

TS-SSC 92-074
Gianni Tassotto
6/16/92

**CHANGE OF LOCATION OF VOLTAGE
TAP ON LOWER OUTER COIL OF SSC 50 mm
MAGNETS DCA322 and DCA323**

After A. Devred and J. Tompkins looked at DCA321 drawing about the location of voltage taps on lower outer coil (see drawing MC-292773), they suggested to change the location of voltage tap 1A at the end of the first turn and relocate it at the beginning of the first turn and, a few inches away from the quarter coil voltage tap C. This voltage tap is now labelled OH.

TS-SSC92-250 outlines how DCA321 was instrumented with the extra voltage taps and spot heaters on the inner coils and with a new type of spot heater/VT assembly on the outer coil.

PROCEDURE

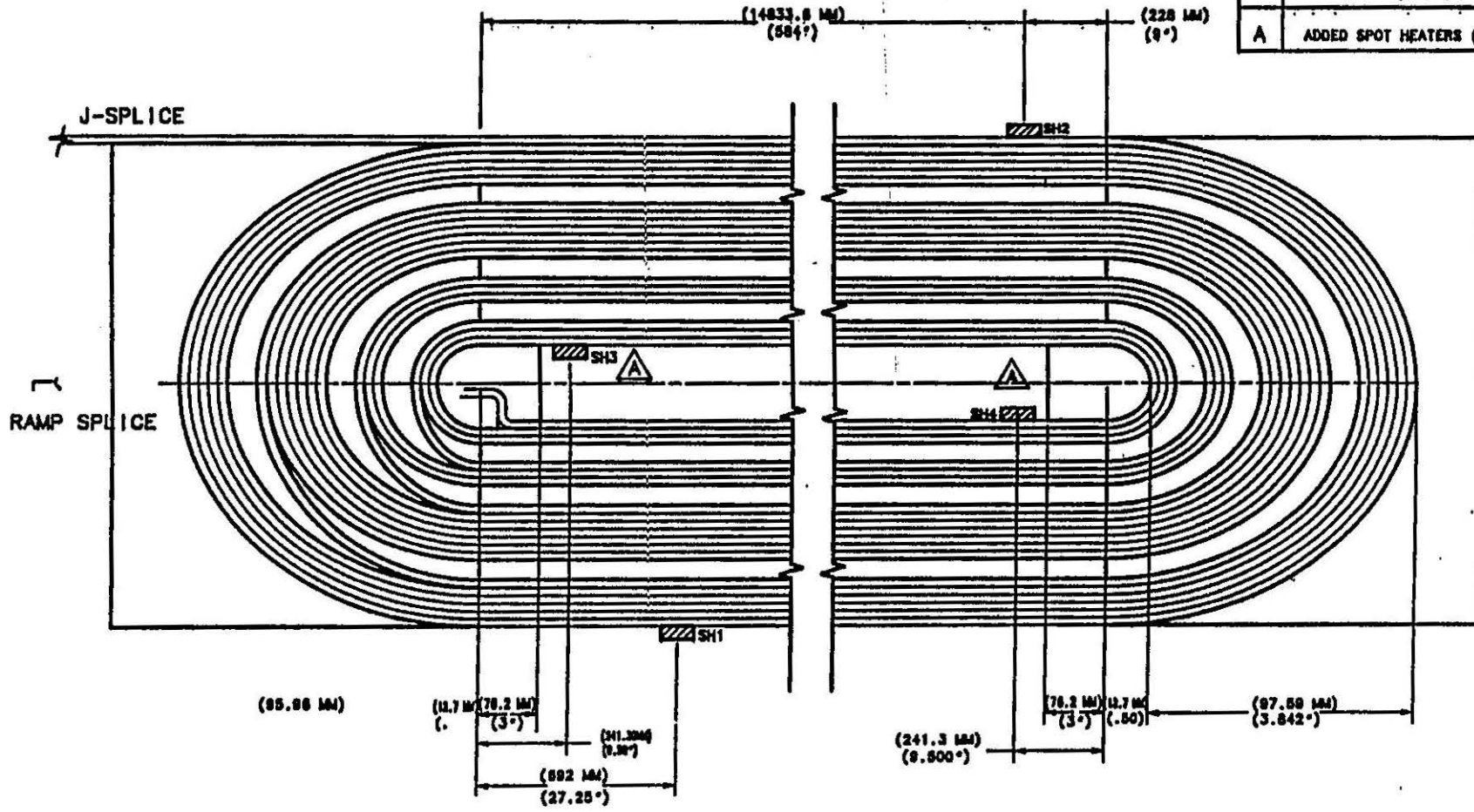
Technicians followed the set of guidelines already outlined in TS SSC92-250. Voltage tap OH was easier to install than 1A because there was no need to separate the turns with a nylon wedge. Also, on magnets DCA322 and DCA323, the thickness of the kapton sheet around the spot heater/voltage tap ass'y was changed to 0.001 inches.

SOLDERING OF THE LEADS

As in DCA321 both spot heater and voltage tap wires exit the magnet on the outside of the outer coil (as the quench heater wires do). Lead and return end-clamp insulators have been modified to allow for soldering of spot heater and voltage tap wires to 22 AWG and 28 AWG kapton coated wires following the same procedure used to solder quench heaters to 14 AWG wires (see TS-SSC-91-395).

Reduced copies of pertinent drawings have been attached.

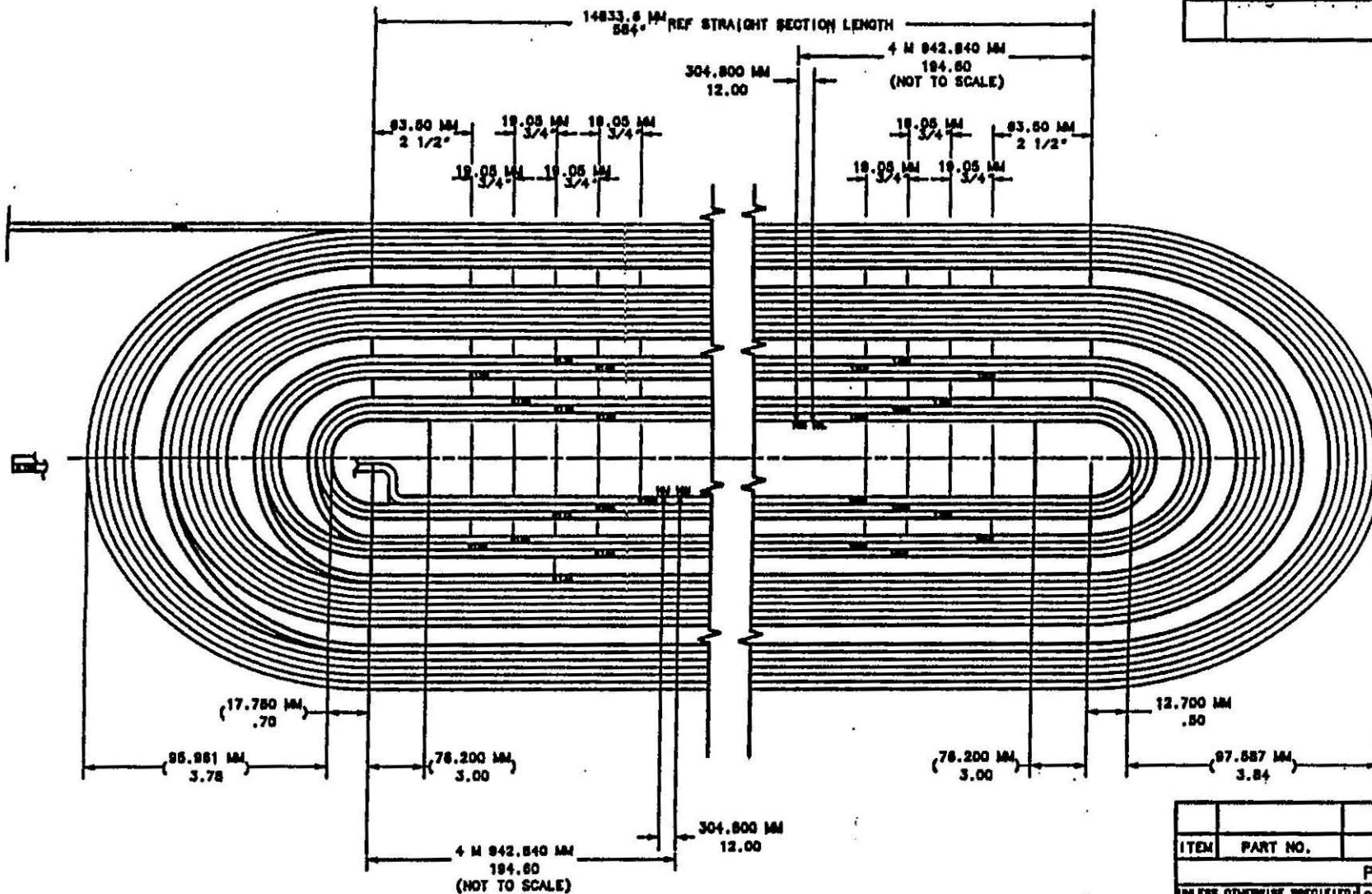
REV.	DESCRIPTION	DRWN.	DATE
		APP.	DATE
A	ADDED SPOT HEATERS (SH) AND NOTE	NTATE	3/16
		P.B.	3-30



