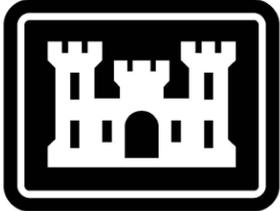


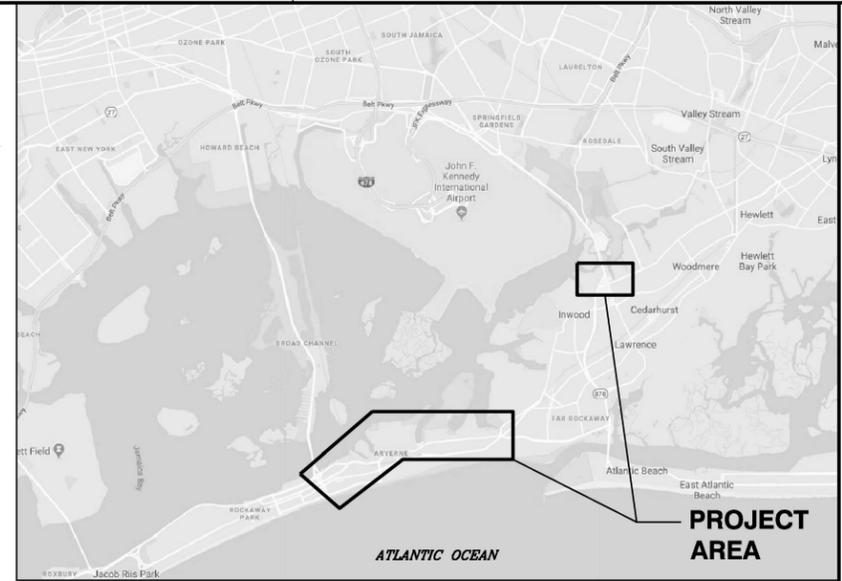


VICINITY MAP
NTS



INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT

ATLANTIC COAST OF NEW YORK



LOCATION PLAN
NTS

JAMAICA BAY

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C	DRAFT FINAL GRR - APPENDIX A2.E	08.30.18	MK
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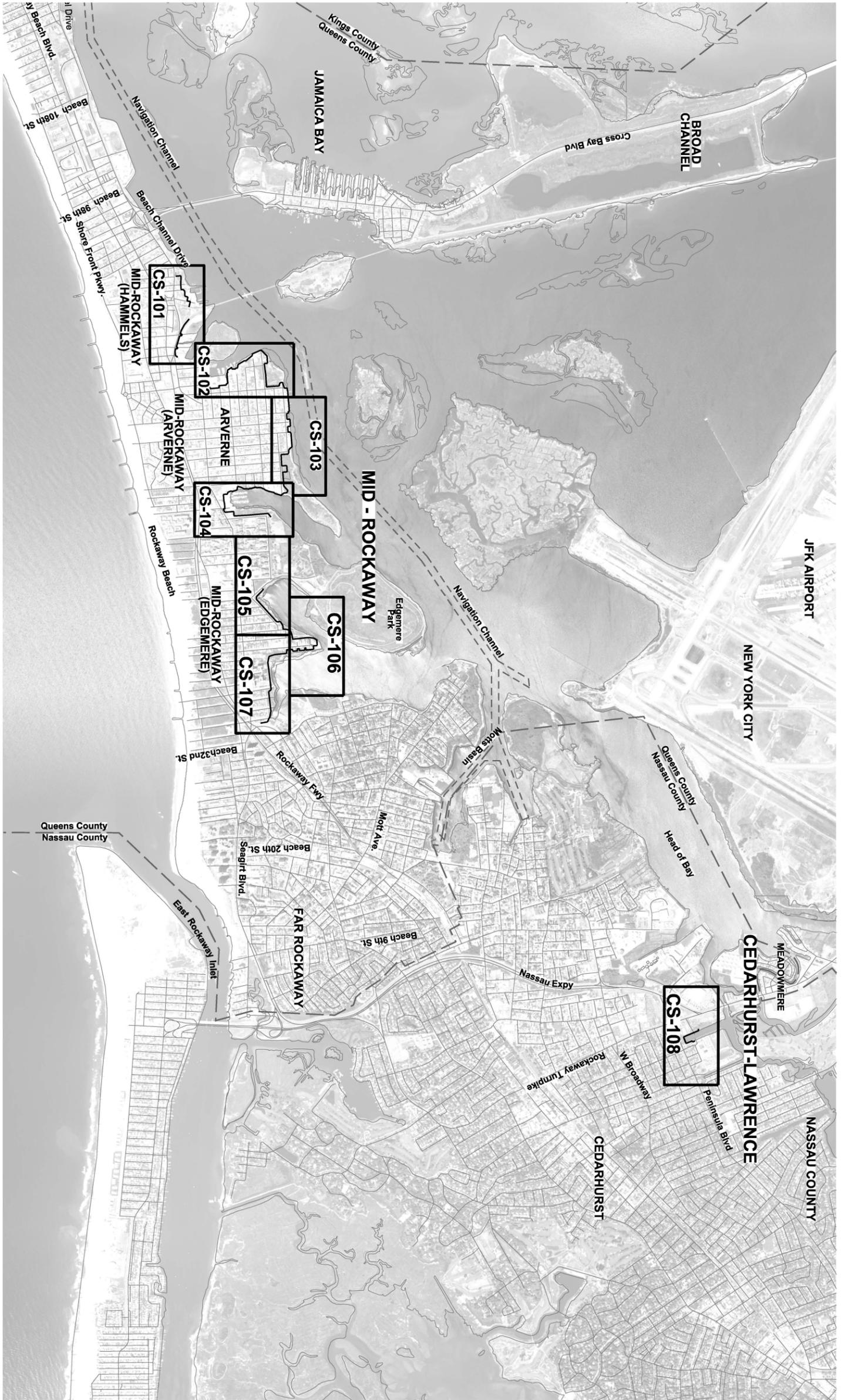
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INTEGRATED HURRICANE SANDY GENERAL
RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT

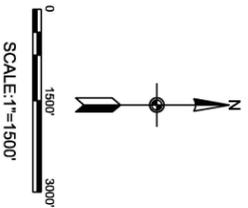
COVER SHEET

SHEET ID
G-001
SHEET 1 OF 26

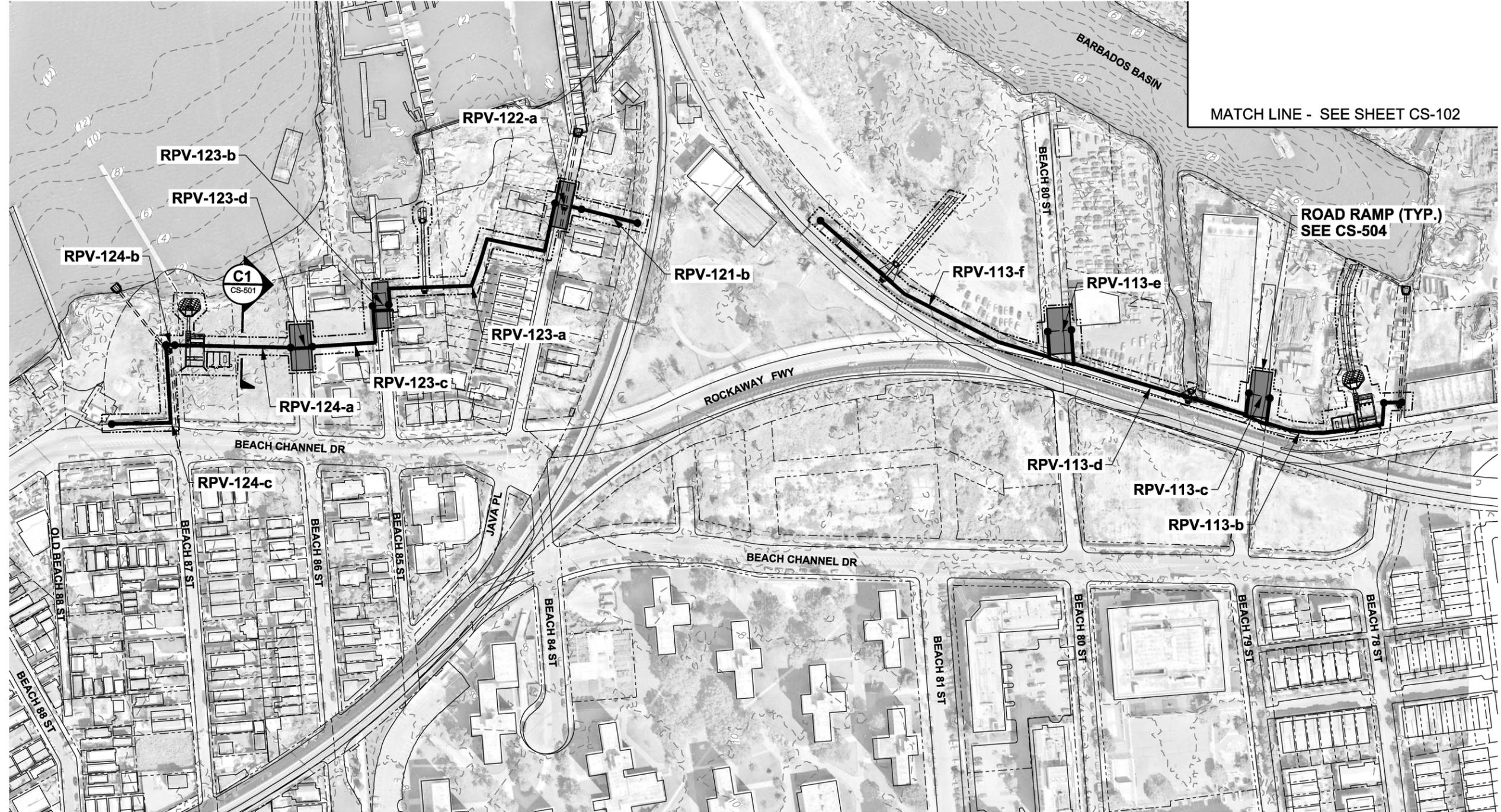
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HIGH FREQUENCY FLOOD RISK REDUCTION FEATURES (HFFRRF) FOR JAMAICA BAY
PROJECT SITES: 1. MID - ROCKAWAY
2. CEDARHURST-LAWRENCE



SHEET ID G-101 SHEET 2 OF 26		INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT SHEETS KEY PLAN		U.S. ARMY CORPS OF ENGINEERS U.S. ARMY ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil MOFFATT & NICHOL 529 FIFTH AVE., 14TH FLOOR NEW YORK, NY 10017 212-768-7454		DESIGNED BY: JK CKD BY: MK SUBMITTED BY: SA PLOT SCALE: 1:0.168867 SIZE: ANSI D		DATE: 12.05.18 SOLICITATION NO.: CONTRACT NO.: 9781-02 FILE NUMBER:		<table border="1"> <tr> <td>E</td> <td>FINAL GRR - APPENDIX A2.F</td> <td>12.05.18</td> <td>MK</td> </tr> <tr> <td>D</td> <td>DRAFT FINAL GRR - APPENDIX A2.E</td> <td>11.19.18</td> <td>MK</td> </tr> <tr> <td>C</td> <td>DRAFT FINAL GRR - APPENDIX A2.E</td> <td>08.30.18</td> <td>MK</td> </tr> <tr> <td>B</td> <td>DRAFT FINAL GRR - APPENDIX A2.E</td> <td>08.20.18</td> <td>MK</td> </tr> <tr> <td>A</td> <td>DRAFT FINAL GRR - APPENDIX A2.E</td> <td>07.19.18</td> <td>MK</td> </tr> </table>		E	FINAL GRR - APPENDIX A2.F	12.05.18	MK	D	DRAFT FINAL GRR - APPENDIX A2.E	11.19.18	MK	C	DRAFT FINAL GRR - APPENDIX A2.E	08.30.18	MK	B	DRAFT FINAL GRR - APPENDIX A2.E	08.20.18	MK	A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	MK		
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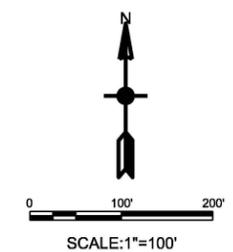
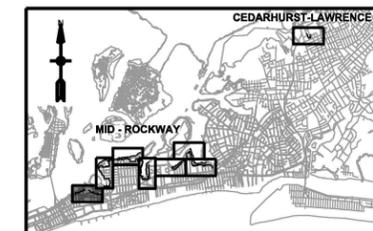
MID-ROCKAWAY - HAMMELS

NOTES

- ALL ELEVATIONS REFERENCED TO NAVD88.
- ELEVATION CONTOURS BASED ON THE FOLLOWING SOURCES:
 - NATIONAL GEOPHYSICAL DATA CENTER (NGDC) HURRICANE SANDY DIGITAL ELEVATION MODELS, 2014.
 - NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) DIGITAL COAST, 2014.
 - 2013-2014 U.S. GEOLOGICAL SURVEY CMGP LIDAR: POST SANDY (NEW YORK CITY), 2018.

LEGEND

- | | | | |
|--|---------------------------------|--|-----------------------------------|
| | FLOODWALL | | EXISTING CONTOURS (LANDSIDE) |
| | BULKHEAD | | EXISTING CONTOURS (BATHYMETRY) |
| | REVETMENT | | INTERTIDAL MARSH SALTMEADOW HAY |
| | BERM | | INTERTIDAL MARSH SMOOTH CORDGRASS |
| | TOE OF BERM | | HIGH MARSH SCRUB-SHRUB |
| | FLOOD PROTECTION LEVEE EASEMENT | | MARITIME FOREST |
| | BANK PROTECTION EASEMENT | | |
| | TAX LOT PROPERTY LINE | | |
| | REACH ID | | |



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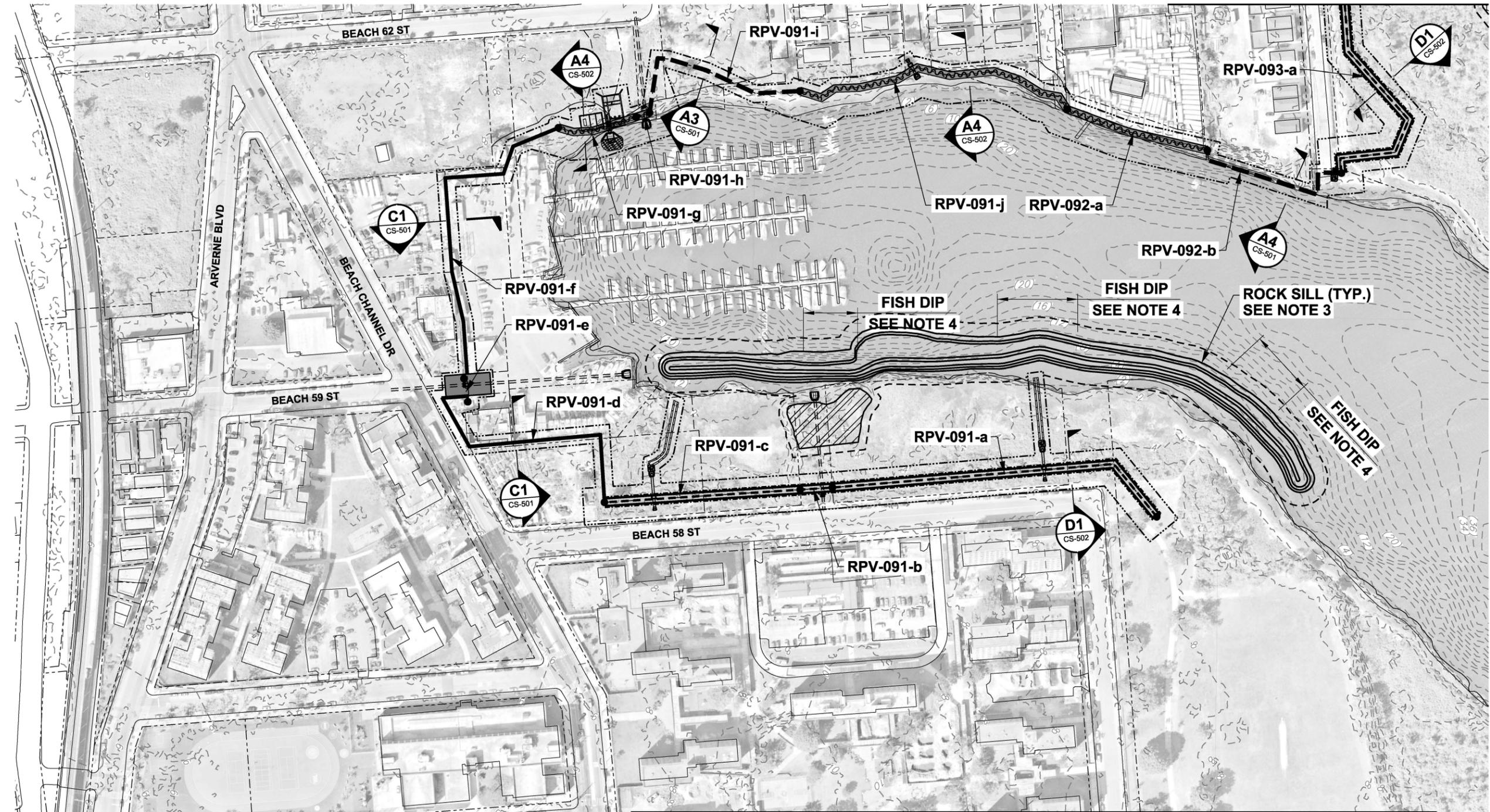
U.S. ARMY CORPS OF ENGINEERS
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INTEGRATED HURRICANE SANDY GENERAL
RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT

SITE PLAN (1 OF 8)

SHEET ID
CS-101
SHEET 3 OF 26

MATCH LINE - SEE SHEET CS-103



MID-ROCKAWAY - ARVERNE (SHEET 3)
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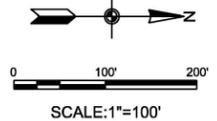
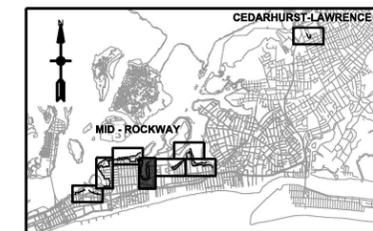
MATCH LINE - SEE SHEET CS-105

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- ALL ELEVATIONS REFERENCED TO NAVD88.
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 - NATIONAL GEOPHYSICAL DATA CENTER (NGDC) HURRICANE SANDY DIGITAL ELEVATION MODELS, 2014.
 - NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) DIGITAL COAST, 2014.
 - 2013-2014 U.S. GEOLOGICAL SURVEY CMGP LIDAR: POST SANDY (NEW YORK CITY), 2018.
- THE OVERLAP IN ROCK SILL DESIGN IS TO ALLOW FOR EXCHANGE OF WATER AND AQUATIC ORGANISMS DURING TIDAL CYCLES. THE OVERLAP DESIGN ALLOWS FOR THE TRANSFER BUT ALSO PROVIDES CONTINUOUS SHORELINE PROTECTION.
- IN LOCATIONS WHERE THE BATHYMETRY PROFILE DOES NOT ALLOW FOR OVERLAP, TO PROVIDE FOR SUFFICIENT HYDRAULIC COMMUNICATION AND ORGANISM EXCHANGE BEHIND THE ROCK SILLS, THE PLACEMENT OF PERIODIC LOWERED ROCK SILL ELEVATIONS (FISH DIP) OF 0.0 FEET MSL OF 100 FEET ARE PROVIDED.

LEGEND

- | | | | |
|--|---------------------------------|--|-----------------------------------|
| | FLOODWALL | | EXISTING CONTOURS (LANDSIDE) |
| | BULKHEAD | | EXISTING CONTOURS (BATHYMETRY) |
| | REVETMENT | | INTERTIDAL MARSH SALTMEADOW HAY |
| | BERM | | INTERTIDAL MARSH SMOOTH CORDGRASS |
| | TOE OF BERM | | HIGH MARSH SCRUB-SHRUB |
| | FLOOD PROTECTION LEVEE EASEMENT | | MARITIME FOREST |
| | BANK PROTECTION EASEMENT | | |
| | TAX LOT PROPERTY LINE | | |
| | REACH ID | | |



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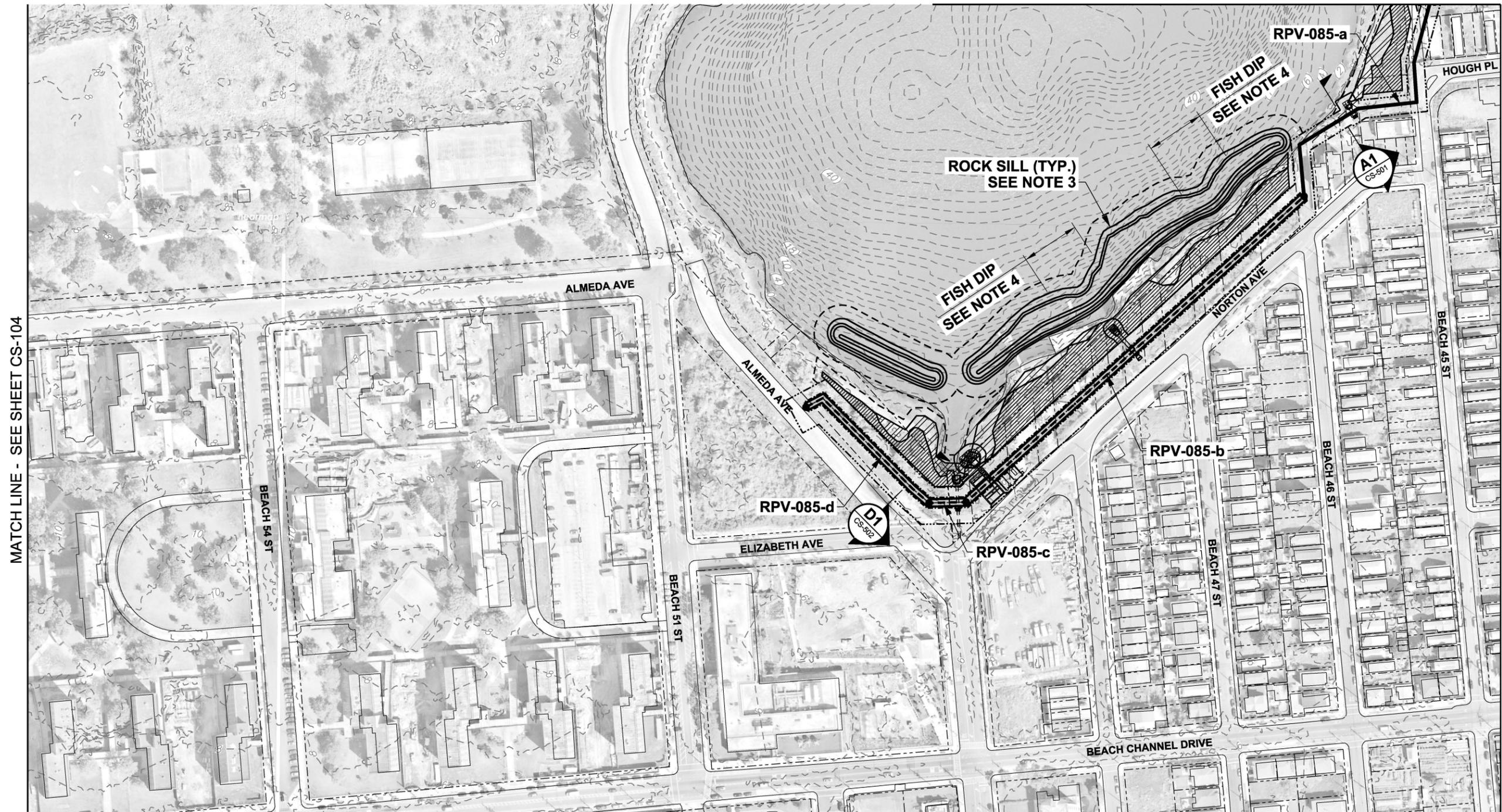
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INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT

SHEET ID
CS-104
SHEET 6 OF 26

SITE PLAN (4 OF 8)

MATCH LINE - SEE SHEET CS-106



MATCH LINE - SEE SHEET CS-104

MATCH LINE - SEE SHEET CS-107

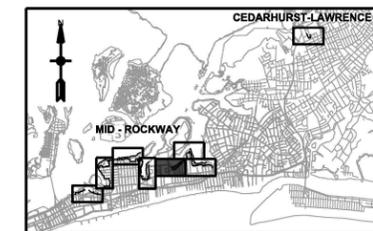
MID-ROCKAWAY - EDGEMERE (SHEET 1)
SCALE: 1" = 100'

NOTES

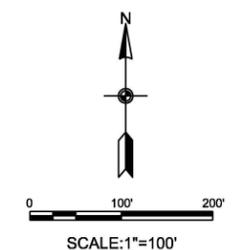
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- ELEVATION CONTOURS BASED ON THE FOLLOWING SOURCES:
 - NATIONAL GEOPHYSICAL DATA CENTER (NGDC) HURRICANE SANDY DIGITAL ELEVATION MODELS, 2014.
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LEGEND

- | | | | |
|--|---------------------------------|--|-----------------------------------|
| | FLOODWALL | | EXISTING CONTOURS (LANDSIDE) |
| | BULKHEAD | | EXISTING CONTOURS (BATHYMETRY) |
| | REVETMENT | | INTERTIDAL MARSH SALTMEADOW HAY |
| | BERM | | INTERTIDAL MARSH SMOOTH CORDGRASS |
| | TOE OF BERM | | HIGH MARSH SCRUB-SHRUB |
| | FLOOD PROTECTION LEVEE EASEMENT | | MARITIME FOREST |
| | BANK PROTECTION EASEMENT | | |
| | TAX LOT PROPERTY LINE | | |
| | REACH ID | | |



KEY PLAN



SCALE: 1"=100'

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C	08.30.18	DRAFT FINAL GRR - APPENDIX A2.E
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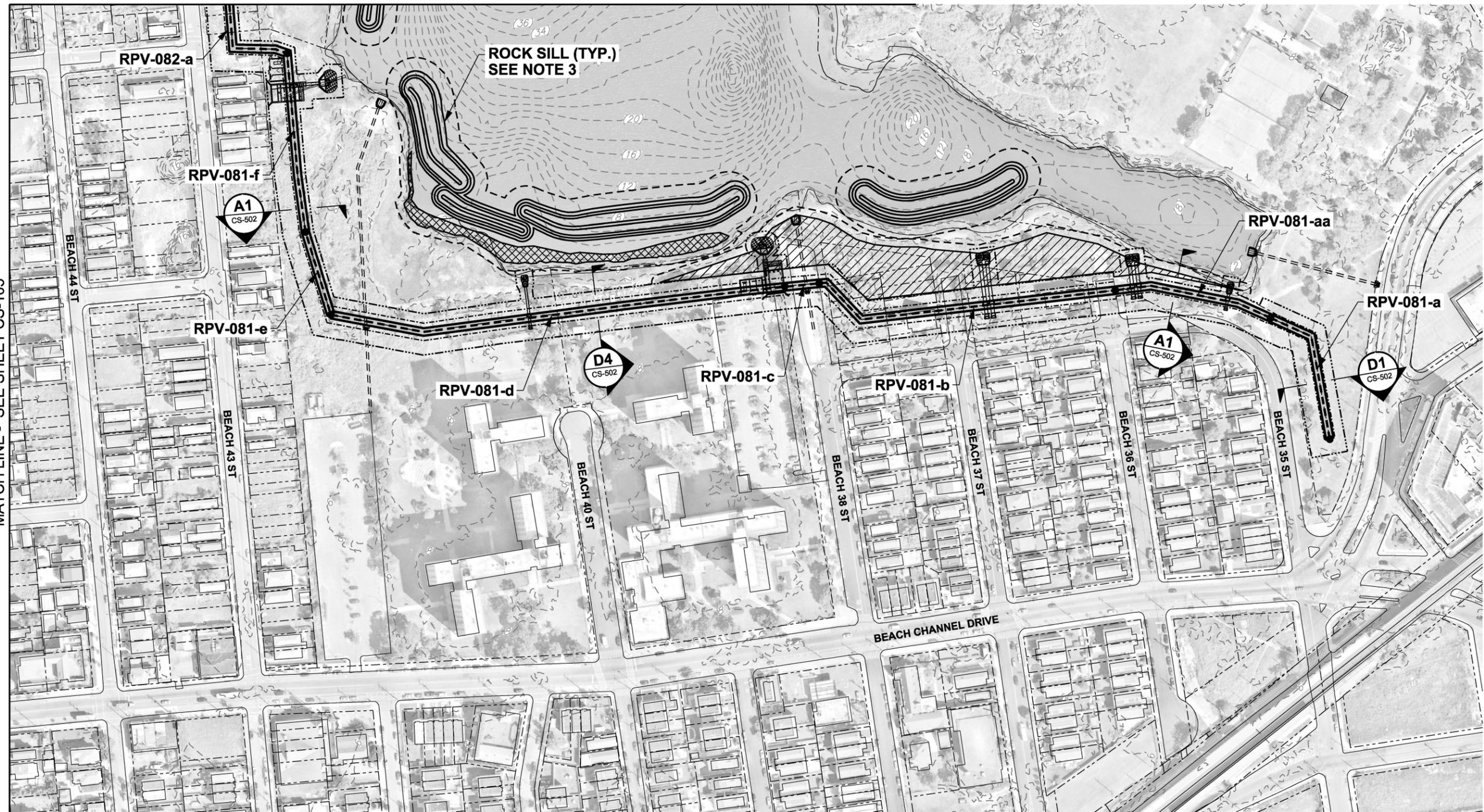
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INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT

SHEET ID
CS-105
SHEET 7 OF 26

SITE PLAN (5 OF 8)

MATCH LINE - SEE SHEET CS-106



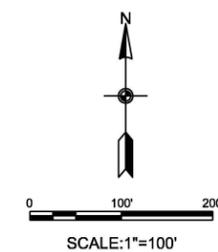
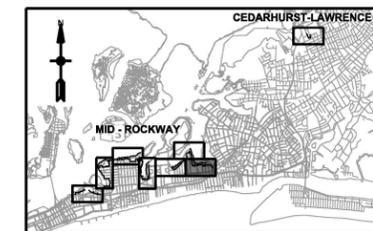
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SCALE: 1" = 100'

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- ALL ELEVATIONS REFERENCED TO NAVD88.
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 - NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) DIGITAL COAST, 2014.
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LEGEND

- | | | | |
|--|---------------------------------|--|-----------------------------------|
| | FLOODWALL | | EXISTING CONTOURS (LANDSIDE) |
| | BULKHEAD | | EXISTING CONTOURS (BATHYMETRY) |
| | REVETMENT | | INTERTIDAL MARSH SALTMEADOW HAY |
| | BERM | | INTERTIDAL MARSH SMOOTH CORDGRASS |
| | TOE OF BERM | | HIGH MARSH SCRUB-SHRUB |
| | FLOOD PROTECTION LEVEE EASEMENT | | MARITIME FOREST |
| | BANK PROTECTION EASEMENT | | |
| | TAX LOT PROPERTY LINE | | |
| | RPV-### REACH ID | | |



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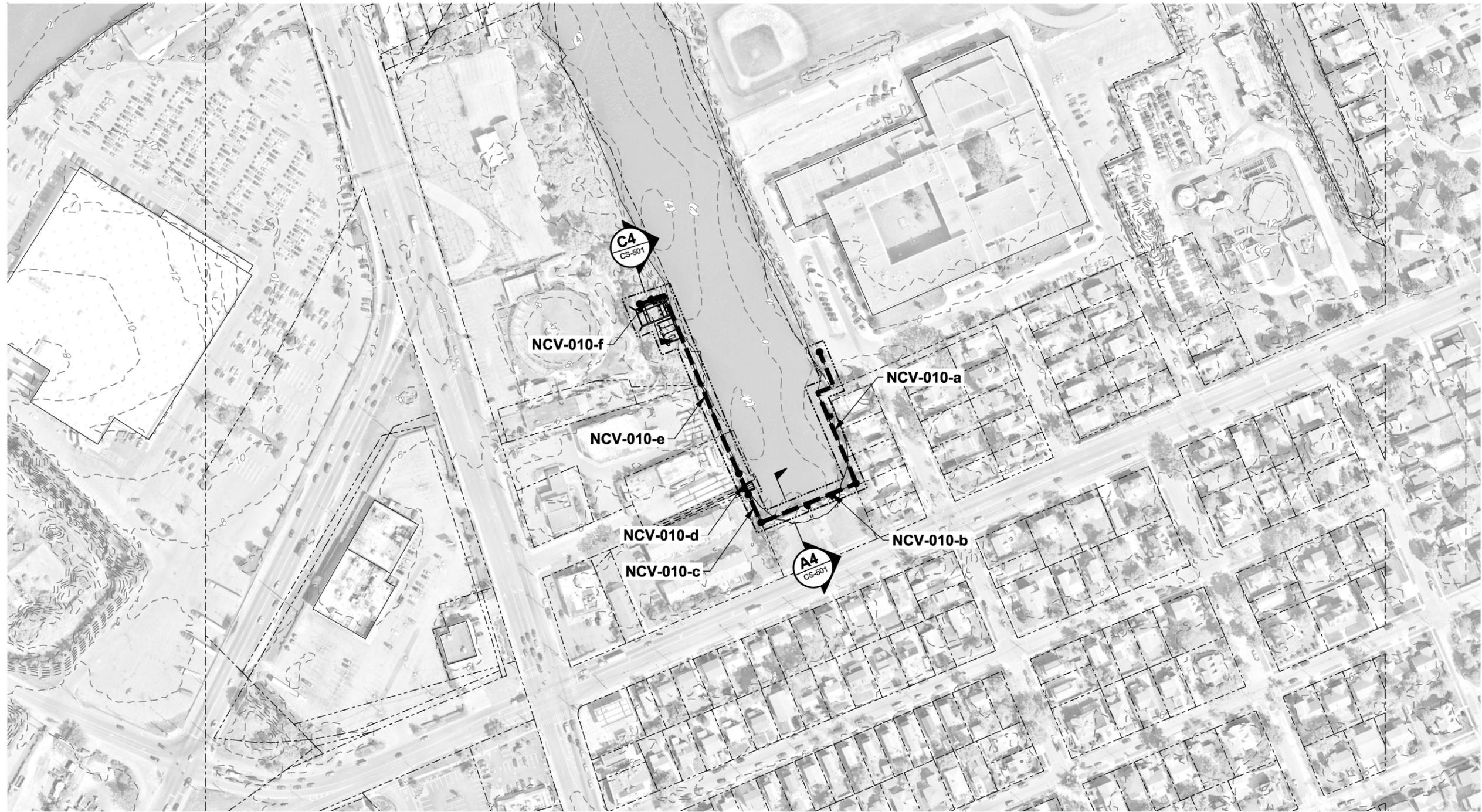
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A	DRAFT FINAL GRR - APPENDIX A2 E	07.18.18	MK

