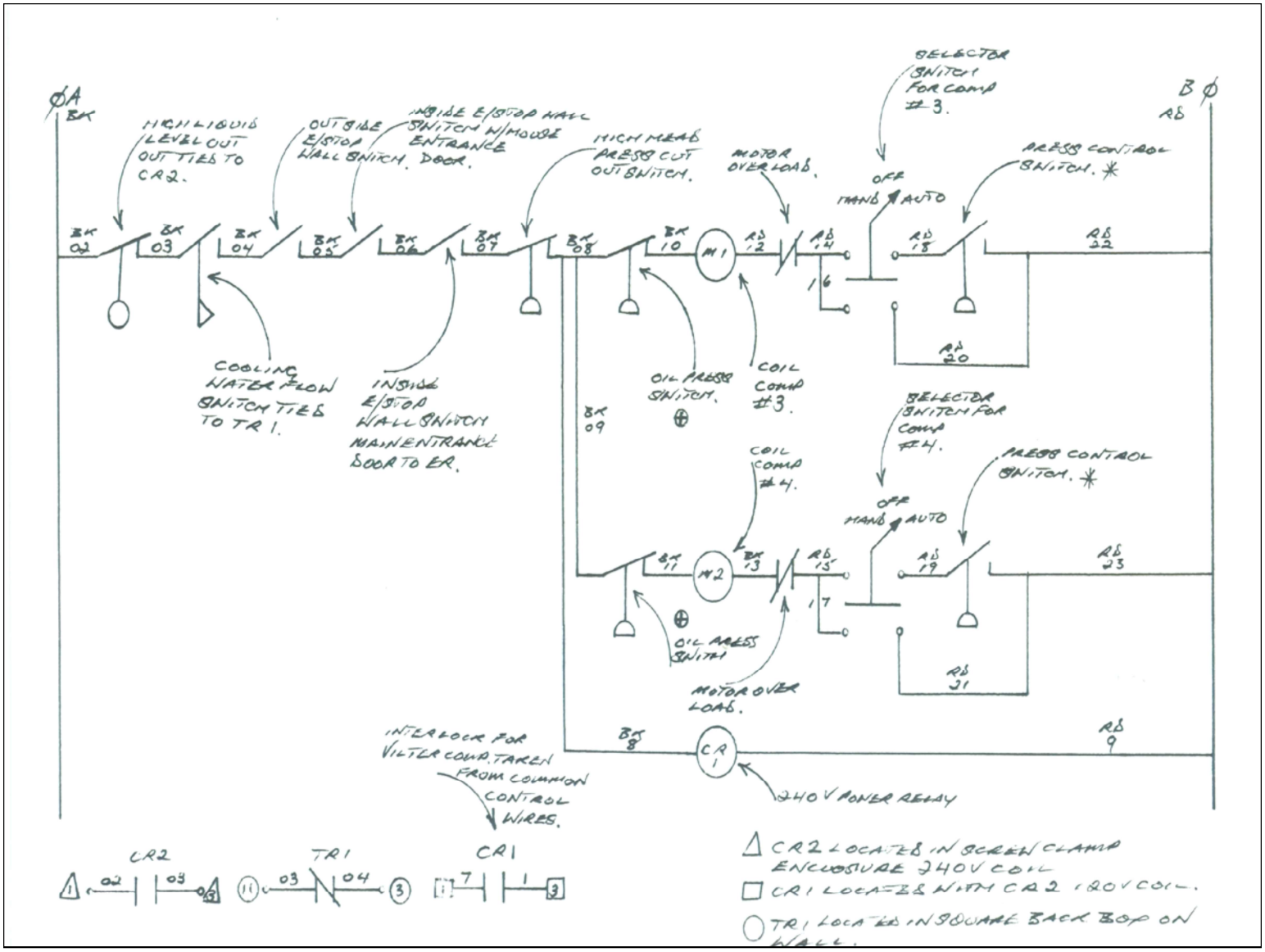
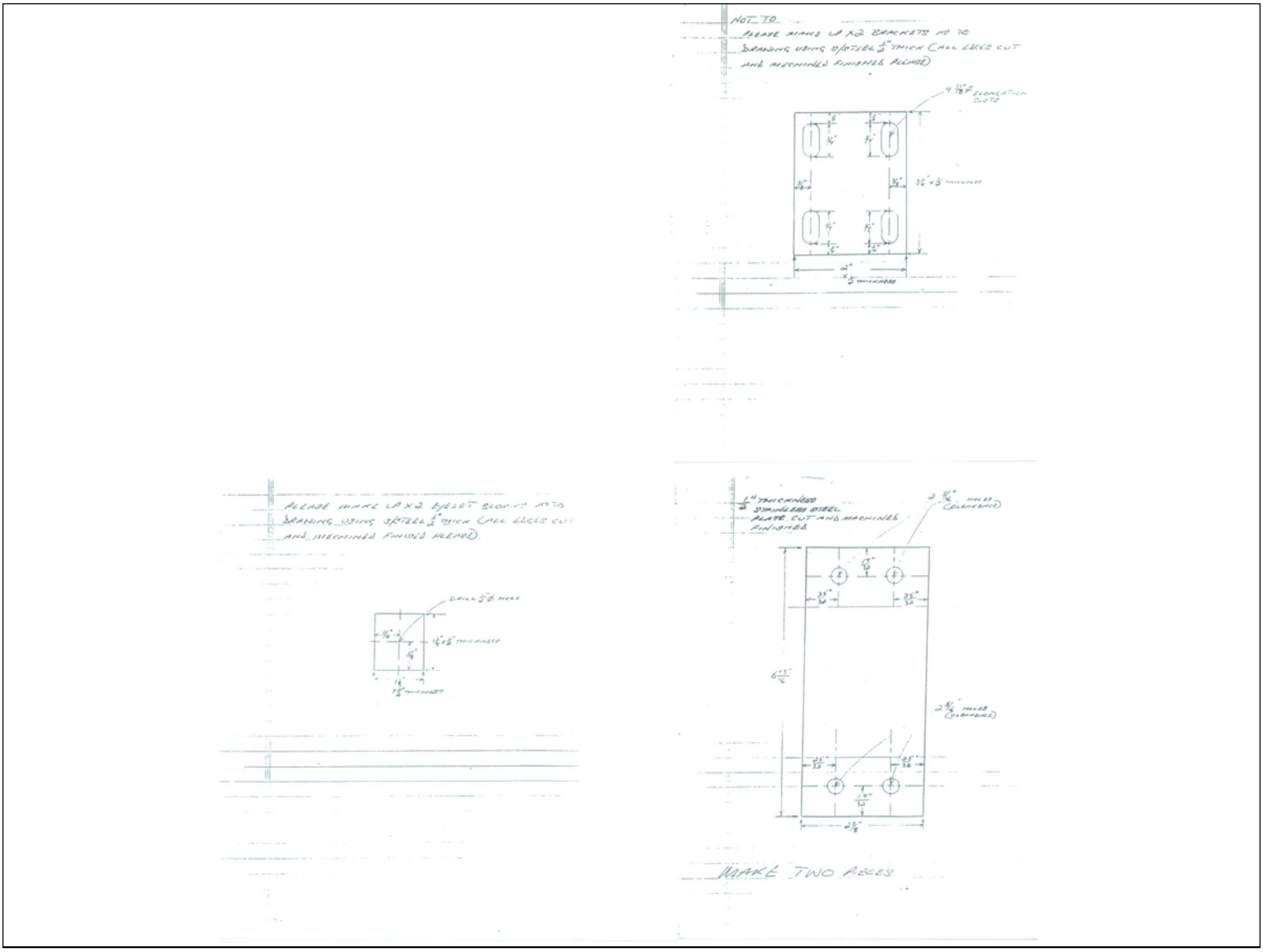


