

Attachment F

"8 GeV shielded Hatch"
Memo from
C.M. Bhat to Tom Pawlak (Feb. 13, 1996).

C

February 13, 1996

To : Tom Pawlak

CC :Phil Martin

From: Chandra Bhat

Subject: 8 GeV shielded Hatch.

I have looked into the possibility of using the two steel plates (which you have mentioned in your letter dated 9 Feb., 1996) with thickness slightly over 3" and can be used to cover the 3' X 12' area. I find that the configurations of shielding you have shown in your letter offers enough shielding. The missing area of 3" X 3" is not a problem. If it is not difficult to cut off 2'-4" x 2'-9" piece from " 16682" you can as well cut off it and use somewhere else.



4-6-9

1021

SUBJECT

8 G2V EQUIPMENT HATCH STEEL SHIELDING

NAME

T. PAWLAK

DATE

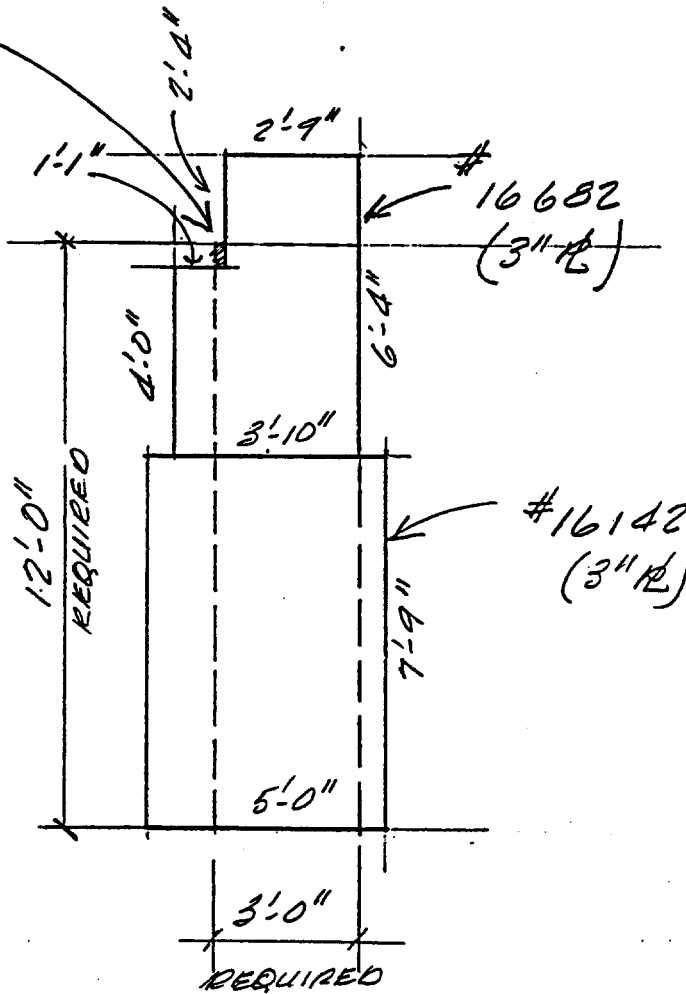
9 FEB '96

REVISION DATE

CHANDRA

I FOUND 2 STEEL PLATES SLIGHTLY THICKER THAN 3" WHICH ALMOST COVER YOUR 3'X12' REQ'MT AT THE 8 G2V SHIELDED HATCH, WHAT DO YOU THINK?

