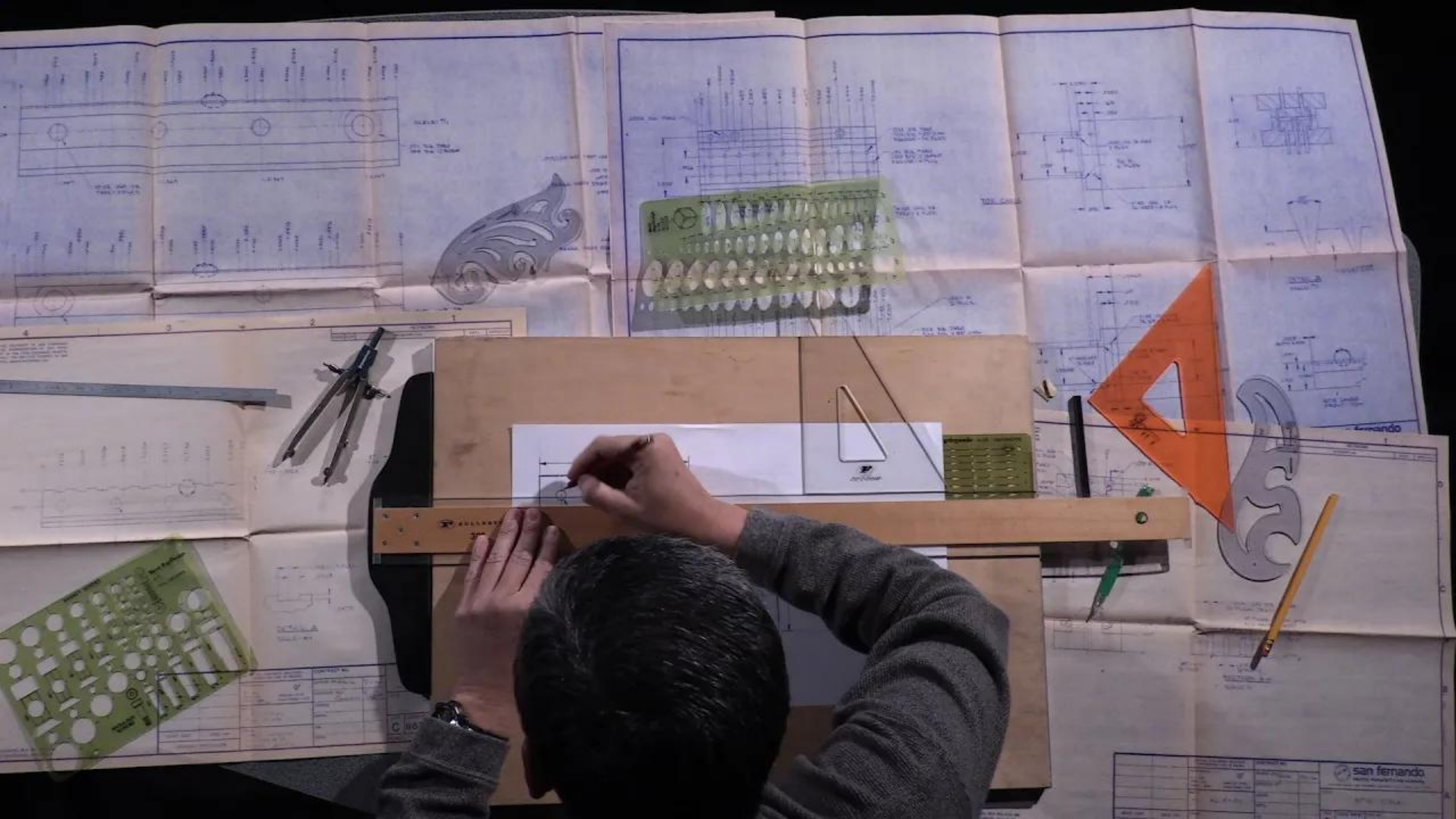
san fernando

1
00:00:00,500 --> 00:00:08,258
[Jet Noise]

2
00:00:08,258 --> 00:00:12,513
[Sonic Boom]

3
00:00:12,513 --> 00:00:54,888
[Music]

4
00:00:55,389 --> 00:00:59,309
>> Back in 1980 my mother
wanted me to have a career

5
00:00:59,309 --> 00:01:02,045
and I just didn't know the
path to how to go about it.

