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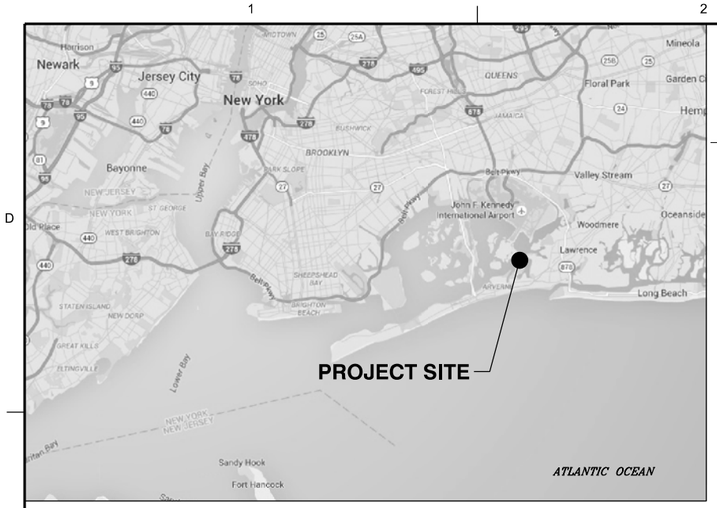
Integrated Hurricane Sandy General Reevaluation Report and Environmental Impact Statement

Atlantic Coast of New York

East Rockaway Inlet to Rockaway Inlet and Jamaica Bay

Sub Appendix A2-F: Plans and Sections for the Recommended Plan for Jamaica Bay

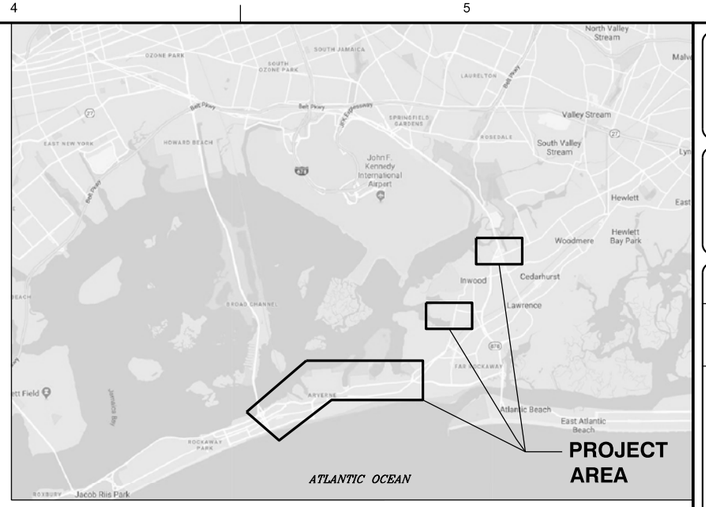
US Army Corps of Engineers



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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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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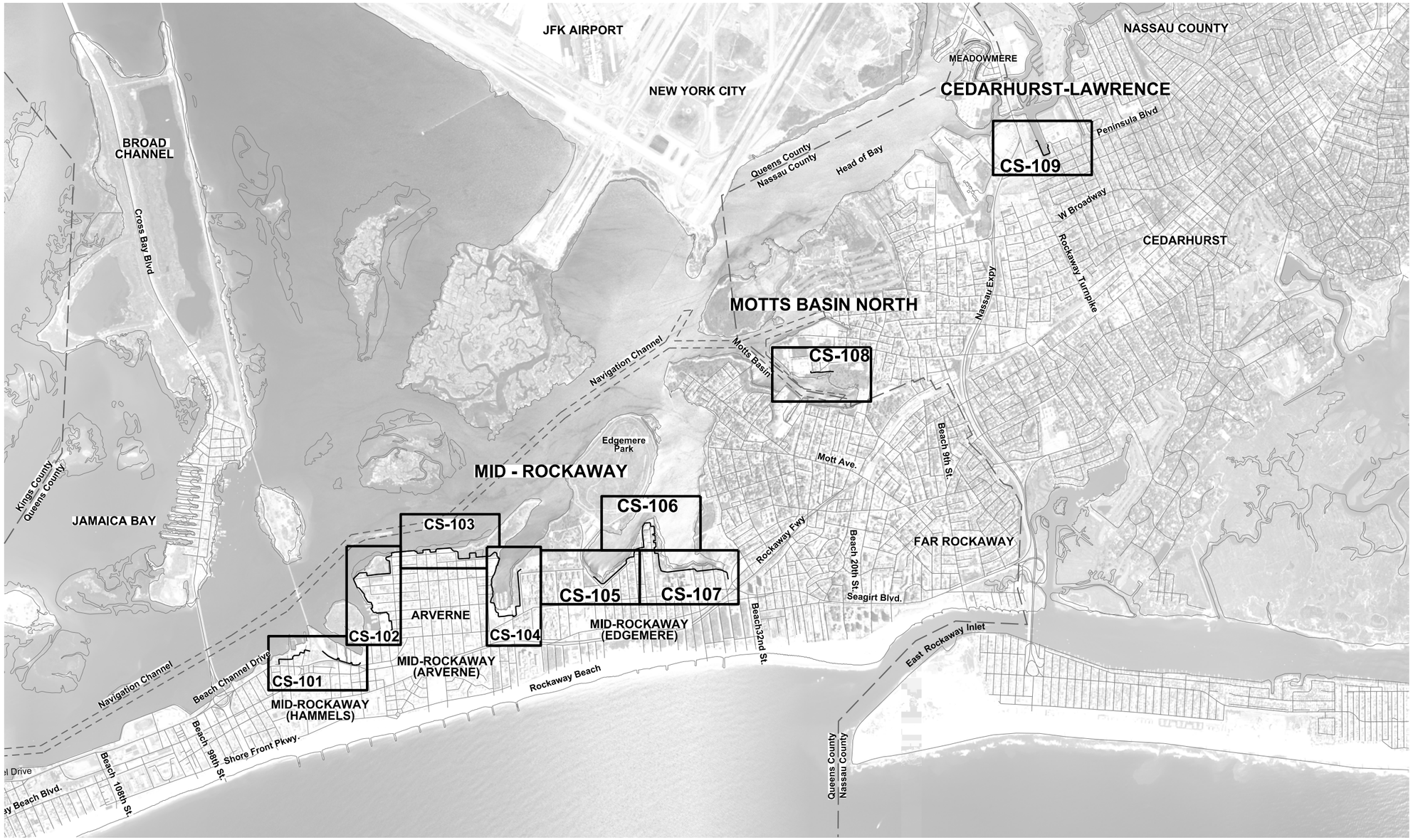
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COVER SHEET

SHEET ID
G-001
SHEET 1 OF 28

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HIGH FREQUENCY FLOOD RISK REDUCTION FEATURES (HFFRRF) FOR JAMAICA BAY

PROJECT SITES:
1. MID - ROCKAWAY
2. MOTTS BASIN NORTH
3. CEDARHURST-LAWRENCE

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N

0 1500' 3000'

SCALE:1"=1500'

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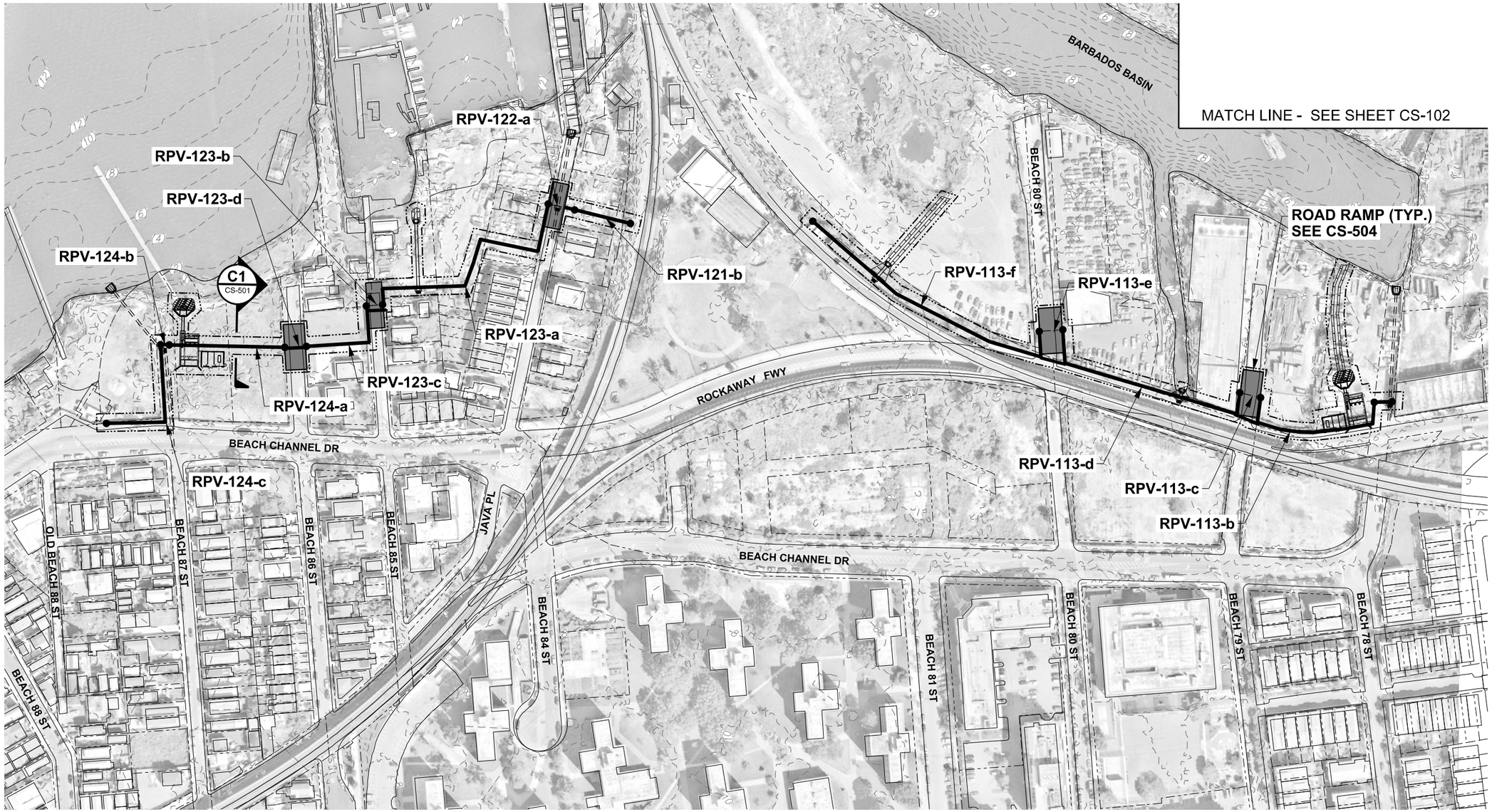
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SHEETS KEY PLAN

SHEET ID
G-101
SHEET 2 OF 28



MID-ROCKAWAY - HAMMELS

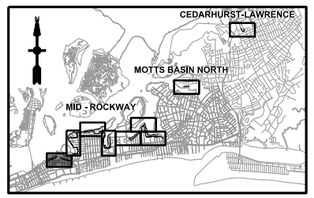
NOTES

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

PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

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



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

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A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	MK

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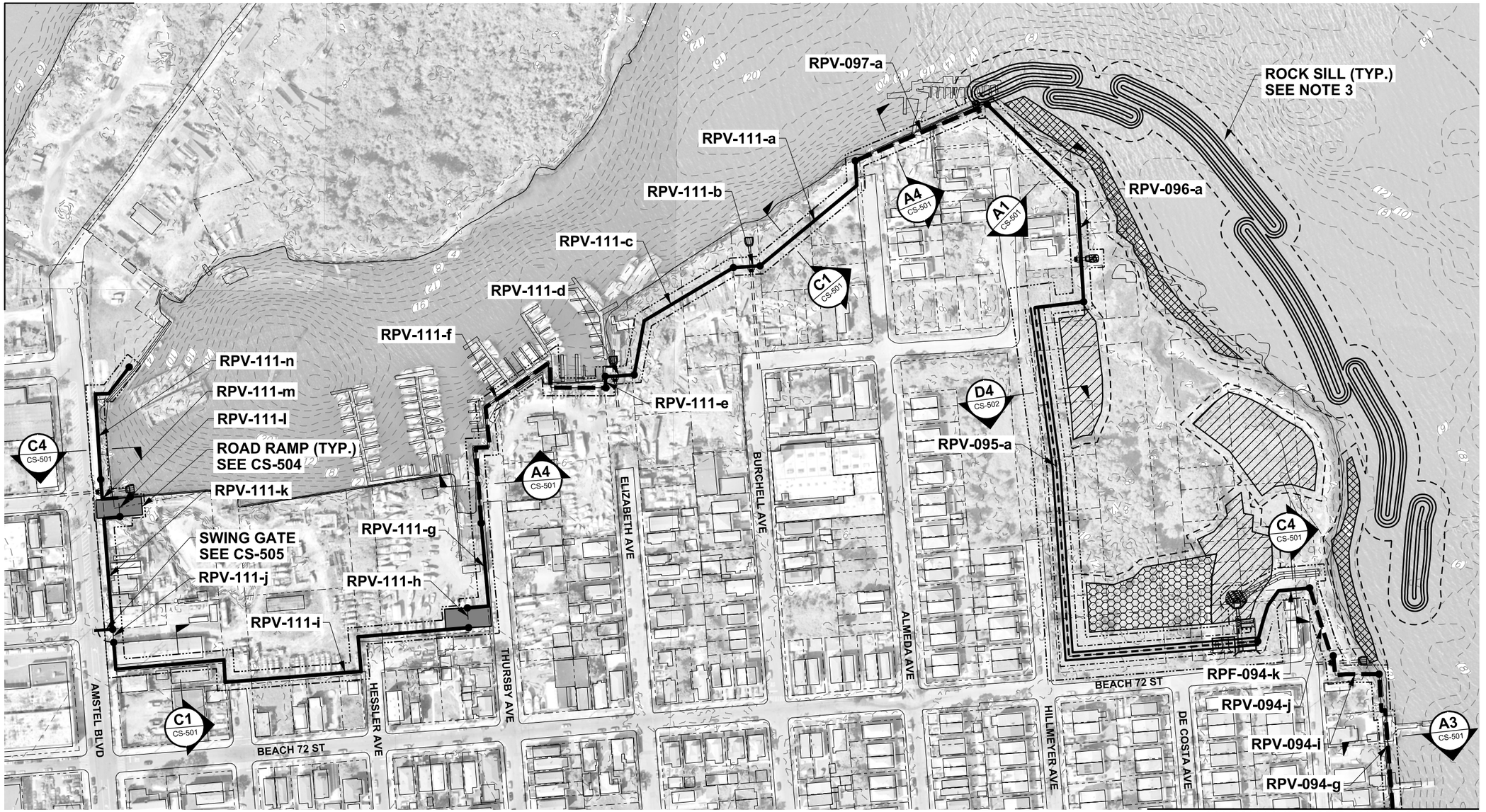
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SITE PLAN (1 OF 9)

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MID-ROCKAWAY - ARVERNE (SHEET 1)

SCALE: 1" = 100'

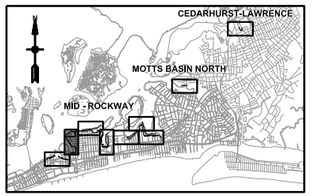
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PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

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



KEY PLAN

0 100' 200'

SCALE:1"=100'

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A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	MK