MISSING AREA
(3" X 3")





SUBJECT

STEEL SHIELDING @ S. WALL OF EQUIP HATCH @ CB817

NAME

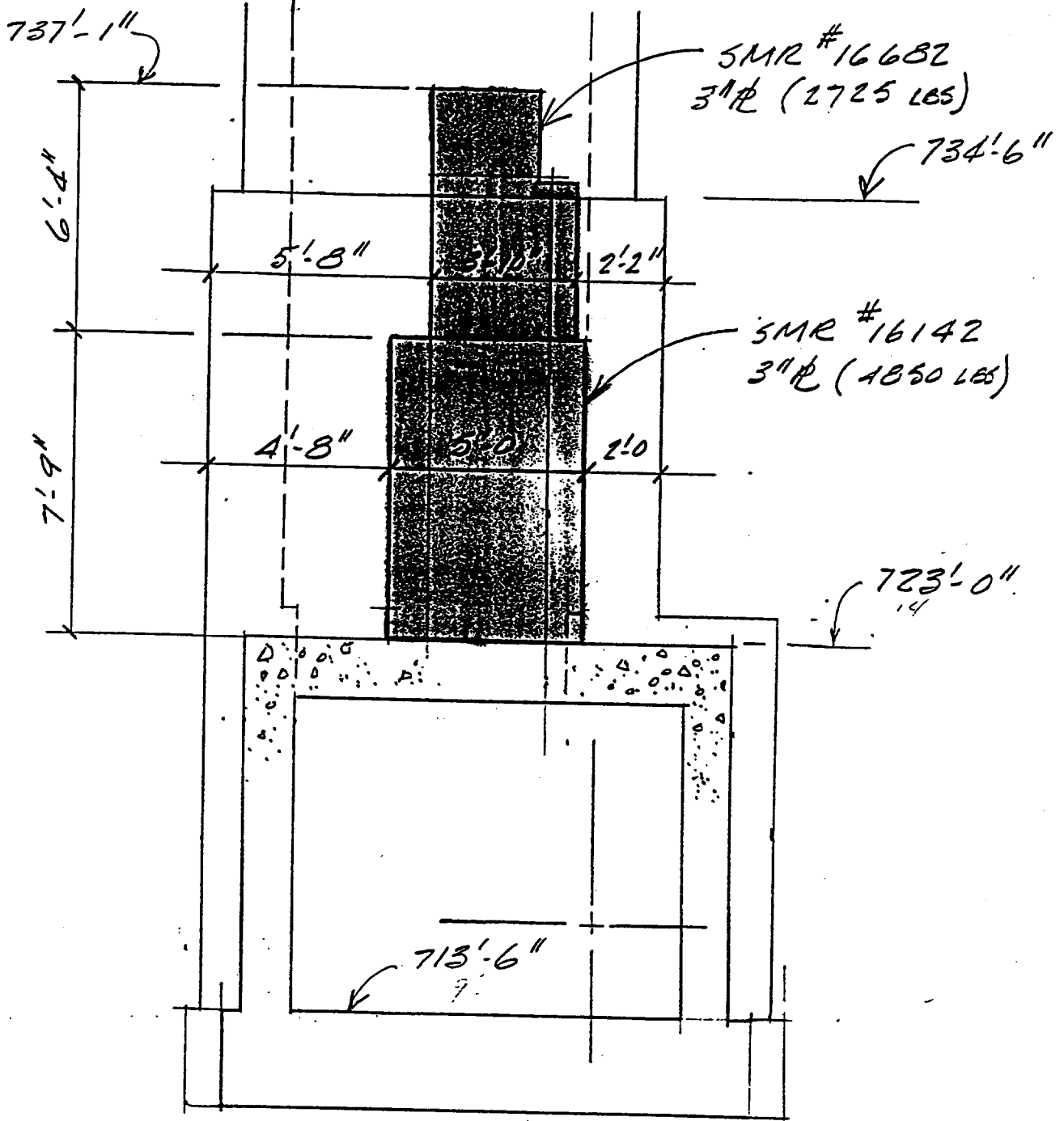
T. PAULAK

DATE

7 FEB. '96

REVISION DATE

ECP 37



SOUTH WALL OF SHIELDED HATCH @ CB817
(LOOKING NORTH OR UPSTREAM)

1/4" = 1'-0"



