DØ SOLENOID UPGRADE PROJECT

DØ Solenoid Chimney
Routing Clearances

D-ZERO ENGINEERING NOTE # 3823.111 EN-356

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Revised July 6, 1994

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INTRODUCTION
This engineering note contains information about the measured clearances along the chimney route from the solenoid to the control dewar. This type of information is best conveyed by sketches and a few photos.

I would strongly suggest looking at D-Zero drawing 3823.111-ME-317048, "Solenoid package nominal placement" first as an overview of the routing and placement. This drawing was generated based on the measurements contained in the sketches of this EN and of course, existing D-Zero drawings.

CONTENT
PHOTOS: Twelve photos taken on 2/17/94 are included which give perspective views along the path. The detector was parked in the collision hall on this date. The CF iron was split open to the east and the South EF iron was rolled back. Also the South EndCap Calorimeter was rolled to the south on this day. This allowed personnel access and the photographic opportunity.

DIMENSIONAL SKETCHES: A full set of raw dimensional sketches are included. These sketches were generated by me using a 25 foot tape measure and a note pad. The sketches are in chronological order with the most recent on top. The first sketch, 5/18/94, describes the "tightest" location for the upward incline portion of the chimney. The sketches on 2/14/94 thru 2/16/94 are refinements of the early 1992 and 1993 sketches. They pick out quite a bit more detail of specific detector components along the path. The dimensional sketches of 1992 and 1993 gave information in not as much detail and therefore gave a more constrained clearance description. Most of the information of the early sketches was jotted down on the plan view dated 10-29-92. This sketch also had some information lifted from prints which later was superseded by the 1994 sketches.

I tried to label components and give views either titled "Elevation" or "Plan" which refers to a top view looking down. Also where I could I jotted down direction, ie. South, East etc. Hopefully with a little effort one can decifer it.

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CC CURVE MEASUREMENTS: The curvature of the CC was determined from a three dimensional topographical survey. This survey information is stored in an electronic drawing file 3823.111-ME-317165, "Solenoid-CC south face 3D shape survey". The "z" dimensions for the radial chimney path were picked off this drawing. A curvature was then generated knowing many points by radial and z coordinates. This curve is stored in drawing file 3823.111-ME-317164, "Solenoid-CC south face-chimney contour layout".

CLOSING REMARKS

All drawings mentioned above are kept in hard copy form in the D-Zero drawing files. The electronic "master" copy is kept in the XDCS drawing control system, d0ms vault. The information contained in this engineering note could be very useful for those who are interested in the clearances and shape of the solenoid chimney path. It could even be of use to future designers and engineers involved with the VLPC project which is planned.
LOOKING DOWN FROM 4th FLOOR THRU CRACK SOUTH EAST SIDE

LOOKING UP FROM SE PLATFORM

LOOKING UP & EAST FROM SE PLATFORM

LOOKING UP & EAST FROM 3rd Platform
ELEVATIONAL VIEWS

\[
\sqrt{(66.75)^2 - (9.375)^2} = 66.088\text{ in}
\]

\[
\begin{align*}
10\text{ in} & \quad \text{SQUARE} \\
5\text{ in} & \quad \text{CF IRON}
\end{align*}
\]

\[
\begin{align*}
34\frac{3}{8}\text{ in} & \quad \text{CF \_\_\_\_} \\
7\frac{3}{4}\text{ in} & \quad \text{\_\_\_\_}
\end{align*}
\]

\[
\begin{align*}
36\frac{7}{8} & \quad - \quad 7\frac{3}{4} \\
29\frac{1}{8} & \quad + \quad 5 \\
34\frac{1}{8}\text{ in to } & \quad 4
\end{align*}
\]
* ECS moved out 40"

So. end iron moved 43 1/2"

5 1/2
- 1 1/2
4" clear when closed.

53 1/2"
- 41 1/2"
12" clear when closed.
1/1A BACKUP TRAILER 10-87 Feni x 192

Other trailers have 5 yrs. Between test and due date.

82?

Pipe through - move back 39" to south

Disassemble chutes from pipe trough.

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PLAN

1/8" 3/4" 3/4" BAR

<table>
<thead>
<tr>
<th>3/4&quot; BAR</th>
<th>REAR CLEARANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot;</td>
<td>6 3/4&quot;</td>
</tr>
</tbody>
</table>

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PLAN

14 3/8" - 5 - 3 1/8" = 9 3/8"
27 10/8
16 1/8

43 3/4 H.E.

37 1/2

15 1/4
9 3/8
5 7/8

68 3/4

11 3/8
3rd Floor

80 11/16 + 3 1/4 = 83 15/16

5 3/8

A/C Platform

84"
COUNTER MEASUREMENTS

27 1/4"

110 1/2"

25"

29 1/2"

7 1/16" BOLT HOLE TLH
ECS PIG TROUGH
MEASUREMENTS

INSIDE BACK SURFACE OF BOX DEFINED BY TWO CIRCLED POINTS REFERENCED FROM THE FRONT EDGE & BOTTOM OF WINDOW

MEASUREMENTS TAKEN 1/27/93
* Chosen based on field measurements.

A 9" CRYO pipe was chosen: 45 1/8" should go to 4 1/2".  RAK 2-16-94

ECS PIG TROUGH MEASUREMENTS
Cryo pipes for ECN set in place. Preliminarily looks good. Will fine tune position tomorrow. Cleaning up for the day.

Cryo pipes aligned and set in, leveled on horizontal and vertical. There is a misalignment matching up to CC piping. We will have to make a jog in the splice sections.

In Z direction, the C of pipes (referenced from muon chamber, box section) is:

Clearances to iron figure to be:

Clearance unknown until muon chamber rail removed and permanent hanging clamps put in place. See 9/4 note.
8/31/91 ECS EXCLUDER

- Leak checked EXCLUDER in manifold
- Leaks found.
- HI VAC - 9x10^{-5}
- Leak rate - 5x10^{-9}

9/3/91 C.R.

0945 EXCLUDER VAC 12 MICRONS

INSTALLED PIPE ROLLER SUPPORT CHANNELS ON ECN.

-\text{Per Platform ORG 3740.510 - MD - 294577 Rev. A L.3 LEGS MOUNTED}
- Field measured
- Dimension given by R. Rignesi thinking top of platform was 66".

\* Swapped signal box side plate (outer) on ECN south box with one without pumping port.
\* Needs to be leak checked.

9/4/91

9:00 ECS Double dish pressure vessel sand blasted and shipped to D-ZERO ASSEMBLY BUILDING.
(\* Excluder was let up to one atm $\text{G}_2$ on 9/3)

Installed relief valve on ECN - needs seal leak check.

9/23

Field measured '2' dimension on iron

\text{Interference of muon chamber rail and cryo pipes found.}
\text{T. Lyons noted that the muon chamber rail 1" x 3". (Cont. next page)}
PIPE, VALVES, FITTINGS & ACCESSORIES
ELECTRIC and PNEUMATIC VALVE ACTUATORS
PIPE BENDING and FABRICATION