Energy, Mineral & Land Resources
ENVIRONMENTAL QUALITY

PAT McCRORY
Governor

DONALD R. VAN DER VAART
Secretary

TRACY DAVIS
Director

August 19, 2016

Commanding Officer
MCB Camp Lejeune
c/o Neal Paul, Deputy Public Works Director
1005 Michael Road
Camp Lejeune, NC 28547

Subject: **Stormwater Permit No. SW8 070847 Mod. (EXPRESS)**
MARSOC Complex
Overall Low Density with Pockets of High Density
Onslow County

Dear Mr. Paul:

The Wilmington Regional Office received a complete, modified Stormwater Management Permit Application for MARSOC Complex on July 27, 2016. Staff review of the plans and specifications has determined that the modified project, as proposed, will comply with the Stormwater Regulations set forth in Title 15A NCAC 2H.1000 and SL 2008-211. We are forwarding modified Permit No. SW8 070847 Modification dated August 19, 2016, for the construction, operation and maintenance of the BMP's and built-upon areas associated with the subject project. The modifications and corrections covered by this permit have been listed on the attached table.

Please replace the previously approved Master Plan sheet with the attached approved Master Plan sheet stamped received on August 18, 2016, and add the approved plans for the approved modification to the approved plan set. All other previously approved plans remain in full force and effect, except as changed by this modification. Attached to this permit are the application, new BMP supplement form(s), O&M agreement(s), updated Drainage Area attachment sheets and the updated Master Table attachment.

This permit shall be effective from the date of issuance until **January 23, 2022**, and the project and the permittee shall be subject to the terms, conditions and limitations as specified therein. Please pay special attention to the Operation and Maintenance requirements contained in this permit. Failure to establish an adequate operation and maintenance program for the stormwater management system will result in future compliance problems.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing by filing a written petition with the Office of Administrative Hearings (OAH). The written petition must conform to Chapter 150B of the North Carolina General Statutes. Per NCGS 143-215.1(e) the petition must be filed with the OAH within thirty (30) days of receipt of this permit. You should contact the OAH with all questions regarding the filing fee (if a filing fee is required) and/or the details of the filing process, at 6714 Mail Service Center, Raleigh, NC 27699-6714, or Telephone 919-431-3000 or visit their website at www.NCOAH.com. Unless such demands are made within the specified time frame, this permit shall be final and binding.

If you have any questions about this permit or its conditions, please contact Linda Lewis at (910) 796-7215 or by email at linda.lewis@ncdenr.gov

Sincerely,

Margaret D Scott

For Tracy E. Davis, P.E., Director
Division of Energy, Mineral and Land Resources

GDS/arl: G:\WQ\Shared\Stormwater\Permits&Projects\2007\070847 HD\2016 08 permit 070847

cc: Stephen Medvick, P.E., NAVFAC Midlant, MCIPT (9324 Virginia Ave., BLGD Z-140 Room 104, Norfolk, VA 23511)
Thomas Bradshaw, P.E., MCB Camp Lejeune

STATE OF NORTH CAROLINA

DEPARTMENT OF ENVIRONMENTAL QUALITY

DIVISION OF ENERGY, MINERAL AND LAND RESOURCES

STATE STORMWATER MANAGEMENT PERMIT

OVERALL LOW DENSITY DEVELOPMENT WITH AREAS OF HIGHER DENSITY

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations

PERMISSION IS HEREBY GRANTED TO

Commanding Officer, MCB Camp Lejeune

MARSOC Complex

Stone Bay, Rifle Range Road, Camp Lejeune, Onslow County

FOR THE

construction, operation and maintenance of eighteen (18) alternative design open sand filters, seven (7) standard design open sand filters, and six (6) infiltration basins, to treat runoff from the areas of higher density, and the associated built-upon areas, in compliance with the provisions of 15A NCAC 2H .1000, 1995 version, (hereafter referred to as the *"stormwater rules"*) and the approved stormwater management plans and specifications and other supporting data as attached and on file with and approved by the Division of Energy, Mineral and Land Resources (the "*Division*") and considered a part of this permit.

This permit shall be effective from the date of issuance until January 23, 2022, and shall be subject to the following specified conditions and limitations:

I. DESIGN STANDARDS

1. This permit is effective only with respect to the nature and volume of stormwater described in the application and other supporting data.

2. The sand filters can be modified to deal with increases in drainage area and/or built-upon area by moving the weir wall further into the sand area to expand the required sediment area, with a corresponding reduction in the sand area, for no net change in the overall size of the sand filter or in the provided volume. A new minimum volume must be calculated based on the new proposed condition. The proposed sand filter area, sediment area, Hmax, and volume must be sufficient to accommodate the new design minimums.

3. The overall tract built-upon area percentage for the 613.37 acre project area must be maintained at no more than 25% of the total tract area, per the requirements of Section .1005 of the stormwater rules. The overall tract built-upon area percentage for the 92.447 acre tract must be maintained at no more than 12% of the total tract area above MHW, per the requirements of Section .1005 of the stormwater rules. The 613.37 acre project area is currently permitted for a maximum of 6,679,599 square feet of BUA based on 25% of the total tract area. The 92.447 acre project area is currently permitted for a maximum of 483,241 square feet of BUA based on 12% of the total tract area above MHW.

4. Future development within MARSOC must be permitted as a modification to this permit. Any new BMP's that are required to serve high density development within MARSOC must be designed using the most recent design requirements. The runoff from any BUA that is added within the drainage area of an existing sand filter must be accounted for at the level specified in the SA rule which is in force at the time the modification is received.

5. After this modification, there is 1,666,019 sf of remaining BUA available within the 613.37 acre original MARSOC tract and there is 20 square feet of future BUA available within the 92.447 acre tract.

6. The stormwater systems have been approved for the management of stormwater runoff as described in Sections I.13, I.14 and I.15 of this permit. The stormwater control BMP's have been designed to handle the runoff from a total of 3,594,623 square feet of impervious area in eighteen (18) alternative design open sand filters, seven (7) standard sand filters, and six (6) infiltration basins from the areas designated as a pocket of high density. The "low density" built-upon area of 1,418,270 square feet that is not associated with an area of higher density is not required to be treated until such time as the overall density within MARSOC exceeds 25%. The untreated areas are required to meet the low density rules to limit piping, use vegetated conveyances to transport runoff, and promote sheet flow and infiltration of the runoff in vegetated areas as much as possible.

7. A 30-foot-wide vegetated buffer shall be provided and maintained adjacent all surface waters within the 613.37 acre MARSOC tract subject to an overall maximum density of 25%. A 50-foot-wide vegetated buffer shall be provided and maintained adjacent all surface waters within the 92.447 acre tract which is subject to an overall maximum density of 12%. No built-upon area shall be allowed in either the 30-foot or the 50-foot buffer.

8. The runoff from all built-upon area within the permitted drainage area of each designated high density drainage area must be directed into the appropriate permitted stormwater control BMP.

9. Development within CAMA's Area of Environmental Concern or in 401/404 wetlands may result in a reduction of the overall maximum allowable built-upon area.

10. The discharge leaving each of the eighteen (18) alternative design sand filters (1, 3, 5, 6, 7, 8, 9A, 9B, 9C, 10, 11, 12, 13, 14, 15, 16, 17, and 22) and the seven (7) standard sand filters (24, 25, 26, 27, 28, 29 and 30) through the underdrain shall be directed at a non-erosive rate into a level spreader and vegetated filter strip system with sufficient area capable of providing effective infiltration of the discharged design storm volume such that no direct discharge to SA waters occurs.

11. The excess design storm from each of the seven (7) standard sand filters and each of the six (6) infiltration basins must overflow into a level spreader and 50' vegetated filter strip capable of passing the peak flow from the 10 year storm in a non-erosive manner.

12. The receiving stream for all BMP's permitted as part of MARSOC is either Stones Bay, Index No. WOK02 19-30, classified as SA HQW or the New River, Index No. WOK02 19-27, also classified as SA HQW. The project is within ½ mile of and draining to SA waters, therefore all of the BMP's must be designed per the rules governing SA waters.

13. The following design criteria have been permitted for the eighteen (18) alternative design open sand filter systems and must be provided and maintained at design condition. Refer to the individual supplement forms for additional design information.

