

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE J	PAGE OF PAGES 1 2
2. AMENDMENT/MODIFICATION NO. 0002	3. EFFECTIVE DATE 25-Aug-2015	4. REQUISITION/PURCHASE REQ. NO. W66QKZ51215710		5. PROJECT NO.(If applicable)
6. ISSUED BY US ARMY CORPS OF ENGINEERS JEFFREY RENNEN PO BOX 2946 PORTLAND OR 97208-2946	CODE W9127N	7. ADMINISTERED BY (If other than item 6) See Item 6		
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		X	9A. AMENDMENT OF SOLICITATION NO. W9127N-15-R-0003	
		X	9B. DATED (SEE ITEM 11) 04-Aug-2015	
			10A. MOD. OF CONTRACT/ORDER NO.	
			10B. DATED (SEE ITEM 13)	
CODE	FACILITY CODE			
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input checked="" type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.				
12. ACCOUNTING AND APPROPRIATION DATA (If required)				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Amends 35 31 26.40 25 (3.2.2).				
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)		
		TEL:	EMAIL:	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA		16C. DATE SIGNED
_____ (Signature of person authorized to sign)		BY _____ (Signature of Contracting Officer)		

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SUMMARY OF CHANGES

(End of Summary of Changes)

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JETTY REPAIRS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C88 (Modified)	(2013) Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C127 (Modified)	(2012) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C131 (Modified)	(2006) Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C666/C666M (Modified)	(2003; R 2008) Resistance of Concrete to Rapid Freezing and Thawing

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 148 (Modified)	(1969) Method of Testing Stone for Expansive Breakdown on Soaking in Ethylene Glycol
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1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section:

SD-01 Preconstruction Submittals

Quarry Documentation/Stone Testing; G

1.3 WORKING ENVIRONMENT

1.3.1 Site Related Weather and Tidal Conditions

a. Perform work with the understanding of hazards likely to arise from the weather conditions during the construction period. The following websites provide weather forecasts, records and reports and data concerning historic and oncoming storms and tides at the worksite:

<http://tidesandcurrents.noaa.gov/noaatidepredictions/NOAATidesFacade.jsp?Stationid=9440574>

<http://tides.mobilegeographics.com/locations/2743.html>

http://www.wrh.noaa.gov/pgr/marine/bars_mover.php

<http://tidesonline.nos.noaa.gov/geographic.html>

<http://polar.ncep.noaa.gov/waves/viewer.shtml?-multi-1-latest-hs-pacific->

http://www.ndbc.noaa.gov/maps/Columbia_River.shtml

b. Within open coast waters of the Pacific Northwest, the favorable work season for marine construction is during June through September. October and May can be a transition time from summer- to winter-like conditions. Marine weather and oceanographic conditions at MCR between November and April can be extremely dangerous. Even during summer, wave action along at coastal inlets and jetties can pose risks for marine construction activities, during specific tidal phases or storm sequences. This is especially the case for exposed areas like the jetty head. During winter, the coastal environment (waves, wind, rain) is generally too dangerous for conducting marine construction activities at exposed locations. Demonstrate that the work can be sequenced to account for the wave environment and tidal action at MCR. Avoid working on the southern half of the jetty during the fall-spring storm season (October to May), when wave action limits safe construction operations.

1.3.2 Managing Work to Match Weather and Oceanographic Conditions

Implement prudent measures to reduce risks of damage to in-progress work elements, associated with periods of high tide, winds, waves, or storms. Protect staging areas, equipment, and vulnerable work elements during active construction periods and during non-construction periods. Do not progress beyond a vulnerable in-progress work component, without being able to secure that component before exposure to a damaging event (high tide, storm condition, etc). Maximize opportunities to perform work on vulnerable work elements when favorable conditions are available; i.e. perform relict stone rework and toe stone placement during periods of low tide and low wave action (avoid exposure to damaging events), and complete work components at higher elevations during periods of high tide. The jetty repair template extends from about -10.6 feet to +23.4 feet NAVD88. Include work tides and storm conditions into the schedule and work plan. Repair damage to any in-progress work caused by environmental processes at the expense of the Contractor.

1.4 DELIVERY

If delivery is made by barge and jetty stone is put in final placement directly from the barge, then volume must be determined by on-deck measurement. If the jetty stone is not put in final placement directly from the barge, on-deck measurement will not be made.

1.5 QUARRY

1.5.1 General

The Contractor is responsible for arrangements of quarry permits and right-of-ways, adequate investigation and exploration, and selection,

development, and operation of the quarry to supply stones for this Contract of the weight, size, shape and quality specified herein. Ensure individual stones meet all Contract requirements. The Government may elect to inspect the stones at the quarry or at the jetty site, at any time, and may reject individual stones that don't meet all Contract requirements.

