,170,257	196,919	291,873	2009	234,689	355,257	59,779	59,779
583,177	877,282	141,483	215,470	2010	350,418	527,139	85,014	85,014
632,002	956,376	149,516	227,038	2011	388,709	588,213	91,960	91,960
719,264	1,098,214	178,118	270,145	2012	277,897	424,310	68,818	68,818
921,873	1,390,830	245,983	368,504	2013	103,992	157,118	27,748	27,748
827,056	1,250,927	219,653	328,592	2014	182,561	276,124	48,485	48,485
875,172	1,323,535	237,183	353,444	2015	165,342	250,049	44,810	44,810
564,989	857,596	131,070	189,949	2016	468,941	711,805	108,788	108,788
				2017				

Original I-94 Westbound Test Sections

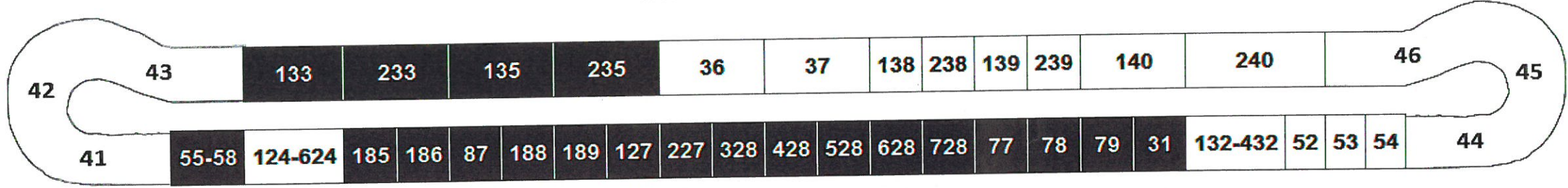
2013 Diamond Grinding			
Section	Layer Description	Length (ft)	Gap (ft)
964	2013 Traditional Grind (First 100' Transil Plus Sealant)	500	0
965	Longitudinal Groved - 125 blades	500	0
966	Longitudinal Groved - 125 blades	500	0
967	Longitudinal Groved - 90 blades	500	0
968	Longitudinal Groved - 90 blades	500	0
969	2013 Traditional Grind (First 100' Transil Plus Sealant)	500	0

2013 Joint Replacement Study (3 Joints per Section)			
Section	Layer Description	Length (ft)	Gap (ft)
970	Full Depth PCC Repair - 1 dowels - No Grout"	80	0
971	Full Depth PCC Repair - 1.25 dowels - No Grout"	80	0
972	Full Depth PCC Repair - 1 dowels - Bag Grout"	80	0
973	Full Depth PCC Repair - 1.25 dowels - Bag Grout"	80	0
974	Full Depth PCC Repair - 1 dowels - Dip Grout Method"	80	0
975	Full Depth PCC Repair - 1.25 dowels - Dip Grout Method"	80	0
976	Full Depth PCC Repair - 1 dowels - Capsule Grout Method"	80	0
977	Full Depth PCC Repair - 1.25 dowels - Capsule Grout Method"	80	0
978	Full Depth PCC Repair - 1 dowels - Powers Epoxy"	80	0
979	Full Depth PCC Repair - 1.25 dowels - Powers Epoxy"	80	0
980	Full Depth PCC Repair - 1 dowels - Rezi Weld Epoxy"	80	0
981	Full Depth PCC Repair - 1.25 dowels - Rezi Weld Epoxy"	80	0
982	No PCC Repair	80	0

2017 Spall Repair Study (~3 Panels per Section)			
Section	Layer Description	Length (ft)	Gap (ft)
94001	Rapid Set - DOT Repair Mix (CTS Cement)	80	0
94002	RepCon 928 (SpecChem)	80	0
94003	FasTrac 246 Concrete Mix (Western Materials & Design)	80	0
94004	PaveSaver - Polymeric Concrete Patch (DS Brown)	80	0
94005	FastPatch (Willamette Valley Company)	80	0
94006	Rapid Surface Repair Easy Mix (Five Star Products)	80	0
94007	ProSpec Rapid Patch Commercial DOT Repair	80	0
94008	AquaPatch	80	0
94009	High Performance (HP) Concrete Repair (Craftco)	80	0
94010	TechCrete TRB (Craftco)	80	0
Break			
94011	3U18 Modified PCC	80	0
94012	ECOFIX™ BRAND RAPID REPAIR PATCH (USG)	80	0
94013	Helix steel fiber in Rapid set DOT mix	80	0
94014	Flexcrete	80	0
94015	HMA Repair (Plant Mix)	80	0

