

# CITY OF REHOBOTH BEACH, DELAWARE OCEAN OUTFALL PROJECT

## PROJECT NUMBER: 2017-001 PERMIT SUBMITTAL

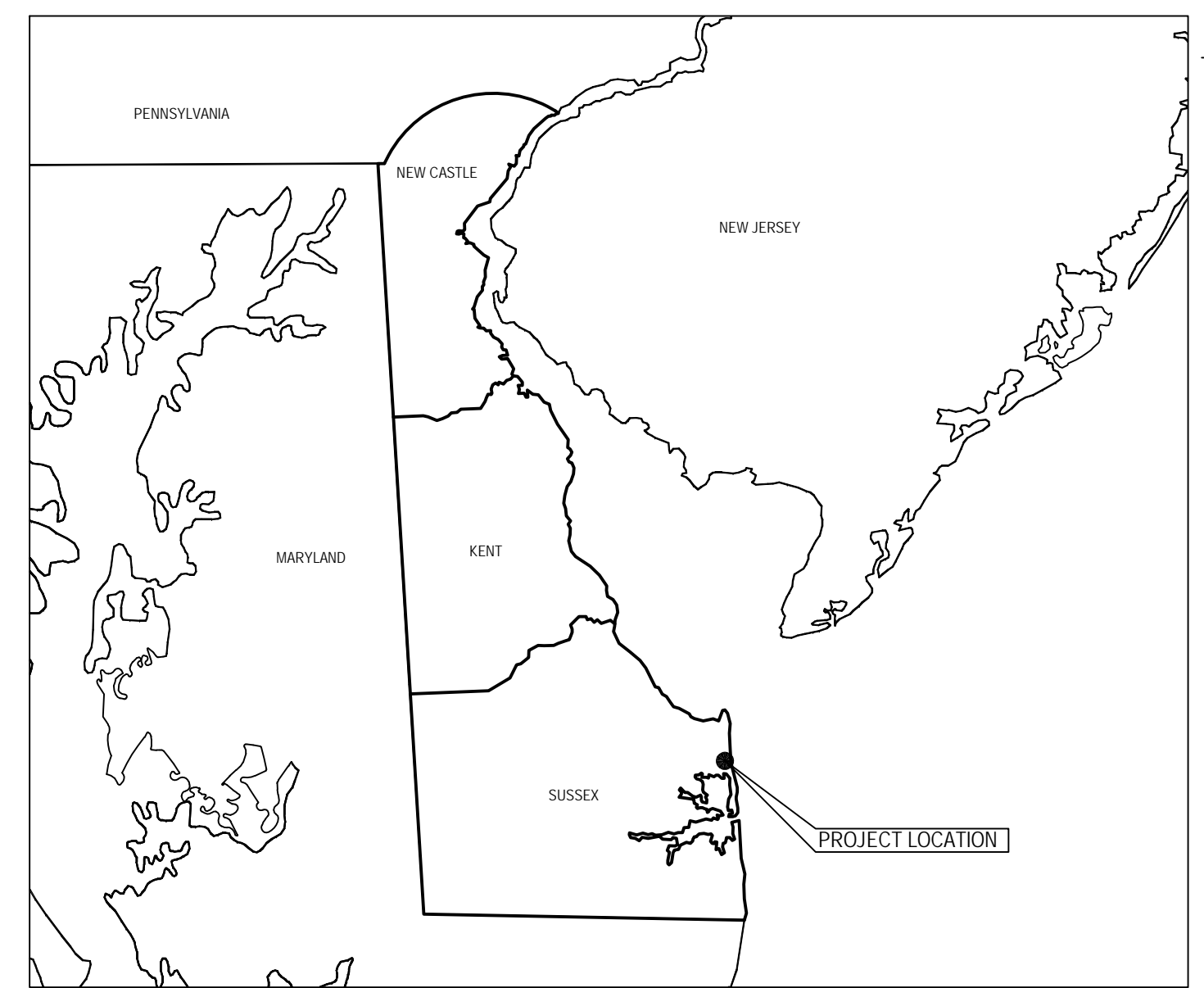


FOR UTILITY LOCATIONS  
CALL AT LEAST 48 HOURS  
BEFORE BEGINNING CONSTRUCTION

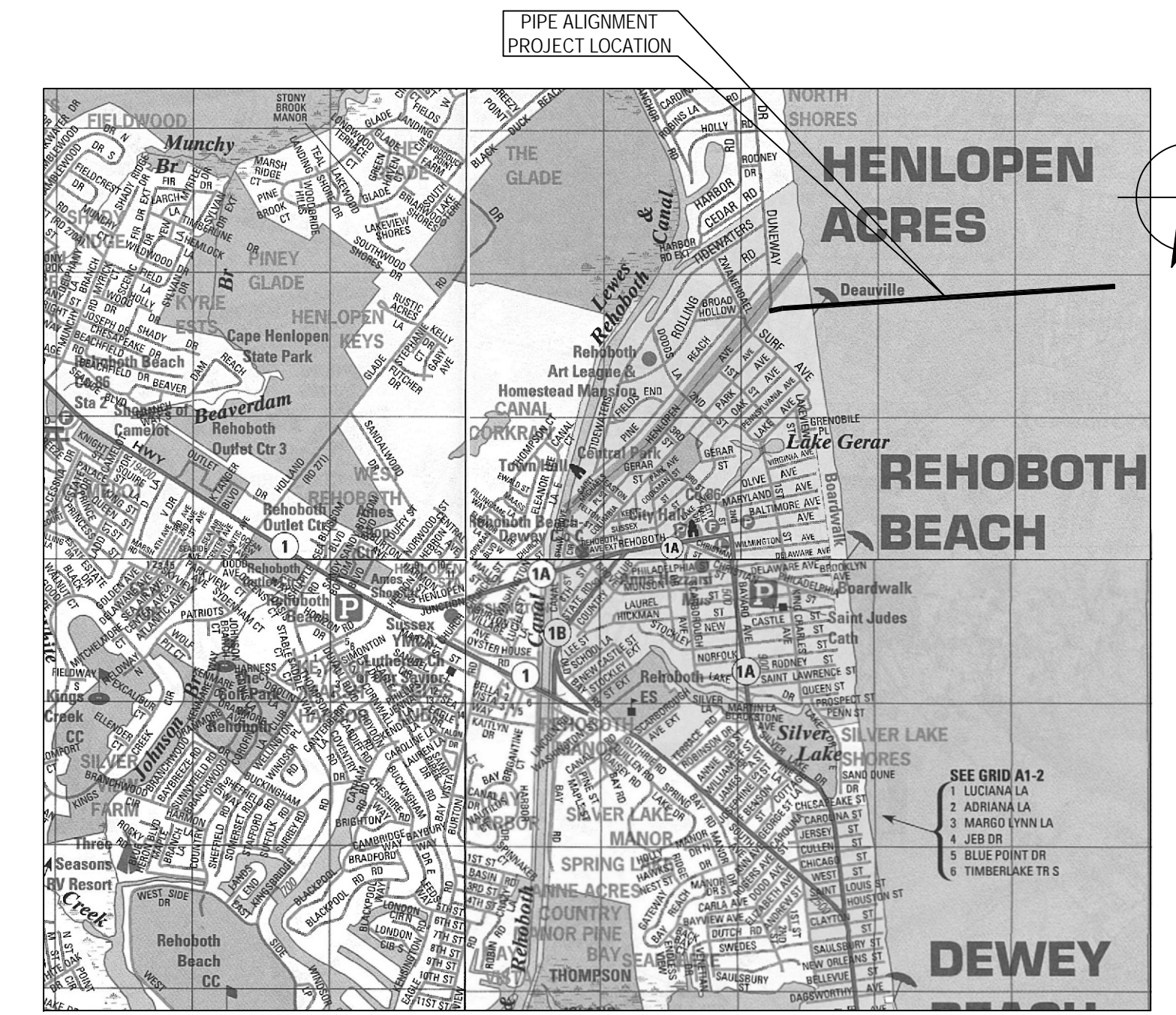
- GENERAL NOTES:**
1. LOT ADDRESS: DUNEWAY DR., DEAUVILLE BEACH  
REHOBOTH BEACH, DE 19971
  2. OWNER: STATE OF DELAWARE
  3. TAX MAP/GRID/  
PARCEL/BLOCK: TAX MAP ----, GRID ----  
PARCEL ----, BLOCK ----
  4. DEED REFERENCES: SEE PLANS
  5. TAX ACCOUNT ID: SEE PLANS
  6. ADC MAP: MAP 27, GRID A2
  7. HORIZONTAL DATUM: NAD 83
  8. VERTICAL DATUM: NAVD 88
  9. STANDARD RESPONSIBILITY NOTES, CONSULTANTS CERTIFICATION, AND SITE ANALYSIS ARE LOCATED ON THE EROSION & SEDIMENT CONTROL NOTES DRAWINGS.

SUSSEX COUNTY ENGINEERING DEPARTMENT

COUNTY ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_



**LOCATION MAP**  
NOT TO SCALE



© ADC, THE MAP PEOPLE, BY PERMISSION PUN # 09011200

**VICINITY MAP**  
NOT TO SCALE

**PRELIMINARY**

				FOR PERMIT SUBMITTAL NOT FOR CONSTRUCTION		 GHD Inc. 16701 Melford Boulevard, Suite 330, Bowie MD 20715 USA T 1 240 206 6810 F 1 240 206 6811 E bowmail@ghd.com W www.ghd.com		Drawn CTF Designer JM Drafting JFM Design Check BMG Approved (Project Director) KSG Date 06/2016		Client <b>CITY OF REHOBOTH BEACH, DELAWARE</b> Project <b>OCEAN OUTFALL PROJECT</b> Title <b>COVER SHEET</b> Contract No. _____ Original Size _____ <b>Ansi D Drawing No: 86-18693-G001</b>		Sheet 1 of 23 <b>Rev: A</b>	
<b>A</b>	<b>PERMIT SUBMITTAL</b>	CTF	BMG	KSG	06/16								
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date							

**LIST OF DRAWINGS**

Total	Dis.	Sht.	Drawing Title	
<b>GENERAL</b>				
1	G	001	COVER SHEET	
2	G	002	LIST OF DRAWINGS, ABBREVIATIONS, GENERAL NOTES, AND MISC. SYMBOLS	
<b>CIVIL</b>				
3	C	001	OVERALL SITE AND KEY PLAN	
4	C	002	OVERALL PROFILE	
5	C	003	PIPELINE PLAN AND PROFILE 1	
6	C	004	PIPELINE PLAN AND PROFILE 2	
7	C	005	PIPELINE PLAN AND PROFILE 3	
8	C	006	PIPELINE PLAN AND PROFILE 4	
9	C	007	PIPELINE PLAN AND PROFILE 5	
10	C	008	PIPELINE PLAN AND PROFILE 6	
11	C	101	STAGING AREA AND ESC PARTIAL PLAN 1	
12	C	102	EROSION AND SEDIMENT CONTROL NOTES	
13	C	103	EROSION AND SEDIMENT CONTROL DETAILS 1	
14	C	104	EROSION AND SEDIMENT CONTROL DETAILS 2	
15	C	105	PLANTING PLANS, NOTES AND DETAILS	
16	C	106	TRAFFIC CONTROL AND PIPE LAYDOWN AREA PLAN	
17	C	107	TRAFFIC CONTROL NOTES AND DETAILS	
18	C	201	MISCELLANEOUS CIVIL DETAILS 1	
<b>STRUCTURAL</b>				
19	S	001	STRUCTURAL GENERAL NOTES	
20	S	101	DIFFUSER SUPPORT STRUCTURE - ALTERNATE A PLAN AND ELEVATION	
21	S	102	DIFFUSER SUPPORT STRUCTURE - ALTERNATE B PLAN AND ELEVATION	
22	S	103	STRUCTURAL DETAILS	
<b>CORROSION PROTECTION</b>				
*	23	CP	001	CORROSION PROTECTION NOTES AND DETAILS
*	24	CP	002	CORROSION PROTECTION DETAILS
<b>MECHANICAL</b>				
24	M	101	DIFFUSER PLAN AND ELEVATION	

NOTE: \* DELINEATES DRAWINGS NOT INCLUDED IN THIS SUBMISSION

**GENERAL NOTES (APPLIES TO ALL DRAWINGS)**

- EXISTING CONDITIONS SHOWN ON THESE CONTRACT DRAWINGS WERE OBTAINED FROM FIELD SURVEY AND RECORD DRAWINGS AND THEREFORE THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING FIELD CONDITIONS.
- CONTRACTOR TO REPAIR AND RESTORE ANY ADJACENT ROADWAYS, DRIVEWAYS, CURB, SIDEWALKS, UTILITIES, STORM DRAINS, CULVERTS, SWALES, CLEANOUTS, STRUCTURES, EQUIPMENT, AND/OR SUBGRADE THAT IS EXPOSED, DISTURBED, OR OTHERWISE DAMAGED BY THE CONTRACTOR'S ACTIVITIES.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO LIMIT REMOVAL OF TREES AND OTHER VEGETATION. CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH CUTTING DOWN, REMOVAL, AND DISPOSAL OF ANY TREES AND VEGETATION, ALONG WITH THE COST ASSOCIATED WITH REPLACING ALL VEGETATION WITH SIMILAR SPECIES.
- EXISTING PAVEMENT SHALL BE PROTECTED FROM DAMAGE WHERE POSSIBLE. ANY DEMOLISHED OR DAMAGED PAVEMENT SHALL BE REPAIRED.
- ALL EXISTING PIPING, EQUIPMENT, AND STRUCTURES MUST BE FULLY SUPPORTED DURING CONSTRUCTION AGAINST VERTICAL, HORIZONTAL, AND OVERTURNING FORCES AND MOVEMENT.
- CONTRACTOR SHALL SUPPLY ALL BENDS REQUIRED TO MAINTAIN SMOOTH FLOW LINES, CHANGES IN ELEVATION AND TO MEET ALL TRANSITIONS.
- CONTRACTOR SHALL REPLACE ALL PARKING AREA PAVEMENT AND ROADWAYS THAT IS 1) SHOWN AS REPLACED ON THE DRAWINGS, 2) IMPACTED BY NEW CONSTRUCTION, AND 3) IMPACTED BY CONTRACTOR'S OPERATIONS.
- USE SUSSEX COUNTY DETAILS WHERE APPLICABLE UNLESS OTHERWISE NOTED.
- HYDROGRAPHIC SURVEY AND MARINE GEOTECHNICAL INFORMATION PROVIDED BY: FUGRO CONSULTANTS INC., 101 WEST MAIN STREET, SUITE 350, NORFOLK, VA 23510.
- LAND AND OCEAN BOTTOM CONTOURS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988. TIDAL INFORMATION SOURCE: NOAA STATION 8557380, LEWES DE (NAVD 88)
- BEACH TOPOGRAPHY BASED ON FIELD SURVEY BY: AXIOM ENGINEERING LLC PO BOX 1008, 18 CHESTNUT STREET, GEORGETOWN, DE 19947.
- GEOTECHNICAL INFO PROVIDED BY: JOHN D. HYNES & ASSOCIATES, INC., 32185 BEAVER RUN DR., SALISBURY, MARYLAND 21804.
- THE PLANS SHOW ALL KNOWN UTILITIES FOR THE CONTRACTOR'S CONVENIENCE. CONTRACTOR SHALL SOFT-DIG VERIFY ALL UTILITIES WITHIN 25 FEET OF THE PROPOSED INSTALLATION PRIOR TO CONSTRUCTION.
- NOTIFY "MISS UTILITY" TWO(2) FULL WORKING DAYS PRIOR TO THE DAY CONTRACTOR PLANS TO START WORK.
- ALL HDD ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH SPECIFICATION SECTION 02200 DIRECTIONAL DRILLING.
- THE EXISTING GRADE CONTOURS DISPLAYED BETWEEN STA 7+00 AND STA 10+50 ARE OUTSIDE THE LIMITS OF THE HYDROGRAPHIC SURVEY AND THE BEACH TOPOGRAPHY SURVEY. CONTOURS SHOWN BETWEEN THESE STATIONS ARE APPROXIMATED.
- CONTRACTOR TO MAINTAIN ACCESS TO ALL HOMES AND BUSINESS DURING CONSTRUCTION.

**GENERAL LEGEND**

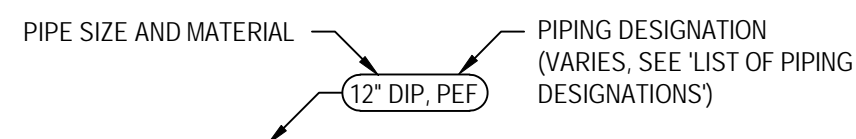
NEW GRAPHICS, EQUIPMENT, STRUCTURES, ETC., ARE SHOWN AS BOLD LINEWORK AND IN THIS TEXT FORMAT.

EXISTING GRAPHICS, EQUIPMENT, CONDITIONS, STRUCTURES, ETC. ARE SHOWN AS LIGHT LINEWORK AND IN THIS TEXT FORMAT.

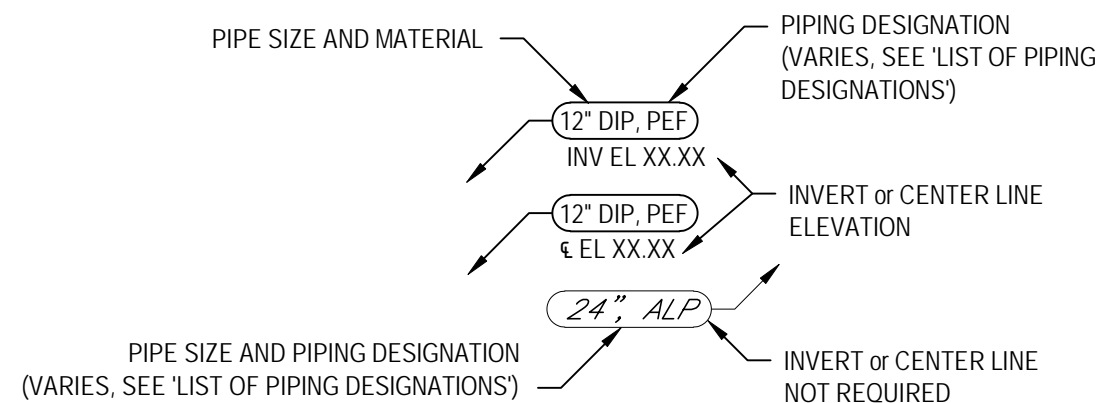
**EXISTING PIPE CALLOUT (FOR PLANS)**



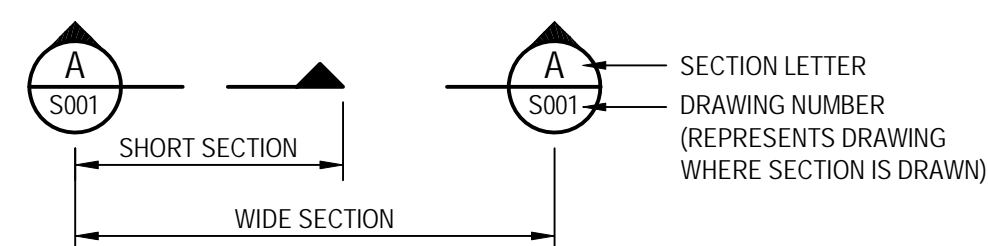
**NEW PIPE CALLOUT (FOR PLANS)**



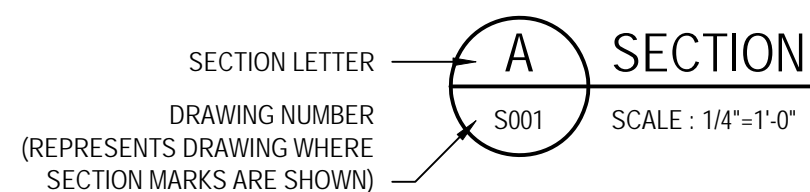
**NEW/EXIST PIPE CALLOUT (FOR PROFILES)**



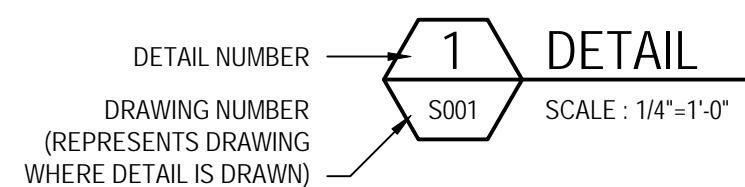
**TYPICAL SECTION MARKS (FOR PLANS)**



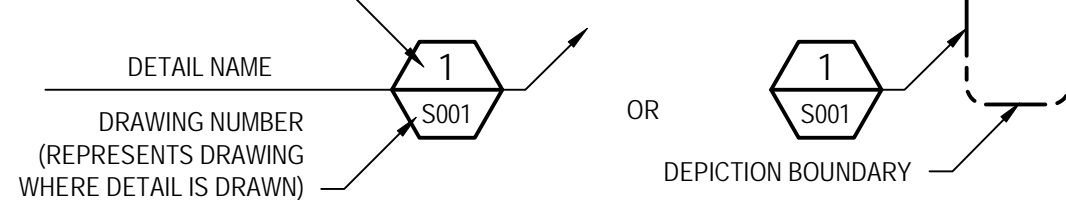
**TYPICAL SECTION SUB-TITLE (FOR SECTIONS)**



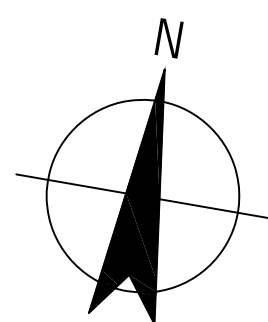
**TYPICAL DETAIL MARKS**



**TYPICAL DETAILING**



**NORTH ARROWS**



CIVIL DRAWINGS ONLY SHOW SURVEY NORTH

**CIVIL LEGEND**

	FENCE		PAVEMENT
	CONTOUR LINE		BUILDING
	OVERHEAD ELECTRICAL SERVICE LINES		GRAVEL PAVEMENT
	UNDERGROUND ELECTRICAL UTILITIES		SIDEWALK
	WOODS		>25% SLOPES
	PROPERTY LINE		15-25% SLOPES
	100 YEAR BASE FLOOD ELEVATION		RIPRAP
	CRITICAL AREA BOUNDARY		ELECTRICAL HANDHOLE
	SOIL DIVIDE LINE		DRAINAGE MANHOLE
	SOUND BUFFER		SANITARY MANHOLE
	LIMIT OF DISTURBANCE		LIGHT POLE
	WATER LINE		UTILITY POLE
	SANITARY SEWER		TREE
	ELECTRICAL LINE		CONE PENETRATION POINT
	CABLE LINE		V-4 VIBRACORE
	TELEPHONE LINE		SOIL BORING
	FORCE MAIN		CONSTRUCTION STAKEOUT POINT
	STORM DRAIN		FIRE HYDRANT
	LIMITS OF WORK		CATCH BASIN
	PIPE LAYDOWN AREA/LIMIT OF DISTURBANCE		SURVEY CONTROL POINT/MONUMENT (BENCHMARK)
	PIPE LAYDOWN AREA		CONCRETE WASHOUT STRUCTURE
	FOREST STAND		PROPOSED MANHOLE
	BEACH PRESERVATION BUILDING LINE		
	PROPERTY LINE		
	LIMIT OF HYDROGRAPHIC SURVEY		
	NON-TIDAL WATERWAY		
	STABILIZED CONSTRUCTION ENTRANCE		

