LOWER SKIN PANEL - WING CENTER TANK

CW-221
C-3492
GREEN

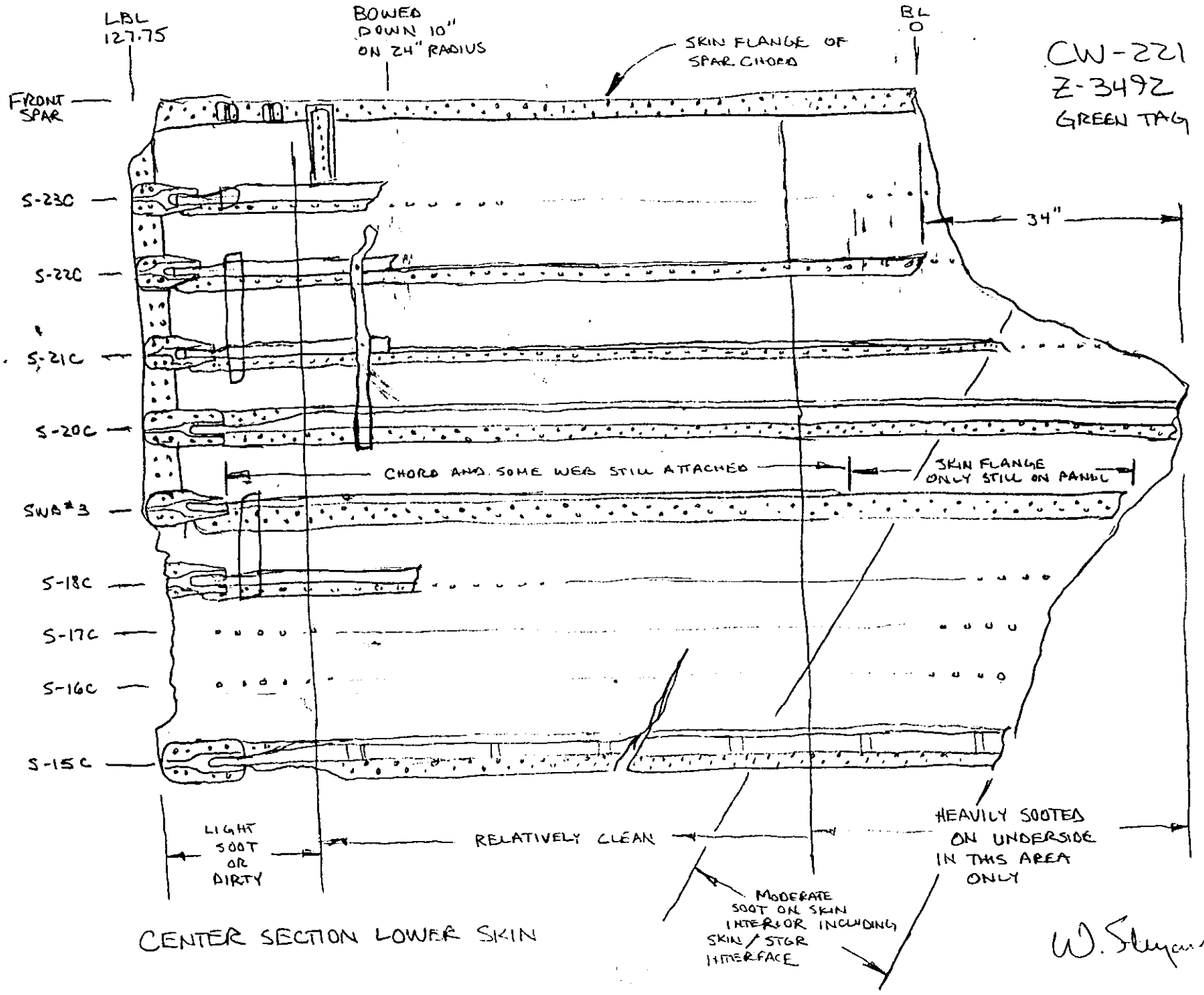
This is a large section of skin panel and stringers that extends from the left S.O.B. to RBL 33 and from S-15 to the front spar. It contains partial stringers at all locations except at S-16 and S-17. It also contains the skin flange of the front spar chord and the inbd portion of the S.O.B. lower splice plate. A portion of the lower web of SWB #3 remains attached from LBL 26 to SOB.

