

of Engineers® GALVESTON DISTRICT PORT HOUSTON THE INTERNATIONAL PORT OF TEXAS



HOUSTON SHIP CHANNEL (HSC), TEXAS EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP) PROJECT 11: PACKAGE #9 SEGMENT 4- BOGGY BAYOU TO SIMS BAYOU



SOLICITATION NO.: W912HYXXXX CONTRACT NO.: WXXXX-XX-X-XXX ISSUE DATE: XX

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G-003	CHANNEL ALIGNMENT DATA	
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V-004	EXISTING CONDITIONS - HSC STA. 758	3+44 TO HSC STA. 859+87
V-005	EXISTING CONDITIONS - HSC STA. 859	9+87 TO HSC STA. 930+00
CIVIL - SITE		
000	OVERALL DREDGING PLAN AND REYMAN	
002	DREDGE PLAN - HSC STA. 677+52	0 HSC STA. 707+48
C=003	DREDGE PLAN - HSC STA. 707+48	0 HSC STA. 755+42
$\frac{c-004}{c-005}$	DREDGE PLAN - HSC STA. $753+42$	0 HSC STA. 810+48
$\frac{c = 005}{c = 006}$	DREDGE PLAN - HSC STA. $810+40$ R	0 + 50 + 514 + 857 + 59
C = 0.07	DREDGE PLAN - HSC STA 907+72 TO	0 HSC STA 930+00
C V = CRO	S-SECTIONS	5 HOC 5HA. 300100
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C=041	CROSS-SECTIONS 34 OF 35	
0-042	CROSS-SECTIONS 34 OF 33	
	CEMENT APEAS	
C=0.43	DEMENT AREAD	2
0-043	FLAGENIENT AREA PLAN - BELIWAY &	ر ۱

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	DRT CON AGING D DES DJECT T OUS HAN MPRO ROJI ROJI ACK		REPRESEN R = ENG SUPPORT N SHII L (HSC ON L SMENT T (ECII T 11: E #9	DATE TATIVE NEERING C) T P)	
SEGMENT 4 - HSC STA 677+52 TO HSC STA 930+00 TITLE SHEET, DRAWING INDEX, STATE, VICINITY, AND LOCATION MAPS					
DES	BIGNER: DD: CCKER: TE:		DJH FM 8/15/	20	
	90-D EET NO.)13	-P11- REV. NO.	002	

LEGEND

LOCATION OF CROSS SECTIONS CHANNEL STATIONING & CENTER LINE
BOTTOM LIMITS OF
PA EXISTING DIKE
PIPELINES GAS GAS GAS
DREDGING PIPELINE ROUTE OVERHEAD ELECTRIC LINE BORING TIDE STAFF MARKER ##
UNLIGHTED BUOYS
DREDGING TEMPLATE (BOTTOM LIMITS)
DISCHARGE CORRIDOR
MAGNETOMETER ANOMALY POTENTIAL SUBMERGED OBSTRUCTIONS

ABBREVIATIONS

AIDS TO NAVIGATION	ATON
ALLOWABLE OVER DEPTH	AOD
APPROVED FOR DREDGING	AFD
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	NOAA
NOT APPROVED FOR DREDGING	NAD
NOT IN CONTRACT	NIC
NOT TO SCALE	NTS
OCEAN DREDGED MATERIAL DISPOSAL SITE	ODMDS
OPERATION AND MAINTENANCE	O&M
PLACEMENT AREA	PA
REQUIRED	REQ'D
TYPICAL	TYP
U.S. ARMY CORPS OF ENGINEERS	USACE

PIPELINE IO			SIZE	PRODUCT	APPROXIMATE ELEVATION OF PIPLEINE AT CHANNEL CROSSING, FT MLLW
1	681+15	HFOTCO	24 inch	Gas	-81
2	685+60	Enterprise Products	30 inch	Gas	-207.9
З	686+90	Shell Oil Company	16 inch	Gas	-105
4	687+65	Enterprise Products	16 inch	Gas	-124
5	687+65	Enterprise Products	12 inch	Gas	-124
6	687+65	Enterprise Products	N/A	Fiber Optic	-124
7	704+70	Enterprise Products	24 inch	Gas	- 100.5
8	704+70	Enterprise Products	12 inch	Gas	-82
9	704+70	Enterprise Products	8 inch	Gas	-83.3
10	708+00	Kinder Morgan	2-12 inch	Gas	-47
11	708+50	Unknown	6 inch	Gas	Unknown
12	725+45	Enterprise Products	30 inch	Gas	-90
13	725+45	Air Products	2-6 inch	Cas	-83
14	725+45	Kinder Morgan	24 inch	Gas	- 108.9
15	776+75	HFOTCO	24 inch	Gas	-113.5
16	778+00	Phillips 66	8 inch	Gas	-96
17	778+00	Explorer	28 inch	Gas	•60
18	779+00	Colonial	40 inch	Gas	-109
19	779+00	Colonial	36 inch	Gas	HDR Pending
20	779+00	Equistar	10 inch	Gas	-69.5
21	780+00	INEOS	16 inch	Gas	-65
22	780+00	Enterprise Products	8 inch	Gas	-92
23	780+00	Enterprise Products	20 inch	Gas	-56.5
24	881+75	PRAXAIR	2-12 inch	Gas	-50
25	890+00	Kinder Morgan	3-20 inch	Gas	-153.4
26	911+60	Magellan Terminals	2-36 inch	Gas	-72.2
27	911+25	Magellan Terminals	2-20 inch	Gas	-135.2
28	911+60	Magellan Terminals	2-14 inch	Gas	-72.2
29	924+00	Targa	8 inch	Cas	-72.2
30	924+00	Chevron	2-8 inch	Gas	-72.2
31	935+70	Mageilan	16 inch	Gas	Proposed Pipeline (not yet installed
32	937+20	Targa	6 inch	Gas	71

1. THIS TABLE IS NOT ALL-INCLUSIVE. 2. THIS TABLE DOES NOT INCLUDE UTILITIES AND BELATED PIPELINES OUTSIDE OF THE SPECIFIED WORK LIMITS 3. SEE NOTES 2, 3. AND 4 THIS SHEET.

PIPELINES NOT HAVING ADEQUATE DEPTH WILL BE REMOVED BY OTHERS PRIOR TO CONSTRUCTION. PIPELINE REMOVAL IS IN THE PROCESS OF BEING COORDINATED AND WILL BE CLARIFIED IN THESE DRAWINGS AFTER 65% DESIGN.

GENERAL NOTES

SAME STATION. 2

SECTIONS OF PIPELINES SHOWN CROSSING THE CHANNEL HAVE BEEN FIELD VERIFIED BY FUGRO LAND USA. PIPELINE LOCATIONS BEYOND THE CHANNEL HAVE З. NOT BEEN FIELD VERIFIED

CONTRACTOR SHALL NOTIFY PIPELINE/UTILITY OWNERS 48 HOURS PRIOR TO ANY WORK OVER OR ADJACENT TO THEIR PIPELINE/UTILITY USING ONECALL OR ANY OTHER MEANS NECESSARY.

KNOWN POTENTIAL DEBRIS AND OTHER EXISTING FEATURES THAT MAY PRESENT OBSTRUCTIONS DURING DREDGING ARE SHOWN ON THESE DRAWINGS. SOME OF THIS INFORMATION WAS OBTAINED FROM NOAA CHART 11325. CONTRACTOR SHALL REVIEW AND BE FAMILIAR WITH POTENTIAL DREDGING OBSTRUCTIONS SHOWN ON NOAA CHART 11325. REFER TO APPENDIX B (GEOPHYSICAL SURVEYS) OF THE SPECIFICATIONS FOR MAGNETOMETER AND SIDE SCAN SONAR DATA SHOWING ADDITIONAL LOCATIONS OF POTENTIAL DEBRIS AND/OR DREDGING OBSTRUCTIONS CHANNEL

AERIAL PHOTOGRAPHY SHOWN IN THESE DRAWINGS WAS OBTAINED FROM BING MAPS/DIGITALGLOBE AND WAS FLOWN 2018.

CONTRACTOR SHALL BE AWARE OF NAVIGATIONAL REQUIREMENTS OF OTHER HARBOR USERS. DREDGING OPERATIONS, EQUIPMENT, AND PERSONNEL SHALL NOT RESTRICT NAVIGATION IN THE SHIP CHANNEL. RIGHT OF WAY SHALL BE PROVIDED TO ANY AND ALL VESSELS ENTERING AND EXITING PORT. CONTRACTOR SHALL KEEP ABREAST OF THE NAVIGATION REQUIREMENTS OF VESSELS' INGRESS AND EGRESS THROUGH THE PORT AND PROVIDE APPROPRIATE ACCOMMODATIONS TO MOVE DREDGING PLANT AND OTHER EQUIPMENT SO AS NOT TO INTERFERE WITH NAVIGATION. DELAYS CAUSED BY SHIPPING SHALL NOT BE GROUNDS FOR CLAIMS.

8. AIDS TO NAVIGATION (ATON) DISPLAYED ON PLAN SHEETS WERE RETRIEVED FROM THE NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION NAUTICAL CHARTS (11325). NAUTICAL CHART 11325 (41ST ED) WAS PUBLISHED IN AUGUST 2015, AND WAS LAST CORRECTED IN MARCH 2020.

9. ALL DREDGED MATERIAL SHALL BE PLACED IN THE BELTWAY 8 AND E2 CLINTON PLACEMENT AREAS SHOWN ON SHEETS C-301 AND C-302. THE APPROXIMATE NEATLINE CAPACITIES OF THESE PLACEMENT AREAS, INCLUDING 3 FT FOR PONDING AND FREEBOARD, ARE AS FOLLOWS: BELTWAY 8 PA: CY E2 CLINTON PA: CY CONTRACTOR SHALL ANTICIPATE BULKING/SWELLING OF DREDGED MATERIAL DURING DREDGING AND DISPOSAL PROCESS, AND DEVELOP A DISPOSAL PLAN THAT UTILIZES THE FULL DISPOSAL CAPACITY OF EACH PLACEMENT AREA. PRIOR TO COMPLETION OF DREDGING, CONTRACTOR SHALL NOT DEMOBILIZE FROM A PLACEMENT AREA UNTIL IT HAS BEEN FILLED TO CAPACITY. REFER TO SPECIFICATION SECTION 35 20 23 (DREDGING) FOR MATERIAL MANAGEMENT REQUIREMENTS DURING DISCHARGE, INCLUDING FREEBOARD AND DECANTING REQUIREMENTS.

1. ALL CHANNEL END SLOPES SHALL BE EQUAL TO CHANNEL SIDE SLOPES AT THE

KNOWN PIRELINE AND UTILITY CROSSINGS WITHIN THE VICINITY OF THE REQUIRED DREDGING WORK ARE SHOWN ON THESE DRAWINGS. ENGINEER HAS NOT PERFORMED FIELD INVESTIGATIONS TO VERIFY THAT ALL EXISTING PIPELINES AND UTILITY CROSSINGS HAVE BEEN IDENTIFIED. REFER TO SPECIFICATION SECTION 35 20 23 DREDGING FOR REQUIREMENTS TO INVESTIGATE PIPELINE AND UTILITY CROSSINGS, INCLUDING REQUIRED PRE-DREDGING HAZARD SURVEYS.

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PORT OF AUTHOR CONSULTANT: CONSULTANT: CENON PREPARE: Not Regime 0. 4 Regime 0	HOUSTON ORITY
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SEAL: This document the purpose of under the author DANIEL J. HEII 86936 8/15/20. used for comb bidding.or perm 65% REVIE	is released for interim review vrity of .MAN, P.E., It is not to be juction, it purposes.
APPROVED:	DATE
	REPRESENTATIVE
MANAGING DIRECTO	OR - ENGINEERING SUPPORT
PROJECT TITLE:	
HOUSTO	
CHANNE	
EXPANSI	
CHANNE	
IMPROVE	
PROJECT	
II	
PROJECT	11:
PACKAG	E #9
SHEET TITLE:	
SEGMEN	T 4 - HSC
STA 677+	52 TO
HSC STA	930+00
	NOTES
	END
REV DATE	DESCRIPTION
REV DATE A 8/15/20 65%	DESCRIPTION
AND LEGI REV DATE A 8/15/20	DESCRIPTION SUBMITTAL
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AND LEGI REV DATE A 8/15/20 B 15/20	DUH FM B/15/20 AS SHOWN REV. NO. A

			PR	OPOSE	ED CHAN	INEL AL	IGNME	NT DA	ТА	
		CURVE NO.	POINTS (*)	STATION	NORTHING	EASTING	RADIUS	LENGTH	DELTA	DIRECTIO
		HORIZONTA	L DATUM: T	ÉXAS SOUTH	-CENTRAL ZONE	, NAD 83. U.S. S	SURVEY FEET			
		BOGGY BAY	OU TO SIM	MS BAYOU						
			PI	684+03.19	13,834.961.12	3.195,277.05				
							STRAIGHT	4392.818	8°42'00"	Right
			PI	750+21.00	13,835.429.27	3.188,675.82			43°00'00"	Right
			PC	727+96.01	13,835,271.88	3,190,895.24				
		1	cc]	13.840.802.99	3.191.287.50	5545.00	2602.396		
			PCC	753+98.40	13,836,047.34	3,188,436.03				
			CC		13,841.406.03	3.191.649.08	6248.142	1757.273		
			PI	805+63.92	13.839.644.79	3,184,753,18			61°28'48"	Left
			PRC	771+55.68	13,837,149,68	3.187.074.94				
		2	CC		13,833,245,79	3.182.879.58	-5730.74	6149.494		
			PT	833+05.17	13,838.795.96	3.181,452.33				
							STRAIGHT	649.755	ļ	
			PI	843+34.65	13,838.539.56	3.180,455.29			11°21'00"	Right
			PC RC	839154.92	13,838.634.13	3,180,823.05				
		3	20		13,842,333.60	3,179,871.71	3819.83	756.957	-	
			PT	847+ 1 1.88	13,838.519.24	3.180,076.12				
			0	000 04 55			STRAIGHT	409.763		
			PI	869+01.58	13,838,402.07	3,177,889.56			26°13'48"	Leii
			PC 00	851+21.65	13.838.497.32	3,179,666.94	7000 50		ļ	
		4		000 40 51	13,830,888.76	3,180,075.73	-7639.50	3497.466		
				886+19,11	13.837.531.06	3.170,337.31	OTRAICUT		· ·	
				000.14.10	12 027 100 02	0 175 701 17	STRAIGHT	347.09	0057:00/	Dielet
1.1				0933+14,10	10,007,190,93	3.175.731.17			0.27.00	ыдт
		5		003+00.20	13,037,301,21	3 173 220 24	5720.00	605.000		
				806+61.27	13,042.000.25	3 175 400 34	5750.00	095.059	· · ·	
	E INTERACTION			080+01.27	15/057.050.02	0.110.409.04	STRAIGHT	. /2 054	•	
	E TANGENCY		PI	022+18 22	13,836,086,20	3 173 044 44	JINAJGIT	12.004	46%53'24"	Leti
POINT O	ECURVATURE		PC	897+33.32	13 837 031 23	3 175 342 70			40.0024	CEII
POINT		6	20	301133.32	13 831 731 60	314/ 521 42	-5730.00	4689 272	· · ·	
CUBVE CEN	IFB		PT	944+22.60	13,833,762,88	3 172 163 55	0.00.00	1000.212	· · ·	

CHANNEL BASELINE WILL BE UPDATED ONCE BW8 ALIGNMENT HAS BEEN FINALIZED



PORT OF HOUSTON AUTHORITY CONSULTANT: CONS
SEAL: This document is released for the purpose of interim review under the authority of DANIEL J. HEILMAN, P.E., 86936 8/15/20. It is not to be used for construction, bidding, or permit purposes. 65% REVIEW
APPROVED: PORT CONTRACT REPRESENTATIVE MMANGING DIRECTOR - ENGINEERING DESIGN & SUPPORT PROJECT TITLE: HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)
PROJECT 11: PACKAGE #9 SHEET TITLE: SEGMENT 4 - HSC STA 677+52 TO HSC STA 930+00
CHANNEL ALIGNMENT DATA REV DATE 047E DESCRIPTION 4 8/15/20 65% SUBMITTAL
DESIGNER: DJH CADD: FM CHECKER: - DATE: 8/15/20 SCALE: AS SHOWN ORAWING NO. C90-D13-P11-002 SHEET NO. REV. NO. G-003 A



	GENERAL NOTES	OUSTON
0000	1. REFER TO GENERAL NOTES ON SHEET G-002.	
E 3380		
0000		
		CONSULTANT:
0000		HDR Engineering, INC TBPELS Firm Registration No. F-754
		SEAL: This document is released for the purpose of interim review
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		65% REVIEW
0000		
		PORT CONTRACT REPRESENTATIVE MANAGING DIRECTOR - ENGINEERING
		PROJECT TITLE: HOUSTON SHIP
οοοο		CHANNEL (HSC) EXPANSION CHANNEL
No. A. M.		IMPROVEMENT PROJECT (ECIP)
		PROJECT 11: PACKAGE #9
0000		SHEET TITLE: SEGMENT 4 - HSC STA 677+52 TO
		HSC STA 930+00
0000		OVERALL SITE
		REV DATE DESCRIPTION
2000		
1000		
0000		
8		DESIGNER: DJH CADD: FM CHECKER: –
E 33800		DATE: 8/15/20 SCALE: AS SHOWN (DRAWING NO.)
20,000'		C90-D13-P11-002
		V-001 A

E 3153000	E 3157000 E 3151000	E 3165000	E 3169000	E 3177000	E 3181000	E 3185000	E 3189000	E 3193000	E 3197000	E 3201000	E 3202000	E 3209000	E 3213000	E 3217000
N 13852000											6			
N 13848000				1-10							1 e	C 1277 1978	-t- 50+20	
N 13844000		EZCLINTON	FEDERAL ROAD	877 0553 07000 GREENS BAYO		MOUTH OF G BAYOU TIDE		CINTOPORT BLVD			Contraction of the second seco	877 BAT	0743 C TLESHIP TEXAS	t t t tootal
N 13840000		PLACEMENT	HUNTING BAYOU TURNING BASIN	900+00 + + 8	++++ 50+00	800+00HOUSTONS	2) 750+00	BELTWAY 8 PLACEMENT AREA	BEGIN DREDGIN HSC STA. 677+55	6004	00			
N 13832000	C STER HOUSTON	CLINTON DRIVE	10000 10000	ND DATE DO ING C STAL 200 MG			HHOUSTON HHOUSTON (HUUSTON (BUL)	BOGGY BAY	00 8 TIDE STAFF #144)					
N 13828000	0 +	1059400	1000+00				SAM				R			
N 13824000	Elle Bar				PASADENA FWY	(SH 225)								
N 13820000														
E 3153000	E 3157000 E 3161000	E 3165000	E 3169000 E 3173000	E 3177000	E 3181000	E3185000	E 3189000	E 3193000	E 3197000	E 3201000	E 3205000	E 3209000	E 3213000	E 3217000

SURVEY CONTROLS, PROJECT DATUMS AND TIDES (A1)

SURVEY CONTROL POINTS									
CONTROL POINT	NORTHING TXSPCS 4204 (Y)	EASTING TXSPCS 4204 (X)	ELEVATION NAVD88 (Z)	ELEVATION MLLW (Z)		CHANNE STATIO			
C 1277 1978	13,846,422.51	3,212,547.72	3.35	3.35					
877 0743 C (Battleship Texas)	13,842,917.12	3,209,339.21	11.10	11.00					
877 0553 070035 (Greens Bayou)	13,839,400.29	3,180,394.36	12.90	12.70					
877 0777C (Manchester Houston)	13.830.815.26	3,152,837,53	29.27	29.11					

NOTES:

1. CONTROL POINT C 1277 1878 SHALL BE APPLIED AS THE SURVEY CONTROL FOR WORK FROM STATION 677+52 TO 760+00. 2. CONTROL POINT 877 0777 C (MANCHESTER HOUSTON) SHALL BE APPLIED AS THE SURVEY CONTROL FOR WORK FROM

STATION 760+00 TO 930+00. 3. CONTROL POINTS 877 0743 C (BATTLESHIP TEXAS) AND 877 0553 070035 (GREENS BAYOU) ARE PROVIDED FOR CHECK PURPOSES ONLY.

