

**Warning: This beamsheet is only for the purpose of reading the annotations. The data are OUT OF DATE. 01/23/04**

This file is an annotated beamsheet. Each new term or symbol is defined or explained the first time it is encountered.



Program ces (A Construction Engineering Survey format) (11/26/91) Fri May 2 13:08:54 2003

Site coordinates for beamline: input\_ces\_v2

NOTES: Coordinates are given for the entrance of the device in DUSAF coordinate system.

Site +x-axis (EAST); site +y-axis (NORTH); Site z-axis (ELEVATION)

Positive bearing is ccw wrt site EAST.

Pitch is the vertical polar angle out of the x-z plane.

Roll is wrt horizontal. Pos is clockwise looking downstream

Surveyor's roll is wrt nearest rectilinear direction

line	location	typ_code	distance [ft]	x [ft]	y [ft]	z [ft]	brng [deg]	pitch [deg]	roll [deg]	surveyor's roll [deg]
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The first part of the beamline refers to MA60 straight section nominal

0000	S1_BML	marker	-56.88634	101383.29654	97215.38336	715.72409	148.76849	0.00000	0.00000	
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First element is a marker denoting the place at which the beamsheet starts. Distances are measured from an upstream point, the historical location of the end of the beamline's C-magnet. Distances are thus negative values up to that point.

0001	LAM60	LAM_1	-56.88634	101383.29654	97215.38336	715.72409	148.76849	0.00000	-81.69232	8.308 wrt v
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First physical element is the upstream NuMI Lambertson LAM60. To be precise, the location is that of the beam at the plane of the upstream Lambertson steel. LAM\_1 is a shorthand for this type of MI Lambertson. This device is powered by its own supply.

0002	LAMEND	DRIFT	-47.70000	101375.44147	97220.14644	715.72409	148.76849	0.00000	0.00000	
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End, nonsteel, region of Lambertson magnet. Space for coils and flanges

0003	.....	drift	-46.94423	101374.79522	97220.53830	715.72409	148.76849	0.00000	0.00000	
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0004	.....	drift	-46.52756	101374.43892	97220.75434	715.72409	148.76849	0.00000	0.00000	
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0005	HQ608	3Q84-2	-46.40256	101374.33206	97220.84917	715.72409	148.76849	0.00000	0.00000	
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Main Injector quadrupole 608. 3Q84-2 is this type of MI device. All quadrupoles are designated HQ, standing for Half Quad. Since this beam sheet gives the upstream ends of devices, the first HQ location is that of the magnet upstream end, the second HQ location is that of the 'upstream end of the quad's downstream half,' namely the quad's midpoint. The subsequent location can be interpreted as the Quad downstream end.

0006	HQ608	3Q84-2	-42.90257	101371.33928	97222.63390	715.72409	148.76849	0.00000	0.00000	
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0007	.....	drift	-39.40258	101368.34651	97224.44863	715.72409	148.76849	0.00000	0.00000	
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0008	.....	drift	-39.21006	101368.18191	97224.54846	715.72409	148.76849	0.00000	0.00000	
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0009	.....	drift	-38.54339	101367.61186	97224.89413	715.72409	148.76849	0.00000	0.00000	
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0010	LAMEND	DRIFT	-38.29339	101367.39809	97225.02376	715.72409	148.76849	0.00000	0.00000	
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0011	LAM61A	LAM_1	-37.53762	101366.75183	97225.41562	715.72409	148.76849	0.00000	-88.85429	1.146 wrt v
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LAM61A and LAM61B are the downstream two Lambertsons. They are powered by a single supply.

0012	LAMEND	DRIFT	-28.35129	101358.89679	97230.17870	715.72409	148.76849	0.00000	0.00000	
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0013	.....	drift	-27.59552	101358.25053	97230.57056	715.72409	148.76849	0.00000	0.00000	
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0014	LAMEND	DRIFT	-27.09552	101357.82301	97230.82982	715.72409	148.76849	0.00000	0.00000	
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0015	LAM61B	LAM_1	-26.33974	101357.17675	97231.22168	715.72409	148.76849	0.00000	-90.00000	0.
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0016	LAMEND	DRIFT	-17.15341	101349.32171	97235.98479	715.72409	148.76849	0.00000	0.00000	
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The remainder of the beamline refers to the NuMI extracted beam

0017	VALVE	VALVE	-16.39760	101348.67545	97236.37666	715.72409	148.78282	0.56236	0.00000	
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Space reserved for a vacuum valve.

0018	.....	drift	-15.89761	101348.27988	97236.68843	716.05483	148.79714	1.12472	0.00000	
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0019	CMGEND	DRIFT	-15.42198	101347.87142	97236.93200	716.06418	148.81261	1.12472	0.00000	
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0020	V100	CMG_1	-14.75532	101347.30121	97237.27718	716.07724	148.81261	1.36536	-90.00000	0.
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Main Injector style C-magnet. V indicates vertical bend. lxx is the arbitrary designation for this beamline. 101 through 121 are quadrupole locations. This magnet is before the first quad, thus denoted 100

0021	CMGEND	DRIFT	-3.75531	101337.89362	97242.97172	716.33935	148.81261	1.60600	0.00000
0022	.....	drift	-3.08864	101337.32351	97243.31680	716.35805	148.81261	1.60600	0.00000
0023	Q12_UP	DRIFT	-2.58864	101336.89595	97243.57562	716.37206	148.81261	1.60600	0.00000

Each magnet has an upstream and downstream extension. This is the upstream one for a 3Q120 magnet. All other magnets have something similar.

0024	HQ101	3Q120-2	-2.01571	101336.40602	97243.87218	716.38810	148.81261	1.60600	0.00000
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Half quads, as explained above.

0025	HQ101	3Q120-2	2.98428	101332.13031	97246.46033	716.52826	148.81261	1.60600	0.00000
0026	Q12_DN	DRIFT	7.98427	101327.85459	97249.04848	716.66838	148.81261	1.60600	0.00000
0027	.....	drift	8.41133	101327.48937	97249.26954	716.68036	148.81261	1.60600	0.00000
0028	BPM_UP	DRIFT	10.17808	101325.97861	97250.18404	716.72987	148.81261	1.60600	0.00000

BPM Beam Position Monitor UP upstream extension for vacuum connection. Similarly for DN

0029	VP101	BPM	10.45900	101325.74344	97250.32637	716.73758	148.81261	1.60600	0.00000
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VP Vertical Position, similarly for HP 101 for nearby quad. For historical reasons all instrumentation is given the location type of DRIFT. A more modern nomenclature is MONITOR in either case the beam passes through undeflected.

0030	BPM_DN	DRIFT	10.98833	101325.28738	97250.60245	716.75250	148.81261	1.60600	0.00000
0031	BPM_UP	DRIFT	11.09466	101325.19472	97250.65852	716.75555	148.81261	1.60600	0.00000
0032	HP101	BPM	11.36966	101324.95955	97250.80087	716.76326	148.81261	1.60600	0.00000
0033	BPM_DN	DRIFT	11.90299	101324.50348	97251.07695	716.77823	148.81261	1.60600	0.00000
0034	.....	drift	12.01133	101324.41084	97251.13302	716.78124	148.81261	1.60600	0.00000
0035	TOR_UP	DRIFT	17.64649	101319.59198	97254.04995	716.93918	148.81261	1.60600	0.00000
0036	TOR101	TOROID	17.97982	101319.30694	97254.22249	716.94853	148.81261	1.60600	0.00000

Toroid intensity monitor

0037	TOR_DN	DRIFT	18.27149	101319.05753	97254.37307	716.95670	148.81261	1.60600	0.00000
0038	PM101	SMALMW	18.64649	101318.73683	97254.56756	716.96720	148.81261	1.60600	0.00000

PM Profile Monitor, SMALW indicates a type with a smaller than normal footprint for use in this crowded area.