Design Criteria	BMP #1	BMP #3	BMP #5	BMP #6	BMP #7	BMP #8
a. Drainage Area: acres	11.56	22.43	1.92	1.63	2.39	8.08
-Onsite, ft^2	503,464	977,196	83,510	70,919	104,051	351,877
-Offsite, ft^2	0	0	0	0	0	0
b. Total BUA, ft^2	178,167	399,360	61,693	43,693	30,115	155,193
c. Design Storm, in.(composited)	1.725	3.07	1.51	1.5	3.0	1.98
d. Adjusted WQV, ft^3	20,017	76,856	5,615	4,023	6,057	19,764
e. Provided WQV, ft^3	25,749	77,357	8,119	5,400	7,933	30,096
f. HMax provided, feet	1.0	2.26	1.0	1.0	1.0	2.4
g. Weir Elevation, FMSL	30.7	28.76	38.5	30.5	34.0	45.0
h. Bypass Elevation, FMSL	31.3	30.5	38.85	31.7	34.4	46.4
i. Bottom elevation, FMSL	27.7	24.5	35.5	27.5	31.0	42.0
j. SHWT Elevation, FMSL	23.0	19.5	24.5	24.0	24.0	38.0
k. Total Sand Filter Area, ft^2	25,749	34,229	8,119	5,400	7,933	12,609
l. Sediment Area As provided	1,794	7,631	506	355	509	1,814
m. Sand Area Af provided	23,955	26,598	7,613	5,045	7,343	10,726
n. Underdrain dia. <40 hrs.	6"	6"	6"	6"	6"	6"

Design Criteria	BMP #9a	BMP #9b	BMP #9c	BMP #10	BMP #11	BMP #12
o. Drainage Area: acres	2.31	2.82	5.14	5.97	4.88	5.95
-Onsite, ft^2	100,519	122,940	223,782	260,028	212,369	259,239
-Offsite, ft^2	0	0	0	0	0	0
p. Total BUA, ft^2	58,683	85,232	114,702	170,760	161,395	197,120
q. Design Storm, in. (composited)	1.5	1.5	1.5	1.5	1.5	1.5
r. Adjusted WQV, ft^3	5,430	7,758	10,727	15,627	14,628	17,835
s. Provided WQV, ft^3	5,575	8,455	10,837	15,627	15,170	19,107
t. HMax provided, feet	1.5	1.1	2.5	2.25	1.75	1.5
u. Weir Elevation, FMSL	45.5	33.1	35.5	42.25	34.75	32.5
v. Bypass Elevation, FMSL	46.0	33.4	35.75	43.10	35.25	32.7
w. Bottom Elevation, FMSL	42.0	30.0	31.0	38.0	31.0	29.0
x. SHWT Elevation, FMSL	39.5	22.0	27.0	34.0	24.5	28.0
y. Total Sand Filter Area, ft^2	3,716	7,686	4,334	6,945	8,669	12,738
z. Sediment Area As, provided	481	749	946	1,368	1,296	1,580
aa. Sand Area, Af, provided	3,235	6,937	3,388	5,577	7,373	11,158
bb. Underdrain dia.<40 hrs.	6"	6"	6"	6"	6"	6"

Design Criteria	BMP #13	BMP #14	BMP #15	BMP #16	BMP #17	BMP #22
cc. Drainage Area: acres	9.63	3.52	11.53	8.20	0.97	3.73
-Onsite, ft^2	419,600	153,526	502,181	357,005	42,290	162,523
-Offsite, ft^2	0	0	0	0	0	0
dd. Total BUA, ft^2	268,566	100,971	303,159	116,044	18,765	90,931
ee. Design Storm, in. (composit)	1.56	3.65	1.63	1.5	1.5	1.5
ff. Adjusted WQV ft^3	25,674	20,766	30,282	11,824	1,784	8,432
gg. Provided WQV, ft^3	32,280	27,768	33,781	12,846	2,151	8,497
hh. HMax provided, feet	1.2	1.67	1.0	1.0	0.5	1.3
ii. Weir Elevation, FMSL	32.9	41.38	17.5	19.0	36.5	27.3
jj. Bypass Elevation, FMSL	33.15	41.5	17.8	19.35	36.75	28.38
kk. Bottom Elev., FMSL	29.7	37.8	14.5	16.0	34.0	26.0
ll. SHWT elevation, FMSL	27.5	34.5	12.0	13.50	32.67	24.0
mm. Total Sand Filter Area ft^2	26,900	11,412	33,781	12,846	6,536	6,536
nn. Sediment Area As provided	2,434	1,831	2,779	1,112	742	742
oo. Sand Area Af provided	24,466	9,581	30,002	11,734	5,794	5,794
pp. Underdrain dia. <40 hrs.	6"	6"	6"	6"	6"	6"

14. The following design criteria have been permitted for the seven (7) standard sand filters. These criteria must be provided and maintained at design condition. Refer to the individual supplement form for additional design information.

Design Criteria	BMP #24	BMP #25	BMP #26	BMP #27	BMP #28	BMP #29	BMP #30
a. Drainage Area: acres	4.71	5.55	5.79	9.62	2.75	4.37	3.64
-Onsite, ft^2:	205,120	241,671	252,153	418,940	119,810	190,357	158,381
-Offsite, ft^2:	0	0	0	0	0	0	0
b. Total BUA, ft^2:	143,496	132,077	138,077	250,977	35,284	80,150	99,742
c. Design Storm, in. (SCS)	3.83	3.83	3.83	3.83	3.68	3.68	3.65
d. Design Storm basis	SCS	SCS	SCS	SCS	SCS	SCS	SCS
e. Adjusted WQV ft^3	19,885	18,521	19,360	35,028	5,526	11,913	20,478
f. Permitted WQV, ft^3	23,096	21,722	22,368	43,344	7,221	15,427	20,959
g. Open or Closed?	Closed	Closed	Closed	Closed	Closed	Closed	Closed
h. HMax provided, feet	1.75	1.75	1.75	1.75	2.0	2.0	2.0
i. Weir Elevation, FMSL	23.25	21.25	23.75	17.75	13.0	22.0	34.25
j. Bypass Elev., FMSL:	23.5	21.5	24	18.25	13.0	22.0	34.4
k. Bottom Elev. FMSL	20.0	18.0	20.5	14.5	9.5	17.5	30.4
l. SHWT elevation, FMSL	18.0	16.0	18.5	12.5	7.5	15.0	29.3
m. Total Sand Filter Area ft^2	11,584	10,861	11,184	21,672	2,589	6,098	10,469
n. Sediment Area As provided	1,777	1716	1,901	3,198	1,741	2,723	3,279
o. Sand Area Af provided	9,771	9145	9,283	18,474	848	3,375	7,190
p. # Underdrains Provided	11	8	8	16	2	2	4
q. Underdrain diameter, in.	6	6	6	6	6	6	4

15. The following design criteria have been permitted for the six (6) infiltration basin systems and must be provided and maintained at design condition. Refer to the individual supplement forms for additional design information.

Design Criteria	BMP #4	BMP #18	BMP #19	BMP #20	BMP #21	BMP #23
a. Drainage Area: acres	0.74	1.18	0.58	0.64	0.45	2.63
-Onsite, ft^2:	32,097	45,454	24,947	27854	19,486	114,572
-Offsite, ft^2:	0	0	0	0	0	0
b. Total Impervious Surfaces, ft^2:	22,295	24,505	12,949	19,707	13,345	67,470
c. Design Storm, in.	1.5	3	3	1.5	1.5	1.5
d. Basin Depth, ft:	0.5	2	2	2.0	1.7	1.21
e. Bottom Elev., FMSL:	22.0	36.0	36.0	41.0	47.0	35.0
f. Bottom Surface Area, ft^2:	1,308	3,906	1,665	1,580	619	8,280
g. Bypass Weir Elevation, FMSL:	22.5	37.5	37.75	43.0	48.7	36.21
h. Permitted Storage Volume, ft^3:	5,790	6,669	3,042	5,795	1,978	11,075
i. Type of Soil:	MaC-Marvyn	Sand	Sand	Sand	Sand	Kureb
j. Expected Infiltration Rate, in/hr:	1.4	10	10	1.4	8.9	4.1
k. SHWT Elevation, FMSL:	18.0	34.0	34.0	39.5	45.0	33.0
l. Draw Down Time, hrs:	18	3	3	31.0	4.3	3.6

II. SCHEDULE OF COMPLIANCE

1. The stormwater management systems shall be constructed in its entirety, vegetated and operational for its intended use prior to the construction of any built-upon surface.

2. During construction, erosion shall be kept to a minimum and any eroded areas of the system will be repaired immediately.

3. The stormwater management systems shall be constructed in accordance with the approved plans and specification, the conditions of this permit, and other supporting data.

4. If the stormwater management system was used as an Erosion Control device, it must be restored to design condition prior to operation as a stormwater treatment device, and prior to occupancy of the facility.

5. The permittee shall maintain access to the stormwater management system at all times for the purpose of inspection, operation and maintenance.

6. The permittee shall at all times provide the operation and maintenance necessary to assure the permitted stormwater system functions at optimum efficiency. The signed Operation and Maintenance agreement must be followed in its entirety and maintenance must occur at the scheduled intervals including, but not limited to:
   a. Semiannual scheduled inspections (every 6 months).
   b. Sediment removal.
   c. Mowing and revegetation of slopes and the vegetated filter.
   d. Immediate repair of eroded areas.
   e. Maintenance of all slopes in accordance with approved plans and specifications.
   f. Debris removal and unclogging of bypass structure, infiltration media, flow spreader, catch basins, piping, level spreader and vegetated filter.
   g. A clear access path to the bypass structures must be available at all times.

7. Records of maintenance activities must be kept and made available upon request to authorized personnel of DEMLR. The records will indicate the date, activity, name of person performing the work and what actions were taken.