These series of drawings and pictures pay example to my orthographic and schematic drawing abilities to conceive an idea, commit it to paper or on a computer screen and then bring it to life through project management. This is pretty old, but back to manual…

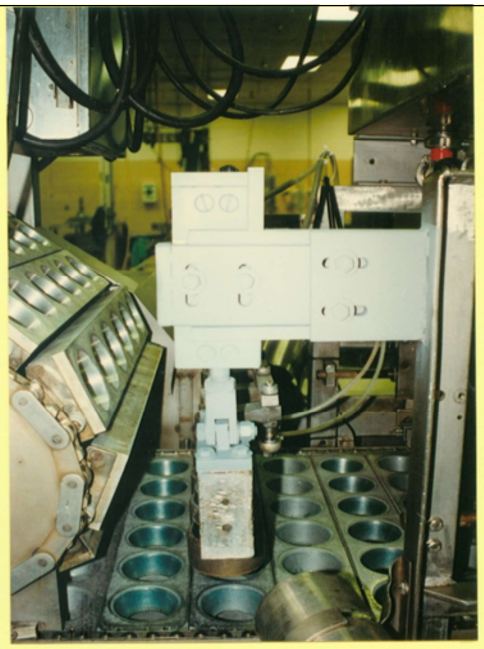
During my employment as a refrigeration technician I was asked come up with a complete electrical interlocked safely circuit for one of the equipment rooms which housed three ammonia piston compressors. This is my drawing, it was approved, I made a materials list and installed it. Nand, And, Or logic with 240 volt separate control.

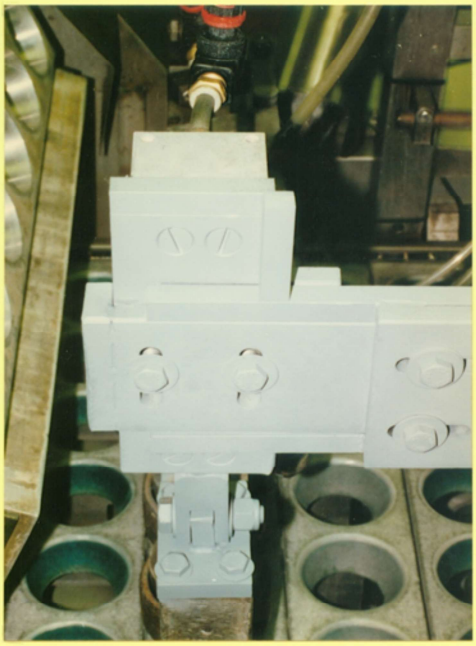
My next continuous self improvement training will be to go to school to learn AutoCAD, this longhand drawing is getting old…