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NEW YORK	529 FIFTH AVE., 14TH FLOOR	
http://www.nm.usace.army.mil	NEW YORK, NY 10017	
	212-768-7454	

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SITE PLAN (7 OF 8)

SHEET ID
CS-107
SHEET 9 OF 26



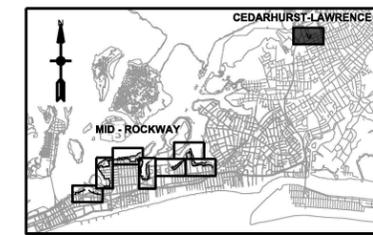
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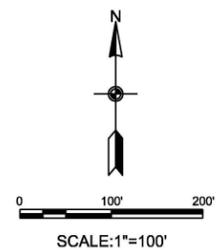
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- ELEVATION CONTOURS BASED ON THE FOLLOWING SOURCES:
 - NATIONAL GEOPHYSICAL DATA CENTER (NGDC) HURRICANE SANDY DIGITAL ELEVATION MODELS, 2014.
 - NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) DIGITAL COAST, 2014.
 - 2013-2014 U.S. GEOLOGICAL SURVEY CMGP LIDAR: POST SANDY (NEW YORK CITY), 2018.

LEGEND

- | | | | |
|--|---------------------------------|--|-----------------------------------|
| | FLOODWALL | | EXISTING CONTOURS (LANDSIDE) |
| | BULKHEAD | | EXISTING CONTOURS (BATHYMETRY) |
| | REVETMENT | | INTERTIDAL MARSH SALTMEADOW HAY |
| | BERM | | INTERTIDAL MARSH SMOOTH CORDGRASS |
| | TOE OF BERM | | HIGH MARSH SCRUB-SHRUB |
| | FLOOD PROTECTION LEVEE EASEMENT | | MARITIME FOREST |
| | BANK PROTECTION EASEMENT | | |
| | TAX LOT PROPERTY LINE | | |
| | REACH ID | | |



KEY PLAN



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C	DRAFT FINAL GRR - APPENDIX A2 E	08.30.18	MK
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INTEGRATED HURRICANE SANDY GENERAL
RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT

SITE PLAN (8 OF 8)

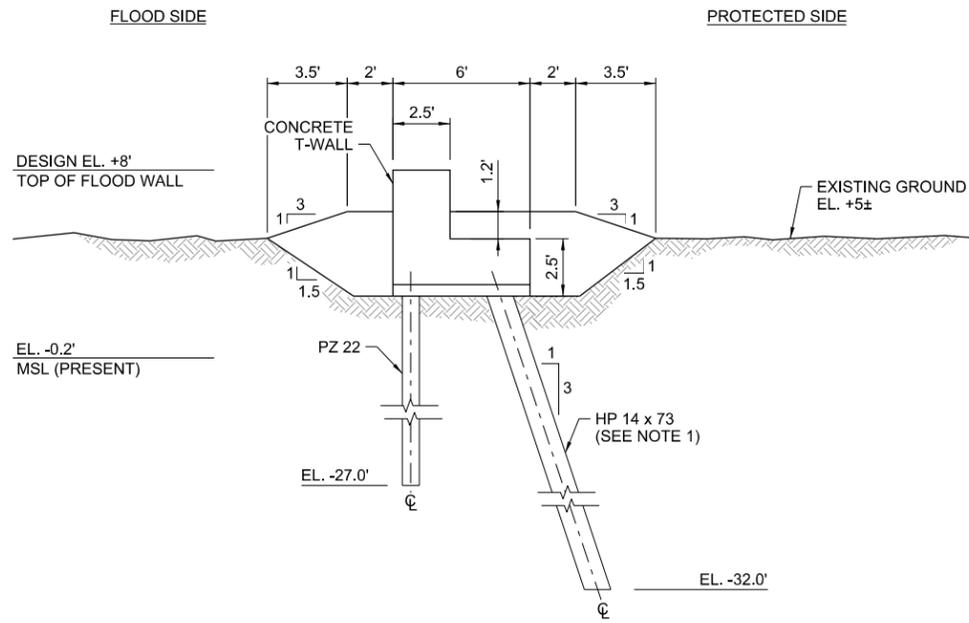
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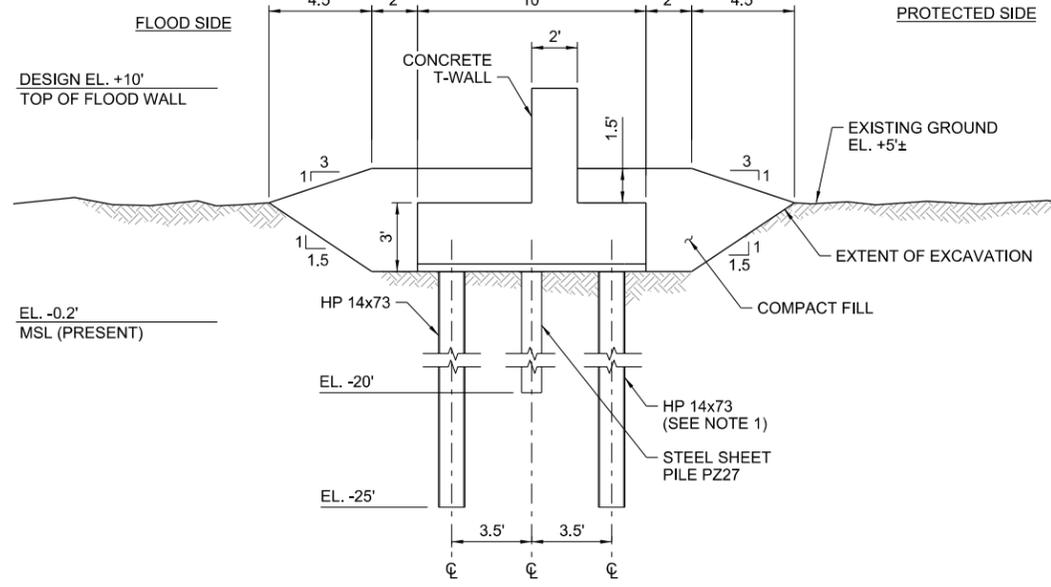
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C1 LOW FLOODWALL

SCALE: 1/4" = 1'-0"

CS-101, CS-102, CS-104



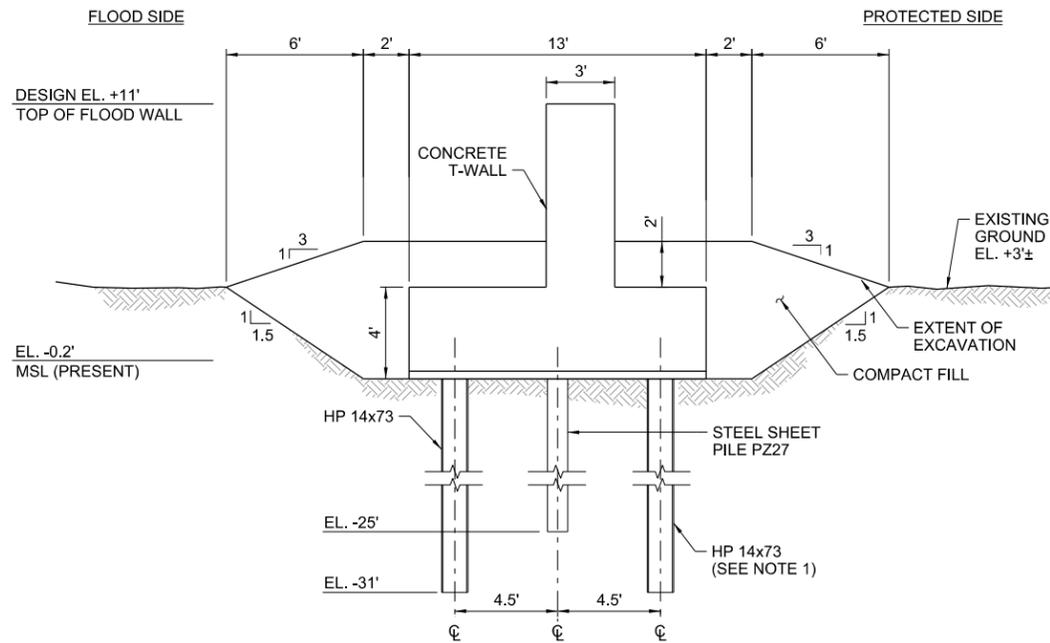
C4 MEDIUM FLOODWALL

SCALE: 1/4" = 1'-0"

CS-102, CS-106, CS-108

NOTE

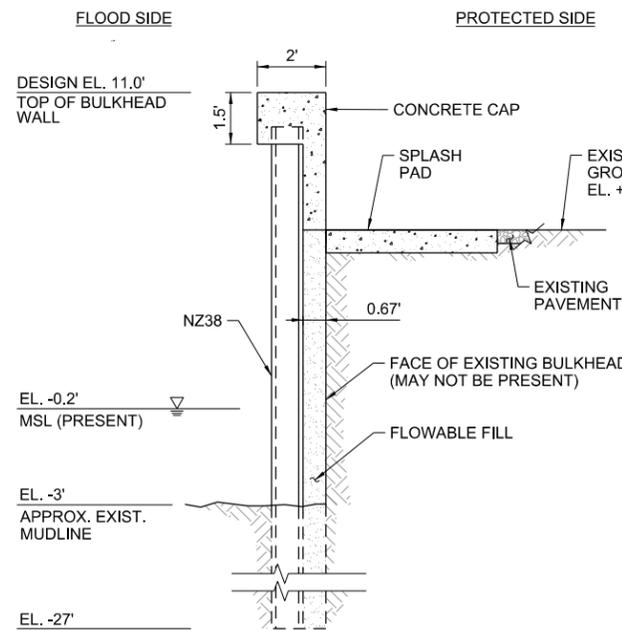
- 1. PILE SPACINGS FOR LOW, MEDIUM, AND HIGH FLOODWALLS ARE 10', 8.5' AND 6.5', RESPECTIVELY.



A1 HIGH FLOODWALL

SCALE: 1/4" = 1'-0"

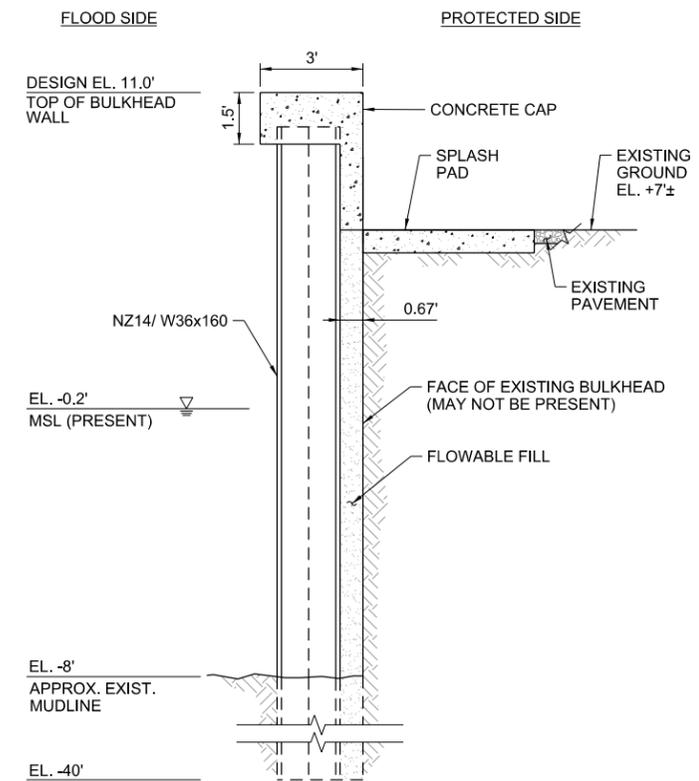
CS-102, CS-105, CS-106



A3 SHALLOW BULKHEAD

SCALE: 3/8" = 1'-0"

CS-102, CS-103, CS-104, CS-106



A4 DEEP BULKHEAD

SCALE: 3/8" = 1'-0"

CS-102, CS-104, CS-108

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of Engineers®

MARK	DATE	DESCRIPTION
E	12.05.18	FINAL GRR - APPENDIX A2F
D	11.19.18	DRAFT FINAL GRR - APPENDIX A2E
C	08.30.18	DRAFT FINAL GRR - APPENDIX A2E
B	08.20.18	DRAFT FINAL GRR - APPENDIX A2E
A	07.19.18	DRAFT FINAL GRR - APPENDIX A2E

DATE	DESIGNED BY	CHECKED BY	CONTRACT NO.
12/3/2018	ME	MK	9781-02

DATE	DESIGNED BY	CHECKED BY	CONTRACT NO.
12/3/2018	SA	SA	9781-02

DATE	DESIGNED BY	CHECKED BY	CONTRACT NO.
12/3/2018	SA	SA	9781-02

INTEGRATED HURRICANE SANDY GENERAL
RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT

FLOODWALL AND BULKHEAD
TYPICAL SECTIONS

SHEET ID
CS-501

SHEET 11 OF 26

PATH: Q:\NY19781-02\500_CADD_Active_HFFRRF_Report-App A21

FILE: W912DS_A2_CS-502.dgn

LAST PLOTTED BY: mestimable 11:40:01 AM 12/3/2018

LAST PLOTTED BY: mestimable 11:40:01 AM 12/3/2018



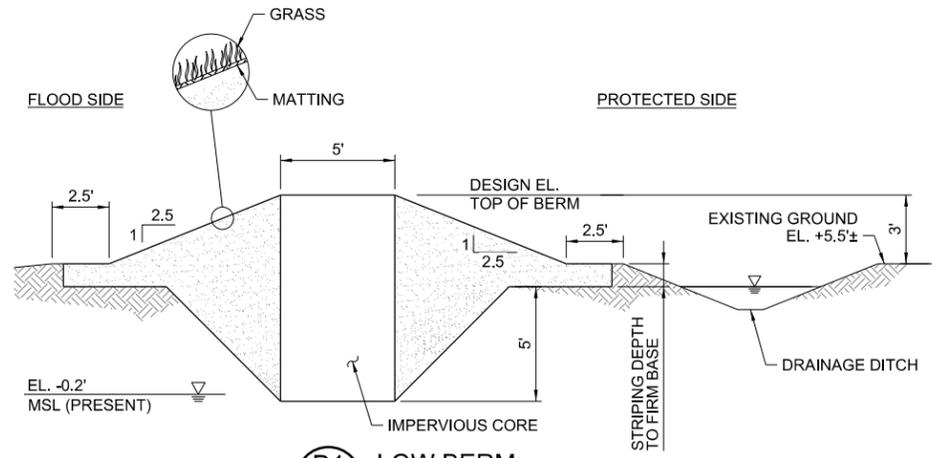
US Army Corps of Engineers

DATE	BY	DESCRIPTION
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08.30.18	MK	DRAFT FINAL GRR - APPENDIX A2E
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07.19.18	MK	DRAFT FINAL GRR - APPENDIX A2E