TIDE STAFFS								
DESIGNATION	NORTHING TXSPCS 4204 (Y)	EASTING TXSPCS 4204 (X)	CHANNEL STATION					
BELTWAY 8 TIDE STAFF (MARKER #144)	13,835,633.00	3,192,661.38						
MOUTH OF GREENS BAYOU TIDE STAFF (MARKER #152)	13,839,148.71	3,184,422.30						
NOTES: 1. BELTWAY 8 TIDE STAFF (MARKER #144) IS AN APPLICABLE REFERENCE FOR WORK PERFORMED FROM STATION								

()

3,000'

677+52 TO 760+00.

2. MOUTH OF GREENS BAYOU TIDE STAFF (MARKER #152) IS AN APPLICABLE REFERENCE FOR WORK PERFORMED FROM STATION 760+00 TO 930+00. 3. ACCURACY OF TIDE STAFFS IS NOT GUARANTEED. CONTRACTOR SHALL VERIFY ALL TIDE STAFFS PRIOR TO WORK.

	GENERAL NOTES	OUSTON AL
1.	REFER TO GENERAL NOTES ON SHEET G-002.	PLA
839000		PORT OF HOUSTON AUTHORITY
COMIS		CONSULTANT: DESIGN PREPARED BY
838000		HCR Engineering, INC THELS Firm Registration No. F.734
		SEAL: This document is released for the purpose of interim review
837000		under the authority of DANIEL J. HEILMAN, P.E., 86336 d/5/20. It is not to be used for construction, bidding, or permit purposes. 65% REVIEW
		APPROVED:
836000		PROJECT TITLE: HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)
		PROJECT 11: PACKAGE #9
		SHEET TITLE: SEGMENT 4 - HSC STA 677+52 TO HSC STA 930+00
834000		EXISTING CONDITIONS -
		REV DATE DESCRIPTION A 8/15/20 65% SUBMITAL
833000		
		DESIGNER: DJH CADD: FM CHECKER: – DATE: 8/15/20
- And I		SCALE: AS SHOWN
		C90-D13-P11-002 SHEET NO. REV. NO. V-003 A

1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	GENERAL NOTES ON SHEET G-002.	PORT OF HOUSTON AUTHORITY
		NOT Engineering, INC THEFELS From Registration No. F.754 SEAL: This document is released for the purpose of interim review under the authority of DANIEL J. HEILIMAN, P.E., 86936 KI5/20. It is not to be used for construction, bidding, or permit purposes. 65% REVIEW
AS DEEP ER PORT		APPROVED:
837000		PROJECT 11: PACKAGE #9 SHEET TITLE: SEGMENT 4 - HSC STA 677+52 TO HSC STA 930+00
1836000 CO		CONDITIONS - HSC STA. 758+44 TO HSC STA. 859+87 REV DATE DESCRIPTION A 8/15/20 655 SUBMITAL
AXIALL		
		DESIGNER: DJH CADD: FM CHECKER: - DATE: 8/15/20 SCALE: AS SHOWN DRAWING NO. C90-D13-P11-002 SHEET NO. REV. NO.
		V-004 A

000	GENERAL NOTES	JOUSTON 4
06218 E B400000	1. REFER TO GENERAL NOTES ON SHEET G-002.	
ONM		PORT OF HOUSTON AUTHORITY
MATCHLINE 4		
338000 KE CAL		SEAL: This document is released for the purpose of interim review under the authority of DANIEL J. HEILMAN, P.E., 86936 8/15/20. It is not to be used for construction, bidding, or permit purposes. 65% REVIEW
337000		APPROVED:
See See		DESIN & SUPPORI PROJECT TITLE: HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)
836000		PROJECT 11: PACKAGE #9 SHEET TITLE: SEGMENT 4 - HSC STA 677+52 TO HSC STA 930+00
192 3355000		EXISTING CONDITIONS - HSC STA. 859+87 TO HSC STA. 930+00
334000		
3179000		DESIGNER: DJH CADD: FM CHECKER: – DATE: 8/15/20 SCALE: AS SHOWN
Ш		DRAWING NO. C90-D13-P11-002 SHEET NO. V-005

den ante	GENERAL NOTES	JOUSTON A
1.	REFER TO GENERAL NOTES ON SHEET G-002.	
1 13848000		TON THE
		PORT OF HOUSTON AUTHORITY
		CONSULTANT: DESIGN PREPARED BY:
1 13844000		HDR Engleuing NC TBFLIS Fin Registration No. 754
		SEAL: This document is released for the purpose of interim review
13840000		under the authority of DANIEL J. HEILMAN, P.E., 86936 8/15/20. It is not to be used for construction, bidding, or permit purposes. 66% DEV/IEW/
-		APPROVED:
S		MANAGING DIRECTOR - ENGINEERING DESIGN & SUPPORT PROJECT TITLE: HOUSTON SHIP
13836000		CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)
		PROJECT 11:
13832000		SHEET TITLE: SEGMENT 4 - HSC STA 677+52 TO HSC STA 930+00
A STATE		
		OVERALL DREDGING PLAN AND KEYMAP
13828000		REV DATE DESCRIPTION A 8/15/20 65% SUBMITAL
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3836500	GI 1. REFEF	ENERAL R TO GENERAL	NOTES (TES ON SH	S EET G-002.	PORT OF HOUSTON AUTHORITY CONSULTANT: CONS
3835500						This document is released for the purpose of interim review under the authority of DANIEL J. HEILMAN, P.E., 86938 6/15/20. Lis not to be used for construction, bidding, or permit purposes. 65% REVIEW
-						APPROVED:
<u>660+00</u> 						PROJECT TITLE: HOUSTON SHIP CHANNEL (HSC) EXPANSION
						CHANNEL IMPROVEMENT PROJECT (ECIP) PROJECT 11:
3834500						PACKAGE #9 SHEET TITLE: SEGMENT 4 - HSC STA 677+52 TO HSC STA 930+00
3834000	SEGME	NT 4 CHANN	EL IMP	ROVE	EMENTS	C-002 - DREDGE PLAN - HSC STA. 677+52 TO HSC STA. 707+48
3004000	BOC DREDC	GGY BAYOU GING TEMPL/	TO SIM ATE CO	S BA' ORD	YOU INATES	REV DATE DESCRIPTION
1	POINT #	NORTHI	NG	E	ASTING	
der-	01	13,835,188	3.08	3,	195,912.33	
1 49 1	02	13,835,206	6.58	3,	194,988.83	
To the	03	13,835,469	9.07	3,	193,424.61	
3833500	27	13,834,65	7.91	3,1	195,915.76	
	28	13,834,677	7.65	3,*	194,930.28	
1	29	13,834,942	2.19	3,1	193,361.86	
2		BORING CO	ORDIN	ATES		DESIGNER: DJH
100	BORING	NORTHING	EAST	NG	ELEVATION	CADD: FM CHECKER: –
19	ECP-402D	13,834,265.72	3,195,77	73.00	-37.23	DATE: 8/15/20
NO 1	ECP-403D	13,834,643.84	3,193,87	70.99	-16.50	DRAWING NO.
						C90-D13-P11-002 SHEET NO. C-002 A

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1 13837500 1 13837500 1 13837000	I. REFER	NERAL NC	ON SHEET G-002.	PORTOF HOUSTON PORTOF HOUSTON AUTHORITY CONSULTANT: CO
				used for construction, bidding, or permit purposes. 65% REVIEW
13836000				APPROVED:
13835500				EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP) PROJECT 11:
+				PACKAGE #9 SHEET TITLE: SEGMENT 4 - HSC STA 677+52 TO HSC STA 930+00
N 138355000				DREDGE PLAN - HSC STA. 707+48 TO HSC STA. 755+42
V 13834500	SEGMEN BOGC DREDGII	T 4 CHANNEL IMF GY BAYOU TO SIN NG TEMPLATE CO	PROVEMENTS IS BAYOU DORDINATES	REV DATE DESCRIPTION A 8/15/20 655 SUBMITAL
1	POINT #	NORTHING	EASTING	
	04	13,835.604.92	3,191.509.07	
1	05	13 835 424 43	3 191 496 27	
	CU 00	12 825 450 70	3 101 104 50	
	00	12 805 601 00	3,191,124.50	
13834000	07	13,835,631.28	3,191,137.36	DESIGNER: DJH
1 and the second	08	13,835,651.52	3,190,851.92	CADD: FM
8	09	13,836,186.06	3,188,867.25	CHECKER: -
930(30	13,835,123.15	3,190,810.15	SCALE: AS SHOWN
E 31	31	13,835,706.28	3,188,642.06	DRAWING NO.
0'			1	C90-D13-P11-002 SHEET NO. REV. NO. C-003 A

8500	G	ENERA	LN	OTE	S			USTON	
E 318	1. REF	ER TO GENERA	L NOTES	S ON S	SHEET G-002.		A PORT OF		
3839000								STON, TE OF HOUS JTHORIT	STON Y
X							CONSULTA DESIGN	INT: PREPARED BY: Deparet By: proceeding. INC Firm fico No. F-754	
3838500									
3838000							SEAL: This doct the purpo under the DANIEL & 86936 8/ used for bidding, c 65% R	ument is releas use of interim n authority of J. HEILMAN, F 15/20. It is not construction, or permit purpo EVIEW	sed for eview ?.E., to be pses.
							APPROVED	ITRACT REPRESE	
1								SIGN & SUPPOR	
3837500							HOUS	TON SHI INEL (HS INSION	¦₽ ;C)
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								LECI 11: (AGE #9	
3837000							STA 6 HSC 5	577+52 TC 5TA 930+) 00
	SEGME BO	ENT 4 CHANN GGY BAYOU GING TEMPI	IEL IMF TO SIM	ROVI IS BA	EMENTS YOU		DRED HSC S TO HS 810+4	GE PLAN 6TA. 755+ 6C STA. 6	- 42
	POINT #	NORTHI	NG		EASTING		REV DATE	DESCRI	PTION
17m	10	13,836,94	4.89	3,	187,658.34		A 8/15/2	65% SUBMITTAL	
	11	13,838,28	9.59	3,	186,003.08				
\succ	32	13,836,53	3.52	3,	187,324.16	1			
00/1/	33	13,837,87	8.22	3,	185,668.90				
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00000	BORING	NORTHING	FAST		ELEVATION				
$\prec \land$	ECP-409D	13,836.645.12	3,188.0	58.16	-13.06				
$\langle \rangle$	ECP-410D	13,837.419.17	3,187.5	66.57	-6.26		DESIGNER	: DJH	
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60 500	ECP-413D	13.838.923.45	3.184.7	96.09	-15.72		DATE:	8/15,	/20
3185	ECP-414D	13,838,601.81	3,183,8	76.15	-20.48		SCALE:	AS SI	HOWN
	L	I	1		<u> </u>		C90-I	D13-P11	-002
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	3840000							CONSULTANT	;
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333000 SEGMENT 4 CHANNEL IMPROVEMENTS BOGGY BAYOU TO SINS BAYOU DREDGING TEMPLATE COORDINATES POINT # NORTHING 13 13.838,016.54 13 13.838,016.54 13 13.838,016.54 13 13.838,016.54 13 13.838,016.54 14 13.838,016.54 13 13.838,016.54 13 13.838,016.54 13 13.838,016.54 13 13.838,016.54 13 13.838,016.54 13 13.838,016.54 14 13.838,016.54 13 13.838,016.54 13 13.838,016.54 14 13.838,016.54 13 13.838,016.54 13 13.838,016.54 14 13.838,016.54 15 13.838,016.54 16 13.838,016.54 17 13.838,024.65 18 13.838,024.65 19 15 19 13.838,024.65 19 13.838,024.65	3839500							SEAL:	
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P4140 SEGMENT 4 CHANNEL IMPROVEMENTS B383000 PC/ECC: TITLE B383000 SEGMENT 4 CHANNEL IMPROVEMENTS DCGGY DAYOU TO SIMS BAYOU DREDGING TEMPLATE COORDINATES PMOJECT (IECP) PDINT # NORTHING EASTING 13 13.839,169.54 3.183,157.28 13 13.839,169.54 3.182,395.14 14 13.838,169.54 14 13.839,165.54 3.182,395.14 14 13.838,169.54 15 13.838,690.03 3.180,068.09 16 13.838,690.03 180,068.09 17 13.838,823.45 3.182,612.01 35 13,838,823.45 3.182,612.01 35 13,838,807.56 3.182,612.01 35 13,838,807.56 3.182,612.01 36 13,838,807.56 3.182,612.01 35 3.180,068.04 31.90,080.41 39 13.838,369.46 3.180,080.41 39 13.838,369.45 3.180,080.41 39 13.838,369.46 3.180,080.41 36.90 ECP-414D 13.838,71.10 3.180,756.75 -20.48 ECP-414D 13.838,71.03 3.182,740.81 -36.90 ECO-117,	+00								
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3333000 13 13,839,106,54 3,182,395,14 14 13,838,941,23 3,181,414.97 15 13,838,679,41 3,180,068,09 16 13,838,647,10 3,179,658,91 34 13,838,647,10 3,179,658,91 34 13,838,607,56 3,182,612,01 35 13,838,607,56 3,182,419,85 36 13,838,606,83 3,181,489,69 37 13,838,468,66 3,180,086,41 38 13,838,369,46 3,180,084,14 39 13,838,347,53 3,179,674,97 BORING COORDINATES BORING NORTHING EASTING ELEVATION ECP-414D 13,838,607,3 3,182,740,81 -36,90 ECP-415D 13,838,711,08 3,182,740,81 -36,90 ECP-418D 13,838,248,38 3,179,801,49 -26,45 GRWING NO. C90-D13-P11-002 SHET NO. CP-418D 13,838,248,38 3,179,801,49 -26,45 OJH CP-418D 13,838,248,	and the	12	13,839,16	9.54	3,	183,157.28		HSC ST	A 930+00
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SEAL: This document is released for the purpose of interim review under the authority of DANIEL J. HEILMAN, P.E., 86936 8/15/20. It is not to be used for construction, bidding, or permit purposes. 65% REVIEW
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	1.	BELTWAY 8 PLACEMENT AREA WILL BE CONSTRUCTED BY OTHERS PRIOR TO THIS CONTRACT.	
Tillit	2.	REFER TO GENERAL NOTES ON SHEET G-002.	
44000	3.	CONTRACTOR SHALL ENSURE DISCHARGE PIPES AT DROP-OUTLET STRUCTURE ARE CLEAR OF SEDIMENT SO THAT EFFLUENT FLOWS FREELY AND IS UNOBSTRUCTED. CLEAR SEDIMENT FROM DISCHARGE PIPES PRIOR TO AND DURING DREDGING AS REQUIRED TO ALLOW PIPES TO FLOW FREELY	PORT OF HOUSTON AUTHORITY
43000	4.	A MINIMUM DISTANCE OF 300' SHALL BE MAINTAINED BETWEEN PIPELINE DISCHARGE POINT AND INSIDE TOE OF ADJACENT CONTAINMENT DIKES. DISCHARGE SHALL NOT BE DIRECTED TOWARDS DIKES.	
42000	5.	DISCHARGE PIPE SHALL REMAIN WITHIN APPROXIMATE DISCHARGE CORRIDOR SHOWN.	HDR Engineering, INC TBPELS Firm Registration No. F-754
41000	6.	DURING DREDGED MATERIAL DISCHARGE, CONTRACTOR SHALL CONTINUOUSLY MONITOR CONTAINMENT DIKES TO ENSURE THAT DISCHARGE DOES NOT SCOUR OR ERODE EXISTING CONTAINMENT DIKES. SHOULD SCOUR OR EROSION OCCUR, CONTRACTOR SHALL NOTIFY CONTRACTING OFFICER AND MODIFY DISCHARGE TO PREVENT IMPACTS TO DIKES. MODIFICATION TO DISCHARGE MAY INCLUDE RELOCATION OR REDIRECTION OF DISCHARGE POINT, OR CONSTRUCTION OF TEMPORARY TRAINING BERMS. MODIFICATION OF DREDGED MATERIAL DISCHARGE AND/OR CONSTRUCTION OF TEMPORARY TRAINING BERMS SHALL BE PERFORMED AT NO ADDITIONAL COST TO PORT.	SEAL: This document is released for the purpose of interim review under the authority of DANIEL J. HELMAN, P.E., 86936 8/15/20. It is not to be used for construction, bidding, or permit purposes. 65% REVIEW
39000 38000	7.	CONTRACTOR SHALL MANAGE BOARDS IN DROP-OUTLET STRUCTURE TO PREVENT DREDGING EFFLUENT FROM OVERTOPPING DIKES. A MINIMUM OF 1 FT OF FREEBOARD SHALL BE MAINTAINED AT ALL TIMES BETWEEN WATER LEVEL IN PA AND DIKE CREST. REFER TO SPECIFICATION 35 20 23.17 45 (PIPELINE DREDGING) FOR ADDITIONAL REQUIREMENTS FOR SPILLWAY OPERATIONS.	APPROVED: DATE PORT CONTRACT REPRESENTATIVE MANAGING DIRECTOR - ENGINEERING DESIGN & SUPPORT PROJECT TITLE: HOUSTON SHIP
37000 36000, x 35000	8.	CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CLEARING AND GRADING THAT IS REQUIRED TO ROUTE DREDGING PIPELINE FROM SHIP CHANNEL TO BELTWAY 8 PLACEMENT AREA. MATERIAL THAT IS CLEARED OR EXCAVATED FOR PIPELINE INSTALLATION SHALL BE PLACED WITHIN PA INTERIOR. BRUSH OR WOODY MATERIAL SHALL BE BURIED WITHIN PA INTERIOR AND SHALL NOT BE ALLOWED TO CLOG OUTFALL STRUCTURE.	CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP) PROJECT 11: PACKAGE #9 SHEET TITLE: SEGMENT 4 - HSC STA 677+52 TO HSC STA 930+00
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844000	3.	CONTRACTOR SHALL ENSURE DISCHARGE PIPES AT DROP-OUTLET STRUCTURE ARE CLEAR OF SEDIMENT SO THAT EFFLUENT FLOWS FREELY AND IS UNOBSTRUCTED. CLEAR SEDIMENT FROM DISCHARGE PIPES PRIOR TO AND DURING DREDGING AS REQUIRED TO ALLOW PIPES TO FLOW FREELY.			HOUSTON ORITY
843000	4.	A MINIMUM DISTANCE OF 300' SHALL BE MAINTAINED BETWEEN PIPELINE DISCHARGE POINT AND INSIDE TOE OF ADJACENT CONTAINMENT DIKES. DISCHARGE SHALL NOT BE DIRECTED TOWARDS DIKES.	DES -	IGN PREPARE	D BY:
842000	5.	DISCHARGE PIPE SHALL REMAIN WITHIN APPROXIMATE DISCHARGE CORRIDOR SHOWN.	HDF TBP Reg	Engineering, II ELS Firm stration No. F-7	NC 154
841000	6.	DURING DREDGED MATERIAL DISCHARGE, CONTRACTOR SHALL CONTINUOUSLY MONITOR CONTAINMENT DIKES TO ENSURE THAT DISCHARGE DOES NOT SCOUR OR ERODE EXISTING CONTAINMENT DIKES. SHOULD SCOUR OR EROSION OCCUR, CONTRACTOR SHALL NOTIFY CONTRACTING OFFICER AND MODIFY DISCHARGE TO PREVENT IMPACTS TO DIKES. MODIFICATION TO DISCHARGE MAY INCLUDE RELOCATION OR REDIRECTION OF DISCHARGE POINT, OR CONSTRUCTION OF TEMPORARY TRAINING BERMS. MODIFICATION OF DREDGED MATERIAL DISCHARGE AND/OR CONSTRUCTION OF TEMPORARY TRAINING BERMS SHALL BE PERFORMED AT NO ADDITIONAL COST TO PORT.	SEAL: This da the pui under th DANIE 86936 used fc bidding 65%	pocument pose of he author J. HEI 8/15/20. or constr J, or perr REVIE	is released for interim review ority of LMAN, P.E., It is not to be uction, mit purposes. EW
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PORT OF HOUSTON AUTHORITY