1.5.2 Sampling, Testing, and Acceptance of Stones

a. Quarry Documentation/Stone Testing. Determine the acceptability of stone by laboratory tests, geologic examination, and service records from a Corps validated testing laboratory. Provide previous satisfactory test results or service records from other Corps of Engineers (COE) projects within the last five years to determine the acceptability of the stone source. When these records are not available, test representative samples as specified to ensure that the stones are durable and suitable for use in the work. Laboratory tests, which the stones must be subjected to include specific gravity, absorption, abrasion, accelerated expansion, magnesium sulfate soundness, and other such supplemental tests described in paragraph TESTING REQUIREMENTS as may be necessary. Perform testing to determine conformance with the requirements for acceptance or rejection of stones proposed for use and to determine stone classification at the Contractor's expense at a Corps validated testing laboratory.

b. Sampling. In the absence of quarry documentation as required above, select representative samples of each different type of stone proposed for use in the jetty repair from each proposed source. Perform sample selection in the presence of the COR or designee. Provide the Government 48 hours notice before the required COR witnessing of the stone sample selection. Samples of each type of stone from each source must consist of 5 to 10 pieces with a total weight of not less than 150 pounds for each stone type proposed. No single piece must weigh more than 100 pounds. The presence of the COR or designee during the stone sample selection must not relieve the Contractor of the responsibility to select representative samples from the quarry for testing.

c. Testing. Perform testing to determine conformance with the requirements for acceptance or rejection of stones proposed for use and to determine stone classification at a Corps-validated testing laboratory at the Contractor's expense. Laboratory tests must include specific gravity, absorption, abrasion, accelerated expansion, magnesium sulfate soundness, and other such supplemental tests described in paragraph TESTING REQUIREMENTS.

d. Separate tests must be made for each different stone type. Satisfactory Contractor documentation or laboratory results on stone samples must not constitute approval of all stone from the quarry and in no way change the requirements for obtaining, developing, and maintaining a satisfactory source of stones. Throughout the duration of this Contract, the Government may sample and test stones proposed for use and delivered to the jetty storage area. No Contract time extension will be granted because materials fail to meet the specification requirements. Stones must meet all testing requirements described herein as well as the geologic examination described in the paragraph STONE QUALITY AND ACCEPTANCE. Should the stone from an individual source vary, as determined by visual inspection, the Contractor may be required to re-do some or all of the required tests. The Contractor must be responsible for the cost of all re-tests.

- e. Failure of Stones. Remove stones failing to meet specific requirements from the off-loading facility or the stockpile area. Only approved materials or stones must be placed in the jetty.

PART 2 PRODUCTS

2.1 SOURCES

2.1.1 General

a. Selection of Source. Designate in writing only one source or one combination of sources that is proposed to furnish stone. It is the Contractor's responsibility to determine that the stone source or combination of sources selected is capable of providing the quality, quantities and gradation needed.

b. Acceptance of Materials. Acceptance of a source of stone is not to be construed as acceptance of all material from that source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels, when such materials are unsuitable for stone as determined by the COR.

2.1.2 Stone Quality and Acceptance

Stone that meets all Corps testing standards is still subject to rejection if visual inspection deems the stone unsatisfactory. Each stone accepted for use must be as follows:

a. Composed of strong, hard, durable materials that must not slake or deteriorate on exposure to the action of water or atmosphere.

b. Contain no cracks, joints, faults, seams, or bands of minerals or deleterious materials which would result in breakage or reduction of specified stone weights or dimensions during or after final placement in the jetty repair.

c. Free of expansive or other materials which would cause accelerated deterioration by exposure to project climatic conditions.

d. Sufficiently uniform physical properties throughout so that all portions of the stone must meet the specified test requirements. Weak or inferior-appearing portions of any non-uniform type stone must be subjected to all testing necessary to determine that the stone will not be susceptible to splitting or differential weathering. Any stone, containing an inferior rock material portion that does not meet the specified test requirements must be rejected as unsatisfactory for jetty repairs and removed from the off-loading site. Igneous flow breccias, volcanic breccias, and sedimentary rocks have not performed well and are considered unsuitable for use as jetty stone.

e. Clean and sharp-edged and the longest dimension of any stone must not exceed three times its shortest dimension. It is intended for jetty stones to be blocky in overall shape. Due to the nature of the repairs, the Contractor must avoid producing jetty stones which are dominant in a single dimension (i.e. slabby or tabular).