0039	.....	drift	19.46315	101318.03847	97254.99030	716.99010	148.81261	1.60600	0.00000
0040	MICR_U	DRIFT	25.20274	101313.13028	97257.96129	717.15096	148.81261	1.60600	0.00000

MI Corrector (alternatively Trim) upstream extension. Similarly MICR\_D

0041	HT102	MIHC	25.69230	101312.71161	97258.21474	717.16467	148.81261	1.60600	0.00000
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Horizontal Trim of type MIHC, which is MI Horizontal Corrector

0042	MICR_D	DRIFT	26.69230	101311.85650	97258.73235	717.19269	148.81261	1.60600	0.00000
0043	EPB_UP	DRIFT	26.99440	101311.59816	97258.88872	717.20516	148.81261	1.60600	0.00000
0044	HV01_1	EPB	27.54647	101311.12605	97259.17448	717.21664	148.81206	1.60600	0.00000

EPB External Proton Beam, a common type of bending magnet. HV indicates rolled such as to bend both horizontally and vertically. This is a string of six magnets \_1 through \_6

0045	EPB_DN	DRIFT	37.54651	101302.54503	97264.30157	717.49689	148.47151	1.60600	0.00000
0046	EPB_UP	DRIFT	37.99445	101302.15934	97264.52903	717.50946	149.47151	1.60600	0.00000
0047	HV01_2	EPB	38.54651	101301.68398	97264.80934	717.52494	149.70982	1.58366	-3.84340
0048	EPB_DN	DRIFT	48.54656	101293.04459	97269.83764	717.80132	150.12812	1.56131	0.00000
0049	Q12_UP	DRIFT	48.99446	101292.06631	97270.06068	717.81352	150.12812	1.56131	0.00000
0050	HQ102	3Q120-2	49.56739	101292.15972	97270.34591	717.82911	150.12812	1.56131	0.00000
0051	HQ102	3Q120-2	54.56738	101287.82561	97272.83528	717.96536	150.12812	1.56131	0.00000
0052	Q12_DN	DRIFT	59.56737	101283.49153	97275.32467	718.10161	150.12812	1.56131	0.00000
0053	BPM_UP	DRIFT	59.99443	101283.12132	97275.53731	718.11326	150.12812	1.56131	0.00000
0054	HP102	BPM	60.26943	101282.88293	97275.67421	718.12074	150.12812	1.56131	0.00000
0055	BPM_DN	DRIFT	60.80277	101282.42063	97275.93973	718.13528	150.12812	1.56131	0.00000
0056	.....	drift	60.91110	101282.32673	97275.99367	718.13823	150.12812	1.56131	0.00000
0057	EPB_UP	DRIFT	61.24443	101282.03779	97276.15965	718.14732	150.12812	1.56131	0.00000
0058	HV01_3	EPB	61.79653	101281.55925	97276.43451	718.16238	150.42835	1.42638	-24.16621
0059	EPB_DN	DRIFT	71.79658	101272.86455	97281.36807	718.41133	150.72858	1.29145	0.00000

0060	EPB_UP	DRIFT	72.24447	101272.47393	97281.58703	718.42140	150.72858	1.29145	0.00000	
0061	HV01_4	EPB	72.79654	101271.99247	97281.85691	718.43386	150.96980	1.06771	-42.83203	-42.83 wrt h
0062	EPB_DN	DRIFT	82.79659	101263.25036	97286.70877	718.62018	151.21101	0.84397	0.00000	
0063	EPB_UP	DRIFT	83.24452	101262.85787	97286.92445	718.62678	151.21101	0.84397	0.00000	
0064	HV01_5	EPB	83.79658	101262.37408	97287.19030	718.63491	151.45996	0.62882	-40.76022	-40.76 wrt h
0065	EPB_DN	DRIFT	93.79663	101253.58978	97291.96775	718.74463	151.70891	0.41368	0.00000	
0066	MICR_U	DRIFT	94.24453	101253.19539	97292.18002	718.74784	151.70891	0.41368	0.00000	
0067	VT103	MIHC-R	94.73413	101252.76429	97292.41204	718.75138	151.70891	0.41368	90.00000	0.

*Magnets used for vertical correctors are MI horizontal corrector devices rolled 90 degrees. MI vertical correctors are not strong enough to be effective.*

0068	MICR_D	DRIFT	95.73413	101251.88378	97292.88599	718.75860	151.70891	0.41368	0.00000	
0069	Q12_UP	DRIFT	96.03619	101251.61777	97293.02917	718.76077	151.70891	0.41368	0.00000	
0070	HQ103	3Q120-2	96.60912	101251.11331	97293.30069	718.76490	151.70891	0.41368	0.00000	
0071	HQ103	3Q120-2	101.60911	101246.71066	97295.67037	718.80099	151.70891	0.41368	0.00000	
0072	Q12_DN	DRIFT	106.60910	101242.30805	97298.04008	718.83708	151.70891	0.41368	0.00000	
0073	BPM_UP	DRIFT	107.03617	101241.93196	97298.24248	718.84013	151.70891	0.41368	0.00000	
0074	VP103	BPM	107.60917	101241.68984	97298.37282	718.84213	151.70891	0.41368	0.00000	
0075	BPM_DN	DRIFT	107.84450	101241.23022	97298.62558	718.84597	151.70891	0.41368	0.00000	
0076	.....	drift	107.95284	101241.02485	97298.67692	718.84676	151.70891	0.41368	0.00000	
0077	EPB_UP	DRIFT	108.28617	101240.83131	97298.83490	718.84915	151.70891	0.41368	0.00000	
0078	HV01_6	EPB	108.83827	101240.34519	97299.09654	718.85316	151.95786	0.19853	-40.76022	-40.76 wrt h
0079	EPB_DN	DRIFT	118.83831	101231.51926	97303.79771	718.88777	152.20681	-0.01662	0.00000	
0080	.....	drift	119.28621	101231.12300	97304.00657	718.88764	152.20681	-0.01662	0.00000	
0081	.....	drift	121.70740	101228.98110	97305.13551	718.88692	152.20681	-0.01662	0.00000	
0082	BPM_UP	DRIFT	132.30453	101219.60652	97310.07684	718.88380	152.20681	-0.01662	0.00000	
0083	HP104	BPM	132.57952	101219.36324	97310.20499	718.88373	152.20681	-0.01662	0.00000	
0084	BPM_DN	DRIFT	133.11286	101218.89143	97310.45367	718.88357	152.20681	-0.01662	0.00000	
0085	Q12_UP	DRIFT	133.22119	101218.79559	97310.50416	718.88354	152.20681	-0.01662	0.00000	
0086	HQ104	3Q60-2	133.79412	101218.28877	97310.77132	718.88337	152.20681	-0.01662	0.00000	

*This quad, along with a few others, is 60 inches long, instead of the more common 130 inches*

0087	HQ104	3Q60-2	136.29412	101216.07719	97311.93700	718.88267	152.20681	-0.01662	0.00000	
0088	Q12_DN	DRIFT	138.79411	101213.86558	97313.10272	718.88190	152.20681	-0.01662	0.00000	
0089	.....	drift	139.22118	101213.48780	97313.30183	718.88176	152.20681	-0.01662	0.00000	
0090	SYTR_U	DRIFT	140.91911	101211.98573	97314.09356	718.88127	152.20681	-0.01662	0.00000	
0091	H104	SYTRIM	141.56494	101211.41441	97314.39468	718.88108	152.20681	-0.01662	0.00000	0.