2017 HMA over PCC			
Section	Layer Description	Length (ft)	Gap (ft)
94001	PCC Control	500	100
94002	1.5 inch HMA overlay (9.5 mm)	500	100
94003	1.5 inch HMA overlay (12.5 mm)	500	100
94004	1.75 inch HMA overlay (12.5 mm)	500	100
94005	2.5 inch (19 mm) HMA overlay; 1.5 inch (9.5 mm) HMA overlay	500	100
94006	25 inch (19 mm) HMA PG 58H-28 overlay; 1.75 inch (12.5 mm) 4.0 voids HMA overlay	500	100
94007	25 inch (19 mm) HMA PG 58H-28 overlay; 1.75 inch (12.5 mm) 5.0 voids HMA overlay	500	100
94008	25 inch (19 mm) HMA PG 58H-28 overlay; 1.75 inch (12.5 mm) 3.0 voids HMA overlay	500	100
94009	25 inch (19 mm) HMA PG 58H-28 overlay; 1.75 inch (9.5 mm) fine mix HMA overlay	500	100
94010	1 inch high-polymer interlayer; 1.5 inch (9.5 mm) HMA overlay	500	100
94011	1.5 inch (9.5 mm) HMA overlay	500	100
94012	1.5 inch (9.5 mm) HMA overlay	500	100
94013	0.75 inch UTBWC	500	100

MnROAD Low Volume Road



Cell numbers in RED were built by NRRA in 2017
Updated October 2, 2017

West Loop			Cold Central Plant Recycling (CCPR)				Original PCC		Reduced Cementitious		Fiber Reinforced PCC Street		Thin Unbonded Concrete Overlay		East Loop		
41	42	43	133	233	135	235	36	37	138	238	139	239	140	240	46	45	44
12" PCC	12" PCC	12" PCC	4" CCPR (Emulsion)	4" CCPR (Foam)	4" CCPR (Foam)	4" CCPR (Emulsion)	6" PCC	6" PCC	8" PCC w/ Optimized Mix Design A	8" PCC w/ Optimized Mix Design B	3" Fiber Reinf PCC	4" Fiber Reinf PCC	3" Fiber Reinf PCC	3" Fiber Reinf PCC	12" PCC	12" PCC	12" PCC
Refer to the note below	Refer to the note below	Refer to the note below	12" Class 6	12" Class 6	12" Class 6	12" Class 6	5" Class 5	5" Class 5	5" Class 5	5" Class 5	6" Class 5	6" Class 5	5.5"-7.0" PCC 15'Lx12'W	5.5"-7.0" PCC 15'Lx12'W			
Clay	Clay	Clay	Clay	Clay	Clay	Clay	Sand	Sand	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
New Ulm Quartz	North Concrete Luverne	Shiely Lakeland					15'Lx12'W 1" dowel	12'Lx12'W 2007 PCC Grind Strips	15'Lx12'W 1" dowel 430-470 Cement	15'Lx12'W 1" dowel 475-500 Cement	6'Lx6'W Sealed Joints 30% RSR	6'Lx6'W Sealed Joints 30% RSR	6'Lx6'W 20% RSR	6'Lx6'W 20% RSR	High Early Mix	Type III Mix	Control
1" dowel	1" dowel	1" dowel					Trans Tined	Trans Tined	Astro Turf	Astro Turf	Astro Turf	Astro Turf	Long Tined	Long Tined	15'Lx12'W 1" dowel Trans Tined	15'Lx12'W 1" dowel Trans Tined	15'Lx12'W 1" dowel Trans Tined
2017	2017	2017	2017	2017	2017	2017	Jul 93	Jul 93	2017	2017	2017	2017	Jul 13	Jul 13	Jul 93	Jul 93	Jul 93
Opened Length (ft)	491	490	494	425	425	425	480	504	257.5	260	270	273	225	234	508	489	442
Inside Gap	97	147	175										108	108	98	146	0
Outside Gap	102	152	175												102	153	0
Outside Cell (ft)	510	510	508												493	511	463

Low Volume Road ESALS per Year						
Year	Inside Lane (80,000 lbs)			Outside Lane (102,000 lbs)		
	Laps	Flexible	Rigid	Laps	Flexible	Rigid
1994	3,283	7,682	12,311	889	6,285	10,241
1995	7,748	18,130	29,055	2,927	20,694	33,719
1996	8,598	20,119	32,243	2,576	18,212	29,676
1997	6,874	16,085	25,778	2,172	15,356	25,021
1998	10,165	23,786	38,119	2,236	15,809	25,759
1999	4,658	10,900	17,468	1,694	11,977	19,515
2000	8,888	20,798	33,330	2,451	17,329	28,236
2001	8,155	19,083	30,581	2,203	15,575	25,379
2002	9,849	23,047	36,934	1,797	12,705	20,701
2003	6,923	16,200	25,961	2,820	19,937	32,486
2004	3,950	9,243	14,813	1,202	8,498	13,847
2005	5,986	14,007	22,448	2,082	14,720	23,985
2006	6,634	15,524	24,878	2,246	15,879	25,874
2007	5,295	12,390	19,856	935	6,610	10,771
2008	2,958	6,922	11,093			
2009	6,229	14,576	23,359			
2010	6,623	15,498	24,836			
2011	5,336	12,486	20,010			
2012	8,447	19,766	31,676			
2013	6,335	14,824	23,756			
2014	8,739	20,449	32,771			
2015	8,160	19,094	30,600			
2016	7,962	18,631	29,858			
	157,795	369,240	591,734	28,230	199,586	325,210