SUBJECT

8 GeV EQUIPMENT HATCH STEEL SHIELDING

NAME

T. PAWLAK

DATE

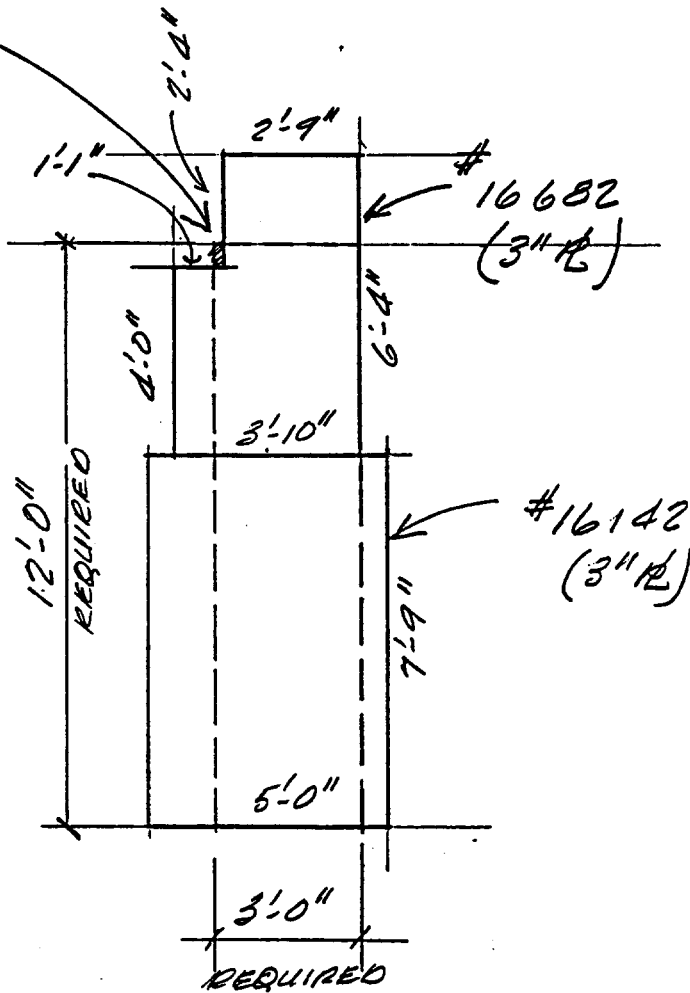
9 FEB '96

REVISION DATE

CHANDRA

I FOUND 2 STEEL PLATES SLIGHTLY THICKER THAN 3" WHICH ALMOST COVER YOUR 3'x12' REQ'MT AT THE 8 GeV SHIELDED HATCH, WHAT DO YOU THINK?

MISSING AREA
(3" x 3")





