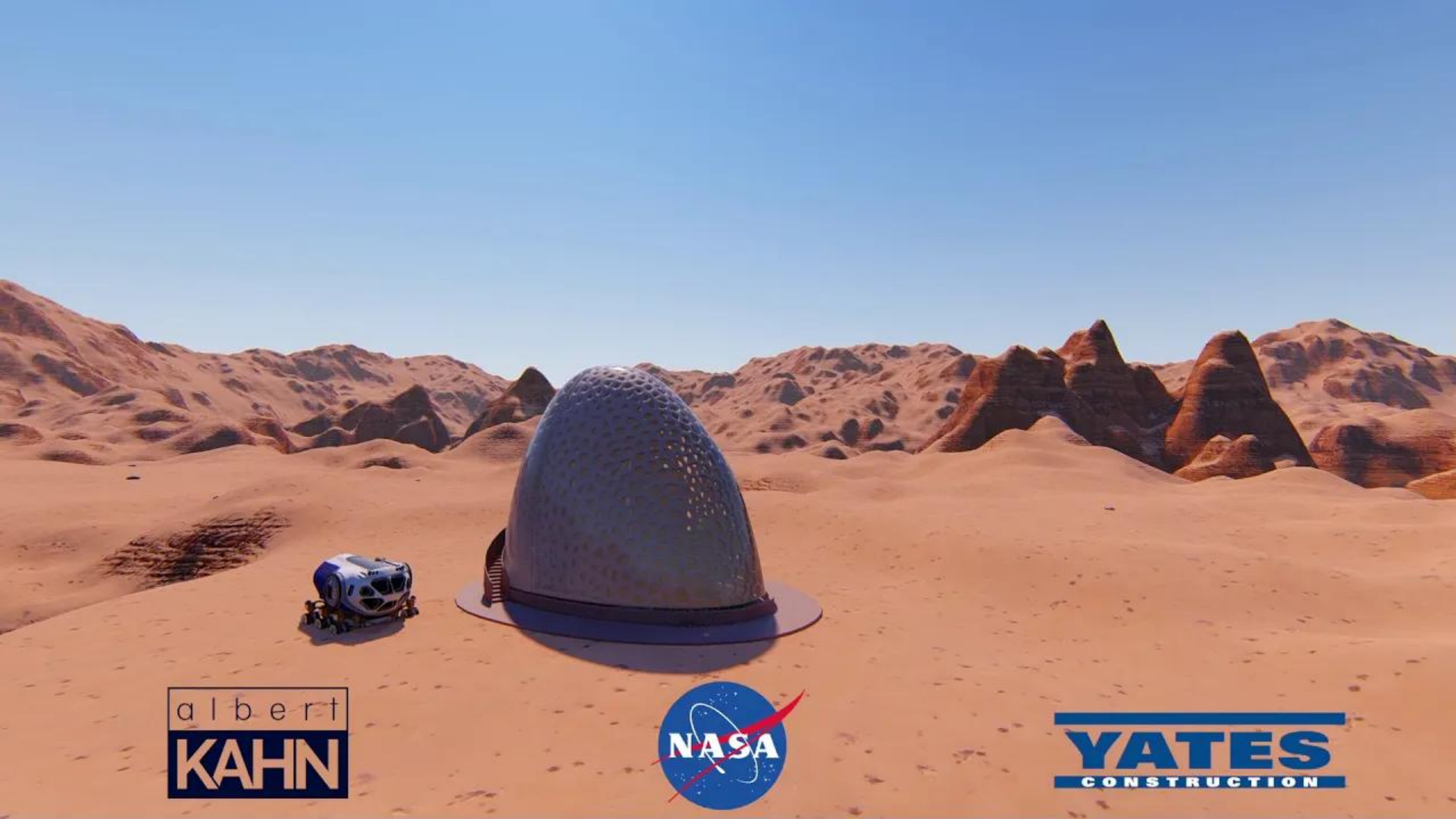
albert
KAHN
NASA
YATES
CONSTRUCTION

1
00:00:06,310 --> 00:00:13,499
[Music]