TECHNICAL SPECIFICATIONS FOR

HSC ECIP – SEGMENT 4 DREDGING

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Section 01 35 29.00 Mod	Health, Safety and Emergency Response Procedures	2
Section 01 35 53.00 Add	Security Procedures	2
DIVISION 35 – WATERWAY A	ND MARINE CONSTRUCTION	
Section 35 20 00.00.00 Add	Construction Surveying	5
Section 35 20 23.13.13 Add	Dredging	15
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	Hydraulic Dredge	13

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REGISTRATION NO: 86936

DATE: 08/14/2020



HDR Engineering, Inc. Texas P.E. Firm **Registration No. F-754**

PORT OF HOUSTON AUTHORITY

TECHNICAL SPECIFICATIONS FOR

HSC ECIP – SEGMENT 4 DREDGING

The Technical Specifications for the above-referenced Project are the Port of Houston Authority Standard Technical Specifications listed herein, inclusive of those that have been amended, supplemented, or otherwise modified herein, and inclusive of added sections as listed herein.

The Port of Houston Authority Standard Technical Specifications listed herein may be obtained from Port of Houston Authority Project & Construction Management Department.

Any Port of Houston Authority Standard Technical Specifications listed herein but not amended, supplemented, or otherwise modified herein shall apply as set forth in the Port of Houston Authority Standard Technical Specifications.

Amendments and other modifications to specific Sections of the Port of Houston Authority Standard Technical Specifications take precedence over such Specification Section language of the Port of Houston Authority Standard Technical Specifications.

Any newly added Technical Specification Sections are in addition to the Port of Houston Authority Standard Technical Specifications.

Subject to the foregoing, the Port of Houston Authority Technical Specifications for the above-referenced Project are as follows.

PORT OF HOUSTON AUTHORITY

TECHNICAL SPECIFICATIONS FOR

HSC ECIP – SEGMENT 4 DREDGING

The following Sections of the Port of Houston Authority Standard Technical Specifications (December 2011) form a part of the Technical Specifications for the Project.

NOT USED

The attached modifications to the following Sections of the Port of Houston Authority Standard Technical Specifications (December 2011) form a part of the Technical Specifications for the Project.

DIVISION 01 - GENERAL REQUIREMENTS

Section 01 35 29.00 Mod

Health, Safety and Emergency Response Procedures

The attached Technical Specification Sections are added to and form a part of the Technical Specifications for the Project.

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 00 50.00 Add Section 01 16 60.00 Add Section 01 25 00.00 Add Section 01 35 53.00 Add Scope of Work Environmental Protection Measures Measurement and Basis of Payment Security Procedures

DIVISION 35 – WATERWAY AND MARINE CONSTRUCTION

Section 35 20 00.00.00 Add Section 35 20 23.13.13 Add Section 35 20 23.13.33 Add Construction Surveying Dredging National Quality Management Program Pipeline Hydraulic Dredge



SECTION 01 00 50.00 Add - SCOPE OF WORK

PART 1 GENERAL

SECTION INCLUDES

The work consists of new work and maintenance dredging within Project 11 – Segment 4 located within the Houston Ship Channel near the Beltway 8 Bridge in Houston, Texas Approximate coordinates are as follows: 13,835,605N 3,191,5090E (ref. Texas State Plane Coordinate System, South Central Zone, NAD 83, in U.S. Survey Feet). Placement of dredged material shall be at the Beltway 8 (BW8) dredged material placement area located adjacent to the Houston Ship Channel near San Houston Parkway and San Jacinto Boulevard (reference the following coordinates: 13,837,5001N 3,192,500E); and at the E2-Clinton (E2C) dredged material placement area located 1.5 miles north of the Houston Ship Channel near Holland Avenue and 19th Street (reference the following coordinates: 13,840,000N 3,164,000E).

The work includes maintenance dredging with a pipeline dredge to remove approximately 4,611,000 CY of material within 4.8 miles of the Houston Ship Channel from Boggy Bayou to Hunting Turning Basin. The channel will be dredged to a required depth of -48.5 ft MLLW. The total volume consists of approximately 364,000 CY of maintenance material, and 4,247,000 CY of newwork material including allowable overdepth. Dredged material shall be placed within the Beltway 8 (BW8) and E2-Clinton (E2C) dredged material placement areas.

The scope of work includes all dredge and pipeline mobilization with multiple setups and relocation; a pre-dredge hazard survey; debris removal from the channel prior to dredging; hydraulic dredging; dredging pipeline management; dredged material discharge management; dredged material placement area management; bathymetric surveys before, during, and after dredging; demobilization and site cleanup; and related ancillary work.

The location of the dredging and placement of material shall occur as indicated on the Drawings and Specifications.

PERIOD OF PERFORMANCE

The period of performance shall be 365 calendar days.

SAFETY

The Contractor shall complete the work in accordance with the safety requirements of Port Authority.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01 16 60.00 Add – ENVIRONMENTAL PROTECTION MEASURES

PART 1 GENERAL

1.1 SUMMARY

This section covers prevention of environmental pollution and damage as the result of construction operations under this Contract and for those measures set forth in the other Specifications. For the purpose of this specification, environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare, unfavorably alter ecological balances of importance to human life, affect other species of importance to man, or degrade the utility of the environment for aesthetic, cultural, and/or historical purposes. The control of environmental pollution and damage requires consideration of air, water, and land and includes management of visual aesthetics, noise, solid waste, radiant energy and radioactive materials, as well as other pollutants. The environment shall be protected and all natural resources shall be preserved during construction. All Federal, State, and local laws and regulations shall be complied with during construction.

1.2 RELATED SECTIONS

Section 35 20 23.13 Add – Dredging

1.3 SUBMITTALS

- A. Prior to construction, Contactor shall provide Environmental Monitoring Plan describing training and credentials for personnel for pollution control and environmental protection/monitoring.
- B. Refer to Paragraph 1.8, "Protection of Environmental Resources," for reporting requirements for required environmental monitoring.

1.4 CONTRACTOR FACILITIES

Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas approved by Port Authority. Temporary movement or relocation of Contractor facilities shall be made only on approval by Port Authority. Disposal areas shall not be located in any wetlands, water body, or stream bed. Fuel and lubricate equipment in a manner that protects against spills and evaporation. Provide a berm with impervious liner around fuel and liquid chemical storage tanks to contain the tank contents in the event of a leak or spill. No refueling shall be done onsite unless approved by Port Authority in advance with acceptable spill protection measures.

QUALITY CONTROL

Contractor shall establish and maintain quality control for environmental protection of all items set forth herein. Contractor shall record on daily reports any problems in complying with laws, regulations, and ordinances and corrective action taken. Any damage caused by Contractor during construction shall be repaired, replaced, or restored to the satisfaction of Port Authority.

1.6 TRAINING OF CONTRACTOR PERSONNEL IN POLLUTION CONTROL

Contractor shall train his personnel in all phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of facilities (vegetative covers, and instruments required for monitoring purposes) to ensure adequate and continuous environmental pollution control.

1.7 VOLATILE ORGANIC COMPOUNDS (VOC)

Contractors are required to comply with local, state, and federal VOC laws and regulations and shall have an acceptable VOC compliance plan. The plan shall demonstrate that the use of paints, solvents, adhesives, and cleaners comply with local VOC laws and regulations governing VOC materials and that all required permits have been obtained or will be obtained prior to starting work involving VOC's, in the air quality district in which the start of work. An acceptable compliance plan shall contain, as a minimum, a listing of each materials subject to restrictions in the air quality management district in question, the rule governing its use, a description of the actions which Contractor will take, a description of the actions which Contractor will use to comply with the laws and regulations, and any changes in the status of compliance during the life of the Contract. Alternatively, if no materials are subject to the restrictions, the compliance plan shall so state.

1.8 PROTECTION OF ENVIRONMENTAL RESOURCES

- A. <u>General</u>: The environmental resources within the Project boundaries and those affected outside the limits of permanent work under this Contract shall be protected during the entire period of this Contract. Contractor shall confine his activities to areas defined by the Drawings and Specifications. Environmental protection shall be as stated in the following subparagraphs.
- B. <u>Protection of Land Resources</u>: Prior to the beginning of any construction, Contractor shall identify all land resources to be approved by Port Authority. Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without special permission from Port Authority. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized.
- C. <u>Protection of Water Resources</u>: Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters. Special management techniques as set out below shall be implemented to control water pollution by the listed construction activities which are included in this Contract. Contractor is responsible for maintaining area drainage during construction. Water shall not be allowed to pond on any roadway surface, and runoff from adjacent properties shall not be impeded by Project Work.

D. <u>Air Quality</u>: The environmental coordination for this project included review by the Texas Commission on Environmental Quality (TCEQ). Based on TCEQ recommendations the following air quality measures are preferred for this project:

- 1. Contractor is encouraged to apply for Texas Emission Reduction Plan grants;
- 2. Contractor should exercise air quality best management practices;
- 3. Contractor should use tugboats and support vessels that use clean fuels;
- 4. Select assist tugs based on lowest NO_X emissions instead of lowest price.
- E. <u>Protection of Fish and Wildlife Resources</u>: Contractor shall keep construction activities under surveillance, management, and control to minimize interference with, disturbance to and damage of fish and wildlife. Prior to beginning of construction operations, Contractor shall list species that require specific attention and describe measures for their protection. At a

minimum, Contactor shall have personnel onsite who are trained to identify and continuously observe the work area for the endangered and/or protected species described under Paragraph 1.8.F. Performing site observations may require having dedicated biologists or environmental scientists at the upland dredged material placement area to serve as environmental monitors. All costs for environmental monitoring shall be borne by Contractor. Environmental monitoring and observations shall be documented in Contractor's daily activities reports each day regardless of whether or not species were observed.

- F. <u>Other Protected Species</u>: Implement the following measures to avoid and minimize impacts to other federal- and state-protected species and habitats:
 - 1. Instruct personnel associated with project of the need to identify eagles and colonial nesting birds and avoid impacting them during the breeding season.
 - 2. Port Authority will coordinate with Texas Parks and Wildlife Department to determine the need for any environmental protection measures related to protection of Bald Eagle, Black Rail, Piping Plover, Rufa Red Knot, and other bird species. If directed by Port Authority, Contractor shall provide environmental observers as stated in Paragraph 1.8.E.
 - 3. Contractor shall not disturb bird nests between February 15 and October 1.
 - 4. In the event that migratory birds are encountered onsite during construction, avoid adverse impacts on birds, active nests, eggs, and/or young.
 - a. Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season (February 1 to October 1).
 - b. Avoid the removal of unoccupied, inactive nests, as practicable.
 - c. Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

1.9 CONTROL AND DISPOSAL OF WASTES

- A. <u>Hazardous Waste</u>: Hazardous wastes are defined in 40 CFR 261. Hazardous wastes that are produced as a result of performing Work under this Contract shall be handled, stored, transported, and disposed of according to 40 CFR 262, where applicable. Prevent hazardous wastes from entering the ground, drainage areas, and surface waters. Immediately notify Port Authority of hazardous material spills. Also refer to Article 3.13 of the General Conditions for requirements if hazardous environmental conditions are encountered at the site.
- B. <u>Sanitary Waste</u>. All sanitary waste shall be collected by a licensed sanitary waste management contractor from the portable units as necessary, or as required by local regulation.

C. <u>Construction Debris</u>: Contractor shall collect and properly dispose all trash and construction debris in accordance with all local and state solid waste management regulations and practices. No construction waste material shall be buried within the Project limits. Contractor shall store all waste materials in approved metal dumpsters or other containers approved by Port Authority. The dumpster shall be emptied as necessary or as required by local and state regulation and the contents hauled away for proper disposal.

1.10 POST CONSTRUCTION CLEAN UP

Contractor shall clean up areas used for construction to the satisfaction of Port Authority.

1.11 RESTORATION OF DAMAGE

Contractor shall restore all features damaged or destroyed during construction operations outside the limits of the approved Work areas. Such restoration shall be in accordance with the plan submitted for approval by Port Authority. This work will be accomplished at Contractor's expense without compensation.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 25 00.00 Add – MEASUREMENT AND BASIS OF PAYMENT

PART 1 – GENERAL

1.1 SUMMARY

The extended prices stated on Contractor's Price Exhibit Form will be considered maximum Contract prices with unit price provisions. Unit price provisions are for Port Authority's convenience in adjusting extended prices based on quantity adjustments resulting from Port Authority-initiated Change Orders. The extended prices shall be full compensation for furnishing all labor, materials, tools, equipment, plant supplies, superintendence, insurance, incidentals, services, overhead, and profit necessary to complete the construction of the various items of Work. Contractor's Price Exhibit Form is not intended to itemize each and every labor, material, or incidental requirement. Any requirement, explicit or implied, as determined by Port Authority for Project completion and not specifically listed on the Contractor's Price Exhibit Form shall be included in items with which they are considered subsidiary. Any item not specifically identified as an Additive/Alternate Price shall be considered as part of the Base Price, unless specified otherwise.

1.2 SUBMITTALS

Engineer's approval is required for:

A. Certificates (Paragraph 1.3 D) – Certified Weight Tickets or Certified Barge Displacement Tickets for debris removal.

1.3 QUANTITIES AND MEASUREMENTS

- A. <u>Quantities</u>: All quantities of Work stated on Contractor's Price Exhibit Form are nominal estimates, computed by Engineer, based on the Contract Documents. Contractor shall verify these quantities by preparing its own estimates. In any case, prices stated shall reflect <u>all</u> Work required by the Contract Documents. No quantity adjustment shall be made for work performed outside the specified lines and grades, nor work completed within its specified tolerance.
- B. <u>Measurements</u>: Only length, area, and/or volume measurements shall be made to compute the quantities of Work stated on Contractor's Price Exhibit Form. Weight, load size/counts, and production rate/time shall not be valid measurement techniques, except as specified for debris removal.

<u>Contract Adjustments</u>: Port Authority reserves the right to adjust the quantities of Work stated on Contractor's Price Exhibit Form as it deems appropriate. Adjustments must be in form of a Change Order to the Contract.

<u>Certified Tickets:</u> Submit certified weight tickets or certified displacement tickets for debris removal. Refer to Paragraph 1.4.F.

BASIS OF PAYMENT

- A. <u>Unit Price Provisions</u>:
 - 1. Extended prices stated on the Contractor's Price Exhibit Form shall be considered

maximum Contract prices unless the quantities of work are adjusted by a Port Authorityinitiated Change Order.