**LIST OF ABBREVIATIONS**

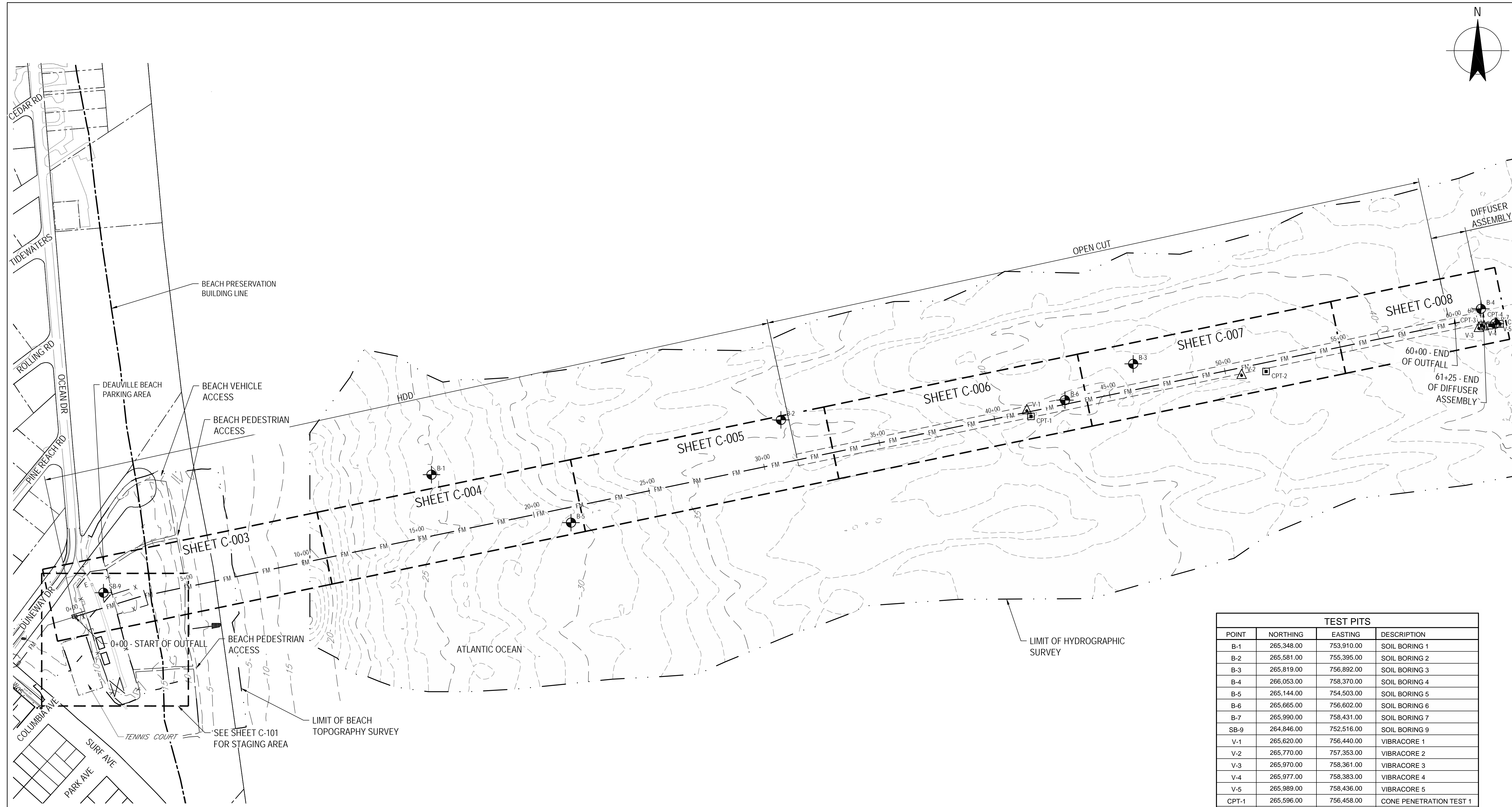
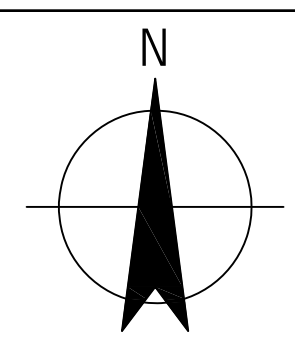
ARV	COMBINATION SEWAGE AIR/ VACUUM VALVE
CL	CENTER LINE
CONC	CONCRETE
CP	CONSTRUCTION POINTS
CV	CHECK VALVE
DELDOT	DELAWARE DEPARTMENT OF TRANSPORTATION
DIP	DUCTILE IRON PIPE
EL	ELEVATION
ELEC	ELECTRIC DUCTBANK
EPDM	ETHYLENE PROPYLENE DIENE MONOMER (M-CLASS) RUBBER
EX	EXISTING
FM	FORCE MAIN
HDD	HORIZONTAL DIRECTIONAL DRILL
HDPE	HIGH DENSITY POLYETHYLENE
MJ	MECHANICAL JOINT
PC	POINT OF CURVATURE
PHC	POINT OF HORIZONTAL CONTACT
PHT	POINT OF HORIZONTAL TANGENCY
PT	POINT OF INTERSECTION
PV	PLUG VALVE
PVC	POINT OF VERTICAL CONTACT OR POLYVINYL CHLORIDE
PVT	POINT OF VERTICAL TANGENCY
MH	MANHOLE
RP	ROAD CONSTRUCTION POINT
SAN	SANITARY SEWER
SD	STORM DRAIN
SS	STAINLESS STEEL
STD	STANDARD
STA	STATION
TEL	TELEPHONE CABLE
TM	TAX MAP
VERT	VERTICAL
Ø	DIAMETER

**LIST OF PIPING DESIGNATIONS**

ELEC	ELECTRICAL
FM	FORCE MAIN
GAS	GAS
TEL	TELEPHONE
SAN	SANITARY SEWER
SD	STORM DRAIN
W	WATER

**PRELIMINARY**

				FOR PERMIT SUBMITTAL NOT FOR CONSTRUCTION		 GHD Inc. 16701 Melford Boulevard, Suite 330, Bowie MD 20715 USA T 1 240 206 6810 F 1 240 206 6811 E bowmail@ghd.com W www.ghd.com		Drawn CTF	Designer BMG	Client Project Title	<b>CITY OF REHOBOTH BEACH, DELAWARE OCEAN OUTFALL PROJECT LIST OF DRAWINGS, ABBREVIATIONS, GENERAL NOTES, AND MISCELLANEOUS SYMBOLS</b>
								Drafting Check JFM	Design Check RJG	Contract No.	
								Approved (Project Director) KSG			Original Size
								Date 06/2016	This Drawing shall not be used for Construction unless Signed and Sealed For Construction		Scale AS NOTED
<b>A PERMIT SUBMITTAL</b>				CTF	BMG	KSG	06/16	Ansi D Drawing No: <b>86-18693-G002</b>		Sht 2 of 23 Rev: A	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date					

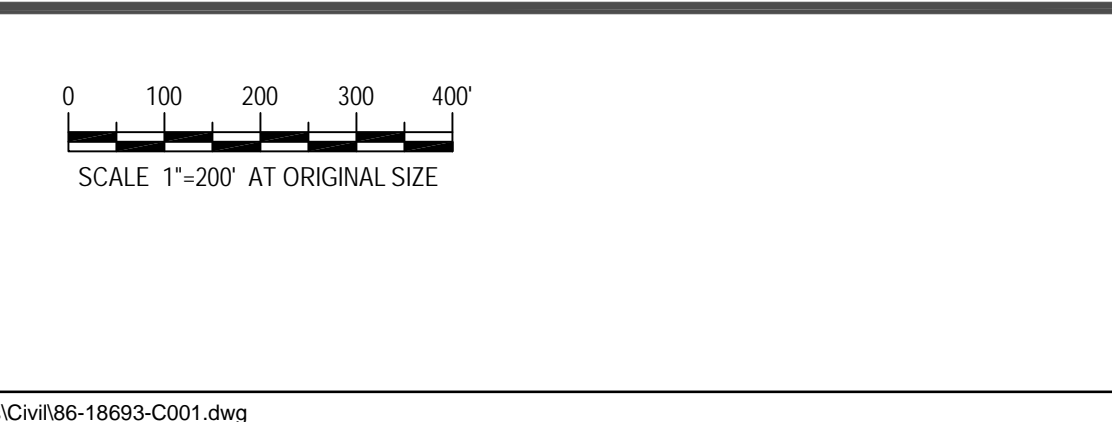


**KEY PLAN**  
SCALE 1"=200'-0"

TEST PITS			
POINT	NORTHING	EASTING	DESCRIPTION
B-1	265,348.00	753,910.00	SOIL BORING 1
B-2	265,581.00	755,395.00	SOIL BORING 2
B-3	265,819.00	756,892.00	SOIL BORING 3
B-4	266,053.00	758,370.00	SOIL BORING 4
B-5	265,144.00	754,503.00	SOIL BORING 5
B-6	265,665.00	756,602.00	SOIL BORING 6
B-7	265,990.00	758,431.00	SOIL BORING 7
SB-9	264,846.00	752,516.00	SOIL BORING 9
V-1	265,620.00	756,440.00	VIBRACORE 1
V-2	265,770.00	757,353.00	VIBRACORE 2
V-3	265,970.00	758,361.00	VIBRACORE 3
V-4	265,977.00	758,383.00	VIBRACORE 4
V-5	265,989.00	758,436.00	VIBRACORE 5
CPT-1	265,596.00	756,458.00	CONE PENETRATION TEST 1
CPT-2	265,787.00	757,457.00	CONE PENETRATION TEST 2
CPT-3	265,983.00	758,373.00	CONE PENETRATION TEST 3
CPT-4	265,982.00	758,408.00	CONE PENETRATION TEST 4
CPT-5	265,989.00	758,451.00	CONE PENETRATION TEST 5

**PRELIMINARY**

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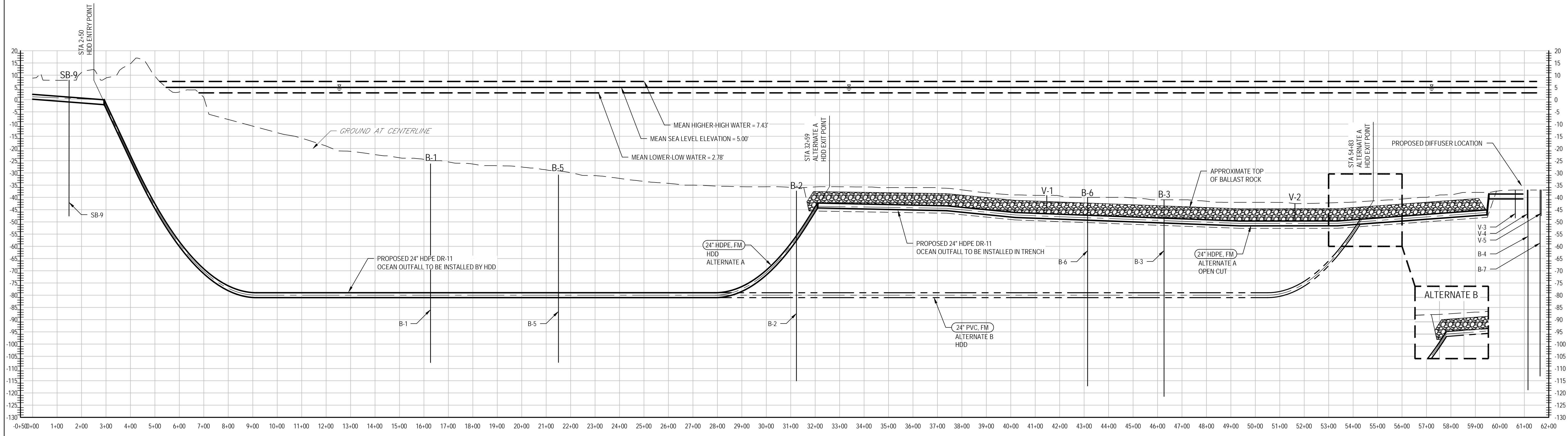
Drawn	CTF	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG		
Date	06/2016		
Scale	1" = 200'		

Client **CITY OF REHOBOTH BEACH, DELAWARE**  
Project **OCEAN OUTFALL PROJECT**  
Title **OVERALL SITE AND KEY PLAN**

Contract No. \_\_\_\_\_  
Original Size \_\_\_\_\_  
Ansi D Drawing No: **86-18693-C001**

This Drawing shall not be used for Construction unless Signed and Sealed For Construction

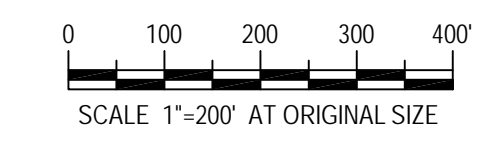
Sheet 3 of 23  
Rev: **A**



**OCEAN OUTFALL OVERALL PROFILE**  
 SCALE 1"=200'-0"  
 NOTE: SEE PLAN SHEETS FOR MORE DETAIL

**PRELIMINARY**

A PERMIT SUBMITTAL		CTF	BMG	KSG	06/16	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date



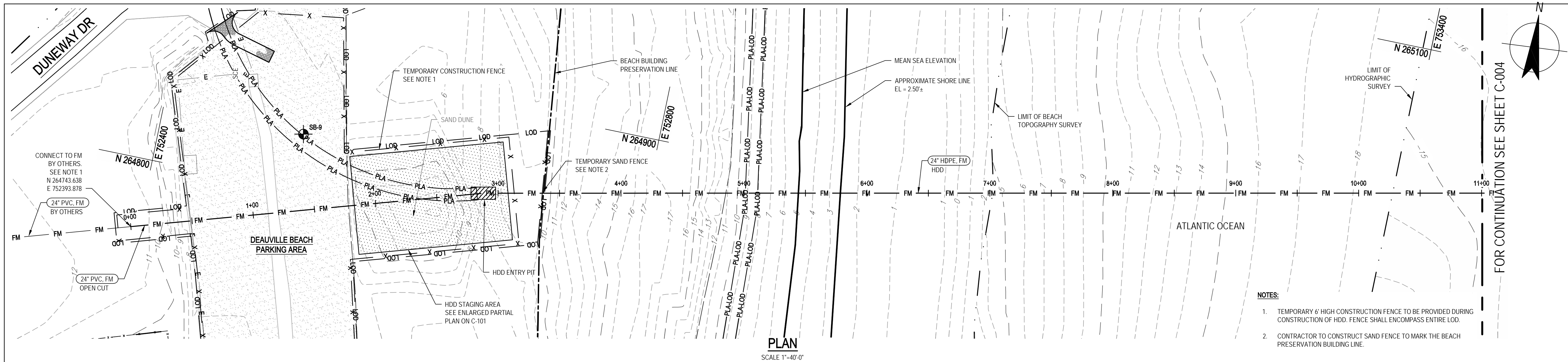
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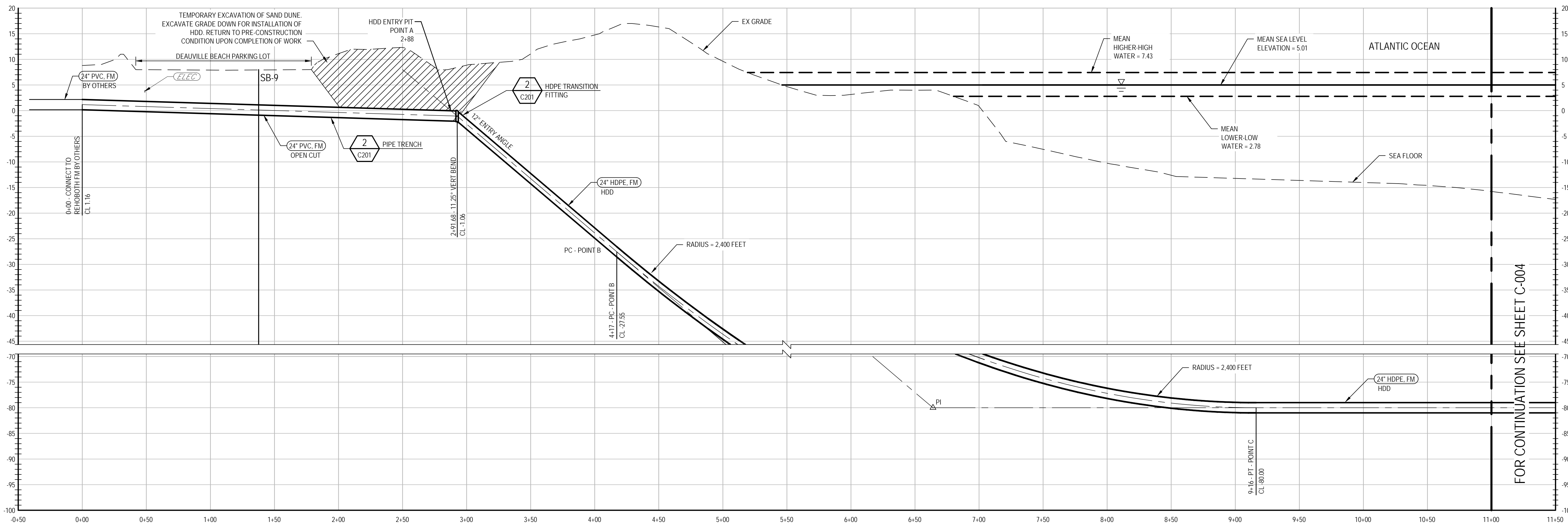
Drawn	CTF	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG		
Date	06/2016		
Scale	AS NOTED		

Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	OCEAN OUTFALL PROJECT		
Title	OVERALL PROFILE		
Contract No.	Original Size		
Original Size	Ansi D Drawing No: 86-18693-C002		
Sheet	4	of	23
Revision	A		



PLAN  
SCALE 1"=40'-0"

- NOTES:
- TEMPORARY 6' HIGH CONSTRUCTION FENCE TO BE PROVIDED DURING CONSTRUCTION OF HDD. FENCE SHALL ENCOMPASS ENTIRE LOD.
  - CONTRACTOR TO CONSTRUCT SAND FENCE TO MARK THE BEACH PRESERVATION BUILDING LINE.

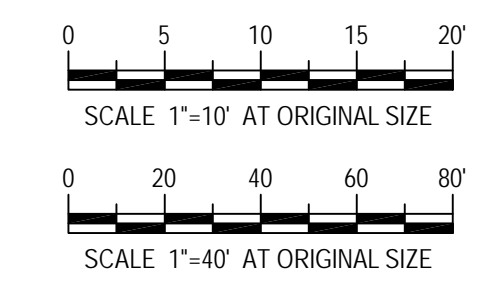


PROFILE  
VERT SCALE 1"=10'-0"  
HORZ SCALE: 1"=40'-0"

- NOTES:
- CONTRACTOR SHALL MAKE CONNECTION TO TREATED EFFLUENT PIPE AT THIS LOCATION UPON TESTING AND ACCEPTANCE. CONTRACTOR SHALL PROVIDE CAP OR PLUG FOR USE WITH SPECIFIED PIPE TO PROTECT PIPE DURING CONSTRUCTION.

**PRELIMINARY**

A PERMIT SUBMITTAL		CTF	BMG	KSG	06/16	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date



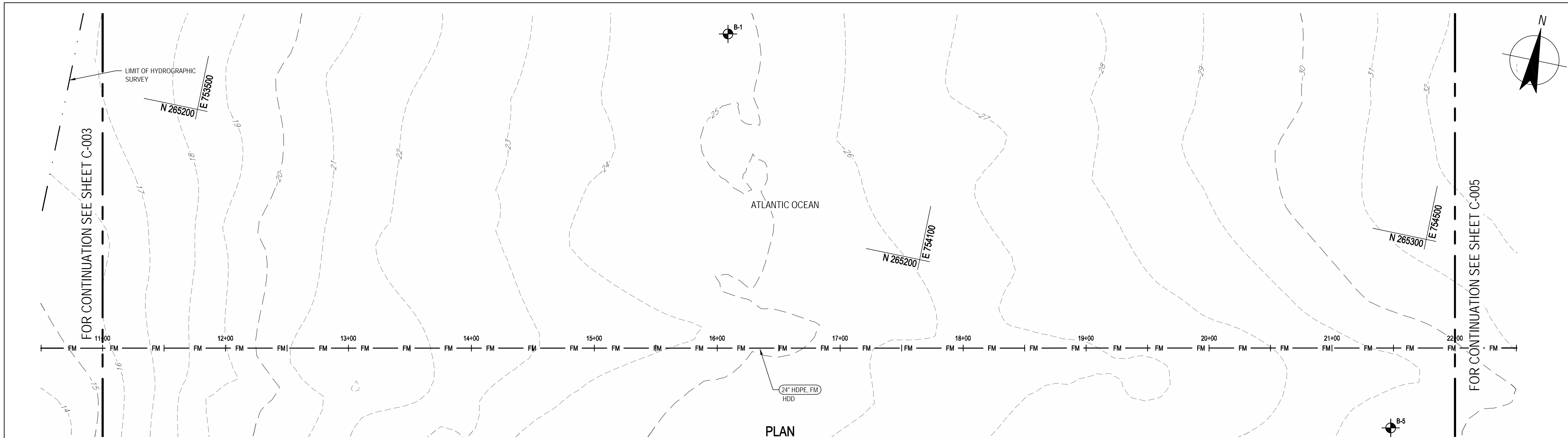
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NOT FOR CONSTRUCTION



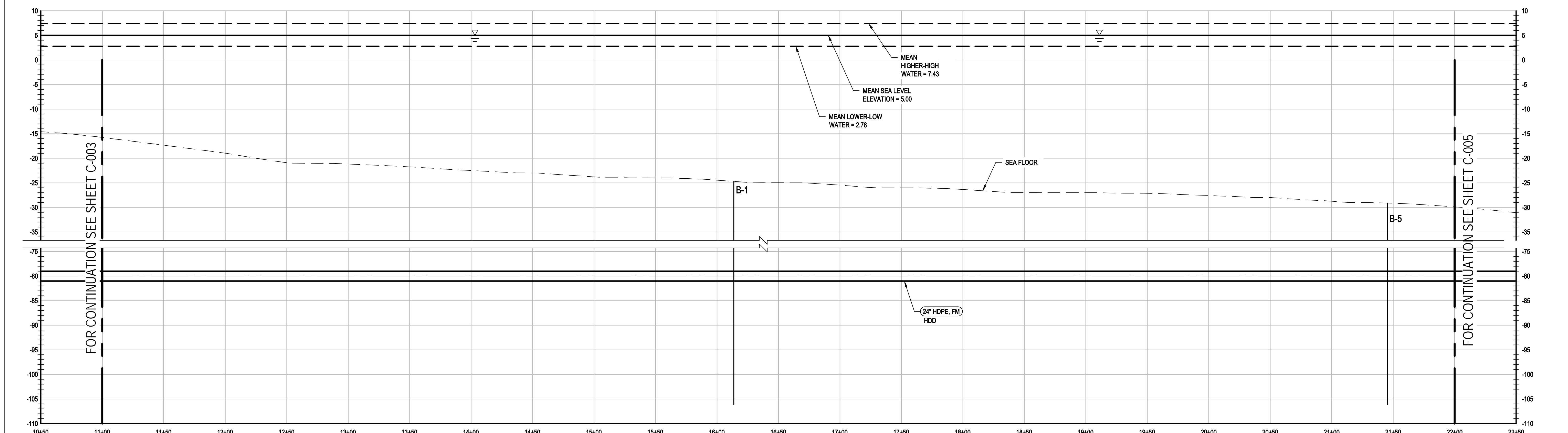
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Approved (Project Director)	KSG		
Date	06/2016		
Scale	AS NOTED		

Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	OCEAN OUTFALL PROJECT		
Title	PIPELINE PLAN AND PROFILE 1		
Contract No.	Original Size		
ANSI D	Drawing No:	86-18693-C003	
Sheet	5	of 23	
Revision	A		



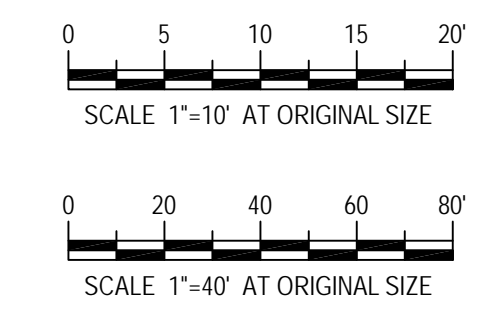
**PLAN**  
SCALE 1"=40'-0"



**PROFILE**  
VERT SCALE 1"=10'-0"  
HORZ SCALE: 1"=40'-0"

**PRELIMINARY**

A PERMIT SUBMITTAL		CTF	BMG	KSG	06/16
No	Revision	Drawn	Job Manager	Project Director	Date