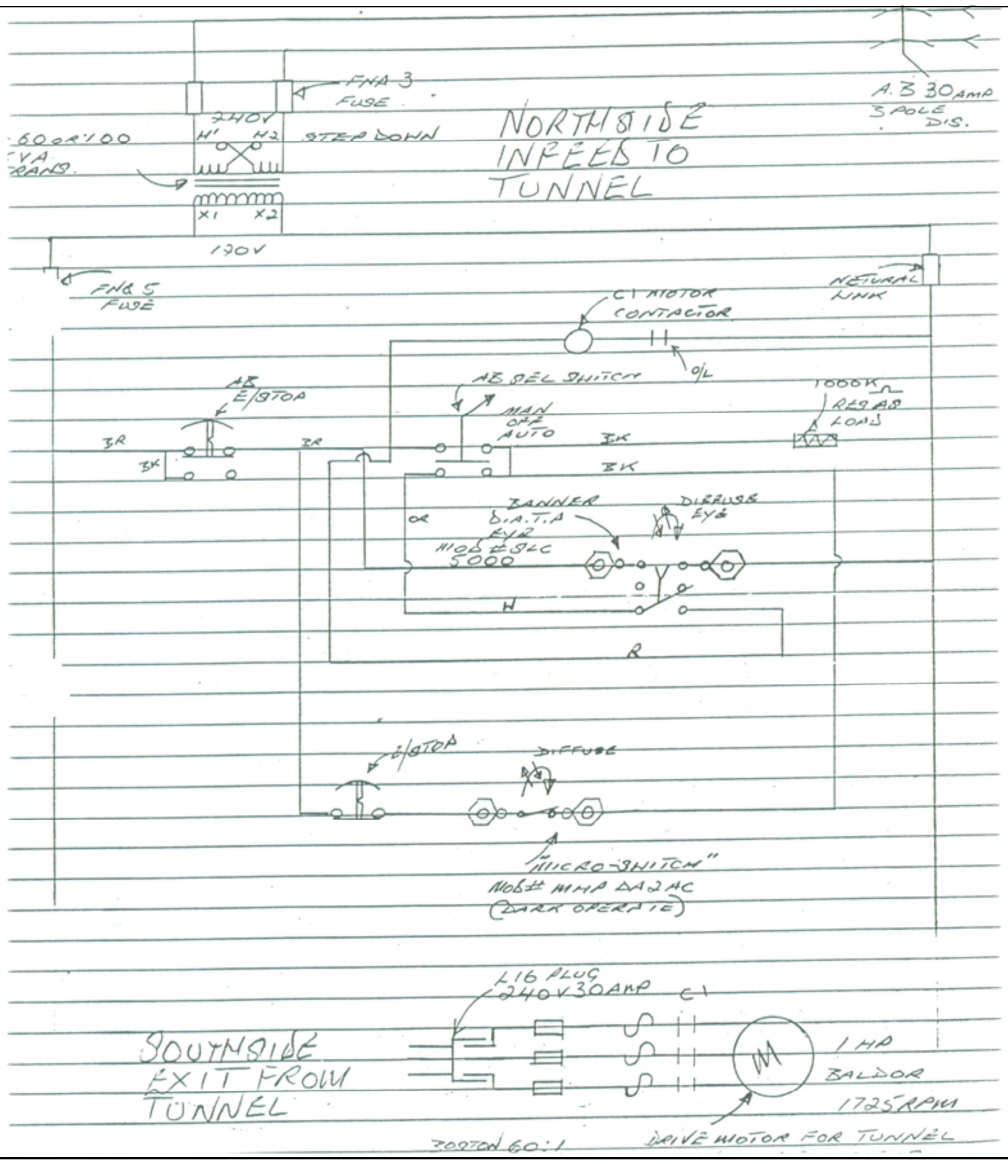
This drawing illustrates three diagrams that I drew up for an improvement on an existing snow cone forming head mounting bracket. The original brackets had little adjustment - elongation - in the X and Z axis and no adjustment in the Y axis.

I ended up making these brackets myself in the company machine shop.