- 2. If quantities of work are adjusted by Port Authority, the cost or credit to Port Authority shall be computed in accordance with the unit prices stated on the Contractor's Price Exhibit Form.
- B. <u>Lump Sum/Progress Payments</u>: Lump Sum Work items listed on the Contractor's Price Exhibit Form will be paid for according to the estimated percentage of Work completed for each item. This amount shall be full compensation for completed in-place Work. Engineer will be the sole judge and make the final decision as to the percentage complete of each item and the monetary amount for progress payments to Contractor.
- C. <u>Mobilization/Demobilization</u>: Payment Mobilization/Demobilization (Price Item No. 1) will be made on a lump-sum basis. The total lump sum amount for Mobilization/Demobilization shall include all costs in connection with the mobilization and demobilization of all plant and equipment associated with Dredging necessary to perform the Work for the Base Bid, including costs associated with compliance with the National Dredging Quality Management Program. Refer to Article 10 of the Special Conditions for additional payment requirements for mobilization.
- D. <u>Pre-Dredge Hazard Survey</u>: Payment for Pre-Dredge Hazard Survey (Price Item No. 2) will be made on a lump-sum basis for costs associated with performing a Pre-Dredge Hazard Survey (magnetometer or similar) and related work as described in Section 35 20 00.00 Add, "Construction Surveying."
- E. <u>Construction Surveying</u>: Payment for Construction Surveying (Price Item No. 3) will be made on a lump-sum basis for costs associated with BD and AD channel surveys. Costs shall include bathymetric surveying; preparation of associated quantity computations and drawings; and related work as described in Section 35 20 00.00 Add, "Construction Surveying."
- F. <u>Debris Removal from Dredging Template:</u>
 - Payment for Debris Removal from Dredging Template (Price Item No. 4) will be made on a unit price (per ton) basis for costs associated with materials, labor, and equipment for removal and disposal of debris from the dredging template, as specified in Section 35 20 23.13 Add, "Dredging."
 - Debris removal during construction shall include all of the debris listed on the drawings that is within the dredging template, and any additional debris encountered within the dredging template during the course of work, that cannot be removed through ordinary dredging. Incidental debris that can be removed through ordinary dredging shall not be included in this pay item.
 - 3. The Contract Price for Debris Removal shall include relocating the debris to an offsite disposal facility in accordance with applicable laws and ordinances. All disposal fees are the responsibility of Contractor.
 - 4. Measurement for Debris Removal shall be per short ton of 2,000 pounds based on the Contractor's submittal of Certified Weight Tickets or Certified Barge Displacement Tickets for debris actually removed. Sediment shall not be included in the debris weight.
- G. <u>Pipeline Management</u>: Payment for Pipeline Management (Price Item No. 5) will be made on a lump-sum basis for costs associated with laying, relocating, removing, and handling shore pipelines to Beltway 8 Dredged Material Placement Area (BW8) and E2-Clinton Dredged Material Placement Area (E2C); procurement of the materials and construction of ramps or

installation of temporary culvert pipes which may be necessary for maintaining public access and laying the shore pipes; clearing pipeline routes as needed for installation of shore pipes; excavation and grading along pipeline routes as needed for installation of shore pipes; hauling any cleared and/or surplus excavated material from pipeline routes to placement areas for disposal; maintenance of pipeline during construction; final cleanup of pipeline routes; and any other related work.

- H. Dredging:
 - 1. Payment for Dredging (Maintenance) (Price Item No. 6) will be made for removal, transportation, and placement of dredged material from the Existing O&M Template as specified in Section 35 20 23.13 Add, "Dredging," and as shown on the Drawings. Payment for dredging will include costs for identification and removal of incidental debris and dredging obstructions, and any other related work.
 - 2. Payment for Dredging (New Work) (Price Item No. 7) will be made for removal, transportation, and placement of dredged material from the New-Work Template as specified in Section 35 20 23.13 Add, "Dredging," and as shown on the Drawings. Payment for dredging will include costs for identification and removal of incidental debris and dredging obstructions, and any other related work.
 - 3. Payment for Dredging (Price Item Nos. 6 and 7) will be based on computations of quantities removed from the pay templates specified in Section 35 20 23 13 Add, "Dredging," and as shown on the drawings, as measured by cubic yards in place. No payments will be made for material removed beyond the limits shown on the Drawings. Quantity computations shall be performed by Contractor and substantiated with BD and AD surveys conducted in accordance with Section 35 20 00.00 Add, "Construction Surveying." Port Authority reserves the right to conduct independent surveys and quantity computations to verify Contractor's payment requests.
 - 4. Payment for Dredging (Maintenance) (Price Item No. 6) will be made for removal, transportation
 - 5. Acceptance and payment for Dredging may be requested for Work completed in segments as defined in Section 35 20 23.13 Add, "Dredging." Contractor may request payment for shorter segments; however, length of pay sections shall not be less than 500 feet.
 - 6. Regardless of actual measured quantities, total payment for Dredging (Price Item No. 6 and 7) will not exceed the associated Extended Prices shown on Contractor's Price Exhibit Form without an Port Authority-initiated Change Order (for example, to increase the Contract quantity).

All costs associated with the National Dredging Quality Management Program (Section 35 20 23.13.33, "National Quality Management Program Pipeline Hydraulic Dredge") shall be considered subsidiary to the dredging cost.

Stockpiling and Shaping Dredged Material: Payment for Stockpiling and Shaping Dredged Material (Price Item No. 8 and 9) will be made on a lump-sum basis for costs associated with stockpiling and shaping dredged material within BW8 and E2C. Costs shall include the mobilization and operation of amphibious earthwork machinery suitable for working in extremely soft and wet soils and in shallow water; redistribution, stockpiling, and shaping dredged material placement areas; degrading any areas where excessive mounding occurs; and installation/removal of temporary grade control stakes to monitor mounding heights adjacent to perimeter dikes within each placement area. Ditching and control of water within each PA is considered subsidiary to this work item.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 35 29.00 Mod – HEALTH, SAFETY AND **EMERGENCY RESPONSE PROCEDURES**

Section 01 35 29.00 Std - Health, Safety and Emergency Response Procedures of the Port of Houston Authority Standard Technical Specifications (December 2011) is modified as set forth below.

Part 1.2 Delete the following sections:

> Section 01 56 13.00 Std – Containment Barriers Section 02 83 00.00 Std - Lead-Based Paint Removal and Disposal

- Part 1.3 Bullet 2 is revised as follows:
 - Other federal, state, and local ordinances, statutes, and regulations as applicable.
- Part 1.4 Subsection C is revised as follows:

The Contractor's Plan shall include but not necessarily be limited to, the following components, as appropriate:

- 1. Safe Work Practices
- 2. Engineering Safeguards
- 3. Personal Protective Equipment (PPE)
- 4. Training
- 5. Standard Operating Procedures
- 6. Emergency and Contingency Planning
- 7. Logs and Reports

Hazard Communication Program 8.

The Contractor's Plan shall be approved by signature of a designated representative of the Contracting firm, stating that the plan is in compliance with 29 CFR 1910 and 29 CFR 1926. The signed Contractor's Plan shall be submitted to the Port Authority for review, prior to commencing site work activities.

Part 3.1	Delete Part 3.1
Part 3.2	Delete Part 3.2
Part 3.3	Delete Part 3.3
Part 3.4	Delete Part 3.4
Part 3.5	Delete Part 3.5

Add the following section:



DREDGING PIPELINE SAFETY

Contractor shall reference U.S. Army Corps of Engineers EM 385-1-1, Section 19.G.03, "Submerged and floating dredge pipeline," for regulations with the following exceptions:

A. Whenever buoyant or semi-buoyant pipeline is used, the dredge operator will assure that the pipeline remains fully submerged and on the bottom. When it is necessary to raise the pipeline, proper clearances shall be made and maintained and the entire

length of the pipeline shall be adequately marked at an interval not to exceed 400 feet to clearly show the pipeline length and course.

- B. Indicators, such as signs or buoys that state "DANGER SUBMERGED PIPELINE" shall be placed at the beginning and end of the pipeline. In addition, indicators are required beginning in areas which reduce the charted depth by more than 10 percent, and, as a minimum, every 400 feet to clearly warn of the pipeline length and course.
- C. Lengths of submerged pipeline located outside of the navigation channel which reduce the charted depth by more than 10 percent shall be identified with high visibility buoys marked with 360 degree visibility retro-reflective tape, such as orange neoprene buoys, placed at an interval not to exceed 400 feet to clearly show the pipeline length and course. Indicators meeting the requirements of Paragraph 3.8A above shall be placed midway between each high visibility buoy.

No other clauses or requirements of Section 01 35 29.00 Std – Health, Safety and Emergency Response Procedures of the Port of Houston Authority Standard Technical Specifications (December 2011) are modified hereby.



SECTION 01 35 53.00 Add – SECURITY PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

Due to absence of physical access barriers around the project area, Contractor shall expect the potential for security risks to assets, equipment, and staff. Possible security concerns include but are not limited to theft, robbery, burglary, vandalism, and assault. It is the responsibility of the Contractor to protect his assets, equipment, and staff from security threats. Engineer or Port Authority shall not be deemed responsible for damages, losses, and harms incurred to Contractor's assets, equipment, and staff from security threats.

1.2 RELATED SECTIONS

Section 35 20 23.13 Add - Dredging

1.3 SUBMITTALS

Prior to commencement of work, Contractor shall submit a Security Procedures Plan to Port Authority for approval. It is the responsibility of the Contractor to ensure his proposed security methods and procedures are adequate and comply with all Federal, State, and Local laws, rules and ordinances. Approval of a Security Procedures Plan shall solely confer Port Authority's consent to execution of such plan on Port Authority's property and shall not make the Engineer or Port Authority responsible for losses, damages, injuries, or harms incurred despite or during execution of such plan nor shall it confirm lawfulness of Contractor's Security Procedures Plan.

The Security Procedures Plan shall at minimum include:

- 1. Cover Letter briefly explaining intended Security Procedures;
- 2. Drawings of proposed physical barriers, surveillance cameras, and lamp posts (if any); and
- 3. Name and address of security services subcontractor (if any).

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 GÉNERAL

Contractor and his security services subcontractor (if any) shall obey all federal, state, and local laws and rules during conduct of security procedures. All security interventions shall be enacted in a professional, dignified, and humane manner. If necessary, it is the responsibility of the Contractor and his security services subcontractor (if any) to pay all related fees and appear in the court of law as plaintiff or defendant regarding all security-related matters.

3.2 PHYSICAL BARRIERS

If included in the Security Procedures Plan and upon approval by Port Authority, Contractor may install physical barriers at the project site. Physical barriers shall only be installed at locations shown on the Security Procedures Plan. Approval from Port Authority is required should the

Contractor wishes to modify locations of physical barriers. All physical barriers shall be removed from the site during demobilization.

3.3 LAMP POSTS

If included in the Security Procedures Plan and upon approval by Port Authority, Contractor may install lamp posts at the project site to maintain adequate lighting for security purposes. Lamp posts may only be installed at locations shown on the Security Procedures Plan. Approval from Port Authority is required should the Contractor wish to modify locations of lamp posts. Contractor is responsible for the energy supply required to operate lamp posts. All lamp posts shall be removed from the site during demobilization.

3.4 SURVEILLANCE CAMERAS

If included in the Security Procedures Plan and upon approval by Port Authority, Contractor may install surveillance cameras at the project site. Surveillance cameras may only be installed at locations shown on the Security Procedures Plan. Approval from Port Authority is required should the Contractor wish to modify locations of surveillance cameras. Contractor is responsible for the energy supply required to operate the cameras. All surveillance cameras shall be removed from the site during demobilization.

3.5 SECURITY PERSONNEL

If included in the Security Procedures Plan and upon approval by Port Authority, Contractor may employ security personnel to patrol the project site. All security personnel employed by the Contractor or his security services subcontractor shall be well-groomed and wear clean and pressed uniforms. Contractor shall ensure that security personnel receive orientation training regarding construction sites and known or potential hazards and methods for recognizing and avoiding known or potential hazards. All security personnel shall have adequate security training and be properly licensed and certified to bear and use service weapons.

END OF SECTION

SECTION 35 20 00.00.00 Add - CONSTRUCTION SURVEYING

PART 1 GENERAL

1.1 SUMMARY

Construction Surveying includes furnishing materials, labor, and equipment for hazard, topographic, and hydrographic surveying where required under the Contract Documents.

1.2 RELATED SECTIONS

Section 01 25 00 – Measurement and Basis of Payment Section 35 20 23.13 – Dredging

1.3 REFERENCES

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

U.S. Army Corps of Engineers (USACE) Publications:EM 1110-1-1005(2007) Control and Topographic SurveyingEM 1110-2-1003(2004) Hydrographic Surveying.

1.4 SUBMITTALS

Engineer's approval is required for submittals with an "E" designation; submittals not having an "E" designation are for information only. Contractor shall be aware that the Port Authority will forward these submittals to the U.S. Army Corps of Engineers for additional review.

- 1. Name of Registered Professional Land Surveyor (Paragraph 1.5 A)
- 2. Surveying Plan (Paragraph 1.5 B);
- 3. Survey Submittal Log (Paragraph 3.2 C)
- 4. Pre-Dredge Hazard Survey (Paragraph 3.4)
- 5. Channel Dredging Surveys and Quantity Computations (Paragraph 3.5); E

6. Multi-Beam Surveys (Paragraph 3.5); E

QUALITY ASSURANCE

<u>General</u>: All survey plots submitted to Engineer shall be sealed by a professional land surveyor registered in the State of Texas, experienced in topographic and bathymetric surveying, and familiar and experienced with the USACE's surveying guidelines in Engineer Manuals (EM) 1110-1-1005 and 1110-2-1003. Prior to commencing Work, Contractor shall provide name and credentials of professional land surveyor (PLS) who will oversee surveys. Use of a PLS who is certified as an American Congress on Surveying and Mapping (ACSM) Hydrographer is strongly encouraged.

1.5

- B. <u>Surveying Plan</u>: As part of the Dredging Work Plan required under specification Section 35 20 23.13, "Dredging," Contractor shall provide description of methods and equipment to be applied for required surveys as well as quality control and quality assurance (QA/QC) procedures to be applied. Contractor shall also provide documentation that survey equipment meets the Minimum Performance Standards for Corps of Engineers Hydrographic Surveys, as shown in Table 3-1 of Engineer Manual (EM) 1110-2-1003, and a description of calibration and other QA/QC procedures to be applied. No other equipment shall be used for surveying without prior notification to Engineer. Refer to Paragraph 3.5.B for additional QA/QC requirements for multibeam surveys.
- C. <u>Transducer Frequency</u>: Where electronic fathometers/echosounders are applied for bathymetric surveys, transducer frequency shall be consistent between "Before Dredging" (BD) and "After Dredging" (AD) surveys within any particular area. Measurements shall normally be determined based on high frequency (200 kHz) data. Low frequency (40 kHz) data shall require prior written concurrence from Engineer.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.1 GENERAL

Contractor shall provide pre-dredge hazard survey; and Before Dredge (BD) and After Dredge (AD) surveys for measurement and acceptance of Work items. Plots showing lines and grades, and quantity computations shall accompany all payment requisitions. Refer to Table 1 for a general summary of the required surveys.

	Table 1. Summary of Required Surveys					
	Survey	Intended Purpose	Submittal(s) Schedule			
	Pre-Dredge Hazard Survey	Magnetometer or similar survey required to locate and avoid pipelines, utilities, hazards, and obstructions.	Before commencing physical dredging			
	BD	Transects: Single-Beam and Topographic survey transects to establish baseline condition for calculation of pay volumes.	Before commencing physical dredging (material extraction) at each survey transect.			
		Multi-Beam Survey: Required for general, overall documentation of pre-dredging bathymetry.	Prior to commencing dredging.			
	AD	Transects: Single-Beam and Topographic survey transects to document final dredging locations and depths, verify that material extraction has not occurred beyond specified limits, and determine pay volumes. (Reference Paragraph 3.5).	Upon completion of physical material extraction at each survey transect (required with each Invoice).			
		Multi-Beam Survey: Required to document conditions within final dredging locations and verify that material extraction has not occurred beyond specified limits.	Upon completion of physical material extraction.			

3.2 SURVEY PLOTS

- A. All construction surveys submitted to Engineer shall be in the form of plan-view, cross section plots, and digital data. All surveys shall be referenced to the project datums shown on the Drawings. <u>Plots shall be transmitted digitally in PDF and AutoCAD format</u>. All plots shall legibly and clearly display the following information:
 - 1. Project name and owner (Port Houston Authority)
 - 2. Professional Land Surveyor's seal, signature, and business affiliation (required on pdf transmittals)
 - 3. Date(s) surveys were performed
 - 4. Location and description of survey control
 - 5. Vertical and horizontal datums
 - 6. Sheet name and number
 - 7. Name of Contractor
 - 8. Drawing scale(s)
 - 9. Transducer frequency (where fathometer/echo sounders used)
 - 10. Submittal title (e.g., "Segment 4 BD")
- B. Survey plots shall include the following:
 - 1. Plan sheets clearly documenting locations, limits, and dimensions of completed Work (as applicable) and locations where cross sections were taken. Bathymetry and topography shall be plotted using an elevation color scale.
 - 2. Cross-section sheets providing an overlay of sequential survey transects (as applicable) along with specified templates. A legend shall be provided indicating the date and survey type (e.g., BD, AD, etc.) for each transect shown.
 - 3. Cross-sectional areas calculated by comparing the BD and AD surveys.
 - 2. <u>Digital Data</u>: In addition to plots in pdf format, all survey submittals shall include digital data on a labeled USB flash drive or a portable (external) hard drive. Digital data shall include the following:
 - 1. A submittal log documenting surveys submitted to date with descriptors for survey dates and locations.
 - 2. AutoCAD files
 - ASCII files containing the following Northing, Easting, Elevation, and Station for Single Beam and Topographic surveys; and Northing, Easting, and Elevation for Multi-beam survey.
 - 4. PDF files with signed Registered PLS seal

3.3 PRE-DREDGE HAZARD SURVEY

Prior to commencing dredging, Contactor shall perform a hazard survey (magnetometer, side-scan sonar, sub-bottom profiler, and/or similar method) over the entire area to be dredged to search for surface debris, uncharted pipelines, and/or other anomalies on or below the existing seafloor. Hazard survey shall be supplemented with probing as required to determine depth of uncharted hazards/obstructions. Probing shall be coordinated with utility owners. Contractor shall be solely responsible for determining necessary extent and methods of pre-dredge hazard survey. Planned scope of pre-dredge hazard survey shall be summarized in Surveying Plan (Paragraph 1.5.B). Results of the pre-dredge hazard survey shall be provided with a summary of findings, interpretation of any located anomalies, and considerations for dredging.

3.4 SURVEY TRANSECTS

The survey transects specified herein apply to all Single-Beam and Topographic surveys performed by Contractor for acceptance and/or submittal with monthly pay requests. Survey transects shall be collected at location of cross-sections shown on the Drawings and 100 ft intervals within the extents of the channel. Shot spacing along each transect shall not exceed 20 ft. Transects shall extend 100 ft (min) beyond the anticipated limits of dredging.

- A. <u>Before Dredging (BD) Surveys</u>: A survey shall be performed prior to dredging at each required survey transect. BD surveys within each transect shall be performed within 15 days before commencement of dredging within that transect.
- B. <u>After Dredging (AD) Surveys</u>: An AD survey shall be performed to document dredging and for calculation of pay volumes and shall be submitted to Port Authority with each invoice. AD survey at each transect shall be performed within 15 days after completion of dredging within that transect.

3.5 MULTI-BEAM SURVEYS

A. <u>General</u>: Multi-beam (acoustic sweep) surveys shall be performed before and after dredging. Contractor shall provide these surveys to Port Authority as described below. Contractor shall provide Port Authority and USACE with a minimum of 24 hour notice prior to the performance of multi-beam surveys. Contractor shall afford Port Authority and USACE representatives the opportunity to be present on the survey vessel during collection of multi-beam survey data. Port Authority and USACE reserve the right to perform a QA multi-beam survey to verify accuracy and completeness of Contractor's surveys.