NOTE:

- 1. COIL AS VIEWED FROM INSIDE.
- 2. POLE TURN SPOT HEATERS (SH3 AND SH4) LOCATED 9 1/2° FROM WEDGES.

ITEM	PART NO.	DESCRIPTION OR SIZE	QTY
PARTS LIST			
UNLESS OTHERWISE SPECIFIED:		ORIGINATOR	STRAIT/KOSKA
1. ALL DIMENSIONS ARE IN MILLIMETERS		DRWN	R. DIXON 4/29/81
2. TOLERANCES: ± .1 MM		CHECKED	G. T. [Signature] 3/20/81
3. DIMENSIONS BASED UPON ANSI Y14.5M-1983		APPROVED	[Signature] 3-20-81
4. INCH DIMENSIONS ARE FOR REFERENCE ONLY		USED ON	DCA321, 322, 323
5. BREAK ALL SHARP EDGES		MATERIAL	65
6. DO NOT SCALE DRAWINGS			
7. MAX. ALL MACH. SURFACES			
8. DIMENSION IDENTIFICATION: MILLIMETER/MILLIMETER/INCH			
FERMILAB NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY BSC			
SSC (50MM) LONG MAGNET SPOT HEATER POSITIONS LOWER INNER COIL			
SCALE	FILMED	DRAWING NUMBER	REV.
NONE		0102-MC-292379	BA



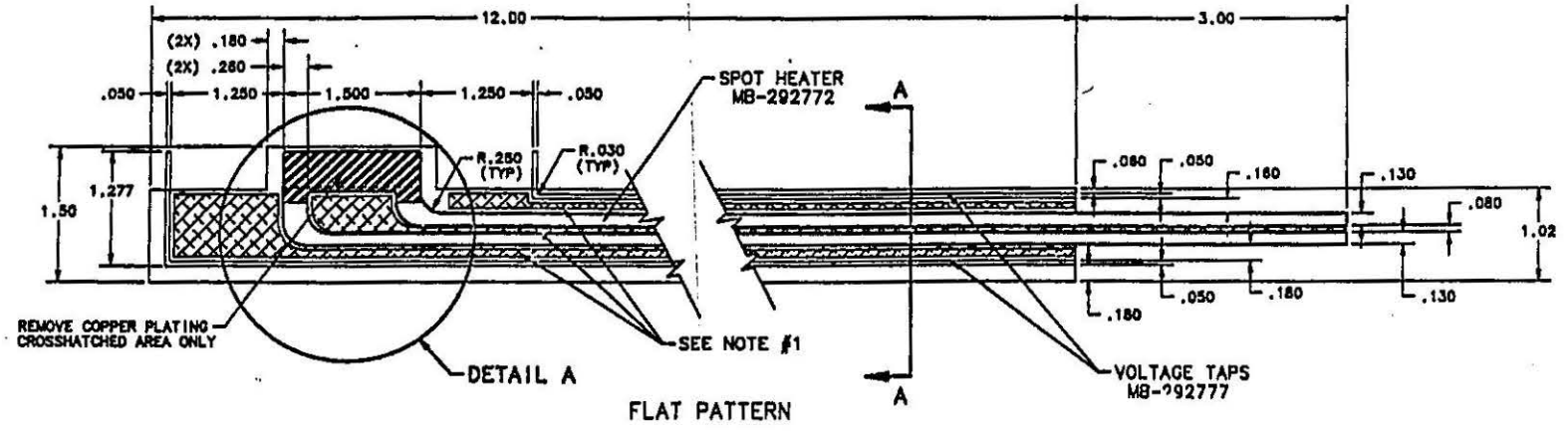
NOTE:

1. VOLTAGE TAP WIRES FOR TAPS 0A, 19B, AND THE HALF COIL TAP ARE #22 AWG TEFLON INSULATED.
2. THE REMAINING VOLTAGE TAP WIRES ARE #30 AWG TEFLON INSULATED.
3. TAP WIRES WITH THE SAME NUMBER AT EACH END SHOULD FORM A TWISTED PAIR (A-B, C-D, J-K, AND L-M).
4. FOR WIRE ROUTING PROCEDURES SEE ES #292400
5. COIL AS VIEWED FROM INSIDE.
6. VOLTAGE TAPS 19J, 19K, 19L, AND 19M LOCATED ON LOWER INNER COIL ONLY.

		APPD.	DATE

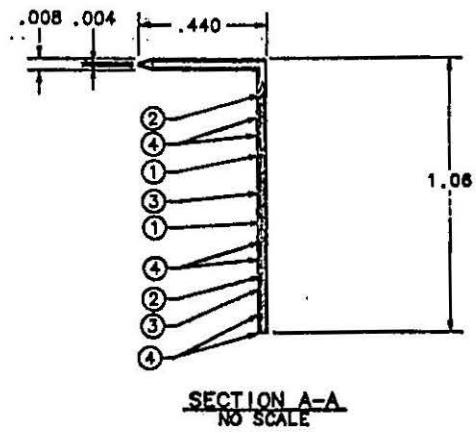
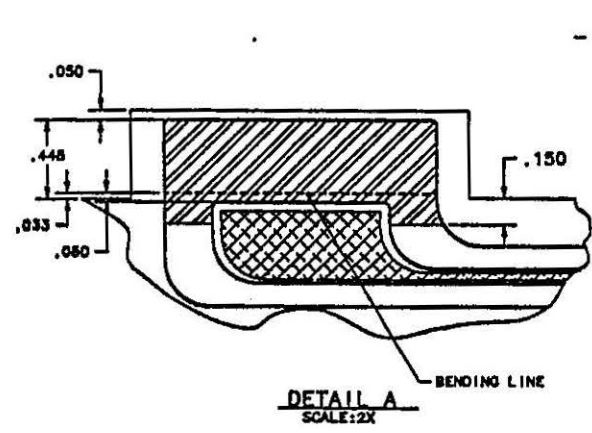
ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED:			
1. ALL DIMENSIONS ARE IN MILLIMETERS	ORIGINATOR	STRAIT/KOSKA	
2. TOLERANCES: ±1 mm	DRAWN	MICHAEL TATE	4/1/92
3. DIMENSIONS BASED UPON ANSI Y14.2M-1982	CHECKED	<i>G. Tank</i>	8/3/92
4. INCH DIMENSIONS ARE FOR REFERENCE ONLY.	APPROVED	<i>Michael Tate</i>	8-2-92
5. BREAK ALL SHARP EDGES.	USED ON	DCA321, 322, 323	
6. DO NOT SCALE DRAWING.	MATERIAL	65	
7. MAX. ALL MACH. SURFACES			
8. DIMENSION IDENTIFICATION: MILLIMETER/MILLIMETER/INCH			
FERMIL NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY BSC			
SSC 50MM LONG COLD MASS INNER COIL ASSEMBLY VOLTAGE TAPS-INNER COIL			
DATE	FILLED	BY	REV.
IN THE	0102-MC-292/41		
PREPARED WITH	1-DEAS 8.0	USER NAME:	DATE