8. The permittee shall submit to the Director and shall have received approval for revised plans, specifications, and calculations prior to construction, for any modification to the approved plans, including, but not limited to, those listed below:
   a. Any revision to any item shown on the approved plans, including the stormwater management measures, built-upon area, details, etc.
   b. Redesign or addition to the approved amount of built-upon area or to the drainage area.
   c. Further subdivision, lease or sale of all or part of the project area.
   d. Acquisition of additional land that will become part of the common plan of development.
   e. Any alteration to the drainage system as shown on the approved plan, including but not limited to, location, grades, surface areas, addition of piping, side slopes, width or depth, etc.

9. Upon completion of construction, prior to issuance of a Certificate of Occupancy, and prior to operation of this permitted facility, a certification must be received from an appropriate designer for the system installed certifying that the permitted facility has been installed in accordance with this permit, the approved plans and specifications, and other supporting documentation. Any deviations from the approved plans and specifications must be noted on the Certification. A modification may be required for those deviations.

10. The permittee shall submit final site layout and grading plans for any future areas shown on the approved plans, prior to construction. Such projects shall be reviewed for a proposed collection system and the creation of an area of higher density. If a collection system or an area of higher density is proposed, the applicant shall design, permit and construct a suitable BMP to treat the associated runoff.

11. The Director may notify the permittee when the permitted site does not meet one or more of the minimum requirements of the permit. Within the time frame specified in the notice, the permittee shall submit a written time schedule to the Director for modifying the site to meet minimum requirements. The permittee shall provide copies of revised plans and certification in writing to the Director that the changes have been made.

III. GENERAL CONDITIONS

1. This permit is not transferable to any person or entity except after notice to and approval by the Director. At least 60 days prior to a change of ownership, or a name change of the permittee or of the project, or a mailing address change, the permittee must submit a completed and signed Name/Ownership Change form to the Division, accompanied by the appropriate documentation as listed on the form. The approval of this request will be considered on its merits and may or may not be approved.

2. The permittee is responsible for compliance with all permit conditions until such time as the Division approves a request to transfer the permit.

3. Any individual or entity found to be in noncompliance with the provisions of a stormwater management permit or the stormwater rules is subject to enforcement procedures as set forth in North Carolina General Statute 143, Article 21.

4. The issuance of this permit does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other government agencies (local, state, and federal) having jurisdiction.

5. In the event that the facilities fail to perform satisfactorily, the Permittee shall take immediate corrective action, including those as may be required by this Division, such as the construction of additional or replacement stormwater management systems.

6. The permittee grants DEQ / DEMLR Staff permission to enter the property during normal business hours for the purpose of inspecting all components of the permitted stormwater management facility. The Division acknowledges that due to the nature of the project, prior notification of an inspection is necessary in order for the Base to provide an escort.

7. The permit may be modified, revoked and reissued or terminated for cause. The filing of a request for a permit modification, revocation and re-issuance or termination does not stay any permit condition.

8. Unless specified elsewhere, permanent seeding requirements for the stormwater control must follow the guidelines established in the North Carolina Erosion and Sediment Control Planning and Design Manual.

9. The approved plans, application, supplements, O&M agreements, calculations and other supporting documentation for this project are incorporated by reference and are enforceable parts of this permit. A copy of the approved plans and documentation shall be maintained on file by the Permittee at all times.

10. The permittee shall submit a permit renewal request to the Director at least 180 days prior to the expiration date of this permit. The request shall include a completed renewal application, fee, and supporting documentation.

Permit modified and reissued this the 19th day of August 2016.

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

For Tracy E. Davis, P.E., Director
Division of Energy, Mineral and Land Resources
By Authority of the Environmental Management Commission

MARSOC – SW8 070847
Onslow County

Designer's Certification

I, _____, as a duly registered _____ in the State of North Carolina, having been authorized to observe (periodically/ weekly/ full time) the construction of the BMP's for the project,

_____
(Project & BMP numbers)

for _____(Project Owner) hereby state that, to the best of my abilities, due care and diligence was used in the observation of the project construction such that the construction was observed to be built within substantial compliance and intent of the approved plans and specifications.

The checklist of items on page 2 of this form is included in the Certification.

Noted deviations from approved plans and specification.

SEAL

Signature _____

Registration Number _____

Date _____

Certification Requirements:

_____1. The drainage area to the system contains approximately the permitted acreage.

_____2. The drainage area to the system contains no more than the permitted amount of built-upon area.

_____3. All the built-upon area associated with the project is graded such that the runoff drains to the system.

_____4. All roof drains are located such that the runoff is directed into the system.

_____5. The bypass structure weir elevation is per the approved plan.

_____6. The bypass structure is located per the approved plans.

_____7. A Trash Rack is provided on the bypass structure.

_____8. All slopes are grassed with permanent vegetation.

_____9. Vegetated slopes are no steeper than 3:1.

_____10. The inlets are located per the approved plans and do not cause short-circuiting of the system.

_____11. The permitted amounts of surface area and/or volume have been provided.

_____12. All required design depths are provided.

_____13. All required parts of the system are provided, including a level spreader and vegetated filter.

_____14. The required system dimensions are provided per the approved plans.

cc: NCDEQ-DEMLR Regional Office
Thomas Bradshaw, MCB Camp Lejeune

SW8 070847 MARSOC 613.37 acre complex MASTER TABLE

BMP	Buildings	Street	Parking	Sidewalks	Other	Existing	Future	Total	Last Mod
1	26833.0	40271.0	79961.0	12508.0	3430.0	0.0	15164.0	178167.0	9/25/2014
3	105564.0	88636.0	167888.0	35087.0	2185.0	0.0		399360.0	9/25/2014
4	22295.0	0.0	0.0	0.0	0.0	0.0		22295.0	7/11/2008
5	1529.0	0.0	58403.0	1761.0	0.0	0.0		61693.0	9/25/2014
6	0.0	0.0	37784.0	1525.0	4384.0	0.0		43693.0	3/17/2011
7	23731.0	0.0	0.0	2001.0	4383.0	0.0		30115.0	11/9/2011
8	73235.0	49767.0	13310.0	18614.0	267.0	0.0		155193.0	9/25/2014
9a	0.0	0.0	57969.0	714.0	0.0	0.0		58683.0	3/17/2011
9b	0.0	0.0	85121.0	111.0	0.0	0.0		85232.0	3/17/2011
9c	5168.0	100074.0	0.0	9239.0	0.0	0.0	221.0	114702.0	9/25/2014
10	41317.0	3490.0	115252.0	1800.0	6050.0	0.0	2851.0	170760.0	9/25/2014
11	37784.0	119.0	123492.0	0.0	0.0	0.0		161395.0	3/17/2011
12	45913.0	0.0	133859.0	1275.0	6050.0	0.0	10023.0	197120.0	11/9/2011
13	28096.0	20148.0	197063.0	310.0	13749.0	0.0	9200	268566.0	9/25/2014
14	11932.0	8677.0	68264.0	1432.0	902.0	0.0	9764	100971.0	3/14/2016
15	123959.0	116709.0	58870.0	3621.0	0.0	0.0		303159.0	7/18/2013
16	4000.0	11430.0	80463.0	8187.0	6899.0	0.0	5065.0	116044.0	10/12/2012
17 (Fire Station)	2907.0	14778.0	0.0	0.0	1080.0	0.0		18765.0	12/15/2011
18 (Fire Station)	11214.0	2873.0	7781.0	2068.0	569.0	0.0		24505.0	12/15/2011
19 (Fire Station)	0.0	1064.0	10815.0	1070.0	0.0	0.0		12949.0	12/2/2008
20 (Exchange)	3050.0	1620.0	13503.0	1534.0	0.0	0.0		19707.0	3/29/2011
21 (Exchange)	4198.0	1550.0	6932.0	78.0	587.0	0.0		13345.0	3/29/2011
22 (Building N)	37882.0	0.0	46510.0	6539.0	0.0	0.0		90931.0	10/11/2011
23 (Intel Ops)	0.0	5065.0	58979.0	3426.0	0.0	0.0		67470.0	10/12/2012
24 (MSOB/SERE SF#1)	60137.0	0.0	76851.0	1308.0	700.0	0.0	4500	143496.0	6/6/2014
25 (MSOB/SERE SF#2)	76070.0	0.0	36960.0	3204.0	843.0	0.0	15000	132077.0	6/6/2014
26 (MSOB/SERE SF#3)	76070.0	0.0	36960.0	3204.0	843.0	0.0	21000	138077.0	6/6/2014
27 (MSOB/SERE SF#4)	0.0	44105.0	167045.0	10031.0	2296.0	0.0	27500	250977.0	6/6/2014
28 (Shoothouse A P1391)	17253.0	6123.0	4036.0	5856.0	2016.0	0.0	0	35284.0	7/31/2014
29 (Indoor Range P1391)	46432.0	16874.0	11121.0	4597.0	1126.0	0.0	0	80150.0	7/31/2014
30 (Intel Ops Exp. P1396)	42340.0	0.0	41726.0	9589.0	4362.0	0.0	1725	99742.0	8/19/2016
Low Density (untreated)									
Existing (2007)	81335.0	608579.0	86248.0	22666.0	26174.0	99258.0		924260.0	
5/4/2011 vehicle lifts	0.0	18911.0	0.0	0.0	4832.0	0.0		23743.0	
11/10/2011 Multiple	6100.0	0.0	14698.0	6208.0	116768.0	0.0		143774.0	
10/08/2012 Multiple	14286.0	0.0	14152.0	0.0	1467.0	0.0		29905.0	
7/18/2013 Mod.	10728.0	4940.0	10809.0	9585.0	543.0	0.0		26725.0	
11/7/2013 Mod.	0.0	4940.0	0.0	0.0	0.0	0.0		4940.0	
SOF Loop Road mod.	0.0	46371.0	0.0	41868.0	0.0	0.0	0.0	88239.0	
P1393	24680.0	14215.0	82326.0	18373.0	455.0	0.0	0.0	140049.0	
7/30/14 Mod P1391	0.0	2343.0	0.0	0.0	302.0	0.0	0.0	2645.0	
R2 Mod 9/24/14	1260.0	13076.0	1390.0	6314.0	0.0	0.0	0.0	22040.0	
7/2015 mod P1396	0.0	0.0	7627.0	1052.0	362.0	0.0	0.0	9041.0	
3/14/16 Mod P1475	0.0	0.0	0.0	2909.0	0.0	0.0	0.0	2909.0	
8/19/2016 P1396B	0.0	0.0	0.0	687.0	0.0	0.0	0.0	687.0	
Low Density Subtotal	138389.0	703495.0	217250.0	109662.0	150903.0	99258.0	0.0	1418957.0	
Total permitted BUA	1067298.0	1236868.0	2014168.0	260351.0	213624.0	99258.0	122013.0	5013580.0	
Current percent impervious		18.8%							
Maximum allowed BUA		6679599.0							
Total BUA remaining		1666019.0	as of	8/19/2016					