2
00:00:17,920 --> 00:00:16,420
we arrived at this distinct shape based

3
00:00:20,470 --> 00:00:17,930
on the structural functional and

4
00:00:22,599 --> 00:00:20,480
programmatic relationships the sleekness

5
00:00:25,240 --> 00:00:22,609
of the design is intended to minimize

6
00:00:27,099 --> 00:00:25,250
the dust storms that may come along our

7
00:00:29,800 --> 00:00:27,109
unique solution located near the equator

8
00:00:32,320 --> 00:00:29,810
of Mars starts out with the arrival of

9
00:00:35,680 --> 00:00:32,330
the spacefaring module whose exterior

10
00:00:38,250 --> 00:00:35,690
shell splits off as it lands similar to

11
00:00:41,680 --> 00:00:38,260
the Curiosity rover leaving behind a

12
00:00:44,590 --> 00:00:41,690
prefabricated core after landing operate

13
00:00:46,900 --> 00:00:44,600

on the Martian surface the five access

14
00:00:48,670 --> 00:00:46,910
print arm extends from the top of the

15
00:00:51,279 --> 00:00:48,680
core and prints of foundation and

16
00:00:54,400 --> 00:00:51,289
footing layers utilizing materials found

17
00:00:55,840 --> 00:00:54,410
on the Martian landscape immediately

18
00:00:58,150 --> 00:00:55,850
following the completion of the

19
00:01:00,700 --> 00:00:58,160
foundation the print arm will transition

20
00:01:03,520 --> 00:01:00,710
vertically to begin printing a concrete

21
00:01:06,370 --> 00:01:03,530
shell secondary print nozzles will begin

22
00:01:08,590 --> 00:01:06,380
printing HDPE layers on either side of

23
00:01:11,170 --> 00:01:08,600
the concrete effectively sandwiching the

24
00:01:13,060 --> 00:01:11,180
Martian concrete in the middle a portion

25
00:01:15,039 --> 00:01:13,070
of the shell construction will give way

26
00:01:17,530 --> 00:01:15,049
to the equipment hatch allowing for

27
00:01:19,359 --> 00:01:17,540
connection to future habitats when the

28
00:01:21,520 --> 00:01:19,369
shell construction reaches the height of

29
00:01:23,200 --> 00:01:21,530
the laboratory level floor plates and

30
00:01:25,600 --> 00:01:23,210
supporting structural members will

31
00:01:27,940 --> 00:01:25,610
deploy from the pre-manufactured core

32
00:01:30,880 --> 00:01:27,950
which will rest upon the newly printed

33
00:01:32,770 --> 00:01:30,890
shell if desired a slab layer can be

34
00:01:35,410 --> 00:01:32,780
printed on top of the plates for a

35
00:01:37,980 --> 00:01:35,420
cohesive floor the shell construction

36
00:01:40,210 --> 00:01:37,990
will continue progressing upward

37
00:01:42,219 --> 00:01:40,220
daylight will be allowed into the

38
00:01:44,470 --> 00:01:42,229

habitat by means of reducing or

39
00:01:46,450 --> 00:01:44,480
eliminating portions of the central

40
00:01:50,050 --> 00:01:46,460
concrete layer in the exterior shell

41
00:01:53,020 --> 00:01:50,060
makeup to have just the HDPE layers as

42
00:01:55,390 --> 00:01:53,030
the skin the location of these daylight

43
00:01:57,970 --> 00:01:55,400
portions will strategically correspond

44
00:01:59,830 --> 00:01:57,980
to programmatic elements of the habitat

45
00:02:02,290 --> 00:01:59,840
and will highlight the intricate nature

46
00:02:05,620 --> 00:02:02,300
of 3d printing capabilities and

47
00:02:07,750 --> 00:02:05,630
parametric modeling the grade level will

48
00:02:10,570 --> 00:02:07,760
contain the access to the SUV and

49
00:02:13,030 --> 00:02:10,580
connections to future habitats access

50
00:02:15,790 --> 00:02:13,040
occurs from a floor hatch in the airlock

51
00:02:18,550 --> 00:02:15,800
a garden area is located outside of the

52
00:02:21,490 --> 00:02:18,560
foundation wall area and accessed from

53
00:02:24,340 --> 00:02:21,500
the laboratory level the design of an

54
00:02:26,110 --> 00:02:24,350
oblong projection in the shell allows

55
00:02:28,800 --> 00:02:26,120
for a great deal of daylight for

56
00:02:31,600 --> 00:02:28,810
gardening and food production the

57
00:02:33,790 --> 00:02:31,610
medical exam and procedure room along

58
00:02:36,130 --> 00:02:33,800
with an emergency shower are located

59
00:02:39,670 --> 00:02:36,140
nearby should any urgent action need to

60
00:02:42,310 --> 00:02:39,680
occur from outside the habitat the lab

61
00:02:44,890 --> 00:02:42,320
is located adjacent to medical next to

62
00:02:46,360 --> 00:02:44,900
the lab is the communications room we

63
00:02:48,100 --> 00:02:46,370

then have a stair that leads to the

64
00:02:50,890 --> 00:02:48,110
living level and one that leads down to

65
00:02:52,870 --> 00:02:50,900
the ground level next to that is the

66
00:02:55,480 --> 00:02:52,880
garden room that can be used to grow

67
00:02:57,070 --> 00:02:55,490
plants from seedlings as well as plants

68
00:02:58,780 --> 00:02:57,080
that require different environmental

69
00:03:01,720 --> 00:02:58,790
conditions than the ones out in the

70
00:03:03,430 --> 00:03:01,730
light at grade after the lab level is

71
00:03:05,530 --> 00:03:03,440
complete and the shell reaches the

72
00:03:07,570 --> 00:03:05,540
height of the living level another set

73
00:03:09,670 --> 00:03:07,580
of floor plates will deploy and the

74
00:03:12,010 --> 00:03:09,680
process will repeat until the habitat

75
00:03:13,630 --> 00:03:12,020
reaches its terminal height on the

76
00:03:17,470 --> 00:03:13,640
living level we have four uniformed

77
00:03:20,170 --> 00:03:17,480
bedrooms a recreation area a dining room

78
00:03:23,289 --> 00:03:20,180
exercise area the food prep and storage

79
00:03:26,050 --> 00:03:23,299
areas will be built into prefabricated

80
00:03:27,940 --> 00:03:26,060
core besides is a stair that goes down

81
00:03:30,759 --> 00:03:27,950
to the lab level there also will be

82
00:03:32,770 --> 00:03:30,769
ladder access to the floor above the

83
00:03:36,430 --> 00:03:32,780
upper level will house the 3d printing

84
00:03:38,770 --> 00:03:36,440
operations and storage when complete the

85
00:03:40,809 --> 00:03:38,780
pre manufactured core will contain all

86
00:03:43,089 --> 00:03:40,819
of the plumbing ventilation and

87
00:03:44,729 --> 00:03:43,099
life-support equipment required for the

88
00:03:48,069 --> 00:03:44,739

duration of the astronauts stay

89
00:03:50,729 --> 00:03:48,079
including toilet facilities a kitchen in

90
00:03:52,390 --> 00:03:50,739
laboratory hookups as required

91
00:03:54,970 --> 00:03:52,400
communications equipment will be

92
00:03:57,220 --> 00:03:54,980
pre-wired into the central core and will

93
00:04:03,140 --> 00:03:57,230
extend through the shell near the top of