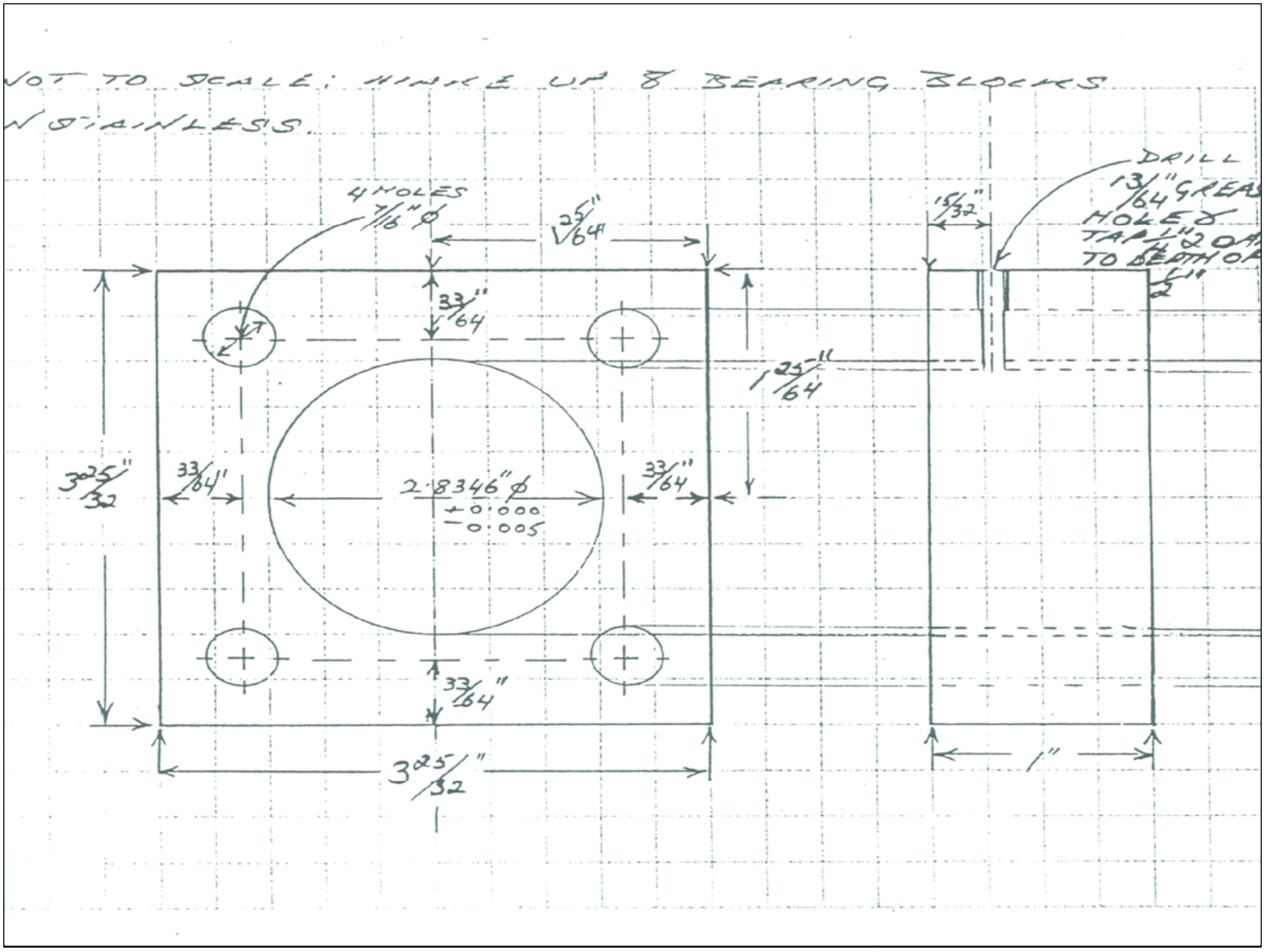


Pictures showing the new designed brackets painted and installed on the machine.

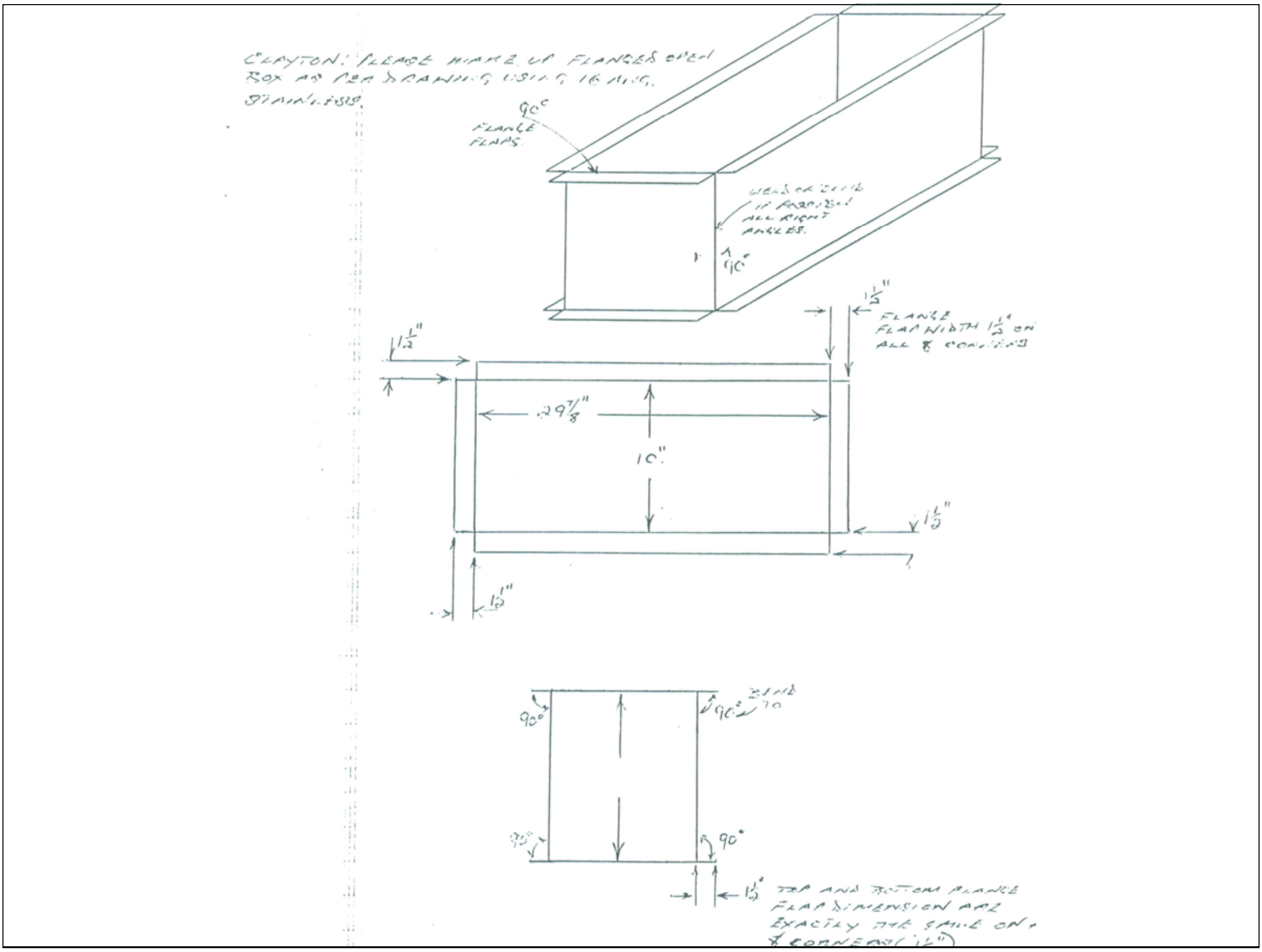


This is an electrical schematic that I devised as a proposal to automate the feeding of molds into a ice cream producing freezing tunnel. Basically, there are two PECs, the out-feed being dark operate - diffuse scan – and the in-feed was light operate. I employed NAND logic to perform on/off, hand/auto and jog functions in the circuit method. This allowed for semiautomatic indexing.