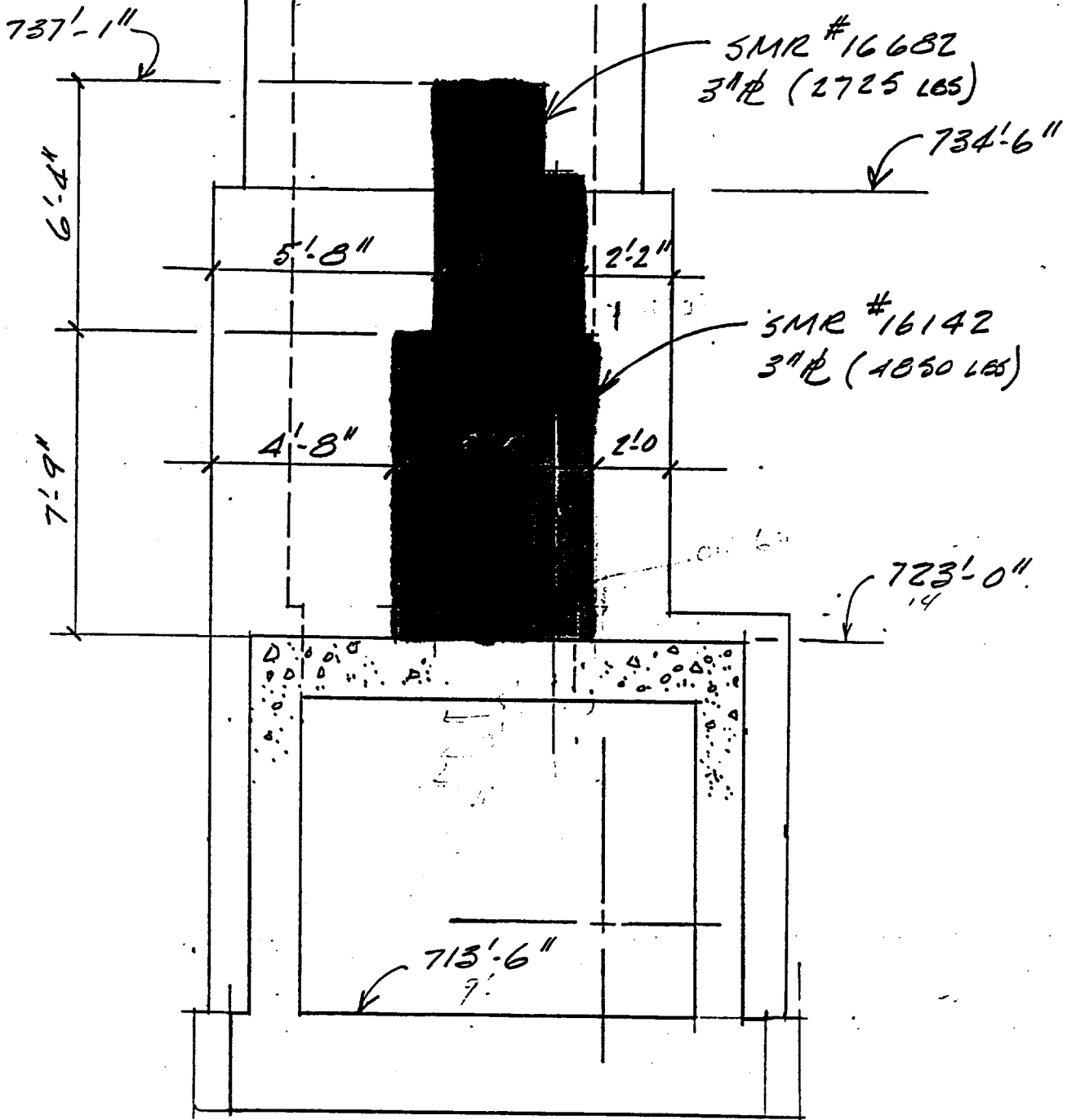
SUBJECT

STEEL SHIELDING @ S. WALL OF EQUIP HATCH @ CBB17

NAME T. PAULAK

DATE 9 FEB. '96