*First of two magnets of type SwitchYard Trim, more strength than a MI trim. This one produces a modest horizontal bend.*

0092	SYTR_D	DRIFT	144.48160	101208.83423	97315.75468	718.88022	152.20681	-0.01662	0.00000	
0093	BPM_UP	DRIFT	144.93993	101208.42878	97315.96839	718.88009	152.20681	-0.01662	0.00000	
0094	HP105	BPM	145.21493	101208.18551	97316.09661	718.88003	152.20681	-0.01662	0.00000	
0095	BPM_DN	DRIFT	145.74826	101207.71369	97316.34529	718.87986	152.20681	-0.01662	0.00000	
0096	.....	drift	145.85660	101207.61786	97316.39579	718.87983	152.20681	-0.01662	0.00000	
0097	PM105	MUWIRE	146.00243	101207.46886	97316.46380	718.87980	152.20681	-0.01662	0.00000	
0098	.....	drift	147.33576	101206.30933	97317.08552	718.87940	152.20681	-0.01662	0.00000	
0099	Q12_UP	DRIFT	147.48159	101206.18033	97317.15350	718.87934	152.20681	-0.01662	0.00000	
0100	HQ105	3Q120-2	148.05449	101205.67351	97317.42065	718.87917	152.20681	-0.01662	0.00000	
0101	HQ105	3Q120-2	153.05448	101201.25032	97319.75205	718.87770	152.20681	-0.01662	0.00000	
0102	Q12_DN	DRIFT	158.05447	101196.82713	97322.08344	718.87625	152.20681	-0.01662	0.00000	
0103	MICR_U	DRIFT	158.48157	101196.44935	97322.28259	718.87612	152.20681	-0.01662	0.00000	
0104	HT105	MIHC	158.97114	101196.01624	97322.51087	718.87596	152.20681	-0.01662	0.00000	0.
0105	MICR_D	DRIFT	159.97114	101195.13160	97322.97714	718.87569	152.20681	-0.01662	0.00000	
0106	.....	drift	160.27324	101194.86434	97323.11798	718.87560	152.20681	-0.01662	0.00000	
0107	.....	drift	182.05594	101175.59456	97333.27482	718.86920	152.20681	-0.01662	0.00000	

0108	BPM_UP	DRIFT	203.11137	101156.96813	97343.09255	718.86300	152.20681	-0.01662	0.00000
0109	VP106	BPM	203.38637	101156.72485	97343.22077	718.86293	152.20681	-0.01662	0.00000
0110	BPM_DN	DRIFT	203.91970	101156.25307	97343.46945	718.86277	152.20681	-0.01662	0.00000
0111	Q12_UP	DRIFT	204.02804	101156.15723	97343.51998	718.86274	152.20681	-0.01662	0.00000
0112	HQ106	3Q120-2	204.60097	101155.65041	97343.78710	718.86257	152.20681	-0.01662	0.00000
0113	HQ106	3Q120-2	209.60096	101151.22722	97346.11850	718.86110	152.20681	-0.01662	0.00000
0114	Q12_DN	DRIFT	214.60095	101146.80404	97348.44989	718.85962	152.20681	-0.01662	0.00000
0115	MICR_U	DRIFT	215.02801	101146.42625	97348.64904	718.85952	152.20681	-0.01662	0.00000
0116	VT106	MIHC-R	215.51761	101145.99315	97348.87732	718.85936	152.20681	-0.01662	90.00000
0117	MICR_D	DRIFT	216.51761	101145.10850	97349.34362	718.85906	152.20681	-0.01662	0.00000
0118	.....	drift	216.81968	101144.84125	97349.48447	718.85900	152.20681	-0.01662	0.00000
0119	.....	drift	237.20095	101126.74929	97359.02047	718.85296	152.20681	-0.01662	0.00000
0120	BPM_UP	DRIFT	258.03479	101108.38089	97368.70221	718.84689	152.20681	-0.01662	0.00000
0121	HP107	BPM	258.30975	101108.13761	97368.83043	718.84679	152.20681	-0.01662	0.00000
0122	BPM_DN	DRIFT	258.84308	101107.66580	97369.07911	718.84663	152.20681	-0.01662	0.00000
0123	.....	drift	258.95142	101107.56996	97369.12964	718.84659	152.20681	-0.01662	0.00000
0124	PM107	MUWIRE	259.06725	101107.44096	97369.19765	718.84656	152.20681	-0.01662	0.00000
0125	.....	drift	260.43088	101106.26144	97369.81933	718.84617	152.20681	-0.01662	0.00000
0126	Q12_UP	DRIFT	260.57641	101106.02243	97369.88735	718.84613	152.20681	-0.01662	0.00000
0127	HQ107	3Q120-2	261.14931	101105.62562	97370.15447	718.84597	152.20681	-0.01662	0.00000
0128	HQ107	3Q120-2	266.14930	101101.20248	97372.48586	718.84449	152.20681	-0.01662	0.00000
0129	Q12_DN	DRIFT	271.14929	101096.77927	97374.81726	718.84302	152.20681	-0.01662	0.00000
0130	MICR_U	DRIFT	271.57639	101096.40145	97375.01640	718.84289	152.20681	-0.01662	0.00000
0131	HT107	MIHC	272.06596	101095.96835	97375.24468	718.84276	152.20681	-0.01662	0.00000
0132	MICR_D	DRIFT	273.06596	101095.08370	97375.40095	718.84246	152.20681	-0.01662	0.00000
0133	.....	drift	273.36806	101094.81648	97375.85194	718.84236	152.20681	-0.01662	0.00000
0134	.....	drift	294.35063	101076.25451	97385.63558	718.83619	152.20681	-0.01662	0.00000
0135	MICR_U	DRIFT	312.87441	101059.86770	97394.27283	718.83078	152.20681	-0.01662	0.00000
0136	VT108	MIHC-R	313.36397	101059.43459	97394.50111	718.83062	152.20681	-0.01662	90.00000
0137	MICR_D	DRIFT	314.36397	101058.54995	97394.96738	718.83032	152.20681	-0.01662	0.00000
0138	BPM_UP	DRIFT	314.66607	101058.28273	97395.10826	718.83026	152.20681	-0.01662	0.00000
0139	VP108	BPM	314.94107	101058.03945	97395.23648	718.83016	152.20681	-0.01662	0.00000
0140	BPM_DN	DRIFT	315.47440	101057.56764	97395.48516	718.82999	152.20681	-0.01662	0.00000
0141	.....	drift	315.58273	101057.47180	97395.53569	718.82996	152.20681	-0.01662	0.00000
0142	PM108	MUWIRE	315.72857	101057.34280	97395.60367	718.82993	152.20681	-0.01662	0.00000
0143	.....	drift	317.06190	101056.16327	97396.22538	718.82953	152.20681	-0.01662	0.00000
0144	Q12_UP	DRIFT	317.20773	101056.03427	97396.29336	718.82950	152.20681	-0.01662	0.00000
0145	HQ108	3Q120-2	317.78063	101055.52745	97396.56052	718.82934	152.20681	-0.01662	0.00000
0146	HQ108	3Q120-2	322.78062	101051.10426	97398.89191	718.82786	152.20681	-0.01662	0.00000
0147	Q12_DN	DRIFT	327.78061	101046.68111	97401.22331	718.82638	152.20681	-0.01662	0.00000
0148	.....	drift	328.20771	101046.30329	97401.42245	718.82625	152.20681	-0.01662	0.00000
0149	.....	drift	329.34947	101045.29322	97401.95483	718.82592	152.20681	-0.01662	0.00000
0150	B2_UPS	DRIFT	329.51614	101045.14578	97402.03256	718.82589	152.20681	-0.01662	0.00000
0151	V108_1	B2	330.13070	101044.60211	97402.31911	718.82569	152.20681	-0.76117	-90.00000

The major downbend at 108, and the subsequent upbend at 118, are accomplished with B2 magnets. These were the major bend components of the Main Ring. Each is 239" long.

0152	B2_DNS	DRIFT	350.04792	101026.98466	97411.60501	718.56110	152.20681	-1.50573	0.00000
0153	B2_UPS	DRIFT	350.59999	101026.49644	97411.86236	718.54659	152.20681	-1.50573	0.00000
0154	V108_2	B2	351.21459	101025.95293	97412.14881	718.53042	152.20681	-2.25001	-90.00000
0155	B2_DNS	DRIFT	371.13177	101008.34756	97421.42839	717.74847	152.20681	-2.99428	0.00000
0156	.....	drift	371.68384	101007.85983	97421.68544	717.71963	152.20681	-2.99428	0.00000
0157	MICR_U	DRIFT	371.85050	101007.71258	97421.76306	717.71093	152.20681	-2.99428	0.00000