Pictures showing the in-feed and out-feed PECs installed.

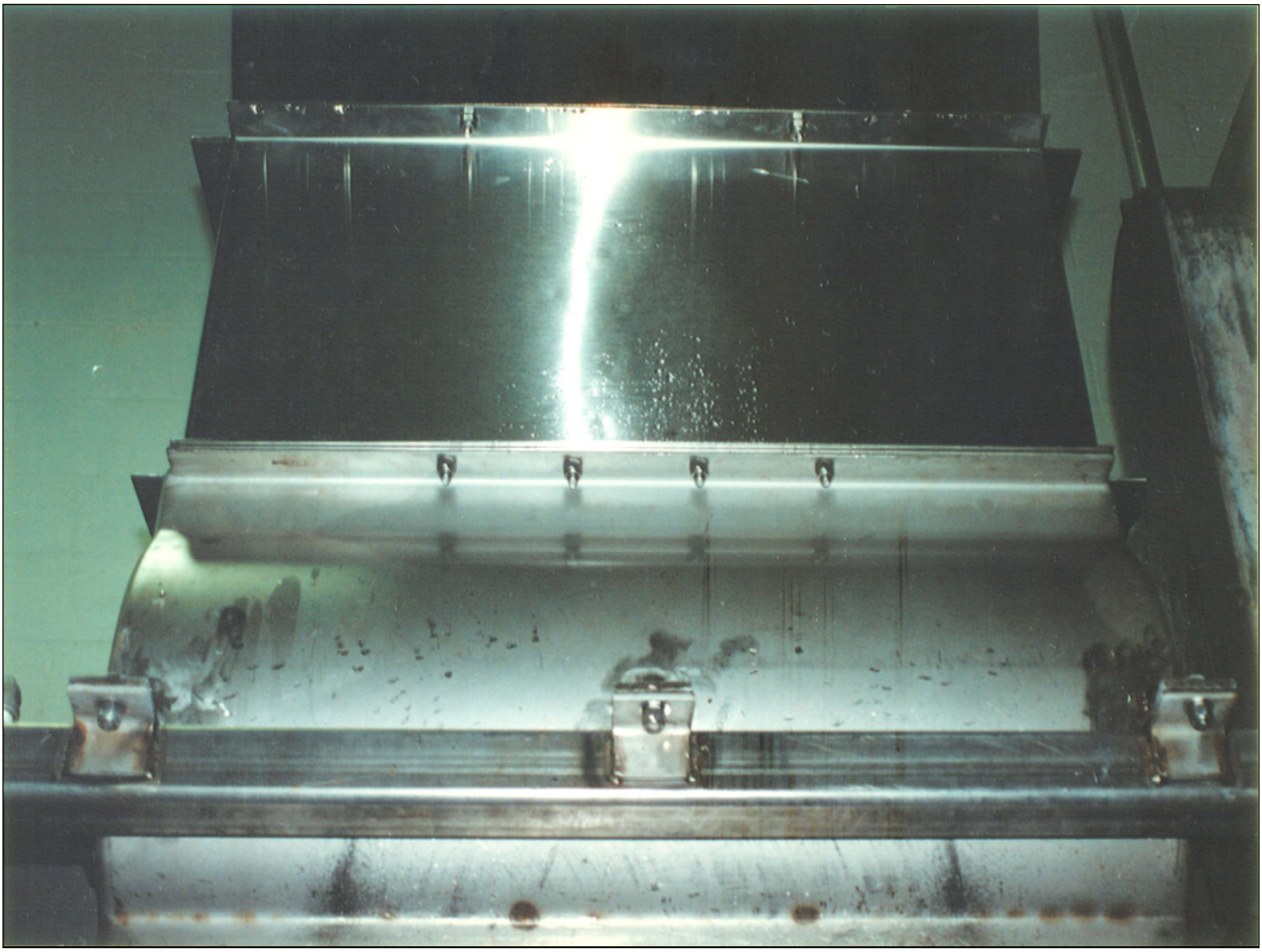


Old school: I drafted this diagram of a parallel bearing housing block. I had 8 of them made up by a machine shop as a replacement to ‘beef-up’ the rigidity of 4 inter-rotating dasher drive shafts for a snow cone making machine. The original spherical bearings allowed the drive shafts to flex under load resulting in the dashers binding up on each causing a real nasty jam up. This happened more than once. This modification that I made ended any further jam ups.

