

## 211 SUPPLEMENT - MARINE CORPS AIRCRAFT MAINTENANCE FACILITIES

1. The basic requirements for aircraft maintenance at the intermediate maintenance level for both the Navy and the Marine Corps are set forth in OPNAVINST 4790 (latest issue) and are identical except that:

a. In the Marine Corps, a Marine Corps air installation may be assigned limited intermediate maintenance level responsibility for its own aircraft; however, most intermediate level aircraft maintenance is performed by a Headquarters and Maintenance Services (H&MS) Squadron for a Marine Corps Air Group. Each Marine Air Group is composed of from three to five squadrons and a Marine Corps air installation normally has from one to three air groups assigned. At Navy air installations, intermediate level maintenance is performed by an aircraft maintenance department for all aircraft based at the station.

b. Because of the expeditionary nature of the Marine Corps air support mission, many of the aviation maintenance support equipments which deploy with the air group are van-configured. For this reason, Marine Corps aircraft maintenance facilities in the continental United States must be a combination of permanent type construction and the mobile expeditionary type vans while Navy aircraft maintenance facilities are all of permanent type construction.

2. Marine Corps aircraft maintenance facilities are planned utilizing the basic criteria for comparable Navy facilities except that it is necessary to:

a. Provide one Type I hangar module for each Headquarters and Maintenance Squadron (H&MS) assigned to an installation. This hangar supports the intermediate maintenance program and is in addition to the hangars required for organizational maintenance. Marine Corps requirements for organizational maintenance hangars are computed in the same manner as Navy requirements (See Cat. Codes 211 05, 211 06, and 211 07).

b. Convert Marine Corps MOS numbers to the Navy Group IX aviation ratings in order to determine sizing factors.

c. Convert the van-configured space into equivalent permanent shop space and reduce the permanent space requirements accordingly. It has been determined that a factor of 3.3 represents the average of the increase in floor space that is required when the maintenance equipment is removed from the vans and located in permanent facilities. Based upon this factor, one standard 8-foot by 20-foot (160 square feet) expeditionary van is equivalent to 528 square feet of permanent-type construction.

d. Plan airframes shop requirements as a part of the H&MS hangar 01 space, and this space should be categorized as 211 06 rather than 211 08.

3. The following is an example of how to determine the amount of permanent intermediate maintenance shop space required for an H&MS squadron (in addition to one Type I hangar), with the gross requirements for each shop being computed utilizing the appropriate criteria. The number and the square footage of the vans to be utilized with each-shop should be determined, and this total square footage is then multiplied by the factor of 3.3. This

product is then subtracted from the gross shop space requirements previously computed and the resultant figure is the permanent shop space required.

Example: Taking an H&MS squadron which supports a group composed of 15 Type VMF aircraft, 12 Type A VMA aircraft, 20 Type B VMA aircraft, 1 Type VR aircraft, and 3 Type VT aircraft as being typical, intermediate maintenance level shop space requirements are computed for each basic shop. In this example, airframes, avionics, aviation armament, parachute and survival equipment, and ground support equipment shops are computed. Hangar space requirements for organizational maintenance are computed utilizing the same criteria as for Navy hangars. See Maintenance Hangar, Category Codes 211 05, 211 06, and 211 07. In addition, one Type I hangar is required for the H&MS squadron. For each of the following space determinations, the I.M.O. factors are utilized to determine the gross area required from the applicable sizing table for each shop as listed in Category Group 210.

Step 1:

(a) In order to develop the size of shop required, refer to the appropriate shop criteria in the 211 category codes. Convert the Navy Group IX aviation ratings shown to Marine Corps MOS numbers and then obtain the I.M.O. factors.

(b) Information pertaining to I.M.O. factors will be released upon request.

Step 2: (Airframes Shop)

(a) To obtain the sizing factor of the airframes shop use the same approach as in paragraph (a) of Step 1 above, but refer to basic Category Code 211 08, Airframes Shop.

Airframes Shop, Category Code 211 08

<u>A/C</u>	<u>No.(n)</u> <u>A/C</u>	<u>I.M.O.</u>	<u>Sizing Factor</u> <u>(I.M.O. x N)</u>
Type VMF	15	.40	6.00
Type A VMA	12	.34	4.08
Type B VMA	20	.37	7.40
Type VR	1	.62	.62
Type VT	3	.26	.78
Total	<u>51</u>		<u>17.48</u>

(b) Using the sizing factor of 17.48 in Column 1 of Table 211-08, Category Code 211 08, the requirement for 5,500 square feet is read from Column 2. Since it is planned to utilize one expeditionary van (hydraulics), the gross requirement is reduced by 528 square feet (1 x 160 x 3.3) which leaves a requirement for 4,972 square feet of permanent shop area. The Type I hangar configured for the H&MS squadron provides space for the Airframes Shop.