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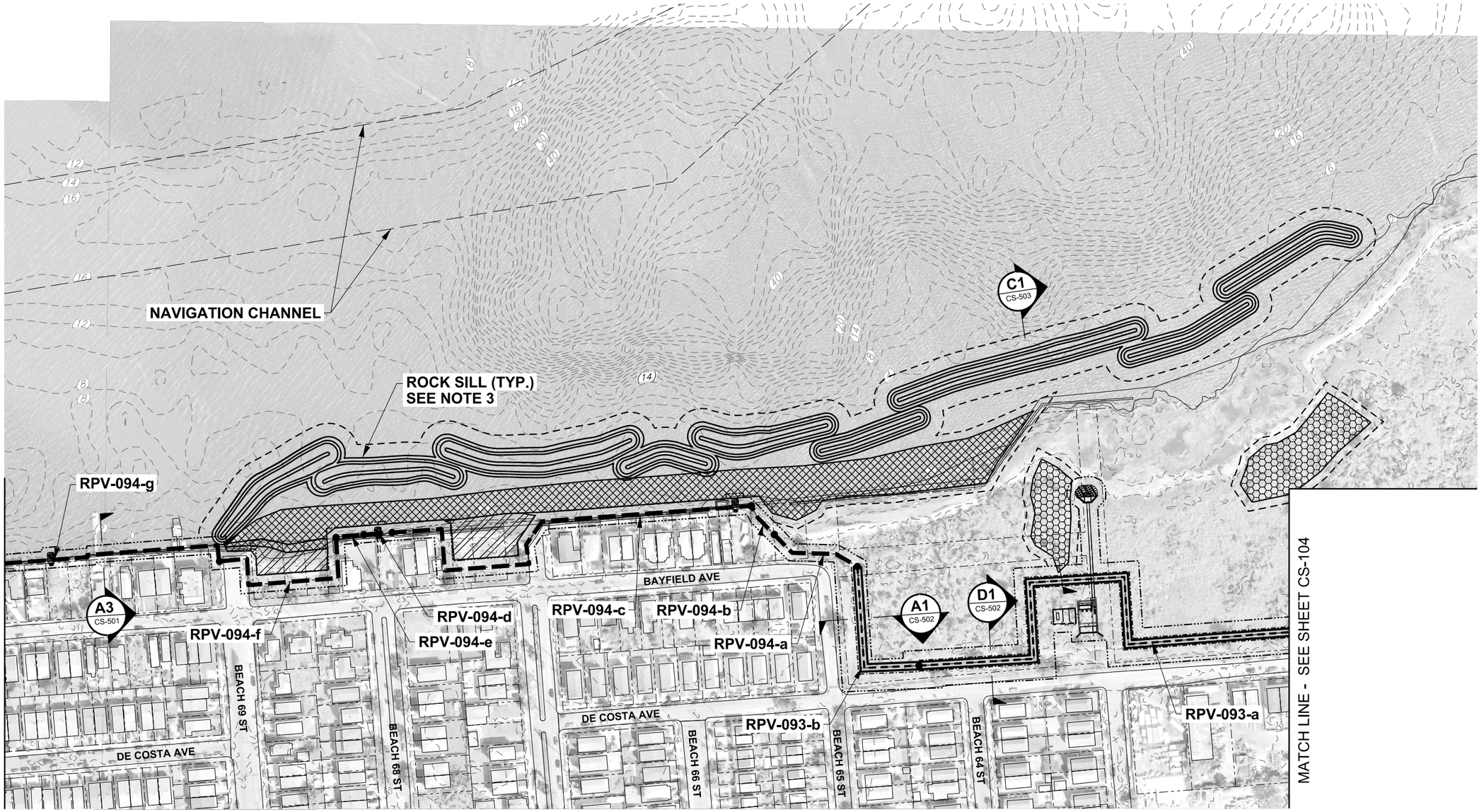
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SITE PLAN (2 OF 9)

SHEET ID
CS-102
SHEET 4 OF 28



MID-ROCKAWAY - ARVERNE (SHEET 2)

SCALE: 1" = 100'

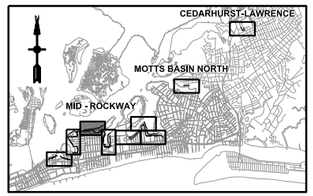
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PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

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



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

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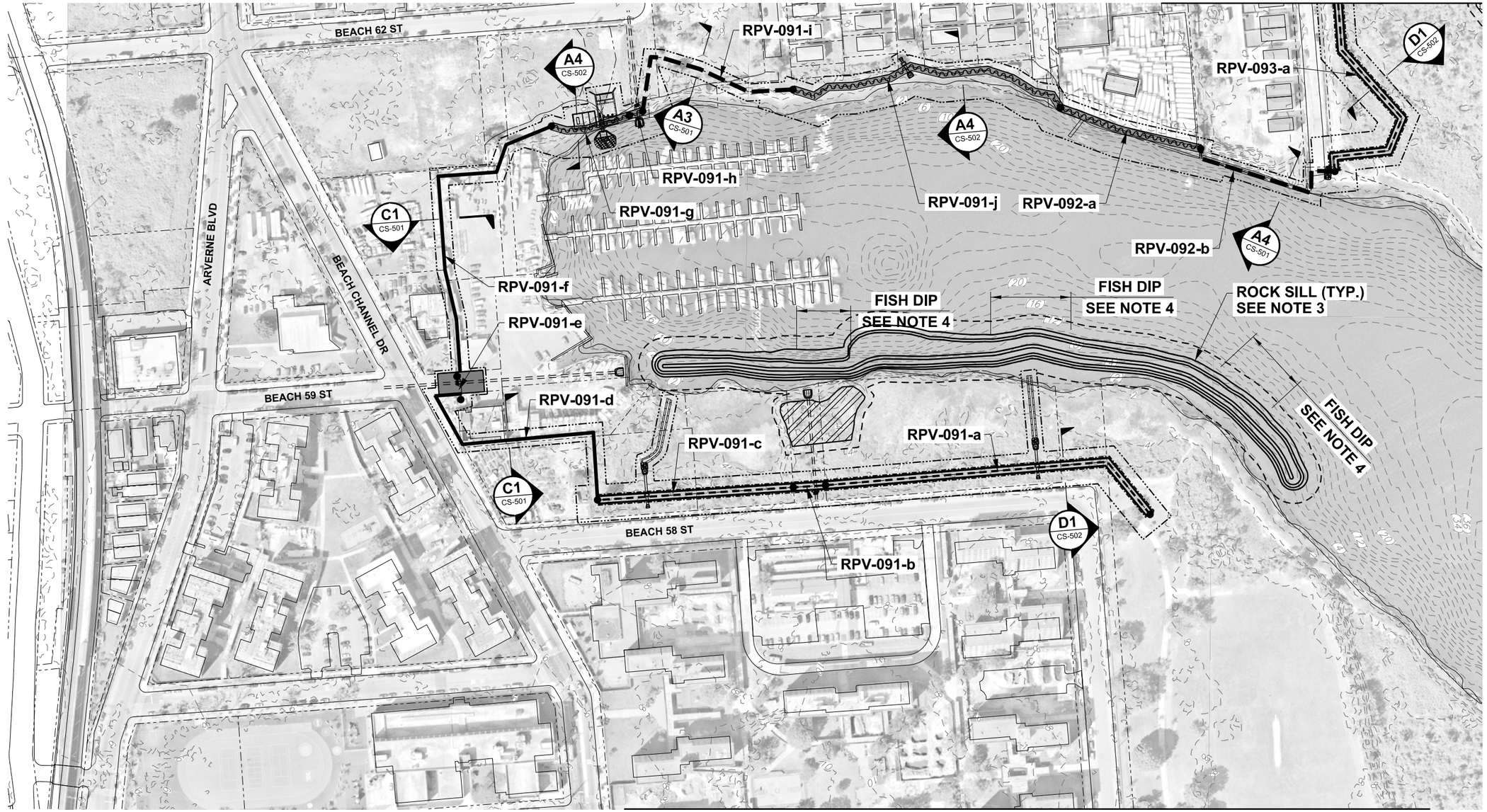
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MATCH LINE - SEE SHEET CS-105

MID-ROCKAWAY - ARVERNE (SHEET 3)

SCALE: 1" = 100'

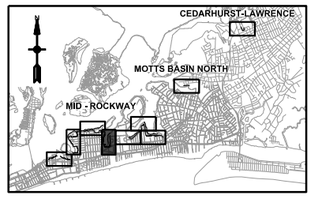
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PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

- FLOODWALL
- BULKHEAD
- REVETMENT
- BERM
- TOE OF BERM
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- TAX LOT PROPERTY LINE
- RPV-### REACH ID
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- INTERTIDAL MARSH SMOOTH CORDGRASS
- HIGH MARSH SCRUB-SHRUB
- MARITIME FOREST



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

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SUBMITTED BY: SA
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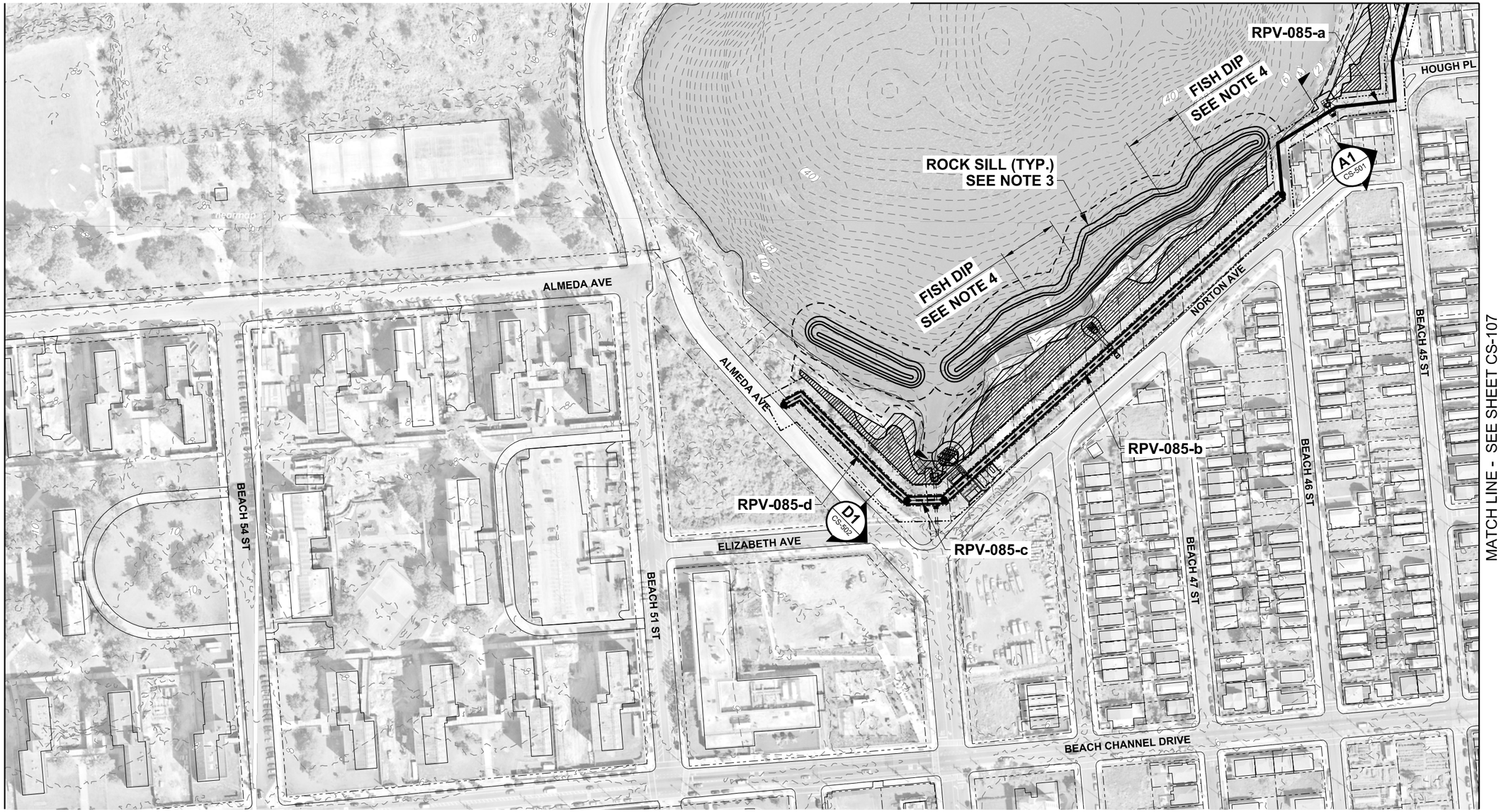
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MATCH LINE - SEE SHEET CS-104

MATCH LINE - SEE SHEET CS-107

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

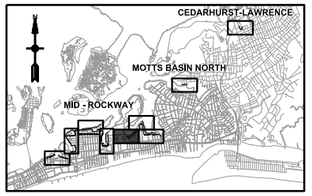
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- HIGH MARSH SCRUB-SHRUB
- MARITIME FOREST



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

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MATCH LINE - SEE SHEET CS-105

MATCH LINE - SEE SHEET CS-107

MID-ROCKAWAY - EDGEMERE (SHEET 2)

SCALE: 1" = 100'

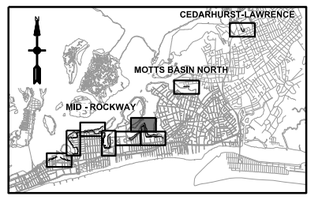
NOTES

1. ALL ELEVATIONS REFERENCED TO NAVD88.
2. 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.
3. 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.
4. 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 DIPS) OF 0.0 FEET MSL OF 100 FEET ARE PROVIDED.

PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

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



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

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MARK	DESCRIPTION	DATE	APPR.
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: MK | DRWN BY: ME | SUBMITTED BY: SA | PLOT SCALE: 1=100' | SIZE: ANSI D | DATE: 08.30.18 | CKD BY: MK | PLOT DATE: 8/28/2018 | FILE NAME: W912DS_A2_CS-106.dgn | SOLICITATION NO.: | CONTRACT NO.: W912-02 | FILE NUMBER:

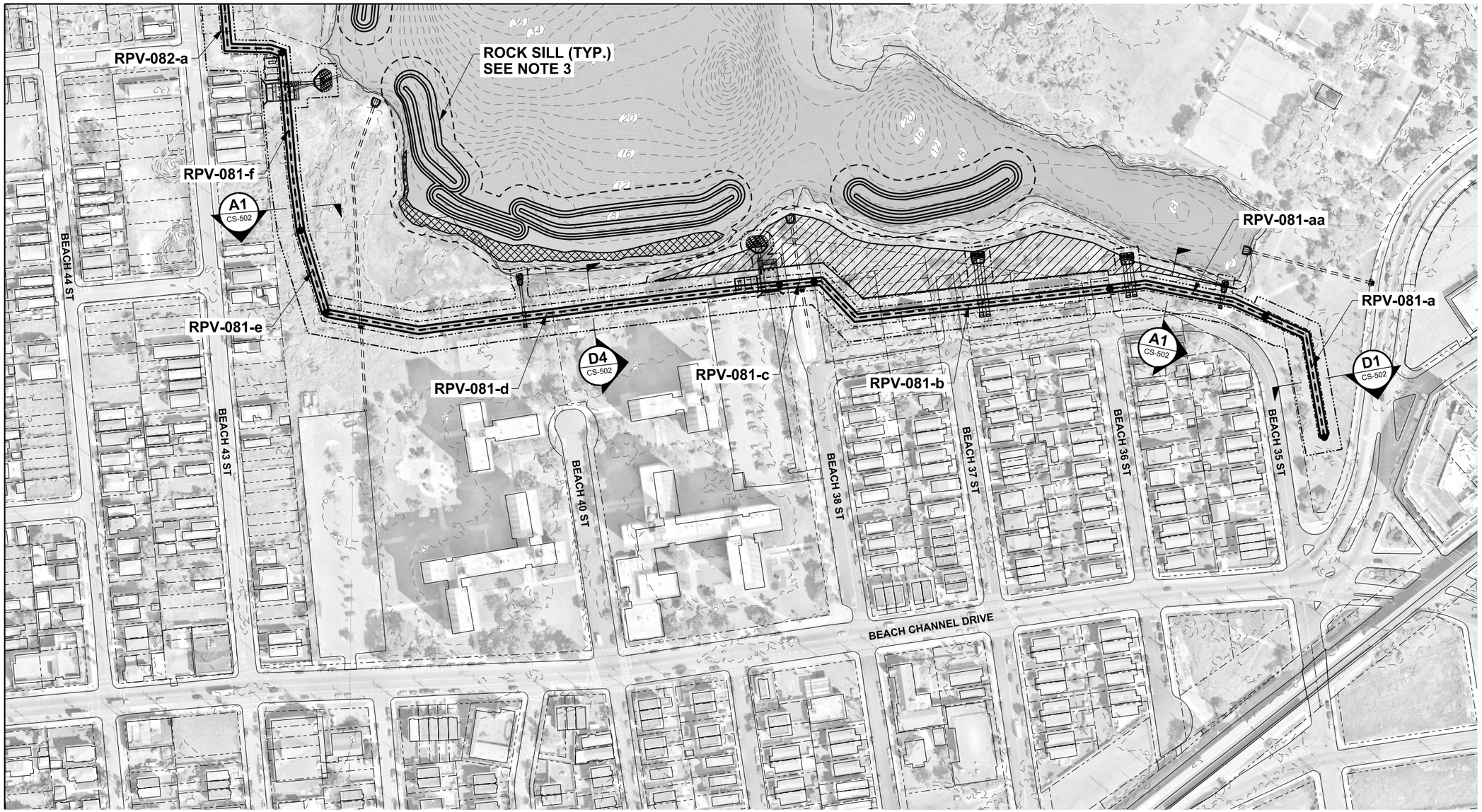
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NEW YORK
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INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT

SITE PLAN (6 OF 9)