2.1.3 Testing Requirements

- a. Each stone must meet all the following test requirements for quality:

TEST	REQUIREMENT
Unit Weight	Not less than 165.0 pounds per cubic foot
Absorption	Not more than 5.0 percent
Abrasion - 500 revolutions	Not more than 20.0 percent loss (by weight)
Magnesium Sulfate Soundness - 5 cycles	Not more than 15.0 percent loss (by weight)
Accelerated Expansion	Not more than 15.0 percent breakdown (by weight) or piece count

b. Supplemental test requirements which may be required by the Government based on visual analysis include the following:

TEST	REQUIREMENT
Wetting and Drying - 80 cycles	Not more than 15.0 percent loss (by weight)
Freezing/Thawing - 100 cycles	Not more than 15.0 percent loss (by weight)
Petrographic Examination	Absence of weakness or materials that could result in significant stone alteration and reduction in durability
X-Ray Analysis (Spectrographic and Diffraction)	Absence of deleterious clays or other minerals that could result in significant deterioration of rock quality

c. All test results reported by the validated testing laboratory must be considered as exact, regardless of any permissible variance that may be established by test procedures for determining acceptability of jetty stone furnished under this Contract. Test procedures to be utilized are as follows:

d. Unit Weight and Absorption. Provide satisfactory test results and service records within the last five years; if not available, determine the unit weight (weight per cubic foot) by multiplying the bulk-saturated-surface-dry (BSSD) specific gravity by 62.4 pounds per cubic foot. Specific gravity and absorption must be determined in accordance with ASTM C127 (Modified) as follows:

- (1) the test sample must consist of about 5,000 grams of generally cubical pieces of stone passing the 2-inch and retained on the 1-1/2 inch standard square mesh sieve sizes
- (2) the test pieces must be laboratory prepared by jaw crushing or chipping.

e. Abrasion. Provide satisfactory test results and service records within the last five years; if not available, determine the abrasion loss in accordance with ASTM C131 (Modified) as follows:

- (1) the test sample must consist of the same size and gradation
- (2) the abrasive charge used must comply with that used for Grading "A"
- (3) the test sample must be subjected to 500 revolutions.

f. Magnesium Sulfate Soundness. Provide satisfactory test results and service records within the last five years; if not available, the test sample must consist of 5± kg of rock pieces passing the 2-inch and retained on the 1-1/2 inch sieve, prepared as specified. The test is based upon ASTM C88 (Modified). Conduct the test through 5 cycles, which requires two to three weeks to complete.

g. Accelerated Expansion. Provide satisfactory test results and service records within the last five years; if not available, the test sample must consist of 5± kg of rock pieces passing the 2-inch and retained on the 1-1/2 inch sieve, prepared and tested in accordance with Testing Procedure COE CRD-C 148 (Modified). Compute the test results by dividing the number of pieces that break down by the number of pieces in the original test sample. Failure or breakdown is defined as any piece separating into two or more pieces or losing sufficient surface material to allow it to pass through the 1-1/2 inch sieve. The test period is 15 days.

h. Wetting and Drying. Submit Wetting and Drying test results if required by the Government when marginal results from the aforementioned tests are obtained or if visual inspection reveals suspicious seams, slaking, laminations, cracks, faults, joints, or bands of minerals or deleterious materials. The test sample must consist of 5± kg of rock pieces passing the 2-inch and retained on the 1-1/2 inch sieve, prepared as specified. The test sample must be oven-dried and weighed, then soaked for 24 hours prior to starting the test. Testing must consist of 80 cycles of wetting and drying. Each cycle must consist of soaking for 3 hours in tap water at approximately 60° F and drying for 3 hours with an infrared heat lamp so that the surface temperature of the rock pieces reach 165° F. Upon completion of the test, samples must be oven-dried, screened over 1-1/2 inch sieve, and weighed. Compute percent loss based on original dry weight.

i. Freezing and Thawing. Submit Freezing and Thawing test results if required by the Government when marginal results from the aforementioned tests are obtained or if visual inspection reveals suspicious seams, slaking, laminations, cracks, faults, joints, or bands of minerals or deleterious materials. The test sample must consist of 5± kg of rock pieces passing the 2-inch and retained on the 1-1/2 inch sieve, prepared by jaw crushing or by hand chipping. All sharp edges must be chipped off and only pieces of approximately cubical shape must be used. Compute the original dry weight of pieces selected for the freeze-thaw test by determining moisture content of room-dry rock from representative sample surplus or undersized pieces using the formula below:

Dry weight of pieces selected from freeze-thaw = Weight room - dry

$$1 + \frac{\text{MC (in percent)}}{100}$$

Where MC = moisture content

j. Immerse specimens in water for 24 hours prior to the start of the test. Then place the sample in a pan approximately 15-inches by 9-1/2 inches by 2-1/4 inches and the pan filled from 1/4-inch to 1/2-inch with water. Subject the sample in the pan to freezing and thawing in the freeze-thaw apparatus described in ASTM C666/C666M (Modified). Accomplish freezing and thawing at the rate of 12 cycles per day, where one cycle consists of approximately one hour at 0 degrees plus/minus 2 degrees F and one hour at 40 degrees plus/minus degrees F. At the end of 100 cycles, wash, dry, sieve over the 1-1/2 inch sieve, and weigh the sample. Compute the percent loss based upon the original dry weight. Report observations of appearance of each piece with comment as to apparent soundness, cracking, etc. Photograph the sample at the end of the test or during the test when significant cracking, flaking crumbling, or disintegration has taken place.

k. Petrographic Examination. Submit Petrographic Examination test results if required by the Government when marginal results from the aforementioned tests are obtained or if visual inspection reveals suspicious seams, slaking, laminations, cracks, faults, joints, or bands of minerals or deleterious materials. Macroscopic and microscopic identification of rock and constituent minerals with general description of typical thin Sections. Examination includes description of any seams, veins, or joints and an estimate of alteration, degree of weathering, and probable rock durability. A comprehensive petrographic examination includes descriptions of dominant, accessory and alteration minerals, and a mode analysis of the rock giving percent constituents by point count examination of typical thin Sections.

l. X-Ray Analysis. Submit X-Ray Analysis (Spectrographic and Diffraction) test results if required by the Government when marginal results from the aforementioned tests are obtained or if visual inspection reveals suspicious seams, slaking, laminations, cracks, faults, joints, or bands of minerals or deleterious materials. The x-ray analyses consist of random pack powder mounts to determine constituents of rock with emphasis on determination of clay minerals and alteration products. X-ray diffraction technique includes quantitative estimates of the mineral assemblages and is of particular importance in the identification of swelling clays.

2.1.4 Stone Classification

a. Stone Classification. Two separate stone classifications are used for this repair contract, based on stone weight and placement location. A-stone is to be used in the main body (trunk) repairs and in the lower armor stone layers of the end section (head). A-Select is to be used in the outer layer of the head section.

b. Gradation. The Stone Gradation Tables on the following pages provide the required weights of individual armor stones in tons of 2,000 pounds based upon the weight per cubic foot of acceptable stone furnished. If larger stones are proposed to be used, they must be approved by the COR and special care must be utilized to provide interlocking with adjacent stones. Armor stones larger than the maximum

allowed by gradation table may be accepted. A uniform variation of stone weights and shapes must be used throughout the repair areas to ensure a consistent high degree stone-to-stone interlocking. Segregation of stone weights or shapes within specified areas of the work must be avoided unless approved by the Government.

MCR Jetty A Rehabilitation

A-Stone Gradation (tons)

Stone Density (pcf)	0% Less Than (By total number)	0% to 10% Less Than (By total number)	40% to 60% Less Than (By total number)	100% Less Than (By total number)
165	8	16	21	31
166	8	15	20	30
167	8	15	20	30
168	8	15	19	29
169	8	14	19	28
170	7	14	18	28
171	7	14	18	27
172	7	13	18	27
173	7	13	17	26
174	7	13	17	25
175	7	12	17	25
176	6	12	16	24
177	6	12	16	24
178	6	12	16	23
179	6	11	15	23
180	6	11	15	22
181	6	11	15	22
182	6	11	14	22
183	6	11	14	21
184	6	10	14	21
185	5	10	14	20
186	5	10	13	20
187	5	10	13	20

MCR Jetty A Rehabilitation

188	5	10	13	19
189	5	9	13	19
190	5	9	12	18
191	5	9	12	18
192	5	9	12	18
193	5	9	12	17
194	5	9	11	17
195	4	8	11	17
196	4	8	11	17
197	4	8	11	16
198	4	8	11	16
199	4	8	10	16
200	4	8	10	15
201	4	8	10	15
202	4	7	10	15
203	4	7	10	15
204	4	7	10	14
205	4	7	9	14

A-Select Stone Gradation (tons)

Stone Density (pcf)	0% Less Than (By total number)	40% to 60% Less Than (By total number)	100% Less Than (By total number)
165	21	26	31
166	20	25	30
167	20	25	30
168	19	24	29
169	19	24	28
170	18	23	28
171	18	23	27
172	18	22	26
173	17	22	26
174	17	21	25
175	17	21	25
176	16	20	24
177	16	20	24
178	16	19	23
179	15	19	23
180	15	19	22
181	15	18	22
182	14	18	21
183	14	18	21
184	14	17	21
185	13	17	20
186	13	17	20
187	13	16	19
188	13	16	19
189	12	16	19
190	12	15	18
191	12	15	18
192	12	15	18
193	12	15	17