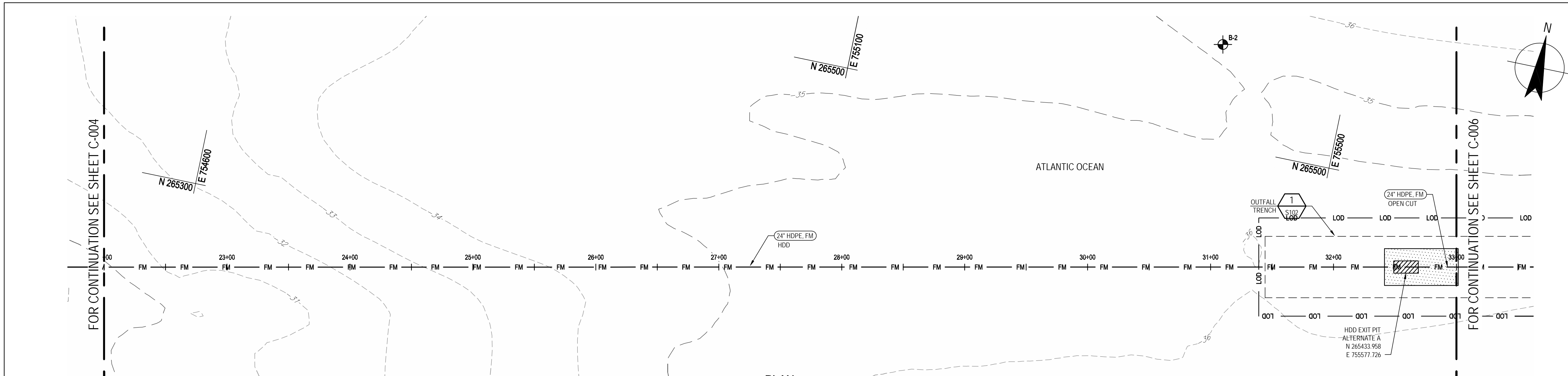
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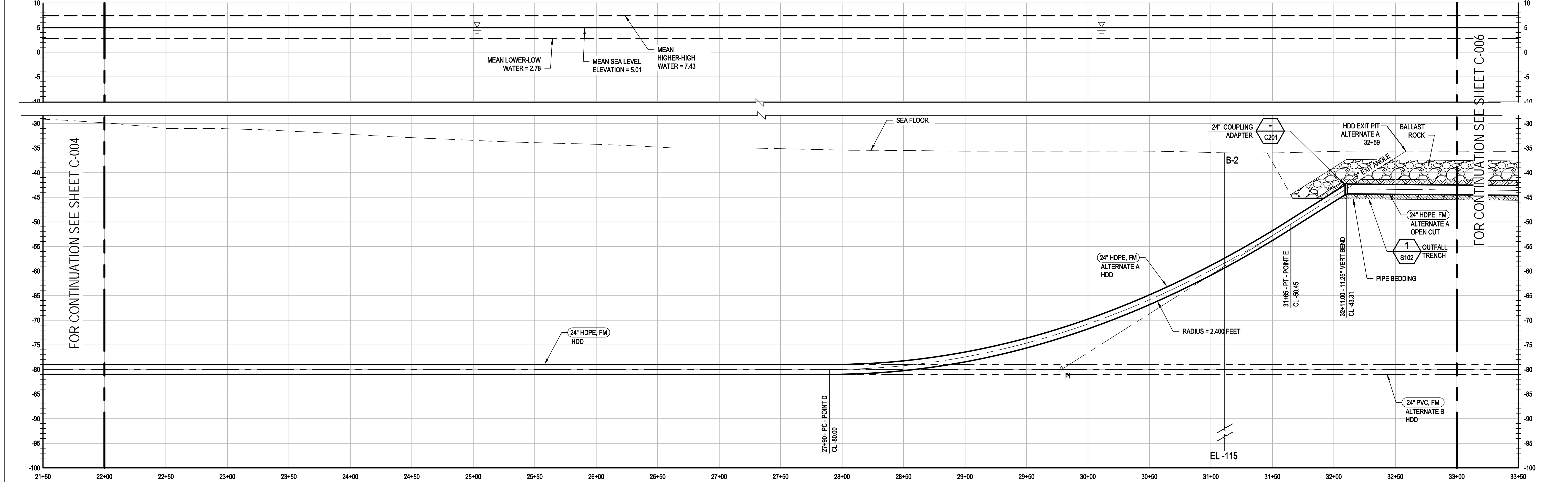
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Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG		
Date	06/2016		
Scale	AS NOTED		

Client	<b>CITY OF REHOBOTH BEACH, DELAWARE</b>		
Project	<b>OCEAN OUTFALL PROJECT</b>		
Title	<b>PIPELINE PLAN AND PROFILE 2</b>		
Contract No.	Original Size		
Original Size	Ansi D Drawing No: <b>86-18693-C004</b>		
Sheet	6	of	23
Revision	<b>Rev: A</b>		



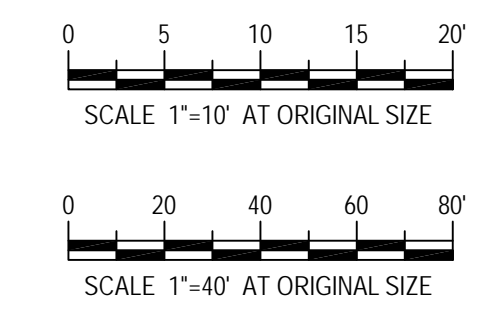
**PLAN**  
SCALE 1"=40'-0"



**PROFILE**  
VERT SCALE 1"=10'-0"  
HORZ SCALE: 1"=40'-0"

**PRELIMINARY**

A PERMIT SUBMITTAL		CTF	BMG	KSG	06/16
No	Revision	Drawn	Job Manager	Project Director	Date



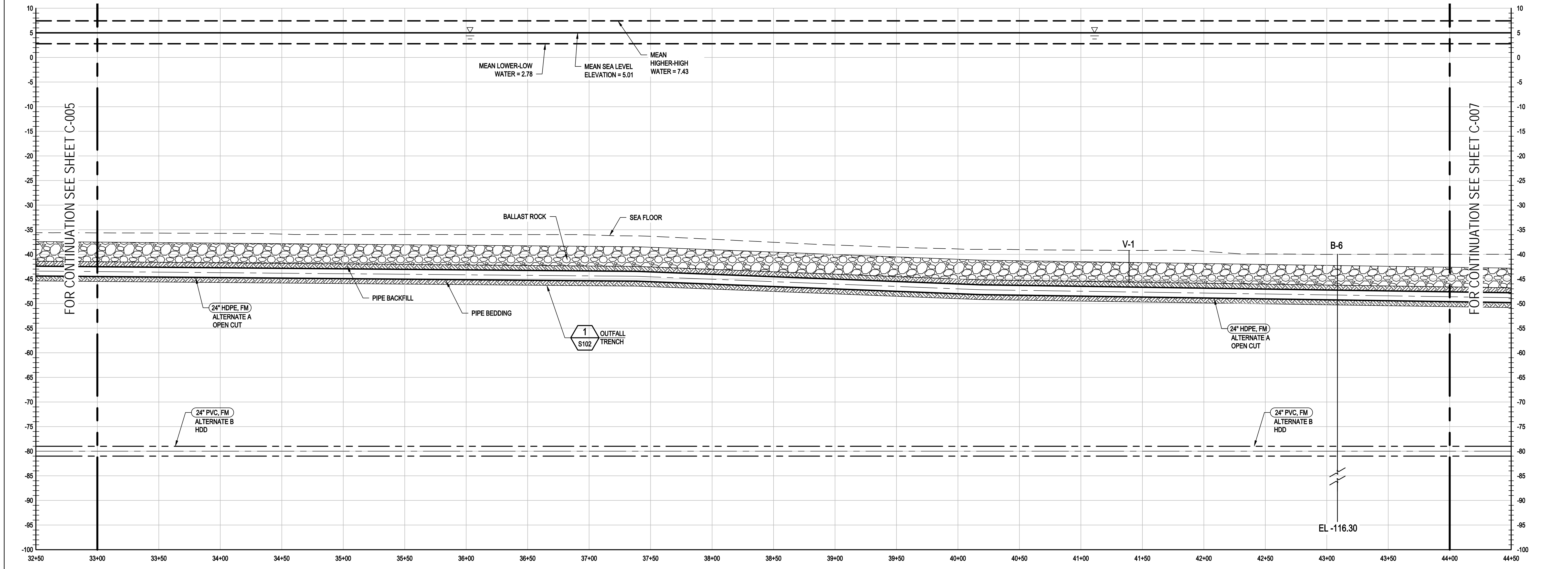
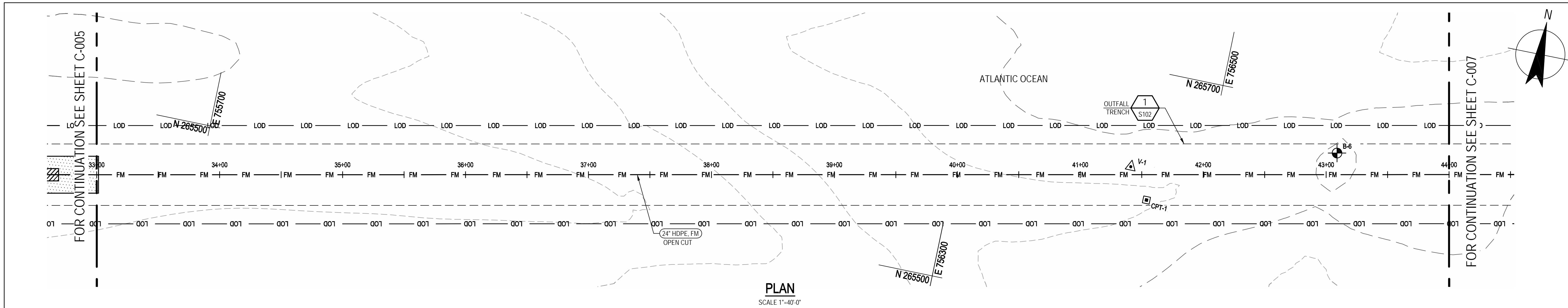
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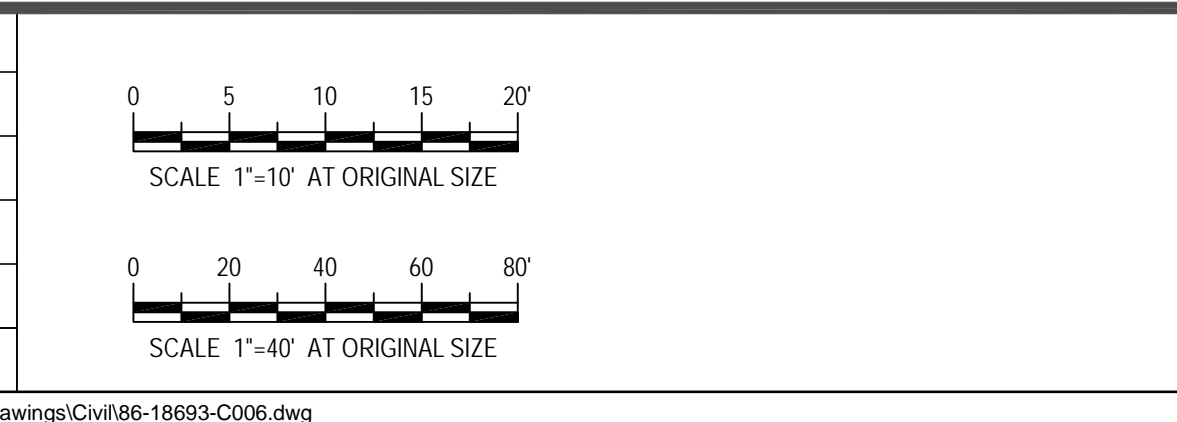
Drawn CTF	Designer JM
Drafting Check JFM	Design Check BMG
Approved (Project Director) KSG	
Date 06/2016	
Scale AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction

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Project	<b>OCEAN OUTFALL PROJECT</b>
Title	<b>PIPELINE PLAN AND PROFILE 3</b>
Contract No.	
Original Size	
<b>Ansi D</b>	<b>Drawing No: 86-18693-C005</b>
Sheet	7 of 23
Rev:	<b>A</b>



**PRELIMINARY**

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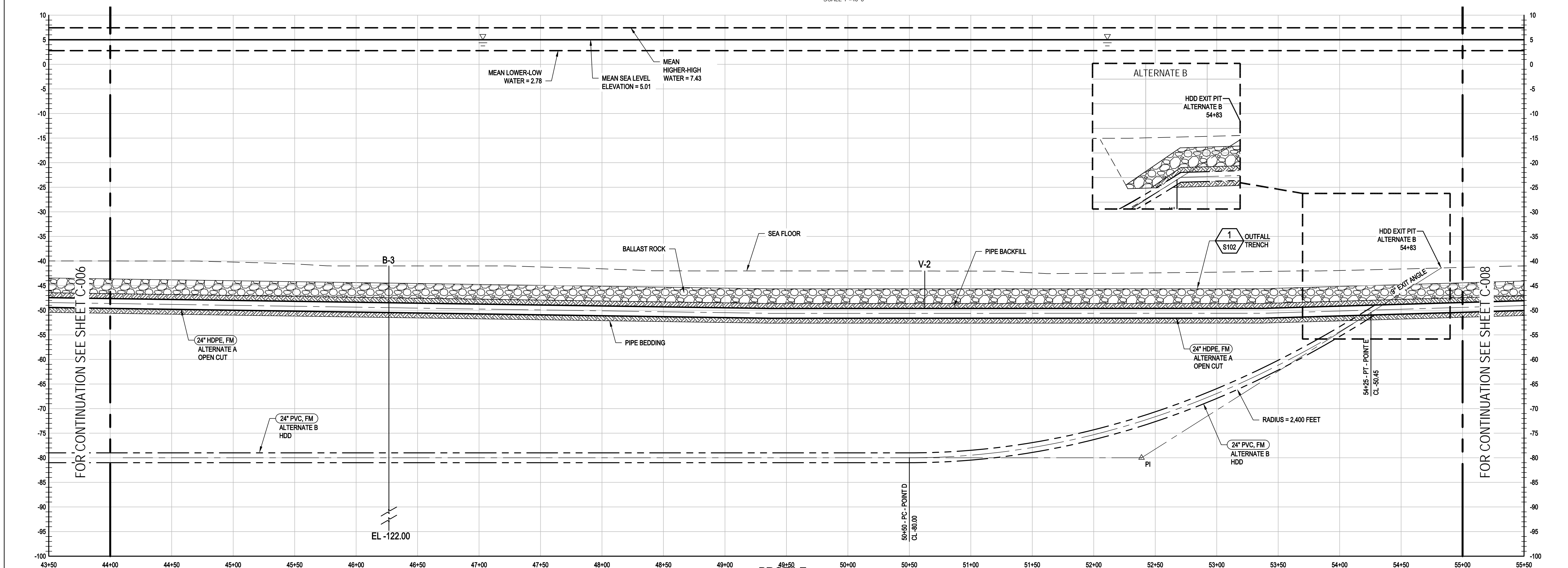
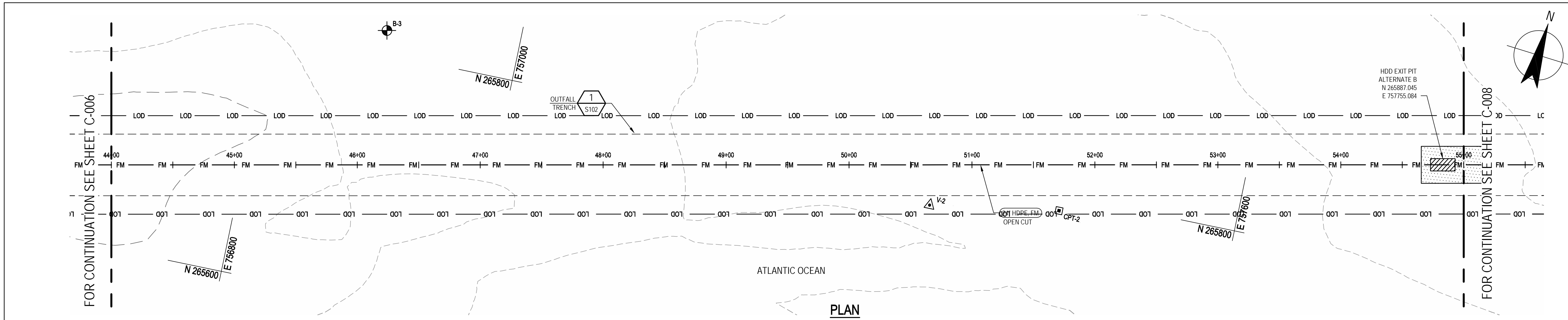
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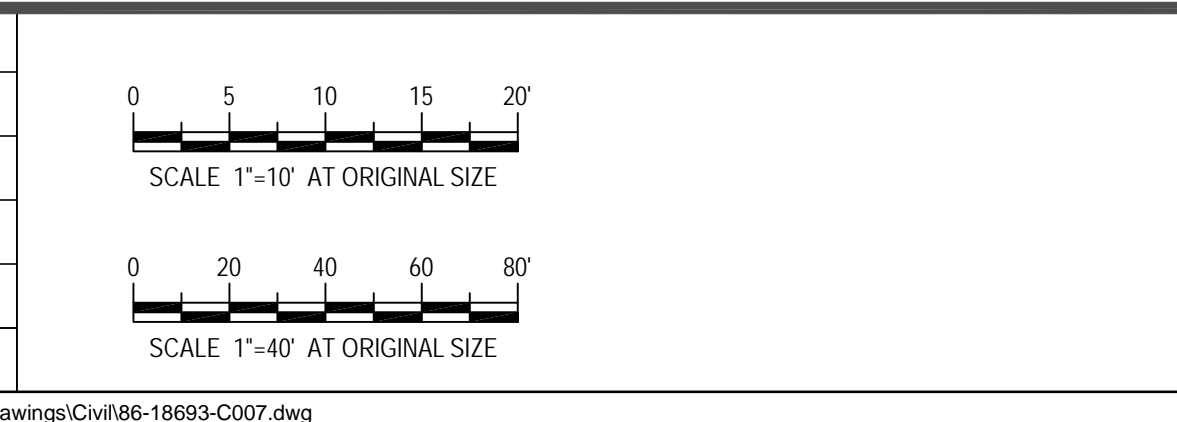
Client	<b>CITY OF REHOBOTH BEACH, DELAWARE</b>		
Project	<b>OCEAN OUTFALL PROJECT</b>		
Title	<b>PIPELINE PLAN AND PROFILE 4</b>		
Contract No.	Original Size		
Original Size	Ansi D Drawing No: <b>86-18693-C006</b>		
Sheet	8	of	23
Revision	<b>Rev: A</b>		





**PROFILE**  
 VERT SCALE 1"=10'-0"  
 HORZ SCALE: 1"=40'-0"

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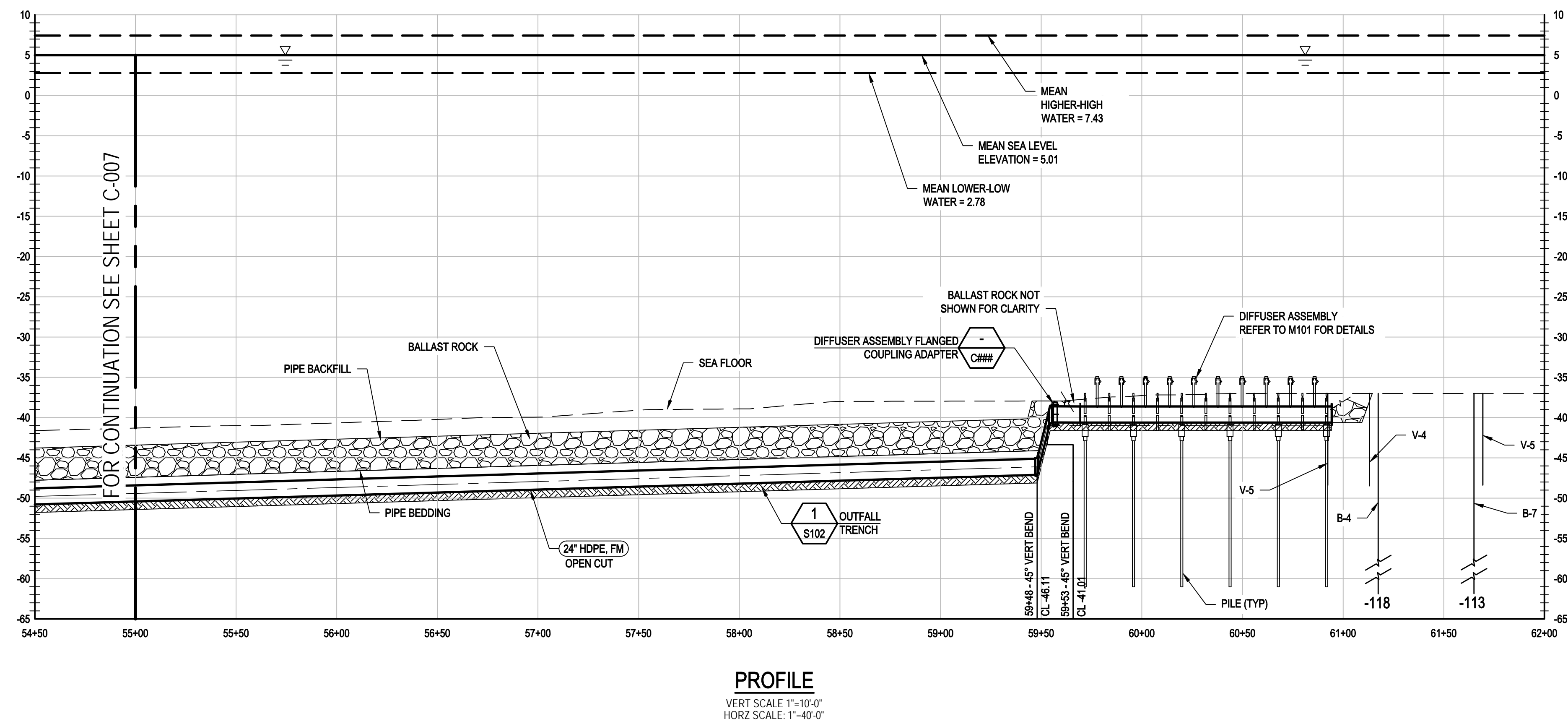
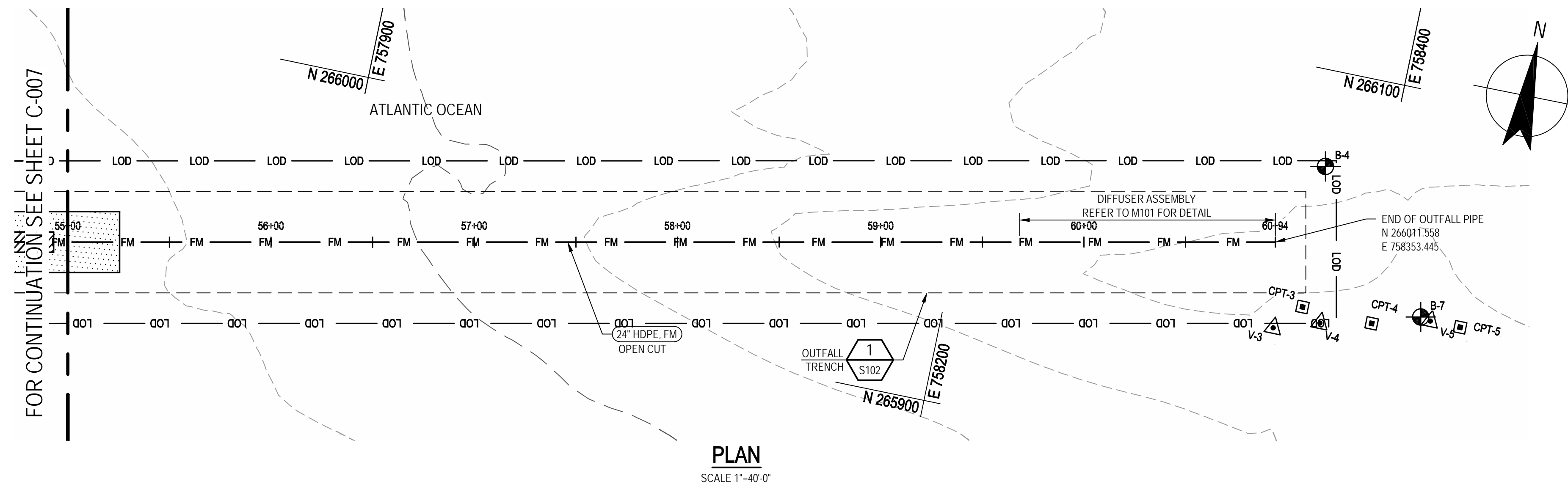
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Scale	AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

Client **CITY OF REHOBOTH BEACH, DELAWARE**  
 Project **OCEAN OUTFALL PROJECT**  
 Title **PIPELINE PLAN AND PROFILE 5**

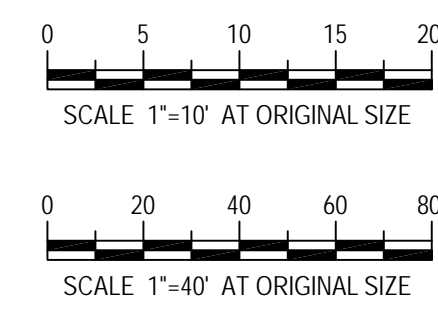
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 Original Size \_\_\_\_\_  
 Ansi D Drawing No: **86-18693-C007**