SHEET ID
CS-106
SHEET 8 OF 28



MATCH LINE - SEE SHEET CS-105

MID-ROCKAWAY - EDGEMERE (SHEET 3)

SCALE: 1" = 100'

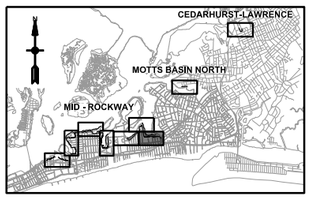
NOTES

1. ALL ELEVATIONS REFERENCED TO NAVD88.
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PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

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



KEY PLAN

N

0 100' 200'

SCALE: 1"=100'

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B	DRAFT FINAL GRR - APPENDIX A2.E	08.20.18	MK
A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	MK

DESIGNED BY: JK
DRWN BY: ME
SUBMITTED BY: SA
PLOT SCALE: ANSI D
SIZE: 22"x36"
DATE: 08.30.18
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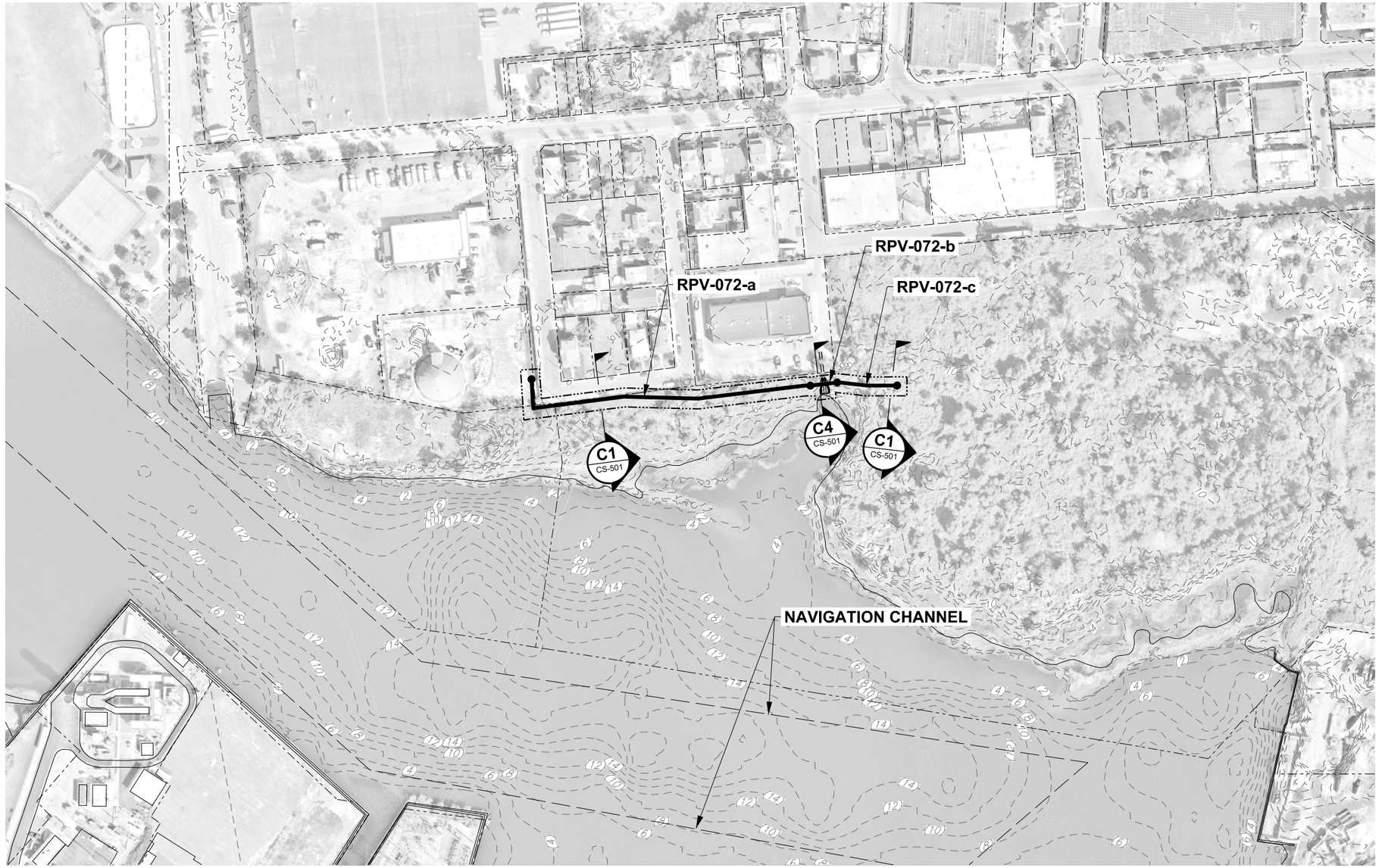
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SITE PLAN (7 OF 9)

SHEET ID
CS-107
SHEET 9 OF 28

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8/28/2018
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LAST PLOTTED BY: mestimable



MOTTS BASIN NORTH
SCALE: 1" = 100'

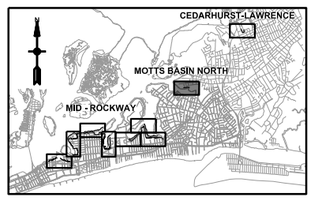
NOTES

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2. ELEVATION CONTOURS BASED ON THE FOLLOWING SOURCES:
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   - 2013-2014 U.S. GEOLOGICAL SURVEY CMGP LIDAR: POST SANDY (NEW YORK CITY), 2018.

PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

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



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

PATH: Q:\NY\9781-02\500_CADD_Active_HFFRRF Report-App A2\
LAST PLOTTED BY: mestimable 1:36:56 PM 8/28/2018 FILE: W912DS_A2_CS-108.dgn

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B	DRAFT FINAL GRR - APPENDIX A2.E	08.20.18	MK
A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	MK

DESIGNED BY: MK
DWN BY: ME
SUBMITTED BY: SA
PLOT SCALE: 1:1
SIZE: ANSI D
DATE: 08.30.18
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NEW YORK
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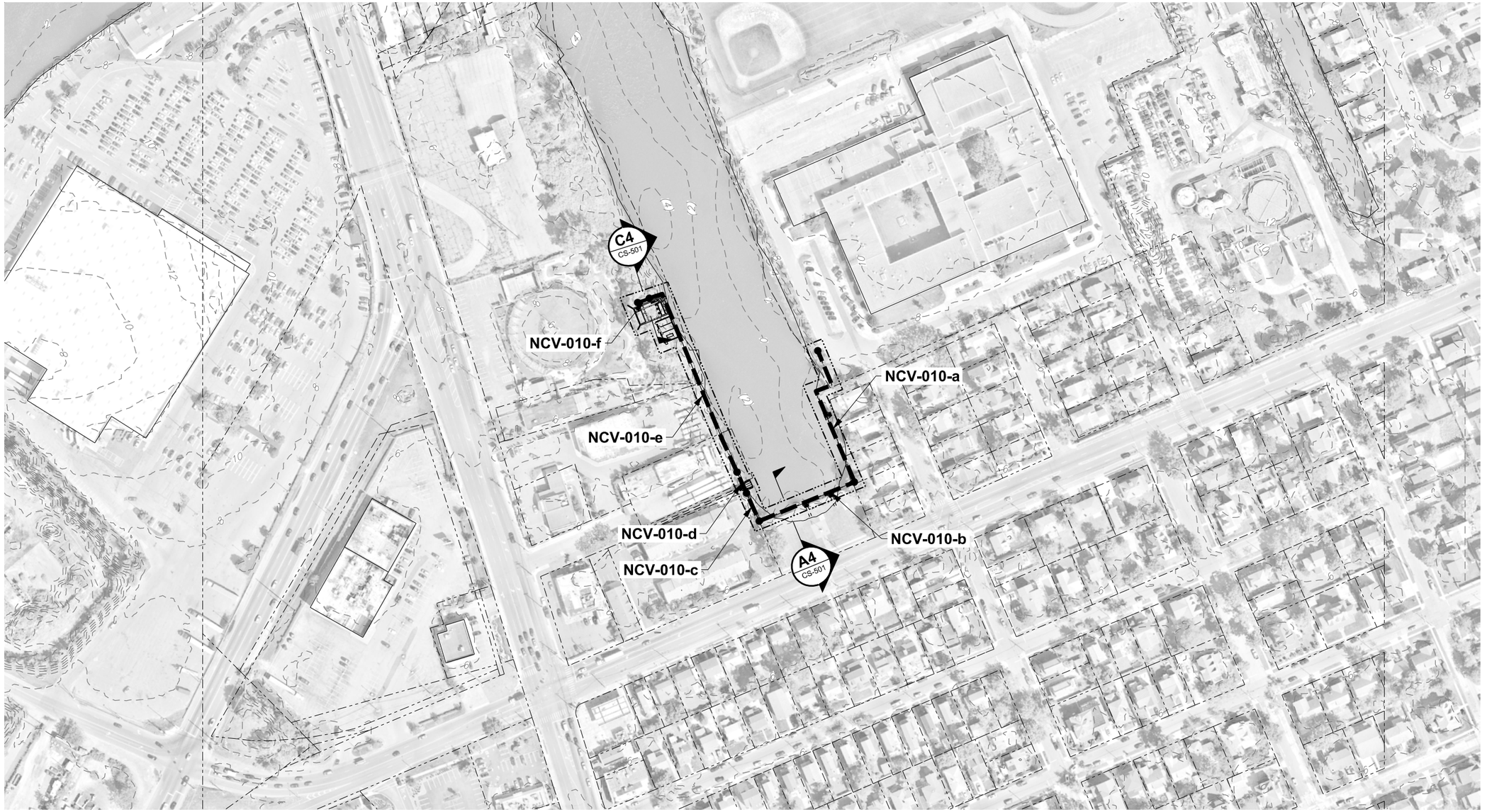
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SITE PLAN (8 OF 9)

SHEET ID
CS-108
SHEET 10 OF 28

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CEDARHURST-LAWRENCE
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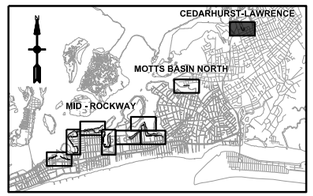
NOTES

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2. ELEVATION CONTOURS BASED ON THE FOLLOWING SOURCES:
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   - 2013-2014 U.S. GEOLOGICAL SURVEY CMGP LIDAR: POST SANDY (NEW YORK CITY), 2018.

PRELIMINARY
NOT FOR CONSTRUCTION

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- INTERTIDAL MARSH SMOOTH CORDGRASS
- HIGH MARSH SCRUB-SHRUB
- MARITIME FOREST



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

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MARK	DESCRIPTION	DATE	APPR.
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

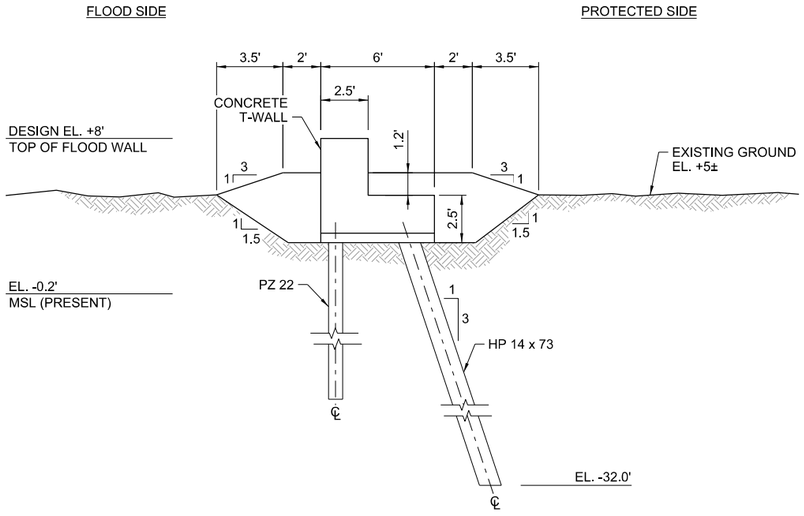
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SUBMITTED BY: SA
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PLOT DATE: 8/28/2018
STATE: ANSI D
FILE NAME: W912DS_A2_CS-109.dgn
DATE: 08.30.18
SOLICITATION NO.:
CONTRACT NO.: 9781-02
FILE NUMBER:

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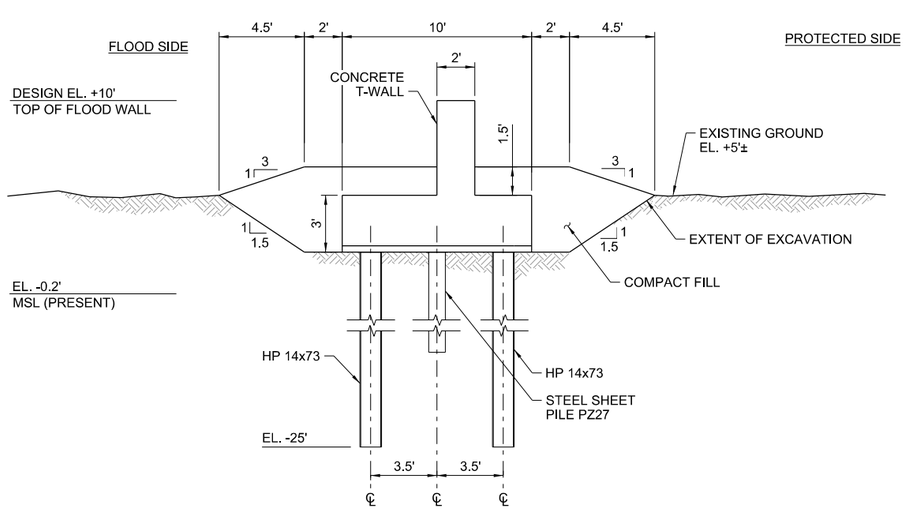
INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT

SITE PLAN (9 OF 9)

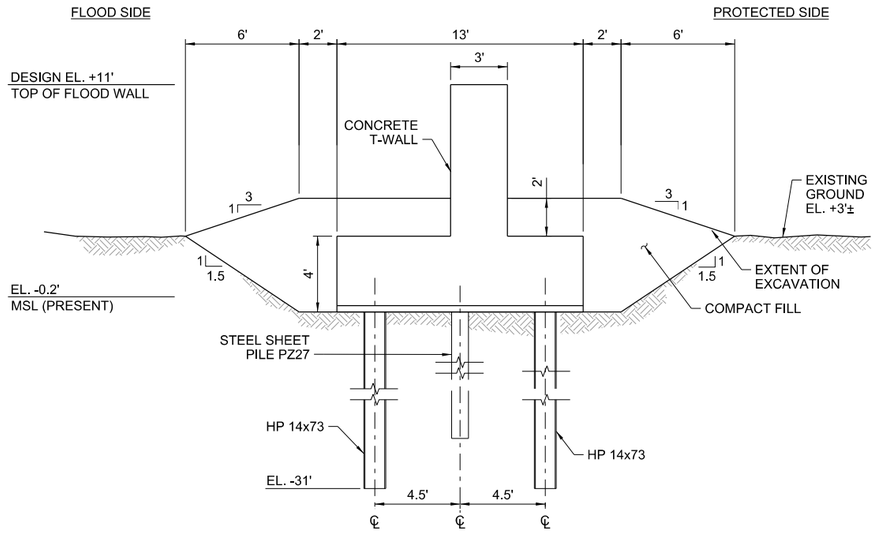
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CS-109
SHEET 11 OF 28



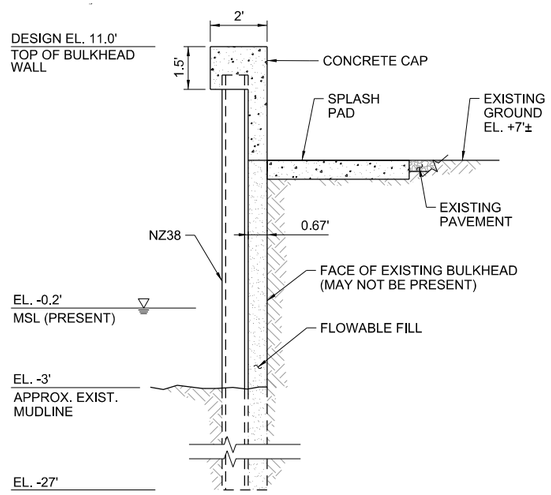
C1 LOW FLOODWALL
SCALE: 1/4" = 1'-0"
CS-101, CS-102, CS-104, CS-108