The following modifications and corrections are currently included in this permit:

AUGUST 19, 2016:

1. The drainage area for BMP #30 increased to 158,381 sf for P-1396B
2. Used up 6,987 sf of the 8,712 sf future BUA allocation to add a building, parking and sidewalk for P-1396B, leaving 1,725 sf available for future development.
3. Added 687 sf of untreated sidewalk to the overall 613.37 acre low density MARSOC project.

MARCH 14, 2016:

1. The drainage area and built-upon area of BMP #14 have been increased to accommodate P-1475, Cultural Assimilation Facility.
2. An alternate bid jogging trail that will add 2,909 square feet of BUA within the untreated portion of the 613.37 acre low density tract.
3. Corrected a mix-up in the reporting of the values for sediment basin area (A_S), filter area (A_F), and total sand filter area for BMP #12.
4. Corrected a mix-up in the reporting of the values for filter area (A_F) and total sand filter area for BMP #13.
5. Corrected a reporting error for the permitted WQV for BMP #30 to 20,959 cubic feet.
6. Changed the drainage area titles in Sections I.13, I.14 and I.15 of this permit from "Basin" to "BMP #" to match up with the supplement forms.
7. Added a "last modified date" column to the Master Table attached to this permit.

DEMLR USE ONLY		
Date Received	Fee Paid	Permit Number
5/27/16	$6,000 (3 checks combined)	SW8070847

Applicable Rules: (select all that apply) ☐ Coastal SW – 1995 ☐ Coastal SW – 2008 ☐ Ph II - Post Construction ☐ Non-Coastal SW- HQW/ORW Waters ☐ Universal Stormwater Management Plan ☐ Other WQ Mgmt Plan: _____

State of North Carolina
Department of Environment and Natural Resources
Division of Energy, Mineral and Land Resources

STORMWATER MANAGEMENT PERMIT APPLICATION FORM

This form may be photocopied for use as an original

I. GENERAL INFORMATION

1. Project Name (subdivision, facility, or establishment name - should be consistent with project name on plans, specifications, letters, operation and maintenance agreements, etc.):

   MARSOC

2. Location of Project (street address):

   MARSOC STONE BAY

   City: Camp Lejeune County: Onslow Zip: 28540

3. Directions to project (from nearest major intersection):

   Projects are at multiple locations in the MARSOC Complex in the Stone Bay/Rifle Range Road Area at MCB Camp Lejeune, North Carolina.

4. Latitude: 34° 34' 44" N Longitude: -77° 26' 43" W of the main entrance to the project.

II. PERMIT INFORMATION:

1. a. Specify whether project is (check one): ☐ New ☒ Modification ☐ Renewal w/ Modification†

   †*Renewals with modifications also requires SWU-102 – Renewal Application Form*

   b. If this application is being submitted as the result of a **modification** to an existing permit, list the existing permit number SW8070847, its issue date (if known) 9/24/14, and the status of construction: ☐ Not Started ☐ Partially Completed* ☐ Completed* **provide a designer's certification*

2. Specify the type of project (check one):
   ☐ Low Density ☐ High Density ☐ Drains to an Offsite Stormwater System ☐ Other

3. If this application is being submitted as the result of a **previously returned application** or a **letter from DEMLR requesting a state stormwater management permit application**, list the stormwater project number, if assigned, _____ and the previous name of the project, if different than currently proposed, _____.

4. a. Additional Project Requirements (check applicable blanks; information on required state permits can be obtained by contacting the Customer Service Center at 1-877-623-6748):
   ☐ CAMA Major ☒ Sedimentation/Erosion Control: 1.0 ac of Disturbed Area
   ☐ NPDES Industrial Stormwater ☐ 404/401 Permit: Proposed Impacts _____

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   b. If any of these permits have already been acquired please provide the Project Name, Project/Permit Number, issue date and the type of each permit: _____

5. Is the project located within 5 miles of a public airport? ☒ No ☒ Yes
   If yes, see S.L. 2012-200, Part VI: http://portal.ncdenr.org/web/lr/rules-and-regulations

III. CONTACT INFORMATION

1. a. Print Applicant / Signing Official's name and title (specifically the developer, property owner, lessee, designated government official, individual, etc. who owns the project):

Applicant/Organization: Commanding Officer-USMCB Camp Lejeune, North Carolina

Signing Official & Title: Thomas Bradshaw, Civil Engineer Public Works Department for Neal Paul

b. Contact information for person listed in item 1a above:

Street Address: 1005 Michael Road

City: Camp Lejeune State: NC Zip: 28547

Mailing Address (*if applicable*):

City: State: Zip:

Phone: (910) 451-3238 x-3285 Fax: (910) 451-2927

Email: thomas.bradshaw@usmc.mil

c. Please check the appropriate box. The applicant listed above is:

- ☐ The property owner (Skip to Contact Information, item 3a)
- ☐ Lessee* (Attach a copy of the lease agreement and complete Contact Information, item 2a and 2b below)
- ☐ Purchaser* (Attach a copy of the pending sales agreement and complete Contact Information, item 2a and 2b below)
- ☐ Developer* (Complete Contact Information, item 2a and 2b below.)

2. a. Print Property Owner's name and title below, if you are the lessee, purchaser or developer. (This is the person who owns the property that the project is located on):

Property Owner/Organization:

Signing Official & Title:

b. Contact information for person listed in item 2a above:

Street Address:

City: State: Zip:

Mailing Address (*if applicable*):

City: State: Zip:

Phone: ( ) Fax: ( )

Email:

3. a. (Optional) Print the name and title of another contact such as the project's construction supervisor or other person who can answer questions about the project:

Other Contact Person/Organization:

Signing Official & Title:

b. Contact information for person listed in item 3a above:

Mailing Address:

City: State: Zip:

Phone: ( ) Fax: ( )

Email:

4. Local jurisdiction for building permits: N/A

Point of Contact: Phone #: ( )

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IV. PROJECT INFORMATION

1. In the space provided below, briefly summarize how the stormwater runoff will be treated.

   Stormwater treatment will be by density controls in low density areas and by sand filter treatment in the other areas.

   Adding P-1396 B adjacent to P-1396. Treatment for the P-1396 B areas will be by the sand filter approved for P-1396

2. a. **If claiming vested rights**, identify the supporting documents provided and the date they were approved:
   - ☐ Approval of a Site Specific Development Plan or PUD Approval Date: _____
   - ☐ Valid Building Permit Issued Date: _____
   - ☐ Other: _____ Date: _____

   b. **If claiming vested rights**, identify the regulation(s) the project has been designed in accordance with:
   - ☐ Coastal SW – 1995
   - ☐ Ph II – Post Construction

3. Stormwater runoff from this project drains to the White Oak River basin.

4. Total Property Area: 615.08/115.10 acres

5. Total Coastal Wetlands Area: 1.71 acres

6. Total Surface Water Area: 0 acres

7. Total Property Area (4) – Total Coastal Wetlands Area (5) – Total Surface Water Area (6) = Total Project Area*: 613.37/115.10 acres

   * *Total project area shall be calculated to exclude the following: the normal pool of impounded structures, the area between the banks of streams and rivers, the area below the Normal High Water (NHW) line or Mean High Water (MHW) line, and coastal wetlands landward from the NHW (or MHW) line. The resultant project area is used to calculate overall percent built upon area (BUA). Non-coastal wetlands landward of the NHW (or MHW) line may be included in the total project area.*

8. Project percent of impervious area: (Total Impervious Area / Total Project Area) X 100 = 18.7/12 %

9. How many drainage areas does the project have?2 *(For high density, count 1 for each proposed engineered stormwater BMP. For low density and other projects, use 1 for the whole property area)*

10. Complete the following information for each drainage area identified in Project Information item 9. If there are more than four drainage areas in the project, attach an additional sheet with the information for each area provided in the same format as below.