6
00:01:02,562 --> 00:01:07,401
So what she did is she paid for
me to attend a vocational school

7
00:01:07,784 --> 00:01:09,686
of mechanical design
and engineering.

8
00:01:10,070 --> 00:01:13,407
Although not an engineering
school, it taught me the basics

9
00:01:13,407 --> 00:01:14,975
on how to do mechanical
drawings.

10
00:01:15,509 --> 00:01:19,780
[Music]

11
00:01:20,280 --> 00:01:21,898
My name is Kelvin Siu.

12
00:01:22,215 --> 00:01:24,251
I was born in El
Salvador, Central America.

13
00:01:24,818 --> 00:01:26,303
My father came from China.

14
00:01:26,303 --> 00:01:31,041
I'm a total mutt.

15
00:01:31,041 --> 00:01:33,360
In El Salvador they
had the civil war.

16
00:01:33,493 --> 00:01:36,513
My mother, she decided to
bring my sister and myself

17
00:01:36,780 --> 00:01:38,982
out of El Salvador to live in
New York for a better life.

18
00:01:44,021 --> 00:01:46,640
Once I broke the news
to my mom that I work

19
00:01:46,640 --> 00:01:48,976
at NASA she was incredibly
very excited.

20
00:01:49,509 --> 00:02:07,711
[Music]

21
00:02:08,211 --> 00:02:12,516
I remember one of my professors
saying that a drawing is a means

22
00:02:12,516 --> 00:02:14,451
of communication

between an engineer

23
00:02:14,968 --> 00:02:16,186
and the fabrication shop.

24
00:02:16,186 --> 00:02:16,553
>> Good morning sir.

25
00:02:16,553 --> 00:02:17,054
>> Morning sir.

26
00:02:17,054 --> 00:02:17,954
>> Morning how's it going?

27
00:02:18,171 --> 00:02:18,989
>> So here are the prints

28
00:02:19,489 --> 00:02:21,591
and here's what we need
to do, the bracketry.

29
00:02:22,092 --> 00:02:24,194
The top brackets is
going to have two pieces.

30
00:02:24,194 --> 00:02:25,462
This is the top brackets.

31
00:02:26,346 --> 00:02:27,831
This is the left side.

32
00:02:28,332 --> 00:02:30,951
>> And it's 125 stainless.

33
00:02:31,718 --> 00:02:33,136
>> 321.

34
00:02:33,136 --> 00:02:35,806

>> 321 stainless steel,
19 thousand, 190 bend.

35
00:02:36,623 --> 00:02:37,607
>> And you only want one.

36
00:02:37,891 --> 00:02:41,461
>> And my job is to make sure
that we speak the same language.

37
00:02:41,878 --> 00:02:48,118
That it is clear, concise and
also that the engineer is clear

38
00:02:48,118 --> 00:02:49,853
in his intent of the design.

39
00:02:50,220 --> 00:02:52,239
And for the shop to be
clear in what needs

40
00:02:52,239 --> 00:02:53,540
to be produced for that design.

41
00:02:54,474 --> 00:02:59,546
[Music]

42
00:03:00,047 --> 00:03:01,932
The drawings that I
produce vary here.

43
00:03:02,132 --> 00:03:06,353
Some are cabinets that I do,
that go into the airplanes.

44
00:03:07,020 --> 00:03:11,208
Others are just fixtures
that go outside.

45

00:03:11,842 --> 00:03:14,561
In this particular project,
this is a fuel line meter

46
00:03:14,561 --> 00:03:18,065
that is going to be put
in into the G-III airplane

47
00:03:18,231 --> 00:03:21,401
for the Flex Wing and
what it's doing is measuring

48
00:03:21,551 --> 00:03:25,539
accurately how much fuel
it uses in any given time

49
00:03:25,539 --> 00:03:26,506
that it goes up in the air.

50
00:03:26,656 --> 00:03:28,225
The engineer designed
the bracket.