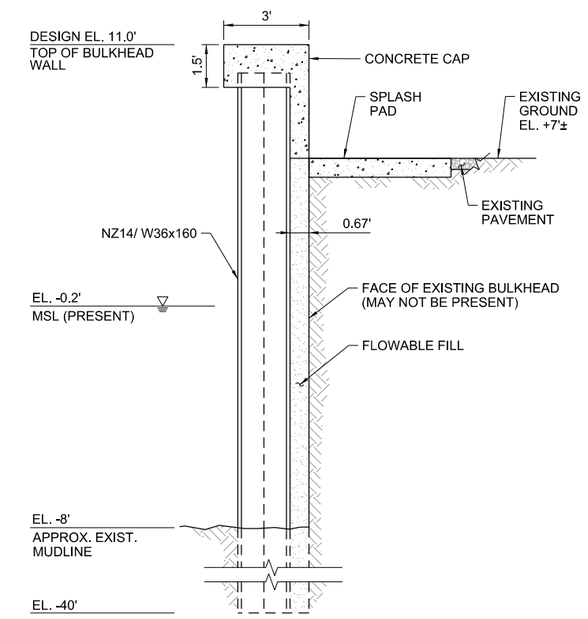
C4 MEDIUM FLOODWALL
SCALE: 1/4" = 1'-0"
CS-102, CS-106, CS-108, CS-109



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-109

PRELIMINARY
NOT FOR CONSTRUCTION

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B	DRAFT FINAL GRR - APPENDIX A2.E	08.20.18	MK
A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	MK

DESIGNED BY: MK
DRWN BY: ME
CKD BY: MK
SUBMITTED BY: SA
PLOT SCALE: 1:1
PLOT DATE: 8/27/2018
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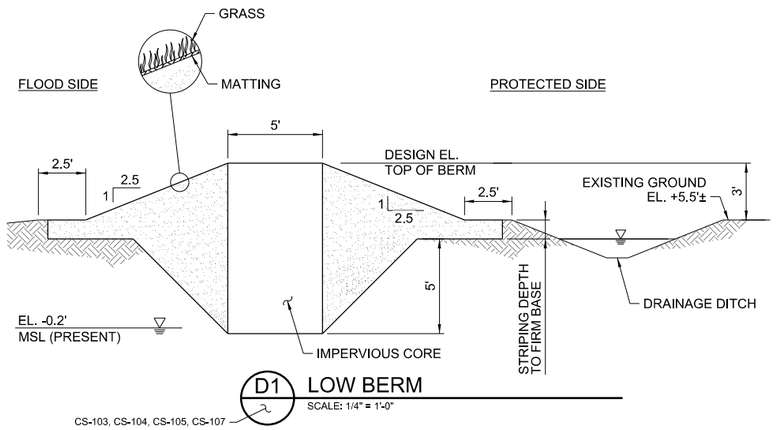
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NEW YORK, NY 10017
212-768-7454

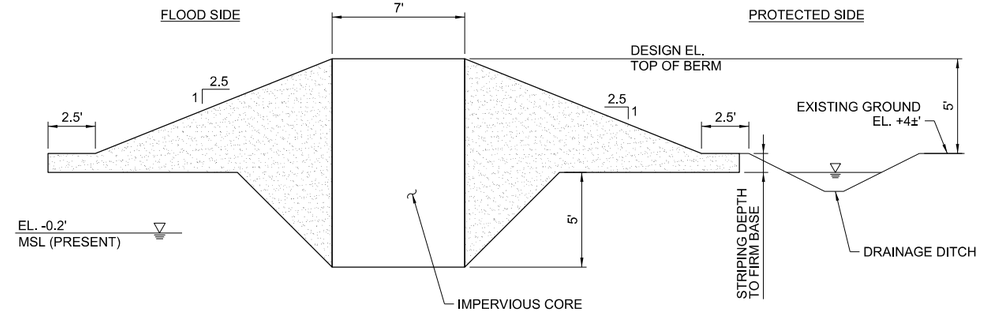
INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT

FLOODWALL AND BULKHEAD TYPICAL SECTIONS

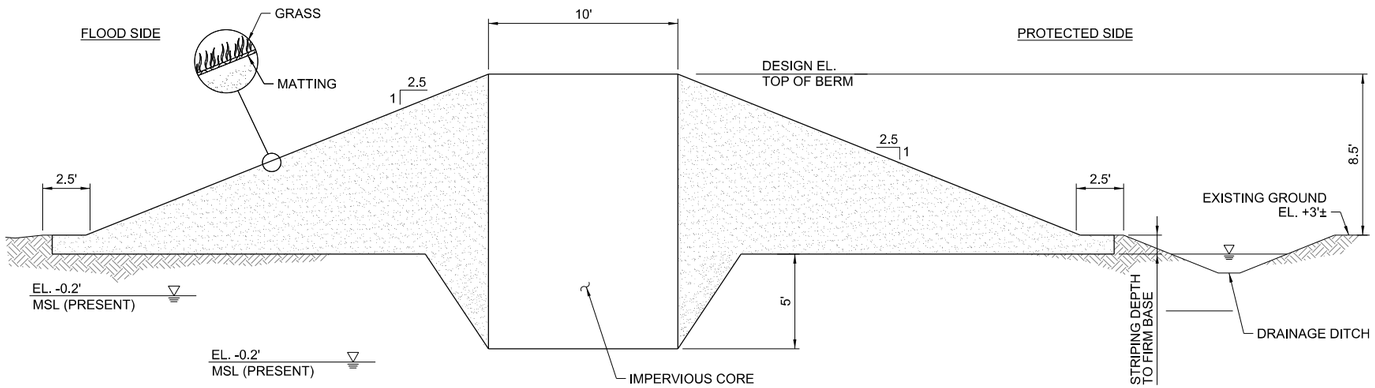
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CS-501
SHEET 12 OF 28



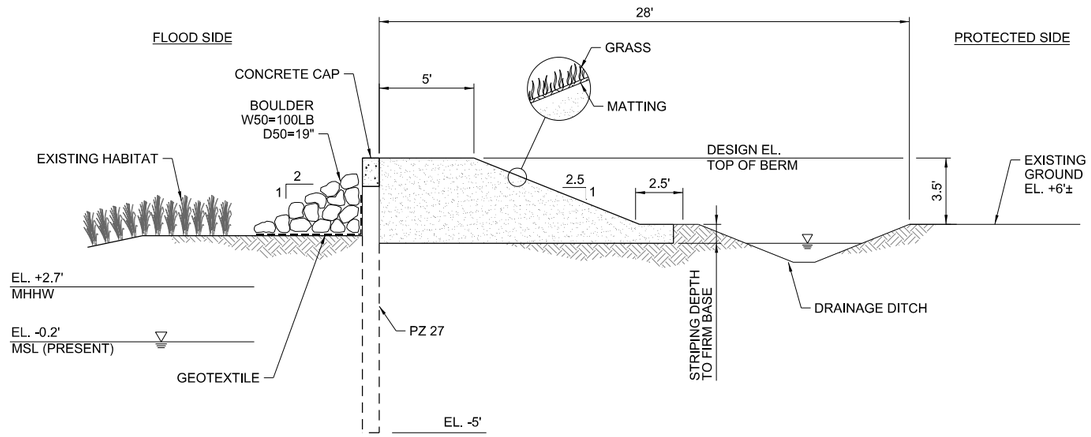
D1 LOW BERM
SCALE: 1/4" = 1'-0"
CS-103, CS-104, CS-105, CS-107



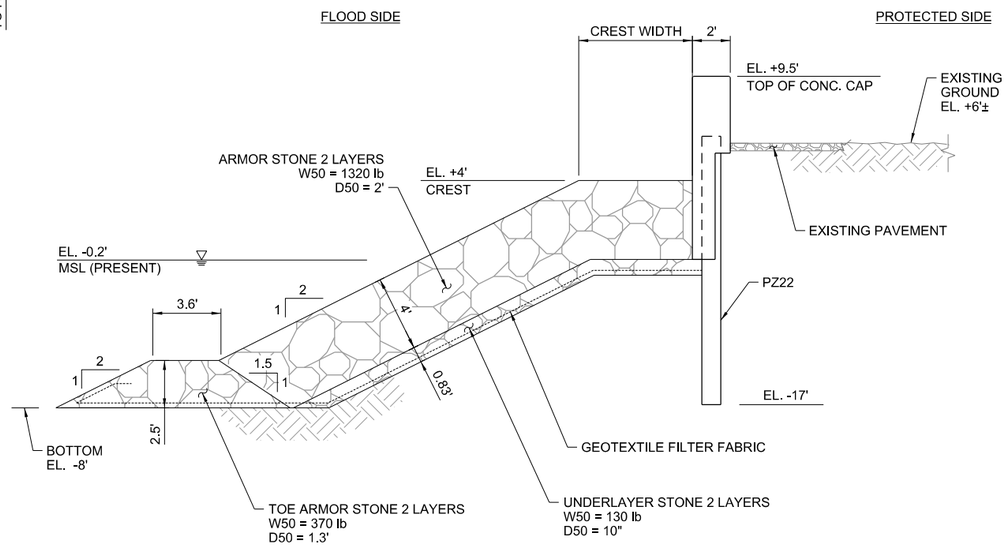
D4 MEDIUM BERM
SCALE: 1/4" = 1'-0"
CS-102, CS-106



B1 HIGH BERM
CS-106
SCALE: 1/4" = 1'-0"



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



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

PRELIMINARY
NOT FOR CONSTRUCTION

LAST PLOTTED BY: mestimable 8/27/2018 5:18:51 PM FILE: W912DS_A2_CS-502.dgn PATH: Q:\NY\9781-02\500_CADD_Active_HFFRRF Report-App A2\

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B	DRAFT FINAL GRR - APPENDIX A2.E	08.20.18	MK
A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	MK

DESIGNED BY: MK
DRN BY: ME
CKD BY: MK
SUBMITTED BY: SA
DATE: 08.30.18
SOLICITATION NO.:
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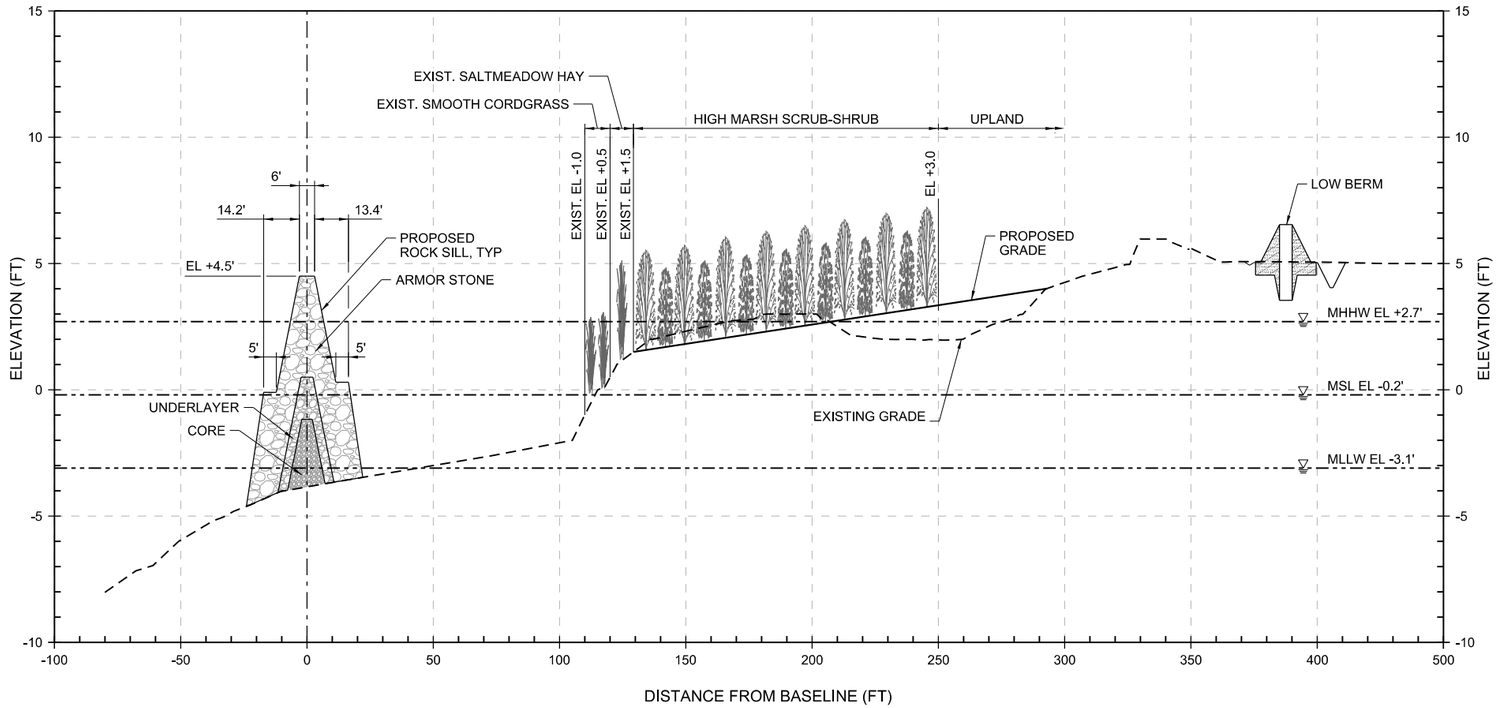
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NEW YORK
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NEW YORK, NY 10017
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RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT

BERM AND REVETMENT WITH FLOODWALL TYPICAL SECTIONS

SHEET ID
CS-502
SHEET 13 OF 28



C1 / CS-103 NATURAL AND NATURE BASED FEATURES (NNBF) TYPICAL SECTION

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/GROUNDSEL 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/GROUNDSEL POTS SHOULD BE PLANTED ON 5 FT. CENTERS.

PRELIMINARY
NOT FOR CONSTRUCTION

0 3' 6'
HOR. SCALE: 1"=3'

0 30' 60'
HOR. SCALE: 1"=30'

PATH: Q:\NY\9781-02\500_CADD_Active_HFFRRF Report-App A2\
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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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DESIGNED BY: MK
DWN BY: ME
SUBMITTED BY: SA
PLOT SCALE: 12
PLOT STYLE: ANSI D
DATE: 08.30.18
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PLOT DATE: AS PLOTTED
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FILE NUMBER:

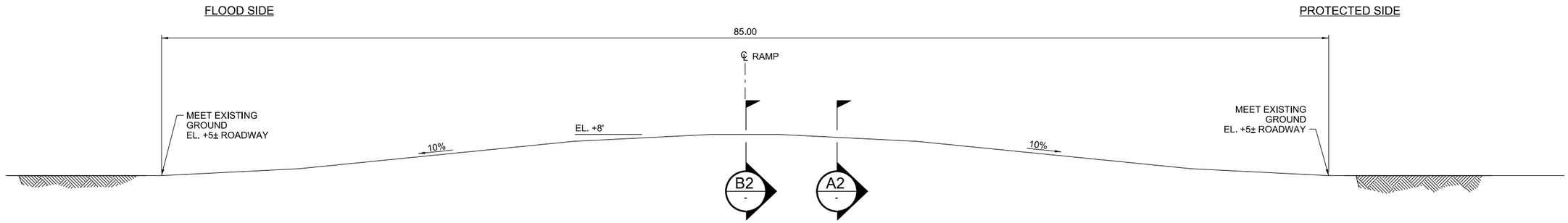
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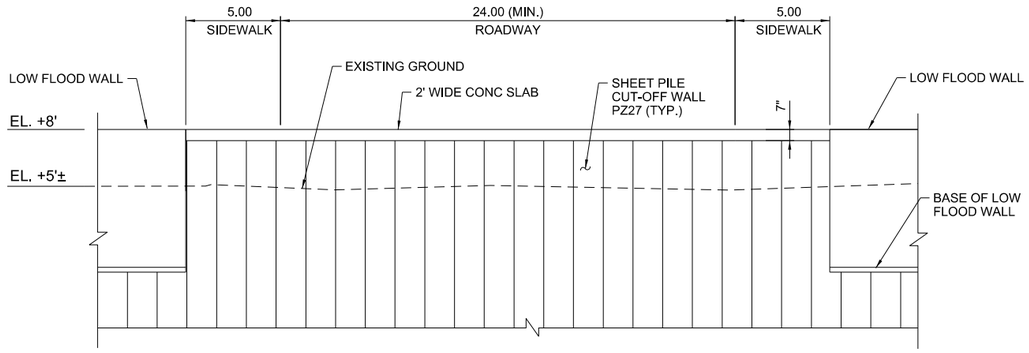
NATURAL AND NATURE BASED FEATURES (NNBF) SECTION

