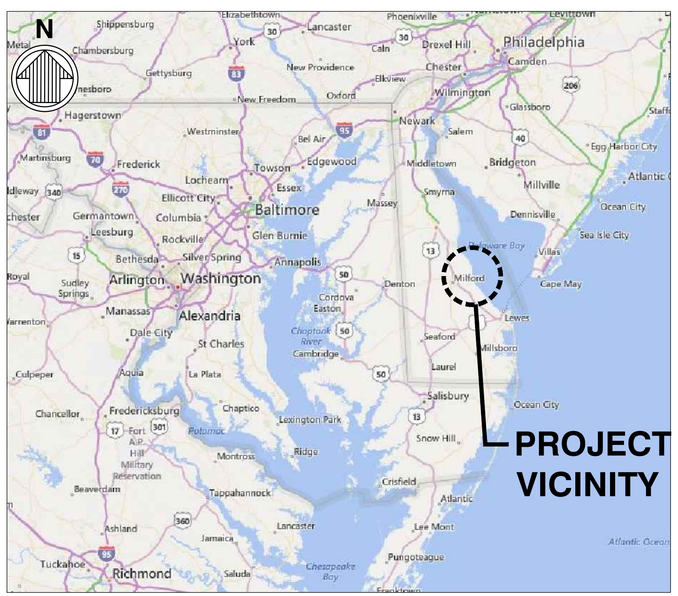
DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DOVER, DELAWARE

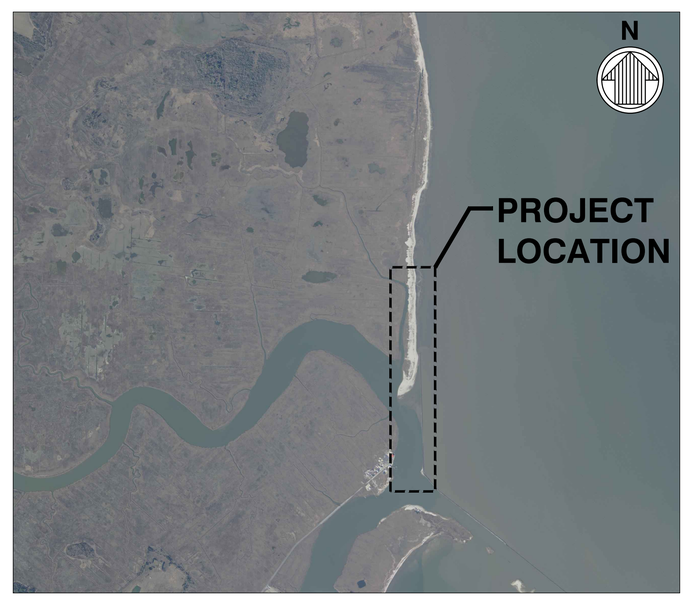
MISPILLION COMPLEX PROJECT

BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES

CONTRACT No. NAT201501/MISPILLION



VICINITY MAP
NTS



LOCATION MAP
NTS

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

TITLE SHEET WITH VICINITY AND LOCATION MAPS

moffatt & nichol
2700 LIGHTHOUSE POINT EAST, SUITE 300
BALTIMORE, MD 21224
410-563-7300

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

Designed by: PWK		Date: MAR 2016	Rev: –
Dwn by: WRF/MSS	Ckd by: PWK	M&N Project No. 8482-04	
Reviewed by: PWK		Drawing code: NAT201501/MISPILLION	
Submitted by: MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)	

PETER WILLIAM KOTULAK LICENSE No. 18765 DELAWARE PROFESSIONAL ENGINEER

Sheet Reference No.
G-001
INDEX: 1 OF 16

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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

INDEX OF DRAWINGS

INDEX NO.	SHEET NO.	SHEET TITLE
		GENERAL
1	G-001	TITLE SHEET WITH VICINITY AND LOCATION MAPS
2	G-002	INDEX OF DRAWINGS, LEGEND, ABBREVIATIONS AND GENERAL NOTES
3	G-101	PLAN – EXISTING CONDITIONS
		CIVIL
4	C-101	PLAN – GENERAL ARRANGEMENT
5	C-102	PLAN – GENERAL SITE – SOUTH
6	C-103	PLAN – GENERAL SITE – NORTH
7	C-301	SECTIONS – TYPICAL GROIN SHEET 1 OF 2
8	C-302	SECTIONS – TYPICAL GROIN SHEET 2 OF 2
9	C-303	PROFILES – BEACH FILL SHEET 1 OF 2
10	C-304	PROFILES – BEACH FILL SHEET 2 OF 2
11	C-305	SECTIONS – BEACH FILL
12	C-306	PLAN – CROSS SECTION LOCATIONS
13	C-307	CROSS SECTIONS SHEET 1 OF 4
14	C-308	CROSS SECTIONS SHEET 2 OF 4
15	C-309	CROSS SECTIONS SHEET 3 OF 4
16	C-310	CROSS SECTIONS SHEET 4 OF 4

GENERAL NOTES

1. NOTES BELOW ARE NOT INTENDED TO REPLACE SPECIFICATIONS. SEE SPECIFICATIONS FOR REQUIREMENTS IN ADDITION TO GENERAL NOTES.
2. VERTICAL DATUM IS REFERENCED TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). HORIZONTAL DATUM IS THE NORTH AMERICAN DATUM OF 1983 (NAD 83), DELAWARE STATE PLANE COORDINATE SYSTEM.

TIDAL DATUM – MISPILLION INLET	
MEAN HIGHER HIGH WATER (MHHW)	2.58 FEET
MEAN HIGH WATER (MHW)	2.16 FEET
NORTH AMERICAN VERTICAL DATUM (NAVD88)	0.00 FEET
MEAN TIDE LEVEL (MTL)	−0.15 FEET
NATIONAL GEODETIC VERTICAL DATUM (NGVD)	−0.78 FEET
MEAN LOW WATER (MLW)	−2.47 FEET
MEAN LOWER LOW WATER (MLLW)	−2.63 FEET

3. THE HYDROGRAPHIC SURVEY WAS PERFORMED BY MORRIS & RITCHIE, ASSOCIATES, INC DURING MAY–JUNE 2015. THE REFERENCE DATUM GPS K1A IS LOCATED AT N 404,689.27, E 643,087.42, ELEVATION 13.64' NAVD88. ADDITIONAL TOPOGRAPHIC DATA OBTAINED FROM LIDAR SURVEY GATHERED FROM USGS IN 2007.
4. THE CONTRACTOR SHALL ABIDE BY ALL APPLICABLE ENVIRONMENTAL PROTECTION STANDARDS, PERMITS, LAWS AND REGULATIONS.
5. ALL SAFETY REGULATIONS ARE TO BE STRICTLY FOLLOWED.
6. CONTRACTOR SHALL TAKE ALL NECESSARY STEPS AND ACTIONS REQUIRED UNDER THE APPLICABLE SAFETY PRACTICES OF THE FOLLOWING REGULATORY AGENCIES INCLUDING, BUT NOT LIMITED TO: DELAWARE OFFICE OF OCCUPATIONAL HEALTH, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH (NIOSH).
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ACTUAL SITE CONDITIONS PRIOR TO COMMENCEMENT OF ANY WORK.

DESIGN SPECIFICATIONS AND REFERENCE

1. ROCK MANUAL THE USE OF ROCK IN HYDRAULIC ENGINEERING (2nd EDITION), CIRIA.
2. STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2001 DELAWARE DEPARTMENT OF TRANSPORTATION.

PROJECT INFORMATION

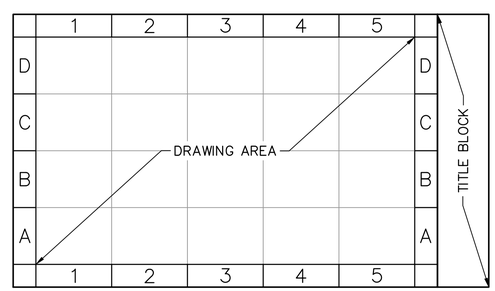
REFERENCE DOCUMENTS – THE FOLLOWING DOCUMENTS WERE UTILIZED IN PREPARING THIS DESIGN

A. DRAWING

1. MISPILLION RIVER, DELAWARE BREACH CLOSURE, 1993 USACE.
2. CONCH BAR BREACH, KENT COUNTY, DELAWARE BREACH REPAIR, 1985.

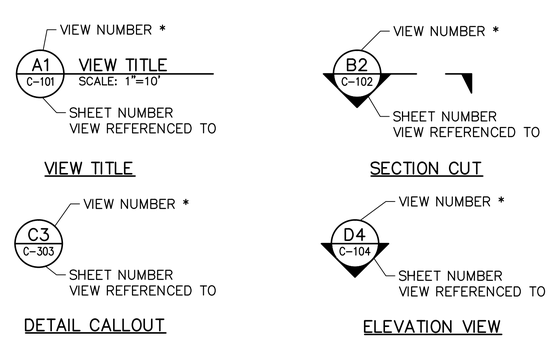
SEQUENCE OF CONSTRUCTION

1. CONSTRUCT NORTH TERMINAL GROIN ROCK STRUCTURE
   - A. EXCAVATE SAND TO LIMITS SHOWN TO CONSTRUCT FULL GROIN SECTION AND STOCKPILE ONSITE FOR RE-USE.
   - B. PLACE GEOTEXTILE, DELDOT R-4 CORE STONE AND DELDOT R-7 ARMOR STONE.
   - C. PLACE SAND FROM EXCAVATION BACK TO PREVIOUS GRADES, AND TIE-IN TO TOP OF DUNE.
2. CONSTRUCT SOUTH TERMINAL GROIN ROCK STRUCTURE
   - A. PLACE GEOTEXTILE, DELDOT R-4 CORE STONE AND DELDOT R-7 ARMOR STONE.
3. REHABILATE EXISTING STONE DIKE
   - A. PLACE DELDOT CLASS R-4 STONE ON INSIDE TO FILL VOIDS AND CREATE SMOOTH SURFACE.
   - B. PLACE GEOTEXTILE ON TOP OF R-4 STONE.
   - C. PLACE DELDOT CLASS R-7 STONE GEOTEXTILE AND ON CREST OF EXISTING STONE DIKE.
4. PLACE SAND BEHIND REHABILITATED STONE DIKE BETWEEN NORTH TERMINAL GROIN AND SOUTH TERMINAL GROIN. PLACE SAND WEST OF BACK BEACH AND IN GRECKOS CANAL.
5. CONSTRUCT INSIDE ROCK GROINS 'A' THROUGH 'C'
   - A. PLACE GEOTEXTILE ON TOP OF NEW SAND FILL, PLACE DELDOT R-4 CORE STONE AND DELDOT R-7 ARMOR STONE.
6. ROCK GROINS D, E AND F ARE OPTIONAL. THE CONTRACTOR SHALL CONSTRUCT THEM UPON AUTHORIZATION FROM DNREC



DRAWING AREA COORDINATE SYSTEM (DACS)