<u>Survey Equipment and QA/QC</u>: Equipment applied for multi-beam surveys shall comply with the guidelines stated in EM 1110-2-1003. Contractor shall perform patch tests and quality assurance tests as described in Chapter 11 of EM 1110-2-1003. Documentation of tests shall be submitted to Port Authority with overall survey results.

Survey Limits: Surveys shall provide 100% coverage of required dredging limits.

D. <u>Before Dredging (BD) Multi-Beam Surveys</u>: BD Multi-Beam survey shall be performed within 15 days prior to commencement of dredging.

<u>After Dredging (AD) Multi-Beam Surveys</u>: AD Multi-Beam survey shall be performed as soon as practicable after completion of dredging. Should any shoals, lumps, or other lack of contract depth be disclosed by this examination, Contractor shall remove same and repeat surveys to show that acceptance area is clear.
F. <u>Quantity Computations</u>: After completion of dredging, Contractor shall provide volume calculations to Port Authority based on comparison of BD and AD surfaces. Contractor shall create BD and AD surfaces (triangulated irregular network or similar) using BD and AD Multi-Beam surveys supplemented by topographic BD and AD survey shots collected at Survey Transects (refer to Paragraph 3.4). This volume will not serve as the contract pay quantity and is for informational purposes only. The volume shall be provided within 10 days of after Project 11 - Segment 4 is cleared to required dimensions.

G. Data Processing

- 1. Selected representative "shot," "average," and "minimum" depths shall be derived from the entire edited multi-beam dataset. Extraneous noise and spikes shall be removed from the raw dataset before any other data processing is performed.
 - a. Shot depth shall be applied to represent the general condition of the bottom for plotting and graphical purposes. Shot depth shall be defined as the depth reading closest to the center of 5 ft x 5 ft cells.
 - b. Average depth shall be applied for volume computations (not for pay purposes). Average depth shall be defined as the average of all depths within 3 ft x 3 ft cells. Volume calculations shall be performed through development of a triangulated irregular network (TIN) as described on page 15-11 of EM 1110-2-1003.
 - c. Minimum depth shall be applied to determine acceptance to the required depth as described on page 11-44, "Dredge Clearance & Acceptance Surveys (Shoal/Strike Detection)" of EM 1110-2-1003. Minimum depth shall be defined as the "shoalest" depth within a 3 ft x 3 ft cell. Shoals shall be delineated by a minimum of 3 hits over successive passes. A single high spot unsupported by other data will be disregarded.
- H. <u>Plots</u>: Contractor shall provide survey data plots within 10 days of completion of field surveys. Plots shall consist of surface renderings for visualization of each BD and AD survey. A color scheme shall be applied that clearly highlights shoals and/or locations that exceed the allowable dredging depth.
 - Shot depth plots shall be printed at a scale of one inch = 200 feet with a cell size of 40 ft x 40 ft.
 - 2. Average depth plots are not required.
 - Minimum depth plots shall be printed at an overall scale of one inch = 200 ft. In addition, a surface rendering of each shoal shall be printed on separate sheets at a scale of one inch = 20 ft.

<u>Acceptance</u>: Contractor shall submit "minimum depth" plots showing no depths above the required contract depth, at which time Engineer/Port Authority will accept the dredging work as being complete.

END OF SECTION

PORT OF HOUSTON AUTHORITY TECHNICAL SPECIFICATIONS FOR HSC ECIP – SEGMENT 4 DREDGING

SECTION 35 20 23.13.13 Add - DREDGING

PART 1 GENERAL

1.1 SUMMARY

Dredging work includes furnishing materials, labor, and equipment for dredging, transport of dredged material, and placement of dredged material in accordance with these Specifications and applicable Drawings. Material shall be excavated by Pipeline Dredge. Hopper and mechanical (e.g., clamshell) dredging is not permitted.

1.2 MEASUREMENT AND PAYMENT

Measurement and payment for dredging and debris removal will be paid for in accordance with provisions of 01 22 10.01 Add, "Measurement and Basis of Payment."

1.3 EXISTING CONDITIONS

The drawings represent conditions existing as of the date of their preparation based on surveys performed by the Port Authority. However, to reflect anticipated shoaling occurring between the dates of preparation of the drawings and the dates of the "Before Dredging (BD)" sections, the estimated dredging quantities stated in the attached Exhibit A: Price Exhibit have been adjusted accordingly. The depths and elevations shown will be verified and corrected by fathometer soundings taken by Contractor before dredging.

1.4 RELATED SECTIONS

 A. Technical Specifications: Section 01 16 60 Add – Environmental Protection Measures Section 35 20 00.00 Add – Construction Surveying Section 35 20 23.13.33 Add – National Dredging Quality Management Program Pipeline Hydraulic Dredge

B. Appendices:

Appendix A – Geotechnical Investigation Data Appendix B – Geophysical Investigation Data

C. Attachments:

Attachment 1 – Quantity Summary Table

1.5 REFERENCES

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

U.S. Army Corps of Engineers (USACE) Publications:

EM 1110-2-5025(2015) Dredging and Dredged Material ManagementEM 385-1-1(2014) Safety and Health Requirements

1.6 SUBMITTALS

Engineer's approval is required for submittals with an "E" designation; submittals not having an "E" designation are for information only. Contractor shall be aware that the Port Authority will forward these submittals to the U.S. Army Corps of Engineers for additional review.

- 1. Daily Activities Reports (Paragraph 1.12.G)
- 2. Logs/Records (Paragraph 1.12.B)
- 3. Dredging Work Plan (Paragraph 1.12.D)
- 4. Documentation of USACE and USCG Notification (Paragraphs 1.12.A and 1.15)
- 5. Request for Temporary Removal of Aids to Navigation (Paragraph 1.13); E
- 6. Dredge Pipeline Map (Paragraph 3.9.A)
- 7. Spill Contingency Plan (Paragraph 3.10)
- 8. Surveys (Refer to Section 35 20 00.00 Add, "Construction Surveying"); E

1.7 CHARACTER OF MATERIAL

The material to be removed is primarily new-work (virgin-cut) material. Bidders are expected to examine the worksite and geotechnical data and, after investigation, decide for themselves the character of materials.

1.8 UTILITIES ACROSS THE LIMITS OF DREDGING

It is Contractor's responsibility to investigate the location of utility and pipeline crossings. Contractor shall take precautions against damages which can result from dredging operations in the vicinity of the utility and pipeline crossings. If damage to utilities or pipelines occurs as a result of dredging operations, Contractor shall suspend dredging until the damage is repaired and approved. Costs of these repairs and downtime of the dredge and attendant plant shall be at Contractor's expense.

1.9 KNOWN PIPELINE/UTILITY CROSSINGS

There are pipelines and utilities which are within the work limits. Pipelines and utilities identified by Port Authority and Engineer are shown on the Drawings. Additional pipelines and utilities may exist. Prior to work, Contractor shall contact the following to verify pipeline locations:

- 1. Lonestar Notification Center
 - 1-713-223-4567 or 1-800-669-8344
 - Texas 811 (Dig-Tess) 1-800-344-8377

1.10 WORK BY OTHER CONTRACTORS IN THE VICINITY

During the course of this Contract, other contractors may be performing work in the vicinity, such as mowing the dikes of the Placement Areas (PAs). The Port Authority may hold coordination meetings between the various contractors, the U.S. Army Corps of Engineers, the U.S. Coast Guard Vessel Traffic Service, Houston Pilots Association, dock/facility operators, and users of the channel on an as-needed basis. Contractor is required to attend these coordination meetings.

ORDER OF WORK

Contractor shall begin dredging no later than 30 days after issuance of Notice to Proceed.

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1.12 QUALITY ASSURANCE

A. Permits

- Port Authority-Obtained Permits: The Federal authorizations for this project included completion of an Environmental Impact Statement (EIS) by the U.S. Army Corps of Engineers for the Houston Ship Channel Expansion Channel Improvement Project. Refer to the following report for documentation of the environmental regulatory approvals for this work: "Final Integrated Feasibility Report – Environmental Impact Statement for Houston Ship Channel Expansion Channel Improvement Project, Harris, Chambers, and Galveston Counties, Texas," prepared by USACE Galveston District. A copy of this report is available from Port Authority.
- 2. Contractor-Obtained Permits: Contractor shall be responsible for all permits not provided by Port Authority, including the following:
 - a. Water Quality: Contractor shall be responsible for coordination of Texas Commission on Environmental Quality (TCEQ) Storm Water Program TPDES General Permit TXR150000 as applicable for any land-based work on this project.
 - b. Notice to Mariners: Contractor shall provide U.S. Coast Guard a work schedule within seven days after the construction Notice to Proceed has been received so that a Notice to Mariners can be issued by the U.S. Coast Guard. A copy of this correspondence shall be provided to Engineer. Should Contractor encounter any objects on the seafloor which could be a hazard to navigation, it shall notify the U.S. Coast Guard, any other pertinent agencies, and Engineer immediately as to the location of said object and any other pertinent information necessary for the U.S. Coast Guard to issue a Notice to Mariners.
- 3. Contractor shall make application for and pay for any necessary permit fees, temporary or permanent utility interruption fees, and/or re-location fees for any Contractor-obtained permits.
- B. Logs/Records: Contractor shall provide documentation as may be required for Port Authority to comply with its obligations under the Permits listed in Paragraph 1.12.A.
- C. Environmental Protection Requirements: Refer to Section 01 16 60 Add, "Environmental Protection Measures."

Dredging Work Plan: Prior to commencing Work, Contractor shall provide a Dredging Work Plan containing the planned procedure and timing for the work to be performed. The plan will be reviewed by Engineer for general conformance with the project design intent. The plan shall include the following:

- 1. The planned number and type of dredges to be used.
- 2. Dredging sequence.
- 3. Dredged material placement area sequence.
- 4. Dredge pipeline route(s) (Paragraph 3.9.A).
- 5. Description of bed leveling apparatus and operation (Paragraph 3.7.C).
- 6. Spill Contingency Plan (Paragraph 3.10).
- 7. Site specific management plan for water quality monitoring (Paragraph 3.11.H).
- E. Easements: Permits authorizing the laying of shore pipe, and for placement of dredged material in the PAs, may be requested from the Port Authority. The instruments authorizing the laying of dredge pipelines on shore may contain certain restrictions relative to specific route,

location, and general use of the land. These instruments form a part of these specifications and Contractor is to strictly comply with the terms thereof.

- F. Construction Observation: At the request of Port Authority/Engineer, Contractor shall provide boats, boatmen, laborers, and materials necessary for Port Authority/Engineer to observe the Work.
- G. Daily Activities Reports: Contractor shall provide daily reports documenting completed/ongoing/upcoming work, comparison of scheduled versus actual work completed, adverse weather or other problems that cause delays, and other items as may be required throughout these specifications. Reports shall be completed for every calendar day from the Notice to Proceed to the date of complete demobilization (including site management operations at each PA after placement operations are complete). Reports shall be submitted via email to Port Authority and Engineer daily. Reports shall include the following information:
 - 1. Weather and marine conditions.
 - 2. Problems that cause delays.
 - 3. Equipment and personnel on site.
 - 4. Percent of project completion.
 - 5. Status of pre-construction submittals.
 - 6. Mobilization/demobilization.
 - 7. Approximate cubic yards dredged
 - 8. Approximate quantity and location of debris removed from channel.
 - 9. Locations where dredging occurred and material was placed.
 - 10. Dredge pipeline locations/routes and discharge points.
 - 11. General composition and consistency of material dredged.
- H. DQM System: The work requires use of the National Dredging Quality Management Program (DQM), formerly known as Silent Inspector (SI), to monitor status of the dredge at all times during this Contract. Refer to Specification Section 35 20 23.13.33, "National Dredging Quality Management Program Hydraulic Dredge," for Dredge Quality Management System requirements.

1.13 TEMPORARY REMOVAL OF AIDS TO NAVIGATION

The temporary removal or changes in locations of channel markers may be required to facilitate dredging operations. Refer to Paragraph 1.15.C for notification requirements.

1.14 SUBSURFACE DATA

Geotechnical investigation data are provided in Appendix A. These data represent the most recent information available. Detailed laboratory test data from the geotechnical investigation are available upon request. Variations may exist in the soil conditions between sample locations. Contractor shall draw its own conclusions as to the character of the in-situ soil materials.

B. Contractor shall be aware that debris will be encountered during dredging. Refer to Paragraph
 3.8 regarding Contractor's requirements for locating surface and subsurface debris and potential dredging obstructions.

Geophysical Investigation Data (i.e., magnetometer and side scan sonar data) obtained by Port Authority are provided in Appendix B. This information is made available as a courtesy to Contractor but is not necessarily complete, accurate, or correct.

1.15 NOTIFICATION PRIOR TO COMMENCEMENT OF DREDGING OPERATIONS

- A. Contractor shall notify the Resident Engineer at the Northern Area Office of the U.S. Army Corps of Engineers (USACE), Galveston District, in writing and electronically at least 10 days prior to commencement of dredging activities. Documentation of notice shall be provided to Engineer prior to commencement of dredging.
- B. Contractor shall notify the U.S. Coast Guard (USCG) to arrange a pre-dredging Safety Coordination Meeting at least 15 days prior to commencement of dredging activities. It is Contractor's responsibility to contact Vessel Traffic Service Houston/Galveston (VTS) at 281-464-4837 to coordinate and schedule this meeting. Contractor is to inform the Port Authority at least 48 hours prior to the scheduled meeting so that the Port Authority Representative may attend. In addition, comply with all other USCG requirements including submittal of a Channel Obstruction Request and submittal of a work schedule for issuance of Notice to Mariners (see paragraph 1.12.A). The following items shall be discussed at the pre-dredging Safety Coordination Meeting regarding the VTS Area:
 - 1. Location of intended operation.
 - 2. Description of intended operation including channel obstructions anticipated by Contractor.
 - 3. Configuration of dredge pipelines and equipment in or along the channel, including pipeline staging.
 - 4. Termination point of dredge pipelines in or along the channel.
 - 5. Time required to re-open channel or move for vessel traffic.
 - 6. Plan for managing operating impairments, including VHF-FM radios.
 - 7. Names of the dredges and assist boats being used.
 - 8. Traffic consideration required. For example: slow bell, no meeting or overtaking, and advance notice requirements.
 - 9. Point of contact phone numbers and working frequencies.
 - 10. The master of dredge or floating plant is to immediately notify the VTS of changes to the above report, and at the completion of operations.
 - 11. The VTS operating area includes the Houston Ship Channel from the sea buoy to the Buffalo Bayou Turning Basin, Galveston Channel, Texas City Channel, Bayport Ship Channel, Barbours Terminal Channel, and 10 miles of the Intracoastal Waterway.
 - 12. Communications with the Vessel Traffic Center, call sign "HOUSTON TRAFFIC," is to be accomplished via VHF-FM Channel 12 or 13. The Traffic Center guards both Channel 12 and Channel 13 on a 24 hour basis.
 - 13. The master of a dredge or floating plant is to be aware of and comply with the provision of the order relating to lighting and bunkering operations and multiple vessel moorings, and will notify the VTS when refueling operations are to be conducted.

The temporary removal or changes in locations of channel markers may be required to facilitate dredging operations. Notify Port Authority at least 30 days prior to the date that the removal or change in location of channel markers will be required so USCG can perform the work and so navigation interests may be informed sufficiently in advance of the proposed removal or change in location. Contractor shall not remove, change the location of, obstruct, willfully damage, make fast to, or interfere with aids to navigation.

1.16 SIGNAL LIGHTS

A. Contractor shall display signal lights and conduct his operations in accordance with the general regulations of the Department of the U.S. Army and the USCG. These general regulations govern lights and day signals on towing vessels with tows, vessels working on wrecks, dredges, vessels engaged in laying cables or pipe, dredge pipelines, vessels of more than 65 feet in length moored or anchored in a fairway or channel, and floating plant working in navigable channels, as set forth in Commandant U.S. Coast Guard Instruction M16672.2, Navigation Rules: International – Inland (COMDTINST M16672.2) or 33CFR81 Appendix A (International) and 33 VFR 84 through 89 (inland) as applicable.

1.17 PLANT

- A. General Requirements: Keep the necessary dredge equipment and attendant plant on the job to meet the requirements of the work. The dredge equipment and attendant plant is to be in satisfactory operating condition and capable of safely and efficiently performing the work as set forth in specifications and be subject to inspection by the Port Authority's representative at all times.
- B. Capacity: No reduction in the capacity of the dredge equipment and attendant plant employed to execute the work shall be made without written approval of the Port Authority. The measure of the capacity of the dredge equipment and attendant plant is to be its actual performance on the work to which these specifications apply.

1.18 INSPECTION

- A. The presence of the Port Authority's on-site representative will not relieve Contractor of responsibility for the proper execution of the work in accordance with the specifications. Contractor is required to furnish the following items.
 - 1. Equipment: At the request of the Port Authority, furnish the use of boats, boatmen, laborers, and material forming a part of the ordinary and usual equipment and crew of the dredging plant as may be reasonably necessary for Port Authority and its representatives to inspect and observe the work.
 - 2. Transportation: At the request of the Port Authority, furnish suitable transportation from all points on shore designated by the Port Authority to and from the various pieces of plant, and to and from the PAs. If Contractor refuses, neglects, or delays compliance with these requirements, the specific facilities may be furnished and maintained by the Port Authority, and the cost thereof will be deducted from the amounts due or to become due Contractor.

PART 2

2.1

PRODUCTS

BRIDGE-TO-BRIDGE RADIO TELEPHONE EQUIPMENT

All dredge and self-propelled attendant floating plant shall be radiotelephone equipped to comply with the provisions of the Vessel Bridge-to-Bridge Radiotelephone Act (Public Law 92-63). This will require, as a minimum, radiotelephone equipment capable of transmitting and receiving on 156.6 MHZ (Channel 12) and 156.65 MHZ (Channel 13). Multi-channel equipment also requires 156.8 MHZ (Channel 16). Dredge tugs and tenders shall be considered towing vessels within the meaning of these requirements.

2.2 LOOKOUTS AND RADIO COMMUNICATIONS

Contractor shall have a lookout posted in the dredge control room at all times to monitor the movement of vessels around the dredge plant, perform radio communications with company work boats, and deliver passing arrangements with other commercial, fishing, and recreational vessels. The lookout shall be competent in USCG and Federal Communication Commission's radio communications procedures and requirements and be trained in the Vessel Bridge-to-Bridge Radiotelephone Act. Lookout shall maintain up-to-the-minute information as required to prevent collisions. Each company work boat shall check in with the lookout when arriving at the dredge and shall receive radio clearance from the lookout before departing the dredge.

FAILURE TO COMPLY WITH THIS REQUIREMENT WILL BE CONSIDERED A VIOLATION OF THE SAFETY PROTOCOL ESTABLISHED HEREIN. PURSUANT TO THE DIRECTION OF ENGINEER, CONTRACTOR MAY BE REQUIRED TO CEASE OPERATIONS UNTIL THIS PROVISION IS COMPLIED WITH. ANY SUSPENSION, DELAY, OR INTERRUPTION OF WORK ARISING FROM NONCOMPLIANCE OF THIS PROVISION SHALL NOT BE CONSTRUED AS STANDBY TIME.