Sheet 9 of 23  
 Rev: A



**PRELIMINARY**

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
A	PERMIT SUBMITTAL		CTF	BMG	KSG	06/16

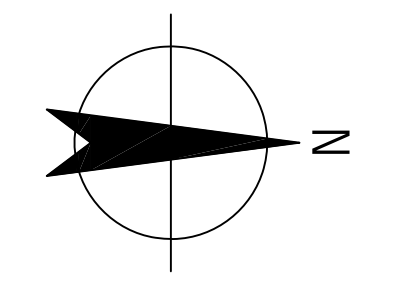
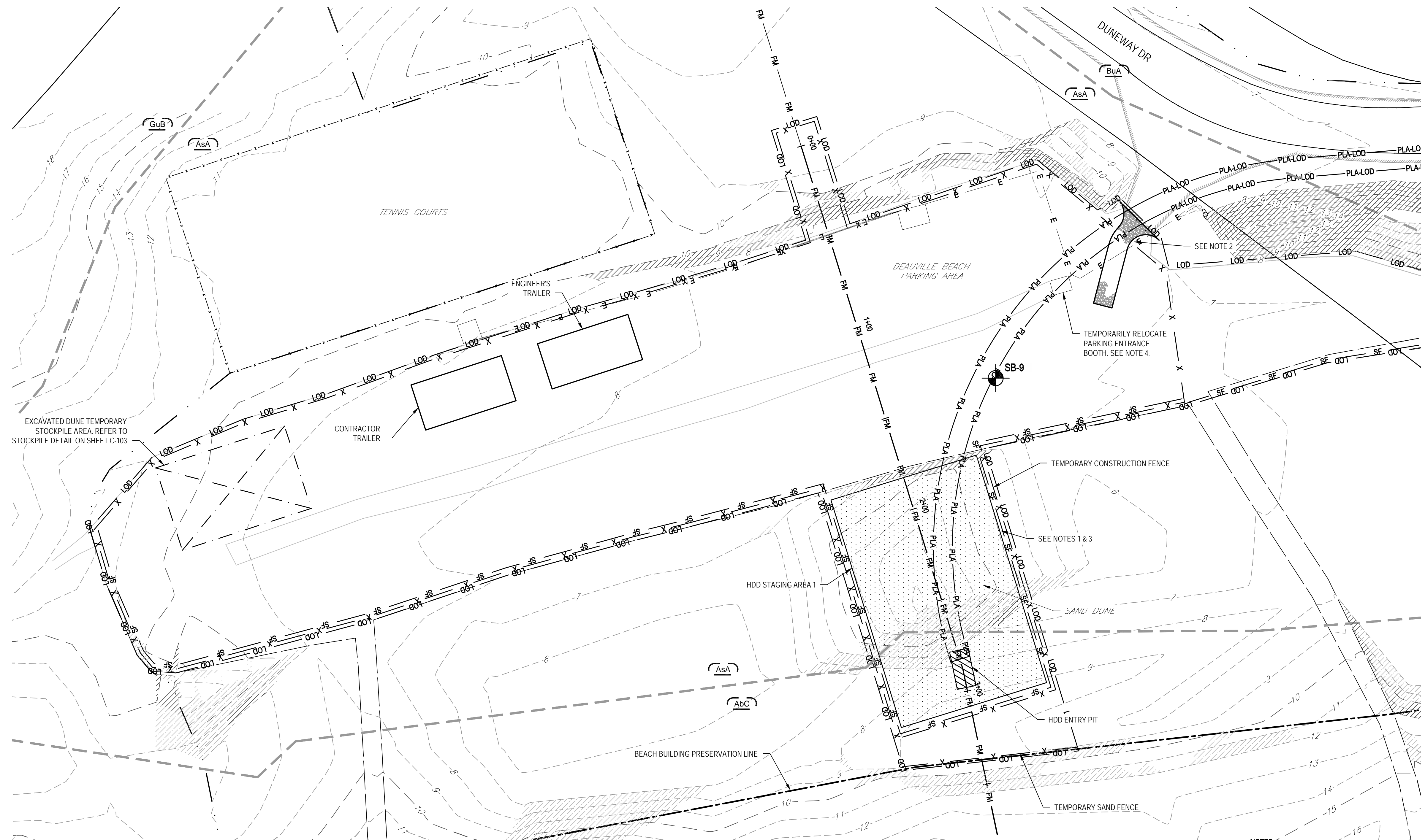


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Client	<b>CITY OF REHOBOTH BEACH, DELAWARE</b>		
Project	<b>OCEAN OUTFALL PROJECT</b>		
Title	<b>PIPELINE PLAN AND PROFILE 6</b>		
Contract No.	Original Size		
Scale	This Drawing shall not be used for Construction unless Signed and Sealed For Construction		
Sheet	Drawing No: <b>86-18693-C008</b>		10 of 23
Revision	<b>Rev: A</b>		



**HDD STAGING/ STOCK PILE AREA 1/EROSION AND SEDIMENT CONTROL PARTIAL PLAN**

SCALE 1"=30'-0"

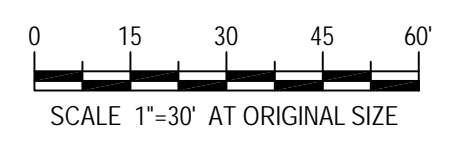
**LEGEND:**

	SOIL TYPE
	15% - 25% SLOPE
	>25% SLOPE
	LIMIT OF DISTURBANCE
	SILT FENCE
	STABILIZED CONSTRUCTION ENTRANCE

- NOTES:**
- CONTRACTOR SHALL REPLACE DUNE TO PRE-EXISTING GRADE AND RE-VEGETATE. REFER TO SHEET C105 FOR PLANTING PLAN.
  - CONTRACTOR SHALL PROVIDE TEMPORARY GATE WITH DOUBLE PADLOCKS.
  - ALL EXCAVATED MATERIAL FROM THIS AREA SHALL REMAIN ONSITE AND BE STOCKPILED AND PROTECTED FOR SITE RESTORATION. NO SAND FROM DUNE AREAS SHALL BE PERMITTED TO LEAVE SITE.
  - PARKING ENTRANCE BOOTH SHALL BE TEMPORARILY RELOCATED TO FACILITATE CONSTRUCTION. CONTRACTOR TO RETURN BOOTH TO ORIGINAL LOCATION AND CONDITION UPON COMPLETION OF WORK.

**PRELIMINARY**

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Approved (Project Director)	KSG	Date	06/2016
Scale	1" = 30'		

Client	<b>CITY OF REHOBOTH BEACH, DELAWARE</b>		
Project	<b>OCEAN OUTFALL PROJECT</b>		
Title	<b>HDD STAGING AREA AND EROSION AND SEDIMENT CONTROL PARTIAL PLAN</b>		
Contract No.	Original Size		
Original Size	ANSI D	Drawing No:	<b>86-18693-C101</b>
Sheet	11	of	23
Revision	<b>Rev: A</b>		



**Standard Detail & Specifications**  
**Silt Fence**

**Section**

Min. 40" stake length  
Reinforcing strip over geosynthetic fabric (typ., each stake)  
Flow  
Embed fabric min. 6" vertically into ground  
Min. 24" stake length above ground  
Min. 16" stake length driven into ground

**Plan**

Ends placed upslope to contain runoff  
6' Max.  
2" X 2" wooden post (Typ.)  
DATA  
Max. controlled slope

Source: Adapted from MD Stds. & Specs. for ESC  
Symbol: **SF**  
Detail No. **DE-ESC-3.1.2.1**  
Sheet 1 of 2  
Date: 6/05

**Standard Detail & Specifications**  
**Silt Fence**

**Construction Detail**

Posts  
Staple  
Section A  
Section B  
Staple  
Top

Method for joining continuous sections

**Construction Notes:**

- Geosynthetic fabric to be fastened securely to fence posts with wire ties or staples.
- When two sections of filter cloth adjoin each other they shall be overlapped by six inches and folded.
- Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.

**Materials:**

- Stakes: Steel (either T or U) or 2" x 2" hardwood
- Geosynthetic Fabric: Type GD-1
- Reinforcing strip: Wooden lath, plastic strip or other approved equivalent
- Prefabricated Unit: Geofab, Envirofence, or approved equivalent

Source: Adapted from MD Stds. & Specs. for ESC  
Symbol: **SF**  
Detail No. **DE-ESC-3.1.2.1**  
Sheet 2 of 2  
Date: 6/05

**Standard Detail & Specifications**  
**Construction Site Waste Mgt & Spill Control**

**Notes:**

The Construction Site Pollution Prevention Plan should include the following elements:

- Material Inventory**  
Document the storage and use of the following materials:
  - Concrete
  - Detergents
  - Paints (enamel and latex)
  - Cleaning solvents
  - Pesticides
  - Wood scraps
  - Fertilizers
  - Petroleum based products
- Good housekeeping practices**
  - Store only enough product required to do the job.
  - All materials shall be stored in a neat, orderly manner in their original labeled containers and covered.
  - Substances shall not be mixed.
  - When possible, all of a product shall be used up prior to disposal of the container.
  - Manufacturers' instructions for disposal shall be strictly adhered to.
  - The site foreman shall designate someone to inspect all BMPs daily.
- Waste management practices**
  - All waste materials shall be collected and stored in securely lidded dumpsters in a location that does not drain to a waterbody.
  - Waste materials shall be salvaged and/or recycled whenever possible.
  - The dumpsters shall be emptied a minimum of twice per week, or more if necessary. The licensed trash hauler is responsible for cleaning out dumpsters.

Source: Adapted from USEPA Pub. 840-B-92-002  
Symbol: **SF**  
Detail No. **DE-ESC-3.6.1**  
Sheet 3 of 5  
Date: 03/13

**Standard Detail & Specifications**  
**Construction Site Waste Mgt & Spill Control**

**Notes (cont.)**

- Trash shall be disposed of in accordance with all applicable Delaware laws.
- Trash cans shall be placed at all lunch spots and littering is strictly prohibited. Recycle bins shall be placed near the construction trailer.
- If fertilizer bags can not be stored in a weather-proof location, they shall be kept on a pallet and covered with plastic sheeting which is overlapped and anchored.

- Equipment maintenance practices**
  - If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
  - If performed on-site, vehicles shall be washed with high-pressure water spray without detergents in an area contained by an impervious berm.
  - Drip pans shall be used for all equipment maintenance.
  - Equipment shall be inspected for leaks on a daily basis.
  - Washout from concrete trucks shall be disposed of in a temporary pit for hardening and proper disposal.
  - Fuel nozzles shall be equipped with automatic shut-off valves.
  - All used products such as oil, antifreeze, solvents and tires shall be disposed of in accordance with manufacturers' recommendations and local, state and federal laws and regulations.
- Spill prevention practices**
  - Potential spill areas shall be identified and contained in covered areas with no connection to the storm drain system.
  - Warning signs shall be posted in hazardous material storage areas.
  - Preventive maintenance shall be performed on all tanks, valves, pumps, pipes and other equipment as necessary.
  - Low or non-toxic substances shall be prioritized for use.

Source: Adapted from USEPA Pub. 840-B-92-002  
Symbol: **SF**  
Detail No. **DE-ESC-3.6.1**  
Sheet 4 of 5  
Date: 03/13

**Standard Detail & Specifications**  
**Construction Site Waste Mgt & Spill Control**

**Notes (cont.)**

- Contact information for reporting spills through the DNREC 24-Hour Toll Free Number shall be prominently posted.

- Education**
  - Best management practices for construction site pollution control shall be a part of regular progress meetings.
  - Information regarding waste management, equipment maintenance and spill prevention shall be prominently posted in the construction trailer.

**CONTACT INFORMATION**

**DNREC 24-Hour Toll Free Number** 800-662-8802  
**DNREC Solid & Hazardous Waste Branch** 302-739-9403

Source: Adapted from USEPA Pub. 840-B-92-002  
Symbol: **SF**  
Detail No. **DE-ESC-3.6.1**  
Sheet 5 of 5  
Date: 03/13

**Standard Detail & Specifications**  
**Soil Stockpile**

**Plan View**

DATA TO BE PROVIDED  
Max. Height, h  
Stockpile entrance to be located on the upslope side, if needed  
3' separation (min.)  
Perimeter Control (i.e., Silt fence)

**Section A-A**

Stabilize per temporary vegetation specifications  
Max. height 20' (10' on residential lot)  
1 max.  
Install perimeter control per specification

Source: Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3  
Symbol: **SP**  
Detail No. **DE-ESC-3.7.3**  
Sheet 1 of 2  
Date: 03/13

**Standard Detail & Specifications**  
**Soil Stockpile**

**Construction Notes:**

- Locate stockpiles so that they are 50 feet from any storm drain inlet, open channel, wetland or waterbody. Redirect any concentrated flow around the stockpile using an approved erosion and sediment control measure.
- Secure the perimeter of the stockpile with an approved erosion and sediment control perimeter device.
- If stockpile is to remain inactive for more than 14 calendar days, the stockpile must be vegetated. Follow the temporary vegetation specifications. The vegetation chosen shall last the duration of the stockpile; the stockpile shall be restabilized if the temporary vegetation dies or erosion results.

Source: Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3  
Symbol: **SP**  
Detail No. **DE-ESC-3.7.3**  
Sheet 2 of 2  
Date: 03/13

**Standard Detail & Specifications**  
**Sensitive Area Protection**

**Location of Sensitive Area Protection**

Drip line  
Protective device  
Limit of disturbance  
Proposed grading  
Min.  
5' min. setback applies to all sensitive areas covered by this specification.

**Methods of Sensitive Area Protection**

Drip line  
Snow fence  
Board fence  
Cord fence  
Plastic fence

Source: Adapted from VA ESC Handbook  
Symbol: **SAP**  
Detail No. **DE-ESC-3.7.2**  
Sheet 1 of 3  
Date: 03/13

**Standard Detail & Specifications**  
**Sensitive Area Protection**

**Construction Notes:**

Fencing shall be installed at the extents of all sensitive areas. For trees, the fencing shall be installed outside the dripline (mature canopy) and at no time within 5 feet of the trunk. Personnel must be instructed to honor protective devices. The devices described are suggested only, and are not intended to exclude the use of other devices which will protect the trees to be retained. If silt fence is to be used for demarcation purposes, appropriate signage shall be provided a minimum of every 20 feet denoting the area as a sensitive area protection zone.

**Materials:**

- Snow Fence - Standard 40-inch high snow fence shall be placed at the limits of clearing or construction on standard steel posts set 6 feet apart.
- Board Fence - Board fencing consisting of 4-inch square posts set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with a minimum of two horizontal boards between posts. For tree protection, if it is not practical to erect a fence at the drip line, construct a triangular fence nearer the trunk. The limits of clearing will still be located at the drip line, since the root zone within the drip line will still require protection.
- Plastic Fencing - 40-inch high "international orange" plastic (polyethylene) web fencing secured to conventional metal "T" or "U" posts driven to a minimum depth of 18 inches on 6-foot minimum centers shall be installed at the limits of clearing. The fence should have the following minimum physical qualities:
  - Tensile yield: Average 2,000 lbs. per 4-foot width (ASTM D638)
  - Ultimate tensile yield: Average 2,900 lbs. per 4-foot width (ASTM D638)
  - Elongation at break (%): Greater than 1000% (ASTM D638)
  - Chemical resistance: Inert to most chemicals and acids

Source: Adapted from VA ESC Handbook  
Symbol: **SAP**  
Detail No. **DE-ESC-3.7.2**  
Sheet 2 of 3  
Date: 03/13

**Standard Detail & Specifications**  
**Sensitive Area Protection**

- Cord Fence - Posts with a minimum size of 2 inches square or 2 inches in diameter set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with two rows of cord 1/4-inch or thicker at least 2 feet apart running between posts with strips of colored surveyor's flagging tied securely to the string at intervals no greater than 3 feet.
- Earth Berms - Temporary earth berms shall be constructed according to specifications for a Temporary Earth Dike with the base of the berm on the sensitive area side located along the limits of clearing. Earth berms may not be used for this purpose if their presence will conflict with drainage patterns.
- Trunk Armoring (Tree Protection Only) - As a last resort, a tree trunk can be armored with burlap wrapping and 2-inch studs wired vertically no more than 2 inches apart to a height of 5 feet encircling the trunk. If this alternative is used, the root zone within the drip line will still require protection. Nothing should ever be nailed to a tree.

**Maintenance:**

Fencing and armoring devices shall be in place before any excavation or grading is begun, shall be kept in good repair for the duration of construction activities, and shall be the last items removed during the final cleanup after the completion of the project.

Source: Adapted from VA ESC Handbook  
Symbol: **SAP**  
Detail No. **DE-ESC-3.7.2**  
Sheet 3 of 3  
Date: 03/13

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Approved (Project Director)	KSG		
Date	06/2016		
Scale	NTS		

Client Project	CITY OF REHOBOTH BEACH, DELAWARE OCEAN OUTFALL PROJECT		
Title	EROSION AND SEDIMENT CONTROL DETAILS 1		
Contract No.	Original Size Ansi D Drawing No: 86-18693-C103		

Sheet	13	of	23
Rev:	A		

PRELIMINARY

### Standard Detail & Specifications Vegetative Stabilization

Mix #	Species <sup>5</sup>	Seeding Rate	Optimum Seeding Dates <sup>1</sup>			Planting Depth <sup>2</sup>
			Coastal Plain	Piedmont	All	
1	Barley	125 4	O	A	O	1-2 inches
2	Oats	125 4	O	A	A	2-3" sandy soils
3	Rye	125 4	O	A	O	1-2 inches
4	Perennial Ryegrass	125 4	O	A	O	2-3" sandy soils
5	Annual Ryegrass	125 4	O	A	O	0.5 inches
6	Winter Wheat	125 4	O	A	O	1-2 inches
7	Foxtail Millet	30 PLS 0.7	O			0.5 inches
8	Pearl Millet	70 PLS 0.5	O			1-2" sandy soils

1. Winter seeding requires 3 tons per acre of straw mulch for proper stabilization.  
 2. May be planted throughout summer if soil moisture is adequate or seeded area is irrigated.  
 3. Applicable on slopes 3:1 or less.  
 4. Fifty pounds per acre of Annual Lespedeza may be added to 1/2 the seeding rate of any of the above species.  
 5. Use varieties currently recommended for Delaware. Contact a County Extension Office for information.  
 6. Warm season grasses such as Millet or Weeping Lovegrass may be used between 5/1 and 9/1 if desired. Seed at 3-5 lbs. per acre. Good on low fertility and acid areas. Seed after frost through summer at a depth of 0.5".

Source: Delaware ESC Handbook  
 Symbol: **CFL**  
 Detail No. **DE-ESC-3.4.3**  
 Sheet 1 of 4  
 Date: 12/03

### Standard Detail & Specifications Vegetative Stabilization

Mix No.	Certified Seed <sup>1</sup>	Seeding Rate <sup>2</sup>	Optimum Seeding Dates <sup>3</sup>			Remarks
			Coastal Plain	Piedmont	All <sup>4</sup>	
1	Well Drained Soils	140 3.2	A	O	A	Good erosion control mix. Tolerant of low fertility soils. Longgrass very difficult to mow. Generations only in best weather.
2	Downy Fescue Sheep Fescue Common Lespedeza <sup>5</sup>	30 0.69 30 0.69 15 0.35	A	O	A	Good erosion control mix. Tolerant of low fertility soils. Good wildlife cover and food.
3	Fall Fescue (Turf-type) String Creeping Red Fescue or Perennial Ryegrass plus Phacelia <sup>6</sup>	50 1.15 50 1.15 50 1.15 15 0.34	O	A	O	Good erosion control mix. Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Phacelia to suppress woody vegetation.
4	String Creeping Red Fescue Kentucky Bluegrass Perennial Ryegrass or Ryegrass plus White Clover <sup>7</sup>	100 2.3 70 1.61 15 0.35 5 0.11 3 0.07	O	A	O	Subsist wet/dry mix. Canada Bluegrass more drought tolerant. Use Ryegrass for increased drought tolerance.
5	Swinggrass <sup>8</sup> or Coastal Panicgrass Big Bluestem <sup>9</sup> Little Bluestem <sup>10</sup> Indian Grass	10 0.23 10 0.23 5 0.11 5 0.11 5 0.11	O		O	Native warm-season mixtures. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N-fixing (leguminous) species.
6	Fall Fescue (turf-type) Blend of 3 cultivars	100 3.5 20 0.46 20 0.46	O	O	A	Managed fair strip for nurseries.
7	Fall Fescue Kentucky Bluegrass (Blend) Perennial Ryegrass	150 3.5 20 0.46 20 0.46	O	O	A	Three cultivars of Kentucky Bluegrass. Traffic tolerant.
8	Big Bluestem <sup>9</sup> Indian Grass Little Bluestem <sup>10</sup> Coastal Panicgrass plus one of: Partridge Pea Bush Clover Wild Indigo Blondy Oak Trefoil	10 0.23 10 0.23 5 0.11 5 0.11 5 0.11 3 0.07 3 0.07 2 0.05	O	A	O	All species are native. Indian Grass and Bluestem have fluffy seed. Plant with a specialized native seed drill. Creeping Red Fescue will provide erosion protection while the warm season grasses get established.

1. When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.  
 2. Winter seeding requires 3 tons per acre of straw mulch. Planting dates listed above are average for Delaware. These dates may require adjustment to reflect local conditions.  
 3. All seed shall meet the minimum purity and minimum germination percentages recommended by the Delaware Department of Agriculture. The maximum % of weed seeds shall be in accordance with Section 1, Chapter 24, Title 3 of the Delaware Code.  
 4. Cool season species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.  
 5. All leguminous seed must be inoculated.  
 6. Warm season grass mix and Seed Canary Grass cannot be mowed more than 4 times per year.  
 7. Warm season grasses require a soil temperature of at least 50 degrees in order to germinate, and will remain dormant until then.

Source: Delaware ESC Handbook  
 Symbol: **CFL**  
 Detail No. **DE-ESC-3.4.3**  
 Sheet 2 of 4  
 Date: 12/03

### Standard Detail & Specifications Vegetative Stabilization

Mix No.	Certified Seed <sup>1</sup>	Seeding Rate <sup>2</sup>	Optimum Seeding Dates <sup>3</sup>			Remarks
			Coastal Plain	Piedmont	All <sup>4</sup>	
9	Poorly Drained Soils	75 1.72 30 0.69 45 1	O	O	O	Quick stabilization of disturbed sites and waterways.
10	Residential Lawns	10 0.23	A	O	A	Good erosion control, wildlife cover and wildlife revegetation.
11	Fall Fescue Perennial Ryegrass Kentucky Bluegrass Blend	100 2.3 25 0.57 30 0.69	O	O	O	High value, high maintenance, light traffic, irrigation necessary. Wet drained soils, full sun.
12	Fall Fescue Perennial Ryegrass Sheep Fescue	100 2.3 25 0.57 25 0.57	O	O	O	Moderate value, low maintenance, traffic tolerant.
13	Creeping Red Fescue Sheep Fescue Kentucky Bluegrass	50 1.15 50 1.15 20 0.4	O	O	O	Shade tolerant, moderate traffic tolerance, moderate maintenance.
14	Creeping Red Fescue Kentucky Bluegrass or Creeping Fescue	50 1.15 90 2.1	O	O	O	Shade tolerant, moisture tolerant.
15	K31 Tall Fescue	150 3.5	O	O	O	Monoculture, but performs well alone in lawn. Discouraged.

1. When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.  
 2. Winter seeding requires 3 tons per acre of straw mulch. Planting dates listed above are average for Delaware. These dates may require adjustment to reflect local conditions.  
 3. All seed shall meet the minimum purity and minimum germination percentages recommended by the Delaware Department of Agriculture. The maximum % of weed seeds shall be in accordance with Section 1, Chapter 24, Title 3 of the Delaware Code.  
 4. Cool season species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.  
 5. All leguminous seed must be inoculated.  
 6. Warm season grass mix and Seed Canary Grass cannot be mowed more than 4 times per year.  
 7. Warm season grasses require a soil temperature of at least 50 degrees in order to germinate, and will remain dormant until then.

Source: Delaware ESC Handbook  
 Symbol: **CFL**  
 Detail No. **DE-ESC-3.4.3**  
 Sheet 3 of 4  
 Date: 12/03

### Standard Detail & Specifications Vegetative Stabilization

**Construction Notes:**

- Site Preparation
  - Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
  - Final grading and shaping is not necessary for temporary seedings.
- Seedbed Preparation
- Soil Amendments
  - Lime - Apply liming materials based on the recommendations of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil.
  - Fertilizer - Apply fertilizer based on the recommendations of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 at the rate of 600 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soils.
- Seeding
  - For temporary stabilization, select a mixture from Sheet 1. For a permanent stabilization, select a mixture from Sheet 2 or Sheet 3 depending on the conditions.
  - Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
  - Seed that has been broadcast should be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.
- Mulching
 

All mulching shall be done in accordance with detail DE-ESC-3.4.5.