* VIEW NUMBER IS BASED ON THE (DACS) LOCATION OF THE LOWER-LEFT EXTENTS OF THE VIEW ON THE REFERENCED SHEET. WHEN REFERENCING DRAWING INFORMATION BETWEEN SHEETS, BOTH THE VIEW AND SHEET NUMBERS MUST BE QUOTED TOGETHER – EITHER IN A CALLOUT FORMAT AS SHOWN ABOVE OR IN THE FORM: "VIEW NO./SHEET NO." (A1/C-501)



ABBREVIATIONS

APPROX	—	APPROXIMATE
BL	—	BASELINE
BLDG	—	BUILDING
BOT	—	BOTTOM
CF	—	CUBIC FEET
CL	—	CENTERLINE
CLR	—	CLEAR
CONC	—	CONCRETE
CONST	—	CONSTRUCTION
CONT	—	CONTINUOUS
CTS	—	CENTERS
CY	—	CUBIC YARDS
DBL	—	DOUBLE
DET	—	DETAIL
DIA	—	DIAMETER
DELDOT	—	DELAWARE DEPARTMENTOF TRANSPORTATION
DISCON	—	DISCONTINUOUS
DWG	—	DRAWING
E	—	EAST
EA	—	EACH
EF	—	EACH FACE
ELEV, EL	—	ELEVATION
EP	—	END POINT
EQ	—	EQUAL
EXIST	—	EXISTING
EXP	—	EXPANSION
F	—	FAHRENHEIT
FT	—	FEET
HORIZ	—	HORIZONTAL
IN.	—	INCHES
INFO	—	INFORMATION
JT	—	JOINT
KIP	—	1000 LB
KSI	—	KIPS PER SQUARE INCH
L	—	LENGTH / ANGLE
LB, LBS	—	POUND, POUNDS
LIDAR	—	LIGHT RADAR
LOD	—	LIMIT OF DISTURBANCE
LF	—	LINEAR FEET
LG	—	LONG
LT	—	LEFT
MAX	—	MAXIMUM
MHW	—	MEAN HIGH WATER
MHHW	—	MEAN HIGHER HIGH WATER
MIN	—	MINIMUM
MISC	—	MISCELLANEOUS
MLW	—	MEAN LOW WATER
MLLW	—	MEAN LOWER LOW WATER
MON	—	MONUMENT
MTL	—	MEAN TIDE LEVEL
N	—	NORTH
NAVD88	—	NORTH AMERICAN VERTICAL DATUM 1988
NGVD	—	NATIONAL GEODETIC VERTICAL DATUM 1929
NIC	—	NOT IN CONTRACT
NTS	—	NOT TO SCALE
NO.	—	NUMBER
OC	—	ON CENTER
OD	—	OUTSIDE DIAMETER
POB	—	POINT OF BEGINNING
PSF	—	POUNDS PER SQUARE FOOT
PSI	—	POUND PER SQUARE INCH
PT	—	POINT OF TANGENT
QTY	—	QUANTITY
REQ'D	—	REQUIRED
RT	—	RIGHT
S	—	SOUTH
SEC	—	SECOND
SCH	—	SCHEDULE
SF	—	SQUARE FOOT, SILT FENCE
SHT	—	SHEET
SPA.	—	SPACES
SQ	—	SQUARE
STA	—	STATION
STD	—	STANDARD
T	—	TON
TBR	—	TO BE REMOVED
TC	—	TURBIDITY CURTAIN
TP	—	TURNING POINT
TYP	—	TYPICAL
U/G	—	UNDERGROUND
UON	—	UNLESS OTHERWISE NOTED
VERT	—	VERTICAL
W	—	WEST
W/	—	WITH
WP	—	WORKING POINT

LEGEND

- – (5) – – EXISTING CONTOUR NUMBER IN PARENTHESIS DENOTES NEGATIVE NUMBER
- —— 5 —— MAJOR CONTOURS
- —— 4 —— MINOR CONTOURS
- – – – – – GEOTEXTILE
- E 686,000 / N 348,400 COORDINATE GRID
- WP-8 WORKING POINT
- – SAND FILL
- – ROCK GROIN
- – EXISTING GROUND

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

INDEX OF DRAWINGS, LEGEND, ABBREVIATIONS AND GENERAL NOTES

Designed by: PWK | Date: MAR 2016 | Rev. –
Dwn by: WRF/MSS | Ckd by: PWK | M&N Project No. 8482-04
Reviewed by: PWK | Drawing code: NAT201501/MISPILLION
Submitted by: MOFFATT & NICHOL | Drawing Scale: Plot scale: 1:1 (0 SHEET)

moffatt & nichol
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410-563-7300

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

PETER WILLIAM KOTULAK LICENSE No. 18765 DELAWARE ASSIGNED ENGINEER

Sheet Reference No.
G-002
INDEX: 2 OF 16

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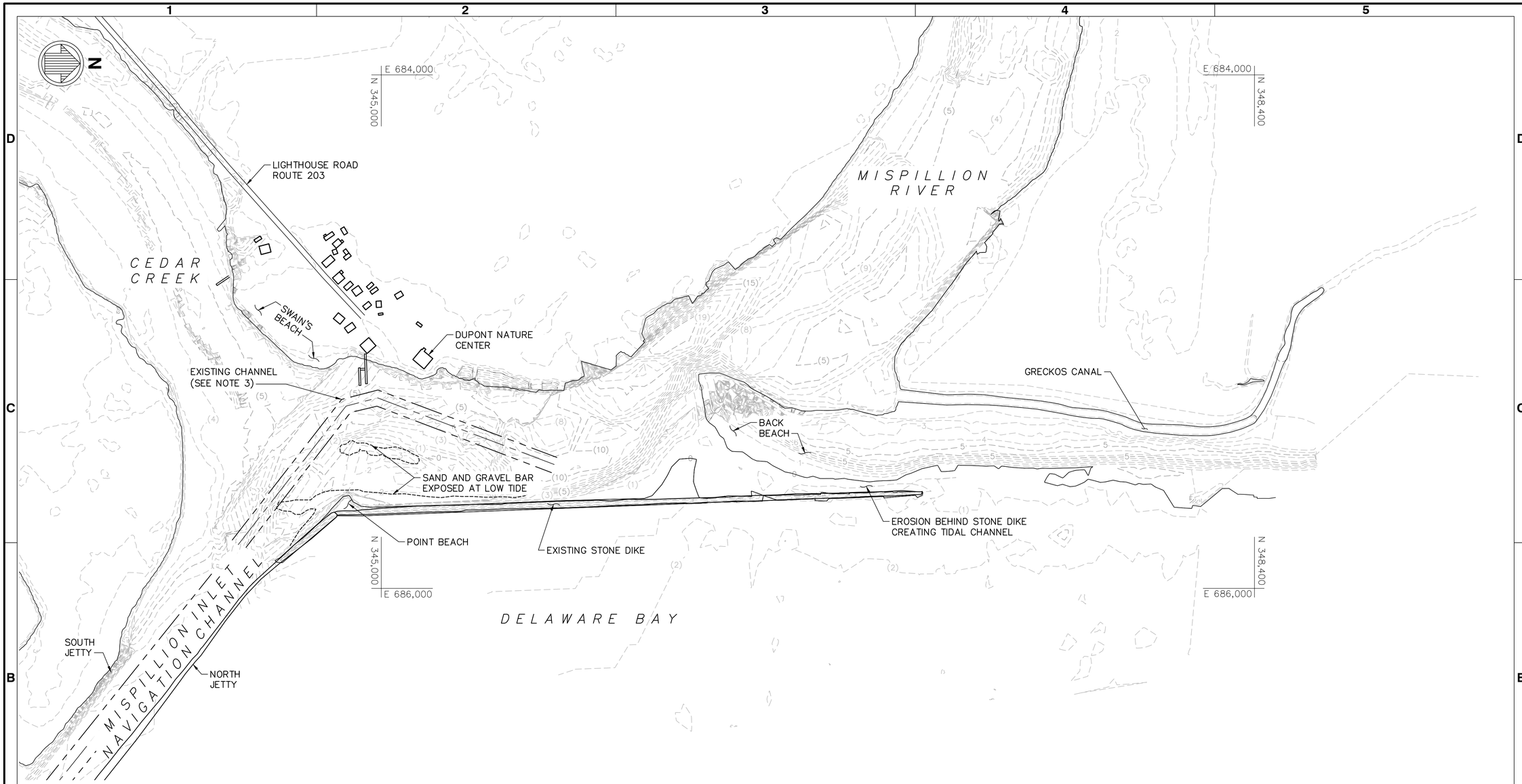

NOTES:

1. SEE SHEET G-002 FOR GENERAL NOTES AND LEGEND.
2. SEE SHEET C-101 FOR BASELINE OF CONSTRUCTION WORKING POINTS.
3. EXISTING CHANNEL SURVEY INFORMATION RECEIVED FROM CORPS OF ENGINEERS. SURVEY DATED JUNE 26, 2013.

A1 / G-101 PLAN – EXISTING CONDITIONS
SCALE: 1" =200'

200' 0' 200' 400'
SCALE: 1"=200'

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

PLAN - EXISTING CONDITIONS

Designed by: PWK
Dwn by: WRF/MSS
Ckd by: PWK
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
Date: MAR 2016
Rev. -
M&N Project No. 8482-04
Drawing code: NAT201501/MISPILLION
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DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

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LICENSE
No. 18765
DELAWARE
PROFESSIONAL ENGINEER