0158	HT109	MIHC	372.34010	101007.28007	97421.99102	717.68534	152.20681	-2.99428	0.00000	0.
0159	MICR_D	DRIFT	373.34010	101006.39664	97422.45666	717.63311	152.20681	-2.99428	0.00000	
0160	Q12_UP	DRIFT	373.64217	101006.12978	97422.59735	717.61733	152.20681	-2.99428	0.00000	
0161	HQ109	3Q120-2	374.21510	101005.62364	97422.86411	717.58741	152.20681	-2.99428	0.00000	
0162	HQ109	3Q120-2	379.21509	101001.20649	97425.19232	717.32619	152.20681	-2.99428	0.00000	
0163	Q12_DN	DRIFT	384.21508	100996.78938	97427.52053	717.06500	152.20681	-2.99428	0.00000	
0164	BPM_UP	DRIFT	384.64214	100996.41208	97427.71942	717.04269	152.20681	-2.99428	0.00000	
0165	HP109	BPM	384.91714	100996.16914	97427.84747	717.02832	152.20681	-2.99428	0.00000	
0166	BPM_DN	DRIFT	385.45048	100995.69798	97428.09579	717.00047	152.20681	-2.99428	0.00000	
0167	.....	drift	385.55881	100995.60227	97428.14625	716.99479	152.20681	-2.99428	0.00000	
0168	B2_UPS	DRIFT	385.72548	100995.45503	97428.22384	716.98610	152.20681	-2.99428	0.00000	
0169	V108_3	B2	386.24007	100994.91208	97428.51003	716.95398	152.20681	-3.73884	-90.00000	0.
0170	B2_DNS	DRIFT	406.25728	100977.33059	97437.77697	715.65520	152.20681	-4.48339	0.00000	
0171	B2_UPS	DRIFT	406.80932	100976.84368	97438.03360	715.61205	152.20681	-4.48339	0.00000	
0172	V108_4	B2	407.42392	100976.30169	97438.31930	715.56402	152.20681	-5.22767	-90.00000	0.
0173	B2_DNS	DRIFT	427.34111	100958.75599	97447.56741	713.74929	152.20681	-5.97194	0.00000	
0174	.....	drift	427.66317	100958.27023	97447.82341	713.69185	152.20681	-5.97194	0.00000	
0175	MICR_U	DRIFT	428.05984	100958.12361	97447.90071	713.67449	152.20681	-5.97194	0.00000	
0176	VT110	MIHC-R	428.54944	100957.62283	97448.12777	713.62357	152.20681	-5.97194	90.00000	0.
0177	MICR_D	DRIFT	429.54944	100956.81302	97448.59152	713.51950	152.20681	-5.97194	0.00000	
0178	Q60_UP	DRIFT	429.85150	100956.54723	97448.73161	713.48807	152.20681	-5.97194	0.00000	
0179	HQ110	3Q60-2	430.30983	100956.14395	97448.94414	713.44040	152.20681	-5.97194	0.00000	
0180	HQ110	3Q60-2	432.80983	100953.94438	97450.10352	713.18030	152.20681	-5.97194	0.00000	
0181	Q60_DN	DRIFT	435.30982	100951.74478	97451.26791	712.92016	152.20681	-5.97194	0.00000	
0182	BPM_UP	DRIFT	435.85149	100951.26821	97451.51409	712.86380	152.20681	-5.97194	0.00000	
0183	VP110	BPM	436.12649	100951.02628	97451.64161	712.83519	152.20681	-5.97194	0.00000	
0184	BPM_DN	DRIFT	436.65982	100950.55702	97451.88895	712.77971	152.20681	-5.97194	0.00000	
0185	.....	drift	436.76816	100950.46171	97451.93918	712.76842	152.20681	-5.97194	0.00000	
0186	B2_UPS	DRIFT	436.93482	100950.31506	97452.01648	712.75110	152.20681	-5.97194	0.00000	
0187	V108_5	B2	437.54942	100949.77435	97452.30148	712.68716	152.20681	-6.71650	-90.00000	0.
0188	B2_DNS	DRIFT	457.46660	100932.27628	97461.52447	710.35770	152.20681	-7.46106	0.00000	
0189	B2_UPS	DRIFT	458.01867	100931.79200	97461.77972	710.28601	152.20681	-7.46106	0.00000	
0190	V108_6	B2	458.63327	100931.25293	97462.06387	710.20622	152.20681	-8.20562	-90.00021	0.
0191	B2_DNS	DRIFT	478.55045	100913.81431	97471.25552	707.38364	152.20681	-8.95017	0.00000	
0192	.....	drift	479.10252	100913.33187	97471.50981	707.27775	152.20681	-8.95017	0.00000	
0193	.....	drift	479.26922	100913.18623	97471.58659	707.25183	152.20681	-8.95017	0.00000	
0194	STUB_E	POINT	482.25412	100910.57780	97472.96145	706.78746	152.20681	-8.95017	0.00000	

Marker for the end of the original NuMI stub.

0195	.....	drift	482.25412	100910.57780	97472.96145	706.78746	152.20681	-8.95017	0.00000	
0196	.....	drift	483.32485	100909.64211	97473.45463	706.62086	152.20681	-8.95017	0.00000	
0197	PM111T	TARGMW	483.47069	100909.51468	97473.52178	706.59819	152.20681	-8.95017	0.00000	

This is a thin target device, probably implemented as a thick wire profile monitor, which can be inserted into the beam to create known losses. The purpose is for calibration of downstream loss monitors.

0198	.....	drift	484.80402	100908.34953	97474.13592	706.39078	152.20681	-8.95017	0.00000	
0199	MICR_U	DRIFT	484.94985	100908.22210	97474.20308	706.36808	152.20681	-8.95017	0.00000	
0200	VT111	MIH-OR	485.43945	100907.79428	97474.42861	706.29193	152.20681	-8.95017	90.00000	0.

This vertical trim is, as for the others, a rolled MI horizontal device. Additionally this one has the gap opened 50%, for aperture reasons, with a corresponding decrease in maximal field.

0201	MICR_D	DRIFT	486.43945	100906.92040	97474.88920	706.13635	152.20681	-8.95017	0.00000	
0202	Q12_UP	DRIFT	486.74151	100906.65642	97475.02834	706.08934	152.20681	-8.95017	0.00000	
0203	HQ111	3Q120-2	487.31445	100906.15577	97475.29222	706.00023	152.20681	-8.95017	0.00000	
0204	HQ111	3Q120-2	492.31444	100901.78645	97477.59523	705.22238	152.20681	-8.95017	0.00000	

0205	Q12_DN	DRIFT	497.31443	100897.41714	97479.89825	704.44452	152.20681	-8.95017	0.00000	
0206	BPM_UP	DRIFT	497.74149	100897.04391	97480.09497	704.37805	152.20681	-8.95017	0.00000	
0207	VP111	BPM	498.01649	100896.80359	97480.22164	704.33527	152.20681	-8.95017	0.00000	
0208	BPM_DN	DRIFT	498.54982	100896.33754	97480.46728	704.25230	152.20681	-8.95017	0.00000	
0209	.....	drift	498.65816	100896.24286	97480.51718	704.23547	152.20681	-8.95017	0.00000	
0210	MICR_U	DRIFT	499.64241	100895.38279	97480.97052	704.08235	152.20681	-8.95017	0.00000	
0211	HT112	MIHC-O	500.13197	100894.95494	97481.19601	704.00617	152.20681	-8.95017	0.00000	0.

*Horizontal corrector with gap opened 50%.*

0212	MICR_D	DRIFT	501.13197	100894.08109	97481.65661	703.85059	152.20681	-8.95017	0.00000	
0213	Q12_UP	DRIFT	501.43407	100893.81711	97481.79575	703.80361	152.20681	-8.95017	0.00000	
0214	HQ112	3Q120-2	502.00697	100893.31645	97482.05966	703.71447	152.20681	-8.95017	0.00000	
0215	HQ112	3Q120-2	507.00696	100888.94714	97484.36268	702.93662	152.20681	-8.95017	0.00000	
0216	Q12_DN	DRIFT	512.00696	100884.57779	97486.66566	702.15877	152.20681	-8.95017	0.00000	
0217	BPM_UP	DRIFT	512.43405	100884.20460	97486.86237	702.09233	152.20681	-8.95017	0.00000	
0218	HP112	BPM	512.70905	100883.96427	97486.98905	702.04955	152.20681	-8.95017	0.00000	
0219	BPM_DN	DRIFT	513.24238	100883.49820	97487.23472	701.96658	152.20681	-8.95017	0.00000	
0220	.....	drift	513.65071	100883.40355	97487.28462	701.94971	152.20681	-8.95017	0.00000	
0221	PM112	MUWIRE	513.49685	100883.27612	97487.35178	701.92704	152.20681	-8.95017	0.00000	
0222	C_P_MK	POINT	514.51347	100882.68744	97487.82018	701.76884	152.20681	-8.95017	0.00000	