Source: Delaware ESC Handbook  
 Symbol: **CFL**  
 Detail No. **DE-ESC-3.4.3**  
 Sheet 4 of 4  
 Date: 12/03

### Standard Detail & Specifications Stabilized Construct. Entrance

**Plan**

**Profile**

Section A-A (Std.)

Source: Adapted from VA ESC Handbook  
 Symbol: **SCE**  
 Detail No. **DE-ESC-3.4.7**  
 Sheet 1 of 2  
 Date: 12/03

### Standard Detail & Specifications Compost Filter Log

**Plan View**

**Profile**

(NOTE: For steeper slopes, drive stakes perpendicular to surface)

Source: Adapted from MD Stds & Specs for ESC & Filtrax<sup>TM</sup> International  
 Symbol: **CFL**  
 Detail No. **DE-ESC-3.1.7**  
 Sheet 1 of 2  
 Date: 03/13

### Standard Detail & Specifications Compost Filter Log

**Construction Notes:**

- Prior to installation, clear bedding area of obstructions including rocks or debris larger than 1 inch and fill in any sharp depression areas.
- Fill the sock fabric using a pneumatic blower so that the logs are rigid and do not deform. Terminate at the desired length.
- For trenched applications, excavate 2 to 4 inches below grade along the width and length of the compost filter log.
- Install the compost filter logs perpendicular to the flow direction and parallel to the slope with the beginning and end of the installation pointing up the slope a minimum of 1 foot elevation difference. On sites where this is not possible, upturn at a minimum length of 10' at a 30 degree angle to prevent runoff bypass.
- For untrenched applications, blow or hand pack soil, mulch, or compost on the upslope side of the log, filling the bottom void area.
- Stake the filled log every 10 feet maximum through the center of the sock for trenched applications, or every 8 feet for untrenched. The stake shall be a 2" by 2" hardwood. It should extend 12" below grade and protrude at least 3" above the top of the sock. If located on a slope greater than 8:1, the stake shall be angled downslope at a 45 degree angle to prevent the force of the water from dislodging to log.
- When the length of the compost filter log needed exceeds the available compost filter sock length, the next sock shall be overlapped a minimum of 12" before being filled, and a stake placed through both socks at the overlap.
- Remove accumulated sediment when it has reached half of the effective height of the log.
- Inspect weekly and after rain event. If sock is degrading or the sock is failing, vegetate to secure the compost, replace the log, or reinforce with an additional log. If the log has been crushed due to construction equipment, it can be "fluffed" back to its effective height. If the effective height can no longer be restored, the log shall be replaced or reinforced with an additional compost filter log.

Source: Adapted from MD Stds & Specs for ESC & Filtrax<sup>TM</sup> International  
 Symbol: **CFL**  
 Detail No. **DE-ESC-3.1.7**  
 Sheet 2 of 2  
 Date: 03/13

### Standard Detail & Specifications Geotextile Dewatering Bag

**Plan**

**Profile**

Source: Adapted from ACF Products, Inc.  
 Symbol: **GB**  
 Detail No. **DE-ESC-3.2.1.2**  
 Sheet 1 of 2  
 Date: 12/03

### Standard Detail & Specifications Geotextile Dewatering Bag

**Construction Notes:**

- The dewatering bag should be placed so the incoming water flows into and through the bag, and then flow off the site without creating more erosion. The neck should be tied off tightly to stop the water from flowing out of the bag without going through the walls. The dewatering bag should be placed on a gravel bed to allow water to flow in all directions.
- The dewatering bag is considered full and should be disposed when it is impractical for the bag to filter the sediment out at a reasonable flow rate. At this point, it should be replaced with a new bag.
- Disposal may be accomplished as directed by the construction reviewer. If the site allows, the bag may be buried on site and seeded, visible fabric removed and seeded or removed from site to a proper disposal area.

**Materials:**

- The geotextile fabric shall be a Type GD-IV.
- The dewatering bag shall be sewn with a double needle machine using high strength thread. All structural seams will be sewn with high strength, double stitched "J" type. Seam strength test will have the following minimum average roll values:

Type	TEST METHOD	TEST RESULT
Heavy duty	ASTM D-4884	100 lb / in

- The dewatering bag shall have an opening large enough to accommodate a four (4) inch discharge hose with attached strap to tie off the hose to prevent the pumped water from escaping from the bag without being filtered.

Source: Adapted from ACF Products, Inc.  
 Symbol: **GB**  
 Detail No. **DE-ESC-3.2.1.2**  
 Sheet 2 of 2  
 Date: 12/03

### Standard Detail & Specifications Stabilized Construct. Entrance

**Section A-A (Opt.)**

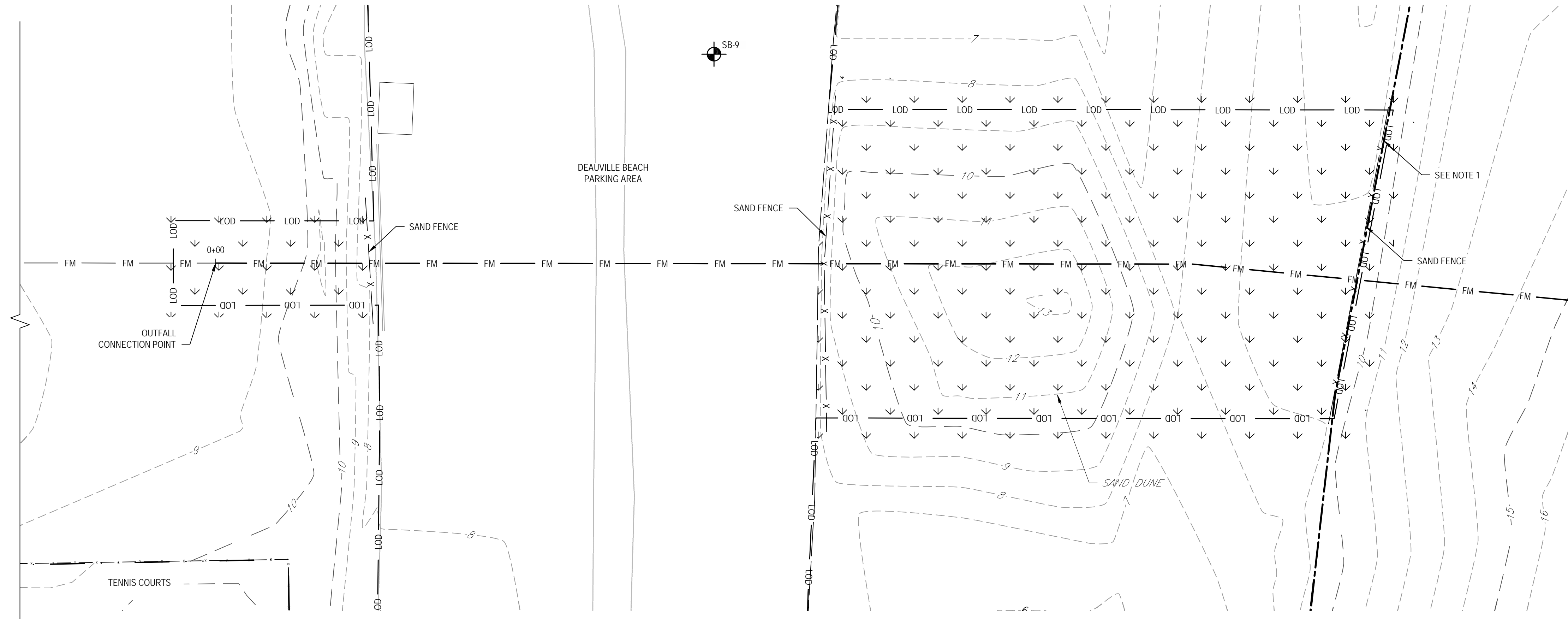
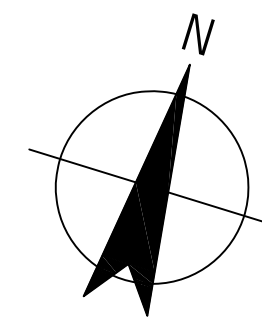
Source: Adapted from VA ESC Handbook  
 Symbol: **SCE**  
 Detail No. **DE-ESC-3.4.7**  
 Sheet 2 of 2  
 Date: 12/03

FOR PERMIT SUBMITTAL NOT FOR CONSTRUCTION			
GHD Inc. 16701 Melford Boulevard, Suite 330, Bowie MD 20715 USA T 1 240 206 6810 F 1 240 206 6811 E bowmail@ghd.com W www.ghd.com			
A	PERMIT SUBMITTAL	CTF	BMG KSG 06/16
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn Job Manager Project Director Date

Drawn	KML	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG	Date	06/2016
Scale	NTS	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

PRELIMINARY

Client Project	<b>CITY OF REHOBOTH BEACH, DELAWARE OCEAN OUTFALL PROJECT</b>
Title	<b>EROSION AND SEDIMENT CONTROL DETAILS 2</b>
Contract No.	Original Size <b>Ansi D Drawing No: 86-18693-C104</b>
Sheet	14 of 23 <b>Rev: A</b>

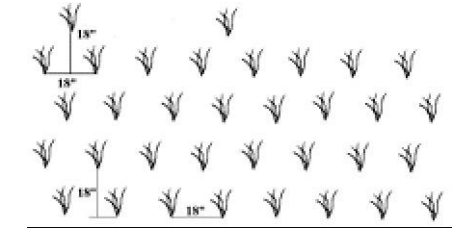


**PLANTING PLAN**  
SCALE 1"=20'-0"

BEACH DUNE PLANT LIST				
KEY	BOTANICAL NAME	TYPE	COMMON NAME	SPACING REMARKS
1	PRUNUS MARITIMA	SHRUB	BEACH PLUM	EVERY 10-15 FEET
3	MORRELLA CERIFERA	SHRUB	SOUTHERN BAYBERRY	EVERY 10-15 FEET
4	HUDSONIA TOMENTOSA	HERB	BEACH HEATER	RANDOM SPACING
5	SOLIDAGO SEMPERVIVENS	HERB	SEASIDE GOLDENROD	RANDOM SPACING
2	YUCCA FILAMENTOSA	HERB	COMMON YUCCA	EVERY 10-15 FEET
6	PANICUM AMARUM	GRASS	BEACH PANIC GRASS	RANDOM SPACING
7	PANICUM BIRGATUM	GRASS	PAUL SWITCH GRASS	RANDOM SPACING
8	AMMOPHILA BREVILIGULATA	GRASS	AMERICAN BEACH GRASS	RANDOM SPACING

**NOTES**

- ERECT SAND FENCING AT THE BASE OF THE DUNE ON BOTH THE SEAWARD AND LANDWARD SIDES TO BLOCK ACCESS. FENCING SHOULD BE SUPPORTED WITH WOODEN POSTS (4"x4") AT 10-FT INTERVALS. FENCING CAN BE SECURED TO THE POSTS USING WIRE OR STAPLES. FENCING SHOULD BE PLACED ON THE LANDWARD SIDE OF THE POSTS.
- HOW TO PLANT BEACHGRASS**
  - BEACH GRASS IS SOLD IN BUNDLES OF 50 OR 100 CULMS (STEMS)
  - PLANT TWO STEMS PER HOLE. PLACING MORE THAN TWO STEMS PER HOLE WILL INCREASE COMPETITION FOR NUTRIENTS CAUSING LOSS OF PLANTS
  - PLANTS (HOLES) SHOULD BE SPACED 18" APART.
  - THERE SHOULD BE 18" BETWEEN ROWS.
  - THE ROWS SHOULD BE STAGGERED TO PROVIDE MAXIMUM WIND EROSION CONTROL. (SEE ILLUSTRATION.)



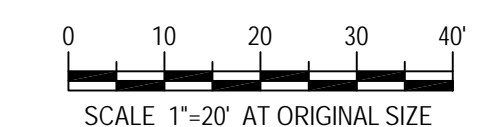
STEP 1: OPEN A HOLE 10 TO 12 INCHES DEEP WITH A POINTED STICK OR SPADE. PLACE 2 STEMS, WITH ROOTS FACING DOWN, IN THE HOLE TO A DEPTH OF 8 INCHES. IF PLANTS ARE NOT PLANTED 8 INCHES DEEP, THEY MAY DRY OUT OR BE BLOWN OUT BY THE WIND.

STEP 2: PRESS NEXT TO THE PLANT TO FIRM THE SAND AND ELIMINATE AIR SPACE IN THE ROOT ZONE.

NEWLY PLANTED AND OLD BEACHGRASS RESPONDS WELL TO FERTILIZER. FERTILIZER SHOULD BE APPLIED 30 DAYS AFTER PLANTING BUT NOT BEFORE APRIL 1. FOR UP TO DATE FERTILIZER RATES CONTACT YOUR LOCAL NURSERY OR THE SHORELINE & WATERWAY MANAGEMENT SECTION.

**PRELIMINARY**

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
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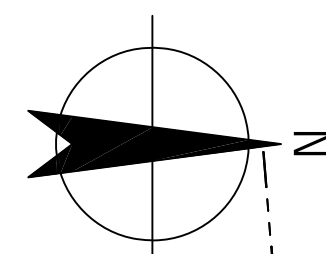
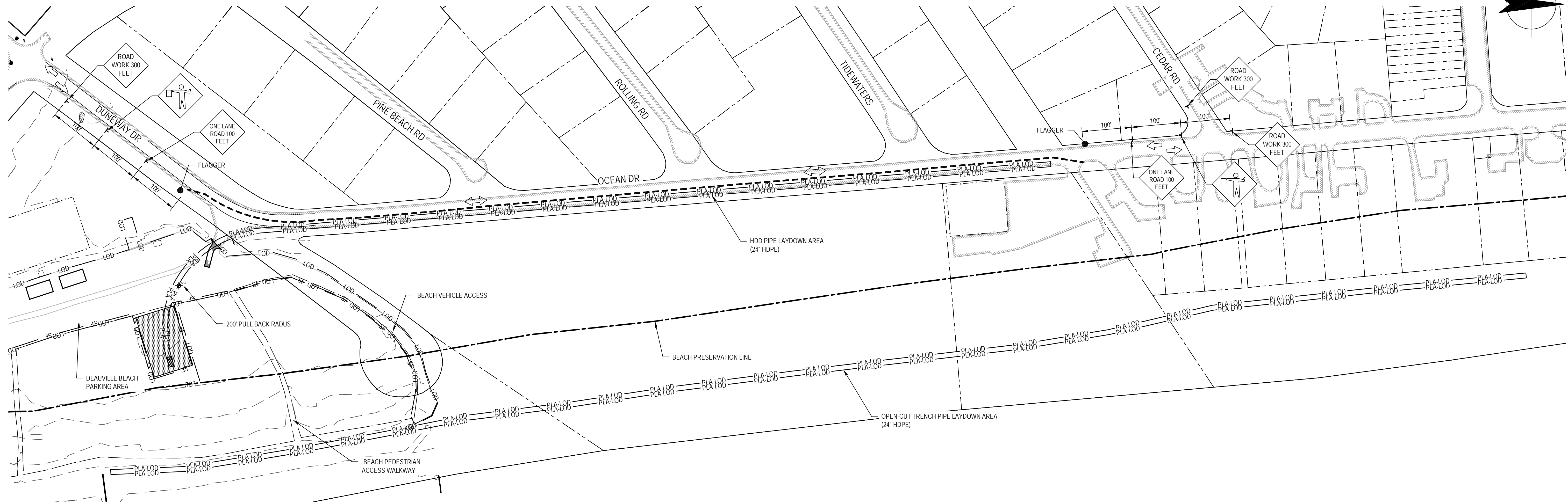
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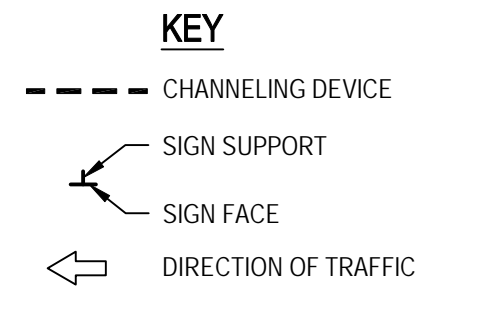
Drawn	CTF	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG	Date	06/2016
Scale	1" = 20'	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

Client	<b>CITY OF REHOBOTH BEACH, DELAWARE</b>		
Project	<b>OCEAN OUTFALL PROJECT</b>		
Title	<b>PLANTING PLANS, NOTES AND DETAILS</b>		
Contract No.	Original Size		
Sheet	15	of	23
ANSI D	Drawing No:	<b>86-18693-C105</b>	Rev: <b>A</b>



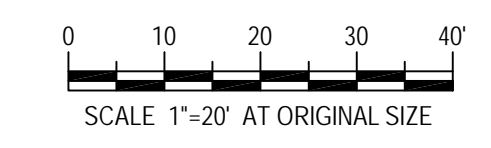
**TRAFFIC CONTROL/PIPE LAYDOWN AREA PLAN 1**  
SCALE 1"=100'-0"

- NOTES:**
1. PRIOR TO CLOSING OF ROADWAY, CONTRACTOR SHALL ESTABLISH DETOUR SIGNAGE AND WARNINGS. ALL DETOUR SIGNS AND BARRICADES SHALL BE REMOVED AFTER COMPLETION OF THE PIPE INSTALLATION.
  2. CONTRACTOR SHALL PROVIDE ACCESS FOR HOMES AND BUSINESSES ALONG OCEAN DRIVE DURING SHUTDOWN.



**PRELIMINARY**

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
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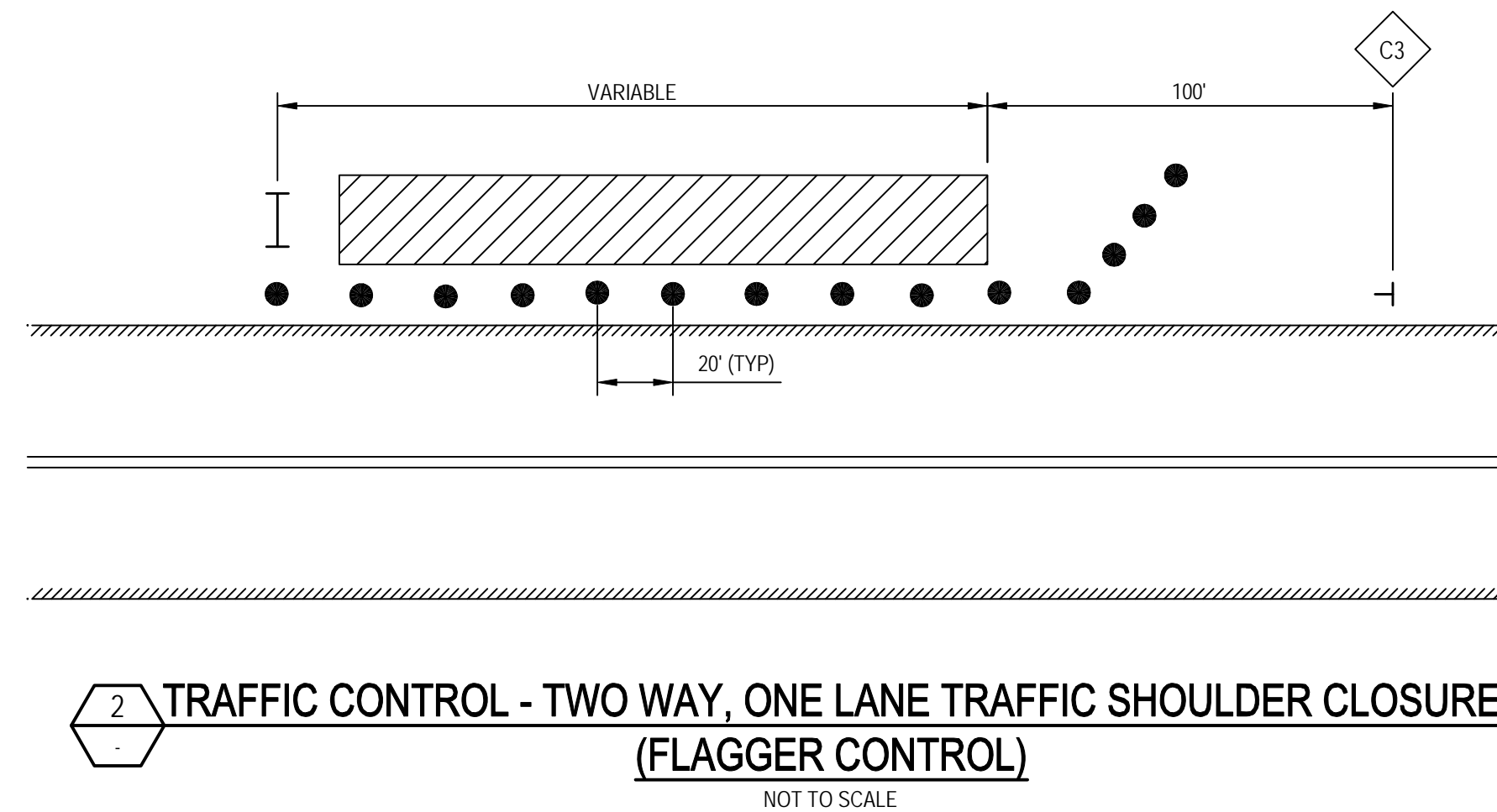
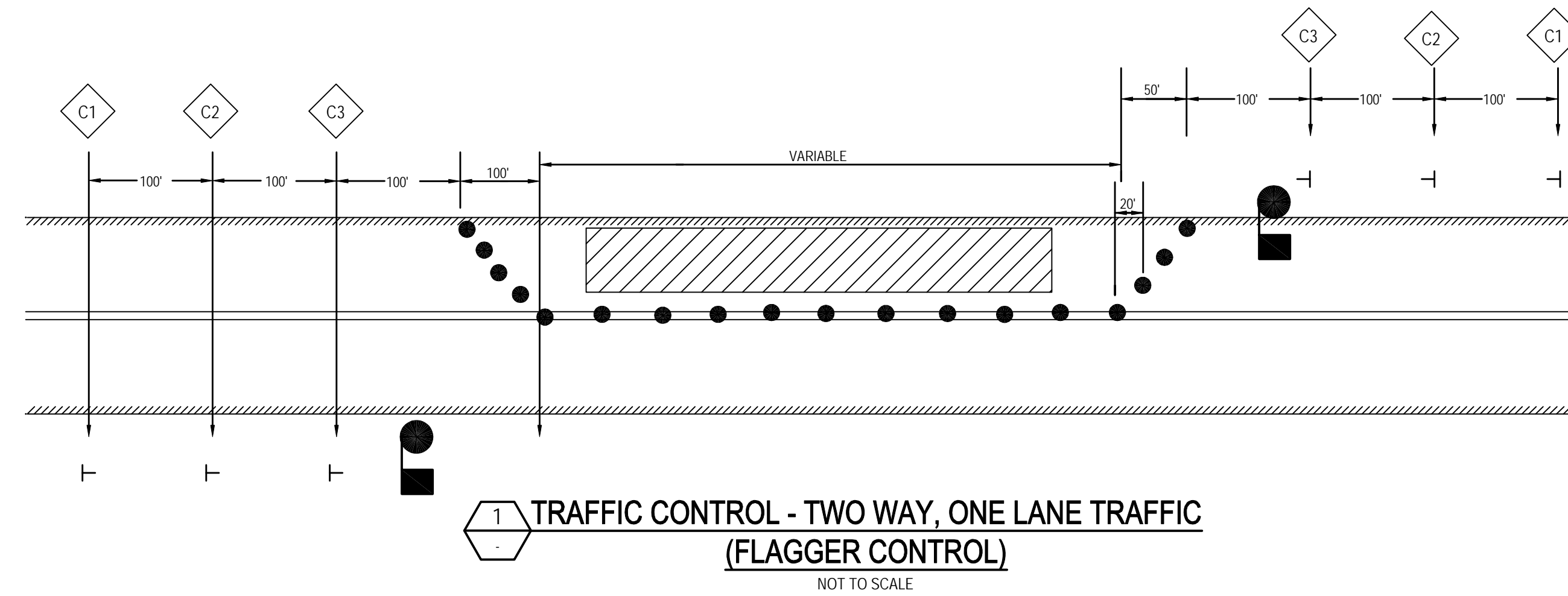
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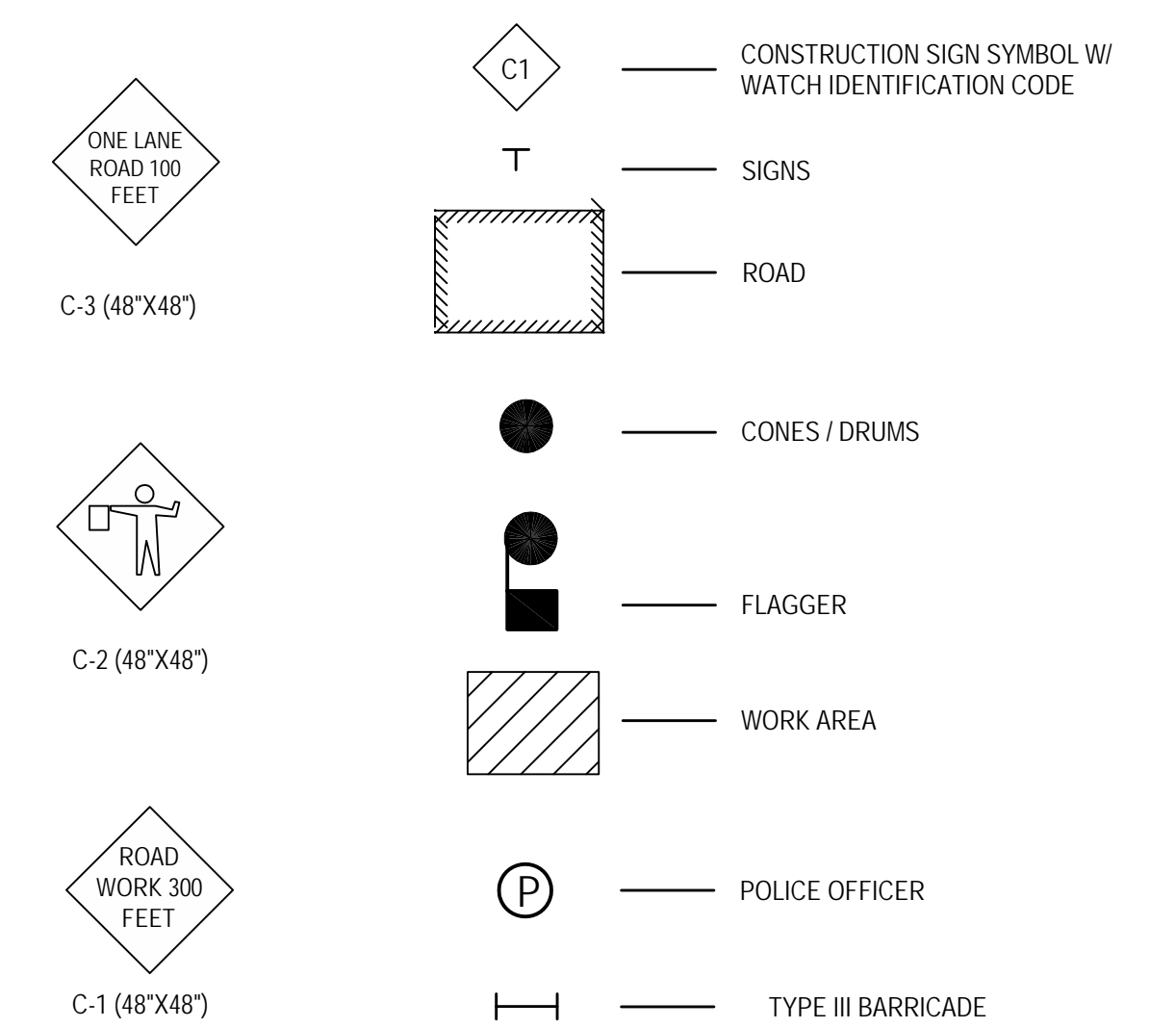
Drawn	CTF	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG		
Date	06/2016		
Scale	1" = 100'		