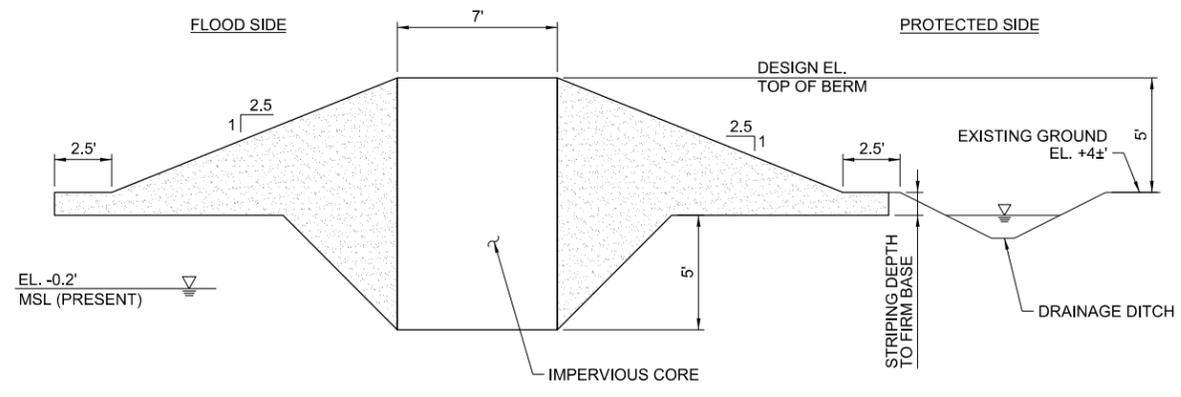
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12/3/2018	MK	DESIGNED BY
12/3/2018	MK	DRAWN BY
12/3/2018	MK	SUBMITTED BY
12/3/2018	MK	PLotted DATE
12/3/2018	MK	FILE NAME
12/3/2018	MK	ANSI D

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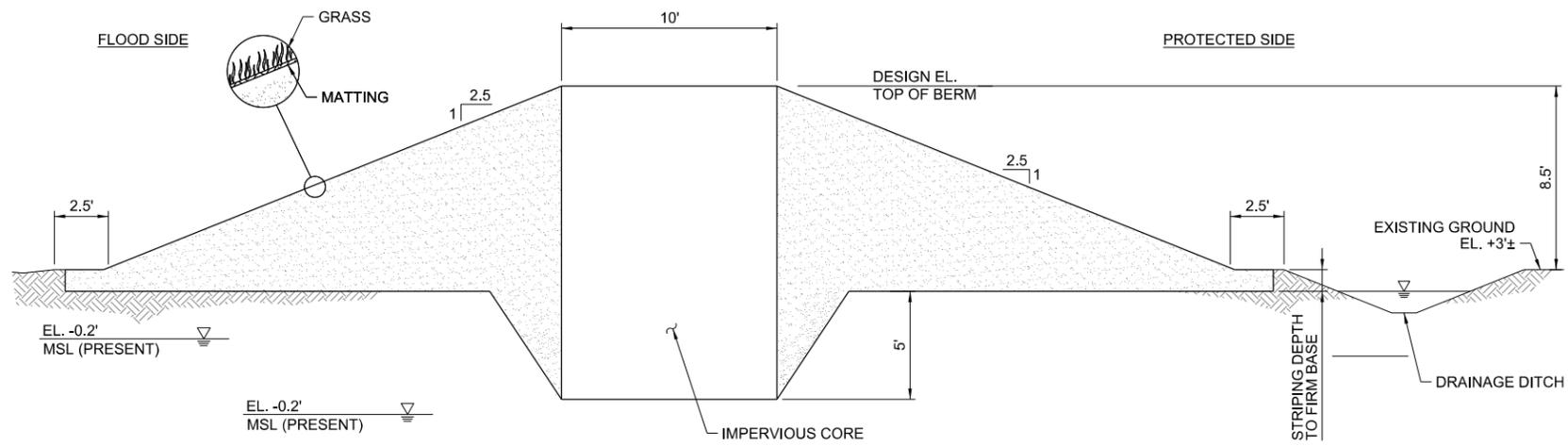
INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT
 BERM AND REVETMENT WITH FLOODWALL TYPICAL SECTIONS
 SHEET ID
CS-502
 SHEET 12 OF 26



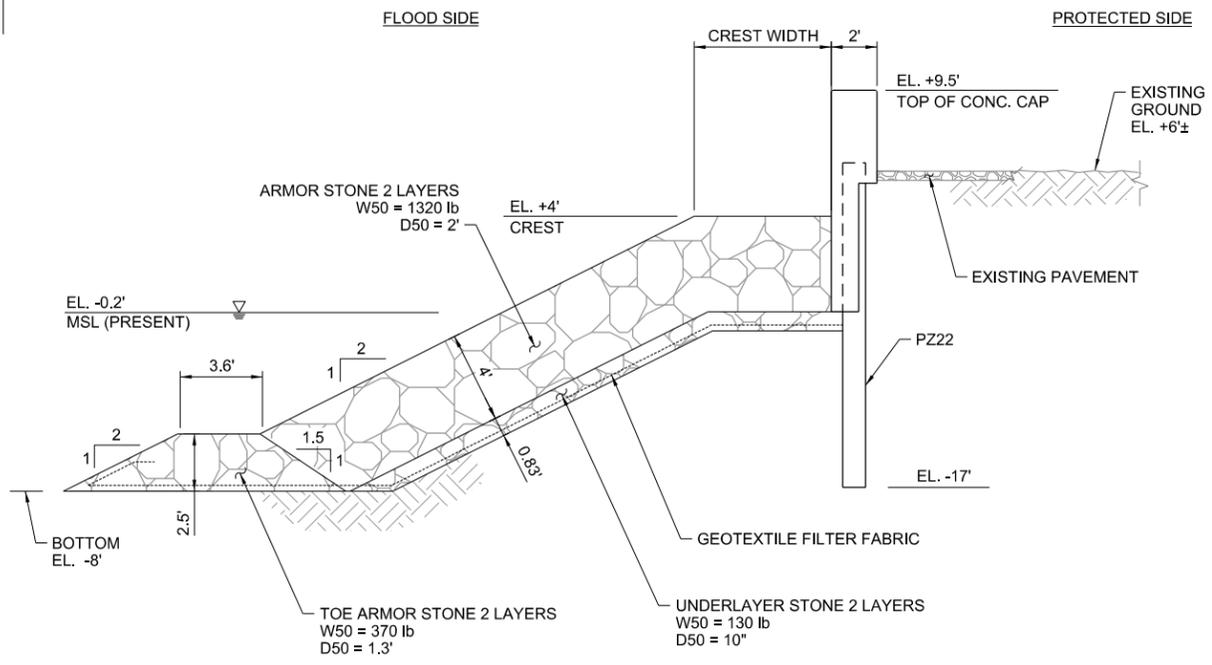
D1 LOW BERM
 SCALE: 1/4" = 1'-0"
 CS-103, CS-104, CS-105, CS-107



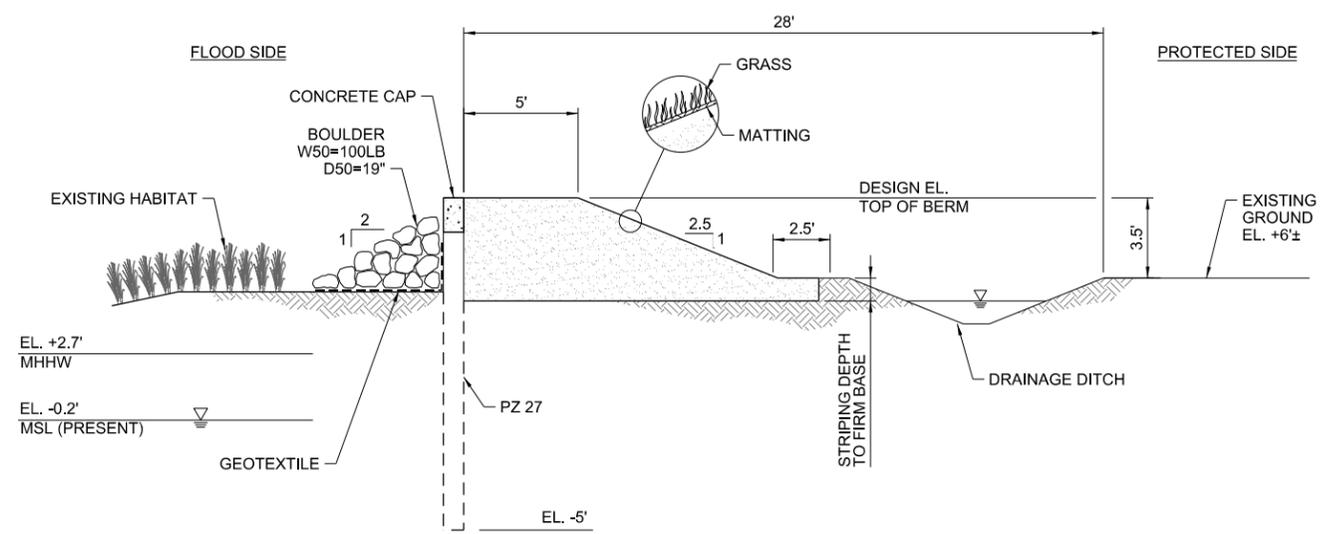
D4 MEDIUM BERM
 SCALE: 1/4" = 1'-0"
 CS-102, CS-106



B1 HIGH BERM
 SCALE: 1/4" = 1'-0"
 CS-108

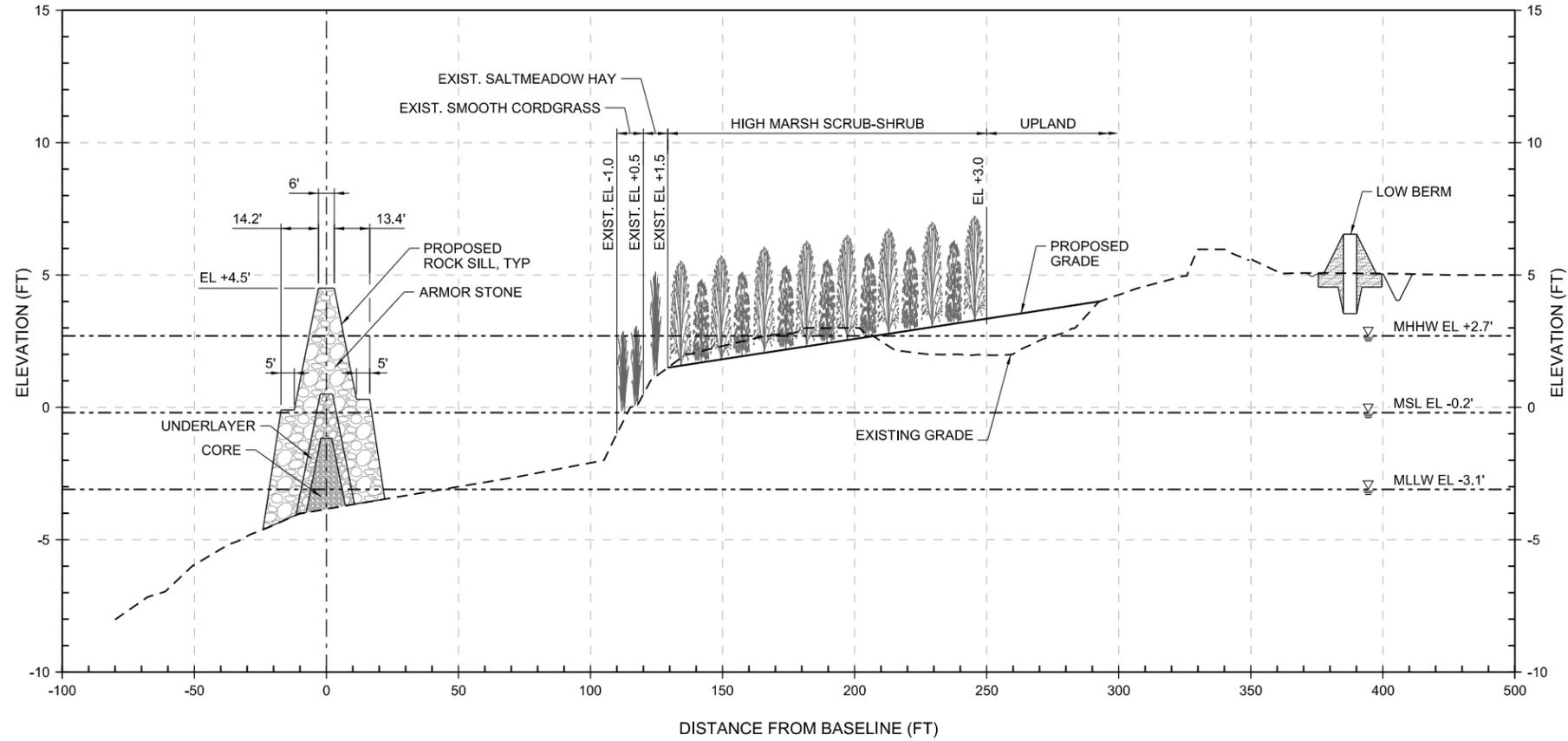


A4 REVETMENT WITH FLOODWALL
 SCALE: 1/4" = 1'-0"
 CS-104



A1 HYBRID BERM
 SCALE: 1/4" = 1'-0"
 CS-103, CS-106, CS-107

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C1 NATURAL AND NATURE BASED FEATURES (NNBF) TYPICAL SECTION
 CS-103 SCALE: 1/4" = 1'-0"

NOTE

1. ALL ELEVATIONS REFERENCED TO NAVD88.

PLANTING PLAN

1. REMOVE ALL STRUCTURES AND DEBRIS.
2. REGRADE SHORELINE SLOPES TO MINIMIZE EXCAVATION AND/OR FILL ACTIVITIES AND TO PROVIDE OPTIMAL HABITAT SPECIFIC ELEVATIONS:
 - A. LOW MARSH (COMMON CORDGRASS) -1.0 TO +0.5
 - B. INTERMEDIATE MARSH (SALTMEADOW HAY/BLACKGRASS) +0.5 TO + 1.5
 - C. HIGH MARSH - SCRUB SHRUB (MARSH ELDER/GROUNSEL BUSH) + 1.5 TO +3.0
 - D. UPLANDS HABITAT + 3.0 AND GREATER
3. SEED OR PLANT (PLUG/POT) WITH APPROPRIATE SPECIES. PLANTING OF PLUGS FOR COMMON CORDGRASS AND SALTMEADOW HAY SHOULD BE PLANTED ON 3 FT. CENTERS. MARSH ELDER/GROUNSEL POTS SHOULD BE PLANTED ON 5 FT. CENTERS.

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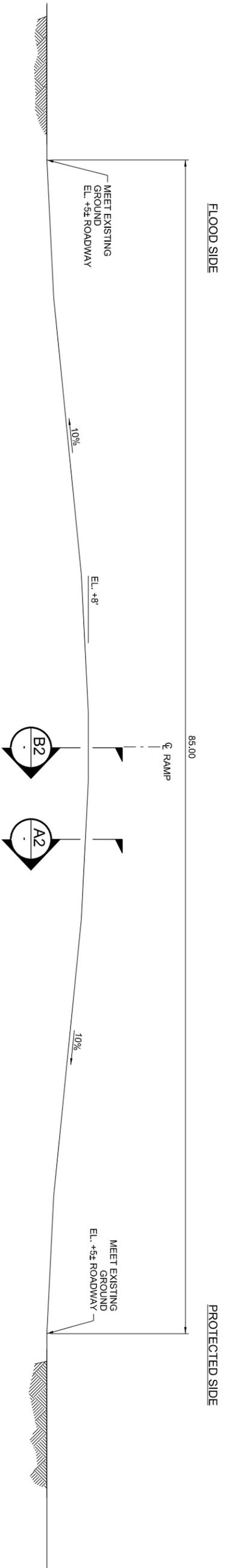
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D	DRAFT FINAL GRR - APPENDIX A2 E	11.19.18	MK
C	DRAFT FINAL GRR - APPENDIX A2 E	08.30.18	MK
B	DRAFT FINAL GRR - APPENDIX A2 E	08.20.18	MK
A	DRAFT FINAL GRR - APPENDIX A2 E	07.19.18	MK

DESIGNED BY: MKS	DATE: 12/05/18
DRAWN BY: MKS	SUBMITTED BY: SA
U.S. ARMY CORPS OF ENGINEERS NEW YORK http://www.nan.usace.army.mil	CONTRACT NO.: 9781-02
MOFFATT & NICHOL 529 FIFTH AVE., 14TH FLOOR NEW YORK, NY 10017 212-768-7454	FILE NUMBER: W912DS_A2_CS-503.dgn