Basin Information	Drainage Area __	Drainage Area __	Drainage Area __	Drainage Area __
Receiving Stream Name	SEE ATTACHED			
Stream Class *				
Stream Index Number *				
Total Drainage Area (sf)				
On-site Drainage Area (sf)				
Off-site Drainage Area (sf)				
Proposed Impervious Area** (sf)				
% Impervious Area** (total)				

Impervious** Surface Area	Drainage Area __	Drainage Area __	Drainage Area __	Drainage Area __
On-site Buildings/Lots (sf)				
On-site Streets (sf)				
On-site Parking (sf)				
On-site Sidewalks (sf)				
Other on-site (sf)				
Future (sf)				
Off-site (sf)				
Existing BUA*** (sf)				
Total (sf):				

* *Stream Class and Index Number can be determined at: http://portal.ncdenr.org/web/wq/ps/csu/classifications*

** *Impervious area is defined as the built upon area including, but not limited to, buildings, roads, parking areas, sidewalks, gravel areas, etc.*

*** *Report only that amount of existing BUA that will remain after development. Do not report any existing BUA that is to be removed and which will be replaced by new BUA.*

11. How was the off-site impervious area listed above determined? Provide documentation. Field visit and topographic survey.

Projects in Union County: *Contact DEMLR Central Office staff to check if the project is located within a Threatened & Endangered Species watershed that may be subject to more stringent stormwater requirements as per 15A NCAC 02B .0600.*

V. SUPPLEMENT AND O&M FORMS

The applicable state stormwater management permit supplement and operation and maintenance (O&M) forms must be submitted for each BMP specified for this project. The latest versions of the forms can be downloaded from http://portal.ncdenr.org/web/wq/ws/su/bmp-manual.

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VI. SUBMITTAL REQUIREMENTS

Only complete application packages will be accepted and reviewed by the Division of Energy, Mineral and Land Resources (DEMLR). A complete package includes all of the items listed below. A detailed application instruction sheet and BMP checklists are available from http://portal.ncdenr.org/web/wq/ws/su/statesw/forms_docs. **The complete application package should be submitted to the appropriate DEMLR Office.** (The appropriate office may be found by locating project on the interactive online map at http://portal.ncdenr.org/web/wq/ws/su/maps.)

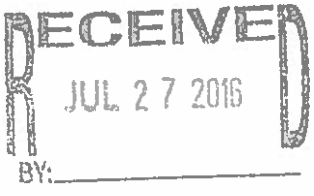
Please **indicate that the following required information have been provided by initialing** in the space provided for each item. All original documents MUST be signed and initialed in **blue ink. Download the latest versions for each submitted application package** from http://portal.ncdenr.org/web/wq/ws/su/statesw/forms_docs.

Initials

1. *Original and one copy* of the Stormwater Management Permit Application Form. _____
2. *Original and one copy* of the signed and notarized Deed Restrictions & Protective Covenants Form. *(if required as per Part VII below)* _____
3. *Original* of the applicable Supplement Form(s) (sealed, signed and dated) **and** O&M agreement(s) for each BMP. _____
4. Permit application processing fee of $505 *payable to NCDENR.* (For an Express review, refer to http://www.envhelp.org/pages/onestopexpress.html for information on the Express program _____

and the associated fees. Contact the appropriate regional office Express Permit Coordinator for additional information and to schedule the required application meeting.)

5. A detailed narrative (one to two pages) describing the stormwater treatment/management for the project. This is required in addition to the brief summary provided in the Project Information, item 1. _____
6. A USGS map identifying the site location. If the receiving stream is reported as class SA or the receiving stream drains to class SA waters within ½ mile of the site boundary, include the ½ mile radius on the map. _____
7. Sealed, signed and dated calculations (one copy). _____
8. Two sets of plans folded to 8.5" x 14" (sealed, signed, & dated), including: _____
   a. Development/Project name.
   b. Engineer and firm.
   c. Location map with named streets and NCSR numbers.
   d. Legend.
   e. North arrow.
   f. Scale.
   g. Revision number and dates.
   h. Identify all surface waters on the plans by delineating the normal pool elevation of impounded structures, the banks of streams and rivers, the MHW or NHW line of tidal waters, and any coastal wetlands landward of the MHW or NHW lines.
      - Delineate the vegetated buffer landward from the normal pool elevation of impounded structures, the banks of streams or rivers, and the MHW (or NHW) of tidal waters.
   i. Dimensioned property/project boundary with bearings & distances.
   j. Site Layout with all BUA identified and dimensioned.
   k. Existing contours, proposed contours, spot elevations, finished floor elevations.
   l. Details of roads, drainage features, collection systems, and stormwater control measures.
   m. Wetlands delineated, or a note on the plans that none exist. (Must be delineated by a qualified person. Provide documentation of qualifications and identify the person who made the determination on the plans.
   n. Existing drainage (including off-site), drainage easements, pipe sizes, runoff calculations.
   o. Drainage areas delineated (included in the main set of plans, not as a separate document).
   p. Vegetated buffers (where required).
9. Copy of any applicable soils report with the associated SHWT elevations (Please identify elevations in addition to depths) as well as a map of the boring locations with the existing elevations and boring logs. Include an 8.5"x11" copy of the NRCS County Soils map with the project area clearly delineated. For projects with infiltration BMPs, the report should also include the soil type, expected infiltration rate, and the method of determining the infiltration rate. **(Infiltration Devices submitted to WiRO:** *Schedule a site visit for DEMLR to verify the SHWT prior to submittal, (910) 796-7378.)* _____
10. A copy of the most current property deed. Deed book: MILITARY Page No: _____ _____
11. For corporations and limited liability corporations (LLC): Provide documentation from the NC Secretary of State or other official documentation, which supports the titles and positions held by the persons listed in Contact Information, item 1a, 2a, and/or 3a per 15A NCAC 2H.1003(e). The corporation or LLC must be listed as an active corporation in good standing with the NC Secretary of State, otherwise the application will be returned. _____
    http://www.secretary.state.nc.us/Corporations/CSearch.aspx



VII. DEED RESTRICTIONS AND PROTECTIVE COVENANTS

For all subdivisions, outparcels, and future development, the appropriate property restrictions and protective covenants are required to be recorded prior to the sale of any lot. If lot sizes vary significantly or the proposed BUA allocations vary, a table listing each lot number, lot size, and the allowable built-upon area must be provided as an attachment to the completed and notarized deed restriction form. The appropriate deed restrictions and protective covenants forms can be downloaded from http://portal.ncdenr.org/web/lr/state-stormwater-forms_docs. Download the latest versions for each submittal.

In the instances where the applicant is different than the property owner, it is the responsibility of the property owner to sign the deed restrictions and protective covenants form while the applicant is responsible for ensuring that the deed restrictions are recorded.

By the notarized signature(s) below, the permit holder(s) certify that the recorded property restrictions and protective covenants for this project, if required, shall include all the items required in the permit and listed on the forms available on the website, that the covenants will be binding on all parties and persons claiming under them, that they will run with the land, that the required covenants cannot be changed or deleted without concurrence from the NC DEMLR, and that they will be recorded prior to the sale of any lot.

VIII. CONSULTANT INFORMATION AND AUTHORIZATION

Applicant: Complete this section if you wish to designate authority to another individual and/or firm (such as a consulting engineer and/or firm) so that they may provide information on your behalf for this project (such as addressing requests for additional information).

Consulting Engineer: Steve Medvick, PE

Consulting Firm: NAVFAC Midlant, MC IPT

Mailing Address: 9324 Virginia Avenue, BLDG Z-140 Room 104

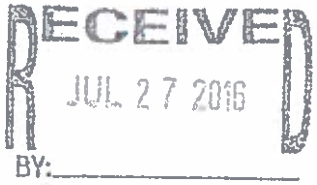
City: Norfolk State: VA Zip: 23511

Phone: (757) 341-0323 Fax: (757) 341-0677

Email: stephen.medvick@navy.mil

IX. PROPERTY OWNER AUTHORIZATION *(if Contact Information, item 2 has been filled out, complete this section)*

I, *(print or type name of person listed in Contact Information, item 2a)* _____, certify that I own the property identified in this permit application, and thus give permission to *(print or type name of person listed in Contact Information, item 1a)* _____ with *(print or type name of organization listed in Contact Information, item 1a)* _____ to develop the project as currently proposed. A copy of the lease agreement or pending property sales contract has been provided with the submittal, which indicates the party responsible for the operation and maintenance of the stormwater system.