SHEET ID
CS-503
SHEET 14 OF 28



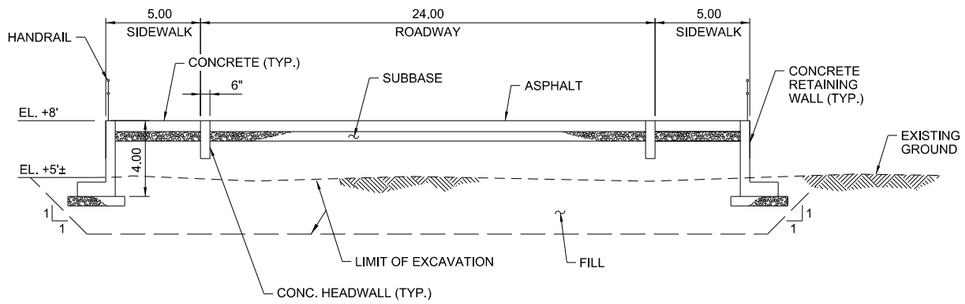
D1 - SECTION - CENTER OF ROAD RAMP

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"

PRELIMINARY
NOT FOR CONSTRUCTION

0 2' 4' 8'

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

LAST PLOTTED BY: mestimable 5:19:17 PM 8/27/2018 FILE: W912DS_A2_CS-504.dgn PATH: Q:\NY\9781-02\500_CADD_Active_HFFRRF Report-App A2\

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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: MK
DWN BY: ME
CKD BY: MK
SUBMITTED BY: SA
PLOT SCALE: 10.000000
PLOT DATE: 8/27/2018
FILE NAME: W912DS_A2_CS-504.dgn
DATE: 08.30.18
SOLICITATION NO.:
CONTRACT NO.: W781-02
FILE NUMBER:
SIZE: ANSI D

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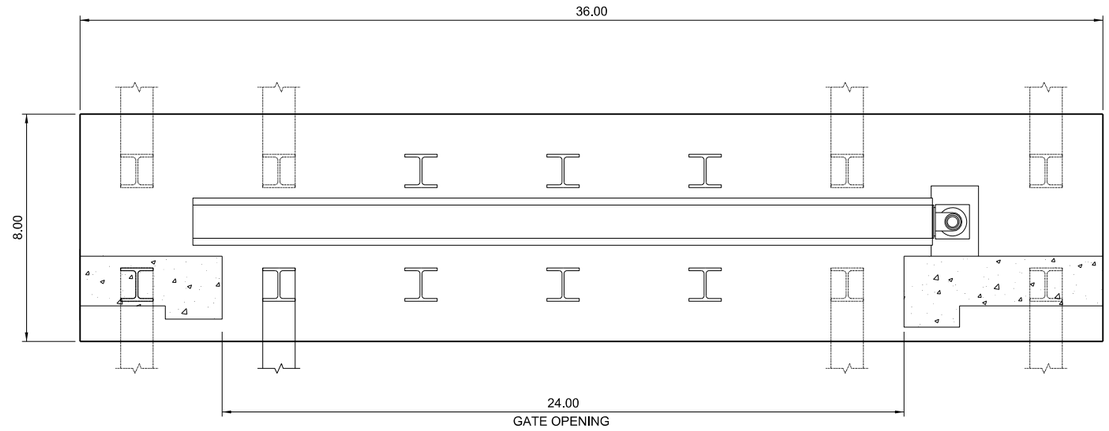
INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT

ROAD RAMP SECTIONS

SHEET ID
CS-504
SHEET 15 OF 28

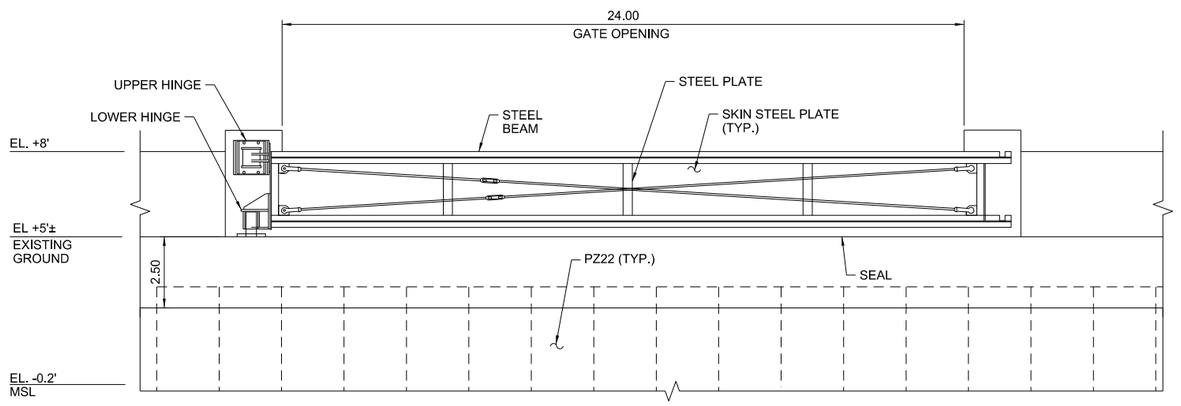
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LAST PLOTTED BY: mestimable 8/27/2018 5:19:30 PM FILE: W912DS_A2_CS-505.dgn

FLOOD SIDE



PROTECTED SIDE

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



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

PRELIMINARY
NOT FOR CONSTRUCTION

0 2' 4' 8'
SCALE: 3/8" = 1'-0"

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C	DRAFT FINAL GRR - APPENDIX A2.E	08.30.18	MK
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DESIGNED BY: MK
DRWN BY: ME
SUBMITTED BY: SA
PLOT SCALE: 1:1
SIZE: ANSI D
DATE: 08.30.18
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PLOT DATE: 8/27/2018
FILE NAME: W912DS_A2_CS-505.dgn
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FILE NUMBER:

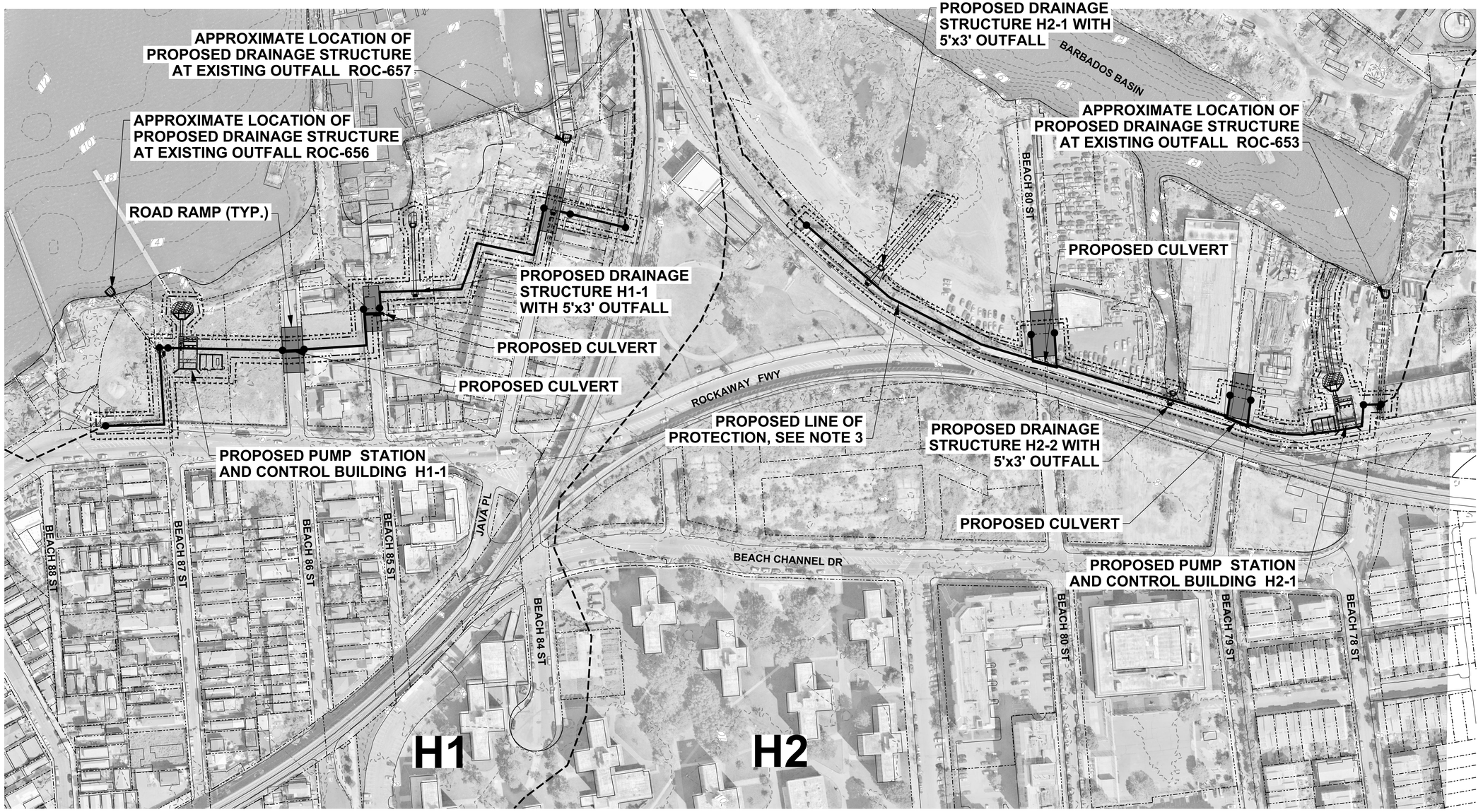
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SWING GATE PLAN AND ELEVATION

SHEET ID
CS-505
SHEET 16 OF 28

PATH: K:\60485269 - IDC 3006 DMA - Mabbett JV\999999999 Jamaica Bay HFFRRF\910-CAD\SHEETS\
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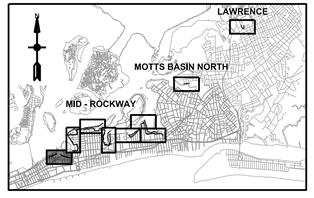
MID-ROCKAWAY - HAMMELS
SCALE: 1" = 100'

NOTES:

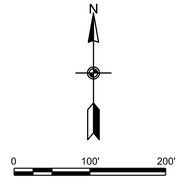
1. ALL ELEVATIONS REFERENCED TO NAVD88.
2. TYPICAL SECTIONS SHOWN ON SHEETS CU-501 TO CU-503.
3. LINE OF PROTECTION SHOWN ON SHEETS CS-101 TO CS-109.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- A1 DRAINAGE AREA



KEY PLAN



SCALE:1"=100'

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A	07.19.18	BU	DRAFT FINAL GRR - APPENDIX A2.E
B	08.20.18	BU	DRAFT FINAL GRR - APPENDIX A1.E
C	08.30.18	BU	DRAFT FINAL GRR - APPENDIX A2.E

DESIGNED BY: BU
DRWN BY: OM
SUBMITTED BY: MC
PLOT SCALE: 1:1
PLOT STYLE TABLE: ANSI D
DATE: 08.30.18
SOLICITATION NO.:
CONTRACT NO.: W91I-02
FILE NUMBER:
PLOT DATE:
FILE NAME: W912DS_A2_CU-101.dgn

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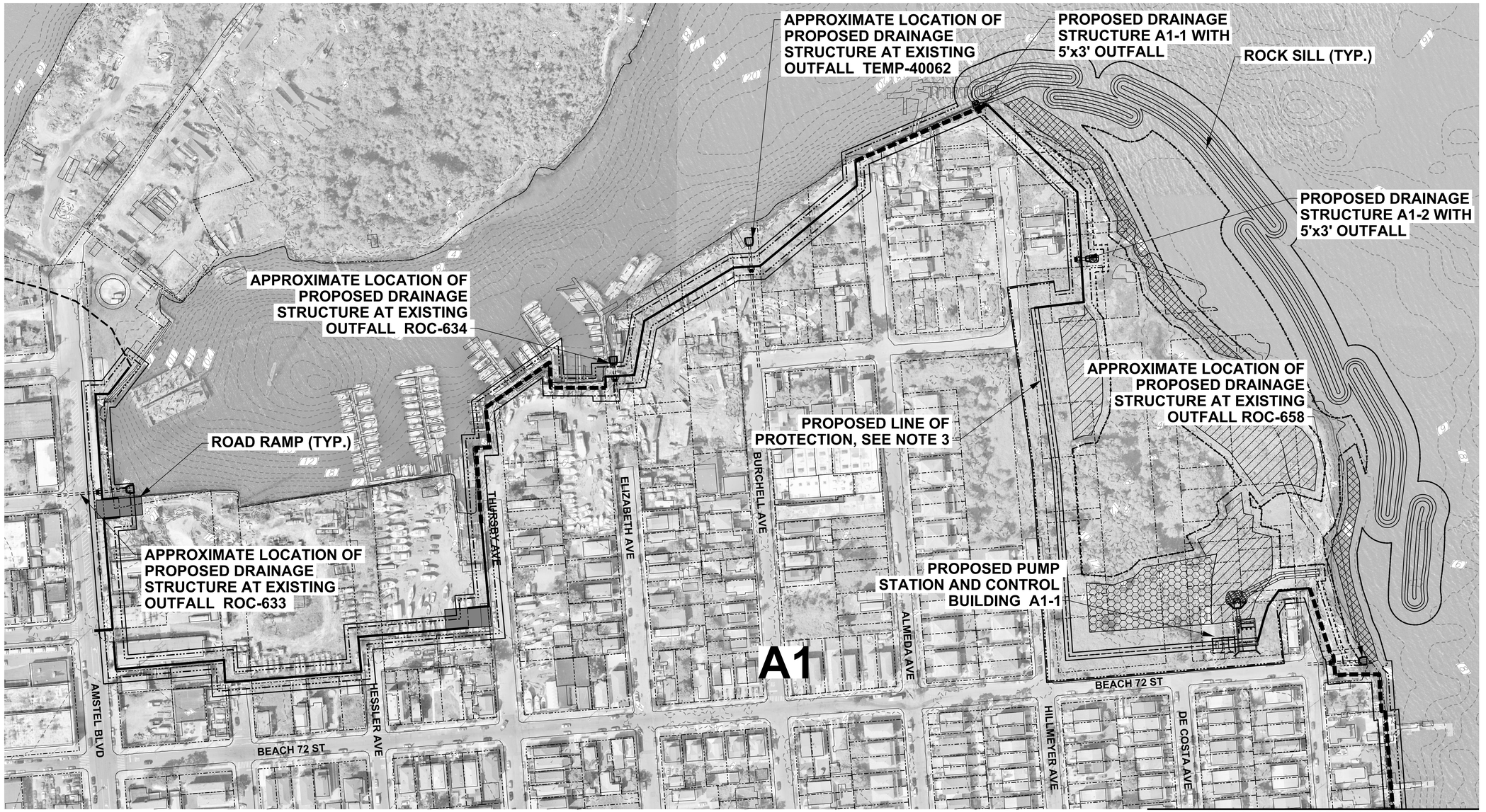
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INTERIOR DRAINAGE PLAN (1 OF 9)

SHEET ID
CU-101
SHEET 17 OF 28

PATH: K:\60485269 - IDC 3006 DMA - Mabbett JV\999999999 Jamaica Bay HFFRRF\910-CAD\SHEETS\
FILE: W912DS_A2_CU-102.dgn
8/24/2018
Onsy.Moawad10:08:34 AM
LAST PLOTTED BY:



MATCH LINE - SEE SHEET CU-103

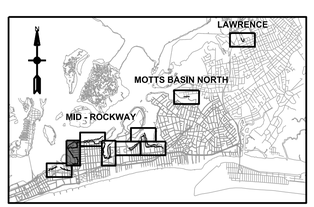
MID-ROCKAWAY - ARVERNE (SHEET 1)
SCALE: 1" = 100'

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-109.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- A1 DRAINAGE AREA



KEY PLAN

0 100' 200'
SCALE:1"=100'

PRELIMINARY
NOT FOR CONSTRUCTION

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A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	BU

DESIGNED BY: BU
DRWN BY: OM
SUBMITTED BY: MC
PLOT SCALE: 1:1
SIZE: ANSI D
DATE: 08.30.18
CKD BY: MJ
PLOT DATE: AS NOTED
FILE NAME: W912DS_A2_CU-102.dgn
SOLICITATION NO.:
CONTRACT NO.: W81-02
FILE NUMBER:

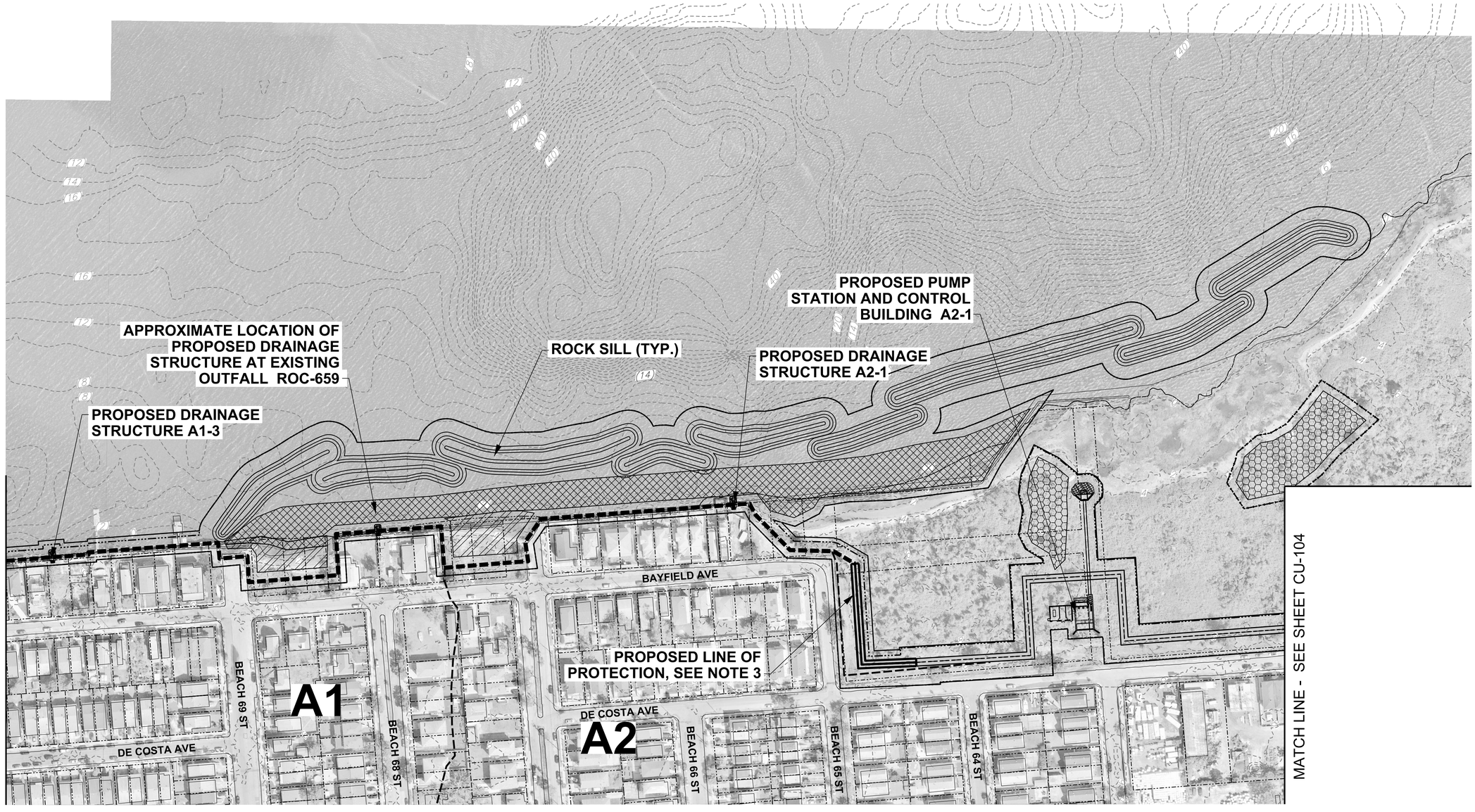
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INTERIOR DRAINAGE PLAN (2 OF 9)

SHEET ID
CU-102
SHEET 18 OF 28

PATH: K:\60485269 - IDC 3006 DMA - Mabbett JV\999999999 Jamaica Bay HFFRRF\910-CAD\SHEETS\
LAST PLOTTED BY: Onsy.Moawad 10:50:07 AM 8/24/2018 FILE: W912DS_A2_CU-103.dgn



MID-ROCKAWAY - ARVERNE (SHEET 2)

SCALE: 1" = 100'

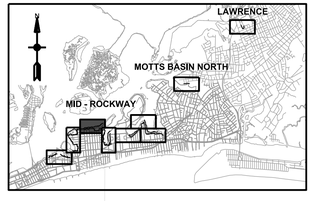
NOTES:

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-109.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- A1 DRAINAGE AREA

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

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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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DWN BY: CM	CKD BY: MJ
SUBMITTED BY: MC	SOLICITATION NO.:
PLOT SCALE: 1.000000	CONTRACT NO.: W91-02
PLOT DATE: 8/24/2018	FILE NUMBER:
SIZE: ANSI D	FILE NAME: W912DS_A2_CU-103.dgn

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

INTERIOR DRAINAGE PLAN (3 OF 9)

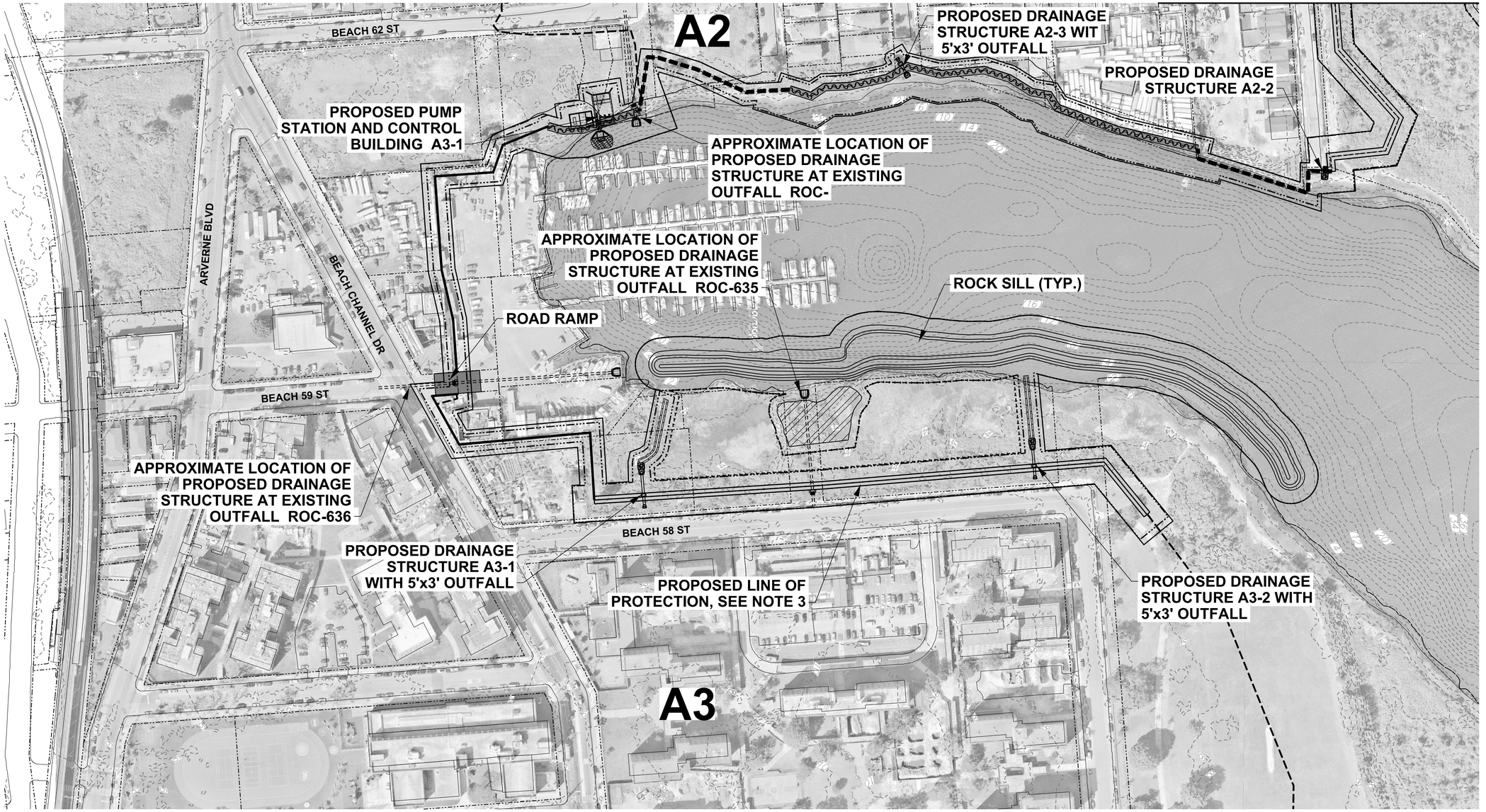
SHEET ID

CU-103

SHEET 19 OF 28

PATH: K:\60485269 - IDC 3006 DMA - Mabbett JV\999999999 Jamaica Bay HFFRRF\910-CAD\SHEETS\
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MATCH LINE - SEE SHEET CU-103



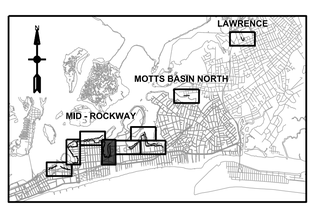
MID-ROCKAWAY - ARVERNE (SHEET 3)
SCALE: 1" = 100'

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-109.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- A1 DRAINAGE AREA



KEY PLAN

0 100' 200'
SCALE:1"=100'

PRELIMINARY
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A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	BU

DESIGNED BY: BU
DRWN BY: OM
SUBMITTED BY: MC
PLOT SCALE: 1:1.000000
SIZE: ANSI D
DATE: 08.30.18
CKD BY: MJ
PLOT DATE: 8/24/2018
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CONTRACT NO.: W91-02
FILE NUMBER:

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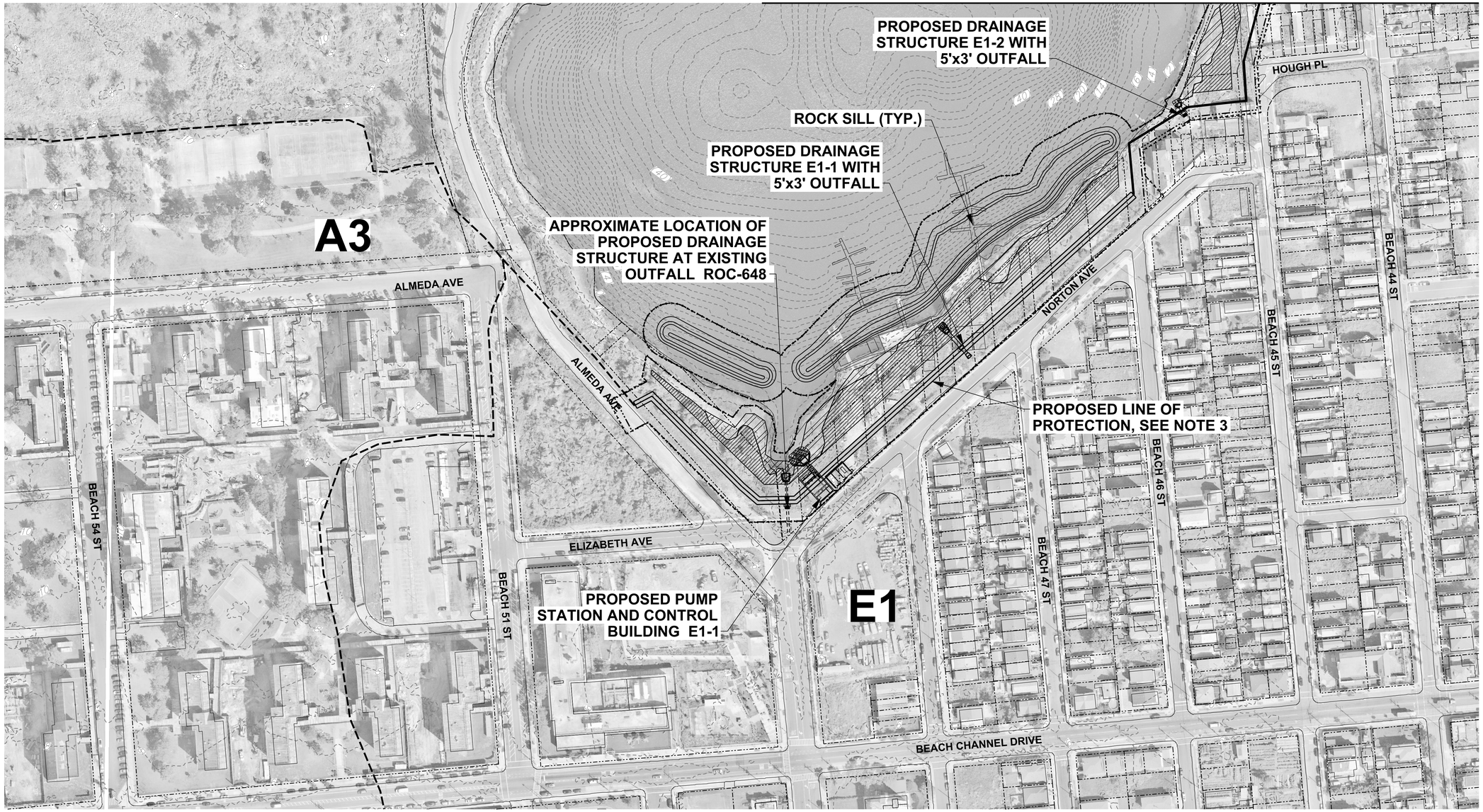
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INTERIOR DRAINAGE PLAN (4 OF 9)

SHEET ID
CU-104
SHEET 20 OF 28

PATH: K:\60485269 - IDC 3006 DMA - Mabbett JV\999999999 Jamaica Bay HFFRRF\910-CAD\SHEETS\
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MATCH LINE - SEE SHEET CU-106



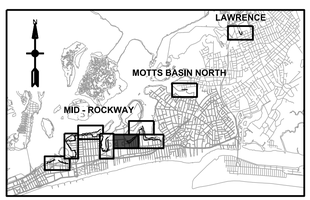
MID-ROCKAWAY - EDGEMERE (SHEET 1)
SCALE: 1" = 100'

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-109.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- A1 DRAINAGE AREA



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

PRELIMINARY
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A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	BU

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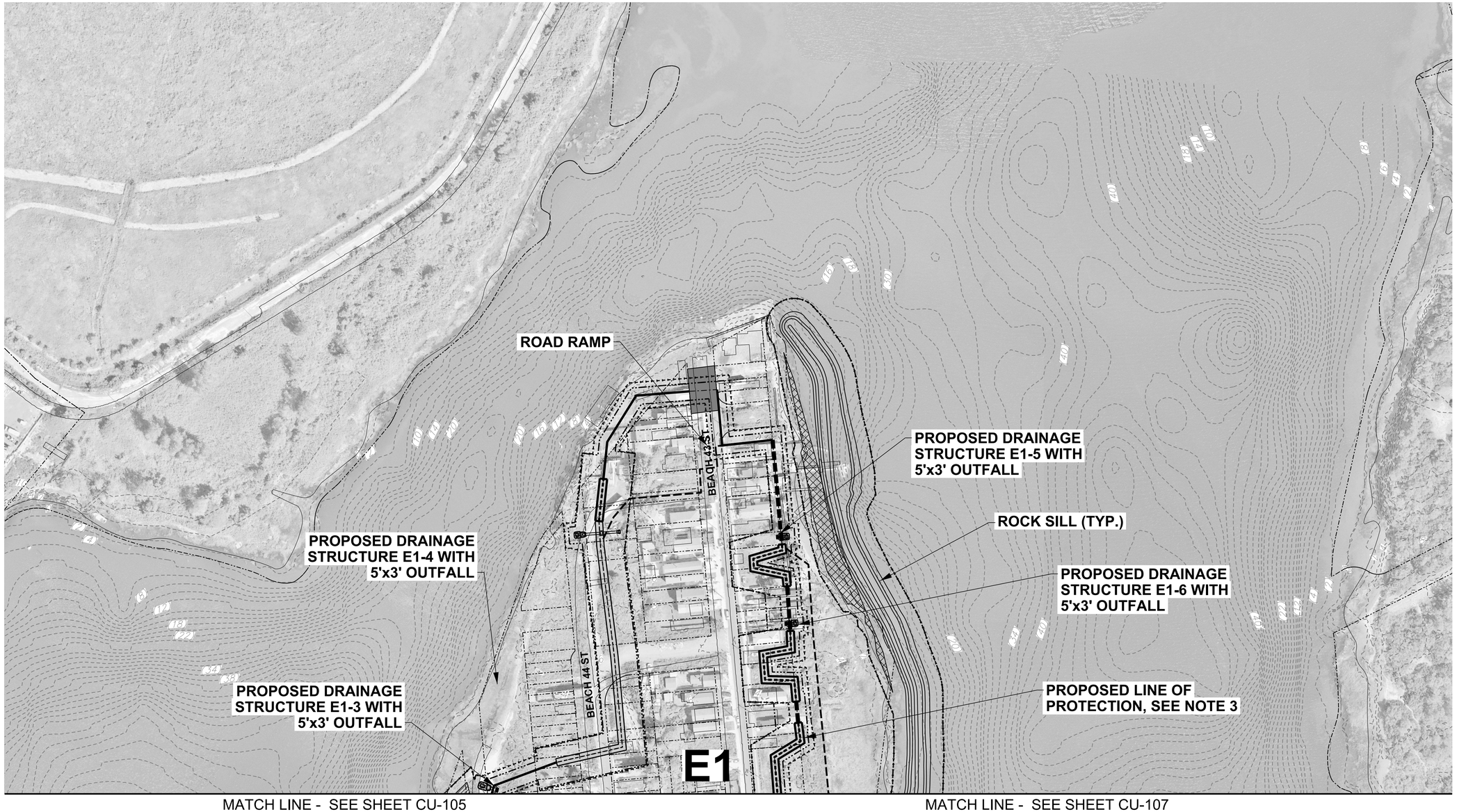
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INTERIOR DRAINAGE PLAN (5 OF 9)