Using the area at BL 0 as a reference, the panel bends down at a 15 degree angle at LBL 43 going outbd and bends back up at a 10 degree angle at LBL 72. The depth of the bend is 7" at the front spar and about 12" at SWB #3. The forward edge of the skin and spar chord is bent down from BL 0 to LBL 75. The remaining stringers are attached to the S.O.B. paddle fittings and only a portion of the remaining stringers are attached to the skin panel and conform to the general shape of the skin panel. See the sketch of this section for description and the quantity of remaining stringer on the panel.

Only the skin flange of the front spar shear ties remain except at LBL 26 which has failed at the attachment to the front spar stiffener. There are small fatigue cracks on the aft side of the shear ties at LBL 84 and LBL 92. There is also a small fatigue crack at the fillet radius of the front spar chord near the longeron splice at LBL 80. The fatigue cracks are fully documented in the metallurgical report. The upper tension bathtub fitting on the inside of the skin panel at the longeron splice is fractured vertically thru the tension bolt hole and is deformed at the fwd end. The lower tension fitting attached to the lower surface of the panel is intact and the tension bolt hole is elongated vertically. The forward facing lug on the longeron splice fitting exhibits a tension failure at the aft bolt hole with some bending to the left. The keel beam chord is missing from the panel and the fasteners remaining in the holes exhibit tension failures. There are several fairing support rods attached to the lower surface at LBL 110.

There is some soot on the inner and outer surfaces of the skin panel. See the Fire and Explosion Group notes for further documentation.

12-6-96 TWA
Stephen F Klapacher
FAA-12-6-96
R Burkett IAM 12-6-96
S D GREEN ALPA 12-6-96
Boeing 12/7/96



CENTER SECTION LOWER SKIN

W. Stewart 9/25/96

ADDITION CW-221 1 OF 3

SUBJECT: LWR SURFACE RUB MARKS

THE SUBJECT MARK APPEARS TO POSSIBLY HAVE BEEN MADE BY CONTACT BETWEEN A FIBREGLASS FACE SHEET AND THE LOWER SURFACE OF THE LOWER CENTER SECTION SKIN PANEL (PANEL CW 221 Z-3492). THE SURFACE IS NOT SOOTED. THE SOOTING ON THE ENTIRE LOWER PANEL IS PROGRESSIVELY MORE PRONOUNCED ON THE LOWER SURFACE AS YOU MOVE TOWARD THE RIGHT HAND SIDE OF BODY RIB. SOOTING ON THE UPPER SIDE IS LESS PRONOUNCED AND IS OBSERVED OVER ITS ENTIRE SURFACE.

THE SUBJECT MARK IS ABOUT 1/4 FT^2 IN SIZE. NO OTHER SIMILAR MARKS ARE FOUND ON THE BALANCE OF THE 400 FT^2 SURFACE (APPROX.). THERE ARE DUCTS ABOVE THE AIR CYCLE MACHINE WHICH CHANNEL AIR INTO/OUT OF THE ACM. THESE APPEAR TO BE OF A SIMILAR PATTERN TO THE MARK OBSERVED. THESE DUCTS HAVE BEEN CRUSHED AND BROKEN IN VARIOUS WAYS. THERE ARE BLADE "STAY OUT" ANGLES ON THE TOP OF ALL 3 ACMS WHICH APPEAR TO PREVENT FOD INTO THE ACM RADIATORS. THE BLADES ON ACM NO. 1 ARE PUSHED FWD WHILE THOSE ON ACM'S 2 & 3 ARE UNTOUCHED. [IF THE LOWER PANELS ON THE CENTER SECTION MOVED DOWN WITH RAPID ACCELERATIONS, THESE MAY HAVE SHOWN WITNESS MARKS. I BELIEVE THE MARKS ON THE LOWER PANEL ABOVE ACM NO. 1 MAY HAVE BEEN MADE WHEN THE ACM WAS SUBJECTED TO AERODYNAMIC AIR AND SUBSEQUENTLY FAILED, EARLY IN THE BREAK-UP SEQUENCE.]