2.3 MATERIAL TO BE REMOVED

- A. Dredged Material: Dredged Material includes any material—including but not limited to soil, mud, sediment, sand, clay, silt, gravel, and incidental debris—that can be removed via ordinary dredging. The dredged material to be removed is primarily new-work material. As described in Paragraph 1.14, explorations, including core borings, to determine the character of materials to be removed have been obtained by the Port Authority.
- B. Debris: Debris includes material such as metal bands, pallets, pieces of broken cable, rope, stumps, broken piles, and other miscellaneous objects that cannot be removed through ordinary dredging. As described in Paragraph 1.14, explorations, including side-scan sonar and magnetometer surveys, have been obtained by the Port Authority to help identify debris.

PART 3 EXECUTION

3.1 AREAS TO BE DREDGED

Required dredging areas are shown on the Drawings.

3.2 CONDUCT OF DREDGING WORK

Pre-Dredging Safety Coordination Meeting: Prior to arrival on location and commencing dredge operations, Contractor shall arrange a pre-dredging safety coordination meeting between the dredge operators, pilots, towing industry representatives, Vessel Traffic Service (VTS), USCG, Port Authority, and USACE. Refer to Paragraph 1.15.B for additional requirements.

Protection of Existing Waterways: Conduct dredging operations using a method that will ensure that material or other debris are not pushed outside of the dredging limits or be otherwise deposited in existing side channels, basins, docking areas, or other areas being used by vessels. Contractor will be required to change its method of operations as may be required to comply with the above requirements. If bottom material or other debris is pushed into areas noted above as a result of Contractor's operations, the same is to be promptly removed by and at the expense of Contractor to the satisfaction of the Port Authority.

C. Adjacent Property and Structures: No dredging shall occur within 25 feet of an existing bulkhead, dock, wharf, revetment, mooring structure, pile, or other existing structure unless specifically stated or shown otherwise on the drawings. Damage to private or public property

or structures resulting from the disposal or dredging operations are to be repaired promptly by and at Contractor's expense. Damage to structures as a result of Contractor's negligence will result in suspension of dredging and require prompt repair at Contractor's expense as a prerequisite to the resumption of dredging. Where dredging to obtain the required dimensions might endanger a structure, the Port Authority shall be notified prior to dredging that area. Upon notification, the Port Authority may reduce the required excavation in the vicinity of this structure.

3.3 PREPARATION

- A. Pre-Dredge Hazard Survey: Prior to dredging, a magnetometer survey, side-scan sonar survey, sub-bottom profile survey, and/or other similar survey shall be performed to search for uncharted pipelines and other anomalies within the dredging template. Refer to Section 35 20 00.00 Add, "Construction Surveying," for requirements of pre-dredge hazard survey. In addition to performing pre-dredge hazard survey, Contractor shall locate and avoid pipelines, cables, and other hazards prior to anchoring, spudding, laying/removing dredge pipeline, etc. throughout the course of the Work. If utility damage occurs as a result of dredging operations, Contractor shall suspend dredging until the damage is repaired and approved. Costs of these repairs and downtime of the dredge and attendant plant(s) shall be Contractor's responsibility.
- B. Debris Removal: Prior to dredging, Contractor shall rake the dredging areas and remove any surface debris from the dredging template. Refer to Paragraph 3.8 for debris removal requirements.
- C. Emergency Spill Response Equipment: Prior to commencing dredging activities, sufficient spill response equipment, i.e. boom, etc. shall be on-site and ready for deployment in the event of an emergency or accident.

3.4 SURVEYING

Refer to Specification Section 35 20 00.00 Add, "Construction Surveying," for surveying requirements.

3.5 AUTOMATIC IDENTIFICATION SYSTEM

A Class "A" Automatic Identification System (AIS) in accordance with the Code of Federal Regulations (CFR) title 33, CFR 164.46, as amended, is required for dredges used under this Contract.

3.6 OBSTRUCTION OF NAVIGATION AND USACE COORDINATION

A. Port Authority will not undertake measures to keep the channel free from vessels or other obstructions. All work shall be conducted in such manner to obstruct navigation as little as possible. If the plant does obstruct the use of channels or passages and makes traffic movement difficult or endangers the passage of vessels, said plant shall be promptly moved on the approach of any vessel to the extent necessary to afford a practicable passage. Refer to Paragraph 1.15 for required coordination with the USCG. Contractor shall comply with all "moving security zone" requirements set forth by USCG. Delays caused by vessel traffic shall not be considered justification for Standby Time.

Project site is located adjacent to existing ship docks which may be utilized by others during construction. Contractor shall coordinate with Port Authority and schedule work so that dredging operations do not impact use of adjacent docks, and so that use of adjacent docks by others does not impact Contractor's dredging work schedule. Delays caused by use of docks

by others shall not be grounds for standby time, claims, changed conditions, or time extensions to the Contract.

3.7 DREDGING

- A. Material Removal: All dredging shall be performed within the limits and depths shown on the drawings.
- B. Dredging Limits/Tolerance: Dredging shall not extend below the allowable depths shown on the Drawings and/or specified herein. Contractor shall establish such control as may be necessary to ensure that the allowable dredging depths are not exceeded. The dredge cut tolerance/allowable overdepth shall be as indicated on the Drawings and specified herein.
- C. Bed Leveling: Final leveling of a dredged area may be performed with a drag bar or other approved apparatus. Bed leveling by dragging the bottom shall be allowed only in areas specified for dredging. Shop drawings and photographs showing proposed dragging apparatus shall be included in Contractor's Dredging Work Plan (Paragraph 1.12.D).
- D. Excessive Dredging: Contractor shall not dredge any material beyond the allowable overdepth and specified limits shown on the Drawings. Such dredging shall be considered excessive Overdepth dredging, or excessive side or end slope dredging. Contractor shall be responsible for damage to adjacent property due to overdredging, and shall pay for all repairs or refilling and compacting to the designed grade.
- E. Protection of Existing Waterways: Contractor shall conduct dredging operations in a manner that prevents displacement of material or debris outside of the dredging limits or otherwise causes deposition within adjacent portions of existing channel or side channels, basins, docking areas, or other navigable areas. Such material shall be removed immediately at Contractor's expense.

3.8 DEBRIS WITHIN THE DREDGING LIMITS

- A. Contractor shall remove debris including but not limited to broken cable, rope, chains, stumps, rock, concrete rubble, tires, piles, and other miscellaneous trash from the dredging template. The Port Authority has no knowledge of existing wrecks, wreckage, or other material of the size or character that would require the use of explosives or special or additional plant for its economical removal. Use of explosives is not allowed for any purpose on this project.
- B. Removed debris shall become the property of Contractor and shall be disposed of in accordance with applicable law and applicable codes and standards. Contractor shall dispose debris at a disposal facility outside Port Authority's property.

C. In the event that existing conditions of debris differ materially from those shown on the drawings and described in the geotechnical and geophysical data in Appendices A and B, an adjustment in contract price or time of completion, or both, will be made in accordance with the following:

- Contractor shall promptly, and before the site conditions are disturbed, provide notification to Port Authority of unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.
- Port Authority will investigate the site conditions promptly after receiving Contractor's notice. If conditions do materially so differ and cause an increase or decrease in Contractor's cost of, or time required for, performing any part of the work under this Contract, whether or not changed as a result of the conditions, an equitable adjustment will

be made under this section through a Change Order or other written agreement in accordance with and subject to Section 8.09, "Claims for Changed Conditions," of the General Conditions.

- D. Pay requests for debris removal shall substantiated by supporting evidence including but not limited to weight tickets and/or barge displacement measurements, timestamped and georefrenced photos of the debris, journal entries describing the debris, and log entries for delays caused specifically by the debris.
- E. Port Authority and Engineer assume no responsibility for failure to show any or all debris and other obstructions on the Drawings, or to show them in their exact location. Failure to show will not be considered sufficient basis for claims for additional compensation for extra work in any manner whatsoever, unless the obstruction encountered necessitates substantial changes in the lines or grades, or requires the building of special work for which no provision is made in the Drawings and which is not essentially subsidiary to some item of work for which provision is made. It is assumed that as elsewhere provided Contractor has thoroughly inspected the site, is informed as to the correct location of surface structures, and has included the cost of such incidental work in the price bid, and has considered and allowed for all foreseeable incidental work due to variable subsurface conditions, whether such conditions and such work are fully and properly described on the drawings or not. Minor changes and variations of the work specified and shown on the Drawings shall be expected by Contractor and allowed for as incidental to the satisfactory completion of a whole and functioning work or improvement.

3.9 DREDGE PIPELINES

- A. Pipeline Map: Contractor shall provide drawings showing all planned dredge pipeline routes, channel crossing details, pipeline anchor locations, and pipeline markings as part of the Dredging Work Plan (Paragraph 1.12.D). Drawings shall include pipe section joining methods. Pipeline maps shall be provided for each PA.
- B. Pipeline Routes:
 - 1. Dredge pipeline route to each PA shall follow the pipeline corridors shown on the Drawings. Contractor shall obtain approval from Port Authority for any alternate pipeline routes.
 - 2. The dredge pipeline route to each PA is to follow closely the location shown or approved. Detailed right-of-way drawings showing the location of the pipeline routes with respect to property lines are available from the Port Authority. Refer to Paragraph 1.12.E regarding pipeline easements obtained by the Port Authority.
 - 3. Pipeline corridors shown on Drawings may utilize drainage ditch easements and/or existing streams for a portion of the routes. The ditches and streams are prone to rapid water rise and strong currents from short-duration rain events. Routes may require passing pipeline through culverts along ditches. Contractor shall ensure security of pipelines for stability and leak control within steams, wetlands, ditches and culverts. Contactor shall be responsible for protecting streams, ditches, and wetlands such that proper water conveyance is maintained. Contractor shall coordinate with Port Authority prior to placement of pipeline through Port Authority's property and/or any private property, through culverts, along any improved drainage ditches, and though any wetlands.

Pipeline in Water: Pontooned or submerged dredge pipeline shall be located, marked, and maintained so as not to interfere with navigation or present a hazard to boats and other channel users. Contractor shall mark navigation openings following USCG regulations as required in 33 C.F.R. 88.15. Should Contractor elect to use a submerged section in the dredge discharge pipeline for crossing a navigable channel, detailed plans of the submerged section shall be

submitted as part of (or as an amendment to) the Dredging Work Plan (Paragraph 1.12.D). The plans shall indicate the width and depth of the navigation opening and the method used to mark it by day and by night for the safety of navigation. The minimum bottom width of the submerged section shall match the bottom width of the channel template. The highest point on the pipe or ball connection across the bottom width of a submerged section shall not be higher than the authorized depth in the channel. Lighted buoys meeting the requirements of USCG Regulation 33 C.F.R. 62.25 shall be provided by Contractor to mark the navigation opening. A red buoy exhibiting a quick flashing red light shall mark the right side of the opening, and a black buoy exhibiting a quick flashing green light shall mark the left side of the opening. The frequency of the flashes shall not be less than 60 per minute. "Right side" and "left side" of the opening shall be in conformance with the lateral system of buoyage established by USCG. Requirements for the lighted buoys and descriptions of the lateral system shall be as found in the USCG publication CG 208 entitled "Aids to Navigation."

- D. Pipeline over Land: Pipelines shall not interfere with road traffic. Where pipeline is adjacent to existing roadway, signs shall be provided in both approach directions indicating "Utility Construction Ahead."
- E. Pipeline Interferences: To the extent such information was available to Port Authority/Engineer, pertinent details on the locations of existing utility pipelines and other facilities which may be encountered in trenching or jacking operations have been provided on the Drawings. Contractor shall investigate existing conditions to determine if additional interferences may exist.
- F. Pipeline Leaks: Pipeline leaks or breaks shall be promptly reported to Engineer and repaired. Dredged material that is improperly placed due to leaks and/or breaks shall be removed immediately. Refer to Paragraph 3.12," Unauthorized Placement of Material."
- G. Cleanup: Upon removal of pipeline, pipeline corridor shall be restored to original or better condition. Refer to Paragraph 3.13, "Preservation of Public and Private Property."

3.10 SPILL CONTINGENCY PLAN

Contractor shall ensure that all hazardous material spills are immediately reported to the proper authorities, to Port Authority, and to Engineer. All hazardous material spills shall be immediately cleaned up in accordance with the U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, and all changes and amendments thereto. In accordance with EM 385-1-1, Contractor shall use suitable methods such as dikes or curbs to prevent the spread of hazardous materials from above ground storage tanks and piping in case of leakage. Contractor shall provide and maintain an effective Spill Contingency Plan that includes the following as a minimum:

- A. During all hours of operation, placement of dredged material within upland PAs shall be monitored continuously by field personnel experienced with dredging and operation/management of dredged material placement areas.
- B. Contractor's Spill Contingency Plan shall include the following procedures to be followed in the event of a spill of (1) dredged material outside of the specified PAs and/or (2) fuel, oil, hydraulic fluid, etc.:
 - 1. Dredging shall cease immediately.
 - 2. Contractor shall notify Port Authority and Engineer immediately.

- 3. Contractor shall submit a specific cleanup plan to Engineer. No cleanup actions will commence until the plan has been submitted to Engineer. All cleanup actions shall be at Contractor's expense.
- 4. Contractor shall identify and have available the names and contact information of companies having portable hydraulic dredged or vacuum pumps that would be ready to clean up any dredged material discharge from the project due to being misplaced or associated with a spill.

3.11 DREDGED MATERIAL PLACEMENT

- A. Dredged material shall be transported by hydraulic means and placed in the Beltway 8 (BW8) and E2-Clinton (E2C) PAs shown on the Drawings. Material shall be discharged within the discharge corridors shown on the drawings.
- B. Contractor shall have sole responsibility for safe operation and maintenance of the PAs during dredging activities. Contractor shall inspect PAs to ensure that Contractor's operations and dredged material discharge will not be in violation or cause a violation of the applicable project permits and regulations.
- C. Every effort has been made to give pertinent details of the location of utilities, pipelines, and other facilities which may be encountered in trenching or jacking operations. Investigate existing conditions and be satisfied that no additional construction which may interfere with dredge pipeline laying specified herein exists.
- D. The perimeter and training dikes of the upland PAs shall be maintained as necessary for the duration of this Contract. Repairs to the breaches or low areas shall be constructed to the lines and grades of the existing adjacent dikes. Discharge shall not be directed towards nearby dikes. Refer to drawings for required separation between the dredge pipeline discharge point and adjacent dikes.
- E. Placement of dredged material within designated PAs shall commence at the locations stated on the Drawings. Denser material that tends to build up or stack within the discharge corridors shall be retained/stockpiled and roughly shaped as specified on the drawings. If, in the opinion of Engineer, the initial discharge point becomes full or otherwise overloaded, Contractor shall relocate the discharge pipe, adding pipe as needed to advance the discharge point, and deposit remaining material in succeeding discharge points.
- F. A spreader shall be used on the end of the discharge pipe to reduce scour and help distribute the material evenly. Contractor shall monitor and control the movement of the discharge pipe throughout PA to ensure an even build-up of material and to prevent overflowing the dikes. The effluent ditches shall be maintained and excavated, as necessary, to prevent overflowing of the ditches.

Contractor shall maintain a minimum of 1 feet of freeboard between pool level and dike crest throughout the dredging and placement operations. Sediments shall not be allowed to stack higher than the crest of adjacent perimeter dikes.

Contractor shall operate and maintain decant structures (drop-outlet structures) through the duration of the Contract as required to restrict the flow of effluent over the weirs while efficiently draining water from the PA. Water quality standards shall be maintained for all return water. If satisfying water quality standards requires Contractor to provide additional weir boards or additional settling time by temporarily ceasing dredging, Contractor shall do so at no additional cost to Port Authority. Existing outfall pipes shall be cleared of all debris and accumulated sediment to allow for unimpeded drainage. Care shall be taken to not damage outfall pipes.

- Contractor shall collect samples from the PA outfalls for total suspended solids (TSS) analysis. EPA method 160.2 requirements for detection limits, holding times, and preservation for TSS shall be the standard for measuring TSS. Samples shall be collected from the outfalls daily. Sampling shall occur at the same time each day at the same location. Contractor shall utilize an appropriately qualified and licensed laboratory for collection and analysis of the TSS samples.
- J. Contractor shall develop a site specific management plan for water quality monitoring that will include dredging production/placement modifications prior to reaching a threshold of 300 mg/L. The management plan shall include specific management actions for measurements exceeding 200 mg/L, and additional limitations when 250 mg/L is observed. Management plans may include weir board management, reduced production, and/or end of pipe management. At no time shall Contractor exceed 300 mg/L. Contractor shall provide daily updates to Port Authority on water quality issues associated with weir operations and water quality measurements.
- K. Contractor shall maintain daily records of TSS results and make them part of the Daily Activities Reports. Contractor shall notify Port Authority when TSS levels exceed 200 mg/L and indicate which portions of management plan will be implemented. If Contractor exceeds the 300 mg/L TSS requirement, immediate actions (e.g., add boards, cease dredging) shall be implemented to improve water quality, and Port Authority shall be notified immediately. Contractor shall be solely responsible for developing and implementing the necessary response measures to maintain acceptable effluent water quality, at no additional cost to Port Authority. No payment will be made for delays that occur due to noncompliance with water quality criteria.
- L. Contractor shall be aware that upland PAs are located adjacent to sensitive environmental habitat. Movement of equipment outside of dikes is prohibited except as otherwise shown on Drawings.
- M. Contractor shall inspect containment dikes daily during dredged material discharge. Inspections shall be recorded in Daily Activities Reports. If a dike, weir, or drop-outlet structure failure occurs while materials are being discharged, dredging shall cease and Port Authority shall be notified immediately. Discharge of material into the PA shall not resume until the confining structures have been restored by Contractor to a condition that is acceptable to Port Authority.
- N. Contractor shall perform site management operations at each PA for a period of 30 calendar days after placement operations are complete. This 30-day period is NOT included in the construction Contract Time. During the site management period, the boards on the drop-outlet structures shall be removed at a proper rate to allow continued drainage of the PAs. Water quality standards shall continue to be maintained. Daily water quality tests shall continue to be taken and submitted on Contractor's daily activities reports. During this period, Contractor shall not allow deposited material to impound water or impede natural drainage. Contractor shall, if necessary, excavate and maintain ditches to drain low areas in the PAs to the drop-outlet structure. The ditches shall be of adequate number and size to eliminate ponding of water within the limits of the PAs.