SHEET ID
CU-105
SHEET 21 OF 28

PATH: K:\60485269 - IDC 3006 DMA - Mabbett JV\999999999 Jamaica Bay HFFRRF\910-CAD\SHEETS\
LAST PLOTTED BY: Onsy.Moawad11:06:44 AM 8/24/2018 FILE: W912DS_A2_CU-106.dgn



MATCH LINE - SEE SHEET CU-105

MATCH LINE - SEE SHEET CU-107

MID-ROCKAWAY - EDGEMERE (SHEET 2)

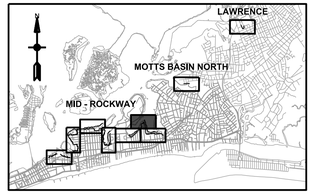
SCALE: 1" = 100'

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-109.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- A1 DRAINAGE AREA



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

PRELIMINARY
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B	DRAFT FINAL GRR - APPENDIX A1.E	08.20.18	BU
A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	BU

DESIGNED BY: BU
DRWN BY: OM
CKD BY: MJ
SUBMITTED BY: MC
PLOT SCALE: 1.000000
PLOT DATE: AS NOTED
SIZE: ANSI D
DATE: 08.30.18
SOLICITATION NO.:
CONTRACT NO.: W912DS-22
FILE NUMBER:
FILE NAME: W912DS_A2_CU-106.dgn

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INTERIOR DRAINAGE PLAN (7 OF 9)

SHEET ID
CU-106

SHEET 22 OF 28

PATH: K:\60485269 - IDC 3006 DMA - Mabbett JV\999999999 Jamaica Bay HFFRRF\910-CAD\SHEETS\
LAST PLOTTED BY: Onsy.Moawad11:17:28 AM 8/24/2018 FILE: W912DS_A2_CU-107.dgn

MATCH LINE - SEE SHEET CU-106

MATCH LINE - SEE SHEET CU-105

PUMP STATION AND CONTROL BUILDING E1-2

APPROXIMATE LOCATION OF PROPOSED DRAINAGE STRUCTURE AT EXISTING OUTFALL ROC-637

ROCK SILL (TYP.)

APPROXIMATE LOCATION OF PROPOSED DRAINAGE STRUCTURE AT EXISTING OUTFALL ROC-638

PROPOSED DRAINAGE STRUCTURE E2-1 AND E2-2 WITH 5'x3' OUTFALLS

PROPOSED DRAINAGE STRUCTURE E2-3 AND E2-4 WITH 5'x3' OUTFALLS

APPROXIMATE LOCATION OF PROPOSED DRAINAGE STRUCTURE AT EXISTING OUTFALL ROC-651

PROPOSED DRAINAGE STRUCTURE E1-7 WITH 5'x3' OUTFALL

PROPOSED PUMP STATION AND CONTROL BUILDING E2-1

PROPOSED LINE OF PROTECTION, SEE NOTE 3

PROPOSED DRAINAGE STRUCTURE E2-5 WITH 5'x3' OUTFALL

E1

E2

BEACH 43 ST

BEACH 40 ST

BEACH 38 ST

BEACH 37 ST

BEACH 36 ST

BEACH 35 ST

BEACH CHANNEL DRIVE

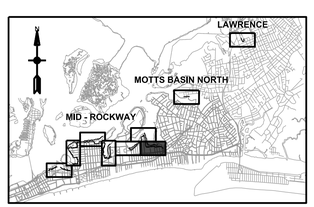
MID-ROCKAWAY - EDGEMERE (SHEET 3)
SCALE: 1" = 100'

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-109.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- A1 DRAINAGE AREA



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

PRELIMINARY
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MARK	DESCRIPTION	DATE	APPR.
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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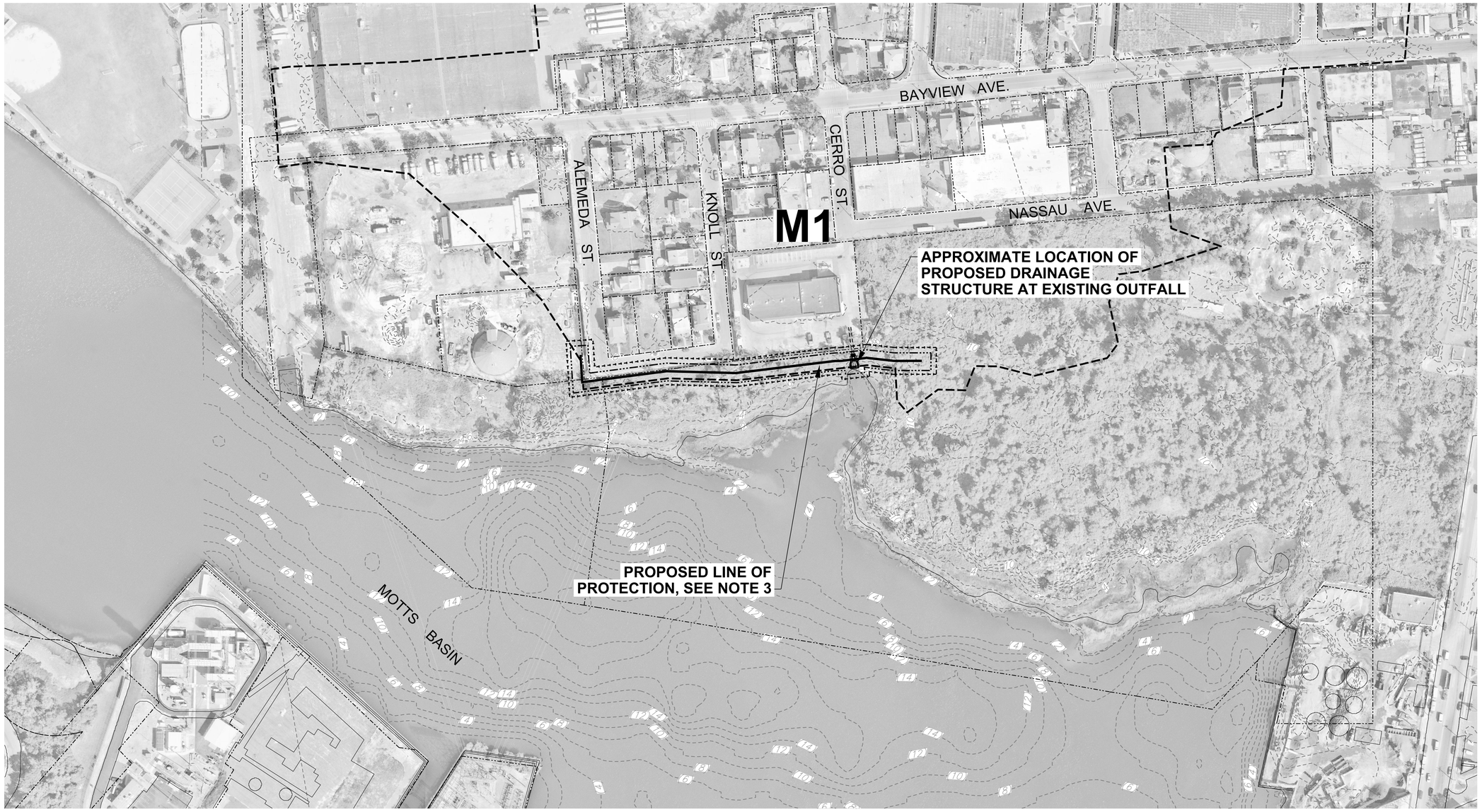
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SUBMITTED BY: MC
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CKD BY: MJ
PLOT DATE: 8/24/2018
FILE NAME: W912DS_A2_CU-107.dgn
SOLICITATION NO.:
CONTRACT NO.: W81-02
FILE NUMBER:

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

INTERIOR DRAINAGE PLAN (7 OF 9)

SHEET ID
CU-107
SHEET 23 OF 28

PATH: K:\60485269 - IDC 3006 DMA - Mabbett JV\999999999 Jamaica Bay HFFRRF\910-CAD\SHEETS\
FILE: W912DS_A2_CU-108.dgn
8/24/2018
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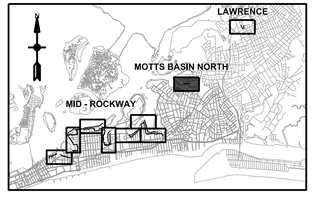
MOTTS BASIN NORTH
SCALE: 1" = 100'

NOTES:

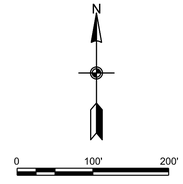
1. ALL ELEVATIONS REFERENCED TO NAVD88.
2. TYPICAL SECTIONS SHOWN ON SHEETS CU-501 TO CU-503.
3. LINE OF PROTECTION SHOWN ON SHEETS CS-101 TO CS-109.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- A1 DRAINAGE AREA



KEY PLAN



SCALE:1"=100'

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B	DRAFT FINAL GRR - APPENDIX A1.E	08.20.18	BU
A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	BU

DESIGNED BY: BU	DRWN BY: OM	SUBMITTED BY: MC	PLOT SCALE: 1.0000
CKD BY: MJ			PLOT DATE: 8/24/2018
DATE: 08.30.18	SOLICITATION NO.:	CONTRACT NO.: W912DS-12-D-0002	FILE NUMBER:
SIZE: ANSI D	FILE NAME: W912DS_A2_CU-108.dgn		

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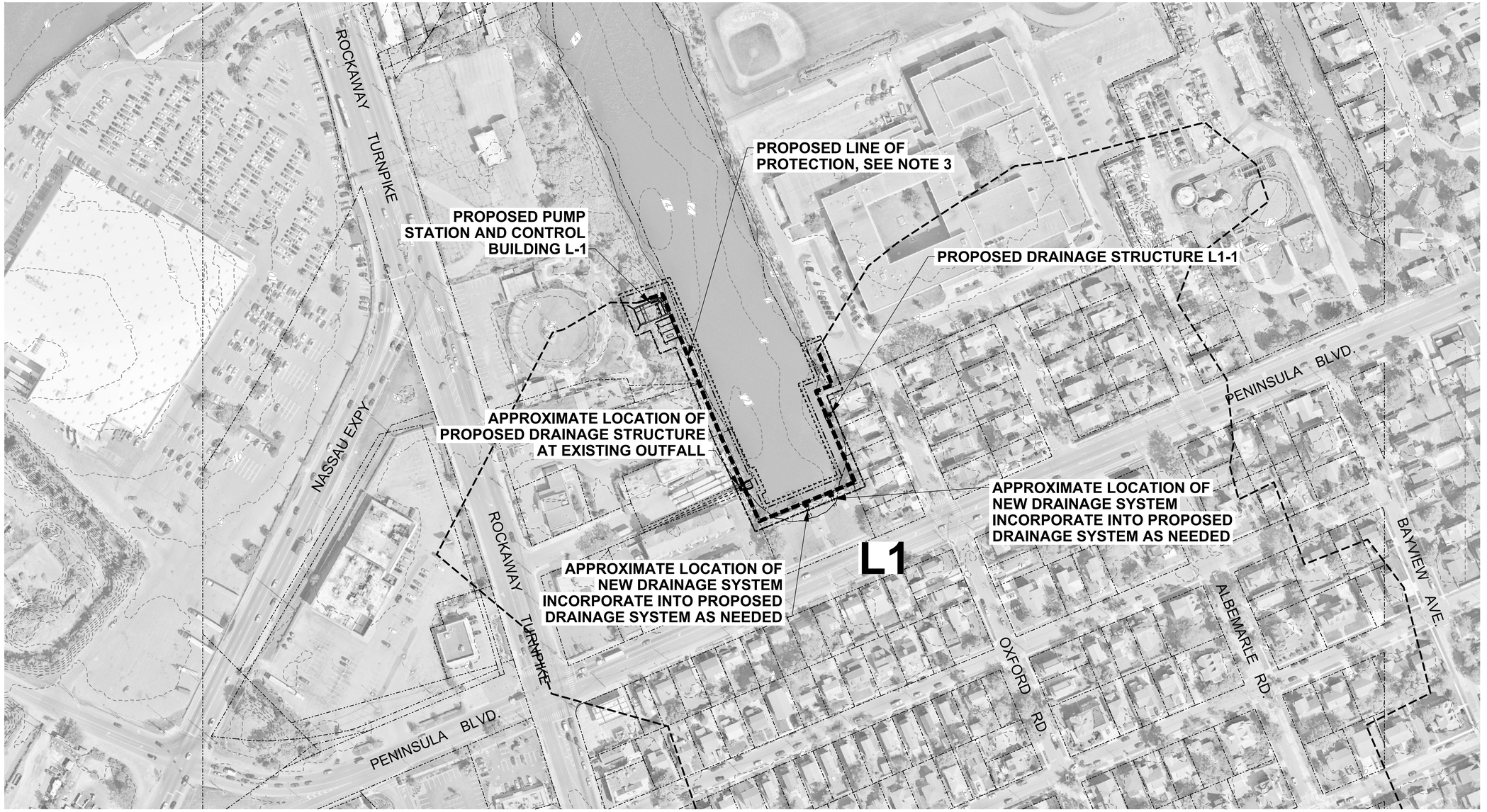
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INTERIOR DRAINAGE PLAN (8 OF 9)

SHEET ID
CU-108
SHEET 24 OF 28

PATH: K:\60485269 - IDC 3006 DMA - Mabbett JV\999999999 Jamaica Bay HFFRRF\910-CAD\SHEETS\
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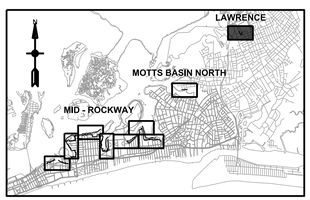
LAWRENCE
SCALE: 1" = 100'

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-109.