Sheet Reference No.
G-101
INDEX: 3 OF 16

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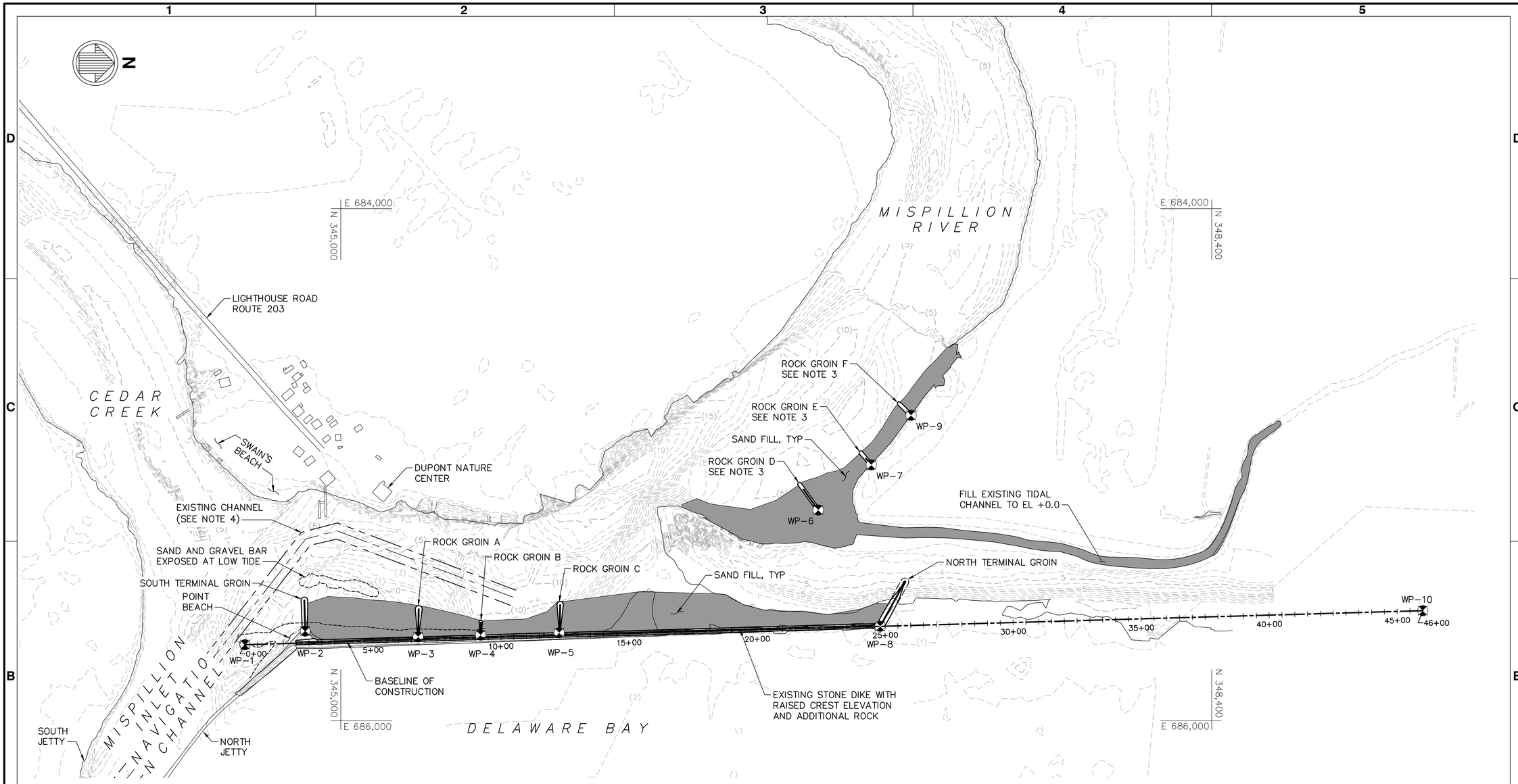

A1 C-101 PLAN – GENERAL ARRANGEMENT
SCALE: 1" =200'

WORKING POINT TABLE					
WP #	LCATION	STATION	BASELINE OFFSET	EASTING	NORTHING
WP-1	BASELINE OF CONSTRUCTION	0+00.00	0.00'	685697.10	344825.76
WP-2	SOUTH TERMINAL GROIN	2+36.76	46.32' LEFT	685649.74	344861.16
WP-3	ROCK GROIN A	6+76.78	11.01' LEFT	685683.35	345301.79
WP-4	ROCK GROIN B	9+20.55	11.41' LEFT	685676.31	345545.46
WP-5	ROCK GROIN C	12+27.25	11.43' LEFT	685669.16	345792.75
WP-6	ROCK GROIN D	22+52.25	461.12' LEFT	685176.91	346863.84
WP-7	ROCK GROIN E	24+64.41	631.17' LEFT	685000.80	347071.00
WP-8	NORTH TERMINAL GROIN	24+80.87	0.00'	685631.23	347105.68
WP-9	ROCK GROIN F	26+25.14	820.29' LEFT	684807.12	347226.20
WP-10	BASELINE OF CONSTRUCTION	46+00.00	0.00'	685570.03	349223.93

NOTES:

1. SEE SHEET G-002 FOR GENERAL NOTES AND LEGEND.
2. SEE SHEET C-101 FOR BASELINE OF CONSTRUCTION WORKING POINTS.
3. ROCK GROINS D, E AND F ARE OPTIONAL. THE CONTRACTOR SHALL CONSTRUCT THEM UPON AUTHORIZATION FROM DNREC.
4. EXISTING CHANNEL SURVEY INFORMATION RECEIVED FROM CORPS OF ENGINEERS. SURVEY DATED JUNE 26, 2013.

200' 0' 200' 400'
SCALE: 1"=200'

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

PLAN - GENERAL ARRANGEMENT

Designed by: PWK
Date: MAR 2016
Rev. –
Dwn by: WRF/MSS
Ckd by: PWK
M&N Project No. 8482-04
Reviewed by: PWK
Drawing code: NAT201501/MISPILLION
Submitted by: MOFFATT & NICHOL
Drawing Scale: Plot scale: 1:1 (0 SHEET)

2700 LIGHTHOUSE POINT EAST, SUITE 301
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DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
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LICENSE No. 18765
STATE OF DELAWARE
PROFESSIONAL ENGINEER

Sheet Reference No.
C-101
INDEX: 4 OF 16

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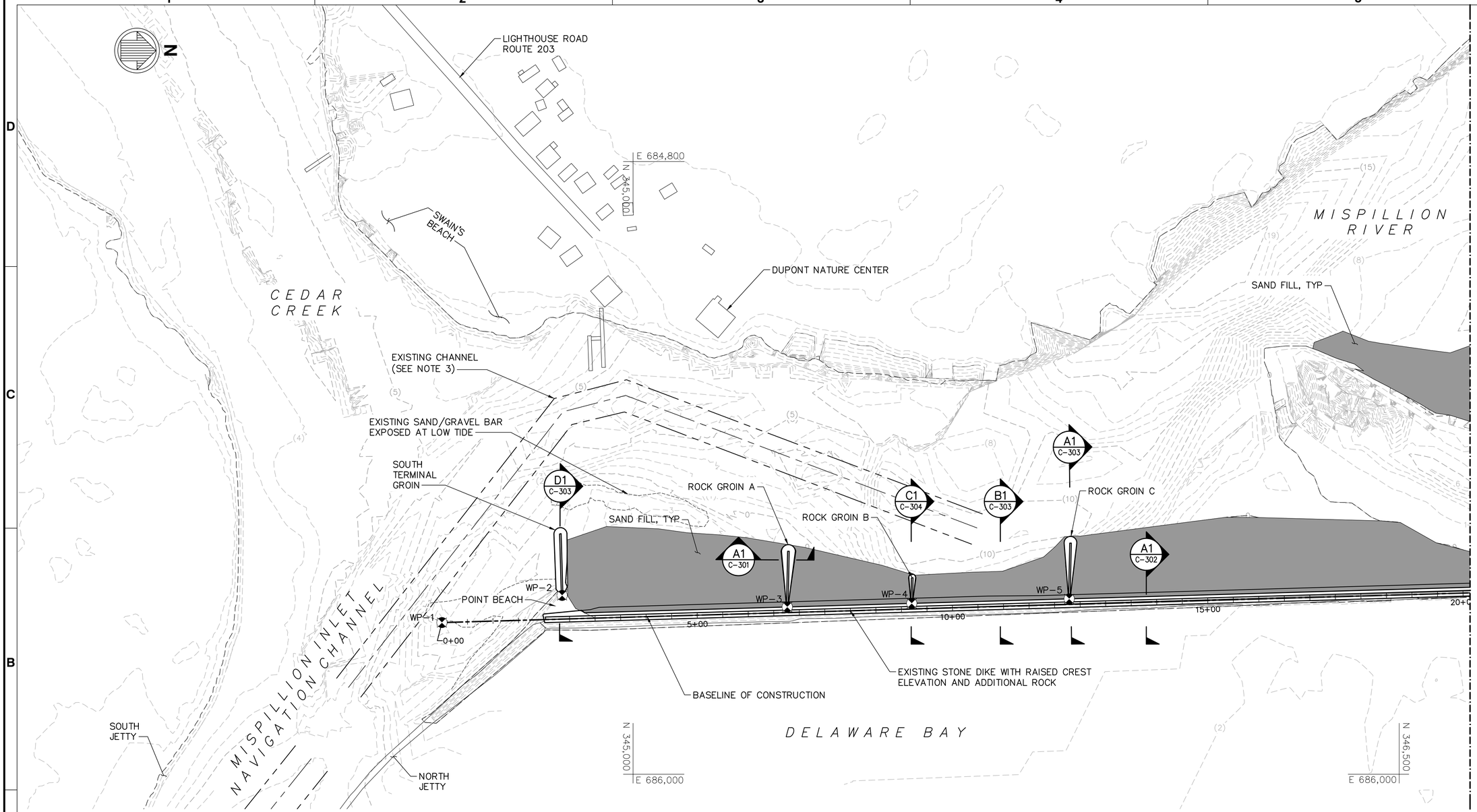

A1 / C-102 PLAN – GENERAL SITE – SOUTH
SCALE: 1" =100'

NOTES:

1. SEE SHEET G-002 FOR GENERAL NOTES AND LEGEND.
2. SEE SHEET C-101 FOR BASELINE OF CONSTRUCTION WORKING POINTS.
3. EXISTING CHANNEL SURVEY INFORMATION RECEIVED FROM CORPS OF ENGINEERS. SURVEY DATED JUNE 26, 2013.

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

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

PLAN - GENERAL SITE - SOUTH

Rev: –
Date: MAR 2016
M&N Project No: 8482-04
Drawing code: NAT201501/MISPILLION
Drawing Scale: Plot scale: 1:1 (D SHEET)
Designed by: PWK
Cad by: PWK
Dwn by: WRF/MSS
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL

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DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
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LICENSE
No. 18765
PROFESSIONAL ENGINEER
DELAWARE