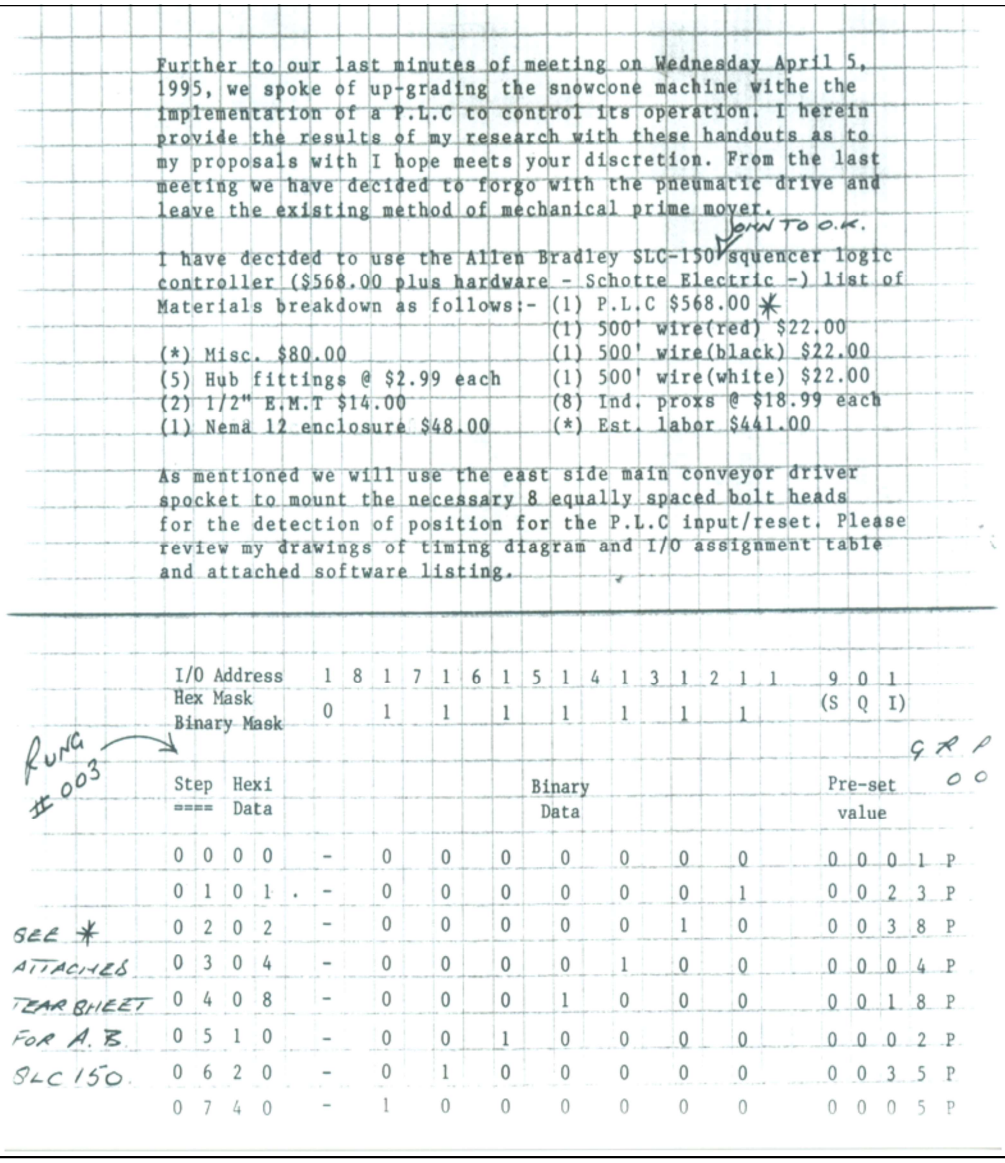


This is a drawing I drafted of an extension section to an ice hammer mill chute again to a snow cone making machine. We were having problems with ice falling form the hammer mill in which much of it was falling off the sides of the conveyor belt and accumulating on the floor which reduced capacity and was wasteful.

I rectified this problem by lowering the hammer mill to 2” inches of the conveyor belt which necessitated my having to have an extension section made - see picture on following slide.



Picture showing the extension section installed.



Further to our last minutes of meeting on Wednesday April 5, 1995, we spoke of up-grading the snowcone machine withe the implementation of a P.L.C to control its operation. I herein provide the results of my research with these handouts as to my proposals with I hope meets your discretion. From the last meeting we have decided to forgo with the pneumatic drive and leave the existing method of mechanical prime mover.

JOHN TO O.K.

I have decided to use the Allen Bradley SLC-150 squencer logic controller ($568.00 plus hardware - Schotte Electric -) list of Materials breakdown as follows:-

(*) Misc. $80.00
(5) Hub fittings @ $2.99 each
(2) 1/2" E.M.T $14.00
(1) Nema 12 enclosure $48.00
(1) P.L.C $568.00 *
(1) 500' wire(red) $22.00
(1) 500' wire(black) $22.00
(1) 500' wire(white) $22.00
(8) Ind. proxs @ $18.99 each
(*) Est. labor $441.00

As mentioned we will use the east side main conveyor driver spocket to mount the necessary 8 equally spaced bolt heads for the detection of position for the P.L.C input/reset. Please review my drawings of timing diagram and I/O assignment table and attached software listing.