*Marker indicating the beginning of the carrier rise, or Hobbit. The subsequent string of drifts represents the unoccupied carrier region.*

0223	.....	drift	514.51347	100883.38744	97487.82018	701.76884	152.20681	-8.95017	0.00000	
0224	.....	drift	514.82988	100882.11097	97487.96592	701.71959	152.20681	-8.95017	0.00000	
0225	.....	drift	514.97571	100881.98350	97488.03307	701.69692	152.20681	-8.95017	0.00000	
0226	.....	drift	524.51736	100873.64540	97492.42798	700.21251	152.20681	-8.95017	0.00000	
0227	.....	drift	535.64233	100863.92363	97497.55278	698.48177	152.20681	-8.95017	0.00000	
0228	.....	drift	546.76731	100854.20190	97502.67639	696.75107	152.20681	-8.95017	0.00000	
0229	.....	drift	557.89229	100844.48013	97507.80059	695.02033	152.20681	-8.95017	0.00000	
0230	.....	drift	569.01727	100834.75840	97512.92479	693.28962	152.20681	-8.95017	0.00000	
0231	.....	drift	580.14225	100825.03667	97518.04896	691.55889	152.20681	-8.95017	0.00000	
0232	.....	drift	591.26722	100815.31490	97523.17318	689.82815	152.20681	-8.95017	0.00000	
0233	.....	drift	602.39220	100805.59317	97528.29736	688.09744	152.20681	-8.95017	0.00000	
0234	.....	drift	613.51718	100795.87141	97533.42157	686.36670	152.20681	-8.95017	0.00000	
0235	.....	drift	624.64216	100786.14967	97538.54577	684.63597	152.20681	-8.95017	0.00000	
0236	.....	drift	635.76713	100776.42794	97543.66994	682.90526	152.20681	-8.95017	0.00000	
0237	.....	drift	646.89211	100766.70618	97548.79414	681.17452	152.20681	-8.95017	0.00000	
0238	.....	drift	658.01709	100756.98444	97553.91834	679.44379	152.20681	-8.95017	0.00000	
0239	.....	drift	669.14207	100747.26268	97559.04255	677.71308	152.20681	-8.95017	0.00000	
0240	.....	drift	680.26704	100737.54095	97564.16672	675.98234	152.20681	-8.95017	0.00000	
0241	.....	drift	691.39202	100727.81921	97569.29092	674.25164	152.20681	-8.95017	0.00000	
0242	.....	drift	702.51700	100718.09745	97574.41512	672.52090	152.20681	-8.95017	0.00000	
0243	.....	drift	713.64198	100708.37572	97579.53932	670.79016	152.20681	-8.95017	0.00000	
0244	.....	drift	724.76696	100698.65395	97584.66352	669.05946	152.20681	-8.95017	0.00000	
0245	BPM_UP	DRIFT	736.01690	100688.82300	97589.84527	667.30926	152.20681	-8.95017	0.00000	
0246	VP113	BPM	736.29190	100688.58268	97589.97195	667.26648	152.20681	-8.95017	0.00000	
0247	BPM_DN	DRIFT	736.82523	100688.11664	97590.21758	667.18351	152.20681	-8.95017	0.00000	
0248	Q12_UP	DRIFT	736.93357	100688.02195	97590.26748	667.16668	152.20681	-8.95017	0.00000	
0249	HQ113	3Q120-2	737.50650	100687.52130	97590.53139	667.07754	152.20681	-8.95017	0.00000	
0250	HQ113	3Q120-2	742.50649	100683.15198	97592.83441	666.29968	152.20681	-8.95017	0.00000	
0251	Q12_DN	DRIFT	747.50648	100678.78266	97595.13739	665.52183	152.20681	-8.95017	0.00000	
0252	MICR_U	DRIFT	747.93354	100678.40944	97595.33411	665.45539	152.20681	-8.95017	0.00000	
0253	VT113	MIH-OR	748.42314	100677.98162	97595.55963	665.37921	152.20681	-8.95017	90.00000	0.
0254	MICR_D	DRIFT	749.42314	100677.10773	97596.02023	665.22364	152.20681	-8.95017	0.00000	

0255	.....	drift	749.72521	100676.84376	97596.15937	665.17666	152.20681	-8.95017	0.00000
0256	MICR_U	DRIFT	749.83492	100676.74792	97596.20989	665.15959	152.20681	-8.95017	0.00000
0257	HT114	MIHC-O	750.32448	100676.32007	97596.43538	665.08341	152.20681	-8.95017	0.00000
0258	MICR_D	DRIFT	751.32448	100675.44622	97596.89598	664.92787	152.20681	-8.95017	0.00000
0259	Q12_UP	DRIFT	751.62658	100675.18225	97597.03512	664.88086	152.20681	-8.95017	0.00000
0260	HQ114	3Q120-2	752.19948	100674.68159	97597.29903	664.79172	152.20681	-8.95017	0.00000
0261	HQ114	3Q120-2	757.19947	100670.31227	97599.60201	664.01386	152.20681	-8.95017	0.00000
0262	Q12_DN	DRIFT	762.19946	100665.94293	97601.90503	663.23601	152.20681	-8.95017	0.00000
0263	BPM_UP	DRIFT	762.62656	100665.56973	97602.10174	663.16957	152.20681	-8.95017	0.00000
0264	HP114	BPM	762.90156	100665.32941	97602.22842	663.12679	152.20681	-8.95017	0.00000
0265	BPM_DN	DRIFT	763.43489	100664.86334	97602.47409	663.04382	152.20681	-8.95017	0.00000
0266	.....	drift	763.54323	100664.76868	97602.52395	663.02699	152.20681	-8.95017	0.00000
0267	PM114	MUWIRE	763.68906	100664.64126	97602.59115	663.00428	152.20681	-8.95017	0.00000
0268	.....	drift	765.02239	100663.47610	97603.20529	662.79687	152.20681	-8.95017	0.00000
0269	.....	drift	765.16822	100663.34864	97603.27244	662.77417	152.20681	-8.95017	0.00000
0270	.....	drift	772.80905	100656.67155	97606.79186	661.58549	152.20681	-8.95017	0.00000
0271	.....	drift	782.46341	100648.21747	97611.24789	660.08044	152.20681	-8.95017	0.00000
0272	.....	drift	792.15277	100639.76339	97615.70392	658.57539	152.20681	-8.95017	0.00000
0273	.....	drift	801.83209	100631.60930	97620.15994	657.07034	152.20681	-8.95017	0.00000
0274	BPM_UP	DRIFT	811.50645	100622.85522	97624.61597	655.56529	152.20681	-8.95017	0.00000
0275	HP115	BPM	811.78145	100623.61496	97624.74264	655.52251	152.20681	-8.95017	0.00000
0276	BPM_DN	DRIFT	812.31478	100622.14885	97624.98828	655.43954	152.20681	-8.95017	0.00000
0277	.....	drift	812.42311	100622.05411	97625.03818	655.42267	152.20681	-8.95017	0.00000
0278	PM115	MUWIRE	812.56895	100621.92674	97625.10534	655.39997	152.20681	-8.95017	0.00000
0279	.....	drift	813.90228	100620.76158	97625.71948	655.19255	152.20681	-8.95017	0.00000
0280	Q60_UP	DRIFT	814.04811	100620.63413	97625.78666	655.16985	152.20681	-8.95017	0.00000
0281	HQ115	3Q60-2	814.50644	100620.23363	97625.99776	655.09856	152.20681	-8.95017	0.00000
0282	HQ115	3Q60-2	817.00644	100618.04896	97627.14927	654.70965	152.20681	-8.95017	0.00000
0283	Q60_DN	DRIFT	819.50643	100615.86429	97628.30077	654.32071	152.20681	-8.95017	0.00000
0284	MICR_U	DRIFT	820.04810	100615.39096	97628.55028	654.23645	152.20681	-8.95017	0.00000
0285	HT115	MIHC	820.53770	100614.96314	97628.77577	654.16022	152.20681	-8.95017	0.00000
0286	MICR_D	DRIFT	821.53769	100614.08926	97629.23637	654.00470	152.20681	-8.95017	0.00000
0287	.....	drift	821.83976	100613.82528	97629.37551	653.95771	152.20681	-8.95017	0.00000
0288	BPM_UP	DRIFT	842.05599	100596.15898	97638.68717	650.87364	152.20681	-8.95017	0.00000
0289	VP116	BPM	842.33099	100595.91869	97638.81384	650.76986	152.20681	-8.95017	0.00000
0290	BPM_DN	DRIFT	842.86432	100595.45261	97639.05948	650.68689	152.20681	-8.95017	0.00000
0291	Q12_UP	DRIFT	842.97266	100595.35796	97639.10938	650.67002	152.20681	-8.95017	0.00000
0292	HQ116	3Q120-2	843.54559	100594.85731	97639.37329	650.58092	152.20681	-8.95017	0.00000
0293	HQ116	3Q120-2	848.54558	100590.48796	97641.67627	649.80306	152.20681	-8.95017	0.00000
0294	Q12_DN	DRIFT	853.54557	100586.11864	97643.97929	649.02521	152.20681	-8.95017	0.00000
0295	MICR_U	DRIFT	853.97264	100585.74545	97644.17600	648.95877	152.20681	-8.95017	0.00000
0296	VT116	MIHC-R	854.46223	100585.31760	97644.40153	648.88259	152.20681	-8.95017	90.00000
0297	MICR_D	DRIFT	855.46223	100584.44375	97644.86212	648.72702	152.20681	-8.95017	0.00000
0298	.....	drift	855.76430	100584.17977	97645.00126	648.68003	152.20681	-8.95017	0.00000
0299	.....	drift	868.77720	100572.80824	97650.99502	646.65560	152.20681	-8.95017	0.00000
0300	.....	drift	881.79010	100561.43670	97656.98881	644.63116	152.20681	-8.95017	0.00000
0301	.....	drift	894.80297	100550.06517	97662.98259	642.60672	152.20681	-8.95017	0.00000
0302	.....	drift	907.81587	100538.69364	97668.97635	640.58231	152.20681	-8.95017	0.00000
0303	BPM_UP	DRIFT	920.82877	100527.32211	97674.97014	638.55788	152.20681	-8.95017	0.00000
0304	HP117	BPM	921.10377	100527.08179	97675.09681	638.51509	152.20681	-8.95017	0.00000
0305	BPM_DN	DRIFT	921.63710	100526.61574	97675.34244	638.43212	152.20681	-8.95017	0.00000
0306	.....	drift	921.74543	100526.52106	97675.39235	638.41526	152.20681	-8.95017	0.00000