Sheet Reference No.
C-102
INDEX: 5 OF 16

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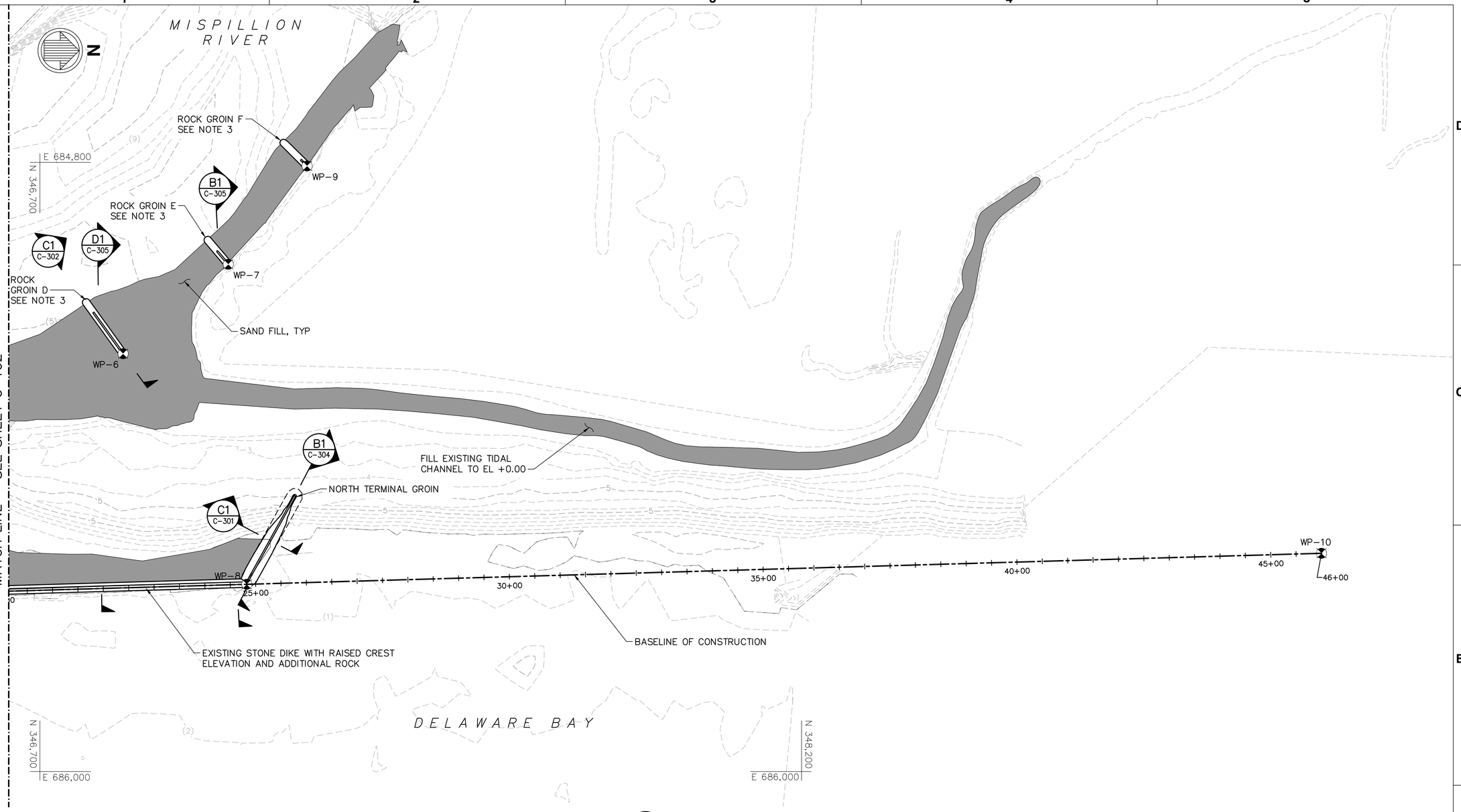

A1 C-103 PLAN – GENERAL SITE – NORTH
SCALE: 1" =100'

NOTES:

1. SEE SHEET G-002 FOR GENERAL NOTES AND LEGEND.
2. SEE SHEET C-101 FOR BASELINE OF CONSTRUCTION WORKING POINTS.
3. ROCK GROINS D, E AND F ARE OPTIONAL. THE CONTRACTOR SHALL CONSTRUCT THEM UPON AUTHORIZATION FROM DNREC.

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

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

PLAN - GENERAL SITE - NORTH

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DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
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Reviewed by: PWK		Drawing code: NAT201501/MISPILLION	
Submitted by: MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (0 SHEET)	

PETER WILLIAM KOTULAK LICENSE No. 18765 PROFESSIONAL ENGINEER

Sheet Reference No.
C-103
INDEX: 6 OF 16

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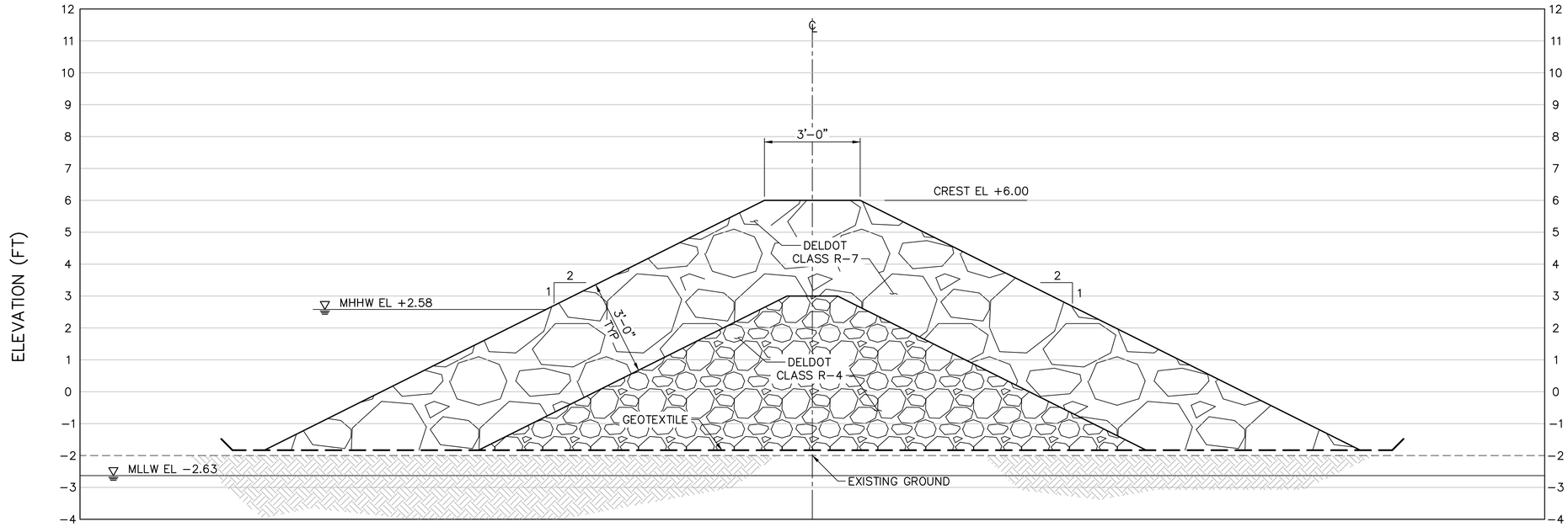
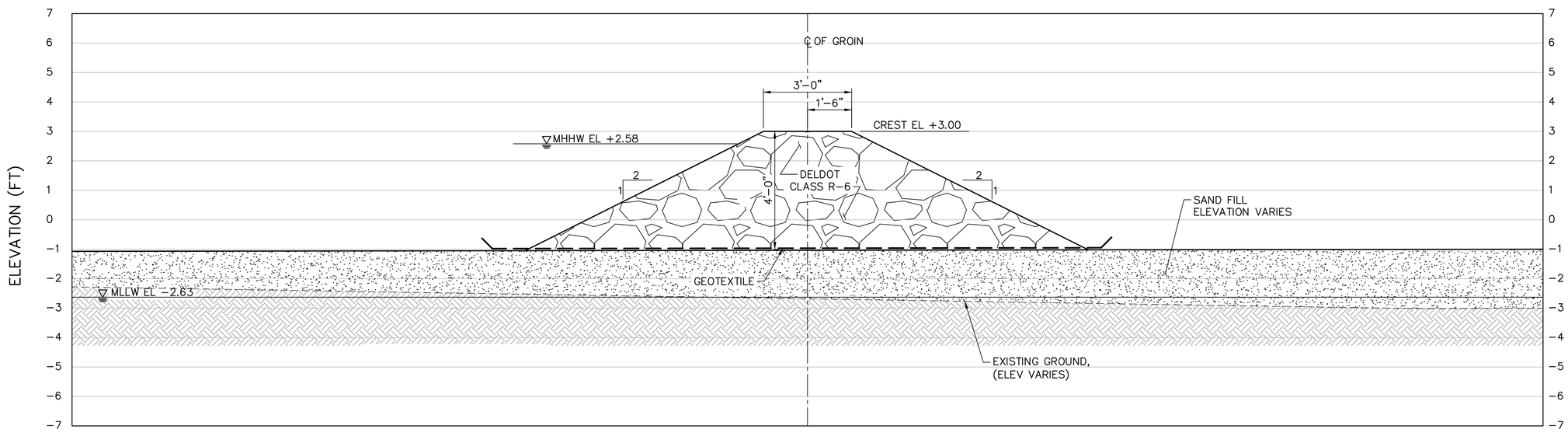


C1 / C-103 SECTION – NORTH TERMINAL GROIN
SCALE: 1" =2'-0"



A1 / C-102 SECTION – TYPICAL SOUTH TERMINAL GROIN AND GROINS "A" – "F"
SCALE: 1" =2'-0"

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

NOTES:

1. SEE SHEET G-002 FOR GENERAL NOTES AND LEGEND.
2. SEE SHEET C-101 FOR BASELINE OF CONSTRUCTION WORKING POINTS.

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

SECTIONS - TYPICAL GROIN
SHEET 1 OF 2

Rev: –
Date: MAR 2016
M&N Project No. 8482-04
Designed by: PWK
Cad by: PWK
Own by: WRF/MSS
Drawing code: NAT201501/MISPILLION
Reviewed by: PWK
Drawing Scale: Plot scale: 1:1 (0 SHEET)
Submitted by: MOFFATT & NICHOL

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DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
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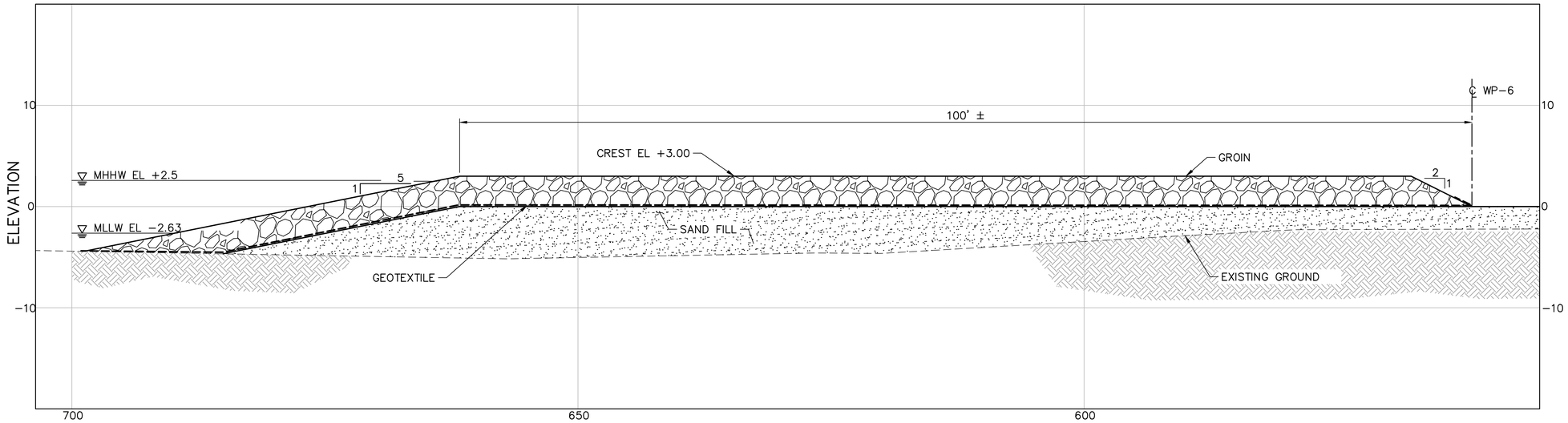
DOVER, DE 19901