As the legal property owner I acknowledge, understand, and agree by my signature below, that if my designated agent (entity listed in Contact Information, item 1) dissolves their company and/or cancels or defaults on their lease agreement, or pending sale, responsibility for compliance with the DEMLR Stormwater permit reverts back to me, the property owner. As the property owner, it is my responsibility to notify DEMLR immediately and submit a completed Name/Ownership Change Form within 30 days; otherwise I will be operating a stormwater treatment facility without a valid permit. I understand that the operation of a stormwater treatment facility without a valid permit is a violation of NC General Statue 143-215.1 and may result in appropriate enforcement action including the assessment of civil penalties of up to $25,000 per day, pursuant to NCGS 143-215.6.

Signature:_____ Date:_____

I, _____, a Notary Public for the State of _____, County of _____, do hereby certify that _____ personally appeared before me this ___ day of _____, _____, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal, _____

SEAL

My commission expires_____

X. APPLICANT'S CERTIFICATION

I, *(print or type name of person listed in Contact Information, item 1a)* Thomas Bradshaw, certify that the information included on this permit application form is, to the best of my knowledge, correct and that the project will be constructed in conformance with the approved plans, that the required deed restrictions and protective covenants will be recorded, and that the proposed project complies with the requirements of the applicable stormwater rules under 15A NCAC 2H .1000 and any other applicable state stormwater requirements.

Signature: Thomas Bradshaw Date: 7/14/16

I, Kim R. Sample, a Notary Public for the State of North Carolina, County of Onslow, do hereby certify that Thomas Bradshaw personally appeared before me this 14 day of July, 2016, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal, KRSample

KIM R. SAMPLE
Notary Public
Onslow County
My Commission Expires
05/26/2019
NORTH CAROLINA

SEAL

My commission expires 05/26/2019

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BY:_____

Current as of August 19, 2016

Basin ID	613.37 LD	92.45 LD	BMP #1	BMP #3	BMP #4	BMP #5	BMP #6
Receiving Stream	Everette Creek	Everette Creek	Stones Bay	Stones Bay	Stones Bay	Stones Bay	Stones Bay
Stream Class *	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW
Stream Index Number *	19-32	19-32	19-30	19-30	19-30	19-30	19-30
Total Drainage Area (sf)	26,718,397	4,027,008	503,464	977,196	32,097	83,510	70,919
Onsite Drainage Area (sf)	26,718,397	4,027,008	503,464	977,196	32,097	83,510	70,919
Offsite Drainage Area (sf)	0	0	0	0	0	0	0
Proposed Impervious Area** (sf)	6,679,599	483,241	178,167	399,360	22,295	61,693	43,693
% impervious ** (total)	25%	12%	35.39%	40.87%	69.46%	73.87%	61.61%

Impervious Surface Area	613.37 LD	92.45 LD	BMP #1	BMP #3	BMP #4	BMP #5	BMP #6
On-site Buildings / Lots (sf)	1,067,298	4,742	26,833	105,564	22,295	1,529	0
On-site Streets (sf)	1,236,868	454,713	40,271	88,636	0	0	0
On-site Parking (sf)	2,014,168	1,061	79,961	167,888	0	58,403	37,784
On-site Sidewalks (sf)	260,351	21,166	12,508	35,087	0	1,761	1,525
Other on-site BUA (sf)	213,624	1,539	3,430	2,185	0	0	4,384
Future BUA for BMP(sf)	122,013	20	15,164	0	0	0	0
Remaining BUA overall (sf)	1,666,019	0	0	0	0	0	0
Existing BUA*** (sf)	99,258	0	0	0	0	0	0
Total BUA (sf):	6,679,599	483,241	178,167	399,360	22,295	61,693	43,693

Current as of August 19, 2016

Basin ID	BMP #7	BMP #8	BMP #9A	BMP #9B	BMP #9C	BMP #10	BMP #11
Receiving Stream	Stones Bay	Stones Bay	Stones Bay	Stones Bay	Stones Bay	Stones Bay	Stones Bay
Stream Class *	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW
Stream Index Number *	19-30	19-30	19-30	19-30	19-30	19-30	19-30
Total Drainage Area (sf)	104,051	351,877	100,519	122,940	223,782	260,028	212,369
Onsite Drainage Area (sf)	104,051	351,877	100,519	122,940	223,782	260,028	212,369
Offsite Drainage Area (sf)	0	0	0	0	0	0	0
Proposed Impervious Area** (sf)	30,115	155,193	58,683	85,232	114,702	170,760	161,395
% impervious ** (total)	28.94%	44.10%	58.38%	69.33%	51.26%	65.67%	76.00%

Impervious Surface Area	BMP #7	BMP #8	BMP #9A	BMP #9B	BMP #9C	BMP #10	BMP #11
On-site Buildings / Lots (sf)	23,731	73,235	0	0	5,168	41,317	37,784
On-site Streets (sf)	0	49,767	0	0	100,074	3,490	119
On-site Parking (sf)	0	13,310	57,969	85,121	0	115,252	123,492
On-site Sidewalks (sf)	2,001	18,614	714	111	9,239	1,800	0
Other on-site BUA (sf)	4,383	267	0	0	0	6,050	0
Future BUA (sf)	0	0	0	0	221	2851	0
Off-site BUA (sf)	0	0	0	0	0	0	0
Existing BUA*** (sf)	0	0	0	0	0	0	0
Total BUA (sf):	30,115	155,193	58,683	85,232	114,702	170,760	161,395

Current as of August 19, 2016

Basin ID	BMP #12	BMP #13	BMP #14	BMP #15	BMP #16	BMP #17	BMP #18
Receiving Stream	Stones Bay	Stones Bay	Stones Bay	Stones Bay	Stones Bay	Stones Bay	Stones Bay
Stream Class *	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW
Stream Index Number *	19-30	19-30	19-30	19-30	19-30	19-30	19-30
Total Drainage Area (sf)	259,239	419,600	153,526	502,181	357,005	42,290	45,454
Onsite Drainage Area (sf)	259,239	419,600	153,526	502,181	357,005	42,290	45,454
Offsite Drainage Area (sf)	0	0	0	0	0	0	0
Proposed Impervious Area** (sf)	197,120	268,566	100,971	303,159	116,044	18,765	24,505
% impervious ** (total)	76.04%	64.01%	65.77%	60.37%	32.50%	44.37%	53.91%

Impervious Surface Area	BMP #12	BMP #13	BMP #14	BMP #15	BMP #16	BMP #17	BMP #18
On-site Buildings / Lots (sf)	45,913	28,096	11,932	123,959	4,000	2,907	11,214
On-site Streets (sf)	0	20,148	8,677	116,709	11,430	14,778	2,873
On-site Parking (sf)	133,859	197,063	68,264	58,870	80,463	0	7,781
On-site Sidewalks (sf)	1,275	310	1,432	3,621	8,187	0	2,068
Other on-site BUA (sf)	6,050	13,749	902	0	6,899	1,080	569
Future BUA (sf)	10,023	9,200	9764	0	5065	0	0
Off-site BUA (sf)	0	0	0	0	0	0	0
Existing BUA*** (sf)	0	0	0	0	0	0	0
Total BUA (sf)	197,120	268,566	100,971	303,159	116,044	18,765	24,505

Current as of August 19, 2016

Basin ID	BMP #19	BMP #20	BMP #21	BMP #22	BMP #23	BMP #24	BMP #25
Receiving Stream	Stones Bay	Stones Bay	Stones Bay	Stones Bay	Stones Bay	Stones Bay	Stones Bay
Stream Class *	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW
Stream Index Number *	19-30	19-30	19-30	19-30	19-30	19-30	19-30
Total Drainage Area (sf)	24,947	27,854	19,486	162,523	114,572	205,120	241,671
Onsite Drainage Area (sf)	24,947	27,854	19,486	162,523	114572	205120	241671
Offsite Drainage Area (sf)	0	0	0	0	0	0	0
Proposed Impervious Area** (sf)	12,949	19,707	13,345	90,931	67,470	143,496	132,077
% impervious ** (total)	51.91%	70.75%	68.49%	55.95%	58.89%	69.96%	54.65%

Impervious Surface Area	BMP #19	BMP #20	BMP #21	BMP #22	BMP #23	BMP #24	BMP #25
On-site Buildings / Lots (sf)	0	3,050	4,198	37,882	0	60,137	76,070
On-site Streets (sf)	1,064	1,620	1,550	0	5,065	0	0
On-site Parking (sf)	10,815	13,503	6,932	46,510	58,979	76,851	36,960
On-site Sidewalks (sf)	1,070	1,534	78	6,539	3,426	1,308	3,204
Other on-site BUA (sf)	0	0	587	0	0	700	843
Future BUA (sf)	0	0	0	0	0	4500	15000
Off-site BUA (sf)	0	0	0	0	0	0	0
Existing BUA*** (sf)	0	0	0	0	0	0	0
Total BUA (sf):	12,949	19,707	13,345	90,931	67,470	143,496	132,077

Current as of August 19, 2016

Basin ID	BMP #26	BMP #27	BMP #28	BMP #29	BMP #30		
Receiving Stream	Stones Bay	Stones Bay	New River	New River	Stones Bay		
Stream Class *	SA HQW	SA HQW	SA HQW	SA HQW	SA HQW		
Stream Index Number *	19-30	19-30	19-27	19-27	19-30		
Total Drainage Area (sf)	252,153	418,940	119,810	190,357	158,381		
Onsite Drainage Area (sf)	252,153	418,940	119,810	190,357	158381		
Offsite Drainage Area (sf)	0	0	0	0	0		
Proposed Impervious Area** (sf)	138,077	250,977	35,284	80,150	99,742		
% impervious ** (total)	54.76%	59.91%	29.45%	42.11%	62.98%	#DIV/0!	#DIV/0!