Client	<b>CITY OF REHOBOTH BEACH, DELAWARE</b>		
Project	<b>OCEAN OUTFALL PROJECT</b>		
Title	<b>TRAFFIC CONTROL AND PIPE LAYDOWN/STAGING AREA PLAN</b>		
Contract No.	Original Size		
Sheet	Drawing No: <b>86-18693-C106</b>		16 of 23
Revision	<b>Rev: A</b>		





**PLAN LEGEND**



**TRAFFIC CONTROL SEQUENCE OF CONSTRUCTION**

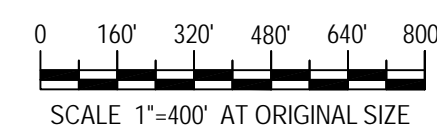
- STEP 1 THE CONTRACTOR SHALL PLACE ALL CONSTRUCTION WARNING SIGNS ONE WEEK PRIOR TO THE BEGINNING OF WORK. THE SIGNS ARE TO REMAIN COVERED UNTIL ROAD CONSTRUCTION BEGINS. THE APPROACH WARNING SIGNS SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETED.
- STEP 2 THE CONTRACTOR SHALL USE DIAGRAM "TWO-WAY, ONE-LANE TRAFFIC (FLAGGER CONTROL)" IN LEFT VIEW ON THIS SHEET AND THE DETAILS SHOWN TO INSTALL TRAFFIC CONTROL DEVICES AND TEMPORARY PAVEMENT MARKING.
- STEP 3 CONSTRUCT ALL PROPOSED WORK.
- STEP 4 REMOVE TRAFFIC CONTROL DEVICES AND REESTABLISH PAVEMENT AND MARKINGS.

**TRAFFIC CONTROL NOTES**

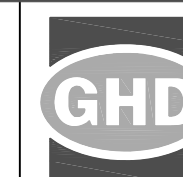
1. CITY OF REHOBOTH BEACH SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO BEGINNING ANY WORK IN ORDER TO SCHEDULE A FIELD INSPECTION OF TRAFFIC CONTROL DEVICES. FOR UTILITY PROJECTS CONTACT XXX-XXX-XXXX
2. ALL CONSTRUCTION AND MATERIALS FOR THE TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE STANDARDS CONTAINED IN THE LATEST EDITION OF THE STATE OF DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
3. NO WORK SHALL BE PERFORMED IN THE ROADWAY FROM 4:00 PM TO 9:00 AM.
4. TRAVEL LANES SHALL BE A MINIMUM OF TEN FEET IN WIDTH. WHEN ONLY ONE LANE IS OPEN, FLAGGERS AND THE APPROPRIATE SIGNING SHALL BE PROVIDED. THE ROADWAY SHOULD BE REOPENED TO TWO LANES AT NIGHT.
5. REFLECTORIZED TRAFFIC DRUMS SHALL BE USED AS CHANNELIZING DEVICES AT NIGHT ALONG THE CONSTRUCTION AREA.
6. IF A DROP-OFF MEASURES GREATER THAN 2", A BARRIER OR 2:1 SLOPE OF COMPACTED CRUSH-RUN GRAVEL WILL BE REQUIRED.
7. PAVEMENT DISRUPTIONS OF ONE INCH (1") OR GREATER SHALL BE RAMPED WITH A BEVELED EDGE OF FOUR HORIZONTAL TO ONE VERTICAL (4:1).
8. ALL OPEN TRENCHES SHALL BE CLOSED AT THE END OF EACH DAY. IF STEEL PLATES ARE TO BE USED, APPROPRIATE SIGNING WILL BE REQUIRED. STEEL PLATES MUST ADHERE TO DESIGN STANDARDS. STEEL PLATES MUST BE PINNED. STEEL PLATES ON ARTERIAL ROADWAYS MUST BE RECESSED, AS MUST ALL STEEL PLATES TO BE PLACED FOR MORE THAN 24 HOURS BETWEEN DECEMBER AND MARCH. ALL OTHER STEEL PLATES MUST BE RAMPED.
9. CONTRACTOR SHALL INSTALL "CAUTION STEEL PLATES AHEAD" SIGNS IN ADVANCE OF STEEL PLATE BRIDGING.
10. ALL TEMPORARY SIGNS THAT DO NOT APPLY SHALL BE COVERED OR REMOVED.
11. CHANNELIZING DEVICES AND TEMPORARY STRIPING SHALL BE REMOVED AS SOON AS PRACTICAL.
12. ALL TRAFFIC CONTROL DEVICES SHALL BE KEPT IN THEIR PROPER POSITION AT ALL TIMES, AND SHALL BE REPAIRED, REPLACED, OR CLEANED AS NECESSARY TO PRESERVE THEIR APPEARANCE AND CONTINUITY.
13. ACCESS SHALL BE PROVIDED TO ALL EXISTING DRIVEWAYS AT ALL TIMES UNLESS COVERED BY THE APPROVED TRAFFIC CONTROL PLAN.
14. ALL CONES AND FLAGMEN SHALL BE MOVED ACCORDINGLY AS CONSTRUCTION PROGRESSES.
15. ALL CONSTRUCTION SIGNING SHALL BE IN ACCORDANCE WITH THE TYPICAL SIGN PLACEMENT SHOWN ON THESE PLANS AND SHALL NOT OBSTRUCT EXISTING TRAFFIC CONTROL DEVICES.
16. ANY CHANGES TO THE TCP SHALL BE SUBMITTED TO THE TRAFFIC ENGINEERING DIVISION FOR REVIEW AND APPROVAL. REQUESTS FOR DETOURS AND ROAD CLOSURES SHALL BE SUBMITTED TO RIGHT OF WAY MANAGEMENT SECTION.
17. THE CONTRACTOR MUST CONTACT CITY OF REHOBOTH BEACH FOR APPROVAL PRIOR TO PLACEMENT OF ANY TEMPORARY PARKING RESTRICTIONS. IF RESTRICTIONS ARE APPROVED, THE CONTRACTOR MUST NOTIFY ALL AFFECTED RESIDENTS AT LEAST 48 HOURS IN ADVANCE AND MUST SUPPLY AND INSTALL ALL NECESSARY SIGNING.
18. CONSTRUCTION & WORKER'S VEHICLES SHALL NOT BE PARKED IN A MANNER THAT WILL IMPEDE TRAFFIC OR IMPAIR SIGHT DISTANCE. THESE VEHICLES SHOULD BE PARKED OFF-STREET ON THE CONSTRUCTION SITE OR ON A SIDE STREET NOT UNDER CONSTRUCTION.
19. CONTRACTORS SHALL ADHERE TO DELAWARE DEPARTMENT OF TRANSPORTATION, DESIGN MANUAL AND STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION, AND TRAFFIC CONTROL.
20. ALL WORK SHALL BE PERFORMED ON DAYS WHEN THE CITY'S DEPARTMENT OF PUBLIC WORKS IS OPEN FOR BUSINESS.
21. ALL LANE CLOSURES WILL REQUIRE FULL-TIME FLAGMEN FOR THE DURATION OF THE LANE CLOSURE REGARDLESS OF TRAFFIC VOLUME, LOCATION OR TIME OF DAY.

**PRELIMINARY**

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
A	PERMIT SUBMITTAL		CTF	BMG	KSG	06/16



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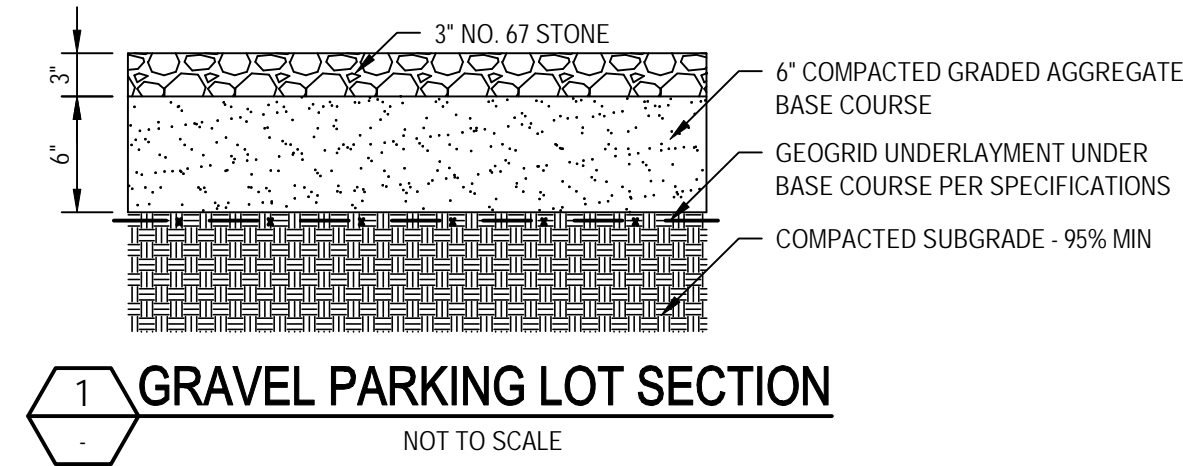
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Drawn	CTF	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG		
Date	06/2016		
Scale	AS NOTED		

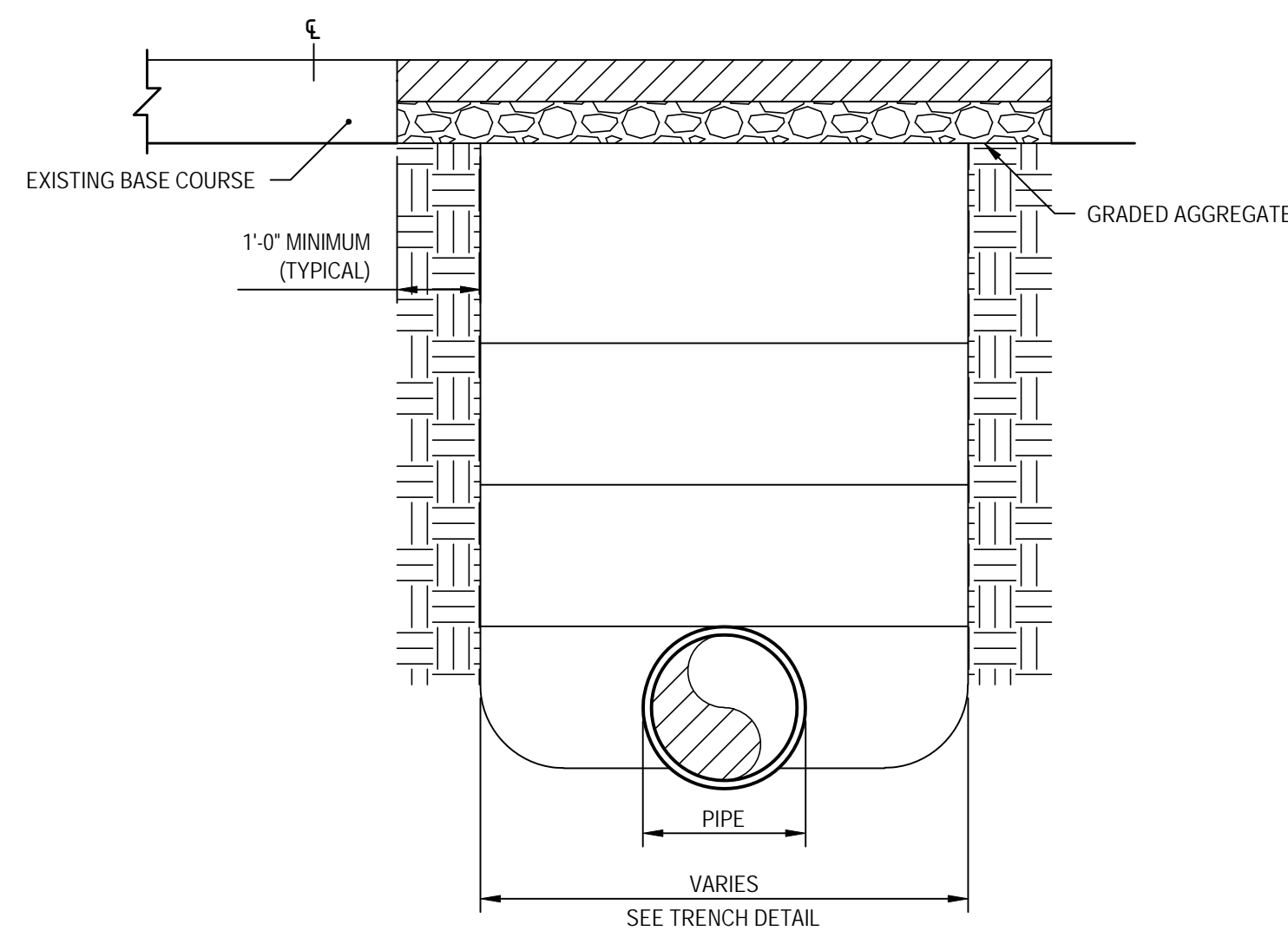
Client **CITY OF REHOBOTH BEACH, DELAWARE**  
Project **OCEAN OUTFALL PROJECT**  
Title **TRAFFIC CONTROL NOTES AND DETAILS**

Contract No. \_\_\_\_\_  
Original Size \_\_\_\_\_  
Ansi D Drawing No: **86-18690-C107**

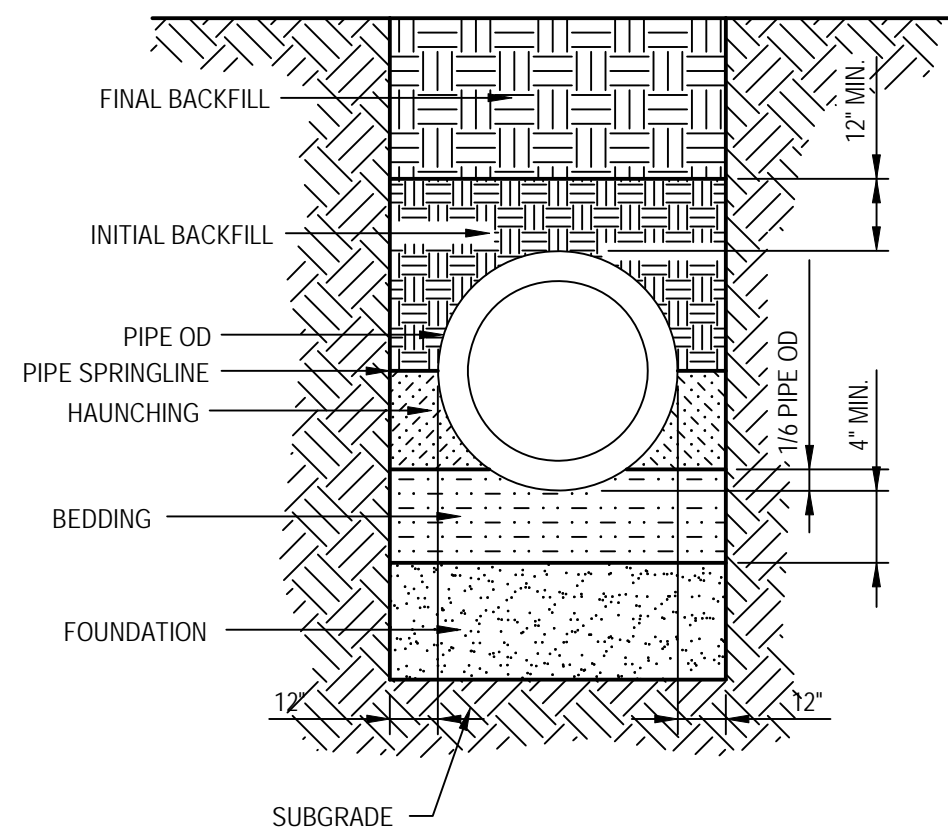
Sheet **17** of **23**  
Rev: **A**



**1 GRAVEL PARKING LOT SECTION**  
NOT TO SCALE

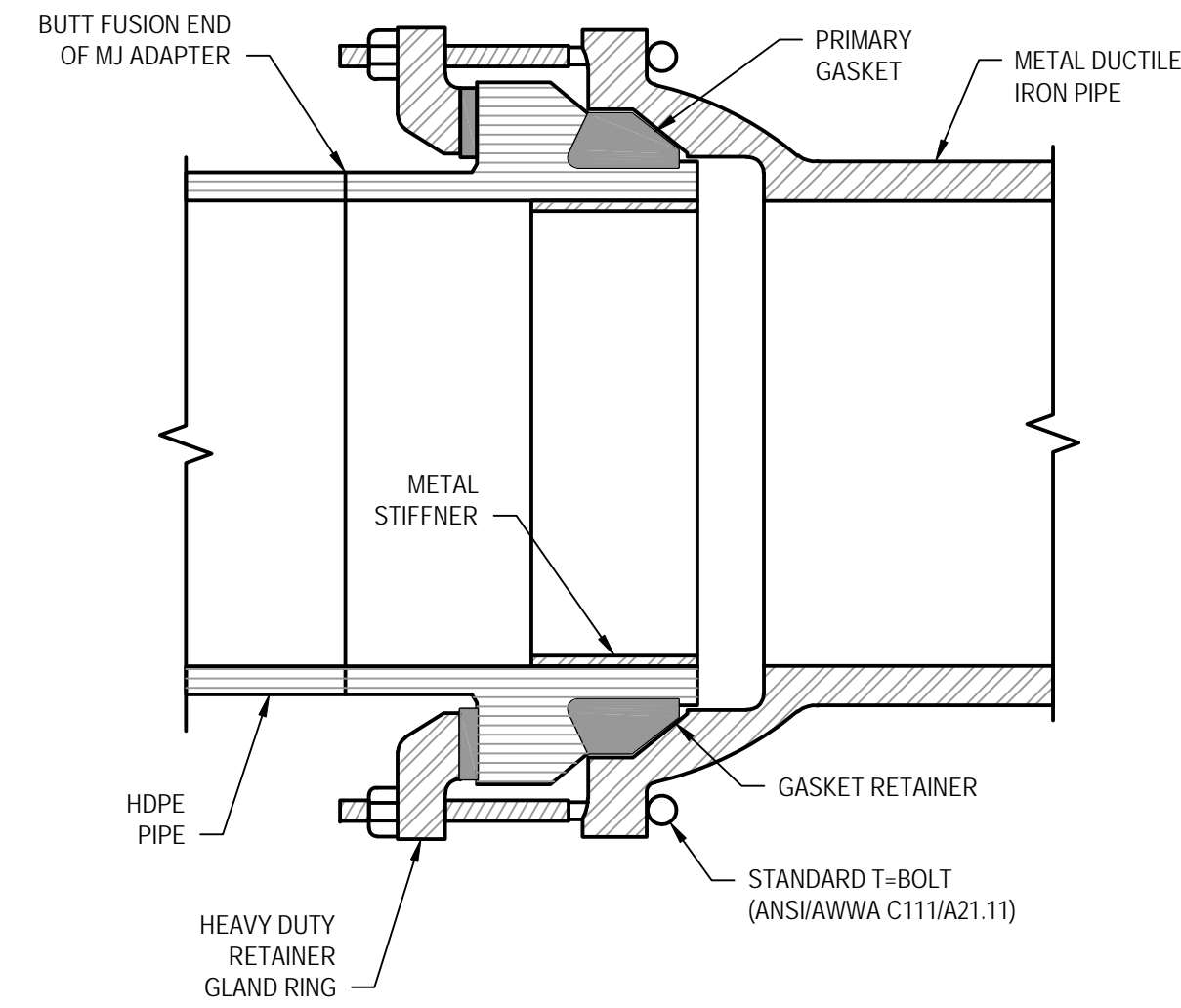


**2 PARKING LOT RESTORATION DETAIL**  
NOT TO SCALE

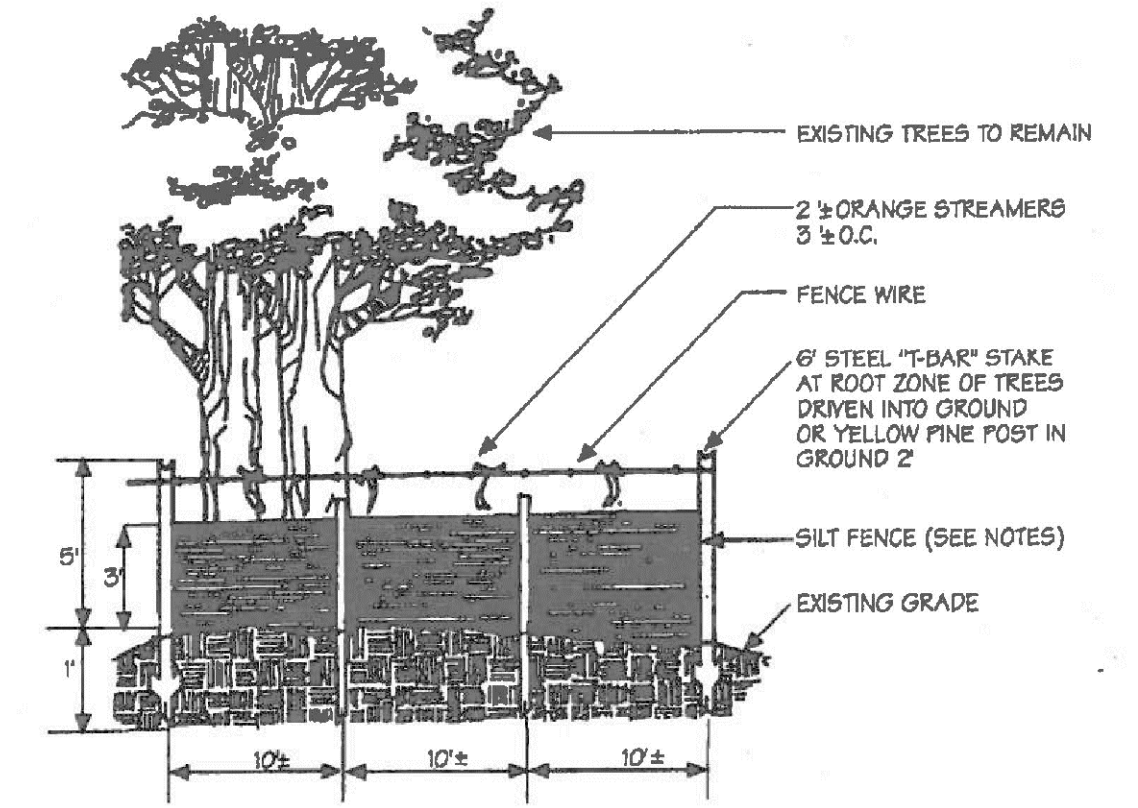


- NOTES:
- FOUNDATION MATERIAL ONLY REQUIRED WHEN UNSUITABLE SUBGRADE MATERIALS ENCOUNTERED.
  - SEE SPECIFICATION 0223 (BACKFILLING) FOR MATERIALS REQUIRED.