PETER WILLIAM KOTULAK LICENSE No. 18765 PROFESSIONAL ENGINEER

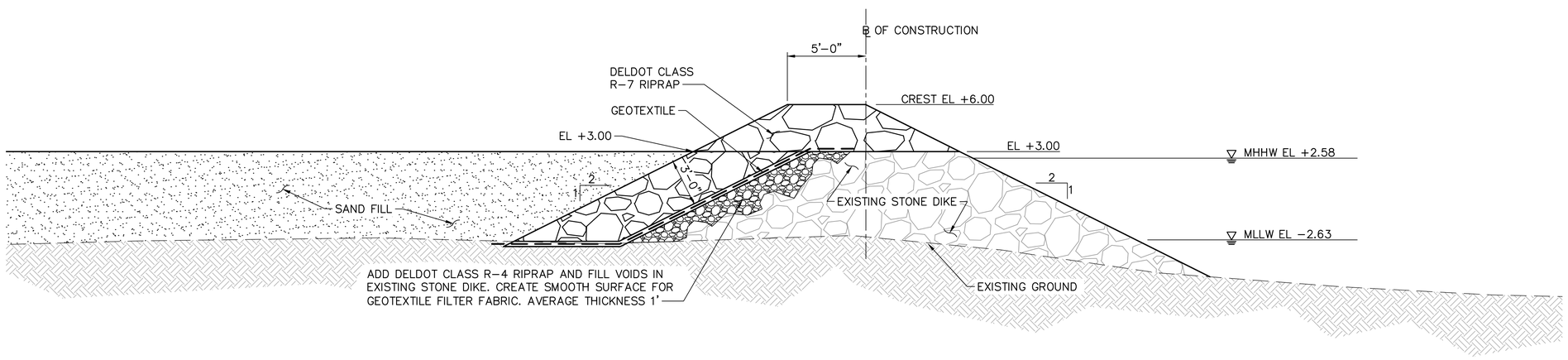
Sheet Reference No.
C-301
INDEX: 7 OF 16

File: P:\8482-04\500 CADD\ACTIVE\sheetset\848204C-301; Plotted: 3/31/2016 8:21 AM by RIDOUANE, HICHAM; Saved: 3/22/2016 10:31 AM by HRIDOUANE



NOTE:
DISTANCE SHOWN TO STONE DIKE BASELINE AT 56' ±

C1 / C-103 PROFILE – GROIN "D" AT SAND FILL
SCALE: 1" =6'-0"



A1 / C-102 SECTION – TYPICAL STONE DIKE REHABILITATION
SCALE: 1" = 4'-0"

6' 0' 6' 12'
SCALE: 1"=6'

4' 0' 4' 8'
SCALE: 1"=4"

NOTES

1. SEE SHEET G-002 FOR GENERAL NOTES AND LEGEND.
2. SEE SHEET C-101 FOR BASELINE OF CONSTRUCTION WORKING POINTS.

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

SECTIONS - TYPICAL GROIN
SHEET 2 OF 2

Designed by: PWK
Date: MAR 2016
Rev. -
Dwn by: WRF/MSS
Ckd by: PWK
M&N Project No. 8482-04
Reviewed by: PWK
Drawing code: NAT201501/MISPILLION
Submitted by: MOFFATT & NICHOL
Drawing Scale: Plot scale: 1:1 (D SHEET)

moffatt & nichol
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BALTIMORE, MD 21224
410-563-7300

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
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PETER WILLIAM KOTULAK
LICENSE No. 18765
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Sheet Reference No.
C-302
INDEX: 8 OF 16

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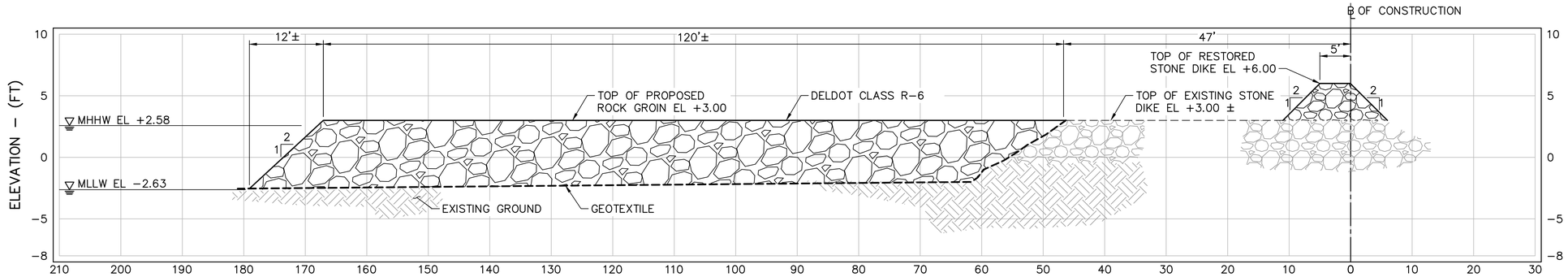
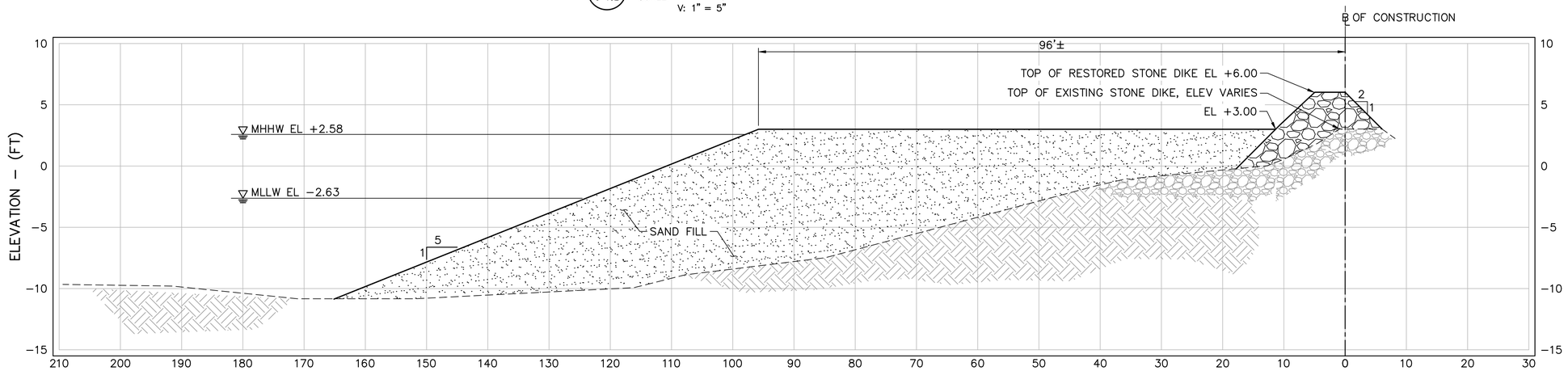
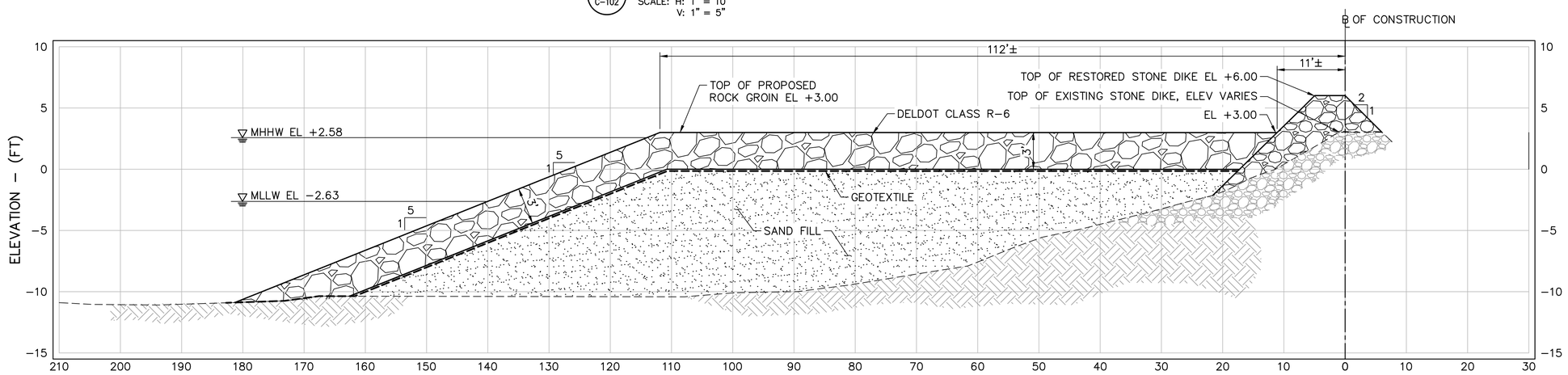
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



D1 C-102 PROFILE – SOUTH TERMINAL GROIN
SCALE: H: 1" = 10'
V: 1" = 5"



B1 C-102 PROFILE – TYPICAL BEACH FILL
SCALE: H: 1" = 10'
V: 1" = 5"



A1 C-102 PROFILE – TYPICAL GROIN A & C ON BEACH FILL
SCALE: H: 1" = 10'
V: 1" = 5"

10' 0' 10' 20'
VERTICAL SCALE: 1"=10'

NOTES:

1. SEE SHEET G-002 FOR GENERAL NOTES AND LEGEND.
2. SEE SHEET C-101 FOR BASELINE OF CONSTRUCTION WORKING POINTS.

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

PROFILES - BEACH FILL
SHEET 1 OF 2

Date: MAR 2016 | Rev. –
M&N Project No. 8482-04
Drawing code: NAT201501/MISPILLION
Drawing Scale: Plot scale: 1:1 (0 SHEET)

Designed by: PWK | Cxd by: PWK
Dwn by: WRF/MSS | Reviewed by: PWK
Submitted by: MOFFATT & NICHOL

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Sheet Reference No.
C-303
INDEX: 9 OF 16