MCR Jetty A Rehabilitation

194	11	14	17
195	11	14	17
196	11	14	17
197	11	14	16
198	11	13	16
199	10	13	16
200	10	13	15
201	10	13	15
202	10	12	15
203	10	12	15
204	10	12	14
205	9	12	14

c. Rebreaking Stones. Breaking of individual pieces in place by blasting or mechanical methods will not be permitted.

d. Weight Identification. Paint representative stones of the various sizes (0%, 0%-10%, 40%-60% and 100% for the A-stone classification and 0%, 40%-60% and 100% for the A-Select classification) to be used for this project with their respective weights and displayed in the quarry and at the job site. The Contractor Quality Control (CQC) System Manager or equivalent and COR must mutually verify on a periodic basis that armor stone gradation requirements are being met. Paint individual weights on each stone. Mark jetty stones delivered to the storage area to show weight (in tons), and quarry name (if more than 1 quarry is used).

e. Rejected Stone and Residue. Determine the weight of all rejected pieces of stone and residue remaining in the hauling vehicle by reloading and weighing, and deduct such weight from the weight previously determined for payment. Dispose of all rejected stone and residue in an approved manner.

f. Handling Breakage. For any stone broken in handling after being weighed for pay quantity determination, the broken pieces may, upon approval, be placed in the appropriate jetty section if it meets the requirements for that section. If the broken stone meets none of the requirements for stone classification, it will be rejected and reweighed and subtracted from the pay quantity and be disposed of in an approved manner.

2.1.1.5 Testing Frequency

All stone classifications must have indicated tests run prior to initial delivery. Rerun unit weight testing at 5,000 ton intervals during the Contract.

PART 3 EXECUTION

3.1 STONE DISTRIBUTION

3.1.1 General

Repair of the MCR Jetty A consists of placement of jetty stone at the jetty side slopes and crest to obtain the full section as shown. Repairs must consist of a maximum 50-foot long transition from the existing jetty to the repair design template starting at Sta. 46+50. No jetty rework other than that to enable development of the haul road is to be performed inshore of Sta. 46+00. The repair section from Sta. 46+50 to 89+00 is to be constructed to the design template utilizing the existing jetty centerline. Blend side slopes to the existing jetty at the edges of the repair site. Initial work should be done during the low tide windows to expose the relict jetty stone to view. Excavation or rearrangement of stones on the existing jetty will be needed to achieve the repair template requirements and tolerances. Key in stones to create an interlocking structure and rearrange existing stones as necessary to achieve maximum interlock with both the existing cross section and new stones. Place all jetty stone by means of a crane, a derrick, or other equipment capable of placing stones to the lines, grades, and slopes shown.

3.1.2 Identification of Repair Areas

The nominal dimension for new A-stone is approximately 5.5 feet (for 171 pcf stone density). The jetty must be repaired if a minimum of 1 layer of new jetty stone can be accommodated within the cross-section template and its tolerances as identified in paragraph STONE PLACEMENT (subparagraph 3.3.1.e). Otherwise the area will not receive new jetty stone placement. The jetty is considered to have significant damage if a contiguous area needing repairs exceeds 50 square feet. First complete repairs where the jetty is significantly damaged, before addressing discrete areas of lesser damage. At areas where the damage is less than the 50 square foot threshold, the Government will direct the Contractor to make repairs based on the stone quantity available within the limits of this contract. Coordinate with the GQAR in order to agree on the prioritization of areas to be repaired within a given reach before repair activities have started.

3.1.3 Variable Repair Areas and Re-handling Existing Jetty Armor Stone

Reworking of existing jetty stone will be required to place, interlock, and seat new jetty stone within the repair cross section template. The present damage trend along the repair area is highly variable; some reaches will require significant amount of new armor stone (>2,000 tons/50-ft segment) to re-establish the jetty cross-section and some reaches will need minor repairs (<200 tons/50-ft segment). Because of the variable damage within the project area, some reaches may require considerable reworking of existing jetty stone to achieve requisite interfacing with new repair armor stone.

3.1.4 Transition Section, Station 46+00 to 46+50

A transition is to be created between the existing jetty and the start of the new repair design template at station 46+50. This transition is to occur over a distance not to exceed 50 feet northward of station 46+50. Move and rearrange existing stone as necessary to allow keying in the new stone to form a tight knit, smooth transition from the existing structure to the new work with no protrusions, notches, or sharp slope changes. Cannibalizing "healthy" jetty areas landward of station 46+00 for the purpose of filling in damaged areas within the transition will be prohibited.