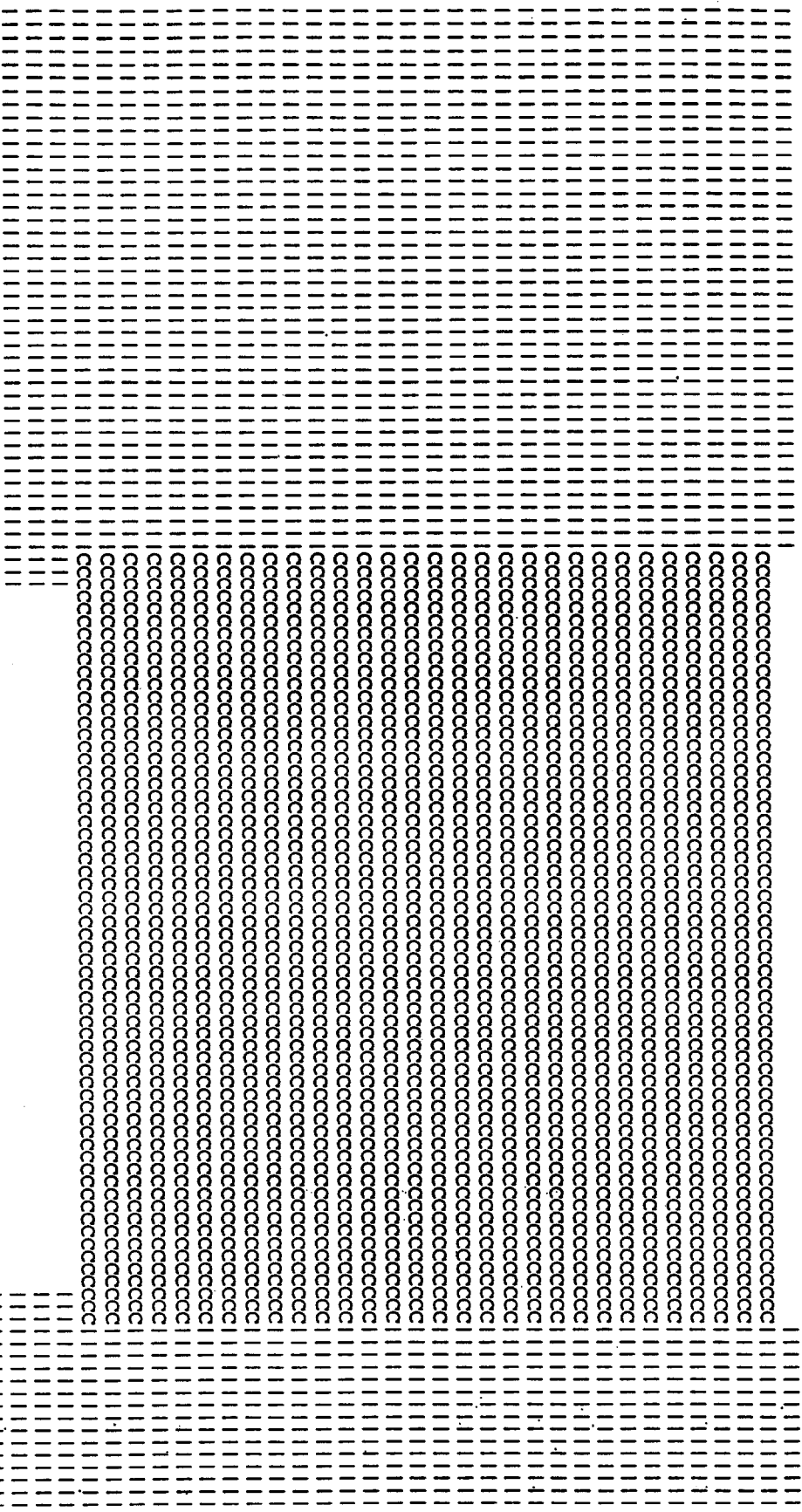
REVISION DATE ECP 37



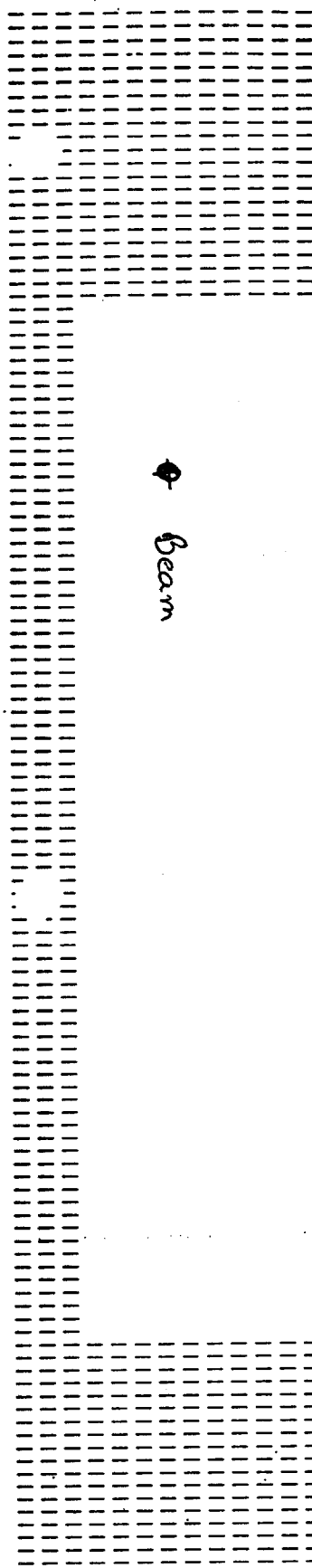
SOUTH WALL OF SHIELDED HATCH @ CBB17
(LOOKING NORTH OR UPSTREAM)