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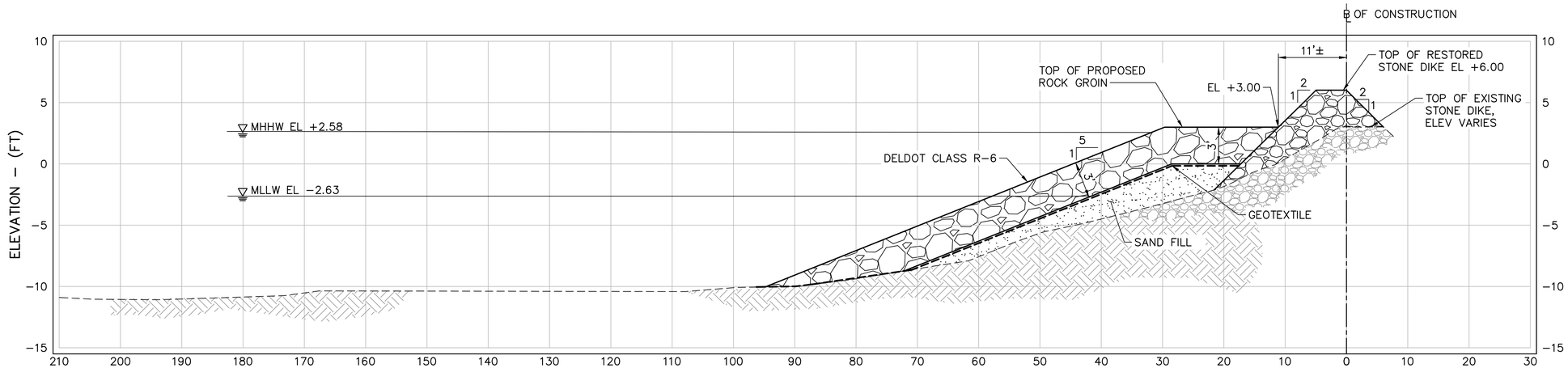
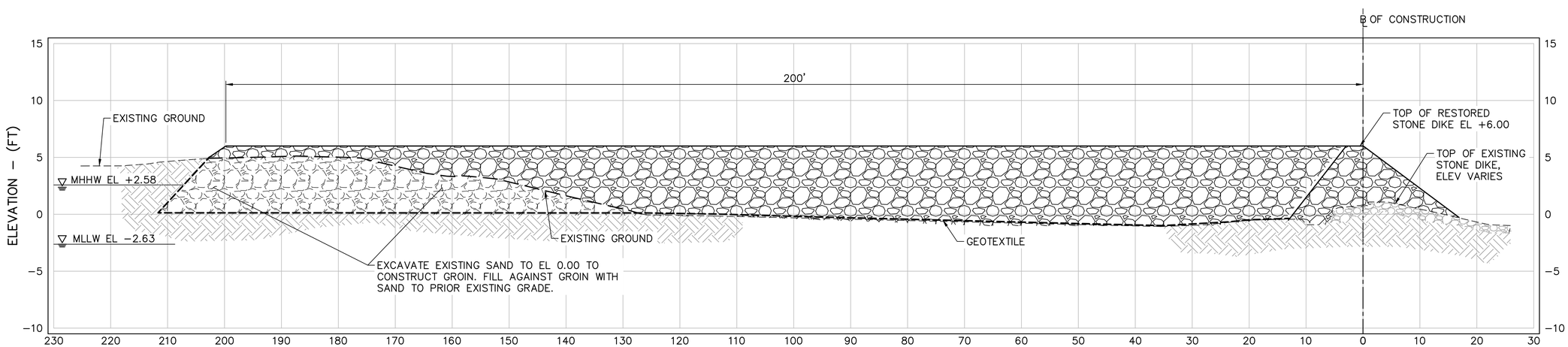
File: P:\8482-04\500 CADD\ACTIVE\sheetset\8482C4-303

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



C1 / C-102 PROFILE – TYPICAL GROIN B ON BEACH FILL
SCALE: H: 1" = 10'
V: 1" = 5"



B1 / C-103 PROFILE – NORTH TERMINAL GROIN
SCALE: H: 1" = 10'
V: 1" = 5"

NOTES:

1. SEE SHEET G–002 FOR GENERAL NOTES AND LEGEND.
2. SEE SHEET C–101 FOR BASELINE OF CONSTRUCTION WORKING POINTS.

10' 0' 10' 20'
VERTICAL SCALE: 1"=10'

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

PROFILES - BEACH FILL
SHEET 2 OF 2

Designed by: PWK
Dwn by: WRF/MSS
Cad by: PWK
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
Date: MAR 2016
Rev: –
M&N Project No. 8482–04
Drawing code: NAT201501/MISPILLION
Drawing Scale: Plot scale: 1:1 (0 SHEET)

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Sheet Reference No.
C-304
INDEX: 10 OF 16

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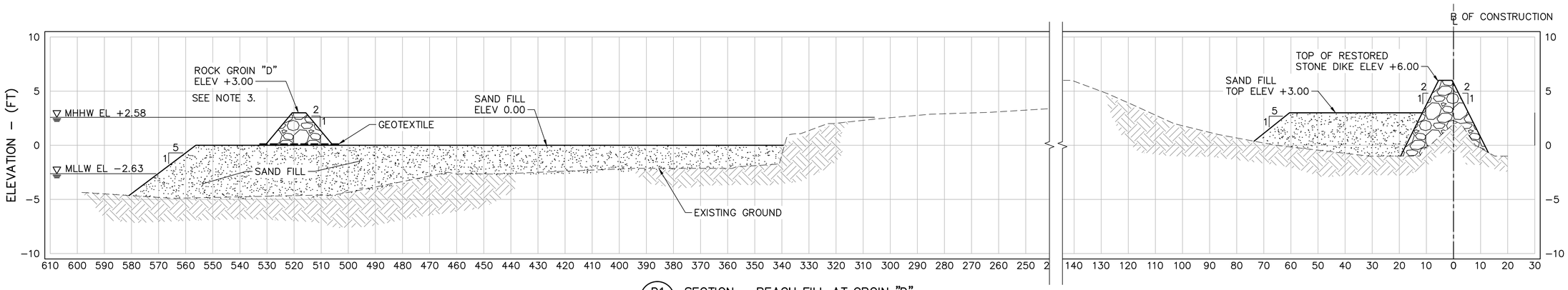
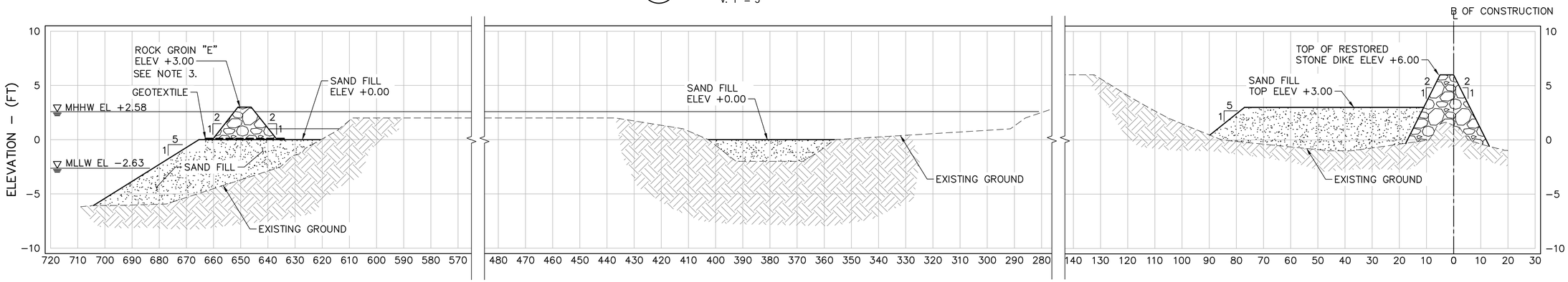
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



D1 C-103 SECTION – BEACH FILL AT GROIN "D"
SCALE: H: 1" = 20'
V: 1" = 5"



B1 C-103 SECTION – BEACH FILL AT GROIN "E"
SCALE: H: 1" = 20'
V: 1" = 5"

NOTES:

1. SEE SHEET G-002 FOR GENERAL NOTES AND LEGEND.
2. SEE SHEET C-101 FOR BASELINE OF CONSTRUCTION WORKING POINTS.
3. ROCK GROINS D AND E ARE OPTIONAL. THE CONTRACTOR SHALL CONSTRUCT THEM UPON AUTHORIZATION FROM DNREC.

20' 0' 20' 40'
HORIZONTAL SCALE: 1"=20'

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

SECTIONS - BEACH FILL

Designed by: PWK
Dwn by: WRF/MSS
Ckd by: PWK
Reviewed by: PWK
Submitted by: MGFFATT & NICHOL
Date: MAR 2016
Rev. –
M&N Project No. 8482-04
Drawing code: NAT201501/MISPILLION
Drawing Scale: Plot scale: 1:1 (0 SHEET)

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LICENSE No. 18765
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Sheet Reference No.
C-305
INDEX: 11 OF 16

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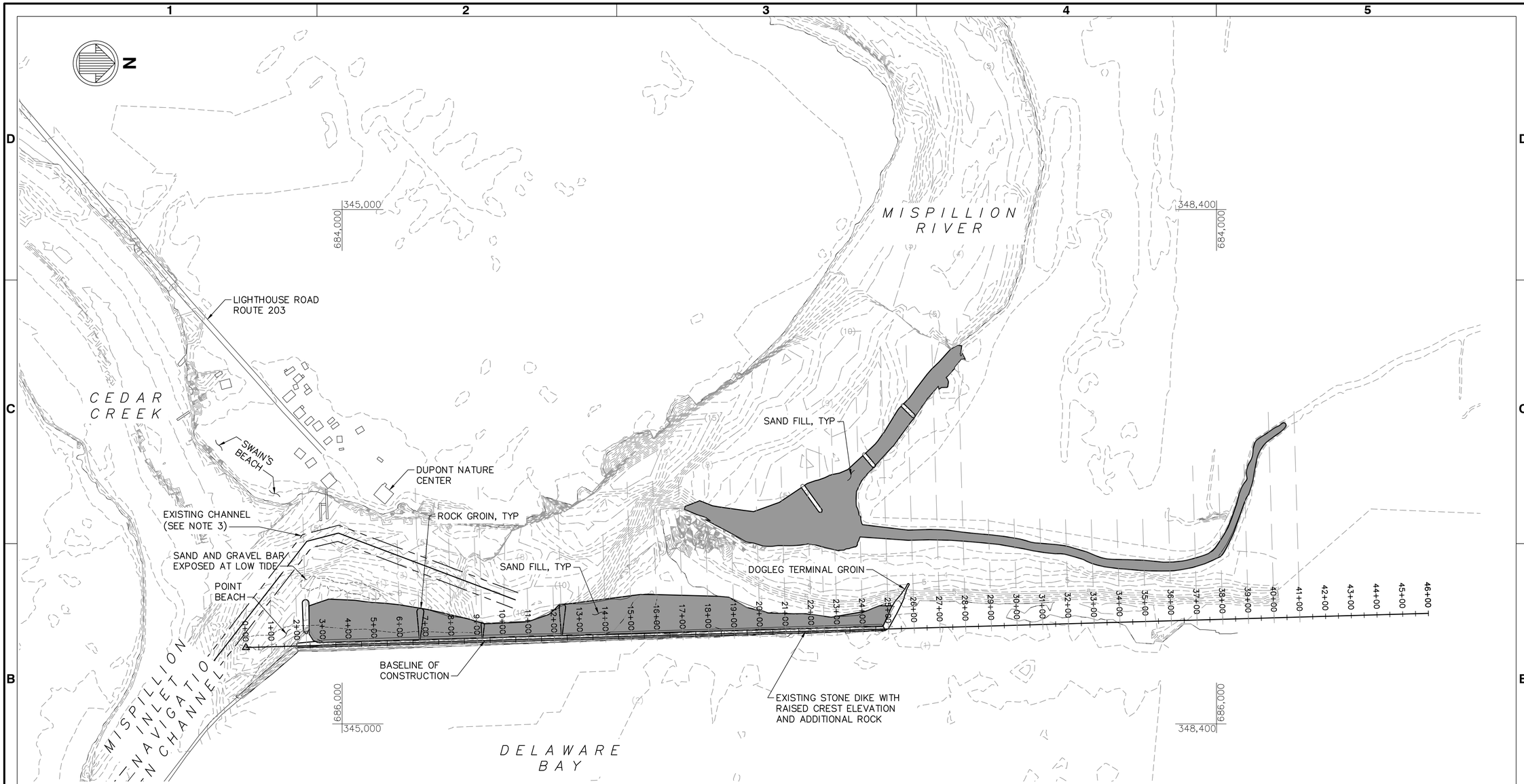

NOTES:

1. SEE SHEET G-002 FOR GENERAL NOTES, LEGEND.
2. SEE SHEET C-101 FOR BASELINE OF CONSTRUCTION WORKING POINTS.
3. EXISTING CHANNEL SURVEY INFORMATION RECEIVED FROM CORPS OF ENGINEERS. SURVEY DATED JUNE 26, 2013.