UNAUTHORIZED PLACEMENT OF MATERIAL

Contractor will not be paid for dredged material that is not deposited in specified PAs. Contractor may be required to remove misplaced material and deposit it where directed by Port Authority/Engineer without cost to Port Authority/Engineer. Material shall not be deposited or allowed to flow into project channels or into a bayou, stream tributary to the channel, or into an existing drainage outlet ditch, canal, water intake or outlet facility, nor shall materials be allowed to flow onto improved areas including highways and roads in or adjacent to the PA. If a stream, bayou drainage outlet, ditch, canal, water intake or outlet facility becomes shoaled as a result of the pipeline dredging or placement operations, immediately notify the Port Authority. Unless otherwise instructed by the Port Authority in writing, Contractor shall promptly remove these shoals and the material shall be placed in the PA. Dragging or washing operations to remove the shoals will not be permitted. Any mitigation required by environmental regulatory agencies for unauthorized placement of fill shall be performed at Contractor's expense.

- B. During the progress of the Work, worn out discharge pipe, wire rope, scrap metal, timbers, broken concrete, or any other such type of rubbish or obstructive material shall not be discarded in the PAs, water, along the shoreline, or anywhere else on public or private property. Such material that may be encountered during the dredging activities shall become the property of Contractor and be removed from the Project Site and disposed of in accordance with applicable law, codes, and standards.
- C. Contractor shall indemnify and hold harmless Port Authority/Engineer from any and all losses, expenses, damages, demands, and claims asserted against or sustained by Port Authority/Engineer as a result of or alleged to be the result of illegal, improper, or unauthorized disposal of dredged material or objectionable material.

3.13 PRESERVATION OF PUBLIC AND PRIVATE PROPERTY

Unless otherwise shown on the drawings for removal and relocation, all existing navigation channels, docks, mooring piles, seawalls, jetties, groins, bulkheads, informational and directional signs, fences, roads, ditches, houses/decks, driveways, ramps, private or public grounds, camp facilities, water wells and tanks, station markers, mile markers, and other structures or improvements that are damaged as a result of Contractor's operations under these Specifications shall be repaired or rebuilt by Contractor at his expense. The areas used by Contractor in laying and maintaining his pipelines shall be restored to the same or better condition as existed prior to commencement of the Work. Upon completion of the Work, all trenches and cuts shall be backfilled to original ground level, the ends of temporary culverts shall be fully closed with wooden bulkheads, and trenches and bank cuts shall be backfilled to the original ground level.

3.14 HOUSTON-GALVESTON VESSEL TRAFFIC SERVICE AREA

Comply with the following requirements while operating within the VTS Area.

- A. General: When Contractor's dredge or floating plant is to be operated within the VTS Area, Contractor shall furnish the Vessel Traffic Center the following report at least 30 minutes prior to beginning operations:
 - 1. Location of intended operation.
 - 2. Description of intended operation including Channel obstructions.
 - 3. Configuration of pipelines and equipment in or along the Channel.
 - 4. Termination point of pipelines in or along the Channel.
 - 5. Time required to re-open Channel or move for vessel traffic.
 - 6. Operating impairments, including VHF-FM radios.
 - 7. Names of the assist boats being used.
 - 8. Traffic considerations required, for example: slow bell, no meeting or overtaking, and advance notice requirements.
 - 9. Point of Contact phone numbers and working frequencies.

- B. Report Changes: Contractor shall immediately notify the VTS of changes to the above report and at the completion of operations.
- C. Vessel Traffic Service Location: The VTS Area consists of the navigable Channels between the Galveston Entrance Channel Buoy 1 and the Houston Turning Basin, Galveston Channel, Texas City Channel, the Gulf Intracoastal Waterway, Bayport Channel and Galveston-Freeport Cutoff from mile 346 to mile 352.
- D. Communications: Communications with the Vessel Traffic Center, call sign "HOUSTON TRAFFIC," shall be accomplished via VHF-FM Channel 12. The Traffic Center guards both Channel 12 and Channel 13 on a 24 hour basis.
- E. Operations: The master of a dredge of floating plant is to be aware of and comply with the provisions of the Order Relating to Lightering and Bunkering Operations and Multiple Vessel Moorings and will notify the VTS when refueling operations are to be conducted.

3.15 WORK IN THE VICINITY OF OTHER CONTRACTORS

Coordinate dredging operations, through the Port Authority, with other Contractors who may be working in the vicinity (for example: revetment, jetty repairs, and dike construction). Refer to Paragraph 1.10 (Work by Other Contractors in the Vicinity), for additional coordination requirements.

3.16 DREDGE PLANT INSTRUMENTATION

The Dredge Plant Instrumentation is a part of the dredge plant and shall be functional at all times. If failure of any part thereof occurs, repair the failed part within the next 36 hours restoring full operations. If the system is not fully functional within this period, the particular plant affected will be considered non-responsive to this Contract requirement and shall either be replaced or a redundancy part added to render the plant fully operational to include the monitored data at no additional increase in price or time to this Contract.

3.17 ESTIMATED QUANTITY OF MATERIAL

Within the limits of available funds, Contractor shall excavate the entire quantity of material necessary to complete the work specified whether the quantities involved are greater or less than those estimated. The work is to be done in accordance with this Contract and at the Contract price or prices, subject to the provisions of Paragraph 3.20 (Variations in Estimated Quantities – Dredging).

3.18 QUANTITY SURVEYS

Dredging quantity surveys shall be conducted by Contractor in accordance with Section 35 20 00.00 Add, "Construction Surveying." The data derived from these surveys will be applied to compute the quantities of work performed and the actual construction completed and in place.

Contractor shall determine when a before dredging (BD) survey is required to establish a volume baseline or an after dredging (AD) survey is required to support a request for a progress payment. Contractor shall perform the computations necessary to determine the quantity of work that has been performed or is finally in place, including intermediate periods for which progress payments are requested.

3.19 FINAL EXAMINATION AND ACCEPTANCE

- A. General: Perform AD survey as soon as practicable after the completion of any Channel Segment. If shoals, lumps, or other lack of Contract depth are disclosed by this survey, Contractor shall remove same by dragging the bottom or by dredging at the Contract rate for dredging. If the bottom is soft and the shoal areas are small and form no material obstruction to navigation, the removal of the shoal may be waived at the discretion of the Port Authority. Contractor shall notify Port Authority and U.S. Army Corps of Engineers when final surveys are to be made so they have opportunity to accompany Contractor's survey party. When the area is found to be in a satisfactory condition, it will be accepted finally.
- B. Determination of Pay Quantities: The total estimated amount of material to be removed from within the specified limits, including side and end slopes, anticipated shoaling occurring prior to the dates of the BD surveys, incidental material during dredging (see Paragraph 3.19.E), and overdepth, is shown in the Quantity Summary Table attached to this specification. Pay quantities for actual work will be determined based on AD surveys performed by Contractor for each Channel Segment. Refer to Section 01 25 00 Add, "Measurement and Basis of Payment," for additional conditions of payment, and Section 35 20 00.00 Add, "Construction Surveying," for additional conditions of Acceptance.
- C. Overdepth: To cover inaccuracies of the dredging process, material actually removed from within the specific area(s) to be dredged to depths as specified on the Drawings will be estimated based on the BD and AD surveys and paid for at the Unit Price rate for Dredging. The maximum amount of allowable overdepth dredging is listed in the Quantity Summary Table.
- D. Side and End Slopes: Dredging for side slopes shall follow, as closely as practicable, the lines indicated or specified. There shall be no vertical faces greater than 6 feet along side slopes. Material actually removed from within approved limits to provide for final side and end slopes as specified on the Drawings, but not in excess of the amounts originally above these limiting side and end slopes, will be estimated based on BD and AD surveys and paid for at the Unit Price for Dredging. In computing the limiting amount of side and end slopes, net dimensions, without allowance for Overdepth, shall be applied.
- E. Incidental Material: Any adjacent material that migrates into the required dredging limits as physical dredging is being performed shall be considered incidental material. No adjustments in pay volume will be made for such incidental material.
- F. Final Examination: In addition to the AD surveys to be conducted by Contractor pursuant to Section 35 20 00.00 Add, "Construction Surveying" and Contractor's obligations thereunder, Port Authority shall maintain the right, in its sole discretion, to perform a survey of a particular Channel Segment after Contractor has reported completion of the dredging for such Segment. Port Authority's survey will be performed within 30 days of Port Authority's receipt of Contractor's AD survey. If shoals, lumps, or other lack of contract depth are disclosed by Port Authority's survey, Contractor shall remove same by dragging the bottom or by dredging. Contractor shall then resurvey the Segment and re-submit it to Engineer. If more than two surveys by Port Authority of a Segment are necessary for removal of shoals disclosed at prior surveys, the cost of the third and any subsequent surveys will be charged against Contractor.

Excessive Dredging: Material taken from beyond the limits specified will be deducted from the total pay volume as excessive overdepth dredging or excessive side or end slope dredging, for which payment will not be made. Nothing herein shall be construed to prevent payment for the removal of shoals performed in accordance with Paragraph 3.19.F.

3.20 VARIATIONS IN QUANTITIES

- A. Contractor is cautioned that funding on this Contract is based on the quantities shown in the Price Exhibit. Therefore, Contractor is not to exceed the estimated quantities in the Contract bid line items without prior specific authorization, and only with a signed modification issued by the Port Authority. Contractor shall specifically notify Port Authority, in writing, once Contractor reaches approximately 75 percent of the quantities specified in the Contract Line Items. This notification will be separate and in addition to other reporting required elsewhere in this Contract. Contractor shall notify Port Authority as soon as it recognizes that the estimated quantities are not sufficient to complete the work indicated and specified.
- B. If the actual total quantity of material within the required dredging prism varies from the Quantity Summary Table, an equitable adjustment will be processed in accordance with FAR 52.211-18, Variation in Estimated Quantity. The equitable adjustment applies only to the quantity within the required dredging prism, which does not include the allowable overdepth. If the total quantity of material to be paid for and actually removed under this Contract exceeds the limit established by FAR 52.211-18, Variation in Estimated Quantity, an additional time will be allowed at the rate of 1 calendar day for each 5,000 cubic yards in excess of the established limit. Contractor shall not exceed the estimated quantities in the Contract Line Items without prior authorization and only with a signed modification issued by the Port Authority.
- C. If Contractor exceeds the estimated quantities without a signed modification in place, it will be considered unauthorized work for which Contractor may not be reimbursed. Once the potential quantity overrun is identified, the Port Authority may, among other choices, provide additional funds (if available) to complete the work and equitably adjust the quantities in the Contract Line Item, modify the work to fit within the estimated quantities, consider the Contract complete once the contractually indicated quantities have been reached, or terminate the Contract for the convenience of Port Authority.
- D. This provision is not to be interpreted as an order for Contractor to stop work upon reaching 75 percent of the estimated quantities, it merely requires notice and potential corrective action at that point. However, absent further specific direction, Contractor shall be prepared to stop work at no additional cost to Port Authority once 100 percent of the line item quantity has been obtained.

3.21 DISPOSAL FEES

There are no disposal fees imposed by Port Authority for placement of dredged material in the PAs shown on the Drawings.

3.22 CLEANUP

Upon completion of the work, dredging plant, including pipeline, ranges, buoys, survey stakes, piles, signage, cables, and any other markers or obstructions placed by of for Contractor shall be removed.

END OF SECTION

		DREDGIN	G QUANTITY S	SUMMARY TAE	BLE		
	ACCEPTANCE SECTIONS			CONTRACT QUANTITIES			
Section No.	From Station	To Station	Length of Station (ft)	Required Depth (CY)	Allowable Overdepth (CY)	Total Estimate (CY)	Placement Area
				(1)(2)	2	2	
		Ν	AINTENANCE D	REDGING			
1	677+00	727+00	5,000	8,000	N/A	8,000	BW8
2	727+00	777+00	5,000	96,000	N/A	96,000	BW8 & E2C
3	777+00	827+00	5,000	90,000	N/A	90,000	E2C
4	827+00	877+00	5,000	44,000	N/A	44,000	E2C
5	877+00	930+50	5,350	126,000	N/A	126,000	E2C
SUBTOTAL		25 250	204.000	NI/A	264.000		
(Maintenace Dredging)			25,350	364,000	N/A	364,000	
NEW WORK DREDGING							
1	677+00	727+00	5,000	1,118,000	170,000	1,288,000	BW8
2	727+00	777+00	5,000	1,495,000	186,000	1,681,000	BW8 & E2C
3	777+00	827+00	5,000	565,000	138,000	703,000	E2C
4	827+00	877+00	5,000	137,000	93,000	230,000	E2C
5	877+00	930+50	5,350	206,000	139,000	345,000	E2C
SUBTOTAL			05 050	3 534 000	726.000	4 247 000	
(New Work Dredging)			25,350	3,521,000	720,000	4,247,000	
TOTAL			N/A	3 885 000	726 000	4 611 000	
(All Pipeline Dredging - Maintenance & New Work)			10/5	0,000,000	120,000	4,011,000	
1	The term "Required Depth" is synonymous with the term "Prescribed Depth" and "Required Dredging Prism" used elsewhere in the specifications.						
2	Includes anticipated shoaling.						

PORT OF HOUSTON AUTHORITY TECHNICAL SPECIFICATIONS FOR HSC ECIP – SEGMENT 4 DREDGING

SECTION 35 20 23.13.33 Add – NATIONAL QUALITY MANAGEMENT PROGRAM <u>PIPELINE HYDRAULIC DREDGE</u>

PART 1 GENERAL

1.1 DESCRIPTION

- A. The work under this Contract requires use of the US Army Corps of Engineers (USACE) National Dredging Quality Management Program (DQM) to monitor the dredge's status at all times during the Contract and manage data history.
- B. This performance-based specification section identifies the minimum required output as well as the precision and instrumentation requirements. The requirements may be satisfied using equipment and technical procedures selected by the Contractor.

1.2 RELATED SECTIONS

 A. Technical Specifications: Section 35 20 23.13 Add – Dredging

1.3 SUBMITTALS

Engineer's approval is required for submittals with an "E" designation; submittals not having an "E" designation are for information only. Submittals with an "E" designation will be forwarded to USACE for their review and approval. The following shall be submitted in accordance with Section 01 33 00, "Submittal Procedures":

- 1. SD-01 Preconstruction Submittals: Dredge Plant Instrumentation Plan Revisions or Addendum (Paragraph 1.07); E
- 2. SD-06 Test Reports: Data Appropriately Archived e-mail, Contractor Data Backup (Paragraph 3.03.D); E
- 3. SD-07 Certificates: Letter of National Dredging Quality Management Program Certification (Paragraph 1.06); E

1.4 PAYMENT

No separate payment will be made for the installation, operation, and maintenance of the DQMcertified system as specified herein for the duration of the dredging operations; all costs in connection therewith will be considered a subsidiary obligation of the Contractor and covered under the Contract unit price for dredging in the bid schedule.

NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION

The Contractor is required to have a current certification from the DQM Program for the cutter/suction head hydraulic dredge instrumentation system to be used under this Contract. Standard Operating Procedures (SOP) and criteria for certification are presented on the DQM website at https://dqm.usace.army.mil.

1.6 DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

The Contractor shall have a digital copy of the Dredge Plant Instrumentation Plan (DPIP) on file with the DQM Support Center. While working on site, the Contractor shall also maintain on the dredge a copy of the DPIP, which is easily accessible to Government personnel at all times. This document shall accurately describe the sensors used, the configuration of the system, how sensor data will be collected, how quality control on the data will be performed, and how the sensors/data-reporting equipment will be calibrated and repaired if it fails. A description of the computed dredge-specific data and how the sensor data will be transmitted to the DQM database shall also be included. Prior to the start of work, the Contractor shall submit to the DQM. Support Center any addendum or modifications made to the plan subsequent to its original submission. Requirements and a template for the DPIP are available on the DQM website at https://dqm.usace.army.mil.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 REQUIREMENTS FOR REPORTED DATA

Provide, operate, and maintain all hardware and software to meet these specifications. Also be responsible for the replacement, repair, and calibration of the sensors and other necessary data acquisition equipment needed to supply the required data.

The procedure to complete a repair shall be documented and completed as soon as practical. If repair is not possible within two business days of any sensor failure, a plan and timeline to complete the repair shall be submitted. Upon completion of a repair, replacement, installation, modification, or calibration, the Contractor shall notify the Contracting Officer's Representative (COR). The COR may request recalibration of the sensors or other hardware components at any time during the Contract as deemed necessary.

Keep a log of sensor repair, replacement, installation, modification, and calibration in the dredge's onboard copy of the DPIP. The log shall contain a three-year history of sensor maintenance, including the time of the sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of sensor replacements, and the time that backup sensor systems were initiated to provide the required data. It shall also contain the name of the person responsible for the sensor work.

Sensors installed shall be capable of collecting parameters within the specified accuracies and resolutions indicated in the following subparagraphs and transmit these parameters to the DQM database. All data shall be transmitted in JSON message bundles. Each bundle can contain multiple message types. Sensor data shall be transmitted as work event messages, and data which relates to the operational state of the dredge or its sensors shall be transmitted as state event messages. (See Paragraph titled "Parameter Transmission to the Web Service.")

Message Bundle Data: Every message bundle shall contain descriptive data that relates the message to a given dredge plant and date/time. The start of a message bundle shall be identified by the tag "DQM_data."

- Messages: Messages contain operational data that populates the DQM database for a dredge plant. A message shall consist of an event type and its associated data (as defined in Paragraph titled "Dredge Events"), a date/time stamp indicating when the event occurred or started, and a comment providing clarification or metadata about the situation. There are multiple event types, but they all fall into one of two categories - work events and state events.
 - a. Message Time: In a work event message, message time is the date and time that the data is collected from the sensors; in a state event message, message time is the date and time that the state event begins. The message time shall be reported to the nearest second and referenced to Coordinated Universal Time (UTC) time based on a 24-hour format (YYYY-MM-DD HH:MM:SS). In order to ensure accuracy and reliability, the time stamp shall be synchronized to UTC format from an accurate, unchangeable source (for example, a GPS National Marine Electronics Association (NMEA) datastring). Message time shall be identified by the tag "msg_time".
 - b. Comment: Comments concerning the work event or state event messages being transmitted provide descriptive information that relates to the data. An example of a comment for work event data is information about a sensor issue; an example of a comment for state event data is a description of operations. A comment shall be identified by the introductory tag "comment", and the comment shall consist of no more than 250 characters.
- 2. Dredge Events Work Event: There are two types of dredge event messages work event messages and state event messages. Work event messages contain data that are instantaneously collected or calculated from sensors and are logged as a series of events. Work events are triggered by a time interval change (as described in Paragraph titled "Work Event Messages"). All work event messages shall be initiated by the header tag "work_event".