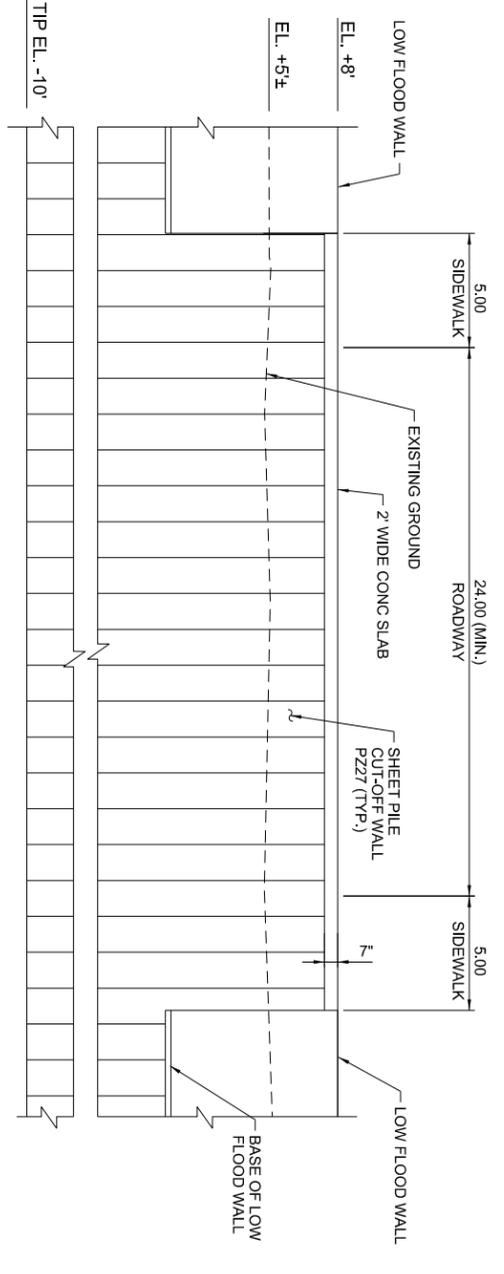
INTEGRATED HURRICANE SANDY GENERAL
RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT

NATURAL AND NATURE
BASED FEATURES (NNBF)
SECTION

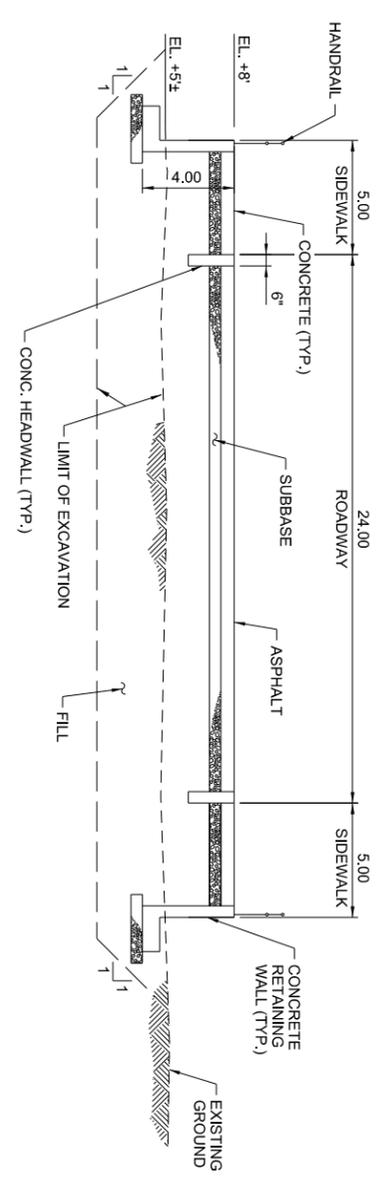
SHEET ID
CS-503
SHEET 13 OF 26



D1 SECTION - CENTER OF ROAD RAMP
SCALE: 1/4" = 1'-0"



B2 SECTION - CENTER OF ROAD RAMP
SCALE: 1/4" = 1'-0"



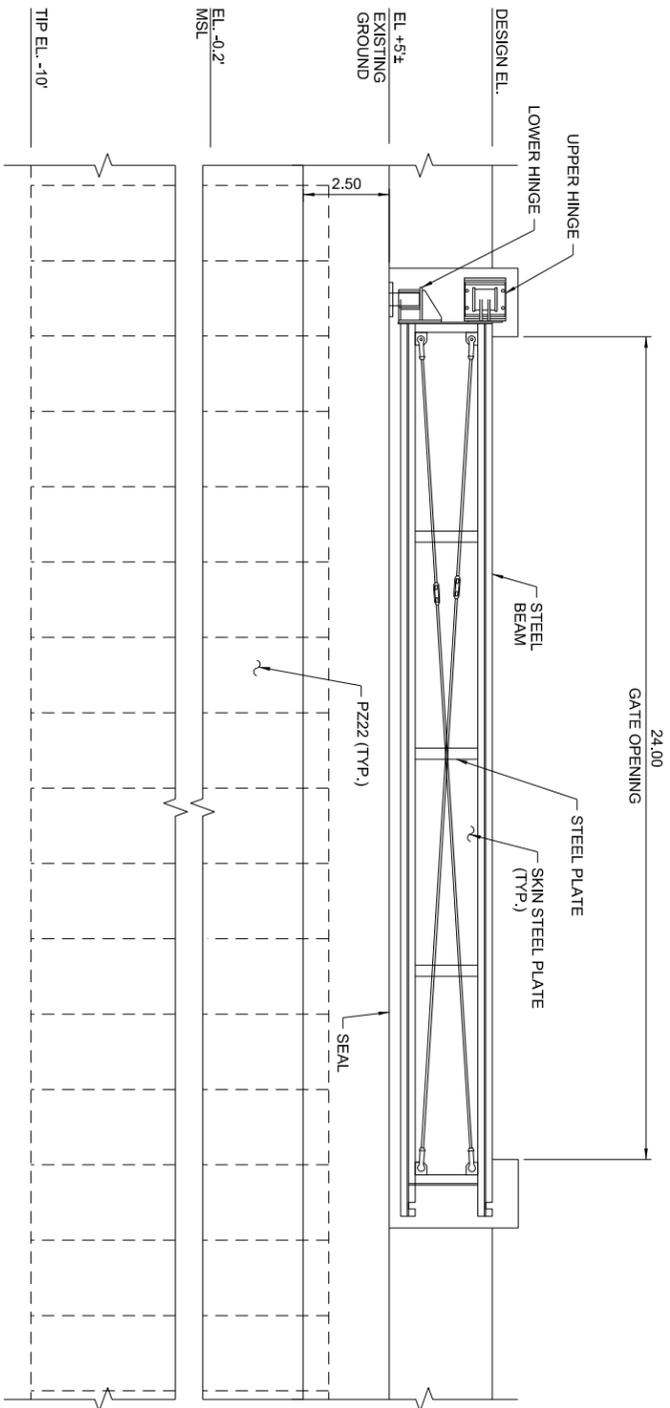
A2 SECTION - PROTECTED SIDE
SCALE: 1/4" = 1'-0"

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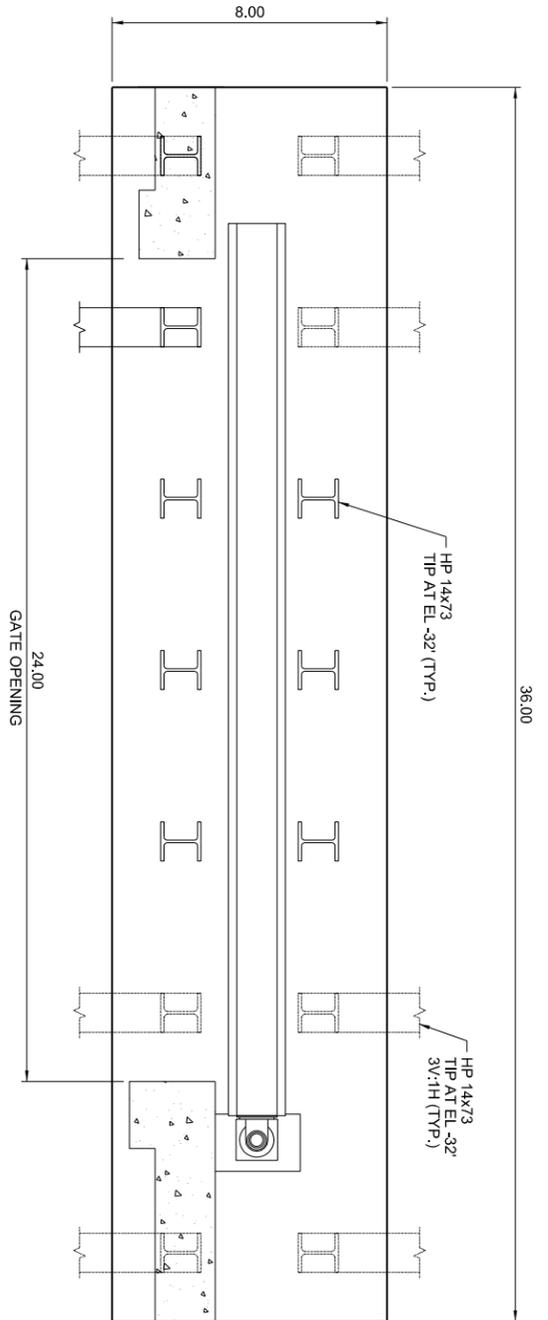
0 2' 4' 8'
SCALE: 1/4" = 1'-0"

SHEET ID CS-504 SHEET 14 OF 26	INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT ROAD RAMP SECTIONS	U.S. ARMY CORPS OF ENGINEERS U.S. ARMY ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil	DESIGNED BY: MK DWN BY: ME SUBMITTED BY: SA	DATE: 12.05.18 SOLICITATION NO.: CONTRACT NO.: 9781-02	<table border="1"> <thead> <tr> <th>MARK</th> <th>DESCRIPTION</th> <th>DATE</th> <th>APPR.</th> </tr> </thead> <tbody> <tr> <td>E</td> <td>FINAL GRR - APPENDIX A2.F</td> <td>12.05.18</td> <td>MK</td> </tr> <tr> <td>D</td> <td>DRAFT FINAL GRR - APPENDIX A2.E</td> <td>11.19.18</td> <td>MK</td> </tr> <tr> <td>C</td> <td>DRAFT FINAL GRR - APPENDIX A2.E</td> <td>08.30.18</td> <td>MK</td> </tr> <tr> <td>B</td> <td>DRAFT FINAL GRR - APPENDIX A2.E</td> <td>08.20.18</td> <td>MK</td> </tr> <tr> <td>A</td> <td>DRAFT FINAL GRR - APPENDIX A2.E</td> <td>07.19.18</td> <td>MK</td> </tr> </tbody> </table>	MARK	DESCRIPTION	DATE	APPR.	E	FINAL GRR - APPENDIX A2.F	12.05.18	MK	D	DRAFT FINAL GRR - APPENDIX A2.E	11.19.18	MK	C	DRAFT FINAL GRR - APPENDIX A2.E	08.30.18	MK	B	DRAFT FINAL GRR - APPENDIX A2.E	08.20.18	MK	A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	MK
		MARK	DESCRIPTION	DATE		APPR.																							
E	FINAL GRR - APPENDIX A2.F	12.05.18	MK																										
D	DRAFT FINAL GRR - APPENDIX A2.E	11.19.18	MK																										
C	DRAFT FINAL GRR - APPENDIX A2.E	08.30.18	MK																										
B	DRAFT FINAL GRR - APPENDIX A2.E	08.20.18	MK																										
A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	MK																										
MOFFATT & NICHOL 529 FIFTH AVE., 14TH FLOOR NEW YORK, NY 10017 212-768-7454	PLOT SCALE: 1:50 PLOT DATE: 12/3/2018 FILE NUMBER: FILE NAME: W912DS_A2_CS-504.dgn	U.S. Army Corps of Engineers®																											

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A1 ELEVATION - SWING GATE
SCALE: 3/8" = 1'-0"



C1 PLAN - SWING GATE
SCALE: 3/8" = 1'-0"



SHEET ID
CS-505
SHEET 15 OF 26

INTEGRATED HURRICANE SANDY GENERAL
RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT

**SWING GATE PLAN
AND ELEVATION**

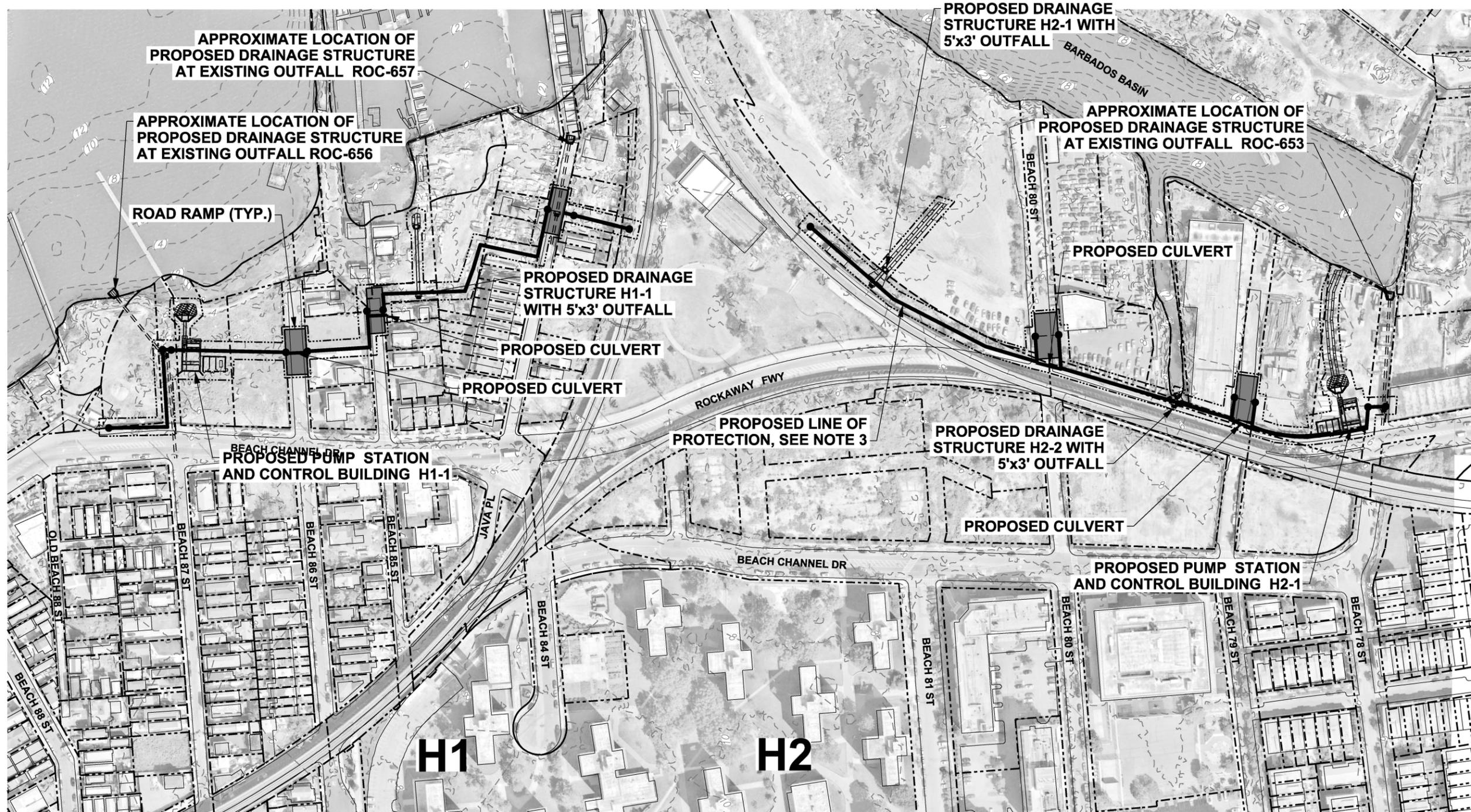
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NEW YORK, NY 10017
212-768-7454

DESIGNED BY: JK	DATE: 12/05/18
DWN BY: ME	SOLICITATION NO.:
CKD BY: MK	CONTRACT NO.:
SUBMITTED BY: SA	FILE NUMBER:
PLOT SCALE: 1/2"	PLOT DATE: 12/3/2018
SIZE: ANSI D	FILE NAME: W912DS_A2_CS-505.dgn

MARK	DESCRIPTION	DATE	APPR.
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D	DRAFT FINAL GRR - APPENDIX A2.E	11.19.18	MK
C	DRAFT FINAL GRR - APPENDIX A2.E	08.30.18	MK
B	DRAFT FINAL GRR - APPENDIX A2.E	08.20.18	MK
A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	MK





MID-ROCKAWAY - HAMMELS
SCALE: 1" = 100'

NOTES:

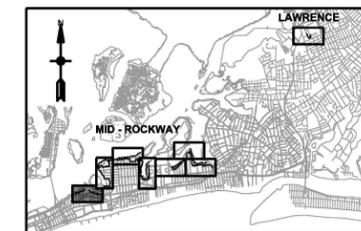
1. ALL ELEVATIONS REFERENCED TO NAVD88.
2. TYPICAL SECTIONS SHOWN ON SHEETS CU-501 TO CU-503.
3. LINE OF PROTECTION SHOWN ON SHEETS CS-101 TO CS-108.