A1 / C-305 PLAN – CROSS SECTION LOCATIONS
SCALE: 1" =200'

200' 0' 200' 400'
SCALE: 1"=200'

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

PLAN - CROSS SECTION LOCATIONS

Designed by: PWK
Dwn by: WRF/MSS
Ckd by: PWK
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
Date: MAR 2016
Rev. –
M&N Project No. 8482-04
Drawing code: NAT201501/MISPILLION
Drawing Scale:
Plot scale: 1:1 (0 SHEET)

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DOVER, DE 19901

PETER WILLIAM KOTULAK LICENSE No. 18765 DELAWARE PROFESSIONAL ENGINEER

Sheet Reference No.
C-306
INDEX: 12 OF 16

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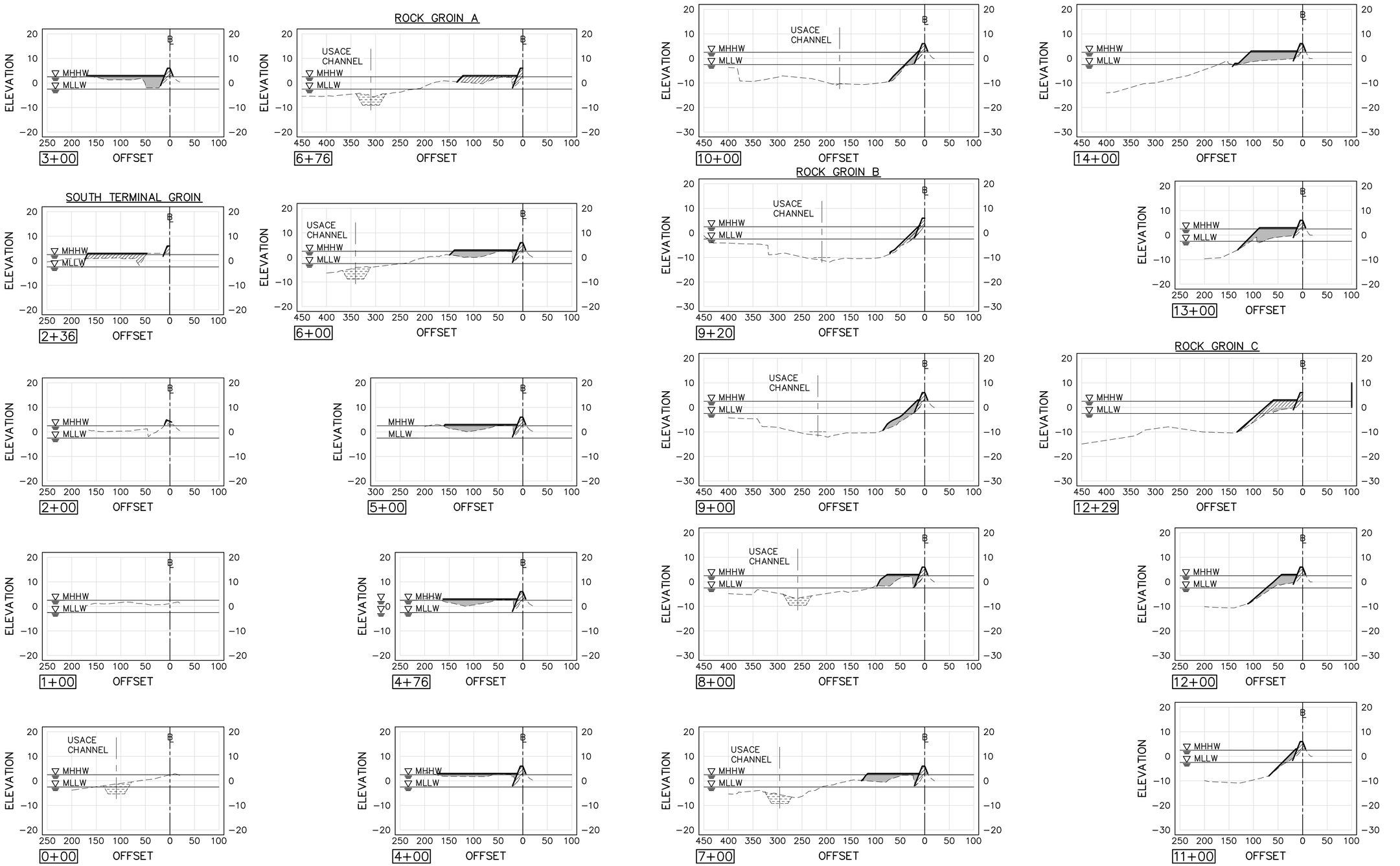

LEGEND

- ROCK GROIN
- EXISTING USACE CHANNEL
- SAND FILL

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

CROSS SECTIONS
SHEET 1 OF 4

Designed by: PWK	Date: MAR 2016	Rev. –	
Dwn by: WRF/MSS	Ckd by: PWK	M&N Project No. 8482-04	
Reviewed by: PWK		Drawing code: NAT201501/MISPILLION	
Submitted by: MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (0 SHEET)	

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Sheet Reference No.
C-307
INDEX: 13 OF 16

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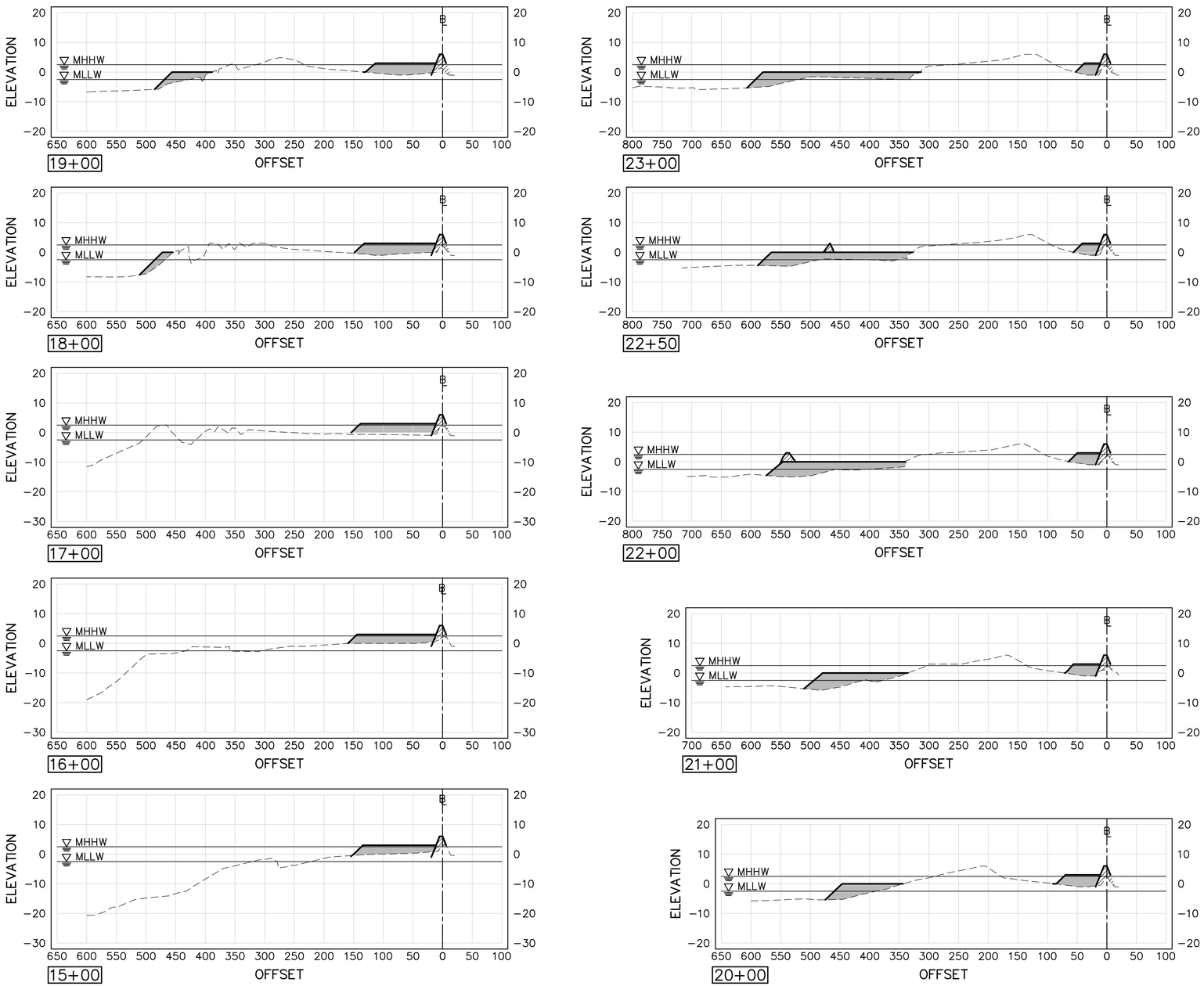

LEGEND

ROCK GROIN

SAND FILL

HORIZONTAL SCALE: 1"=100'

VERTICAL SCALE: 1"=20'

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

CROSS SECTIONS
SHEET 2 OF 4

Designed by: PWK
Dwn by: WRF/MSS
Ckd by: PWK
Date: MAR 2016
Rev. –
M&N Project No. 8482-04
Reviewed by: PWK
Drawing code: NAT201501/MISPILLION
Submitted by: MOFFATT & NICHOL
Drawing Scale: Plot scale: 1:1 (0 SHEET)

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DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
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Sheet Reference No.
C-308
INDEX: 14 OF 16