REV.	DESCRIPTION	DRAWN	DATE
A	ADDED USED ON NOTE	MTATE	4/30/92
B	NOTES CHANGED	MTATE	4/30/92
		RB	5-1-92

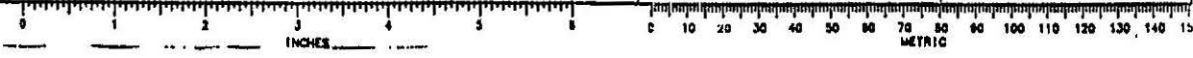


NOTES:

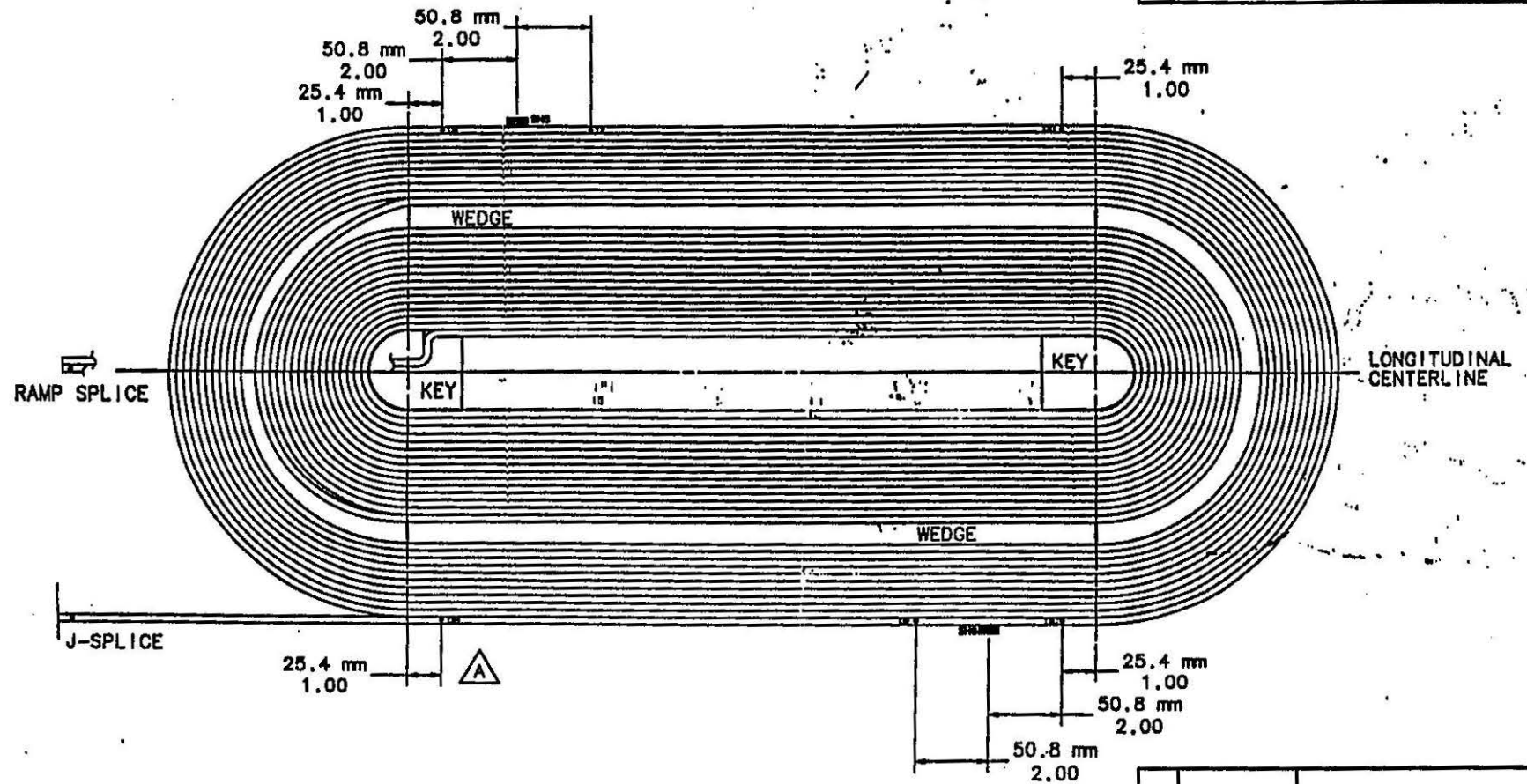
- ⚠ 1. PLACE .003 IN KAPTON STRIP BETWEEN EACH LEAD
- ⚠ 1 AR STAINLESS STEEL, TYPE 304, COPPER CLAD, .004 THICK
- ⚠ 2 AR STAINLESS STEEL, TYPE 302, .001 THICK
- ⚠ 3 AR KAPTON SHEET, TYPE H, .002 THICK
- ⚠ 4 AR KAPTON TAPE, TYPE H, .001 THICK, + .0015 THICK SILICONE ADHESIVE



ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED ORIGINATOR: GIANNI TASSOTTO			
.XX	.XXX	ANGLES	DRAWN: MICHAEL TATE 3/19/92
± .01	± .005	±	CHECKED: [Signature]
1. BREAK ALL SHARP EDGES .02 MAX.			APPROVED: [Signature] 3-19-92
2. DO NOT SCALE DRAWING.			USED ON: DCA322 -DCA323 ⚠
3. DIMENSIONS BASED UPON ASST Y14.00-1993			
4. MAX. ALL MACH. SURFACES			MATERIAL:
FERMI NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY			
SSC 50MM LONG COLDMASS LOWER OUTER COIL SPOT HEATER & VOLTAGE TAP ASSEMBLY			
SCALE	FILMED	DRAWING NUMBER	REV.
FULL		0102-MC-292778	B
CREATED WITH I-DEAS 5.0		USER NAME: MTATE	



REV.	DESCRIPTION	DRAWN	DATE
		APPD.	DATE
A	RELOCATED VOLTAGE TAP (OH) OH WAS 1A ON DCA321	MTATE	4/30/92
		P.S.	5-1-97



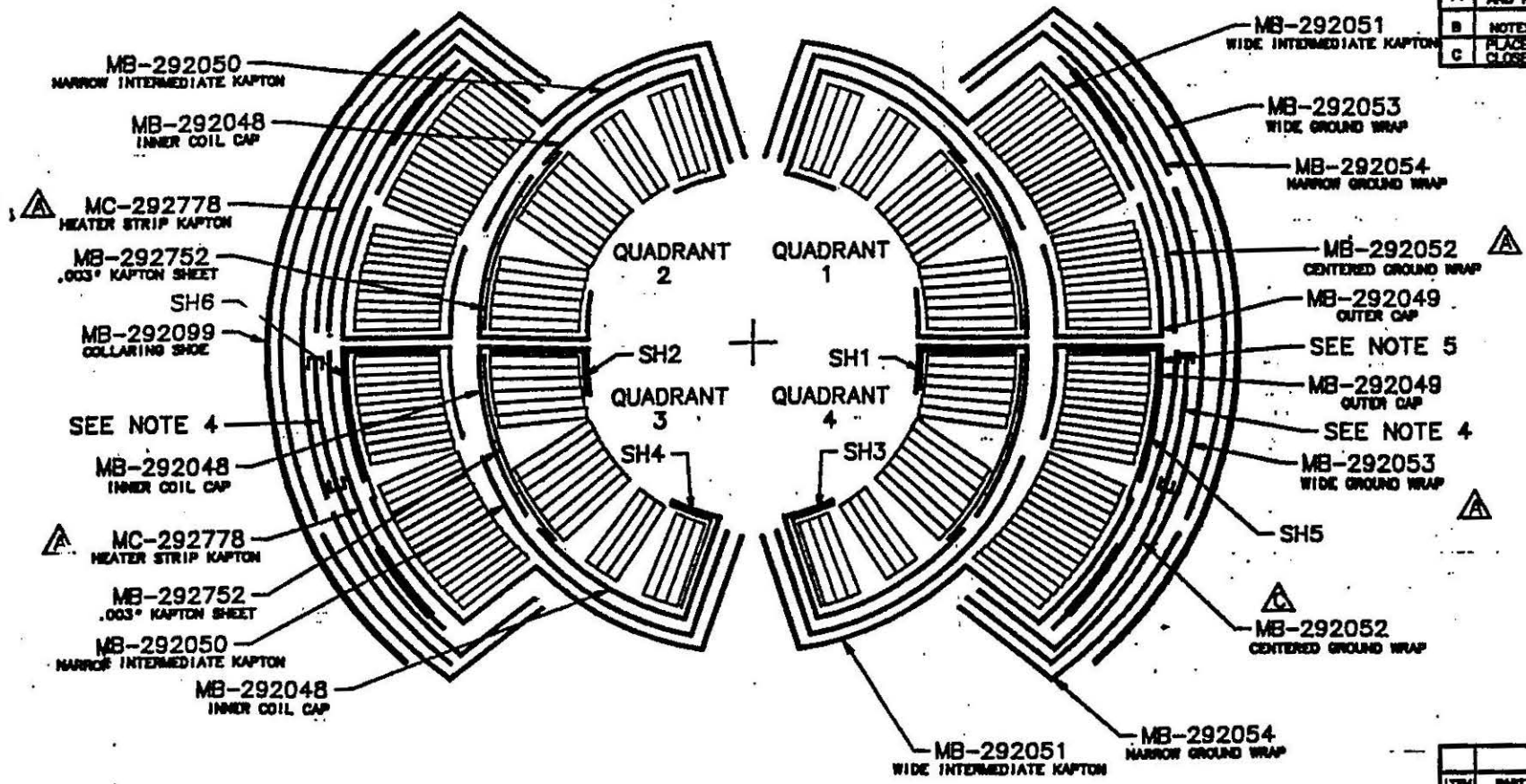
NOTE:

1. FOR ASSEMBLY OR SPOT HEATERS SH5 AND SH6 SEE DRAWING 0102-MC-292778 REV.B.
2. FOR ASSEMBLY OF VOLTAGE TAPS OD AND OH SEE DRAWING 0102-MC-292777.

ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED:		ORIGINATOR	G. TASSOTTO
1. ALL DIMENSIONS ARE IN MILLIMETERS.		DRAWN	MICHAEL TATE 3/18/92
2. TOLERANCES: ± .1 mm.		CHECKED	
3. DIMENSIONS BASED UPON ANSI Y14.2M-1982.		APPROVED	<i>Michael Tate</i> 3-18-92
4. INCH DIMENSIONS ARE FOR REFERENCE ONLY.		USED ON	DCA322-DCA323
5. BREAK ALL SHARP EDGES.		MATERIAL	
6. DO NOT SCALE DRAWING.			
7. MAX. ALL MACH. SURFACES			
8. DIMENSION IDENTIFICATION: MILLIMETER/MILLIMETER/INCH			
FERMIL NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY SSC			
SSC 50MM LONG COLD MASS OUTER COIL ASSEMBLY VOLTAGE TAPS/SPOT HEATERS			
SCALE	FILED	DRAWING NUMBER	REV.
NONE		0102-MC-292773	A
CREATED WITH I-DEAS 5.0		USER NAME: LTATE	

VIEW FORM LEAD END

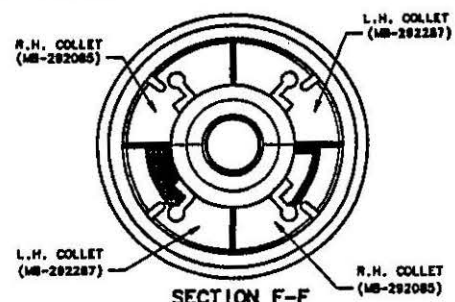
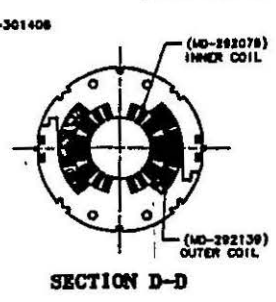
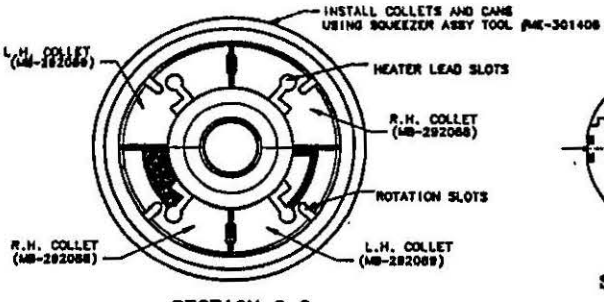
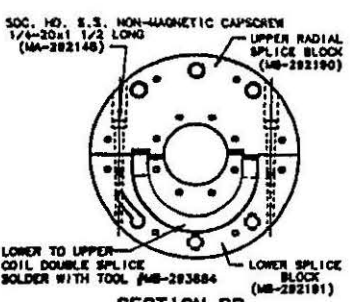
REV.	DESCRIPTION	DATE
A	POSITION OF HEATER STRIP AND KAPTON CHANGED	MIATE R.B. 8/18
B	NOTES ADDED TO DRAWING	MIATE R.B. 8/18
C	PLACED HEATERS 2, 4 CLOSER TO CORE	MIATE R.B. 8/18



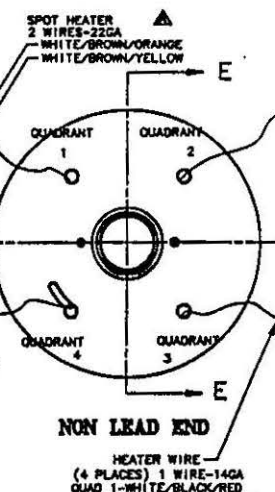
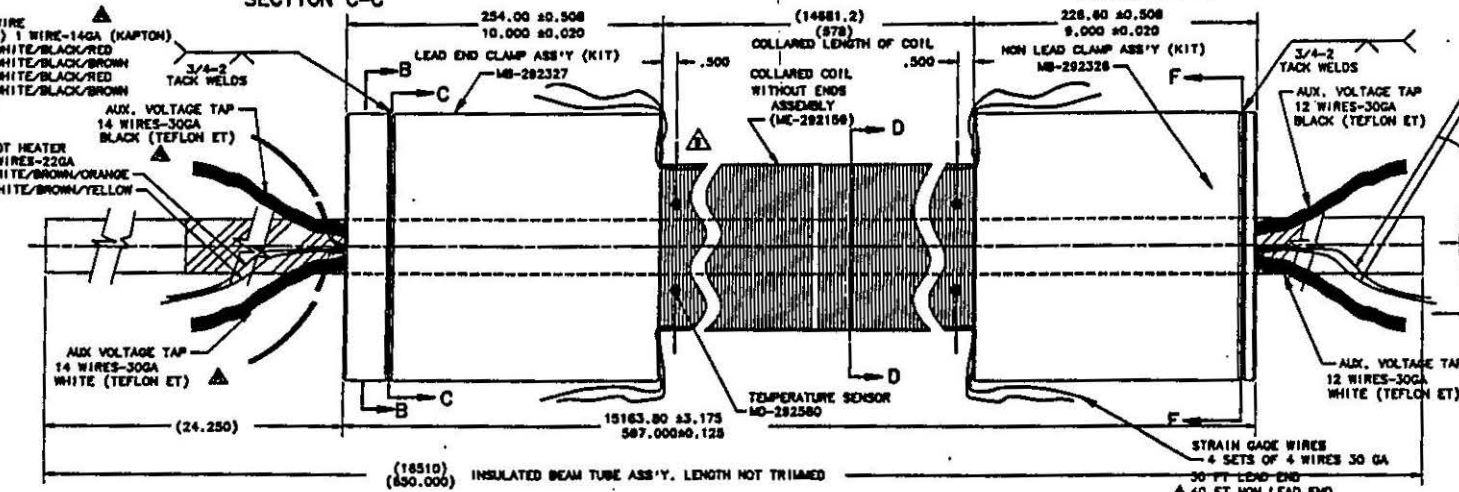
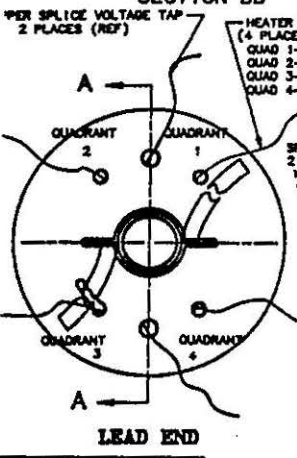
- NOTES:**
- INNER COIL SPOT HEATERS
A. MIDPLANE SH1, SH2
B. POLE TURN SH3, SH4
 - FOR INFO ON INNER COIL SPOT HEATER SEE DWG 0102-MB-292371 AND ES-292370
 - OUTER COIL SPOT HEATERS SH5, SH6
 - CENTER GROUND WRAP WAS CUT AROUND SPOT HEATER ASSEMBLY TO REDUCE BUILD UP.
 - SPOT HEATER/VOLTAGE TAP ASSEMBLY 0102-MC-292773.