1/4" = 1'-0"

1CROSS SECTION OF GEOMETRY FOR CONSTANT Z= 20.00 ft
FROM X= 710.00 TO X= 748.00 ft (VERTICAL) AND
FROM Y= -5.00 TO Y= 10.00 ft (HORIZONTAL)



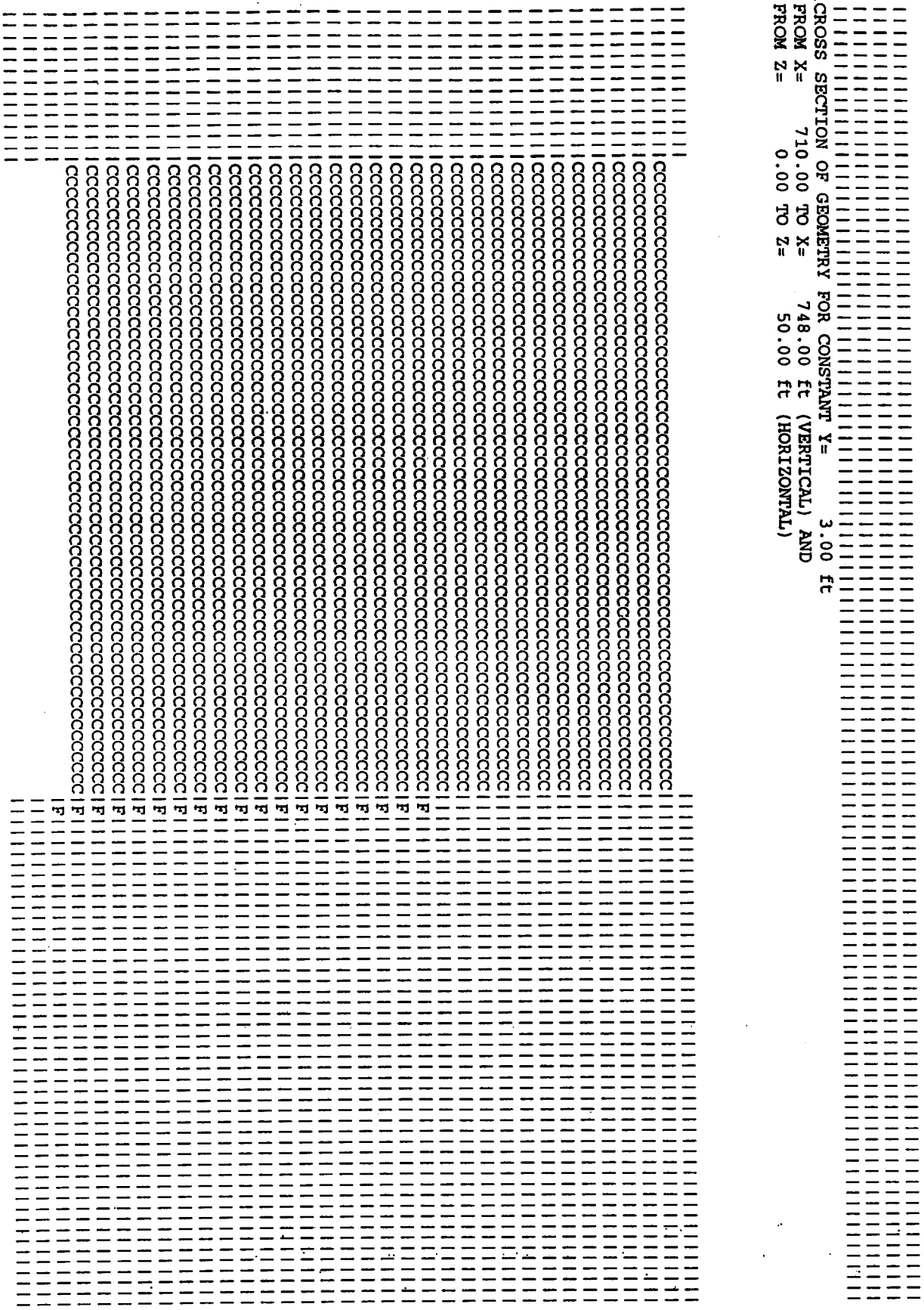
φ Beam



ICROSS SECTION OF GEOMETRY FOR CONSTANT Z= 30.60 ft
FROM X= 710.00 TO X= 748.00 ft (VERTICAL) AND
FROM Y= -5.00 TO Y= 10.00 ft (HORIZONTAL)

Beam

1 CROSS SECTION OF GEOMETRY FOR CONSTANT Y= 3.00 Ft
 FROM X= 710.00 TO X= 748.00 Ft (VERTICAL) AND
 FROM Z= 0.00 TO Z= 50.00 Ft (HORIZONTAL)



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Fermilab

January 24, 1996

MEMO TO: Phil Martin

FROM: Tom Pawlak

SUBJECT: 8 GeV Shielded Hatch

Al Guthke has surplus concrete shielding blocks which I would like to allocate for the subject hatch. However, before I can request a quantity, I need your confirmation of a shielding scheme. The attached sketch proposes a 22'-6" high stack of concrete blocks (which extend 4" above the top of adjacent berm consisting of 16 "A" blocks and 52 "B" blocks. Assuming lightly reinforced concrete weighs 145 p.c.f., the block mass is equivalent to the earth shielding at a typical precast enclosure cross section. Note the beam line is 9" beyond the nominal 7'-0" wide hatch opening. Please let me know how much concrete block shielding is required and what joint pattern you prefer.

Encl: As Noted.