3.1.5 Jetty Repair Section, Station 46+50 to 86+50

Use A-stone for the trunk section of the jetty repair and construct to a crest elevation of +23.4 ft NAVD88, a width of 30 feet, and side slopes of 1V on 1.5H. The depth for placement may extend to approximately -5 feet NAVD88.

3.1.6 Transition Section, Station 86+50 to 87+50

A transition section will be created starting at Station 86+50 and extending to 87+50, to transition from the trunk to the head. This 100-foot section will transition the crest width from 30 to 40 feet, the crest elevation from +23.4 to +19.4 feet NAVD88, and side slope angles from 1V on 1.5H to 1V on 2H. It is the designer's intent that the transition be smooth with no protrusions, notches, or sharp slope changes.

3.1.7 Head Stabilization, Station 87+50 to 89+00

- a. Use A-stone and A-Select stone to construct the head section of the

jetty to a crest elevation of +19.4 feet NAVD88 and a width of 40 feet. Build side slopes, including the outer or western end of the repairs, to a stable 1V on 2H slope configuration. Two or more layers of new armor stone may be required. The outer layer of armor stone must be A-Select stone. A-stone shall be used to construct underlayering within the cross section, where needed. The elevation of the existing relict base stone will vary from neat lines shown on the drawings. The lowest elevation for new armor stone placement may extend approximately -10 feet NAVD88. Seat and interlock the new repair stone with the relict stone base.

b. The repair work in the approximate 150-foot head section is intended to provide a tightly interlocked mass of repair stone which slopes down to the existing relict stone base and ties the new repair section into the seaward extent of relict base. Proper construction of this section is critical to the resilience of the entire jetty head repair. Some excavation of existing stone may be needed to achieve the full new design template.

3.2 EQUIPMENT

3.2.1 Hauling Equipment

Plainly mark all hauling equipment with numbers. Weigh empty vehicles at least once a day and at any time after the equipment is modified or repaired in a manner that could affect its weight. The tare weight thus determined will be deducted from the gross weight to determine the net weight of the stone.

3.2.2 Placing Equipment

Placing equipment must be capable of placing jetty stone individually without dropping the stone and in such a manner to not displace the underlying material. Stone placing equipment must have adequate safe capacity to repair the jetty to the lines, grades, and slopes shown. Size of equipment should include consideration for handling overweight stones for both newly placed and existing jetty armor stone. Note that the size of some of the existing armor stones presently on the jetty may exceed 30 tons. The selected equipment must be capable of placing the armor stone near its final position before release and be capable of moving the stone if necessary to achieve maximum interlock with adjacent stones. It is essential that all armor stone be placed as dictated by the repair template. The equipment used to place armor stone on the jetty must be capable of securely positioning the toe stone along the lowest point of the template. The total distance from the jetty centerline at Station 89+00 on the finished crest to the toe of the repairs extends approximately 80 feet. The equipment must be capable of turning all stones placed above and below -10 feet NAVD88 at least 90 degrees in both the horizontal and vertical planes, to the extent necessary for final positioning. The Contractor must sequence the work such that equipment must not be affected by wave action during various phases of tide. Daily inspection of all handling equipment must be conducted. Written documentation of the inspection must be available for review by the GQAR.

3.2.3 Equipment Operator

The operator of the placing equipment must be experienced in jetty stone placement and be experienced in operating the stone placing equipment as proposed to be used in this Contract work. Submit placement operator's

qualifications and certifications. The Government will require that the Contractor replace any operator not capable of placing stone as herein specified.

3.3 STONE PLACEMENT

3.3.1 General

a. Construction Control. Prior to the placement of stone, establish construction control markers clearly visible and understandable to the equipment operators placing the stone. Stone placement on the jetty's side slopes must be controlled by construction control markers established by the Contractor. Templates or other approved methods to define the limits and slopes must be set up at appropriate intervals so that the stone-placing operator can easily delineate the horizontal and vertical limits of the surfaces of stone to be placed. Construction control markers setup and construction control methods must be reviewed by the COR prior to any placement of repair stone.

b. Placement of New Armor Stone. Place stone on the prepared slopes within the limits shown. The finished slopes must present a uniform and regular surface not steeper than that shown. Key rock into the existing jetty stone side slopes. Maintain the stone until final acceptance. The position and orientation of each stone should be noted by the stone placing operator and used as a guide to select, orient, and place the next stone. The stone placing operator must have a minimum of five stones to choose from to plan the placement. Pre-selection of stone at the offloading site must be performed to ensure that various shapes and sizes of stones are available for the stone placing operator to pick from for placement. Key in the transition from existing stone to new stone to produce maximum interlocking of stone at the beginning station of the work.

(1) Control individual stone placement to achieve an interlocked mass with the maximum surface contact and interlock with both the existing cross section and other new stones making contact on all faces after final placement. Maximum interlocking with adjacent stone must be achieved by orienting each individual stone until a well keyed-in mass is produced.