ITEM	PART NO.	DESCRIPTION OR SIZE	QTY
PARTS LIST			
DESIGNED BY: H. PULYON		DATE: 8/18	
DRAWN BY: MICHAEL TATE		DATE: 8/18	
CHECKED BY: O. TASSOTTO		DATE: 8/18	
APPROVED BY: R. BOSSERT		DATE: 8/18	
LIMIT ON: DCA322 - 323			
MATERIAL:			
FERMILAB NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY SSC			
SSC 50MM DDX201A DIPOLE COLDMASS COIL PACKAGING INSULATION ASSY ASSEMBLY			
SCALE: 1.5X	PLANS:	DRAWING NUMBER: 0102-MB-292047	
CREATED WITH I-DEAS 4.1		USER NAME: MIATE	

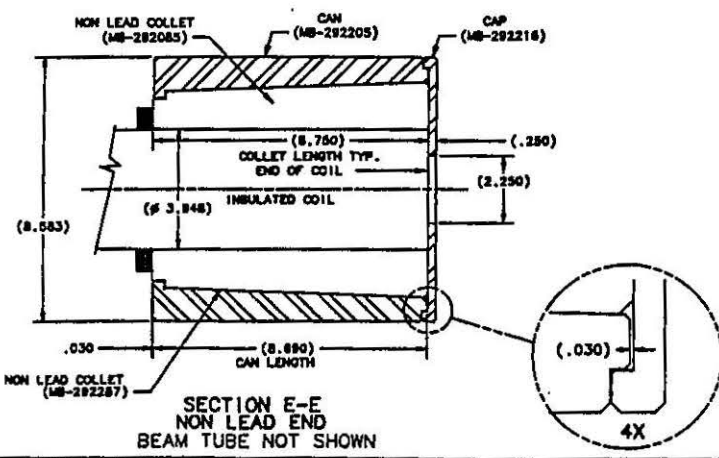
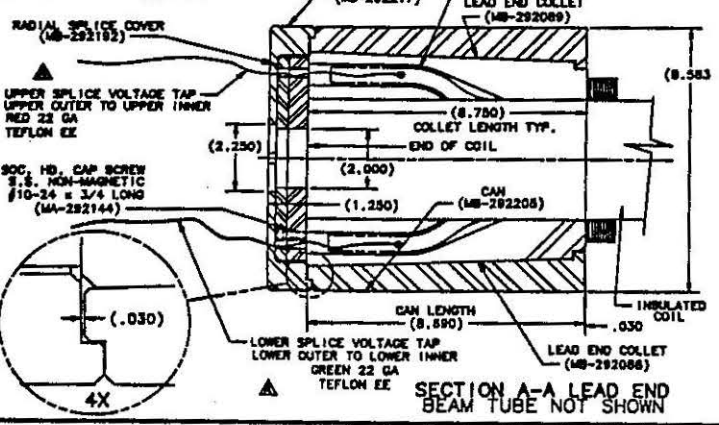




REV.	DESCRIPTION	DATE	BY
A	ADDED VOLTAGE TAP STRAIN GAUGE AND HEATER WIRES	12/21/81	M. TATE
B	ADDED 1 TWISTED QUAD 32 GAGE PER SENSOR	4/20/82	MTATE



NOT SHOWN ON THIS ASSY QUARTER COIL VOLTAGE TAP 5 WIRES-22GA COLORS:BLACK,RED,YELLOW GREEN,ORANGE,TEFLON EE



NOTES:
 ASSOCIATED REFERENCE DRAWINGS
 MB-292000 CONDUCTOR CROSS SECTION
 MD-292075 INNER COIL ASSEMBLY
 MD-292139 OUTER COIL ASSEMBLY
 MB-292225 LONG COIL INSULATION ASS'Y
 MB-292158 COLLARED COIL ASS'Y W/O END CLAMPS
 JES-298290 TRAVELER

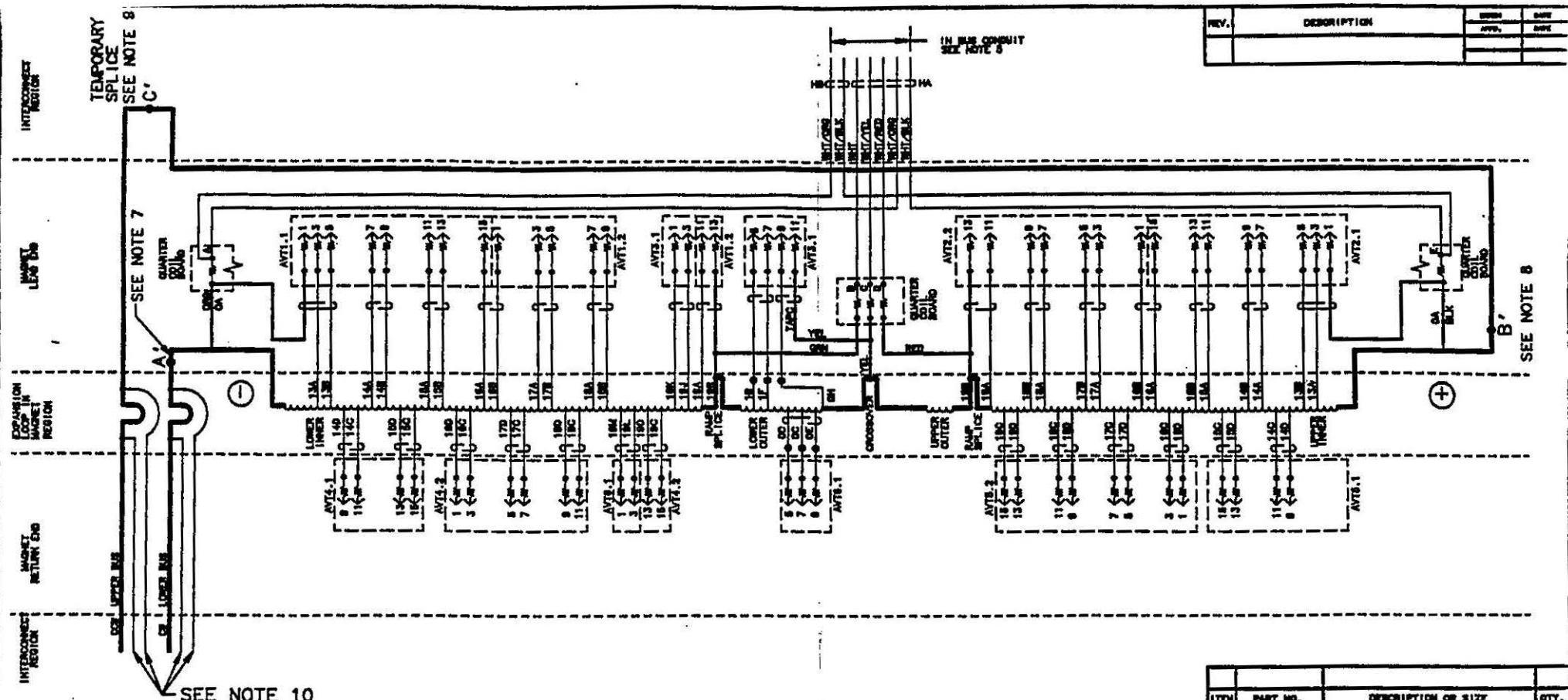
ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.
PARTS LIST			
1.	ALL DIMENSIONS ARE TO UNLESS NOTED OTHERWISE	H. FULTON	
2.	ALL DIMENSIONS ARE TO UNLESS NOTED OTHERWISE	MICHAEL TATE	5/20/91
3.	DESIGNED BY	H. FULTON	5/20/91
4.	APPROVED BY	R. BOSSERT	5/20/91
5.	DATE		
6.	SCALE		
7.	PROJECT	DCA322 -DCA323	
8.	REVISIONS		
9.	APPROVED BY		
10.	DATE		