Step 3: (Avionics Shop)

(a) To obtain the sizing factor of the Avionics Shop, use the same

approach as in paragraph (a) of Step 1, but refer to basic Category Code 211 45, Avionics Shop, and use the format described therein.

Avionics Shop, Category Code 211 45

<u>A/C</u>	<u>No.(n) A/C</u>	<u>I.M.O.</u>	<u>Sizing Factor (I.M.O. x n)</u>
Type VMF	15	.66	10.00
Type A VMA	12	.75	9.00
Type B VMA	<u>20</u>	1.00	<u>20.00</u>
	47		39.00
Type VR	1	.50	0.50
Type VT	<u>3</u>	.40	<u>1.20</u>
Total	4		<u>1.70</u>

(b) Using a sizing factor of 39.00 for VMF/VMA in Table 211-45 B, a requirement of 15,400 square feet is read from Column 1. Using a sizing factor of 1.70 for VR/VT in Table 211-45, a requirement of 2,000 square feet is read from Column 3. The total requirement is then computed as 15,529 square feet using Equation (1) of Category Code 211 45. Since it is not planned to utilize any expeditionary vans with this facility at this particular installation, 15,529 square feet represents the area of permanent construction required.

Step 4: (Aviation Armament Shop)

(a) Same as paragraph (a) of Step 1 above, but refer to basic Category Code 211 54 Aviation Armament Shop.

Aviation Armament Shop, Category Code 211 45

<u>A/C</u>	<u>No.(n) A/C</u>	<u>I.M.O.</u>	<u>Sizing Factor (I.M.O. x n)</u>
Type VMF	15	.08	1.20
Type A VMA	12	.08	.96
Type B VMA	20	.08	1.60
Type VR	1	-0-	-0-
Type VT	<u>3</u>	-0-	<u>-0-</u>
Total	<u>51</u>		<u>3.76</u>

(b) Using the total sizing factor of 3.76 in Column 1 of Table 211-54, Category Code 211 54, the requirement for 7,500 square feet is read from Column 2. Since it is planned to utilize two expeditionary vans (missile check-out and test), the gross requirement is reduced by 1,056 square feet (2 x 160 x 3.3) which leaves a requirement for 6,444 square feet of permanent shop area.

Step 5: (Parachute and Survival Equipment Shop)

(a) Same as paragraph (a) of Step 1, but refer to basic Category Code 211 75, Parachute and Survival Equipment Shop.

Parachute and Survival Equipment Shop, Category Code 211 45

<u>A/C</u>	<u>No.(n) A/C</u>	<u>I.M.O.</u>	<u>Sizing Factor (I.M.O. x n)</u>
Type VMF	15	.24	3.60
Type A VMA	12	.08	.96
Type B VMA	20	.14	2.80
Type VR	1	.35	.35
Type VT	3	.14	.42
Total	<u>51</u>		<u>8.13</u>

(b) Using the total sizing factor of 8.13 in the VA/VF column of Table 211 75A, Category Code 211 75, the requirement for 4,000 square feet is read from the gross area column. Since the VMF type used in this typical mix utilizes a drogue chute and there are less than 100 such chutes assigned, an additional 1,200 square feet is authorized by Table 211 75B. Since there are no expeditionary vans planned for use with this shop, the total requirement for permanent shop space is an area of 5,200 square feet.

Step 6: (Ground Support Equipment Shop and Shed)

(a) Criteria for the Ground Support Equipment Shop and Shed are provided in Category Codes 218 60 and 218 61.

Step 7: (Summary)

(a) In summary the Intermediate Maintenance Shop space requirements for the typical Marine Corps Fighter/Attack Group used for this example are summarized as follows:

<u>Steps</u>	<u>Shop Space</u>	<u>No. Vans</u>	<u>Area of Permanent Building</u>
1	No computation involved		
2	Airframes	1	4,972
3	Avionics	0	15,529
4	Aviation Armament	2	6,444
5	Parachute and Survival Equip	0	5,200
6	Ground Support Equip Shop	See Category Code 218 60	
	Ground Support Equip Shed	See Category Code 218 61	

(b) In addition to shop space, one Type I hangar (configured for an H&MS squadron) is required for support of the H&MS squadron. This hangar requirement is in addition to the hangar modules for organizational maintenance as computed in Category Codes 211 05, 211 06 and 211 07.

4. See NAVFAC P-272 for definitive drawings of:

a. A Type I hangar configured for an H&MS squadron supporting a typical VMF/VMA group, including the intermediate level airframes space.

- b. An H&MS Avionics Shop configured for a typical VMF/VMA group.
- c. An H&MS Avionics Shop configured for a typical helicopter group.
- d. A combined GSE shop and shed and Parachute and Survival Equipment Shop configured for a typical VMF/VMA group.
- e. A combined Jet Engine Maintenance Shop and Armament Shop configured for a typical VMF/VMA group.