SPECULATION

This is analysis and probably should be removed SDG

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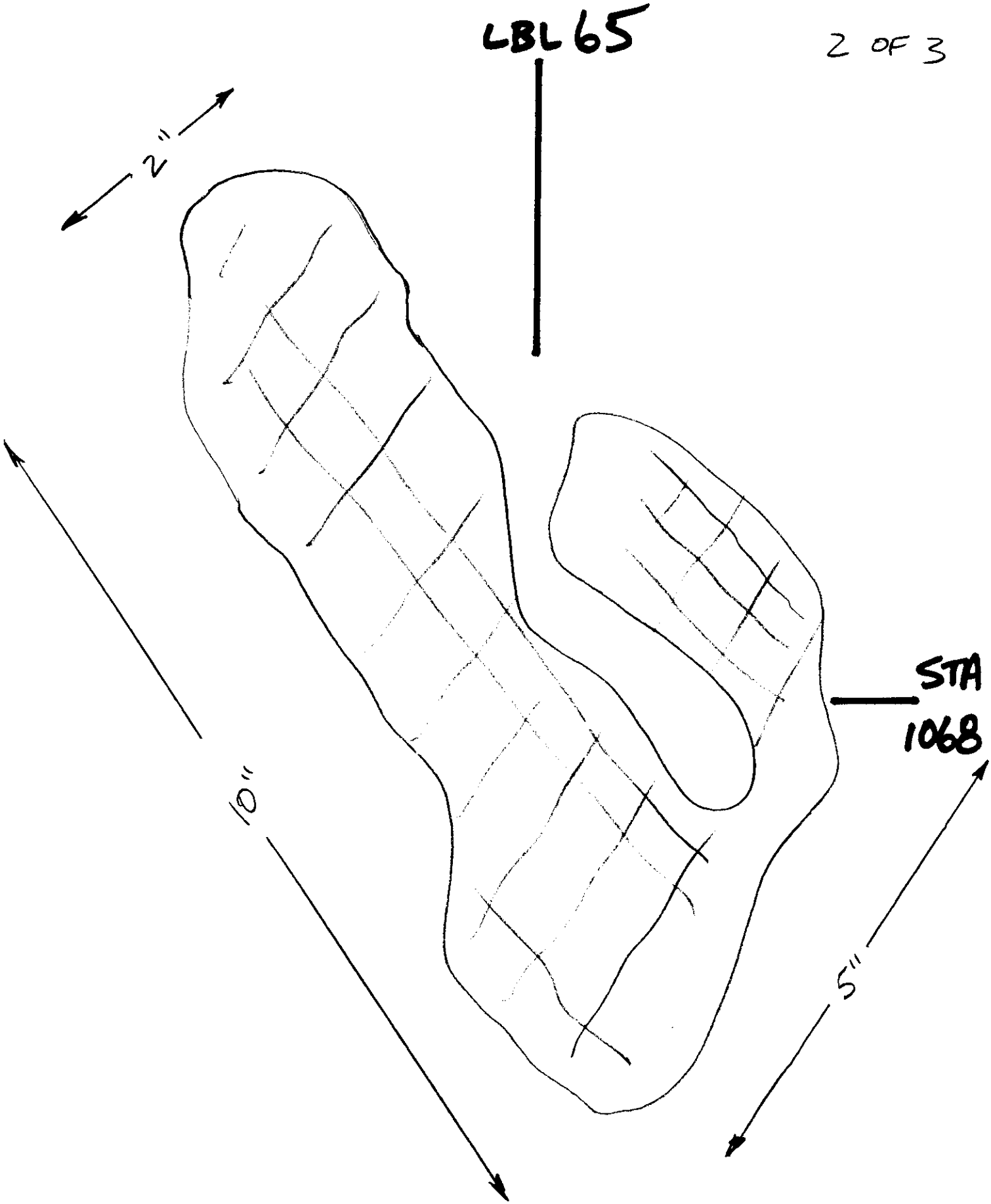
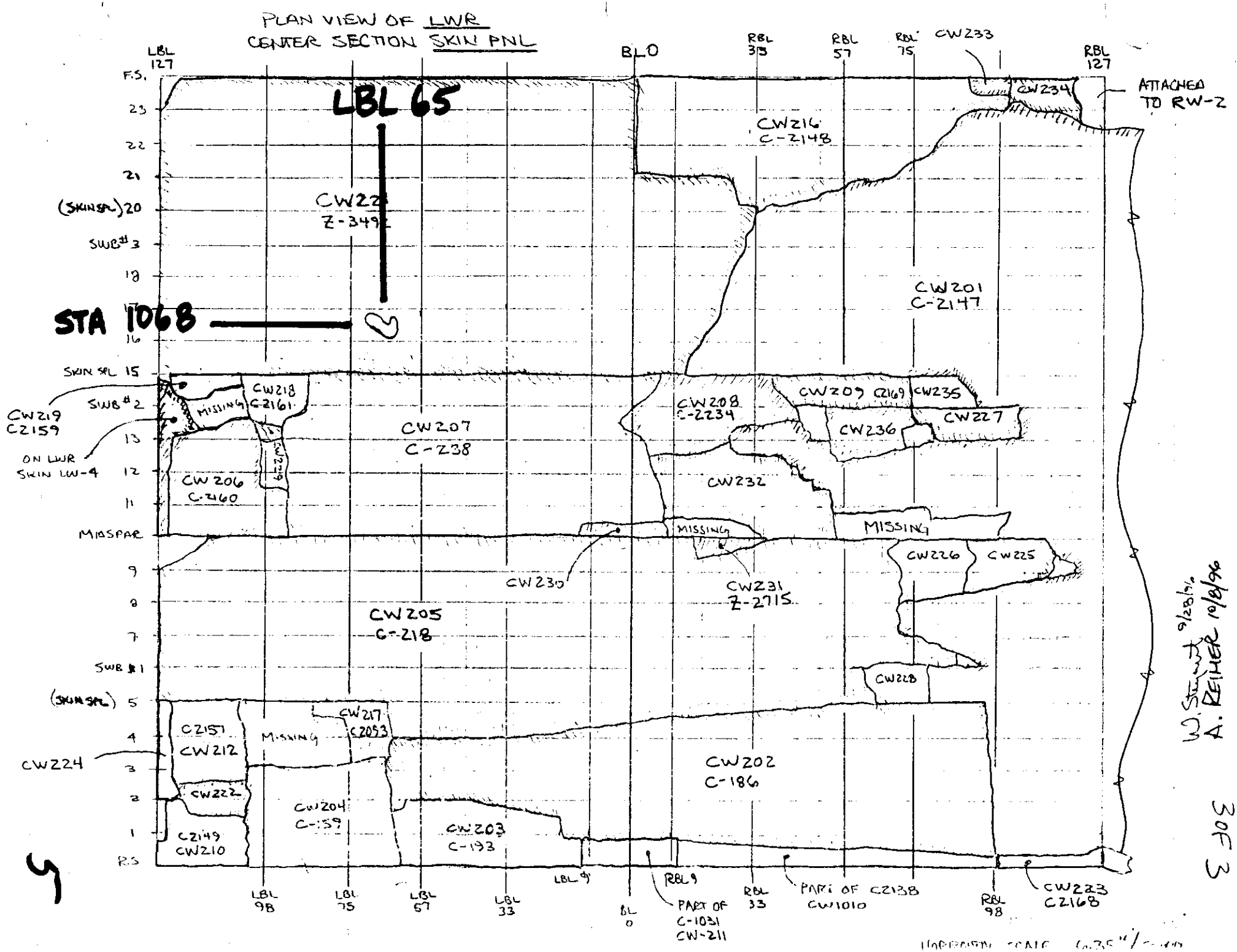
BOEING R.H. 10/11/96


LBL 65
2"
STA
1068
10"
5"


PLAN VIEW OF LWR CENTER SECTION SKIN PNL
LBL 65
STA 1068
LBL 127
BLO
RBL 33
RBL 57
RBL 75
CW233
RBL 127
CW234
ATTACHED TO RW-2
CW216 C-2148
CW201 C-2147
CW208 C-2234
CW209 C2169
CW235
CW236
CW227
CW232
MISSING
MISSING
CW226
CW225
CW230
CW231 Z-2715
CW228
CW205 C-218
CW207 C-238
CW206 C-260
CW219 C2159
ON LWR SKIN LW-4
CW218 C-2161
MISSING
CW224
C2151 CW212
MISSING
CW217 C2053
CW222
C2149 CW210
CW204 C-159
CW203 C-193
CW202 C-186
F.S.
SKIN SPL
SWB #2
MIDSPAR
SWB #1
(SKIN SPL)
LBL 98
LBL 75
LBL 57
LBL 33
LBL 9
BL 0
RBL 9
RBL 33
RBL 98
PART OF C-1031 CW-211
PART OF C2138 CW1010
CW223 C2168
W. Stewart 9/28/96
A. Reimer 10/8/96
3 OF 3
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