FERMILAB NATIONAL ACCELERATOR LABORATORY
 UNITED STATES DEPARTMENT OF ENERGY
 BSC

SSC 50MM DIPOLE COLDMASS
 COLLARED COIL / WITH ENDS
 LONG ASSEMBLY

DATE	FILED	DRAWING NUMBER	REV.
HALF		0102-MD-292161	B
CREATED WITH 1-DEAS 3		USER NAME: MTATE	

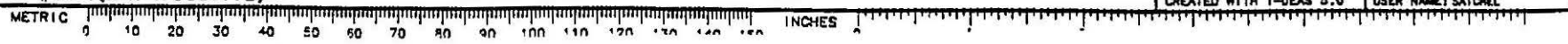


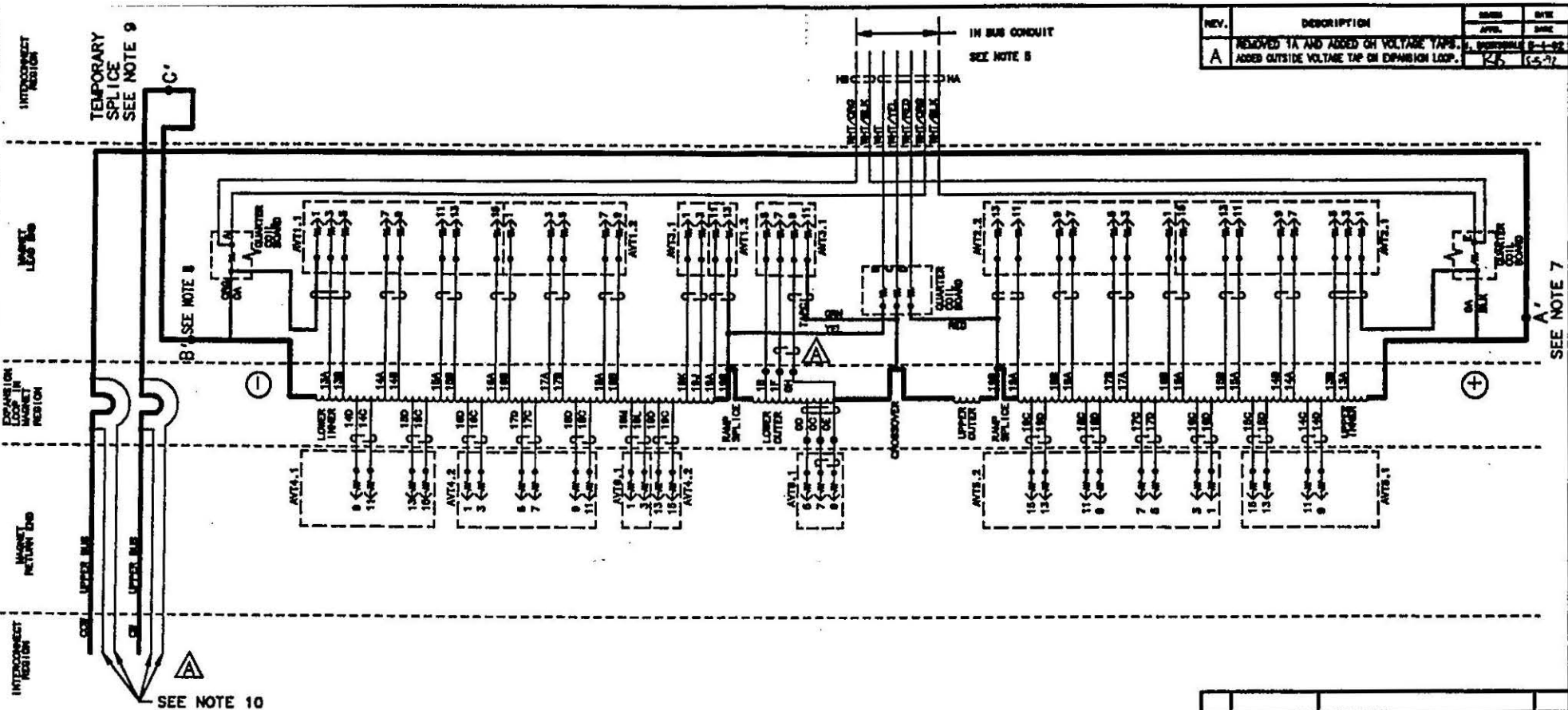


REV.	DESCRIPTION	DATE

- NOTES:**
- FOR LOCATION OF THE VOLTAGE TAPS SEE DRAWING #0102-MC-292211(INNER),MC-292773(OUTER)
 - ALL QUARTER COIL VOLTAGE TAPS INTERCONNECTION WIRES ARE #22AWG,1KV TEFLON EE INSULATION: MIL-W-16876/5
 - ALL AUXILIARY VOLTAGE TAPS ARE #30AWG TEFLON ET: MIL-W16878/4: IS TWISTED PAIR
 COLOR: LOWER INNER = WHITE
 UPPER INNER = BLACK
 LOWER OUTER = RED #28AWG TEFLON EE
 - ALL RESISTORS ARE 200 OHM, 5 WATT, WIRE WOUND, DALE ELECTRONICS P/N CW-5-5 MIL TYPE RW67G201 UNLESS OTHERWISE SPECIFIED.
 - ALL QUARTER COIL VOLTAGE TAP RESISTORS ARE DALE ELECTRONICS #SN-5(NON-INDUCTIVE)
 - ALL QUARTER COIL VOLTAGE TAPS ARE ROUTED TO RETURN END VIA CABLE HA & HB
 - SPLICE A' FROM LOWER BUS TO LOWER INNER COIL.
 - SPLICE B' FROM UPPER INNER COIL TO LOWER BUS.
 - SPLICE C' FROM UPPER TO LOWER BUS.
 - VOLTAGE TAPS ON BUS INSIDE AND OUTSIDE OF EXPANSION LOOP,EXIT UPPER PORT.

ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED:		ORIGINATOR: D. TASSITTO	
1. ALL DIMENSIONS ARE IN MILLIMETERS	DRWGR: J. SACHTSCHALE	DATE: 6-28-92	
2. DIMENSIONS IN PARENTHESIS ARE FOR INFORMATION ONLY	CHECKED: [Signature]	DATE: 11/3/92	
3. DIMENSIONS IN SQUARE PARENTHESIS ARE FOR INFORMATION ONLY	APPROVED: [Signature]	DATE: 10-5-93	
4. DIMENSIONS IN CIRCLES ARE FOR INFORMATION ONLY	USED ON:	DCA 322	
5. DIMENSIONS IN BRACKETS ARE FOR INFORMATION ONLY	MATERIAL:		
6. DIMENSIONS IN DASHES ARE FOR INFORMATION ONLY			
FERMIL NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY			
SSC (50MM) LONG DIPOLE COLDMASS VOLTAGE TAPS WIRING DIAGRAM (CLOCKWISE CONFIGURATION)			
DATE: N/A	DRAWING NUMBER: 0102-MB-292794	SHEET: 1 of 1	REV.:
CREATED WITH I-DEAS 6.0		USER NAME: SATCHEL	





- NOTES:
1. FOR LOCATION OF THE VOLTAGE TAPS SEE DRAWING #0102-MC-292211(INNER), 292773(OUTER)
 2. ALL QUARTER COIL VOLTAGE TAPS INTERCONNECTION WIRES ARE 22AWG, 1KV TEFLON EE INSULATION: MIL-W-16878/5
 3. ALL AUXILIARY VOLTAGE TAPS ARE 30 AWG TEFLON ET: MIL-W16878/4: IS TWISTED PAIR COLOR: LOWER INNER = WHITE
UPPER INNER = BLACK
LOWER OUTER = RED AWG28 TEFLON EE
 4. ALL RESISTORS ARE 200 OHM, 5 WATT, WIRE WOUND, DALE ELECTRONICS P/N CW-5-5 MIL TYPE RW67G201 UNLESS OTHERWISE SPECIFIED.
 5. ALL QUARTER COIL VOLTAGE TAP RESISTORS ARE DALE ELECTRONICS #SN-5(NON-INDUCTIVE)

6. ALL QUARTER COIL VOLTAGE TAPS ARE ROUTED TO RETURN END VIA CABLE HA & HB SEE DWG# MC-292581
7. SPLICE A' FROM UPPER BUS TO UPPER INNER COIL.
8. SPLICE B' FROM LOWER INNER COIL TO UPPER BUS.
9. SPLICE C' FROM UPPER TO LOWER BUS.
10. VOLTAGE TAPS ON BUS INSIDE AND OUTSIDE OF EXPANSION LOOP, EXIT UPPER PORT.