cc: D. Bogert
Project File 6-6-9
Chrono File

$$145 \text{ p.c.f.} = 2.32 \text{ gm/cm}^3$$

$$\text{soil} = 2.15 \text{ gm/cc.}$$

TP/jm



FERMILAB
ENGINEERING NOTE

SECTION

PROJECT

6-6-9

SERIAL-CATEGORY

PAGE

10/1

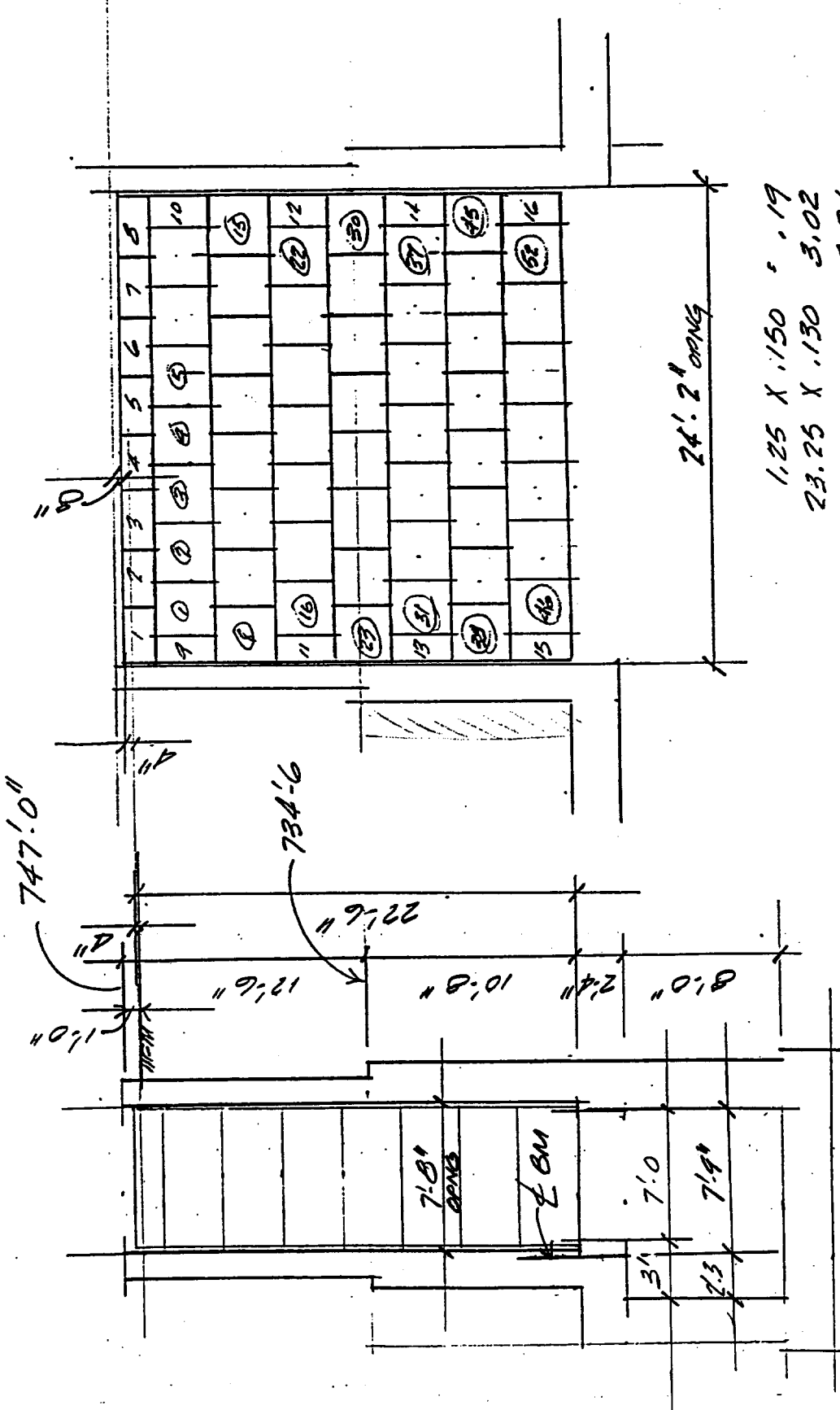
SUBJECT

SHIELDED MATCH @ BGLV ENCLOSURE

NAME T. PAWLAK

DATE 11.23.96

REVISION DATE



1.25 X .150 = .19
23.25 X .130 = 3.02
3.21

22.5 X .145 = 3.26 > 3.21 OK

W = 7.5 X 22.5 X 24 = 4050 CF

16 X 1.5 X 3 X 7.5 = 540
52 X 3 X 3 X 7.5 = 3510

16	"A"
52	"B"

4050 CF

January 31, 1996

To : Phil Martin

From: Chandra Bhat

Subject: 8 GeV shielded Hatch

I have looked into the Tom Pawlak's proposal for concrete shielding of the 8 GeV shielded hatch with my computer program. With his scheme there will be only 22.5ft of shielding in this region. The dimension of the shielded region is 7.67ft wide X 22.5 ft thick X 24.17ft along the beam direction. As per Fermilab Main Injector Preliminary Safety Analysis Report (dated May 1992), we need a minimum of 24.5 ft thick soil equivalent shielding radially up. Tom has also pointed out that 1) in this region the beam line is about 9 in off the shielded hatch. and 2) the density of the reinforced concrete is about 2.32 gm/cc (i.e., about 1.079 times that of the soil). This certainly helps the shielding. However there is a shielding deficiency up to about 1 ft soil equivalent in certain location towards the down stream end of the hatch. According to my calculations this deficiency in the shielding would give rise to increased radiation level.

I estimate about a factor of 2.2 higher radiation level. This can be reduced to acceptable limit by adding a 12ft X 3 ft X .25 ft steel slab. A figure is attached herewith. Or we may have to display a sign stating 'Caution - Controlled Area'.

8 GeV Beam Line Shielded Hatch