I/O Address 1 8 1 7 1 6 1 5 1 4 1 3 1 2 1 1 9 0 1
Hex Mask
Binary Mask 0 1 1 1 1 1 1 1 (S Q I)

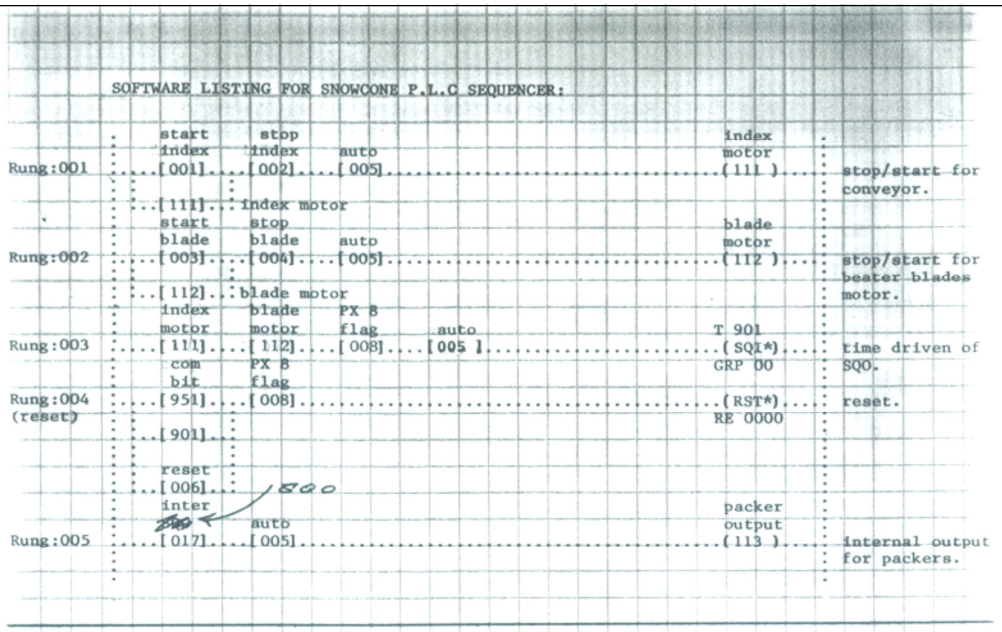
RUNG #003

GRP 00

Step ====	Hexi Data	Binary Data								Pre-set value	
0000	-	0	0	0	0	0	0	0		0001	P
0101	-	0	0	0	0	0	0	1		0023	P
0202	-	0	0	0	0	0	1	0		0038	P
0304	-	0	0	0	0	1	0	0		0004	P
0408	-	0	0	0	1	0	0	0		0018	P
0510	-	0	0	1	0	0	0	0		0002	P
0620	-	0	1	0	0	0	0	0		0035	P
0740	-	1	0	0	0	0	0	0		0005	P

SEE * ATTACHED TEAR SHEET FOR A.B SLC 150.

PLCs for me were a continuous process of developing expertise. This is my first attempt of research into the implementation of a PLC sequencer to control the operational logic of a machine process. This was to be an upgrade improvement on the original mechanical means of cams. Shown is my proposal with i/o table and software listing.



SOFTWARE LISTING FOR SNOWCONE P.L.C SEQUENCER:

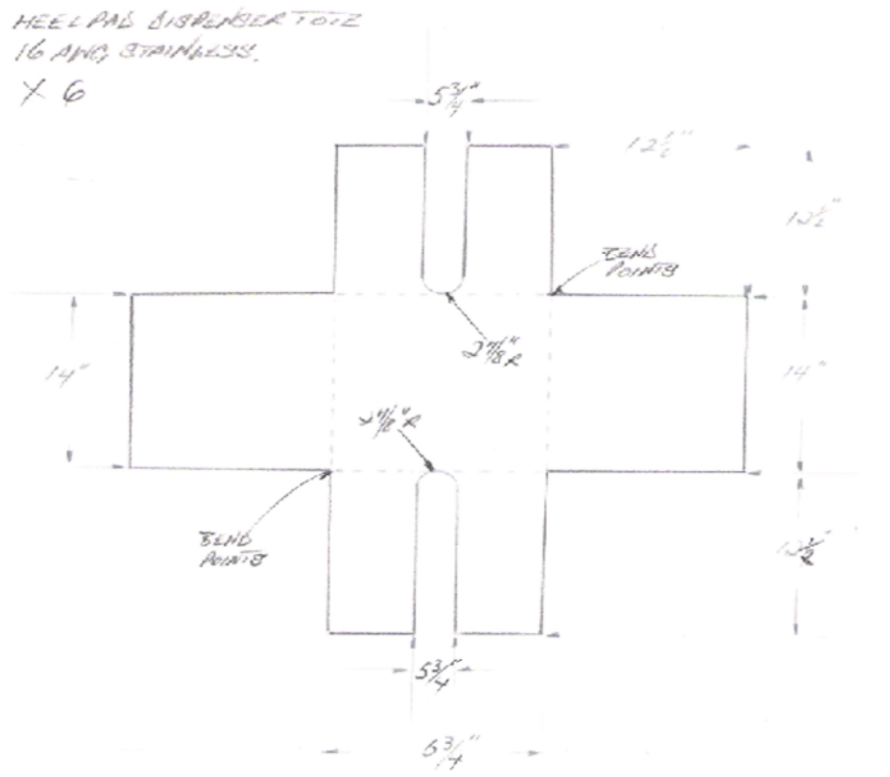
```
                start     stop                                          index
                index     index     auto                                motor
Rung:001  ....[001]....[002]....[005]..................................(111 )....  stop/start for
                                                                                  conveyor.
          ....[111]....index motor
                start     stop                                          blade
                blade     blade     auto                                motor
Rung:002  ....[003]....[004]....[005]..................................(112 )....  stop/start for
                                                                                  beater blades
          ....[112]....blade motor                                                motor.
                index     blade     PX 8
                motor     motor     flag      auto                      T 901
Rung:003  ....[111]....[112]....[008]....[005 ]..........................(SQI*)....  time driven of
                com       PX 8                                          GRP 00      SQO.
                 bit      flag
Rung:004  ....[951]....[008]..............................................(RST*)....  reset.
(reset)                                                                 RE 0000
          ....[901]....
                reset
          ....[006]....
                inter                                                     packer
                auto                                                      output
Rung:005  ....[017]....[005]..............................................(113 )....  internal output
                                                                                  for packers.
```