**3 TRENCH DETAIL**  
NOT TO SCALE



**4 MJ ADAPTER DETAIL DIP TO HDPE TRANSITION**  
NOT TO SCALE

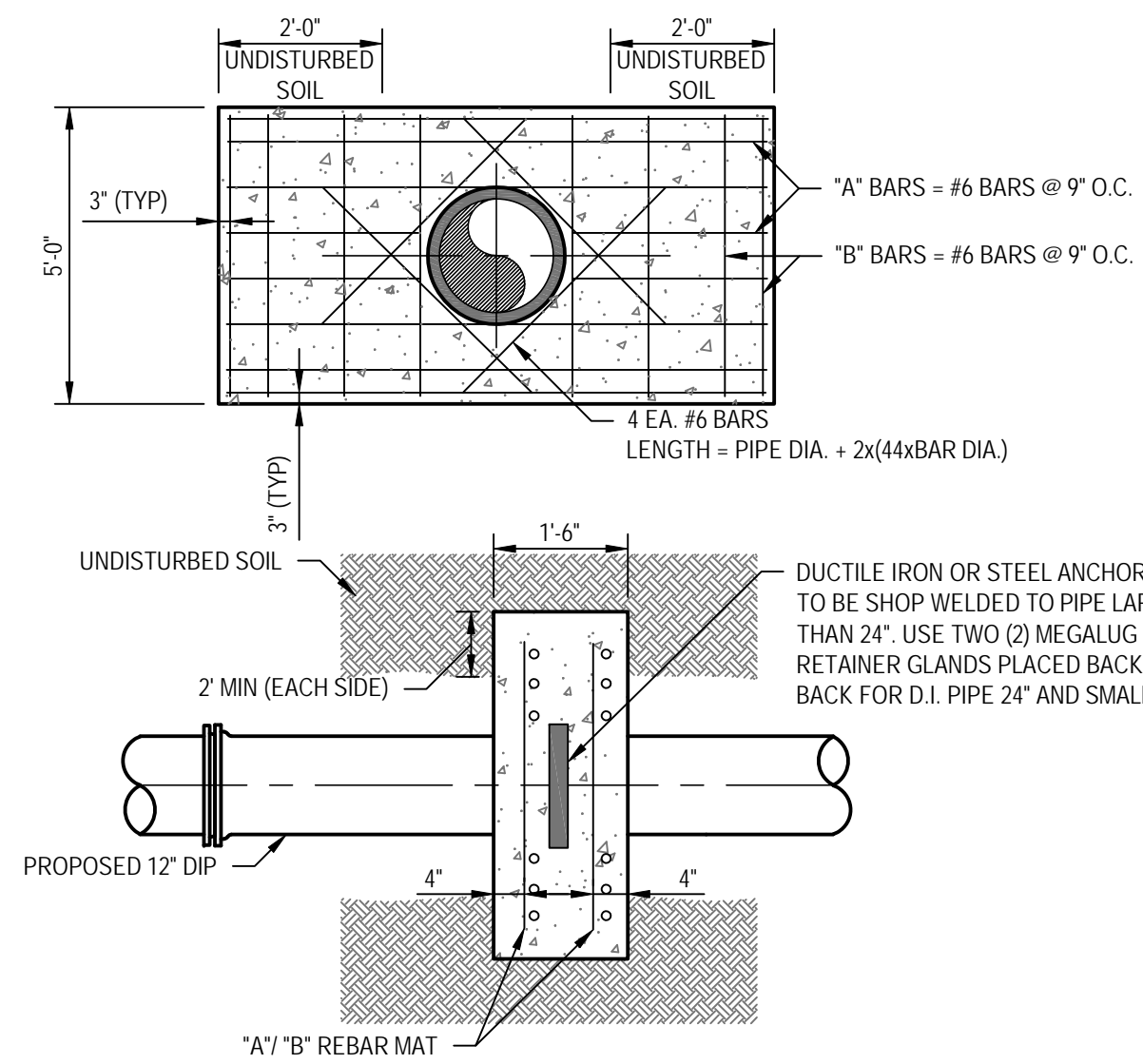


- Notes:
- Silt fence to be heeled into the soil.
  - Wire, snow fence, etc. for tree protection only.
  - Boundaries of Retention Area will be established as part of the forest conservation plan review process.
  - Boundaries of Retention Area should be staked and flagged prior to installing device.
  - Avoid root damage when placing anchor posts.
  - Device should be properly maintained throughout construction.
  - Protection signs are also required.
  - Locate fence outside the Critical Root Zone.

Source: Adapted from Steve Clark & Associates/ACRT, Inc.

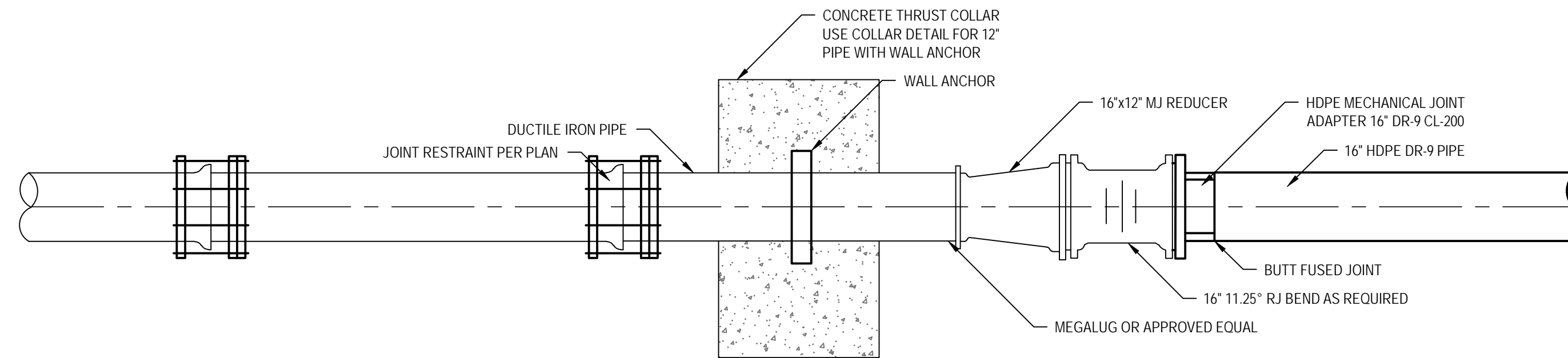
**Silt Fence and Tree Protection**

**Figure D:8**



**5 CONCRETE THRUST COLLAR DETAIL**  
NOT TO SCALE

- NOTES:
- ALL RETAINER GLANDS SHALL BE MEGA-LUG OR APPROVED EQUAL.
  - WELD-ON THRUST RING SHALL BE DUCTILE IRON OR STEEL AND SHALL BE DESIGNED FOR 250 PSI WORKING PRESSURE AND 375 PSI TEST PRESSURE.
  - PIPE SURFACES SHALL BE CLEANED OF ALL FOREIGN MATERIAL BEFORE CONCRETE COLLAR IS POURED. 72 HOUR CURE BEFORE PRESSURE APPLIED TO PIPE AND COLLAR.
  - CONCRETE SHALL BE 3000 PSI.
  - REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
  - PLACE ANCHOR RING CENTERED ON ONE FULL JOINT OF PIPE.



**6 HDPE/DIP CONNECTION DETAIL**  
NOT TO SCALE

**PRELIMINARY**

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Drafting Check JFM	Design Check BMG
Approved (Project Director) KSG	
Date 06/2016	
Scale NTS	This Drawing shall not be used for Construction unless Signed and Sealed For Construction

Client **CITY OF REHOBOTH BEACH, DELAWARE**  
Project **OCEAN OUTFALL PROJECT**  
Title **MISCELLANEOUS CIVIL DETAILS 1**

Contract No. \_\_\_\_\_  
Original Size \_\_\_\_\_  
Ansi D Drawing No: **86-18693-C201**

Sheet 18 of 23  
Rev: **A**

<b>A</b>	<b>PERMIT SUBMITTAL</b>	<b>CTF</b>	<b>BMG</b>	<b>KSG</b>	<b>06/16</b>	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date

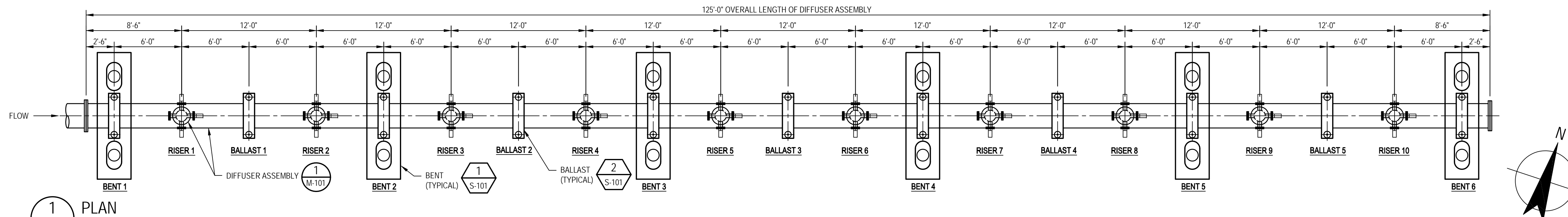
STRUCTURAL GENERAL NOTES

- A. GENERAL:
- THESE DRAWINGS ARE FOR INFORMATION ONLY, NOT FOR CONSTRUCTION.
  - CONTRACTOR SHALL CAREFULLY EXAMINE ALL CONTRACT DOCUMENTS AND SITE CONDITIONS AND UNDERSTAND THE CHARACTER, QUALITY AND QUANTITY OF WORK CALLED FOR INCLUDING ALL CONDITIONS OF THE CONTRACT. CONTRACTOR SHALL CAREFULLY COMPARE AND CHECK ALL CONTRACT DOCUMENTS FOR OMISSIONS AND DISCREPANCIES AND SHALL REPORT THESE TO THE OWNER AND ENGINEER PRIOR TO CONSTRUCTION.
  - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS BEFORE COMMENCING WORK. REPORT ANY DISCREPANCIES AND/OR INCONSISTENCIES TO DESIGNER OF RECORD FOR CLARIFICATION.
  - DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON DRAWINGS.
  - NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
  - THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE AND ADJACENT PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, SHORING FOR LOADS DURING CONSTRUCTION OR CAUSED BY REMOVAL OF CAPACITY TO SUPPORT DEAD AND/OR LIVE LOADS BY EXCAVATION, TRENCHING, SEQUENCING OR OTHER CONSTRUCTION OPERATIONS, ETC.
  - ASTM SPECIFICATIONS NOTED ON THE DRAWINGS SHALL BE THE LATEST REVISION.
  - WHERE NO CONSTRUCTION DETAILS ARE SHOWN OR NOTED FOR ANY PORTION OF THE WORK, SUCH DETAILS SHALL BE THE SAME AS FOR SIMILAR WORK SHOWN ON THE DRAWINGS.
  - PILE DRIVING EQUIPMENT SHALL BE CAPABLE OF DRIVING THE PILES TO THE SPECIFIED TIP ELEVATIONS.
  - REFER TO THE GEOTECHNICAL INVESTIGATION REPORT PREPARED BY FUGRO, FOR GHD ON BEHALF OF THE CITY OF REHOBOTH BEACH, DATED XXXX,2016 FOR EXISTING SITE AND SOIL CONDITIONS.
- B. DESIGN CRITERIA:
- OCCUPANCY CLASS: STANDARD
  - DEAD LOADS:  
CONCRETE: 150 PCF  
STEEL: 490 PCF  
HDPE PIPE: 60 PCF (SPECIFIC GRAVITY = 0.95)  
SEA WATER: 64 PCF
  - STORM LOADS (100-YR RETURN PERIOD):  
IMPORTANCE FACTOR = 1.0  
DRAG COEFFICIENTS:  
CYLINDER, CD = 1.0  
OTHER, CD = 2.0  
CURRENT VELOCITY AT DIFFUSER PIPE:  
3.3 FT/SEC PERPENDICULAR TO PIPE  
0.0 FT/SEC PARALLEL TO PIPE  
SIGNIFICANT WAVE HEIGHT, HS: 28.7 FEET  
SIGNIFICANT WAVE PERIOD, TP: 12.6 SECONDS  
WAVE WATER PARTICLE VELOCITY AT DIFFUSER PIPE:  
3.6 FT/SEC PARALLEL TO PIPE  
0.0 FT/SEC PERPENDICULAR TO PIPE
  - SEISMIC (ASCE 7-10):  
IMPORTANCE FACTOR: IE = 1.0  
SITE CLASS D - "STIFF SOIL"  
SS = 0.097 G SDS = 0.103 G  
S1 = 0.044 G S1S = 0.071 G  
R FACTOR = 1.0 CD = 1.0  
ADDED MASS COEFFICIENT (UNDERWATER), CM = 1.0
- C. CONCRETE:
- MINIMUM 28-DAY COMPRESSIVE STRENGTH, F' C: 5,000 PSI
  - MAXIMUM WATER-CEMENT RATIO: 0.40
  - THE CONTRACTOR SHALL SUBMIT CONCRETE PLACEMENT SCHEDULE TO THE DESIGNER OF RECORD PRIOR TO CONSTRUCTION.
  - ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 0.75 INCHES UNLESS OTHERWISE NOTED.
- D. REINFORCEMENT:
- UNLESS OTHERWISE INDICATED, REINFORCEMENT FOR MARINE CONCRETE STRUCTURES SHALL CONFORM TO ASTM A615 OR ASTM A706 GRADE 60 KSI AND BE PRE-FABRICATED EPOXY-COATED TO ASTM A775.
  - CONCRETE CLEAR COVER TO ALL REINFORCEMENT SHALL BE 3 INCHES MINIMUM UNLESS OTHERWISE SHOWN.
  - SPLICES IN ADJACENT BARS AT ANY SECTION SHALL BE STAGGERED A MINIMUM DISTANCE EQUAL TO THE REQUIRED LAP SPLICE FOR THE BAR.
  - REINFORCEMENT HOOKS SHALL BE STANDARD HOOKS CONFORMING TO ACI 315.
  - REINFORCEMENT SHALL NOT BE WELDED UNLESS APPROVED BY THE DESIGNER OF RECORD. WELDING OF REINFORCEMENT SHALL BE CONFINED TO BARS CONFORMING TO ASTM A706. WELDING SHALL CONFORM TO "STRUCTURAL WELDING CODE - REINFORCING STEEL" (AWS D1.4).
  - CONCRETE CURING AND FINISHING
- 6.1 TERMINOLOGY IS DEFINED IN ACI 301.

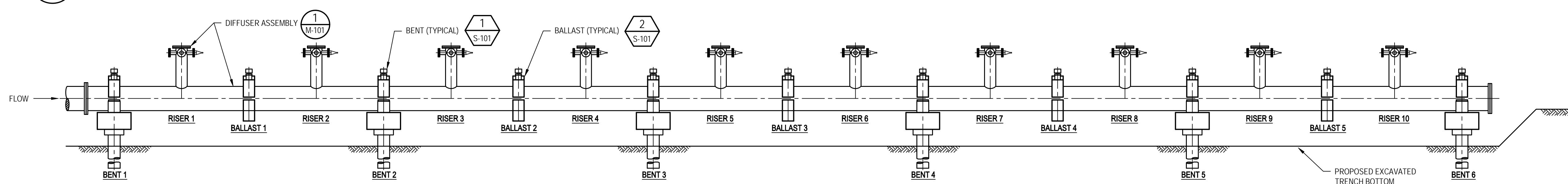
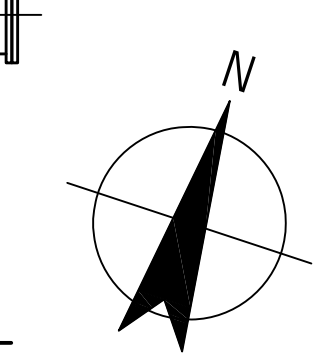
- 6.2 MOIST CURE CONCRETE SURFACES IN ACCORDANCE WITH ACI 301 AND PROJECT SPECIFICATIONS.
  7. HEADED STEEL BARS
  - 7.1 HEADED STEEL BARS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A970 AND ACI 318.
  - 7.2 PROVIDE 1.375 INCH MINIMUM CLEAR SPACING BETWEEN HEADS AND PROVIDE REQUIRED CONCRETE COVER.
  - 7.3 HEADED STEEL BARS SHALL BE EPOXY-COATED AS SPECIFIED FOR REINFORCING BARS.
  8. MECHANICAL REINFORCING BAR SPLICES
  - 8.1 MECHANICAL REINFORCING BAR SPLICES SHALL MEET THE REQUIREMENTS OF ACI 318.
  - 8.2 PROVIDE 1.375 INCH MINIMUM CLEAR SPACING BETWEEN SPLICING DEVICES AND REQUIRED CONCRETE COVER OVER SPLICING DEVICES.
  - 8.3 MECHANICAL BAR SPLICES AND THE ATTACHING REINFORCING BARS SHALL BE EPOXY COATED AS SPECIFIED FOR REINFORCING BARS (COATED AFTER FABRICATION). REINFORCING BARS TO BE CONNECTED TO THE PREVIOUSLY INSTALLED MECHANICAL SPLICES SHALL BE EPOXY COATED EXCEPT FOR THE THREADS WHICH WILL ENGAGE THE SPLICE DEVICE FOR A THREADED TYPE COUPLER.
- E. GROUT:
- WHERE UNDERWATER GROUTING OF PILE TO CAP CONNECTION CLOSURE POURS IS INDICATED ON THE DRAWINGS, THE SPACE BETWEEN THE PILES AND SURROUNDING PILE CAP STRUCTURE SHALL BE CAREFULLY FILLED WITH GROUT. PRIOR TO INSTALLATION, THE COMPRESIVE STRENGTH OF THE GROUT MIX DESIGN SHOULD BE CONFIRMED ON A REPRESENTATIVE NUMBER OF LABORATORY SPECIMENS CURED UNDER CONDITIONS WHICH SIMULATE THE FIELD CONDITIONS. LABORATORY TEST PROCEDURES SHALL BE IN ACCORDANCE WITH ASTM C109. THE UNCONFINED COMPRESSIVE STRENGTH OF 28 DAY OLD GROUT SPECIMENS SHALL NOT BE LESS THAN 3000 PSI.
  - UNDERWATER GROUTING OPERATIONS SHALL PREVENT GROUT FROM ENTERING THE WATER. GROUT SHALL NOT OVERFLOW FORMWORK. FORMWORK SHALL BE SEALED AGAINST GROUT LEAKAGE.
  - WHERE EPOXY EMBEDMENT FOR REINFORCING BARS OR ANCHOR BOLTS IS INDICATED ON THE DRAWINGS, CONTRACTOR SHALL USE SIMPSON SET-XP ADHESIVE FOR USE IN CONCRETE. CONTRACTOR MAY SUBMIT OTHER EPOXY SYSTEMS FOR APPROVAL ALONG WITH AN ICBO EVALUATION REPORT FOR EACH SPECIFIC PRODUCT.
- F. CATHODIC PROTECTION:
- EACH STEEL PIPE PILE SHALL BE ELECTRICALLY CONNECTED TO ONE ZINC SACRIFICIAL ANODE. ANODES SHALL BE ATTACHED BY WELDING THE STEEL CORE STRAP TO THE PILE. METHODS AND MATERIALS FOR ANODE CORE STRAP TO PILE WELD ATTACHMENT SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO COMMENCING WITH THE WORK.
  - EACH SACRIFICIAL ANODE SHALL BE A 26-LB ZINC ANODE (MODEL LL-26 HULL ANODE OR APPROVED EQUIVALENT) AND SHALL BE AFFIXED TO EACH STEEL PILE APPROXIMATELY HALFWAY BETWEEN EXISTING GRADE AND THE BOTTOM OF THE PILE CAP, OR 1 FOOT BELOW THE BOTTOM OF THE PILE CAP, WHICHEVER IS HIGHER.
  - PILE COATING SHALL BE REMOVED AT WELD LOCATIONS PRIOR TO WELDING AND REPAIRED FOLLOWING COMPLETION OF WELDS IN ACCORDANCE WITH THE COATING MANUFACTURER'S RECOMMENDATIONS.
  - ALL WELDS SHALL BE COATED.
  - ZINC ANODES SHALL NOT BE COATED.
  - STRUCTURAL STEEL AND MISCELLANEOUS METAL:
- STEEL PIPE PILES SHALL CONFORM TO ASTM A252 GRADE 3 OR APPROVED EQUAL.
  - MISCELLANEOUS PLATES SHALL CONFORM TO ASTM A36 OR APPROVED EQUAL.
  - BOLTS, WASHERS AND NUTS SHALL CONFORM TO STAINLESS STEEL TYPE 316 UNLESS NOTED OTHERWISE.
  - ANCHOR BOLTS:
  - BOLTS, NUTS AND WASHERS SHALL CONFORM TO STAINLESS STEEL TYPE 316 UNLESS NOTED OTHERWISE:
  - WELDING SHALL CONFORM TO "STRUCTURAL WELDING CODE - STEEL" (AWS D1.1) OR "STRUCTURAL WELDING CODE - STAINLESS STEEL" (AWS D1.6), AS APPLICABLE.
  - WHERE INDICATED, EXPOSED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED CONFORMING TO ASTM A123 GRADE 100 FOR SHAPES, PLATES, AND FABRICATIONS OR ASTM A153 CLASS C FOR HARDWARE.
  - SET ALL EMBEDDED ANCHOR BOLTS AND ANCHOR RODS USING TEMPLATES THAT ARE VERIFIED WITH CERTIFIED DRAWINGS OF THE CONNECTION HARDWARE PRIOR TO THE CONCRETE POUR. NOTIFY THE DESIGNER OF RECORD OF ANY CHANGES TO ANCHOR BOLT SIZES, SPACING, OR QUANTITIES FROM WHAT IS SHOWN ON THE DRAWINGS. TEMPLATES SHALL BE ADOQUATE TO HOLD THE BOLTS ACCURATELY IN PLACE DURING THE CONCRETE POUR.
- H. BEST MANAGEMENT PRACTICES (BMP):
- CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICES (BMP) DURING ALL CONSTRUCTION WORK TO PREVENT / MINIMIZE POLLUTANT DISCHARGE INTO THE WATER.
  - NO DEBRIS SHALL BE ALLOWED TO ENTER THE WATER. CONTRACTOR SHALL PROVIDE POSITIVE MEANS OF CAPTURING DEBRIS FROM CONSTRUCTION OPERATIONS. THESE FACILITIES SHALL BE IN PLACE BEFORE STARTING CONSTRUCTION WORK.
  - FRESH CONCRETE OR GROUT SHALL BE PREVENTED FROM ENTERING THE WATER DURING ALL CONCRETE WORK. CONCRETE SHALL NOT OVERFLOW FORMWORK. FORMWORK SHALL BE SEALED AGAINST CONCRETE OR GROUT LEAKAGE.
  - CONSTRUCTION WASTE THAT MAY CONTAIN OIL OR OTHER POLLUTANTS SHALL BE CAPTURED BY CONTRACTOR AND PROPERLY DISPOSED OF OFF-SITE.