LEGEND

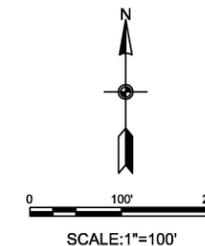
- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- DRAINAGE AREA

A1

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KEY PLAN



SCALE: 1" = 100'



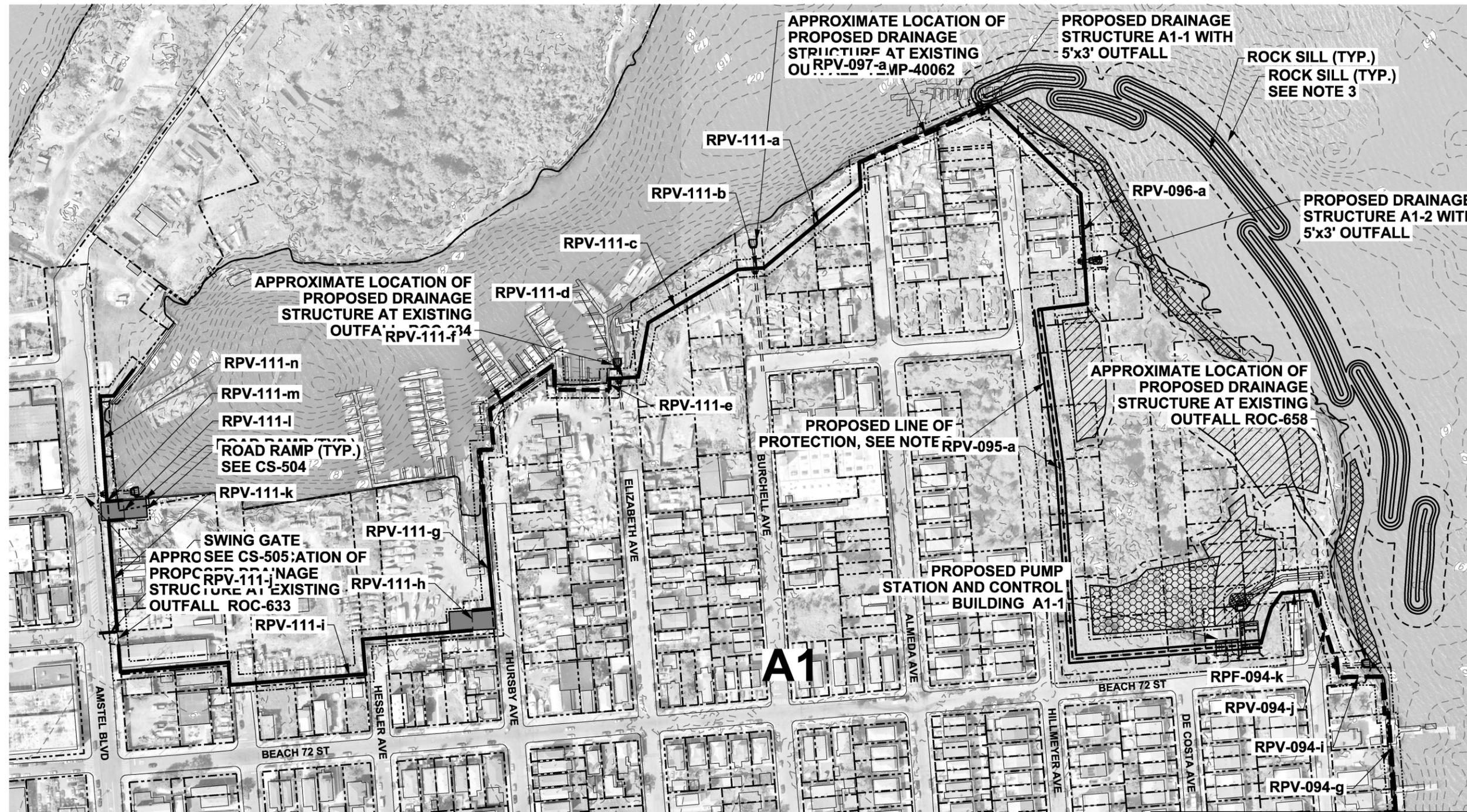
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BU	11.18.18	DATE
BU	08.30.18	DATE
BU	08.20.18	DATE
BU	07.19.18	DATE

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E	FINAL GRR - APPENDIX A2 F
D	DRAFT FINAL GRR - APPENDIX A2 E
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INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT
INTERIOR DRAINAGE PLAN (1 OF 8)

SHEET ID
CU-101
SHEET 16 OF 26



MID-ROCKAWAY - ARVERNE (SHEET 1)
SCALE: 1" = 100'

MATCH LINE - SEE SHEET CU-103

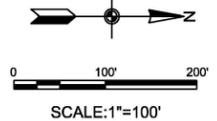
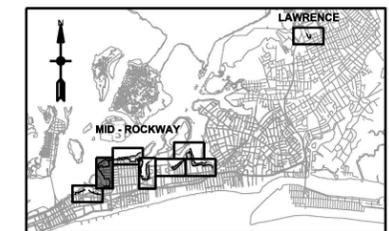
NOTES:

1. ALL ELEVATIONS REFERENCED TO NAVD88.
2. TYPICAL SECTIONS SHOWN ON SHEETS CU-501 TO CU-503.
3. LINE OF PROTECTION SHOWN ON SHEETS CS-101 TO CS-108.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- DRAINAGE AREA

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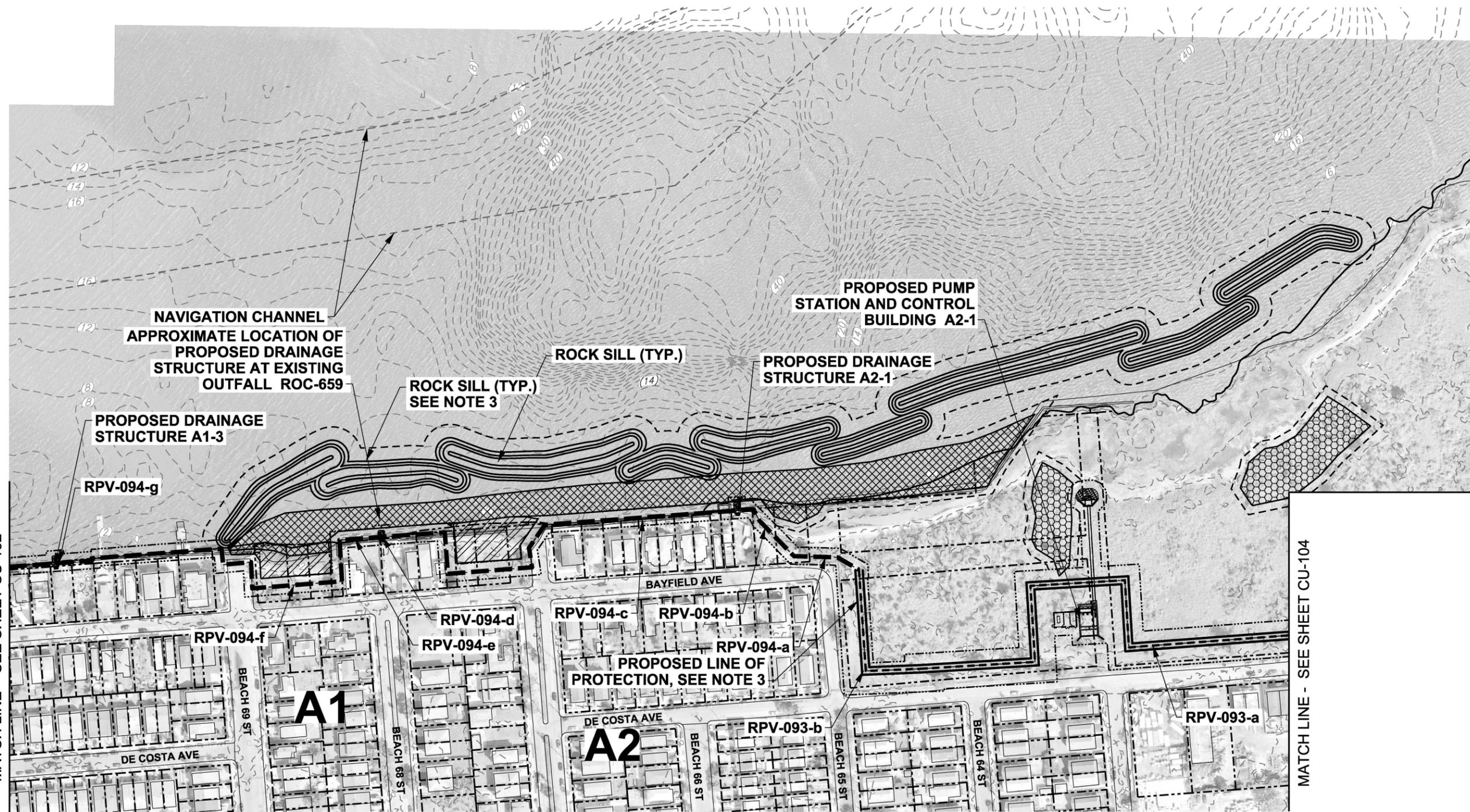
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BU	11.18.18	DATE
BU	08.30.18	
BU	08.20.18	
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DATE	3/3/18	DESCRIPTION
DESIGNED BY	CS	
DRAWN BY	MJ	
CHECKED BY	MC	
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INTEGRATED HURRICANE SANDY GENERAL
RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT
INTERIOR DRAINAGE PLAN (2 OF 8)

SHEET ID
CU-102
SHEET 17 OF 26



MATCH LINE - SEE SHEET CU-102

MATCH LINE - SEE SHEET CU-104

MID-ROCKAWAY - ARVERNE (SHEET 2)
SCALE: 1" = 100'

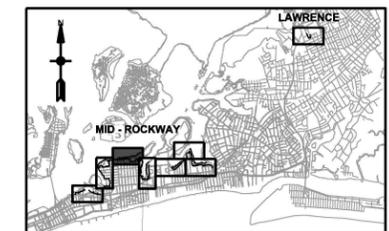
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1. ALL ELEVATIONS REFERENCED TO NAVD88.
2. TYPICAL SECTIONS SHOWN ON SHEETS CU-501 TO CU-503.
3. LINE OF PROTECTION SHOWN ON SHEETS CS-101 TO CS-108.

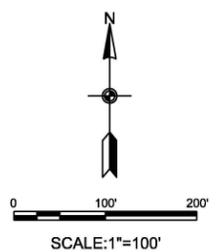
LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- DRAINAGE AREA

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KEY PLAN



SCALE: 1" = 100'



DATE	DESCRIPTION	MARK
12.05.18	FINAL GRR - APPENDIX A2 F	BU
11.18.18	DRAFT FINAL GRR - APPENDIX A2 E	BU
08.30.18	DRAFT FINAL GRR - APPENDIX A2 E	BU
08.20.18	DRAFT FINAL GRR - APPENDIX A2 E	BU
07.18.18	DRAFT FINAL GRR - APPENDIX A2 E	BU

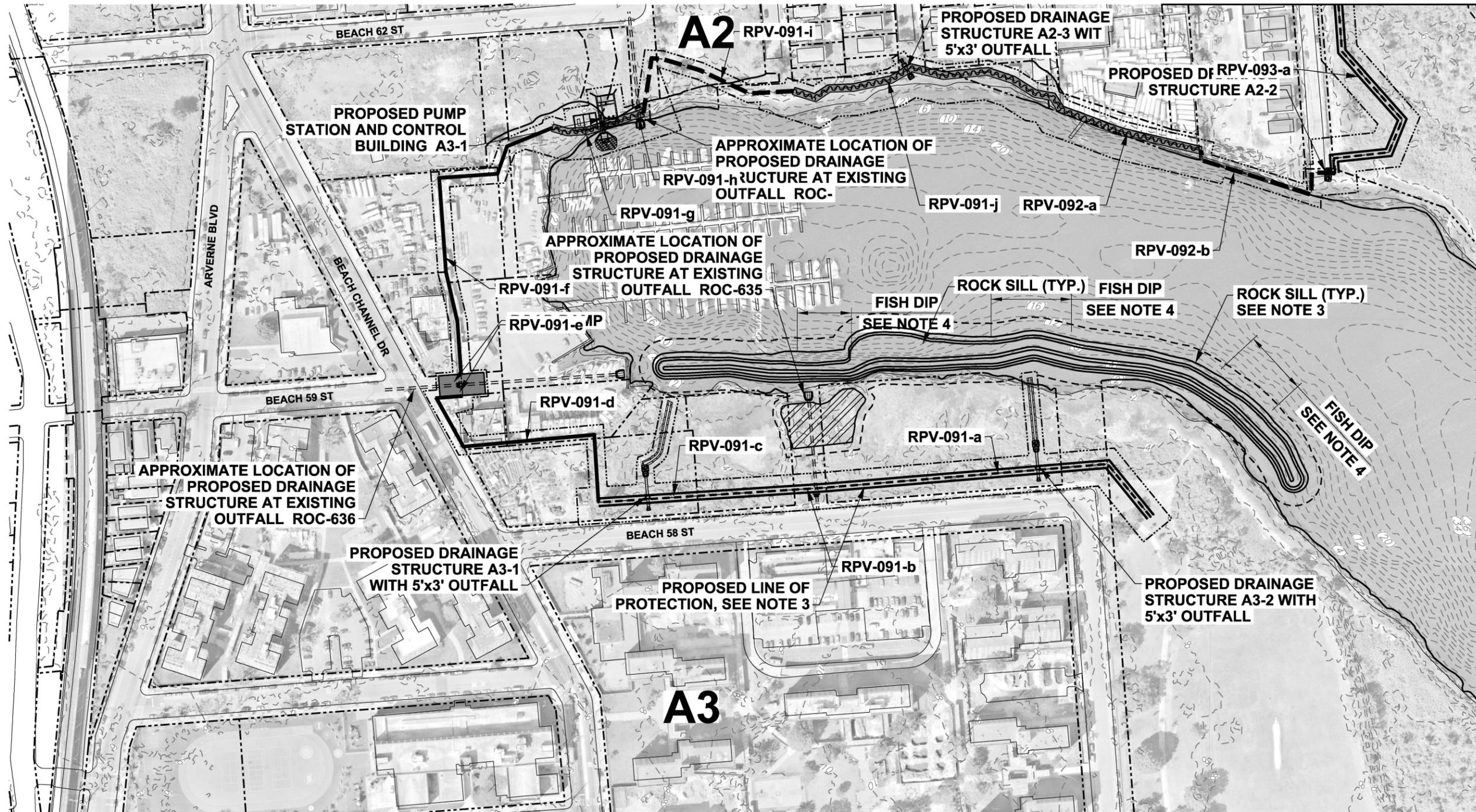
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SUBMITTED BY:	CONTRACT NO.:	9781-02
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INTEGRATED HURRICANE SANDY GENERAL
RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT
INTERIOR DRAINAGE PLAN (3 OF 8)

SHEET ID
CU-103
SHEET 18 OF 26

MATCH LINE - SEE SHEET CU-103



MID-ROCKAWAY - ARVERNE (SHEET 3)
SCALE: 1" = 100'

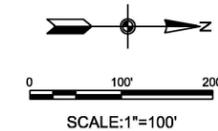
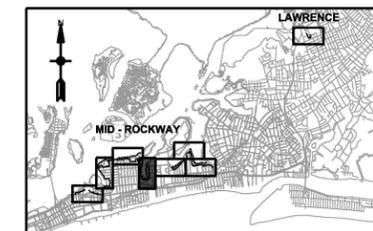
NOTES:

1. ALL ELEVATIONS REFERENCED TO NAVD88.
2. TYPICAL SECTIONS SHOWN ON SHEETS CU-501 TO CU-503.
3. LINE OF PROTECTION SHOWN ON SHEETS CS-101 TO CS-108.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- DRAINAGE AREA