(2) Place all stones individually with the long axis of each stone oriented perpendicular to the outer surface with staggered vertical joints, and arranged to secure maximum surface contact and interlock between adjacent stones in order to minimize void size, reduce movement of the stone, and protect underlying stone. When necessary, set aside stones until suitable fits for each stone are found in order to achieve maximum interlock. No slab-like stone must be placed with its broadest dimension facing upward. Place all stone beginning at the bottom of the side slope and then continue up the slope to the crest with overlapping vertical joints. Toe stone must be placed with face to face contact with adjacent stones, and not face to point or point to point contact. The toe stone must be well seated and securely placed within the existing jetty surface. Place toe stone to take advantage of the tides as much as possible to provide the greatest visibility of the completed jetty toe and tie-in to the existing jetty slope. Coordinate toe stone placement activities with the COR prior to toe stone placement.

(3) In the event that sand is encountered in an area where armor stone is to be placed, excavation must take place to achieve exposure of the existing relict stone to provide the best possible stone to stone contact. Excavation must not exceed 6 feet. Government approval is required for work to be accomplished in these areas.

(4) Casting or dropping of stone or moving by drifting or manipulating down the slope will not be permitted. Placing by methods likely to cause segregation will not be permitted. Materials that do not meet the specified requirements for size, quality, or distribution of sizes must be removed and replaced with suitable materials at no additional cost to the Government.

(5) The finished work must be a well-distributed mass, free of pockets of either smaller or larger stone with a minimum of voids and a maximum of stone interlocking with stones making contact on all faces.

c. Repair Template Transition and Rehandling of Existing Stone. The transition from repair area to competent existing structure must be continuous (to avoid unraveling of repair area armor stone), for the toe, slope face, and crest areas of repair. Repositioning of existing stone may be required to facilitate a smooth transition. Perform reworking of existing stone within the designated repair areas only when needed:

(1) to achieve stone-stone interlocking with new and existing armor stone,

(2) ensure smooth transition between repaired jetty and existing grade,

(3) ensure that the appropriate size/shape of armor stone protects the jetty where repair areas transition to the existing grade, and

(4) to gain access to areas along the lower elevation of the repair template.

d. Reworking Limitations. Limit the reworking (or excavation) of the existing jetty grade within the repair areas such that no excavation is greater than 8 feet or extends below +10 feet NAVD88. If the existing crest elevation within a repair area is below +10 feet NAVD88, limit excavation of the existing jetty grade to the minimum required for completing repairs. Unless approved by the Government, reworked stone smaller than 4 tons must not be placed within the repair template. Evenly distribute any extra displaced stone not used in the repair template on the existing finished west side slope of the jetty and interlock as appropriate without disturbing the existing slope stone. Any existing stones encountered with rounded edges must be repositioned to the inside portion of the jetty cross section. Coordinate jetty rework activities with the GQAR prior to initiating the work. Take special care during the jetty repair activities to avoid activating side slope instabilities due to the cumulative effect of jetty toe destabilization. Repositioning of existing stone or placing new stone along unstable areas of the jetty may initiate a cascading slope failure on the jetty. Implement procedures to pre-plan the jetty repairs along susceptible areas of the jetty to minimize risk of jetty instability during construction. Rehandling of individual stones after

initial placement should be anticipated and will be required to achieve the aforementioned requirements. Existing stones may have to be reworked in some areas to achieve these requirements and meet construction tolerances.

e. Tolerances. Place all stone as shown on the drawings. A tolerance of plus 3-feet or minus 1-foot from the lines and grades shown on the drawings will be allowed for the A-stone except that the extreme of such tolerance must not be continuous over an area greater than 200 square feet and adjacent stones must vary no more than 3 feet in top elevation from each other. The outside slopes must present a uniform appearance with a minimum of pieces projecting outside the finished slope surface. The intention is that the work will be built generally to the required elevations, slopes, and grades, and that the outer surfaces must be even in appearance. Though tolerances are important, a smooth transition is more important than having discontinuous elevation of the crest with a few stones to meet a specific tolerance.

f. Woody Debris. A large amount of logs, driftwood, and other debris is present on the jetty between Stations 49+00 and 55+00. Any wood and debris interfering with jetty repair activities must be removed from the jetty in a way that leaves the jetty undamaged and not be incorporated into the jetty cross section. Jetty stones, new or reworked, shall not be placed on any woody debris. Woody debris removed from the jetty repair section is to be disposed of as indicated in Section 31 11 00.00 25, CLEARING AND GRUBBING.