LEGEND

- PROPOSED DRAINAGE AT EXISTING OUTFALL
- PROPOSED DRAINAGE AT BERM
- PROPOSED DRAINAGE AT FLOODWALL
- PROPOSED DRAINAGE AT BULKHEAD
- LIMIT OF DRAINAGE AREA
- A1 DRAINAGE AREA



KEY PLAN

N

0 100' 200'

SCALE:1"=100'

PRELIMINARY
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MARK	DESCRIPTION	DATE	APPR.
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B	DRAFT FINAL GRR - APPENDIX A1.E	08.20.18	BU
A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	BU

DESIGNED BY: BU
DRWN BY: OM
CKD BY: MJ
SUBMITTED BY: MC
PLOT SCALE: 1.000000
PLOT DATE: 08.30.18
SIZE: ANSI D
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DATE: 08.30.18
SOLICITATION NO.:
CONTRACT NO.: W91-02
FILE NUMBER:

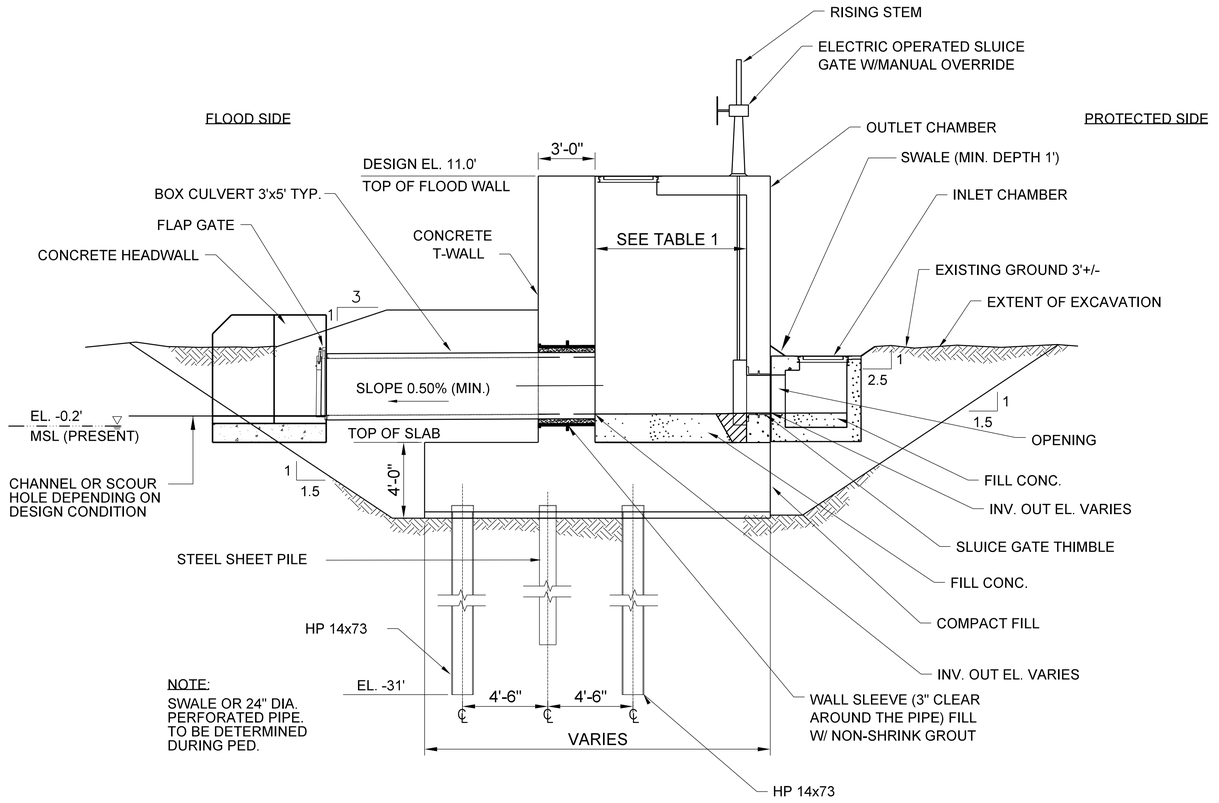
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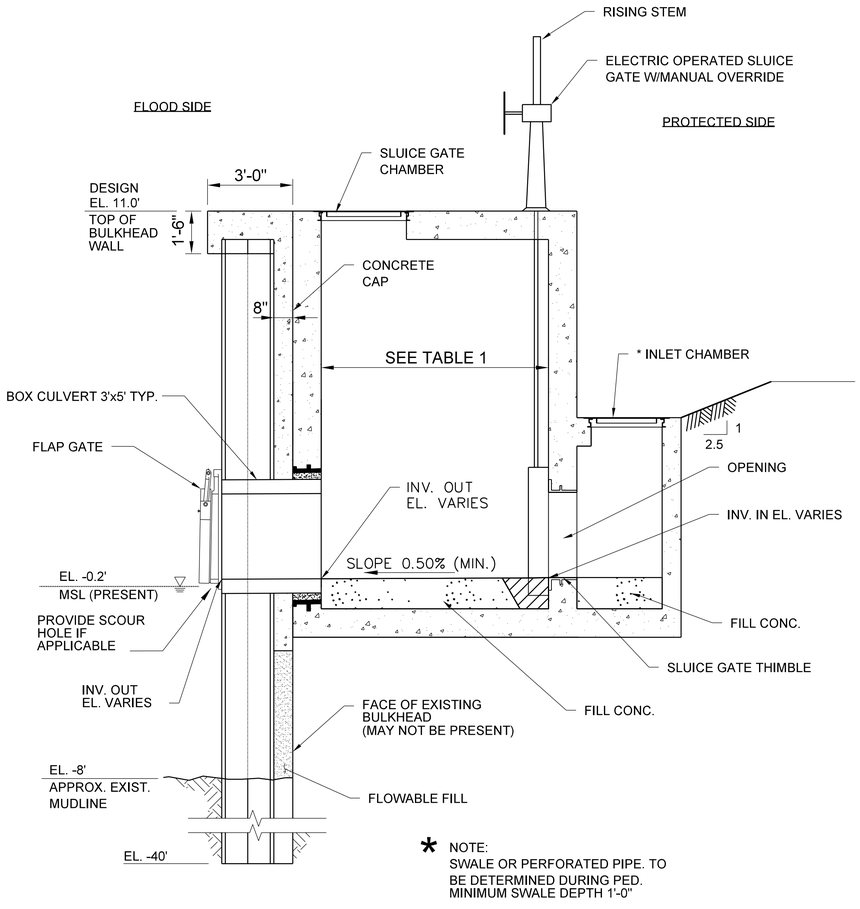
INTERIOR DRAINAGE PLAN (9 OF 9)

SHEET ID
CU-109
SHEET 25 OF 28



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)	ROOF THICKNESS (FT)	FLOOR SLAB THICKNESS (FT)	CHAMBER WIDTH	CHAMBER LENGTH
5'x3'	1.5	1.0	1.5	8'-0"	8'-0"

0 2' 4' 8'

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

0 2' 4' 8'

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

PRELIMINARY
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B	DRAFT FINAL GRR - APPENDIX A1.E	08.20.18	BU
A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	BU

DESIGNED BY: BU
DRWN BY: OM
CKD BY: MJ
SUBMITTED BY: MC
PLOT SCALE: AS NOTED
PLOT DATE: AS NOTED
SITE: ANS D
FILE NAME: W912DS_A2_CU-501.dgn
DATE: 08.30.18
SOLICITATION NO.:
CONTRACT NO.: W912DS-20
FILE NUMBER:

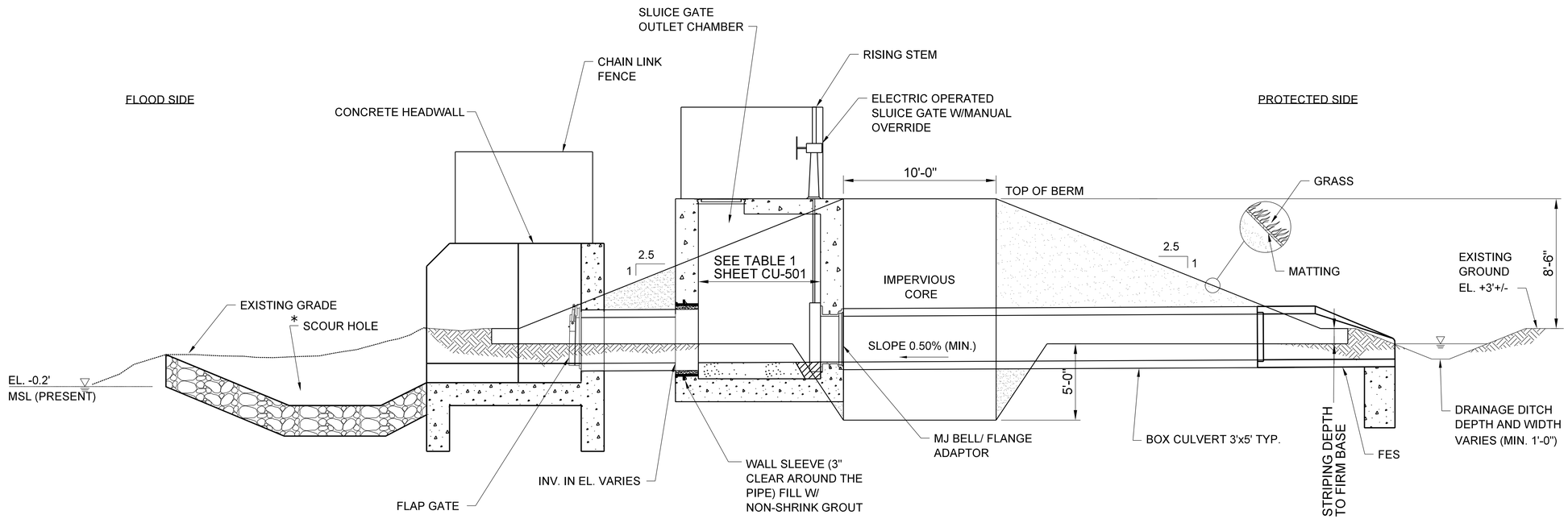
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INTEGRATED HURRICANE SANDY GENERAL RE-EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT

TYPICAL DRAINAGE OUTFALL DETAILS - SHEET 1

SHEET ID
CU-501
SHEET 26 OF 28

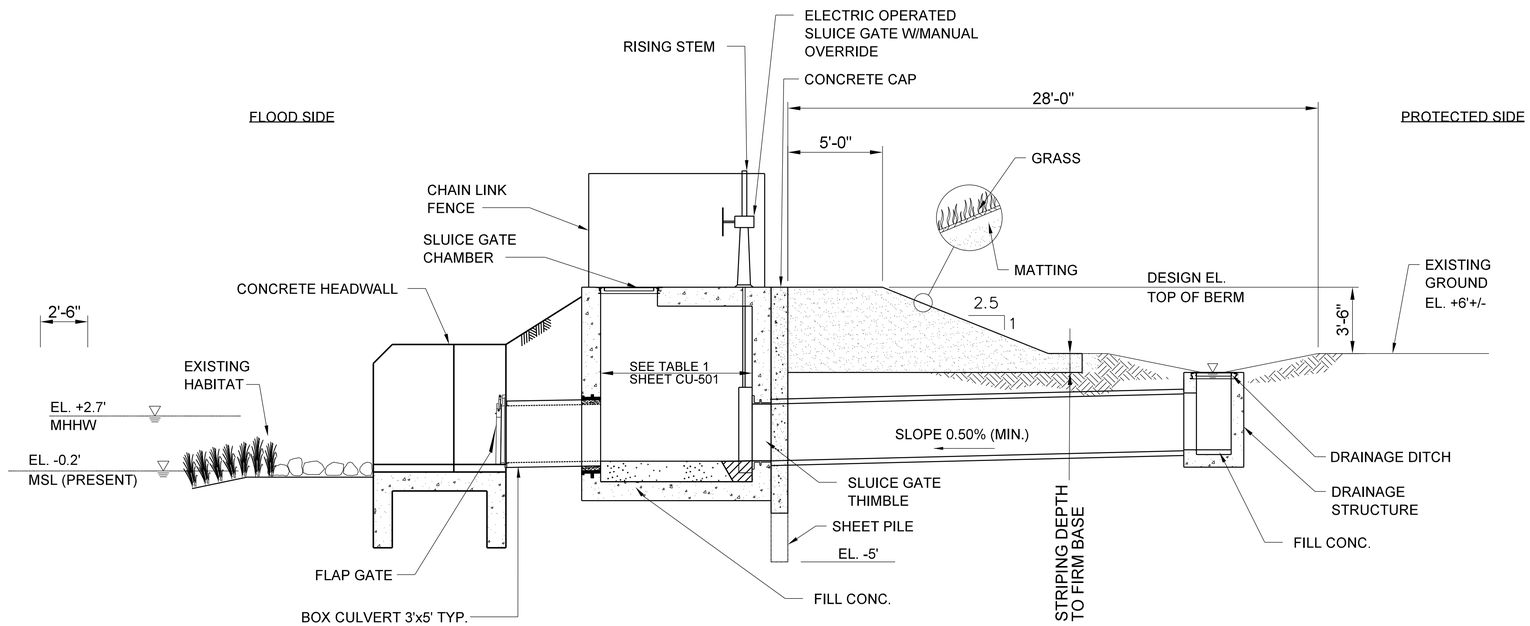
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FILE: W912DS_A2_CU-501.dgn
8/24/2018
LAST PLOTTED BY: Onsy.Moawad11:33:31 AM



* SCOUR HOLE OR CHANNEL DEPENDING ON DESIGN CONDITION.

3 TYPICAL OUTFALL DETAIL THROUGH BERM

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



4 TYPICAL OUTFALL DETAIL THROUGH HYBRID BERM

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

PRELIMINARY
NOT FOR CONSTRUCTION

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

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

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DESIGNED BY: BU
DRN BY: OM
CKD BY: MJ
SUBMITTED BY: MC
PLOT SCALE: 1:1
PLOT DATE: 8/24/2018
SIZE: ANSI D
DATE: 08.30.18
SOLICITATION NO.:
CONTRACT NO.: W91-02
FILE NUMBER:
FILE NAME: W912DS_A2_CU-502.dgn

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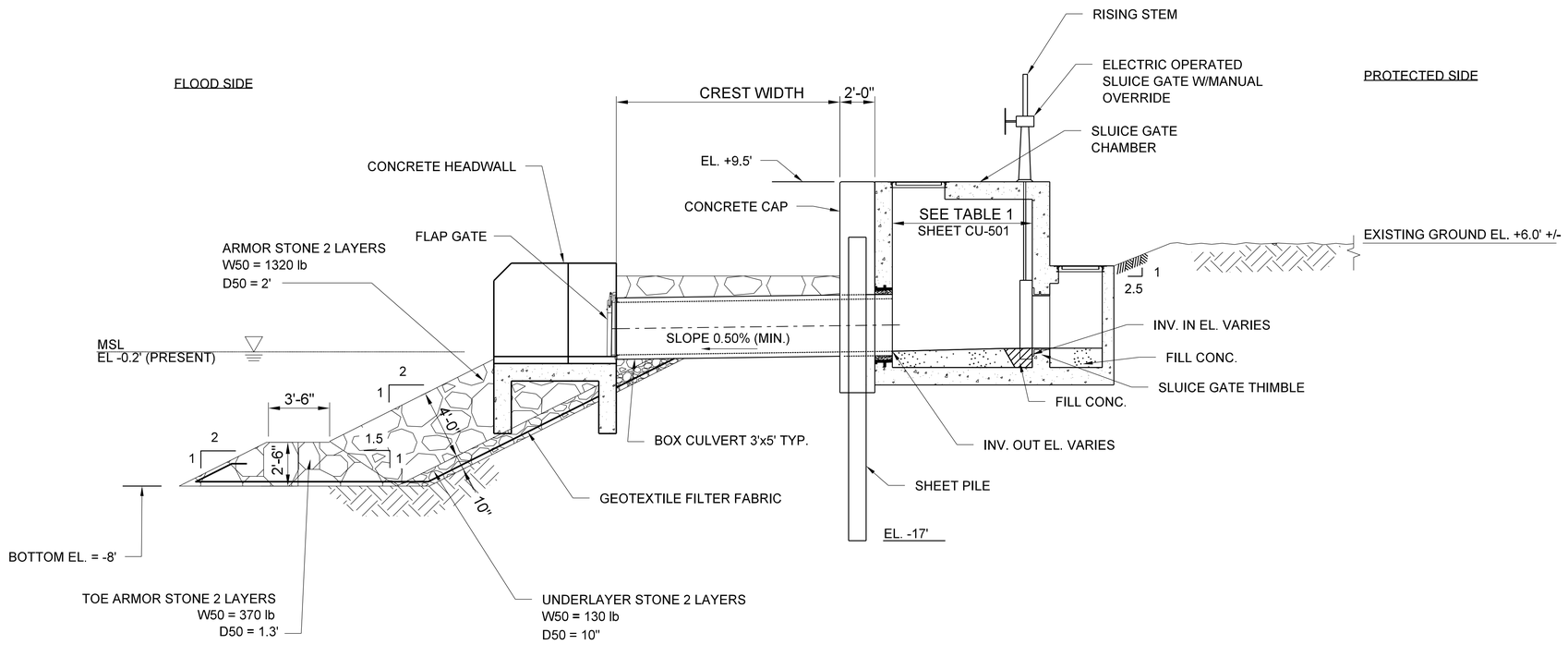
INTEGRATED HURRICANE SANDY GENERAL
RE-EVALUATION REPORT AND ENVIRONMENTAL
IMPACT STATEMENT

TYPICAL DRAINAGE OUTFALL
DETAILS - SHEET 2

SHEET ID
CU-502

SHEET 27 OF 28

PATH: K:\60485269 - IDC 3006 DMA - Mabbett JV\999999999 Jamaica Bay HFFRRF\910-CAD\SHEETS\
LAST PLOTTED BY: Onsy.Moawad1:35:41 PM 8/24/2018 FILE: W912DS_A2_CU-502.dgn



5 - TYPICAL OUTFALL DETAIL THROUGH REVETMENT WITH FOOLDWALL

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

PRELIMINARY
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0 2' 4' 8'

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

PATH: K:\60485269 - IDC 3006 DMA - Mabbett JV\999999999 Jamaica Bay HFFRRF\910-CAD\SHEETS\
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A	DRAFT FINAL GRR - APPENDIX A2.E	07.19.18	BU

DESIGNED BY: BU
DRN BY: OM
SUBMITTED BY: MC
PLOT SCALE: 1:1
SIZE: ANSI D
DATE: 08.30.18
CKD BY: MJ
PLOT DATE: AS SHOWN
FILE NAME: W912DS_A2_CU-503.dgn
SOLICITATION NO.:
CONTRACT NO.: W91-02
FILE NUMBER:

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TYPICAL DRAINAGE OUTFALL DETAILS - SHEET 3

SHEET ID
CU-503
SHEET 28 OF 28