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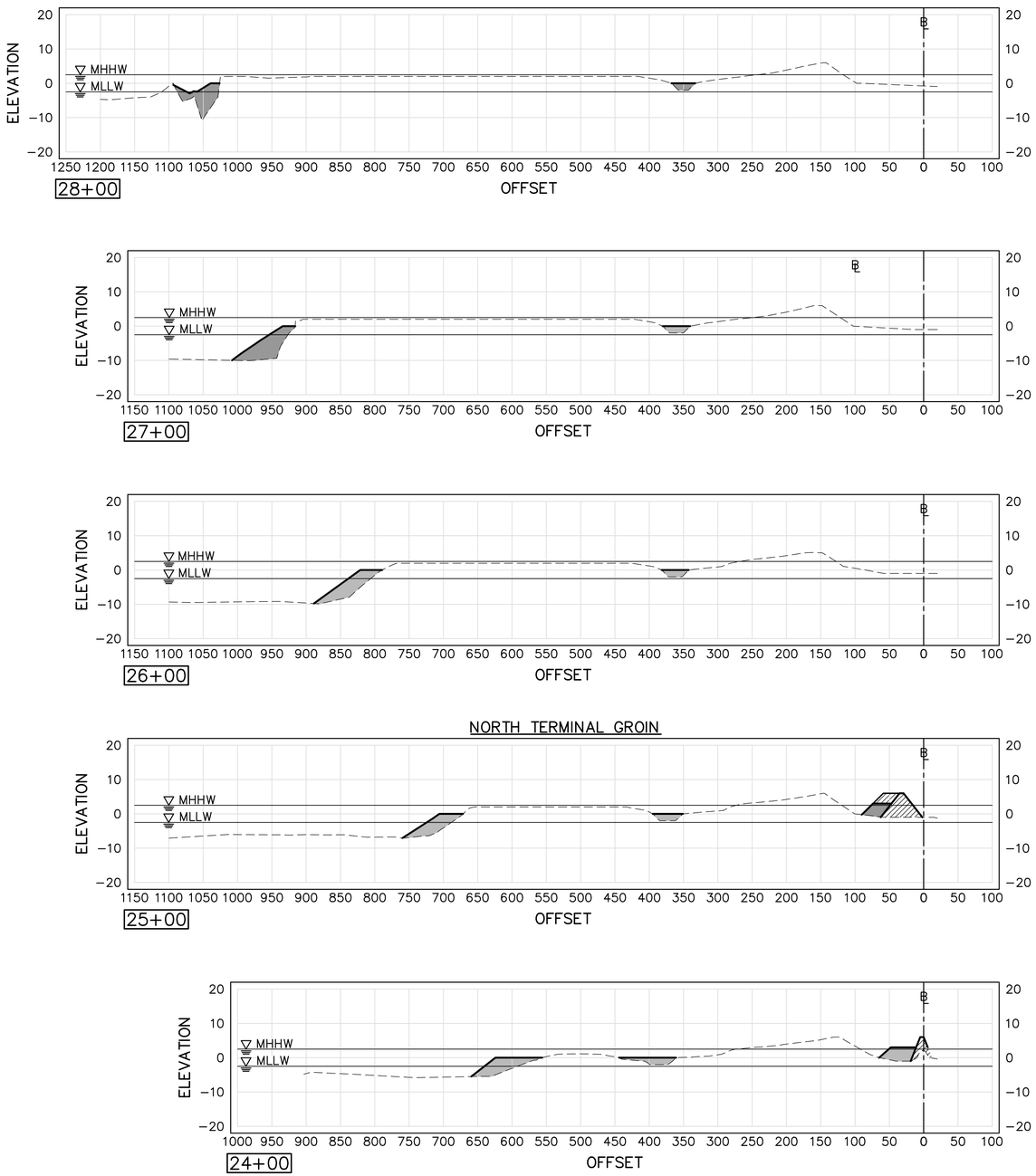

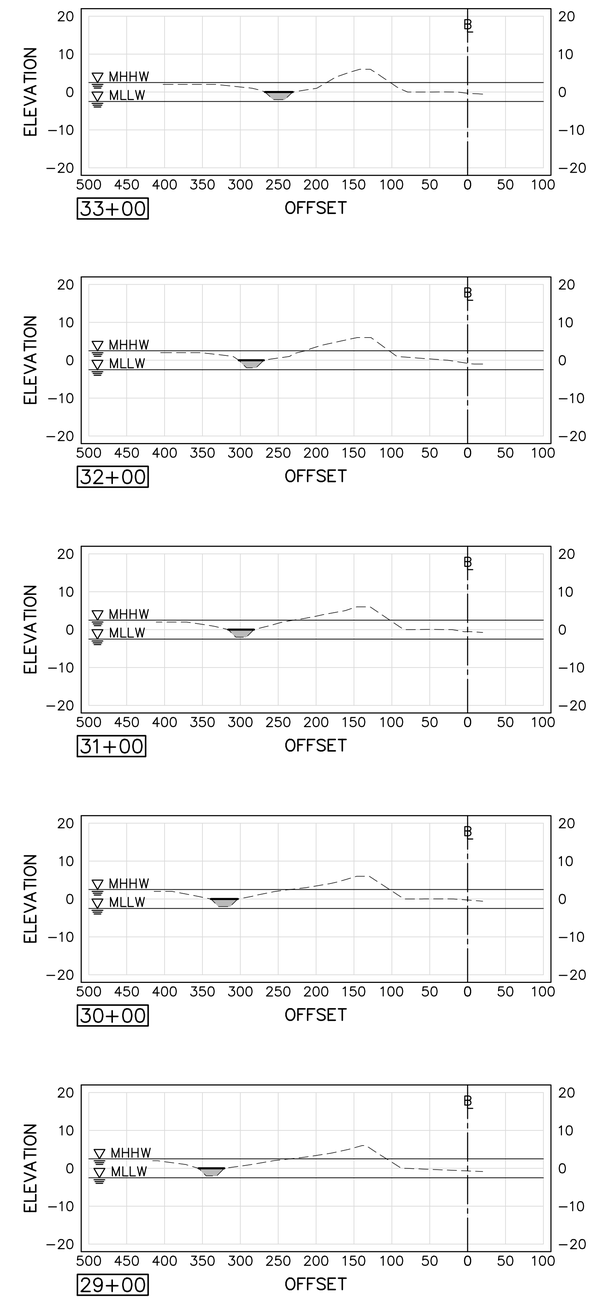

LEGEND

ROCK GROIN

SAND FILL

HORIZONTAL SCALE: 1"=100'

VERTICAL SCALE: 1"=20'

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

CROSS SECTIONS
SHEET 3 OF 4

Designed by: PWK
Dwn by: WRF/MSS
Ckd by: PWK
Date: MAR 2016
Rev. –
M&N Project No. 8482-04
Drawing code: NAT201501/MISPILLION
Reviewed by: PWK
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Submitted by: MOFFATT & NICHOL

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Sheet Reference No.
C-309
INDEX: 15 OF 16

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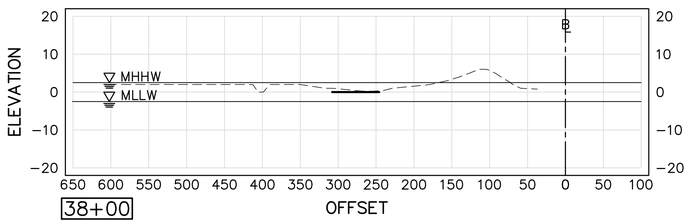

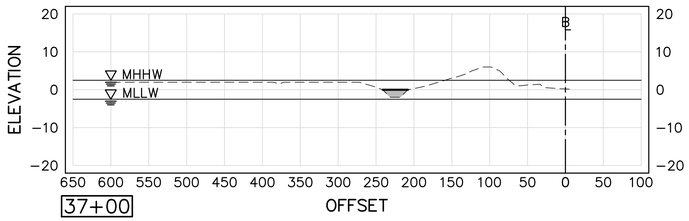

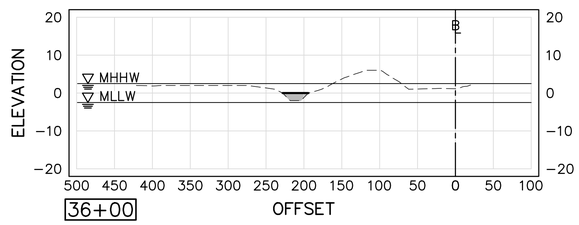

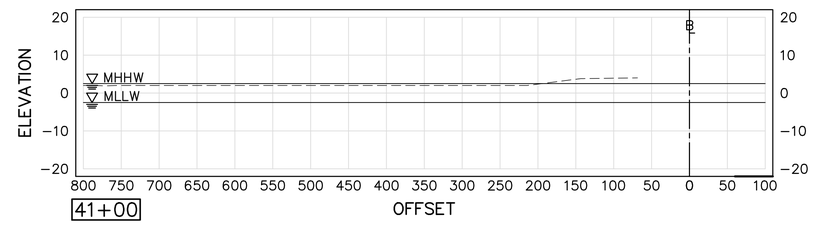

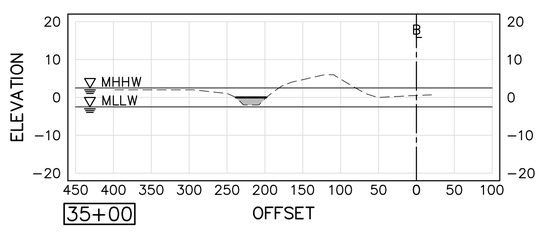

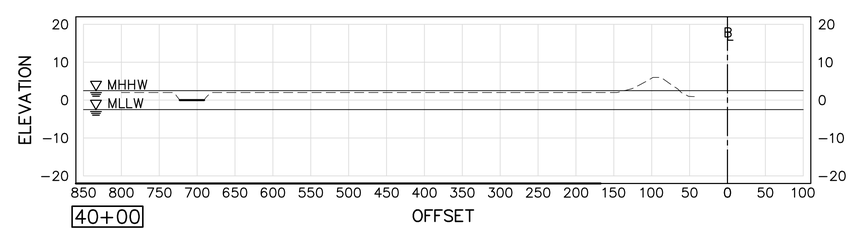

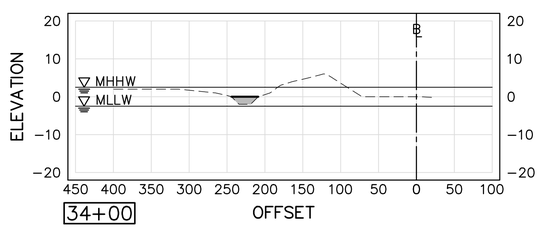

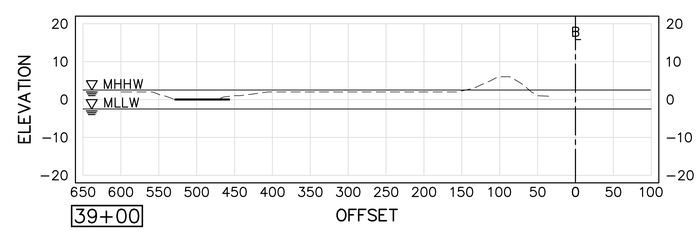

LEGEND

ROCK GROIN

SAND FILL

HORIZONTAL SCALE: 1"=100'

VERTICAL SCALE: 1"=20'

Mark	Description	Date	Appr.

MISPILLION COMPLEX PROJECT
BEACH NOURISHMENT AND ROCK PROTECTION STRUCTURES
MILFORD, DELAWARE

CROSS SECTIONS
SHEET 4 OF 4

Designed by: PWK
Dwn by: WRF/MSS
Ckd by: PWK
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
Date: MAR 2016
Rev. -
M&N Project No. 8482-04
Drawing code: NAT201501/MISPILLION
Drawing Scale: Plot scale: 1:1 (0 SHEET)

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Sheet Reference No.
C-310
INDEX: 16 OF 16

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