Vertical Correction: The variation of the water level from the vertical datum for the river stage or tidal gage described in the state events shall be obtained using appropriate equipment to give the water level with an accuracy of plus/minus 0.1 ft. Vertical correction values above project datum described in the dredging specification shall be entered with a positive sign and those below with a negative sign. The tag for vertical correction shall be "vert_correction".

Cutter/Suction Head Location and Movement: The X, Y, and Z components of the cutter/suction head location shall be monitored. Additional calculations made from the observed values determine the rates of movement to track the progress of the dredge.

b.1. Cutter/Suction Head Horizontal Position: The forwardmost point of the cutter/suction head shall be obtained using a positioning system operating with a minimum accuracy level of 3-10 feet horizontal Circular Error Probable

35 20 23.33 Add NATIONAL QUALITY MANAGEMENT PROGRAM PIPELINE HYDRAULIC DREDGE (CEP). It shall be reported as Latitude/Longitude WGS 84 in decimal degrees with West Longitude and South Latitude values reported as negative. Position values shall be identified by the tags "ch_latitude" and "ch_longitude".

- b.2. Cutter/Suction Invert Depth: Cutter/suction invert depth is the depth of the invert of the suction mouth relative to the surface of the water.
 Instrumentation shall be capable of reporting to an accuracy of plus/minus 0.5 foot and a resolution to the nearest 0.1 foot with no tidal adjustments. Minimum accuracies are conditional to relatively calm water. The tag "ch_depth" shall be used to identify the cutter/suction head depth.
- b.3. Cutter/Suction Head Heading: The cutter/suction head heading is the angle of the centerline of the cutter/suction head and dredge ladder measured relative to true north. All headings shall be provided using industry-standard equipment. The heading shall be accurate to within 5 degrees and reported to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention. The tag "ch heading" shall be used to identify the cutter/suction head heading.
- c. Dredge Activity: Dredge activity shall be monitored using a combination of the following parameters.
 - c.1. Slurry Velocity: A flow-metering device, calibrated according to the manufacturer's specifications, shall be used to record the slurry velocity to the nearest 0.01 fps with an accuracy of plus 0.1 fps. If the manufacturer does not specify a frequency of recalibration, calibration shall be conducted prior to the commencement of work. The slurry velocity shall be measured for the same pipeline inside diameter as that used for the slurry density measurement. The tag "slurry velocity" shall be associated with this value.
 - c.2. Slurry Density: A density-metering device, calibrated according to the manufacturer's specifications, shall be used to record the slurry density to the nearest 0.01 g/cc. It is understood that the accuracy of this sensor can vary based on several factors, including the type of material, the magnitude of the cut, and the length of time since calibration. If the manufacturer does not specify a frequency of recalibration, calibration shall be conducted prior to the commencement of work. Continuous monitoring of this sensor ensures that drift and other factors inherent in the dredging process can be accounted for in monitoring dredge activity. The tag "slurry_density" shall be associated with this value.
 - c.3. Pump RPM: The pump rpm is the number of revolutions per minute measured for the slurry pump shaft. The shaft revolution rate (rev/min) shall be measured with the highest level of accuracy that is standard on the vessel's operational displays either at the bridge or in the engine room. This value shall be identified by the tag "rpm".
 - c.4. Pump Vacuum: The vacuum pressure of the dredge pump(s) (inches of mercury) shall be measured as near to the eye as practicable in the pump's suction pipe with the highest level of accuracy that is standard on the vessel's operational displays either at the leverman's controls or in the engine room. Vacuum pressure shall be identified by the tag "vacuum".



- c.5. Pump Outlet Pressure: The pump outlet pressure shall be measured in the discharge line on the pump side of the flap valve in terms of pounds per square inch (psi) on a gauge. Pump outlet pressure shall be identified by the tag "outlet_psi".
- d. Outfall Information (Open Water/Spill Barge Disposal): The X and Y position of the terminal end of the outfall pipe shall be monitored continuously and the position reported as part of the work event string.
 - d.1. Discharge Horizontal Position: The horizontal position of the outfall end of the discharge pipe shall be obtained using a positioning system operating with a minimum accuracy level of 3-10 feet horizontal Circular Error Probable (CEP). It shall be reported as Latitude/ Longitude WGS 84 in decimal degrees with West Longitude and South Latitude values being reported as negative. Position values shall be identified by the tags "outfall_latitude" and "outfall_longitude".
- 3. Dredge Events State Event: There are two types of dredge event messages work event messages and state event messages. State event messages provide information about the current state of the dredge equipment or operations. They are created and sent only when a state changes. Since state events often cannot be collected in real time, state events are tagged with a date time stamp (referenced to Coordinated Universal Time (UTC)) that indicates when the state change happened relative to the work event message tag. This data is considered to be "true" until another state event tag is received. Each type of state event message shall be indicated by a specific header tag as enumerated in the following subparagraphs. State events can be transmitted along with work event message bundles directly by the Contractor using the indicated format, or they can be entered on the "State" tab in the DQM-provided software.
 - Message Time: The state event time is the date and time that the event starts. The leverman's time shall be entered to the nearest second as local time and automatically converted to and reported in UTC based on a 24-hour format (YYYY-MM-DD HH:MM:SS). Message time shall be identified by the tag "msg_time".
- b. C.
- Contract Event: Information concerning the Contract under which dredging is being performed shall be reported at the start and completion of each Contract using the header tag "contract_event".
- b.1. Contract Number: The USACE-assigned Contract number for the project shall be reported using the tag "contract_number".
- b.2. Contract Start and End: The start and end of a Contract shall be reported using the tag "event_type" with the appropriate value of "start" or "end".

Tide Station/River Stage Gage Event Properties associated with the vertical correction (see Paragraph titled "Vertical Correction") for the tide station/river stage gage shall be grouped together under the header tag "station_event". This information shall be sent at the start of the Contract and each time the dredge has moved enough to change the station being used.

c.1. Station Name: The station name is a concise name defining the tide station/river stage gage begin referred to. It shall be introduced by the tag

"station_name", and it shall consist of a descriptor of no more than 25 characters.

- d. Length of Pipe Event: The leverman's estimate of the length of pipe downflow from the dredge pump, measured to the nearest whole foot, shall be reported under the header tag "pipe_length_event". This information shall be sent at the start of the Contract and at the completion of each 24-hour period ending at midnight local time.
 - d.1. Floating Pipe: The total length of floating pipe shall be reported with the tag "length_floating".
 - d.2. Submerged Pipe: The total length of floating pipe shall be reported with the tag "length_submerged".
 - d.3. Shore Pipe: The total length of shore pipe shall be reported with the tag "length_land".
 - d.4. Booster Pump Event: Information concerning the booster pumps being used shall be included under the header tag "booster_pump_event". A message shall be sent to indicate any change in the status of the booster pumps being used.
- e. Dredge Advance: The dredge advance, the total forward progress of the dredge relative to the centerline of the cut, shall be measured to the nearest whole foot and cumulatively calculated over a 24-hour period from midnight to midnight local time. It shall be identified by the tag "advance_daily". The msg_time associated with this tag shall be reported as the first timestamp of the following 24-hour period (based on the local time) rather than as midnight of the day for which the value was calculated, and it shall be reported in Greenwich Mean Time (GMT).
- f. Outfall Information. The X and Y position of the terminal end of the outfall pipe shall be monitored and sent at the start of the Contract and thereafter according to the following table. Discharge Heading and Pipe Elevation may be omitted if the dredge is not discharging into an upland disposal site. For beach nourishment, the horizontal X and Y position of the outfall shall be sent at the start of the Contract and at the completion of each 24-hour period ending at midnight local time.



Discharge Location	Horizontal Position	Discharge Pipe Elevations	Discharge Outfall Heading
Open Water	Continuous Work Event	N/A	N/A
Scow	Upon Change	N/A	N/A
Beach	Every 24 Hours	N/S	N/S
Upland	Upon Change	Upon Change	Upon Change

- f.1. Discharge Location: Information on where the slurry is being discharged shall be reported with the tag "outfall_location". Acceptable values include "upland", "open water", "beach", and "scow".
- f.2. Discharge Horizontal Position: The horizontal position of the outfall end of the discharge pipe shall be obtained using a positioning system operating with a minimum accuracy level of 3-10 feet horizontal Circular Error Probable (CEP). It shall be reported as Latitude/ Longitude WGS 84 in decimal

degrees with West Longitude and South Latitude values being reported as negative. Position values shall be identified by the tags "outfall_latitude" and "outfall_longitude".

- f.3. Discharge Outfall Heading: The discharge outfall heading is the angle relative to true north measured from the centerline of the pipe in the direction of discharge. All headings shall be provided using industry-standard equipment. They shall be accurate to within 5 degrees and reported to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention. The discharge heading shall be identified by the tag "outfall_heading".
- f.4. Discharge Outfall Heading: The discharge pipe elevation is the height of the outfall measured in feet and tenths of a foot relative to the project datum. The required accuracy is contingent upon Contract requirements. The tag "outfall_elevation" shall be used to identify this elevation.
- g. Non-effective Work Event: Delays and dredge downtime shall be reported at the conclusion of the event. The reason for the non-effective work time shall be submitted under the header tag "non_eff_event" within 24 hours of the event
 - g.1. Non-effective Work Interval: The start and end times for the non-effective work event shall be reported using the tags "msg_start_time" and "msg_end_time".
 - g.2. Dredge Function Code: The dredge operator indication of production delays, as listed on Form 4267, shall be transmitted at the end of the non-effective interval. Dredge function event messages shall be identified by the tag "function_code" and shall consist of one of the following standardized entries to indicate the operation:
 - AGV Assisting Grounded Vessels
 - CCH Change Cutterhead
 - CCSH Clear Cutter Suction
 - CLPJ Change Location Bar
 - COLL Collision
 - CPPL Clear Pump Pipeline
 - CPR Change Impeller
 - DR Dike Repair
 - FBD Fire Boat Drills
 - HPL Handling Pipe Line
 - HSL Handling Swing Line
 - HSP Handling Shore Pipe
 - LDNE Loss Due to Natural Elements
 - LDPV Loss Due to Passing Vessel
 - LNL Transfer to New Location
 - MISC Miscellaneous
 - MOB Mobilization & Demobilization
 - MSC Miscellaneous/Non-pay
 - OC Out of Commission
 - OR Operating Repairs
 - P Preparation
 - PREP Preparation & Making Up Tow
 - RPL Repair Pipeline
 - SB Sounding & Buoying

NATIONAL QUALITY MANAGEMENT PROGRAM PIPELINE HYDRAULIC DREDGE

- SBT Stand-By Time as Directed
- SH Sundays-Holidays
- TFS Taking on Fuel & Supplies
- TOW Time on Tow
- WAP Waiting Attendant Plant
- g.3. Additional Comments: The "comment" tag shall be used to provide additional explanation for the noted delays or downtimes. For example, when the code "LDPV" (Loss Due to Passing Vessel) is indicated, the name of the vessel and the number of tows shall be listed with the "comment" tag.

3.2 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIREMENTS

The Contractor's DQM system shall be capable of collecting and transmitting information to the DQM onboard computer. The applicable parameters from Paragraph titled "Requirements for Reported Data," shall be recorded as events locally and continuously transmitted to the DQM database anytime an Internet connection is available. The dredge shall be equipped with a DQM computer system consisting of a computer, monitor, keyboard, mouse, data modem, Universal Power Supply (UPS), and network hub. The computer system shall be a standalone system, exclusive to the DQM monitoring system, and shall have USACE DQM software installed on it. If a hardware problem occurs, or if a part of the system is physically damaged, then the Contractor shall be responsible for repairing it within two business days of the determination of the condition or submitting a plan and timeline for repair if the repair will take more than two business days.

A. Computer Requirements: Provide a dedicated onboard computer for use by the Dredging Quality Management system. This computer shall run the USACE DQM software and receive data from the Contractor's data-reporting interface. This computer must meet or exceed the following performance specifications:



Install a fully licensed copy of Windows 7 Professional Operating System on the computer specified above. Also install any necessary manufacturer- provided drivers for the installed hardware.

This computer shall be located and oriented to allow data entry and data viewing as well as to provide access to data ports for connection of external hardware.

- B. Software: The DQM computer's primary function is to transmit data to the DQM shoreside database. No other software which conflicts with this function shall be installed on it. The DQM computer shall also have the USACE-provided Dredging Quality Management Onboard Software (DQMOBS) installed on it by DQM personnel.
- C. UPS: Supply an Uninterruptible Power Supply (UPS) for the computer and networking equipment. It shall interface with the DQM computer to communicate UPS status, and it shall provide backup power at 1 kVA for a minimum of 10 minutes. Ensure that sufficient power outlets are available to run all specified equipment.
- D. Internet Access: Maintain an Internet connection capable of transmitting real-time data to the DQM server as well as enough additional bandwidth to clear historically queued data when a connection is re-established. The telemetry system shall always be available and have connectivity in the Contract area. If connectivity is lost, unsent data shall be queued and transmitted upon restoration of connectivity. The Contractor shall acquire and install all necessary hardware and software to make the Internet connection available for data transmission to the DQM web service. The hardware and software shall be configured to allow the DQM Support Center remote access to this computer, and the telemetry system shall be capable of meeting these minimum reporting requirements in all operating conditions.

In areas with poor cellular service and at the local District's discretion, it may be required to manually download the data on a daily basis using the protocol for retrieving and submitting backup files provided by the DQM Support Center. This method of data transmission should be used only if Internet connectivity is unavailable at the dredging site, and it should be considered a temporary measure.

E. Data Routing Requirements: Onboard sensors continually monitor dredge conditions, operations, and efficiency and route this information to the shipboard dredge-specific system (DSS) computer to assist in guiding dredge operations. Portions of this Contractor-collected information, as described in this specification, shall be routed to the DQM computer on a real-time basis. Standard sensor data shall be sent to the DQM computer via an RS-232 serial interface with a baud rate of 9600 or 19200bps. The serial interface shall be configured as 8 bits, no parity, and no flow control

Information regarding changes in the state of the dredge shall be digitally logged and transmitted as close to the time of the occurrence as possible. These events can either be included in a separate message bundle going to the DQM onboard computer, or they can be entered on the "State" tab in the DQM Pipeline Software

DREDGE MONITORING DATA

General: Onboard sensors continuously collect dredging data in support of the dredge Contractor's operations. Portions of this Contractor-collected information, as described in this specification, and calculations based on them shall be stored and transmitted to the DQM database on a near real-time basis. Additionally, information regarding the state of the dredge shall be digitally logged and transmitted.

- B. Data Measurement Frequency: The frequency of data transmission is dependent on the type of message being sent. Work Event messages contain data that are instantaneously collected or calculated from sensors and are logged as a series of events. State event messages are activated by a change in the dredge state.
 - Work Event Messages: Data shall be logged as a series of events. Each event shall consist of a dataset containing dredge information (as defined in Paragraph titled "Requirements for Reported Data"). Each set of measurements (for example, time and position) shall be considered an event, and there shall be a 6-12 second interval between work events. This interval shall remain consistent across event types for the dredge plant.

A standard data string shall be recorded within one second of an event trigger with the time stamp and all parameters reflecting when the event happened.

- 2. State Event Messages: A set of descriptive information (event name, time, description, comment) shall be considered a state event. These events shall be recorded within 24 hours of a change in state with the time stamp reflecting when the event happened.
- C. Parameter Transmission to the Web Service: The data shall be formatted as JSON (JavaScript Object Notation, as defined at http://www.json.org) strings of arbitrary length. These JSON strings represent a hierarchical data structure consisting of a message bundle which may contain 0-3 automatic data messages and any number of manual data messages.

A tag/parameter is reported only when it contains a value. No "Null" value strings shall be included in a message bundle.





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- D. Contractor Data Backup: Maintain an archive of all data sent to the DQM computer during the dredging Contract. The COR may require, at no increase in the Contract price, that the Contractor provide a copy of these data covering specified time periods. The data shall be provided in the same JSON format as would have been transmitted to the DQM computer. There shall be no line breaks between the parameters, and each record string shall be on separate line. The naming convention for the files shall be dredgenames_<StartYYYYMMddhhmmsssace, EndYYYYMMddhhmmsss.txt. Data submission shall be via a storage medium acceptable to the COR.

At the end of the dredging Contact, the Contractor shall call the National DQM Support Center prior to discarding the data to ensure that it has been appropriately archived. Record the following information in a separate section at the end of the dredge's onboard copy of the DPIP:

- Person who called the National DQM Support Center
- Date of the call
- DQM representative who gave permission to discard the data

On the same day that the call is made, but prior to discarding the data, the Contractor shall submit a "Data Appropriately Archived" e-mail to the local USACE District's COR with the above information and cc: the DQM Support Center representative who granted the permission. In addition to the above information, the following shall also be included in the e-mail:

- Project name and Contract number
- Dredge start and end dates
- Name of the dredge

3.4 PERFORMANCE REQUIREMENTS

The Contractor's National Dredging Quality Management Program's data transmission shall be fully operational at the start of dredging operations. To meet Contract requirements for operability, the Contractor's system shall provide an accurate data string return and be compliant with hardware requirements. Data string return is defined as the number of quality records within an event or state tag sent by the Contractor's system to the DQM database. Quality data strings are considered to be those providing accurate values for all parameters reported when operating according to the specification. Repairs necessary to restore data return compliance shall be made within two business days, or a plan and timeline for repair shall be submitted if the repair will take more than two business days. Failure by the Contractor to report quality data within the specified time window for dredge measurements as stated in the specifications (see Paragraphs titled "Internet Access", "Data Measurement Frequency" and "Parameter Transmission to the Web Service"), may result in withholding progress payments.

3.5 QUALITY ASSURANCE CHECKS

Quality assurance (QA) checks are a part of the DQM dredge certification procedure. They are required prior to the commencement of dredging and, at the discretion of the COR, periodically throughout the duration of the Contract. The SOP and criteria for QA checks are presented on the DQM website at https://dqm.usace.army.mil.

CONTRACTOR QUALITY CONTROL

The dredging Contractor shall designate a Quality Control Systems Manager (QCSM), who shall develop and maintain daily procedures to ensure quality control (QC) of the dredge Contractor's DQM system. These methods shall include the procedure by which data being collected is

checked against known values, and verification that the telemetry is functioning. These procedures shall be outlined in the DPIP and submitted prior to the Notice to Proceed. In the event a Contractor Quality Control (CQC) Report is required, daily annotations shall be made in the Daily CQC Report, documenting all actions taken on each day of work, including all deficiencies found and the corrective actions taken.

- 3.7 LIST OF ITEMS PROVIDED BY THE CONTRACTOR
 - DPIP Paragraph titled "Dredge Plant Instrumentation Plan (DPIP)"
 - DQM System Paragraph titled "National Dredging Quality Management Program System Requirements," including all subparagraphs
 - Dredge Data Paragraph titled "Dredging Monitoring Data"

END OF SECTION