51
00:03:28,742 --> 00:03:32,612
Once he did the 3D CAD
model here, he gave it to me

52
00:03:32,612 --> 00:03:34,948
and I produced all the
drawings on this side.

53
00:03:34,948 --> 00:03:38,068
And my job, my responsibility
is not only to do the drawings

54
00:03:38,068 --> 00:03:41,238
of the assembly with the
bill of materials on the side

55
00:03:41,555 --> 00:03:46,893

and also do the parts, every
single part that is to be

56
00:03:46,893 --> 00:03:49,529
in that drawing and dimension
it and make sure

57
00:03:49,529 --> 00:03:50,530
that everything is correct.

58
00:03:51,131 --> 00:03:53,500
An engineer will do the design,

59
00:03:54,050 --> 00:03:58,371
then after he completes the
model, then he will give me

60
00:03:58,371 --> 00:04:02,209
that model and I begin putting
all the parts into the drawing.

61
00:04:02,542 --> 00:04:03,894
Doing the dimensions,

62
00:04:04,227 --> 00:04:08,398
making sure that it
matches the NASA standards

63
00:04:08,398 --> 00:04:10,333
and the ASME mechanical
standards.

64
00:04:10,901 --> 00:04:13,370
And after I am done
with the drawing,

65
00:04:13,620 --> 00:04:16,339
then I return the drawing to
the engineer to be checked.

66
00:04:17,207 --> 00:04:19,626
Once a drawing is
approved by the engineer,

67
00:04:19,626 --> 00:04:22,212
I will send the drawing to
configuration management.

68
00:04:22,212 --> 00:04:23,780
They do a couple of things.

69
00:04:23,780 --> 00:04:26,766
One is that they will release
the drawing into the system,

70
00:04:26,766 --> 00:04:29,569
so the engineer can
write a work order

71
00:04:29,569 --> 00:04:34,641
to have the design be
built by the machine shop.

72
00:04:34,641 --> 00:04:36,276
Second and very importantly,

73
00:04:36,276 --> 00:04:39,946
is that they are the
single repository for AFRC,

74
00:04:39,946 --> 00:04:43,216
in which they put the
drawings and the CAD files

75
00:04:43,216 --> 00:04:45,552
into their system
for safe keeping.

76
00:04:45,552 --> 00:04:49,823

If an engineer later on needs
either the CAD files or a copy

77
00:04:49,823 --> 00:04:56,296
of the drawing, they will call
them in order to get a copy.

78
00:04:56,296 --> 00:04:57,981
A typical day here when I come

79
00:04:57,981 --> 00:05:00,450
to work is I come
in at 7 o'clock.

80
00:05:00,450 --> 00:05:02,185
[Background Conversation]

81
00:05:02,185 --> 00:05:04,938
Usually on Tuesday, we
have a meeting at 8 o'clock

82
00:05:04,938 --> 00:05:08,625
in the morning with my manager
just to review all the projects.

83
00:05:08,625 --> 00:05:14,047
Where they are, where they're
going and when is the due dates.

84
00:05:14,047 --> 00:05:15,582
>> Alright Kelvin,
what do we got here?

85
00:05:15,582 --> 00:05:17,584
>> Okay so we got
this completed here.

86
00:05:17,584 --> 00:05:19,519
So we want to take a look at it.

87
00:05:19,519 --> 00:05:21,171
>> It's going to be
passivated.

88
00:05:21,171 --> 00:05:22,772
>> I put this overall
dimension here.

89
00:05:22,772 --> 00:05:27,177
So but you want to know more
dimensions between center holes

90
00:05:27,177 --> 00:05:27,811
or just from...

91
00:05:27,811 --> 00:05:28,044
>> No.

92
00:05:28,044 --> 00:05:32,415
>> After that I just go
about my business of working

93
00:05:32,415 --> 00:05:35,001
for the engineers and
working on their projects.

94
00:05:35,001 --> 00:05:38,822
And making sure that
the timelines are met.