Impervious Surface Area	BMP #26	BMP #27	BMP #28	BMP #29	BMP #30		
On-site Buildings / Lots (sf)	76,070	0	17,253	46,432	42,340		
On-site Streets (sf)	0	44,105	6,123	16,874	0		
On-site Parking (sf)	36,960	167,045	4,036	11,121	41,726		
On-site Sidewalks (sf)	3,204	10,031	5,856	4,597	9,589		
Other on-site BUA (sf)	843	2,296	2,016	1,126	4,362		
Future BUA (sf)	21,000	27,500	0	0	1,725		
Off-site BUA (sf)	0	0	0	0	0		
Existing BUA*** (sf)	0	0	0	0	0		
Total BUA (sf):	138,077	250,977	35,284	80,150	99,742	0	0

Permit Number: SW8070847
(to be provided by DWQ)

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DIVISION OF WATER QUALITY DWQ

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

SAND FILTER SUPPLEMENT

This form must be filled out on line, printed and submitted with all of the required information.
Make sure to also fill out and submit the Required Items Checklist (Section III) and the I&M Agreement (Section IV)

I. PROJECT INFORMATION

Project name	MARSOC R2 Project P-1396 and P-1396 B
Contact name	Stephen Medvick
Phone number	757-341-0323
Date	~~3.29.16~~ 7-18-2016
Drainage area number	BMP # 30

II. DESIGN INFORMATION

Site Characteristics			
Drainage area (A_D)	158,381.00	ft^2	OK
Impervious area	99,742.00	ft^2	
% Impervious (I_A)	63.0%	%	
Design rainfall depth (R_D)	1.50	in	
Peak Flow Calculations			
1-yr, 24-hr runoff depth	3.65	in	
1-yr, 24-hr intensity	0.15	in/hr	
Pre-development 1-yr, 24-hr runoff	3.86	ft^3/sec	
Post-development 1-yr, 24-hr runoff	0.90	ft^3/sec	
Pre/Post 1-yr, 24-hr peak control	-2.96	ft^3/sec	
Storage Volume			
Design volume (WQV)	27,304.00	ft^3	
Adjusted water quality volume (WQV_{Adj})	20,478.00	ft^3	
Volume contained in the sedimentation basin and on top of the sand filter	20,959.00	ft^3	OK
Top of sand filter/grate elevation	32.5	ft amsl	
Weir elevation (between chambers)	34.25	ft amsl	Bypass weir @ 34.4
Maximum head on the sedimentation basin and sand filter ($h_{MaxFilter}$)	2.0 ~~1.90~~	ft	~~Insufficient depth~~.
Average head on the sedimentation basin and sand filter (h_A)	0.95	ft	OK
Runoff Coefficient (R_V)	0.62	(unitless)	
Type of Sand Filter			
Open sand filter?	N	Y or N	
SHWT elevation		ft amsl	
Bottom of the sand filter elevation		ft amsl	
Clearance (d_{SHWT})			
Closed/pre-cast sand filter?	Y	Y or N	
SHWT elevation	29.30	ft amsl	
Bottom of the sand filter elevation	30.40	ft amsl	
Clearance (d_{SHWT})	1.10		
If this is a closed, underground closed sand filter: The clearance between the surface of the sand filter and the bottom of the roof of the underground structure (d_{Space})		ft	

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SECTION D: STORM DRAINAGE CALCULATIONS

Permit Number:_____
(to be provided by DWQ)

Sedimentation Basin			
Surface area of sedimentation basin (A_S)	3,279.00 ft^2		OK. Meets minimum, but may need to be increased to contain the required volume if error under Storage
Sedimentation basin/chamber depth	1.50 ft		
Sand Filter			
Surface area of sand filter (A_F)	7,190.00 ft^2		OK. Meets minimum, but may need to be increased to contain the required volume if error under Storage
Top of sand media filter bed elevation	32.50 ft amsl		
Bottom of sand media filter bed/drain elevation	30.40 ft amsl		
Depth of the sand media filter bed (d_F)	2.10 ft		
Coefficient of permeability for the sand filter (k)	3.50 (ft/day)		
Outlet diameter	12.00 in		
Outlet discharge/flowrate	0.15 ft^3/sec		
Time to drain the sand filter (t)	40.00 hours		OK. Submit drainage calculations
Time to drain the sand filter (t)	1.67 days		
Additional Information			
Does volume in excess of the design volume bypass the sand filter?	Y	Y or N	OK
Is an off-line flow-splitting device used?	Y	Y or N	OK
If draining to SA waters: Does volume in excess of the design volume flow evenly distributed through a vegetated filter?	Y	Y or N	OK
What is the length of the vegetated filter?	50.00 ft		
Does the design use a level spreader to evenly distribute flow?	Y	Y or N	OK
Is the BMP located at least 30ft from surface waters (50ft if SA waters)?	Y	Y or N	OK
If not a closed bottom, is BMP located at least 100ft from water supply wells?	Y	Y or N	OK
Are the vegetated side slopes equal to or less than 3:1	Y	Y or N	OK
Is the BMP located in a recorded drainage easement with a recorded access easement to a public Right of Way (ROW)?	N/A	Y or N	Insufficient ROW location.
What is the width of the sedimentation chamber/forebay (W_{Sed})?	80.00 ft		OK
What is the depth of sand over the outlet pipe (dpipe)?	1.00 ft		OK

Please complete the yellow shaded items.

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DIVISION OF WATER QUALITY DWQ

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

LEVEL SPREADER - VEGETATED FILTER STRIP (LS-VFS) SUPPLEMENT

This form must be completely filled out, printed, initialed, and submitted.

I. PROJECT INFORMATION

Project name	P-1396 and P-1396 B SOF INTEL/OPS EXPANSION
Contact name	STEVE MEDVICK, PE
Phone number	757-341-0323
Date	3.28.16
Drainage area number	AREA 1 LS/VFS #1

II. DESIGN INFORMATION

The purpose of the LS-VFS	SW Rule: 10-year drawdown from Wet Pond
Stormwater enters LS-VFS from	A BMP
Type of VFS	Engineered filter strip (graded & sodded, slope < 8%)
Explanation of any "Other" responses above	

If Stormwater Enters the LS-VFS from the Drainage Area

Drainage area		ft^2	Do not complete this section of the form.
Impervious surface area		ft^2	Do not complete this section of the form.
Percent impervious		%	Do not complete this section of the form.
Rational C coefficient			Do not complete this section of the form.
Peak flow from the 1 in/hr storm		cfs	Do not complete this section of the form.
Time of concentration		min	Do not complete this section of the form.
Rainfall intensity, 10-yr storm		in/hr	Do not complete this section of the form.
Peak flow from the 10-yr storm		cfs	Do not complete this section of the form.
Design storm	Pick one:		
Maximum amount of flow directed to the LS-VFS		cfs	Do not complete this section of the form.
Is a flow bypass system going to be used?		(Y or N)	Do not complete this section of the form.
Explanation of any "Other" responses above			

If Stormwater Enters the LS-VFS from a BMP

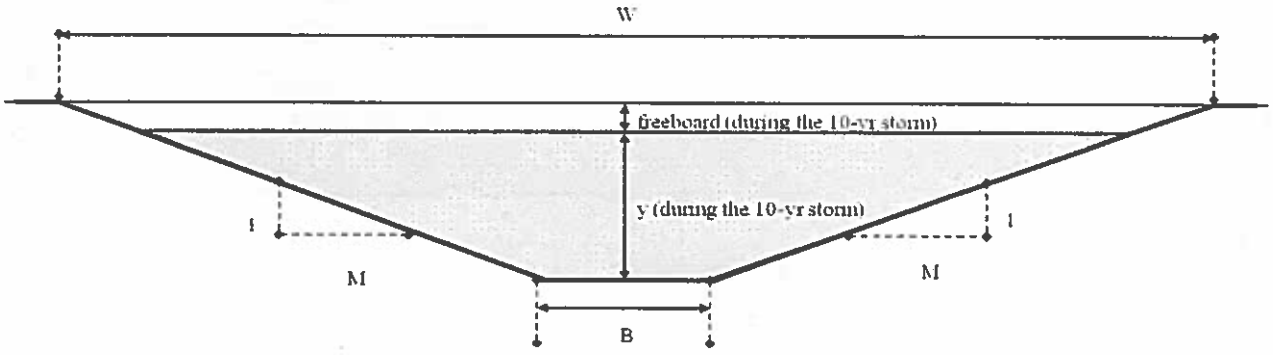
Type of BMP	Other: Explained below	
Peak discharge from the BMP during the design storm	0.9	cfs
Peak discharge from the BMP during the 10-year storm	7.9	cfs
Maximum capacity of a 100-foot long LS-VFS	10	cfs
Peak flow directed to the LS-VFS	7.9	cfs
Is a flow bypass system going to be used?	Y	(Y or N)
Explanation of any "Other" responses above	BMP IS A CLOSED SAND FILTER	