Located at the MnROAD Site - not on LVR		
PCC Pervious Pavements		
64	2007	7" PCC / 12" CA-15 Base / Geotextile / clay (Parking Lot)
64-1	2011	6" Precast PCC / 1" base / 12" CA-15 Base / Geotextile / clay (Parking Lot)
74	2006	4" PCC / 6" washed Sstone/ Geotextile / clay (Side Walk)
Implements of Husbandry		
83	2007	3.5" HMA / 8" C-5 Base / Clay (Stockpile Area) - 450 feet
84	2007	5.5" HMA / 9" C-5 Base / Clay (Stockpile Area) - 450 feet

West Loop Tie to Cell 41	South Side Cells (West to East)																														East Loop Tie to Cell		
	Open Graded Friction Coarse				Early Traffic						Recycled Unbound Base					Large Subbase		Large Subbase and Geogrid Cells						Stabilized Full Depth Reclamation			Mesabi Rock	Thin PCC	PCC Dowels	60-Year PCC	Mesabi PCC		
	55	56	57	58	124	224	324	424	524	624	185	186	87	188	189	127	227	328	428	528	628	728	77	78	79	31	32	52	53	54			
	1" OGFC Reg Tack	1" OGFC Trackless	1" OGFC Trackless 3" HMA 58-34	1" OGFC Reg Tack 3" HMA 58-34	6" PCC	6" PCC	6" PCC	6" PCC	6" PCC	6" PCC	3.5" HMA	3.5" HMA	4" HMA	3.5" HMA	3.5" HMA	3.5" HMA	3.5" HMA	3.5" HMA	3.5" HMA	3.5" HMA	3.5" HMA	3.5" HMA	4" 58-34 Elvaloy + PPA	4" 58-34 Elvaloy + PPA	4" 58-34 Elvaloy + PPA	4" 64-34	5" PCC	7.5" PCC	12" PCC	7.5" PCC			
	12" PCC	12" PCC	4" Class 6	4" Class 6	6" Class 6	6" Class 6	6" Class 6	6" Class 6	6" Class 6	6" Class 6	12" Coarse RCA	12" Fine RCA	4" Mesabi Ballast	12" Limestone Aggregate Base Class 6	12" Recycled Aggregate Base Class 6	6" Class 6	6" Class 6	6" Class 6	6" Class 5Q	6" Class 5Q	6" Class 5Q	6" Class 5Q	8" FDR	8" Class 6	8" FDR + Fly Ash	4" Class 5	7" Class 5Q	5" Class 4	3" Class 5	12" Class 6			
	12x15 1" dowel Trans Tined	12x15 1" dowel Trans Tined	Sand	Sand	6" Class 6	6" Class 6	6" Class 6	6" Class 6	6" Class 6	6" Class 6	12" Coarse RCA	12" Fine RCA	11"	12" Limestone Aggregate Base Class 6	12" Recycled Aggregate Base Class 6	18" Large Aggregate Subbase	18" Large Aggregate Subbase	9" Large Aggregate Subbase	9" Large Aggregate Subbase	9" Large Aggregate Subbase	9" Large Aggregate Subbase	9" Large Aggregate Subbase	Clay	Clay	Clay	12" Class 3	Clay	Clay	36" Select Granular	Clay			
	Clay	Clay			Sand	Sand	Sand	Sand	Sand	Sand	3.5" Select Granular Borrow Sand	3.5" Select Granular Borrow Sand	Clay Sand	3.5" Select Granular Borrow Clay	3.5" Select Granular Borrow Clay	1 lift	2 lifts	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	12'x12' Panels 20127 Repairs + Diamond Grind	15'Lx 13'14"W Var Dowels	15'Lx 15'Lx12'W 1.5" SS dowels PCC Shld Trans Broom	15'Lx12'W 1" dowel	Clay			
	Sept 2016	Sept 2016	Sept 2016	Sept 2016	2017	2017	2017	2017	2017	2017	2017	2017	Oct 08	2017	2017	2017	2017	2017	2017	2017	2017	2017	Oct 07	Oct 07	Sep 07	Sep 04	June 00	June 00	Oct 08	Oct 04			
	Opened Length (ft)	50	50	50							226.5	226	225	226	225.5	282.5	285	285	285	285	285	285	286	365	325	500	115	285	118	194			
	Gap (ft)																						49	49	70	30	0	0					

* All thicknesses shown as design thickness