95
00:05:38,822 --> 00:05:42,559
What I like from here
that it will be different

96
00:05:42,559 --> 00:05:44,661
than in the private
sector manufacturing,

97
00:05:44,661 --> 00:05:48,198

is that every piece that
we make here in NASA

98
00:05:48,198 --> 00:05:54,120
AFRC is prototype, is one of
a kind and I truly enjoy that.

99
00:05:54,120 --> 00:05:57,340
One is because well there's
only one of a kind and second

100
00:05:57,340 --> 00:06:01,444
because it's not mass produced,
therefore we put the best

101
00:06:01,444 --> 00:06:06,266
of our minds and mathematics
into it, to make it a reality.

102
00:06:06,266 --> 00:06:10,670
[Background Conversation]

103
00:06:10,670 --> 00:06:12,155
>> Alright Kelvin, so I'm going

104
00:06:12,155 --> 00:06:13,823
to show you the primary
location.

105
00:06:13,823 --> 00:06:14,558
>> Okay.

106
00:06:14,558 --> 00:06:15,942
>> Where it's going to connect,

107
00:06:15,942 --> 00:06:18,011
so if you look right
there, the harness.

108

00:06:18,011 --> 00:06:23,967
So let me go real
quick right up here.

109
00:06:23,967 --> 00:06:28,305
So basically we're going
to connect from that screw

110
00:06:28,305 --> 00:06:29,522
to this screw right here.

111
00:06:29,522 --> 00:06:30,757
>> Oh okay, now I see it.

112
00:06:30,757 --> 00:06:32,342
>> To get these two points.

113
00:06:32,342 --> 00:06:35,412
>> As I work with the engineers
here in AFRC, it is very nice

114
00:06:35,412 --> 00:06:38,114
and brings a satisfaction
not only

115
00:06:38,114 --> 00:06:41,518
to see their personal
designs, that I do the drawings

116
00:06:41,518 --> 00:06:44,287
and check the drawings, that
I have some kind of input,

117
00:06:44,287 --> 00:06:47,824
as small as it may be, and to
see that it's going into a plane

118
00:06:47,824 --> 00:06:51,544
and doing research because I
know that that research is going

119
00:06:51,544 --> 00:06:55,115
to convey something to
the scientific community.

120
00:06:55,115 --> 00:07:01,087
And therefore reward humankind
in a positive way and knowing

121
00:07:01,087 --> 00:07:06,893
within me, that I made a real
difference, albeit it's small,

122
00:07:06,893 --> 00:07:08,261
but a real difference.

123
00:07:08,261 --> 00:07:10,013
One of the main points
that I appreciate

124
00:07:10,013 --> 00:07:13,700
from doing some design is
when I see something like this,

125
00:07:13,700 --> 00:07:17,187
when I began my career,
it was all done in paper.

126
00:07:17,187 --> 00:07:19,606
There were no computers
or no CAD models.

127
00:07:19,606 --> 00:07:21,992
So my appreciation
is all the curves,

128
00:07:21,992 --> 00:07:23,877
there's no flat surfaces.

129

00:07:23,877 --> 00:07:26,079
Everything has an in and out.

130
00:07:26,079 --> 00:07:28,048
Everything is just
flowing and now

131
00:07:28,048 --> 00:07:31,718
that we have CAD we can
do that, but in the past,

132
00:07:31,718 --> 00:07:34,954
all this was done
by pencil and paper.

133
00:07:34,954 --> 00:07:37,957
[Music]

134
00:07:37,957 --> 00:07:43,463
You have to be good in math and
also to have the know-how on how

135
00:07:43,463 --> 00:07:47,450
to come up with the
solutions to a need.

136
00:07:47,450 --> 00:07:49,969
The brain, yes, functions
on both sides.

137
00:07:49,969 --> 00:07:52,455
The creative side on
what it will look like,

138
00:07:52,455 --> 00:07:58,978
but also to have the math
to correctly design it.

139
00:07:58,978 --> 00:08:04,067
There is a pride in knowing

that as I go to museums

140
00:08:04,067 --> 00:08:07,704
and I see NASA and
they talk about NASA,

141
00:08:07,704 --> 00:08:10,740
inside I always tell
myself I work there.

142
00:08:10,740 --> 00:08:14,494
And I'm so thankful to make a
difference as many others do.