0307	PM117	MUWIRE	921.89127	100526.39363	97675.45950	638.39259	152.20681	-8.95017	0.00000
0308	.....	drift	923.22460	100525.22848	97676.07364	638.18514	152.20681	-8.95017	0.00000
0309	Q12_UP	DRIFT	923.37043	100525.10102	97676.14083	638.16247	152.20681	-8.95017	0.00000
0310	HQ117	3Q120-2	923.94333	100524.60036	97676.40471	638.07333	152.20681	-8.95017	0.00000
0311	HQ117	3Q120-2	928.94332	100520.23105	97678.70773	637.29548	152.20681	-8.95017	0.00000
0312	Q12_DN	DRIFT	933.94331	100515.86173	97681.01074	636.51762	152.20681	-8.95017	0.00000
0313	MICR_U	DRIFT	934.37041	100515.48850	97681.20746	636.45119	152.20681	-8.95017	0.00000
0314	HT117	MIHC	934.86001	100515.06068	97681.43295	636.37501	152.20681	-8.95017	0.00000
0315	MICR_D	DRIFT	935.86500	100514.18683	97681.89355	636.21946	152.20681	-8.95017	0.00000
0316	.....	drift	936.16207	100513.92286	97682.03269	636.17245	152.20681	-8.95017	0.00000
0317	SYTR_U	DRIFT	937.95846	100512.35304	97682.86011	635.89299	152.20681	-8.95017	0.00000
0318	H117	SYTRIM	938.60429	100511.78867	97683.15759	635.79253	152.19507	-8.95017	0.00000
<i>This is the second Switchyard trim magnet. It serves as a strong horizontal trim, and runs at zero field as its design value.</i>									
0319	SYTR_D	DRIFT	941.52095	100509.24016	97684.50155	635.33876	152.18332	-8.95017	0.00000
0320	.....	drift	941.97928	100508.83973	97684.71280	635.26746	152.18332	-8.95017	0.00000
0321	BPM_UP	DRIFT	943.55871	100507.45984	97685.44085	635.02176	152.18332	-8.95017	0.00000
0322	VP118	BPM	943.68371	100507.21959	97685.56762	634.97898	152.18332	-8.95017	0.00000
0323	BPM_DN	DRIFT	944.36704	100506.75361	97685.81345	634.96901	152.18332	-8.95017	0.00000
0324	Q12_UP	DRIFT	944.47537	100506.65899	97685.86339	634.87914	152.18332	-8.95017	0.00000
0325	HQ118	3Q120-2	945.04827	100506.15844	97686.12749	634.79000	152.18332	-8.95017	0.00000
0326	HQ118	3Q120-2	950.04826	100501.79009	97688.43231	634.01215	152.18332	-8.95017	0.00000
0327	Q12_DN	DRIFT	955.04825	100499.45168	97690.73713	633.23430	152.18332	-8.95017	0.00000
0328	MICR_U	DRIFT	955.47535	100497.04855	97690.93398	633.16786	152.18332	-8.95017	0.00000
0329	VT118	MIHC-R	955.96492	100496.62082	97691.15367	633.09171	152.18332	-8.95017	90.00000
0330	MICR_D	DRIFT	956.96492	100495.74714	97691.62063	632.93614	152.18332	-8.95017	0.00000
0331	.....	drift	957.26702	100495.48323	97691.75990	632.88912	152.18332	-8.95017	0.00000
0332	PM118T	TARGMW	957.41285	100495.35580	97691.82712	632.86645	152.18332	-8.95017	0.00000
<i>A second thin target device for loss monitor calibration.</i>									
0333	.....	drift	958.74618	100494.19091	97692.44172	632.65900	152.18332	-8.95017	0.00000
0334	.....	drift	958.89201	100494.06351	97692.50895	632.63633	152.18332	-8.95017	0.00000
0335	.....	drift	975.83535	100479.26049	97700.31920	630.90045	152.18332	-8.95017	0.00000
0336	B2_UPS	DRIFT	976.00202	100479.11489	97700.39604	629.97449	152.18332	-8.95017	0.00000
0337	V118_1	B2	976.61658	100478.57795	97700.67934	629.87889	152.18332	-8.24916	90.00000
0338	B2_DNS	DRIFT	996.53370	100461.14504	97709.87718	627.02132	152.18332	-7.54815	0.00000
0339	B2_UPS	DRIFT	997.08580	100460.66099	97710.13256	626.94878	152.18332	-7.54815	0.00000
0340	V118_2	B2	997.70040	100460.12214	97710.41688	626.86804	152.18332	-6.84742	90.00000
0341	B2_DNS	DRIFT	1017.61752	100442.63261	97719.64459	624.49344	152.18332	-6.14669	0.00000
0342	.....	drift	1018.16958	100442.14715	97719.90072	624.43435	152.18332	-6.14669	0.00000
0343	MICR_U	DRIFT	1018.33625	100442.00059	97719.97805	624.41650	152.18332	-6.14669	0.00000
0344	HT119	MIHC	1018.82585	100441.57008	97720.20518	624.36407	152.18332	-6.14669	0.00000
0345	MICR_D	DRIFT	1019.82585	100440.69072	97720.66916	624.25699	152.18332	-6.14669	0.00000
0346	Q60_UP	DRIFT	1020.12791	100440.42507	97720.80932	624.22464	152.18332	-6.14669	0.00000
0347	HQ119	3Q60-2	1020.58625	100440.02202	97721.02195	624.17556	152.18332	-6.14669	0.00000
0348	HQ119	3Q60-2	1023.08624	100437.82363	97722.18185	623.90787	152.18332	-6.14669	0.00000
0349	Q60_DN	DRIFT	1025.58624	100435.62524	97723.34176	623.64019	152.18332	-6.14669	0.00000
0350	BPM_UP	DRIFT	1026.12790	100435.14893	97723.59307	623.58218	152.18332	-6.14669	0.00000
0351	HP119	BPM	1026.40290	100434.90710	97723.72066	623.55276	152.18332	-6.14669	0.00000
0352	BPM_DN	DRIFT	1026.93623	100434.43811	97723.96810	623.49564	152.18332	-6.14669	0.00000
0353	.....	drift	1027.04457	100434.34283	97724.01836	623.48405	152.18332	-6.14669	0.00000
0354	B2_UPS	DRIFT	1027.21123	100434.19628	97724.09569	623.46621	152.18332	-6.14669	0.00000
0355	V118_3	B2	1027.82583	100433.65586	97724.38083	623.40039	152.18332	-5.44596	90.00000
0356	B2_DNS	DRIFT	1047.74295	100416.12020	97733.63288	621.51017	152.18332	-4.74524	0.00000