g. Spotter. Utilize a spotter to aid in stone placement at all times except for times when unsafe working conditions exist. The spotter must be experienced in jetty stone placement and be familiar with the stone placing equipment as proposed to be used in this Contract work. Submit spotter's qualifications. The spotter and stone placement operator must maintain visual and radio contact during placing operations.

h. Vehicle Blockage Stones. Place three jetty stones on the jetty crest near the start of the jetty repairs as directed by the COR following completion of the jetty repairs.

i. Protection of Existing Survey Control Monuments. Existing survey control monuments (brass caps) encountered on the jetty crest must be marked and protected if no work is done in that area that disturbs their location.

j. Vertical Datum. The drawings show the vertical datum as NAVD88 (0 feet NAVD88 = +0.6 feet MLLW).

3.3.2 Jetty Demonstration Section

Demonstrate that the equipment has the capability and all stone placing operators have the ability to place jetty stone to the lines, grades, orientation, and fit as specified. Submit, for approval, the location of a Demonstration Section 50 feet in length. Demonstrate the ability to adequately reach, manipulate, and interlock stone along the entire repair template; particularly at the toe of the repair area. Perform an interim survey to verify lines and grades have been met prior to the visual inspection. The demonstration section will have both pre-construction and post-construction surveys and be incorporated in the jetty when it conforms to the specification requirements in the paragraph SURVEYS. If the work performed in the demonstration section is deficient, either rebuild the

section with the same operator or replace the equipment and/or the operator and recommence work on the demonstration section until the work complies with the Contract requirements. Work will not commence on the remainder of the jetty until it is demonstrated that equipment and operator have the ability to place the jetty stone as specified in the Contract.

3.4 STOCKPILING

Stockpile jetty stone, if required, in the area designated on the drawings. The designated area is approximately 7-acres in size, consists of some rocky overburden on top of quarry waste fill, and is not surfaced. Stockpile jetty stone no more than two pieces high. The side slopes of the stockpiles must be tight and stable to prevent movement of material from slight disturbances. Any method of stockpiling which could cause excessive breakage will not be permitted. Stone stockpiling must not take place within the helicopter pad buffer or in an any access road leading to the pad.

3.5 JETTY CREST HAUL ROAD

a. Provide and maintain a jetty haul road on the jetty crest if travel on the jetty by trucks or equipment is required. See Section 01 10 10.00 25, CONTRACTOR'S OPERATIONS AND REQUIREMENTS. The jetty haul road constructed by the Contractor must have sufficient quarry waste or road building material to prevent damage to the existing armor stone in areas not being repaired and protect new armor stone placed within the repair areas. Protect newly constructed areas of the jetty with haul road material, rubber mats, tires, or other approved devices prior to any equipment access. Construct the jetty crest haul road with two basic types of material:

(1) large "chinking" stone to fill large voids in the jetty stone or to provide shoulder support and

(2) smaller quarry material to provide a "driving" layer having sufficient thickness and strength to support heavy equipment and protect existing jetty stones.

b. The haul road must have no more than 12 percent fines by weight (i.e. - no more than 12 percent of the material passing the No. 200 U.S. Standard Sieve Size).

c. Locate and construct the jetty haul road in a manner to minimize disturbance to the existing jetty grade/surface in areas outside of the repair limits. Existing jetty stone above Elevation +23.4 feet NAVD88 must remain in place unless stone needs to be moved to provide construction equipment access or appropriate installation of new jetty stone. Existing jetty stone greater than 4 tons that is moved may be used to fill the design template. Evenly distribute any extra displaced stone not used in the repair template or used to fill holes in the crest on the existing finished west side slope of the jetty and interlock as appropriate without disturbing the existing slope stone. Make appropriate provisions for placing a sufficient thickness of haul road material to provide for a level roadway. Accomplish work in a manner that does not create unstable areas that can initiate a cascading slope failure. The haul road is not required to be removed at the end of the contract. Where turnouts are to be constructed, end dumping of stone is permitted but only after the underlying required cross section has been constructed to meet paragraph STONE PLACEMENT.

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Minimize the number of turnouts necessary to allow the construction operations to be carried out. All turnouts on the jetty constructed by the Contractor must be removed by the end of the Contract.

3.6 NAVIGATION LIGHT BASE

The existing Desdemona Sands Leading Light is located near the centerline of the jetty crest at approximate Station 74+00. Demolition of the SC-LED lantern and tower is the responsibility of the Contractor. The SC-LED lantern must not be damaged in the process and will become property of the U.S. Coast Guard upon completion. The remaining concrete base with existing wood concrete pouring forms must be removed prior to construction of the jetty crest haul road in that area. The base, minus forms, may be buried in an adjacent section of damaged jetty or as approved by the COR.

-- End of Section --