ASSIGNMENT TABLE:

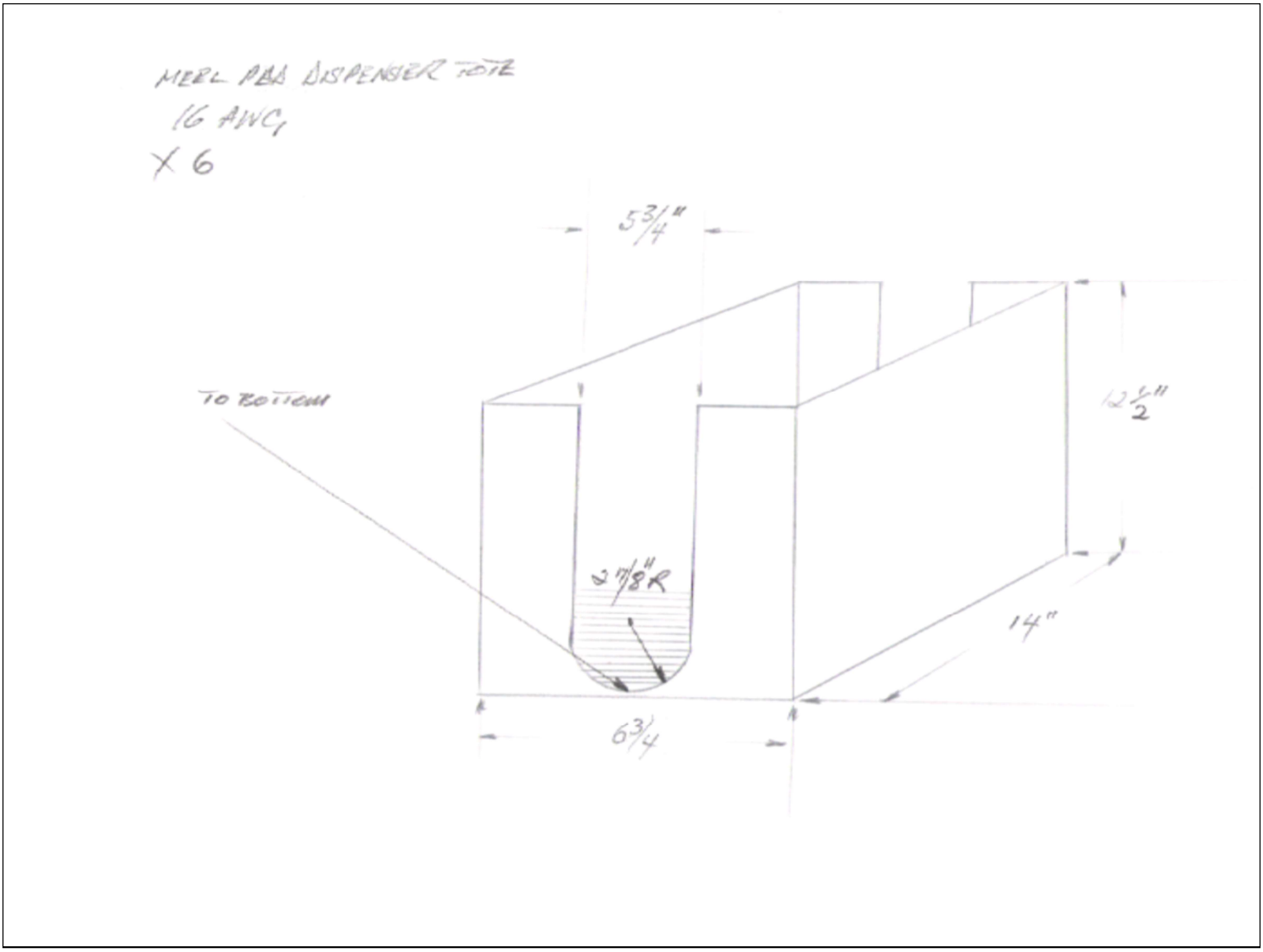
address	element	rung number/s	instruction comment
0 0 1	-[ ]-	0 0 1	start index
0 0 2	-[ ]-	0 0 1	stop index
0 0 3	-[ ]-	0 0 2	start blade
0 0 4	-[ ]-	0 0 2	stop blade
0 0 5	-[ ]-	0 0 1 0 0 2 0 0 3 0 0 5	auto
0 0 6	-[ ]-	0 0 4	reset
0 0 8	-[ ]-	0 0 3 0 0 4	PX 8 flag
0 1 7	-[ ]-	0 0 5	inter SQO
1 1 1	-[ ]-	0 0 1 0 0 3	index motor
1 1 1	-( )-	0 0 1	index motor
1 1 2	-[ ]-	0 0 2 0 0 3	blade motor
1 1 2	-( )-	0 0 2	blade motor
1 1 3	-( )-	0 0 5	pack outpt
9 0 1	-(RST)-	0 0 4	

TOTAL WORDS USED 00049

PLC continued…



Drawing that I drafted to make metal heel pad dispenser totes from - expanded view.



Heel pad dispenser tote - folded and welded view.