PRELIMINARY
NOT FOR CONSTRUCTION



BU	12.05.18	APPR.
BU	11.18.18	DATE
BU	08.30.18	DATE
BU	08.20.18	DATE
BU	07.19.18	DATE

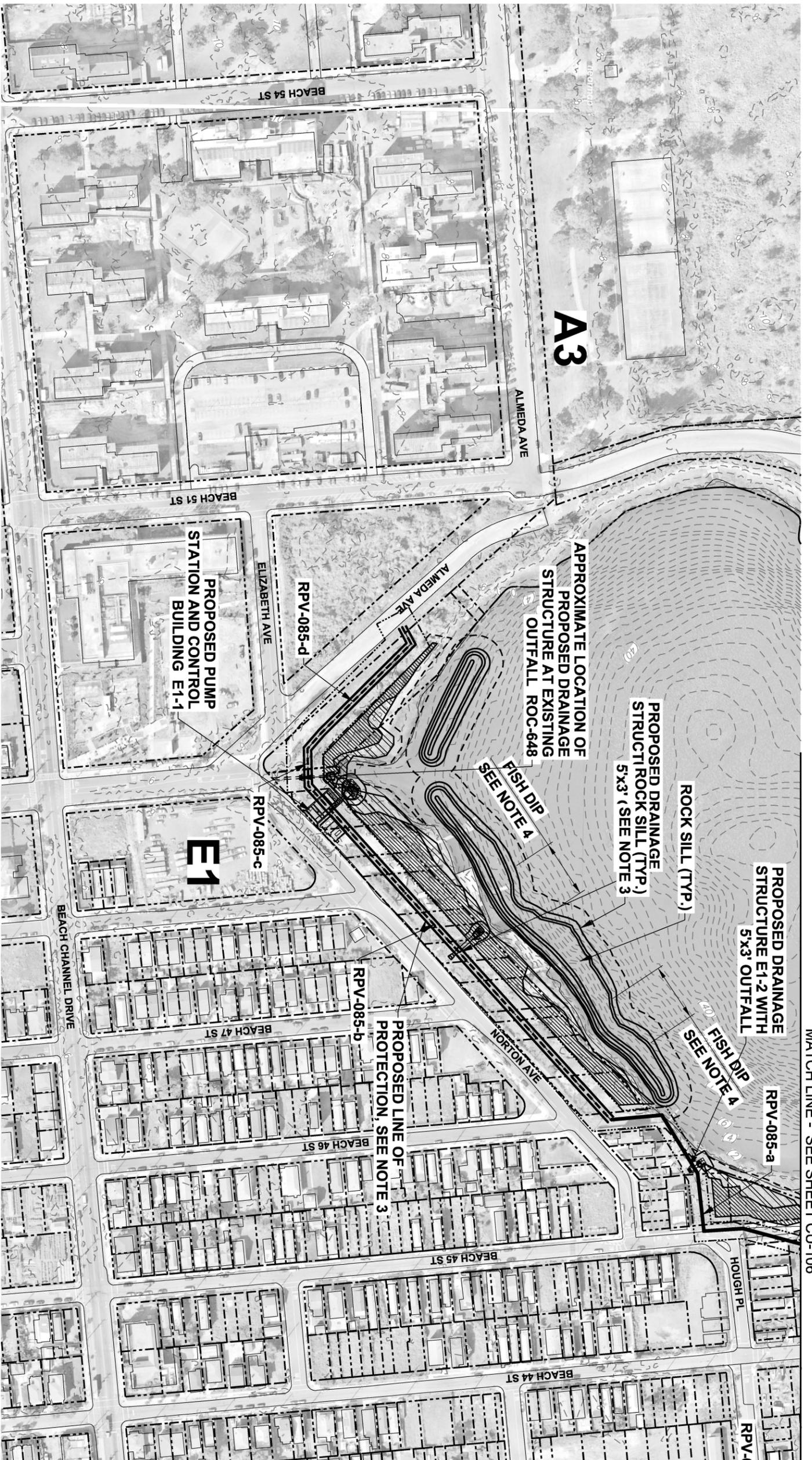
MARK	DESCRIPTION
E	FINAL GRR - APPENDIX A2 F
D	DRAFT FINAL GRR - APPENDIX A2 E
C	DRAFT FINAL GRR - APPENDIX A2 E
B	DRAFT FINAL GRR - APPENDIX A2 E
A	DRAFT FINAL GRR - APPENDIX A2 E

DESIGNED BY:	DATE:
U.S. ARMY CORPS OF ENGINEERS	12/3/18
U.S. ARMY ENGINEER DISTRICT	DESIGNED BY:
NEW YORK	CS/JM
http://www.nm.usace.army.mil	CONTRACT NO.:
529 FIFTH AVE., 14TH FLOOR	9781-02
NEW YORK, NY 10017	FILE NUMBER:
212-768-7454	19781-02

INTEGRATED HURRICANE SANDY GENERAL
RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT

INTERIOR DRAINAGE PLAN (4 OF 8)

SHEET ID
CU-104
SHEET 19 OF 26



MID-ROCKAWAY - EDGEMERE (SHEET 1)
SCALE: 1" = 100'

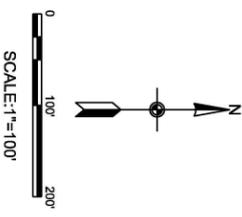
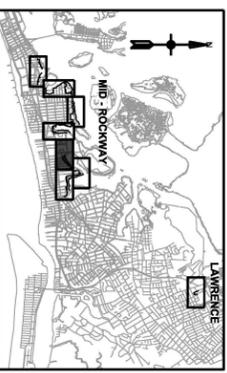
NOTES:

1. ALL ELEVATIONS REFERENCED TO NAVD88.
2. TYPICAL SECTIONS SHOWN ON SHEETS CU-501 TO CU-503.
3. LINE OF PROTECTION SHOWN ON SHEETS CS-101 TO CS-108.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
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- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- DRAINAGE AREA

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MATCH LINE - SEE SHEET CU-106

SHEET ID CU-105 SHEET 20 OF 26	INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT INTERIOR DRAINAGE PLAN (5 OF 8)	U.S. ARMY CORPS OF ENGINEERS U.S. ARMY ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil MOFFATT & NICHOL 529 FIFTH AVE., 14TH FLOOR NEW YORK, NY 10017 212-768-7454	DESIGNED BY: BU DWN BY: OM CKD BY: MJ SUBMITTED BY: MC PLOT SCALE: 1:0.168867 FILE NAME: W912DS_A2_CU-105.dgn SIZE: ANSI D	DATE: 12.05.18 SOLICITATION NO.: CONTRACT NO.: 9781-02 PLOT DATE: 12/3/2018 FILE NUMBER:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>MARK</th> <th>DESCRIPTION</th> <th>DATE</th> <th>APPR.</th> </tr> </thead> <tbody> <tr> <td>E</td> <td>FINAL GRR - APPENDIX A2.F</td> <td>12.05.18</td> <td>BU</td> </tr> <tr> <td>D</td> <td>DRAFT FINAL GRR - APPENDIX A2.E</td> <td>11.19.18</td> <td>BU</td> </tr> <tr> <td>C</td> <td>DRAFT FINAL GRR - APPENDIX A2.E</td> <td>08.30.18</td> <td>BU</td> </tr> <tr> <td>B</td> <td>DRAFT FINAL GRR - APPENDIX A1.E</td> <td>08.20.18</td> <td>BU</td> </tr> <tr> <td>A</td> <td>DRAFT FINAL GRR - APPENDIX A2.E</td> <td>07.19.18</td> <td>BU</td> </tr> </tbody> </table>	MARK	DESCRIPTION	DATE	APPR.	E	FINAL GRR - APPENDIX A2.F	12.05.18	BU	D	DRAFT FINAL GRR - APPENDIX A2.E	11.19.18	BU	C	DRAFT FINAL GRR - APPENDIX A2.E	08.30.18	BU	B	DRAFT FINAL GRR - APPENDIX A1.E	08.20.18	BU	A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	BU
		MARK	DESCRIPTION	DATE	APPR.																								
E	FINAL GRR - APPENDIX A2.F	12.05.18	BU																										
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A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	BU																										

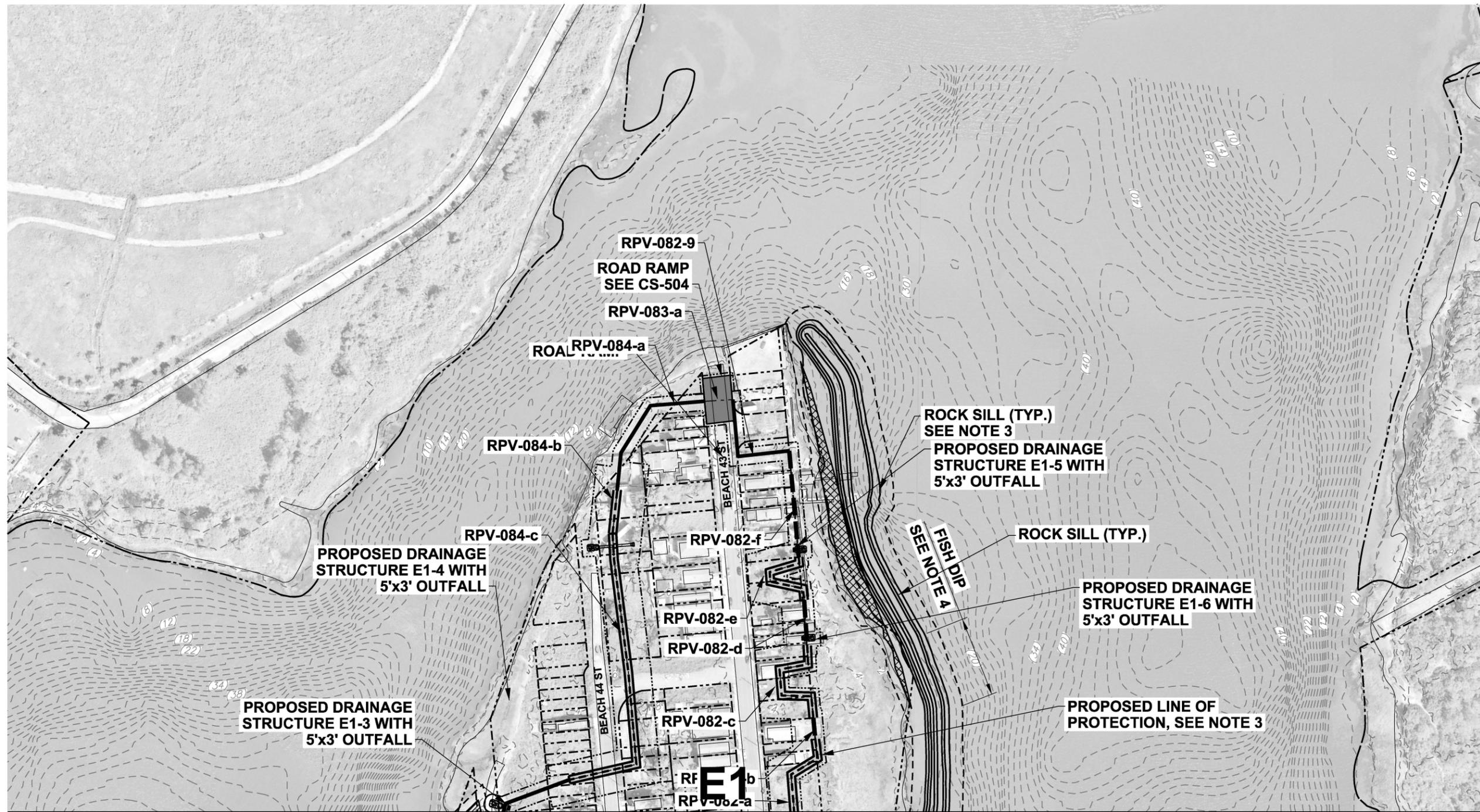
1

2

3

4

5



MATCH LINE - SEE SHEET CU-105

MATCH LINE - SEE SHEET CU-107

MID-ROCKAWAY - EDMERE (SHEET 2)

SCALE: 1" = 100'

NOTES:

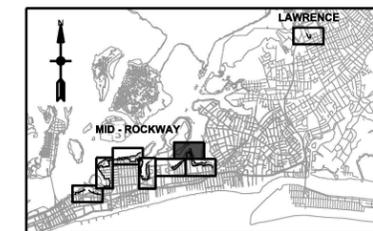
1. ALL ELEVATIONS REFERENCED TO NAVD88.
2. TYPICAL SECTIONS SHOWN ON SHEETS CU-501 TO CU-503.
3. LINE OF PROTECTION SHOWN ON SHEETS CS-101 TO CS-108.

LEGEND

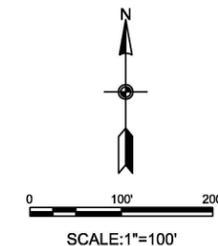
- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- DRAINAGE AREA

A1

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KEY PLAN



SCALE: 1" = 100'



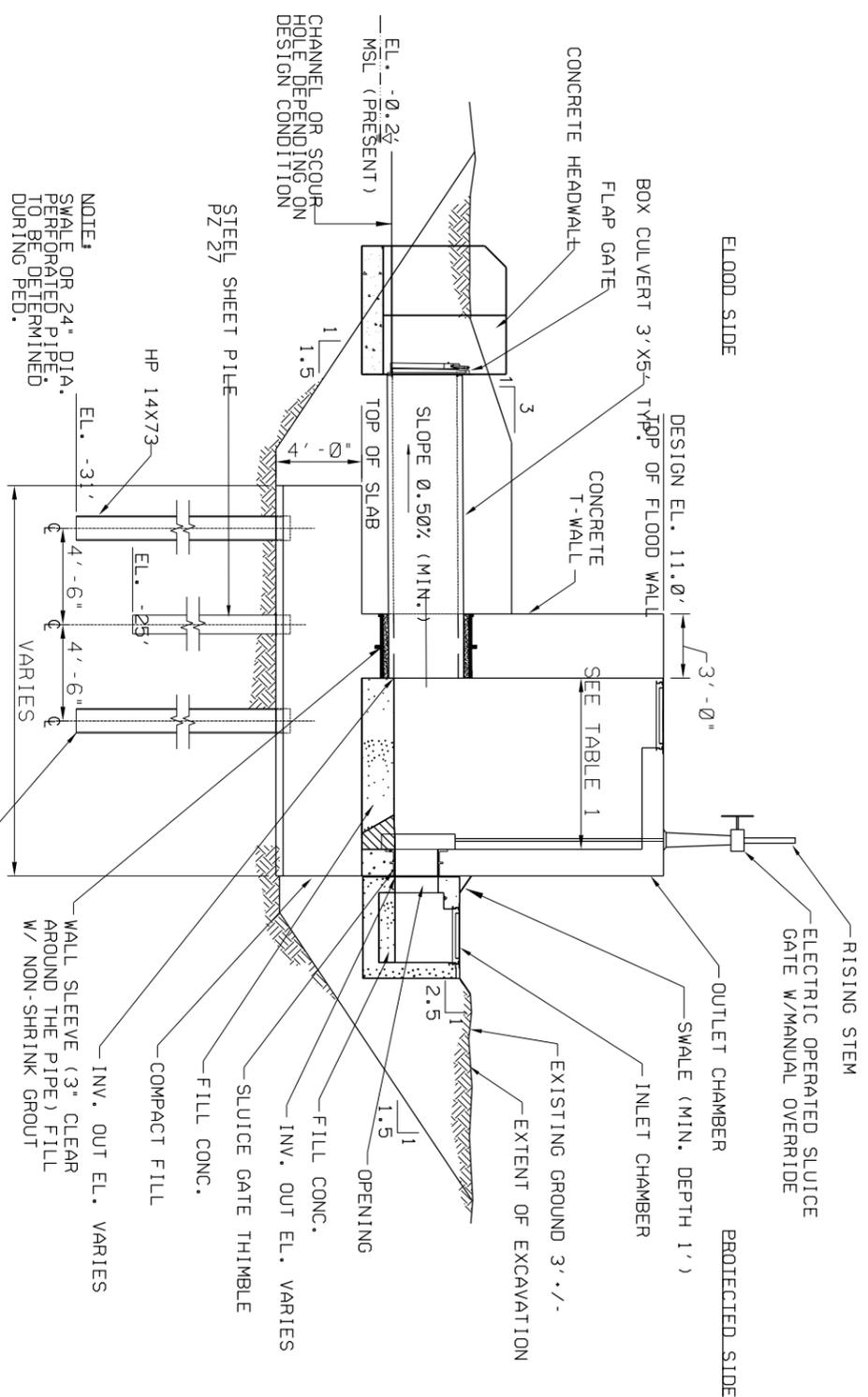
MARK	DATE	DESCRIPTION
A	07.18.18	DRAFT FINAL GRR - APPENDIX A2 E
B	08.20.18	DRAFT FINAL GRR - APPENDIX A1 E
C	08.30.18	DRAFT FINAL GRR - APPENDIX A2 E
D	11.08.18	DRAFT FINAL GRR - APPENDIX A2 E
E	12.05.18	FINAL GRR - APPENDIX A2 F

DESIGNED BY:	DATE:	12/3/18
DRAWN BY:	SUBMITTED BY:	12/3/2018
CHECKED BY:	FILE NAME:	W912DS_A2_CU-106.dgn
SCALE:	ANSI D	
U.S. ARMY CORPS OF ENGINEERS	DESIGNATION NO.:	
U.S. ARMY ENGINEER DISTRICT	CONTRACT NO.:	9781-02
NEW YORK	FILE NUMBER:	
http://www.nm.usace.army.mil		
MOFFATT & NICHOL		
529 FIFTH AVE., 14TH FLOOR		
NEW YORK, NY 10017		
212-768-7454		