0357	B2_UPS	DRIFT	1048.29502	100415.63358	97733.88964	621.46451	152.18332	-4.74524	0.00000	
0358	V118_4	B2	1048.90961	100415.09189	97734.17543	621.41368	152.18332	-4.04422	90.00000	0.
0359	B2_DNS	DRIFT	1068.82673	100397.52060	97743.44628	620.00900	152.18332	-3.34321	0.00000	
0360	.....	drift	1069.37880	100397.03313	97743.70346	619.97681	152.18332	-3.34321	0.00000	
0361	Q12_UP	DRIFT	1069.54547	100396.88598	97743.78112	619.96710	152.18332	-3.34321	0.00000	
0362	HQ120	3Q120-2	1070.11840	100396.38015	97744.04802	619.93367	152.18332	-3.34321	0.00000	
0363	HQ120	3Q120-2	1075.11839	100391.96546	97746.37728	619.64207	152.18332	-3.34321	0.00000	
0364	Q12_DN	DRIFT	1080.11838	100387.55077	97748.70650	619.35047	152.18332	-3.34321	0.00000	
0365	.....	drift	1080.54544	100387.17367	97748.90545	619.32557	152.18332	-3.34321	0.00000	
0366	Q12_UP	DRIFT	1080.95532	100386.81179	97749.09640	619.30165	152.18332	-3.34321	0.00000	
0367	HQ121	3Q120-2	1081.52822	100386.30595	97749.36329	619.26825	152.18332	-3.34321	0.00000	
0368	HQ121	3Q120-2	1086.52821	100381.89126	97751.69255	618.97662	152.18332	-3.34321	0.00000	
0369	Q12_DN	DRIFT	1091.52828	100377.47657	97754.02178	618.68502	152.18332	-3.34321	0.00000	
0370	MICR_U	DRIFT	1091.95530	100377.09948	97754.22076	618.66011	152.18332	-3.34321	0.00000	
0371	HT121	MIHC	1092.44496	100376.66719	97754.44881	618.63157	152.18332	-3.34321	0.00000	0.
0372	MICR_D	DRIFT	1093.44489	100375.78425	97754.91466	618.57324	152.18332	-3.34321	0.00000	
0373	MICR_U	DRIFT	1093.74896	100375.51756	97755.05541	618.55562	152.18332	-3.34321	0.00000	
0374	VT121	MIHC-R	1094.23683	100375.08527	97755.28346	618.52708	152.18332	-3.34321	90.00000	0.
0375	MICR_D	DRIFT	1095.23652	100374.20234	97755.74930	618.46874	152.18332	-3.34321	0.00000	
0376	BPM_UP	DRIFT	1095.53862	100373.93560	97755.89005	618.45113	152.18332	-3.34321	0.00000	
0377	HP121	SMABPM	1095.81362	100373.69288	97756.01817	618.43508	152.18332	-3.34321	0.00000	

The final two BPMs in each plane, this one and others to follow, are two times as accurate as the others. This is accomplished by having the plates closer together, thus the nomenclature *SMALLBPM*.

0378	BPM_DN	DRIFT	1096.34695	100373.22192	97756.26659	618.40398	152.18332	-3.34321	0.00000	
0379	BPM_UP	DRIFT	1096.45529	100373.12625	97756.31709	618.39765	152.18332	-3.34321	0.00000	
0380	VP121	SMABPM	1096.73029	100372.88344	97756.44551	618.38164	152.18332	-3.34321	0.00000	
0381	BPM_DN	DRIFT	1097.26362	100372.41254	97756.69363	618.35050	152.18332	-3.34321	0.00000	
0382	.....	drift	1097.37195	100372.31691	97756.74409	618.34420	152.18332	-3.34321	0.00000	
0383	PM121	TAMUWI	1097.51779	100372.18813	97756.81203	618.33571	152.18332	-3.34321	0.00000	

The final two multiwires, this one and another to follow, are for targeting the beam *MULTIWIre*. The wire pitch is half as great as in the others, and the area seen is correspondingly reduced.

0384	.....	drift	1098.85112	100371.01087	97757.43316	618.25792	152.18332	-3.34321	0.00000	
0385	.....	drift	1098.99695	100370.88213	97757.50111	618.24942	152.18332	-3.34321	0.00000	
0386	TOR_UP	DRIFT	1135.37883	100338.75913	97774.44963	616.12757	152.18332	-3.34321	0.00000	
0387	TORTGT	TOROID	1135.71216	100338.46481	97774.60491	616.10812	152.18332	-3.34321	0.00000	

Target toroid

0388	TOR_DN	DRIFT	1136.00383	100338.20730	97774.74080	616.09112	152.18332	-3.34321	0.00000	
0389	BPM_UP	DRIFT	1136.37883	100337.87619	97774.91547	616.06924	152.18332	-3.34321	0.00000	
0390	HPTGT	SMABPM	1136.65383	100337.63338	97775.04359	616.05320	152.18332	-3.34321	0.00000	

Target horizontal BPM, vertical follows

0391	BPM_DN	DRIFT	1137.18716	100337.16248	97775.29205	616.02209	152.18332	-3.34321	0.00000	
0392	BPM_UP	DRIFT	1137.29549	100337.06681	97775.34251	616.01580	152.18332	-3.34321	0.00000	
0393	VPTGT	SMABPM	1137.57049	100336.82403	97775.47062	615.99975	152.18332	-3.34321	0.00000	
0394	BPM_DN	DRIFT	1138.10383	100336.35310	97775.71908	615.96865	152.18332	-3.34321	0.00000	
0395	.....	drift	1138.21216	100336.25746	97775.76954	615.96232	152.18332	-3.34321	0.00000	
0396	PMTGT	TAMUWI	1138.35799	100336.12869	97775.83749	615.95382	152.18332	-3.34321	0.00000	

Target multiwire

0397	.....	drift	1139.69132	100334.95146	97776.45861	615.87606	152.18332	-3.34321	0.00000	
0398	.....	drift	1139.83716	100334.82269	97776.52656	615.86757	152.18332	-3.34321	0.00000	
0399	.....	drift	1141.18591	100333.63181	97777.15487	615.78889	152.18332	-3.34321	0.00000	
0400	M_TACA	POINT	1147.18589	100328.33419	97779.94998	615.43896	152.18332	-3.34321	0.00000	