REV.	DESCRIPTION	ISSUE	DATE
A	REMOVED 1A AND ADDED OH VOLTAGE TAPS, ADDED OUTSIDE VOLTAGE TAP ON EXPANSION LOOP.	RLB	6-5-92

ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.
PARTS LIST			
UNLESS OTHERWISE SPECIFIED:		ORIGINATOR	G. TASSOTTO
1. ALL DIMENSIONS ARE IN MILLIMETERS	DRAWN	J. SACITSCHALE	4-8-92
2. TOLERANCES: ±.1 mm	CHECKED	G. TASSOTTO	4-8-92
3. DIMENSIONS IN PARENTHESIS ARE FIRST PREFERRED	APPROVED	RODGER BOSSERT	4-10-92
4. TYPICAL DIMENSIONS ARE FOR REFERENCE ONLY	USED ON	DCA 323	
5. BREAK ALL SHARP EDGES	MATERIAL		
6. DO NOT SCALE DIMENSIONS	FERRIS NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY SSC		
7. MAINT. ALL SURFACES	SSC (50MM) LONG DIPOLE COLDMASS VOLTAGE TAPS WIRING DIAGRAM(COUNTER CLOCKWISE)		
8. DIMENSIONS IDENTIFY PARTS SEE INSTRUCTIONS AND DRAWINGS	SCALE	DRAWING NUMBER	REV.
	NTS	0102-MB-292775	1 of 1 A
CREATED WITH I-DEAS 5.0 USER NAME: SATCHEL			