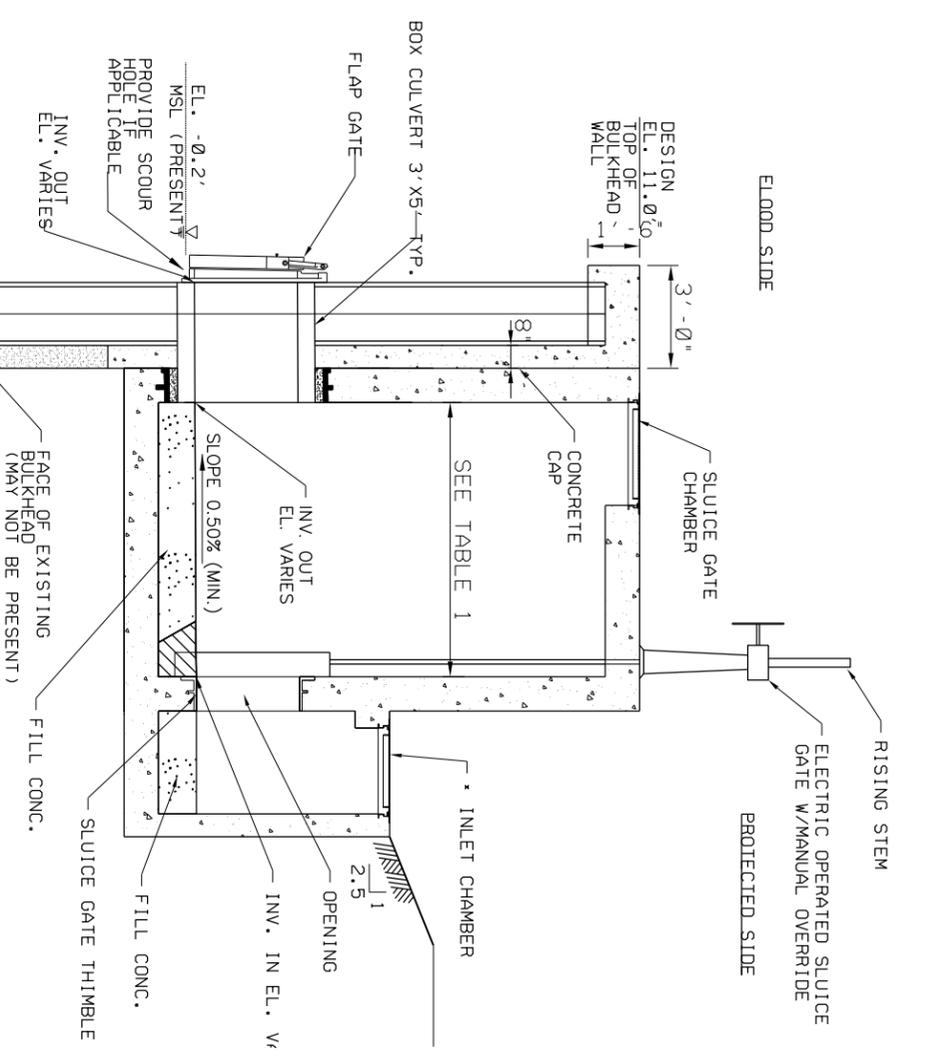
INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT

INTERIOR DRAINAGE PLAN (6 OF 8)

SHEET ID
CU-106
SHEET 21 OF 26



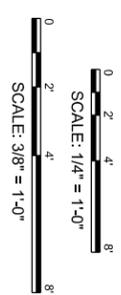
1 TYPICAL OUTFALL DETAIL THROUGH FLOODWALL
SCALE: 1/4" = 1'-0"



2 TYPICAL OUTFALL DETAIL THROUGH BULKHEAD
SCALE: 3/8" = 1'-0"

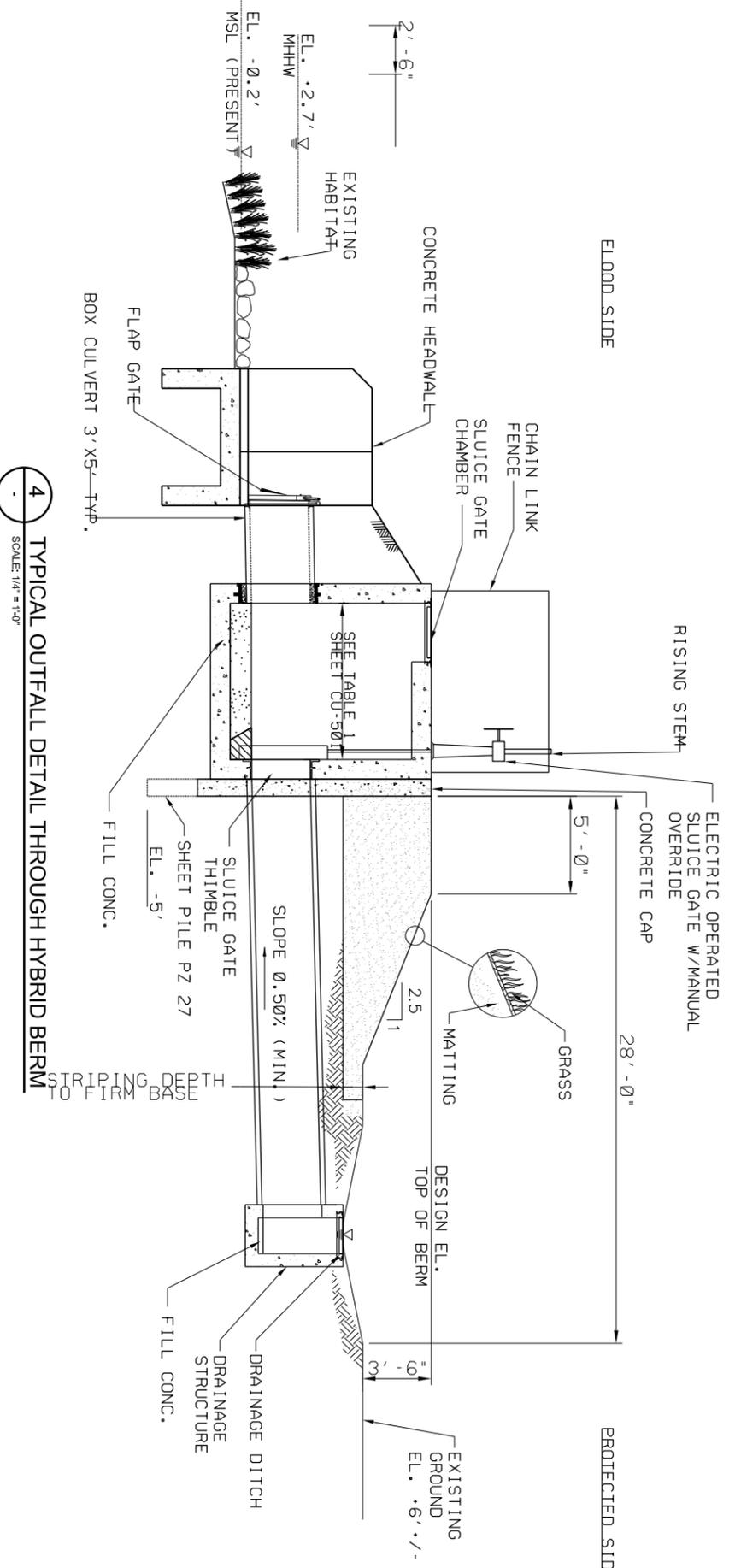
DRAINAGE STRUCTURE DIMENSION				
CULVERT SIZE	WALL THICKNESS (FT)	PROF THICKNESS (FT)	FLOOR SLAB THICKNESS (FT)	CHAMBER WIDTH
5'x3'	1.5	1.0	1.5	8'-0"
				CHAMBER LENGTH
				8'-0"

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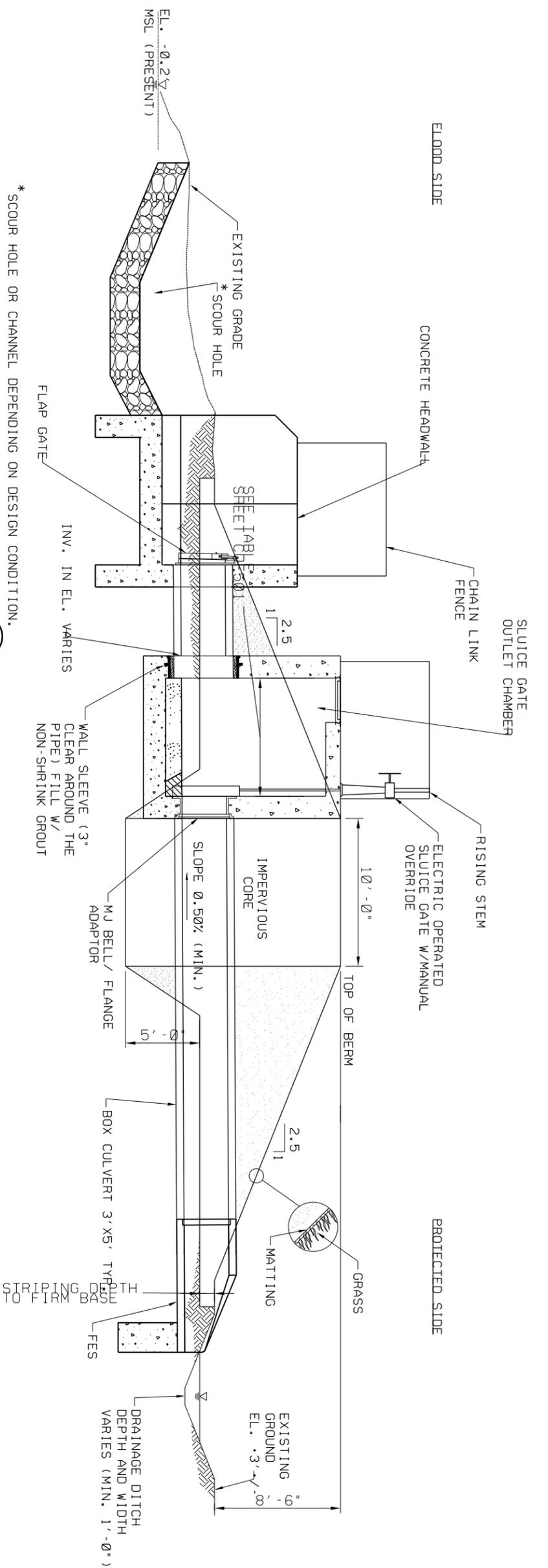


SHEET ID CU-501 SHEET 24 OF 26	INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT TYPICAL DRAINAGE OUTFALL DETAILS - SHEET 1	U.S. ARMY CORPS OF ENGINEERS U.S. ARMY ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil	DESIGNED BY: RB DRAWN BY: OM CHECKED BY: MJ SUBMITTED BY: MC	DATE: 12/05/18 SOLICITATION NO.: CONTRACT NO.: 9781-02 FILE NUMBER:	E FINAL GRR - APPENDIX A2.F 12.05.18 BU D DRAFT FINAL GRR - APPENDIX A2.E 11.19.18 BU C DRAFT FINAL GRR - APPENDIX A2.E 08.30.18 BU B DRAFT FINAL GRR - APPENDIX A1.E 08.20.18 BU A DRAFT FINAL GRR - APPENDIX A2.E 07.19.18 BU	US Army Corps of Engineers
		MOFFATT & NICHOL 529 FIFTH AVE., 14TH FLOOR NEW YORK, NY 10017 212-768-7454	PLOT SCALE: 1/4" = 1'-0" PLOT DATE: 12/3/2018 SIZE: 12 FILE NAME: W912DS_A2_CU-501.dgn	MARK DESCRIPTION DATE APPR.		

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3 TYPICAL OUTFALL DETAIL THROUGH BERM
SCALE: 1/4" = 1'-0"



4 TYPICAL OUTFALL DETAIL THROUGH HYBRID BERM
SCALE: 1/4" = 1'-0"

SCALE: 1/4" = 1'-0"

INTEGRATED HURRICANE SANDY GENERAL
RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT

TYPICAL DRAINAGE OUTFALL
DETAILS - SHEET 2

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK
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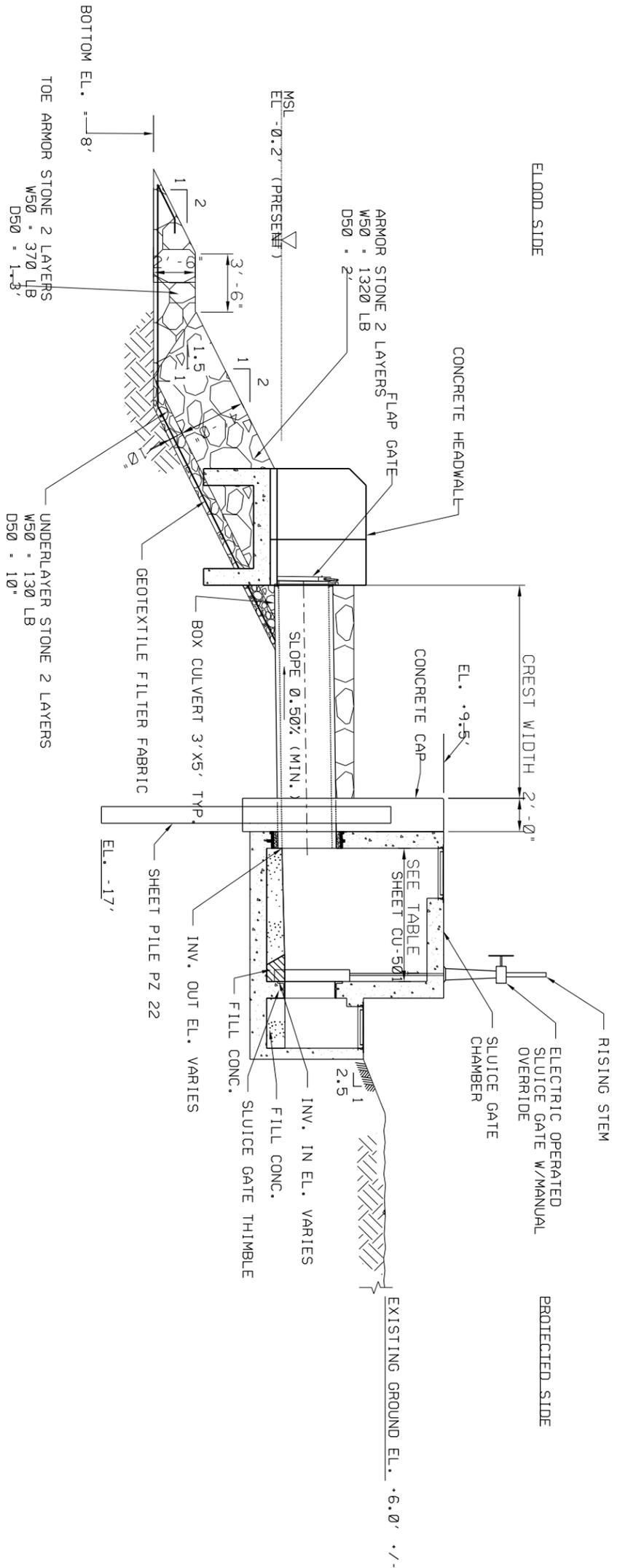
DESIGNED BY: BU	DATE: 12.05.18
DWN BY: MU	SOLICITATION NO.:
CHKD BY: MU	CONTRACT NO.:
OM	9781-02
SUBMITTED BY: MC	FILE NUMBER:
PLOT SCALE: 1:2	PLOT DATE: 12/3/2018
SIZE: ANSI D	FILE NAME: W912DS_A2_CU-502.dgn

MARK	DESCRIPTION	DATE	APPR.
E	FINAL GRR - APPENDIX A2.F	12.05.18	BU
D	DRAFT FINAL GRR - APPENDIX A2.E	11.19.18	BU
C	DRAFT FINAL GRR - APPENDIX A2.E	08.30.18	BU
B	DRAFT FINAL GRR - APPENDIX A1.E	08.20.18	BU
A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	BU

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SHEET ID
CU-502
SHEET 25 OF 26

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5 TYPICAL OUTFALL DETAIL THROUGH REVETMENT WITH FOLDWALL
SCALE: 1/4" = 1'-0"

0 2 4 8
SCALE: 1/4" = 1'-0"

INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT TYPICAL DRAINAGE OUTFALL DETAILS - SHEET 3	U.S. ARMY CORPS OF ENGINEERS U.S. ARMY ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil MOFFATT & NICHOL 529 FIFTH AVE., 14TH FLOOR NEW YORK, NY 10017 212-768-7454	DESIGNED BY: BU DWN BY: OM CHKD BY: MJ SUBMITTED BY: MC PLOT SCALE: 1/2" PLOT DATE: 12/3/2018 FILE NAME: W912DS_A2_CU-503.dgn ANSI D	DATE: 12.05.18 SOLICITATION NO.: CONTRACT NO.: 9781-02 FILE NUMBER: E FINAL GRR - APPENDIX A2.F 12.05.18 BU D DRAFT FINAL GRR - APPENDIX A2.E 11.19.18 BU C DRAFT FINAL GRR - APPENDIX A2.E 08.30.18 BU B DRAFT FINAL GRR - APPENDIX A1.E 08.20.18 BU A DRAFT FINAL GRR - APPENDIX A2.E 07.19.18 BU
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