LS-VFS Design

Forebay surface area	700	sq ft	No forebay is required.
Depth of forebay at stormwater entry point	18	in	
Depth of forebay at stormwater exit point	18	in	Too deep.
Feet of level lip needed per cfs	10	ft/cfs	
Computed minimum length of the level lip needed	79	ft	
Length of level lip provided	80	ft	
Width of VFS	50	ft	
Elevation at downslope base of level lip	29.50	fmsl	
Elevation at the end of the VFS that is farthest from the LS	27.00	fmsl	
Slope (from level lip to the end of the VFS)	5.00	%	
Are any draws present in the VFS?	N	(Y or N)	OK
Is there a collector swale at the end of the VFS?	N	(Y or N)	

Bypass System Design (if applicable)

Is a bypass system provided?	Y	(Y or N)	
Is there an engineered flow splitting device?	Y	(Y or N)	Please provide plan details of flow splitter & supporting calcs.
Dimensions of the channel (see diagram below):			
M	3.00	ft	
B	4.00	ft	
W	13.00	ft	
y (flow depth for 10-year storm)	0.84	ft	
freeboard (during the 10-year storm)	1.16	ft	
Peak velocity in the channel during the 10-yr storm	1.44	ft/sec	
Channel lining material	Grass		
Does the bypass discharge through a wetland?	N	(Y or N)	
Does the channel enter the stream at an angle?		(Y or N)	
Explanation of any "Other" responses above	BYPASS SYSTEM IS SHOWN FOR LS/VFS # 1		



FROM P-1396 SUBMITTAL

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

LEVEL SPREADER - VEGETATED FILTER STRIP (LS-VFS) SUPPLEMENT

This form must be completely filled out, printed, initialed, and submitted.

I. PROJECT INFORMATION

Project name	P-1396 SOF INTEL/OPS EXPANSION
Contact name	STEVE MEDVICK, PE
Phone number	757-341-0323
Date	6 24 2015
Drainage area number	AREA 1 LS/VFS #2

II. DESIGN INFORMATION

The purpose of the LS-VFS	SW Rule: Diffuse flow at the end of a swale discharging to SA waters
Stormwater enters LS-VFS from	A BMP
Type of VFS	Engineered filter strip (graded & sodded, slope < 8%)
Explanation of any "Other" responses above	

If Stormwater Enters the LS-VFS from the Drainage Area

Drainage area		ft^2	Do not complete this section of the form.
Impervious surface area		ft^2	Do not complete this section of the form.
Percent impervious		%	Do not complete this section of the form.
Rational C coefficient			Do not complete this section of the form.
Peak flow from the 1 in/hr storm		cfs	Do not complete this section of the form.
Time of concentration		min	Do not complete this section of the form.
Rainfall intensity, 10-yr storm		in/hr	Do not complete this section of the form.
Peak flow from the 10-yr storm		cfs	Do not complete this section of the form.
Design storm	Pick one		
Maximum amount of flow directed to the LS-VFS		cfs	Do not complete this section of the form.
Is a flow bypass system going to be used?		(Y or N)	Do not complete this section of the form.
Explanation of any "Other" responses above			

If Stormwater Enters the LS-VFS from a BMP

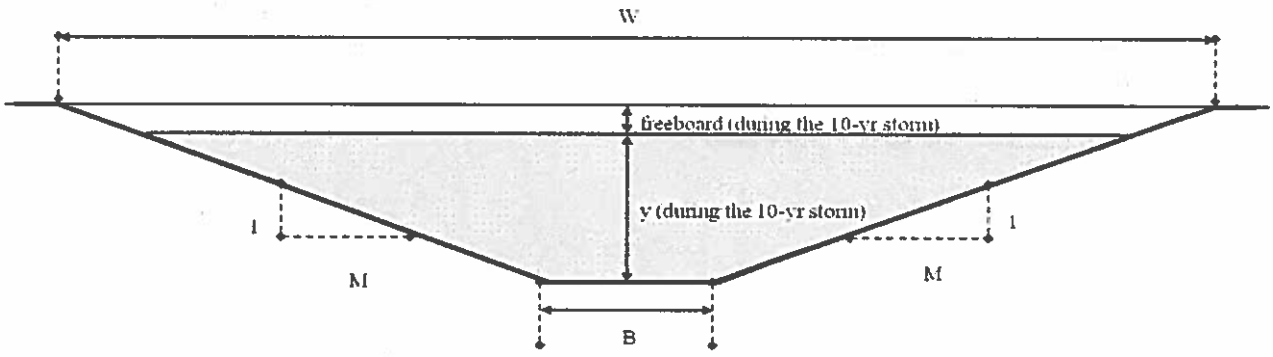
Type of BMP	Other: Explained below	
Peak discharge from the BMP during the design storm	0 72	cfs
Peak discharge from the BMP during the 10-year storm	6 6	cfs
Maximum capacity of a 100-foot long LS-VFS	10	cfs
Peak flow directed to the LS-VFS	0 29	cfs
Is a flow bypass system going to be used?	Y	(Y or N)
Explanation of any "Other" responses above	BMP IS A CLOSED SAND FILTER	

LS-VFS Design

Forebay surface area	700	sq ft	No forebay is required.
Depth of forebay at stormwater entry point	18	in	
Depth of forebay at stormwater exit point	18	in	Too deep.
Feet of level lip needed per cfs	10	ft/cfs	
Computed minimum length of the level lip needed	3	ft	Ten feet is the minimum level spreader length
Length of level lip provided	70	ft	
Width of VFS	50	ft	
Elevation at downslope base of level lip	29.50	fmsl	
Elevation at the end of the VFS that is farthest from the LS	29.00	fmsl	
Slope (from level lip to the end of the VFS)	1.00	%	
Are any draws present in the VFS?	N	(Y or N)	OK
Is there a collector swale at the end of the VFS?	N	(Y or N)	

Bypass System Design (if applicable)

Is a bypass system provided?		(Y or N)
Is there an engineered flow splitting device?		(Y or N)
Dimensions of the channel (see diagram below):		
M		ft
B		ft
W		ft
y (flow depth for 10-year storm)		ft
freeboard (during the 10-year storm)		ft
Peak velocity in the channel during the 10-yr storm		ft/sec
Channel lining material	Pick one:	
Does the bypass discharge through a wetland?		(Y or N)
Does the channel enter the stream at an angle?		(Y or N)
Explanation of any "Other" responses above	BYPASS SYSTEM IS SHOWN FOR LS/VFS # 1	



III. REQUIRED ITEMS CHECKLIST

EDIT Please indicate the page or plan sheet numbers where the supporting documentation can be found. **An incomplete submittal package will result in a request for additional information. This will delay final review and approval of the project.** Initial in the space provided to indicate the following design requirements have been met. If the applicant has designated an agent, the agent may initial below. **If a requirement has not been met, attach justification.**

Requried Item:	Initials	Page or plan sheet number and any notes:
1. Plans (1" - 50' or larger) of the entire site showing: - Design at ultimate build-out, - Off-site drainage (if applicable), - Delineated drainage basins (include Rational C coefficient per basin), - Forebay (if applicable), - High flow bypass system, - Maintenance access, - Proposed drainage easement and public right of way (ROW), and - Boundaries of drainage easement.	_____	
2. Plan details (1" = 30' or larger) for the level spreader showing: - Forebay (if applicable), - High flow bypass system, - One foot topo lines between the level lip and top of stream bank, - Proposed drainage easement, and - Design at ultimate build-out.	_____	
3. Section view of the level spreader (1" = 20' or larger) showing: - Underdrain system (if applicable), - Level lip, - Upslope channel, and - Downslope filter fabric.	_____	
4. Plan details of the flow splitting device and supporting calculations (if applicable).		
5. A construction sequence that shows how the level spreader will be protected from sediment until the entire drainage area is stabilized.	_____	
6. If a non-engineered VFS is being used, then provide a photograph of the VFS showing that no draws are present.		
7. The supporting calculations.	_____	
8. A copy of the signed and notarized operation and maintenance (O&M) agreement.	_____	

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