Beginning of shielding cave

0401	.....	drift	1147.18589	100328.33419	97779.94998	615.43896	152.18332	-3.34321	0.00000
0402	BAFL2P	BAFFLE	1160.87015	100316.25183	97786.32480	614.64086	152.18332	-3.34321	0.00000
<i>Horn protection baffle</i>									
0403	.....	drift	1165.79140	100311.90666	97788.61735	614.35386	152.18332	-3.34321	0.00000
0404	.....	drift	1167.23146	100310.63517	97789.28821	614.26987	152.18332	-3.34321	0.00000
0405	HALTA1	TAR-2	1168.02214	100309.93708	97789.65655	614.22374	152.18332	-3.34321	0.00000
<i>Upstream part of target. Note that this region contains both horn and target.</i>									
0406	MCZERO	TAR-2	1169.17043	100308.92320	97790.19149	614.15678	152.18332	-3.34321	0.00000
<i>Coordinate system origin for Monte Carlo neutrino studies.</i>									
0407	ACTRN1	ACTRN1	1169.26886	100308.83629	97790.23733	614.15104	152.18332	-3.34321	0.00000
<i>Marks the beginning of the active part of horn one, which is overlapped with the target.</i>									
0408	HALTA2	TAR-2	1169.58677	100308.55558	97790.38542	614.13250	152.18332	-3.34321	0.00000
<i>Downstream part of target, still overlapped with horn one.</i>									
0409	ENDFIN	ENDFIN	1171.15140	100307.17412	97791.11433	614.04126	152.18332	-3.34321	0.00000
<i>Target downstream cooling fin</i>									
0410	DWNRN1	DWNRN1	1179.01293	100300.23286	97794.77662	613.58276	152.18332	-3.34321	0.00000
<i>Horn one downstream extension</i>									
0411	.....	drift	1181.70046	100297.85994	97796.02859	613.42600	152.18332	-3.34321	0.00000
0412	UPHRN2	UPHRN2	1201.79930	100280.11388	97805.39166	612.25380	152.18332	-3.34321	0.00000
<i>Upstream extension, active part, and downstream extension of horn two.</i>									
0413	ACTRN2	ACTRN2	1201.97876	100279.95544	97805.47525	612.24333	152.18332	-3.34321	0.00000
0414	DWNRN2	DWNRN2	1211.82126	100277.26511	97810.06038	611.66931	152.18332	-3.34321	0.00000
0415	.....	drift	1217.16574	100266.54625	97812.55014	611.35760	152.18332	-3.34321	0.00000
0416	UPHRN2	UPHRN2	1244.45014	100242.45578	97815.26058	609.76633	152.18332	-3.34321	0.00000
<i>Space for horn two in medium energy neutrino configuration. Similar location for high energy follows</i>									
0417	ACTRN2	ACTRN2	1244.62960	100242.29732	97825.34418	609.75587	152.18332	-3.34321	0.00000
0418	DWNRN2	DWNRN2	1254.47210	100233.60701	97829.92931	609.18185	152.18332	-3.34321	0.00000
0419	.....	drift	1259.81657	100228.88816	97832.41903	608.87014	152.18332	-3.34321	0.00000
0420	UPHRN2	UPHRN2	1290.48023	100201.81400	97846.03712	609.08179	152.18332	-3.34321	0.00000
0421	ACTRN2	ACTRN2	1290.65969	100201.65557	97846.78734	607.97133	152.18332	-3.34321	0.00000
0422	DWNRN2	DWNRN2	1300.50219	100192.96523	97851.37247	606.48728	152.18332	-3.34321	0.00000
0423	.....	drift	1305.84667	100188.24638	97853.86220	606.18557	152.18332	-3.34321	0.00000
0424	M_CAVE	POINT	1309.12750	100185.34960	97855.39057	605.99423	152.18332	-3.34321	0.00000
<i>marks end of target cave</i>									
0425	OVERHA	OVERHA	1309.12750	100185.34960	97855.39057	605.99423	152.18332	-3.34321	0.00000
<i>Horn room overhangs decay region approx 10'</i>									
0426	DKINHL	DKINHL	1319.09848	100176.54584	97860.03555	605.41270	152.18332	-3.34321	0.00000
<i>Part of decay region inside target hall.</i>									
0427	M_THAL	POINT	1337.62698	100160.18629	97868.66709	604.33209	152.18332	-3.34321	0.00000
<i>Marks end of target hall</i>									
0428	DK_PCA	DECA44	1337.62698	100160.18629	97868.66709	604.33209	152.18332	-3.34321	0.00000
<i>Six regions of decay region beyond target hall</i>									
0429	DK_PCB	DEC150	1483.23857	100031.62011	97936.50032	595.83975	152.18332	-3.34321	0.00000
0430	DK_PCC	DEC150	1975.36357	99597.10363	98165.75711	567.13817	152.18332	-3.34321	0.00000
0431	DK_PCD	DEC100	2467.48857	99162.58714	98395.01387	538.43655	152.18332	-3.34321	0.00000
0432	DK_PCE	DEC100	2795.57190	98872.90950	98547.85172	519.30214	152.18332	-3.34321	0.00000
0433	DK_PCF	DEC125	3123.65524	98583.23187	98700.68957	500.16773	152.18332	-3.34321	0.00000
0434	DENCU	DU_ENU	3533.75940	98221.13479	98891.73686	476.24974	152.18332	-3.34321	0.00000
<i>Absorber (dump) enclosure upstream of absorber, followed by device itself and downstream part of enclosure</i>									
0435	DUMP	DUMP	3540.32107	98215.34123	98894.79361	475.86703	152.18332	-3.34321	0.00000
0436	DENCD	DU_END	3564.33677	98194.13685	98905.98135	474.46641	152.18332	-3.34321	0.00000
0437	.....	drift	3583.75930	98176.98793	98915.02937	473.33363	152.18332	-3.34321	0.00000

0438	MUOND	MUON	3588.68892	98172.63538	98917.32582	473.04613	152.18332	-3.34321	0.00000
<i>First muon alcove, others follow</i>									
0439	.....	drift	3590.33212	98171.18453	98918.09130	472.95030	152.18332	-3.34321	0.00000
0440	.....	drift	3593.77628	98168.14356	98919.69576	472.74945	152.18332	-3.34321	0.00000
0441	.....	drift	3633.21311	98133.32325	98938.06744	470.44942	152.18332	-3.34321	0.00000
0442	MUOND	MUON	3638.14269	98128.97070	98940.36390	470.16192	152.18332	-3.34321	0.00000
0443	.....	drift	3639.78590	98127.51985	98941.12938	470.06609	152.18332	-3.34321	0.00000
0444	.....	drift	3643.23005	98124.47888	98942.73384	469.86520	152.18332	-3.34321	0.00000
0445	.....	drift	3702.38528	98072.24841	98970.29133	466.41518	152.18332	-3.34321	0.00000
0446	MUOND	MUON	3707.31490	98067.89586	98972.58782	466.12768	152.18332	-3.34321	0.00000
0447	.....	drift	3708.95807	98066.44501	98973.35330	466.03184	152.18332	-3.34321	0.00000
0448	.....	drift	3712.40223	98063.40404	98974.95776	465.83096	152.18332	-3.34321	0.00000
0449	.....	drift	3810.99428	97976.35326	99020.88693	460.08090	152.18332	-3.34321	0.00000
0450	MUOND	MUON	3815.92890	97972.00071	99023.18338	459.79340	152.18332	-3.34321	0.00000
0451	.....	drift	3817.56710	97970.54986	99023.94887	459.69757	152.18332	-3.34321	0.00000
0452	.....	drift	3821.01126	97867.50889	99025.55333	459.49669	152.18332	-3.34321	0.00000
0453	TUNNEL	TUNNEL	4409.11943	97448.24510	99299.52394	425.19718	152.18332	-3.34321	0.00000
<i>Beam is in rock here, but constructed tunnel is parallel to it</i>									
0454	M_ENCUC	EX_ENUC	4484.70668	97381.50816	99334.73630	420.78879	152.18332	-3.34321	0.00000
<i>MINOS near detector hall upstream region, followed by detector itself and downstream part of hall.</i>									
0455	MIN_ND	EXP	4570.35031	97305.88800	99374.63344	415.79389	152.18332	-3.34321	0.00000
0456	M_ENCD	EX_END	4624.93744	97257.89088	99400.06291	412.61026	152.18332	-3.34321	0.00000
0457	.....	drift	4634.95438	97248.84655	99404.72931	412.02608	152.18332	-3.34321	0.00000
<i>Drift space, Fermilab to Soudan</i>									
0458	MINOFU	EXP_F2	2413631.69740	-2029748.91592	1221637.51293	-140084.96990	152.18332	-3.34321	0.00000
<i>Far detector upstream end, similarly downstream end follows. (Note that the coordinate system is flat, not curved with earth. Thus detector is at 140,000' below sea level.)</i>									
0459	MINOFD	EXP_F2	2413690.85266	-2029801.14639	1221665.07041	-140088.41992	152.18332	-3.34321	0.00000

(reduced to the beam sheet  
 standard to the beamsheet)