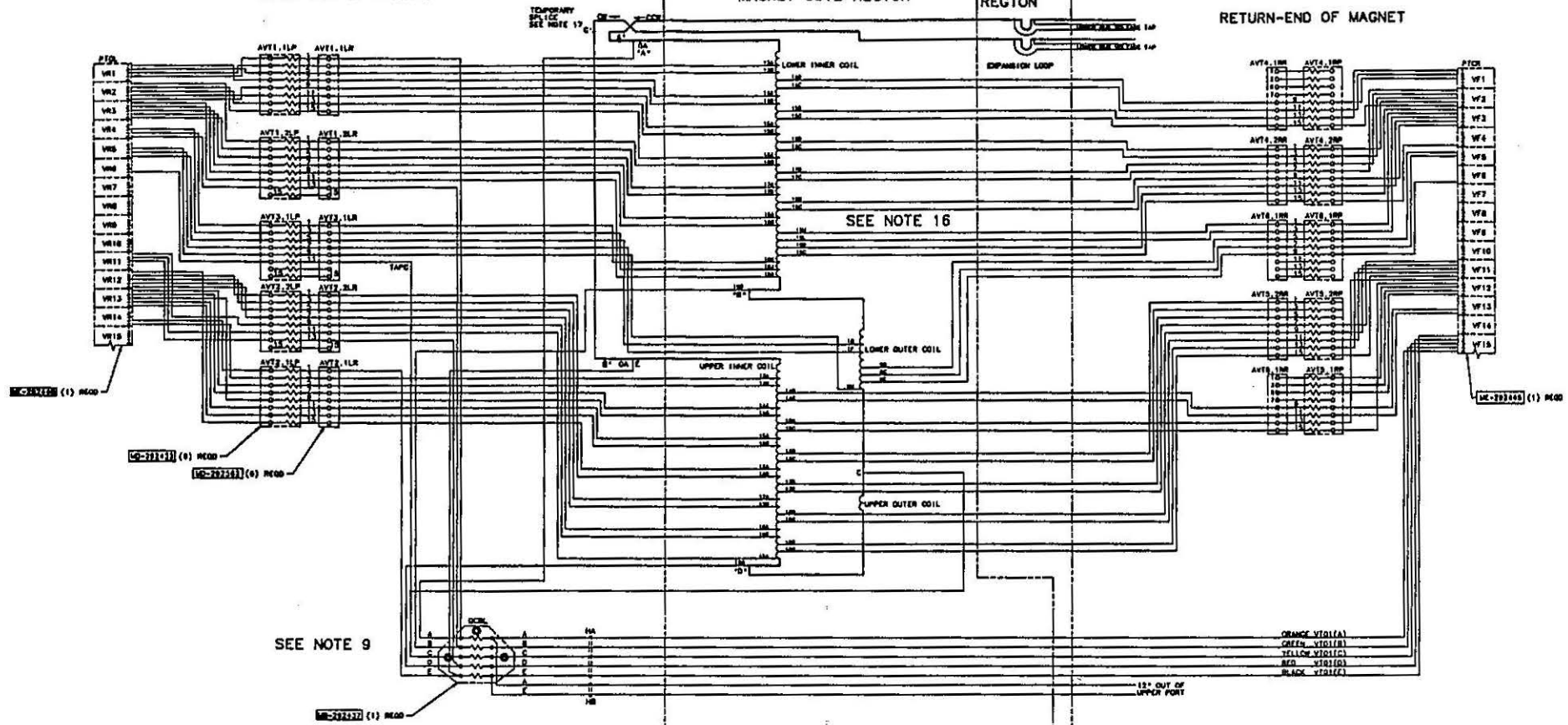


LEAD-END OF MAGNET

MAGNET COIL REGION

EXPANSION LOOP REGION

RETURN-END OF MAGNET

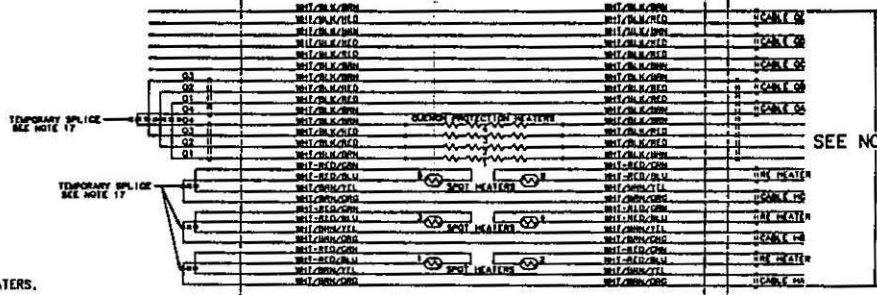


SEE NOTE 9

SEE NOTE 16

ORANGE VIOLIA
GREEN VIOLIA
YELLOW VIOLIA
RED VIOLIA
BLACK VIOLIA

15' OUT OF UPPER PORT



SEE NOTE 15

LEAD-END END PLATE

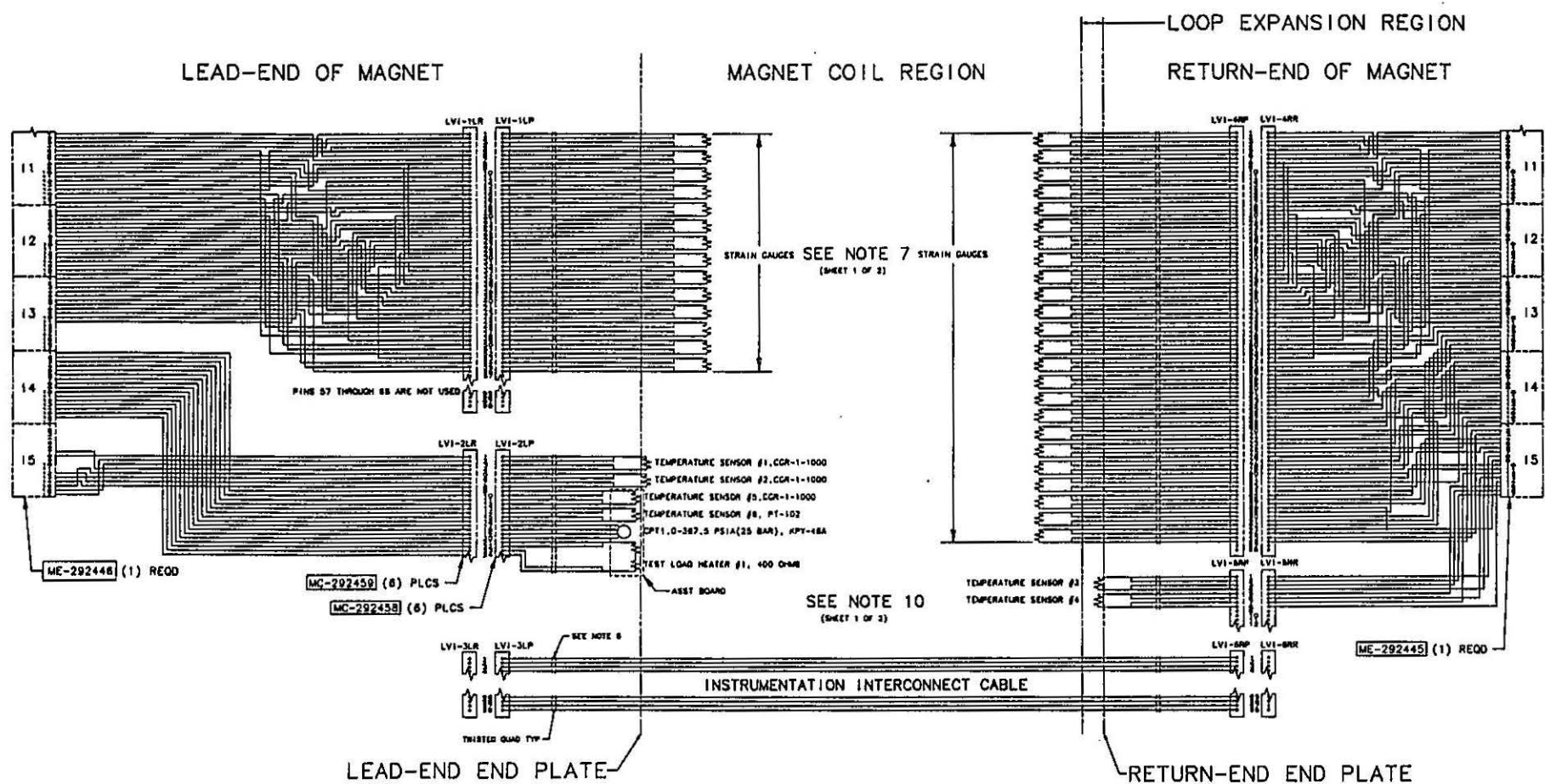
RETURN-END END PLATE

NOTES:

1. ALL CONNECTIONS FROM LVI-1 AND LVI-4 ARE TO STRAIN GAUGES.
2. ONLY PINS 1 THROUGH 24 ARE USED ON LVI-2, AND 1 THROUGH 8 ON LVI-5
3. ALL CONNECTIONS FROM LVI-3 TO LVI-6 ARE PIN TO PIN.
4. LVI-3/LVI-6 ARE ROUTED THROUGH INSTRUMENTATION BUS PULTRUSION.
5. UPPER BUS PULTRUSION CABLES ARE:
(6) #30AWG TWISTED KAPTON INSULATED WIRES FOR 1/4 COIL VOLTAGE TAPS.
(1) #22AWG TWISTED PAIR KAPTON INSULATED WIRES FOR SPOT HEATERS.
6. LOWER BUS PULTRUSION CABLES ARE:
(5) #14AWG TWISTED PAIR KAPTON INSULATED WIRES FOR STRIP AND QUENCH HEATERS.
(24) #30AWG TWISTED QUAD KAPTON INSULATED WIRES FOR LVI'S.
7. REFER TO MB-282381 FOR STRAIN GAUGE WIRING LOCATIONS.
8. REFER TO MC-282315 FOR AUXILIARY VOLTAGE TAP WIRING LOCATIONS.
9. REFER TO MB-292311 FOR QUARTER COIL VOLTAGE TAP WIRING LOCATIONS.
10. REFER TO MC-282801 FOR ADDITIONAL TEMPERATURE/PRESSURE SENSOR INFORMATION.
11. ALL AVT AND LVI CONNECTORS WITH "RR" ARE RETURN-END RECEPTACLES.
12. ALL AVT AND LVI CONNECTORS WITH "RP" ARE RETURN-END PLUGS.
13. ALL AVT AND LVI CONNECTORS WITH "LP" ARE LEAD-END PLUGS.
14. ALL AVT AND LVI CONNECTORS WITH "LR" ARE LEAD-END RECEPTACLES.
15. REFER TO MD-292782 FOR ADDITIONAL SPOT AND QUENCH HEATER INFORMATION.
16. REFER TO MB-292774, 775 FOR ADDITIONAL VOLTAGE TAP INFORMATION
17. FOR SINGLE MAGNET TEST, QUENCH HEATERS, SPOT HEATERS, AND QUARTER COIL VOLTAGE TAPS ARE ROUTED TO THE RETURN-END OF THE MAGNET.
18. ALL RESISTORS ARE 200 OHM 5 WATT, 5% UNLESS NOTED

ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.
PARTS LIST			
1	MC-292803	COMPLETE MAGNET ELECTRICAL SCHEMATIC	1
SSC NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY BNC			
SSC 50MM LONG COLDMASS MAGNET INSTRUMENTATION DISTRIBUTION COMPLETE MAGNET ELECTRICAL SCHEMATIC			
N/A 0102-ME-292803 11 OF 21			
CHECKED BY: [Signature] DATE: [Date]			

REV.	DESCRIPTION	DATE	BY



SEE NOTE 8

TEMPERATURE SENSOR #1, CCR-1-1000
 TEMPERATURE SENSOR #2, CCR-1-1000
 TEMPERATURE SENSOR #3, CCR-1-1000
 TEMPERATURE SENSOR #4, PT-102
 CPT1.0-387.5 PSIA(25 BAR), RPT-48A
 TEST LOAD HEATER #1, 400 OHM
 ASST BOARD

SEE NOTE 10 (SHEET 1 OF 3)

ME-292446 (1) REOD
 MC-292459 (8) PLCS
 MC-292458 (8) PLCS
 ME-292445 (1) REOD

LEAD-END OF MAGNET
 MAGNET COIL REGION
 RETURN-END OF MAGNET

LEAD-END END PLATE
 RETURN-END END PLATE

INSTRUMENTATION INTERCONNECT CABLE
 TWISTED QUAD TYP

LVI-3LR LVI-3LP
 LVI-6RP LVI-6RR

STRAIN GAUGES SEE NOTE 7 (SHEET 1 OF 3)
 STRAIN GAUGES

LVI	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
WHT/ORN	1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61	65	69	73	77	81	85	89	93
WHT/BLU	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	62	66	70	74	78	82	86	90	94
WHT/VIO	3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63	67	71	75	79	83	87	91	95
WHT/GRY	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96

LVI-3, LVI-6 PIN NUMBERS

REV	PART NO.	DESCRIPTION OR DIM	QTY.

PARTS LIST

1. QUANTITY SHOWN IN PARENTHESES
 2. QUANTITY SHOWN IN SQUARE BRACKETS
 3. QUANTITY SHOWN IN CIRCLES
 4. QUANTITY SHOWN IN TRIANGLES
 5. QUANTITY SHOWN IN DASHES
 6. QUANTITY SHOWN IN UNDERSCORES
 7. QUANTITY SHOWN IN SUPERSCRIPTS
 8. QUANTITY SHOWN IN SUBSCRIPTS
 9. QUANTITY SHOWN IN SMALL CAPS
 10. QUANTITY SHOWN IN ALL CAPS
 11. QUANTITY SHOWN IN MIXED CASE

DCA 322, 323

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