PRELIMINARY

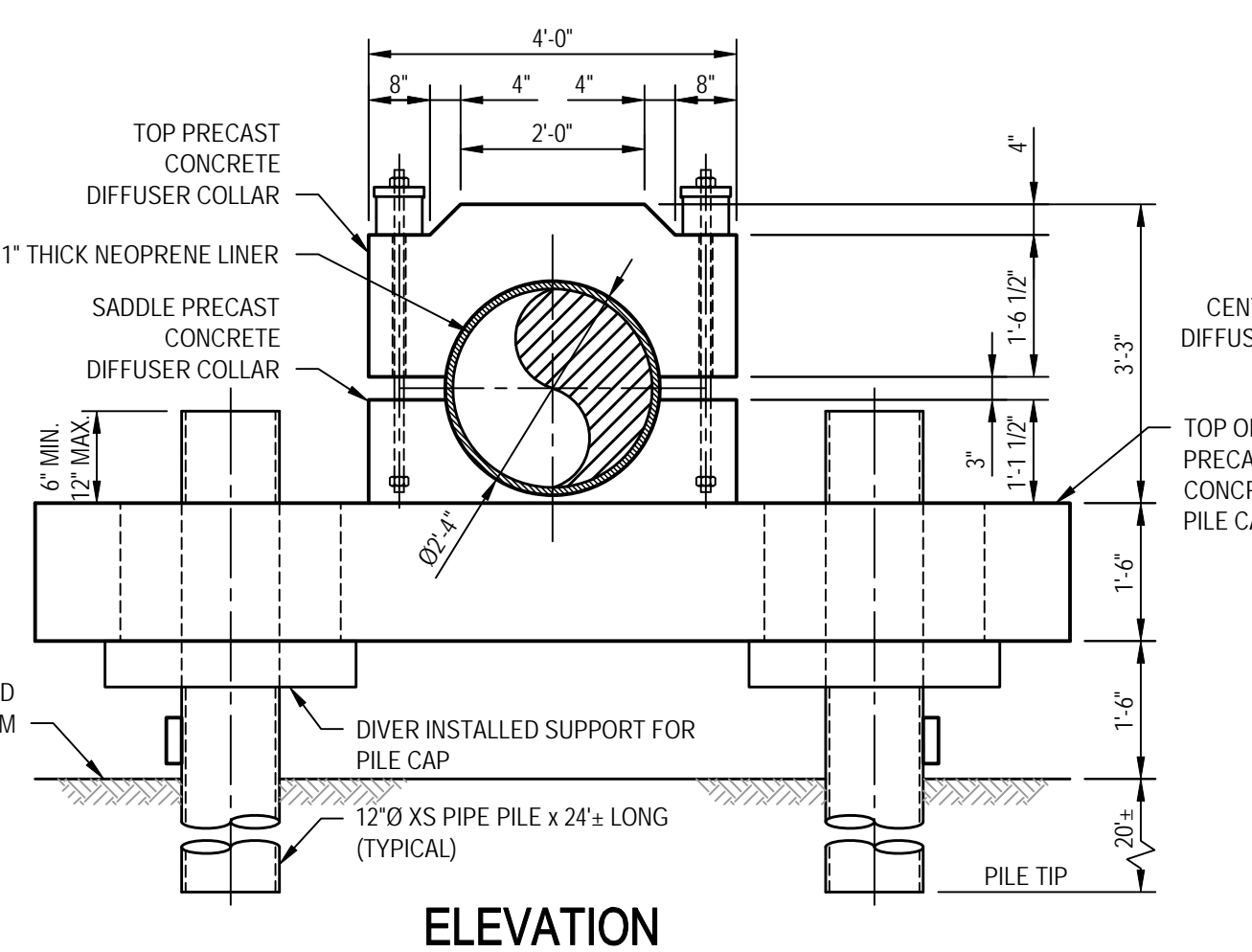
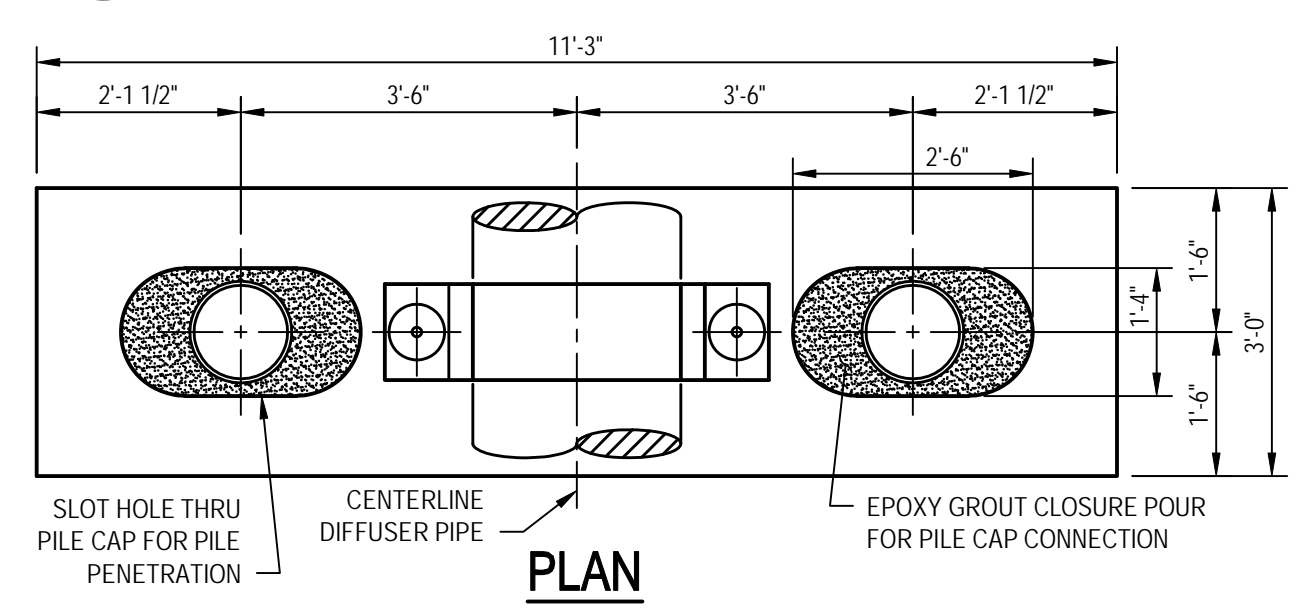
				FOR PERMIT SUBMITTAL NOT FOR CONSTRUCTION				 GHD Inc. 16701 Melford Boulevard, Suite 330, Bowie MD 20715 USA T 1 240 206 6810 F 1 240 206 6811 E bowmail@ghd.com W www.ghd.com		Drawn PS Designer CS Drafting Check JM Design Check CL Approved (Project Director) KSG Date 06/2016		Client <b>CITY OF REHOBOTH BEACH, DELAWARE</b> Project <b>OCEAN OUTFALL PROJECT</b> Title <b>STRUCTURAL GENERAL NOTES</b> Contract No.	
<b>A PERMIT SUBMITTAL</b>				<b>BMG</b>		<b>KSG</b>		<b>06/16</b>		Original Size <b>Ansi D Drawing No: 86-18693-S001</b>		Sheet <b>23</b> of <b>23</b> Rev: <b>A</b>	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date							



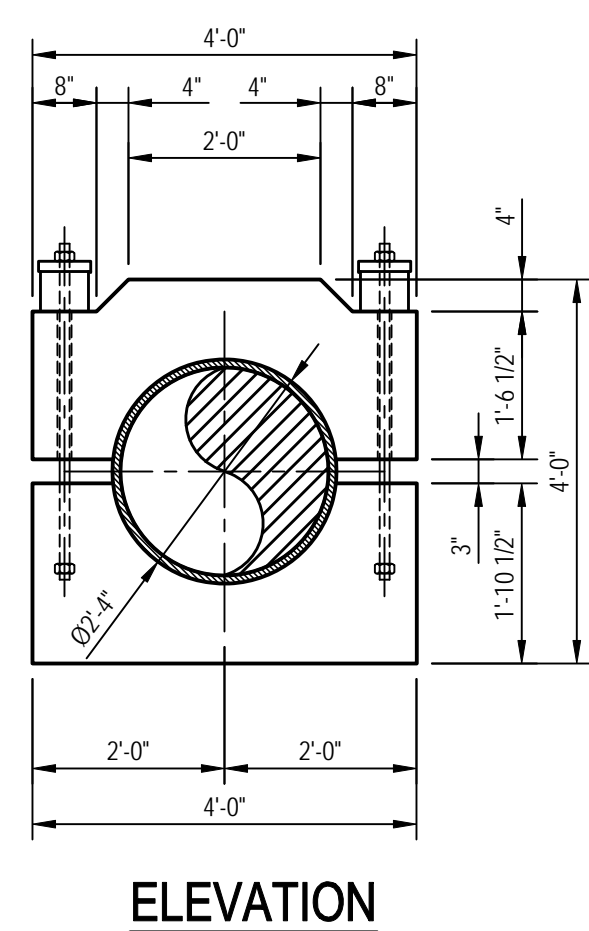
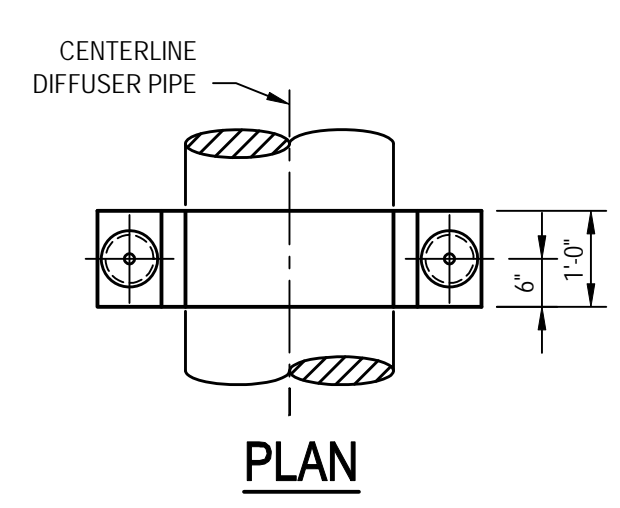
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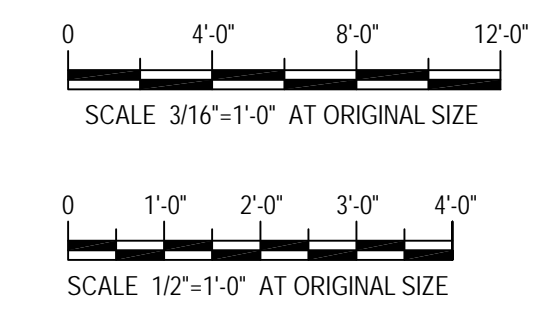
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1 DETAIL  
SCALE: 1/2"=1'-0"



2 DETAIL  
SCALE: 1/2"=1'-0"



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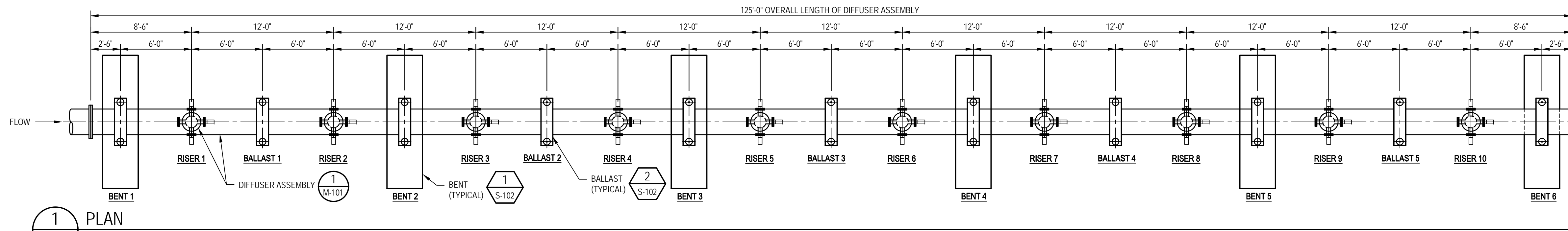


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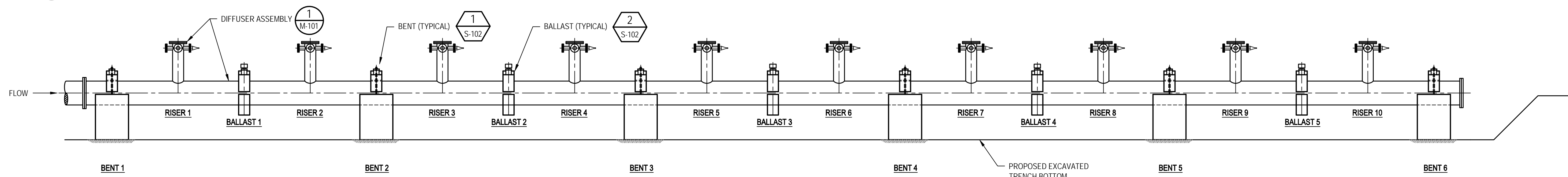
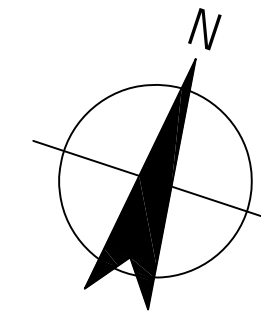
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Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	OCEAN OUTFALL PROJECT		
Title	DIFFUSER SUPPORT STRUCTURE - ALTERNATE A PLAN AND ELEVATION		
Contract No.	Original Size		
Scale	Ansi D Drawing No: 86-18693-S101		
Plot Date:	Plotted by:	Cad File No:	Sheet of 23 Rev: A

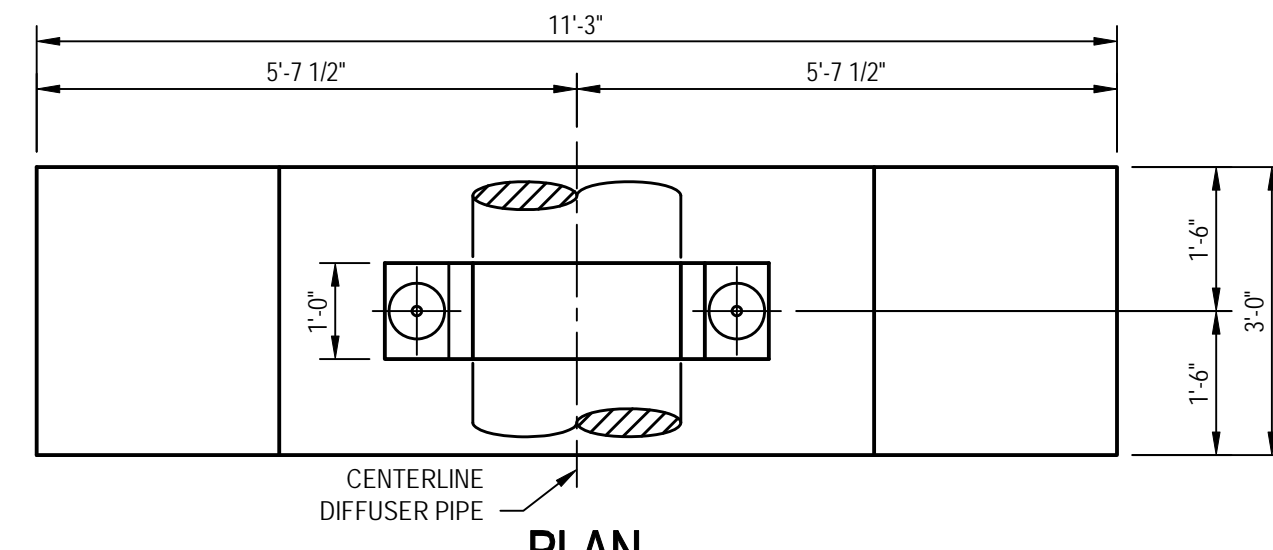
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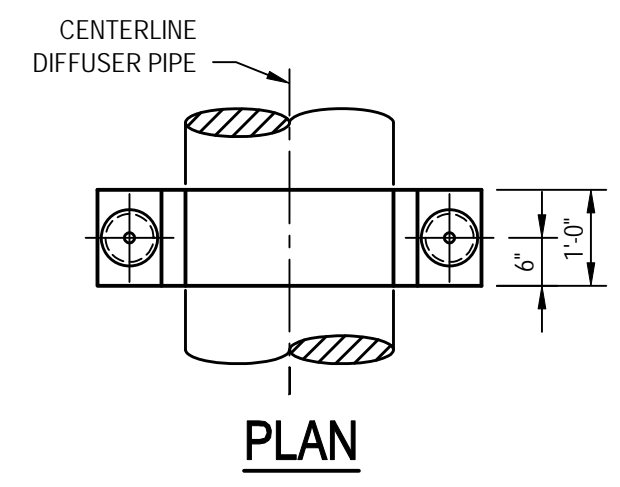
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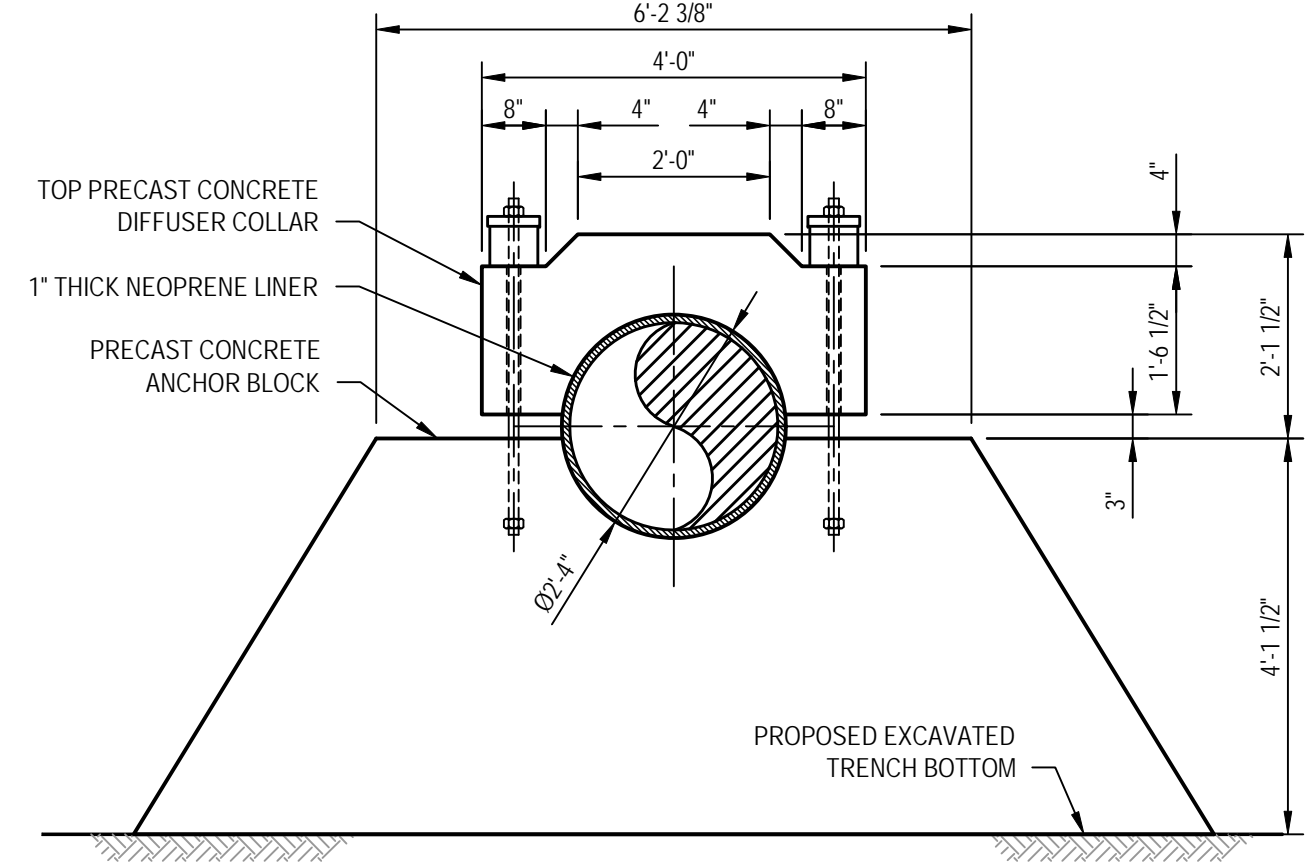
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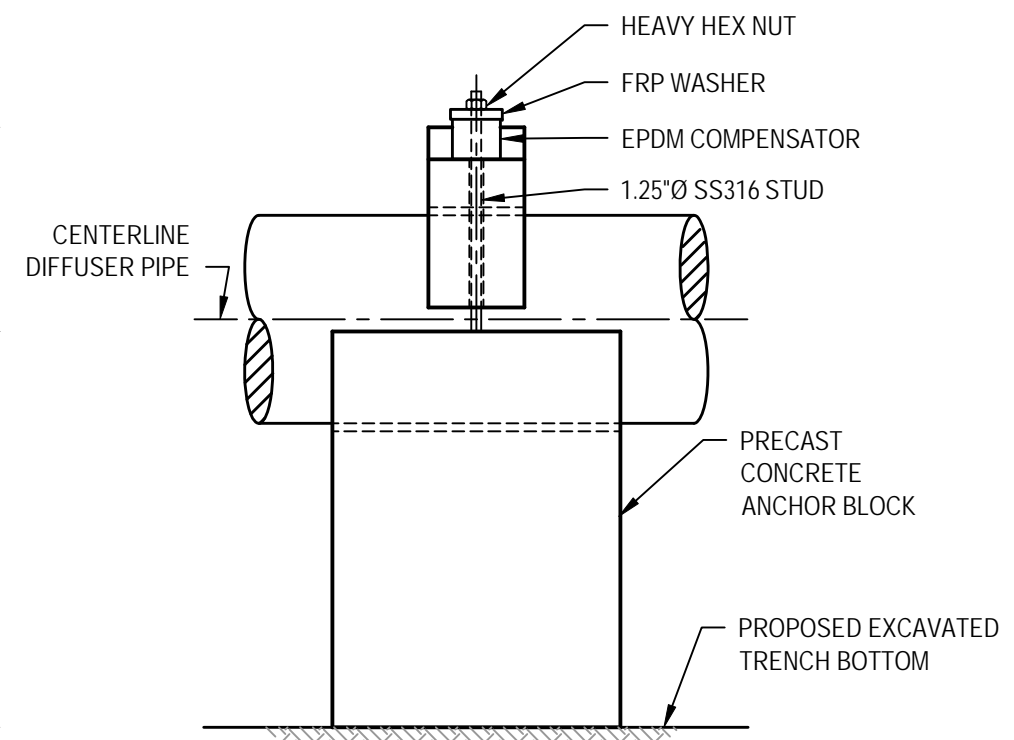
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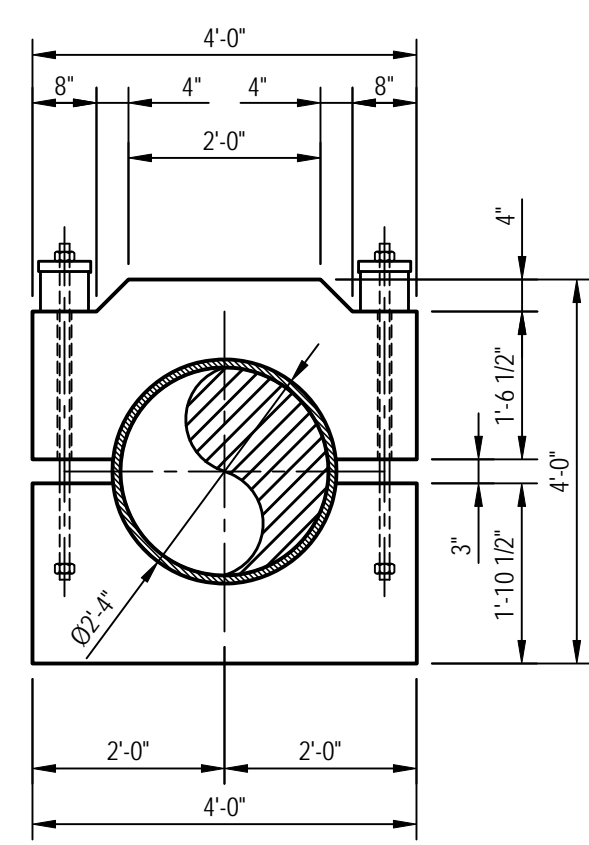
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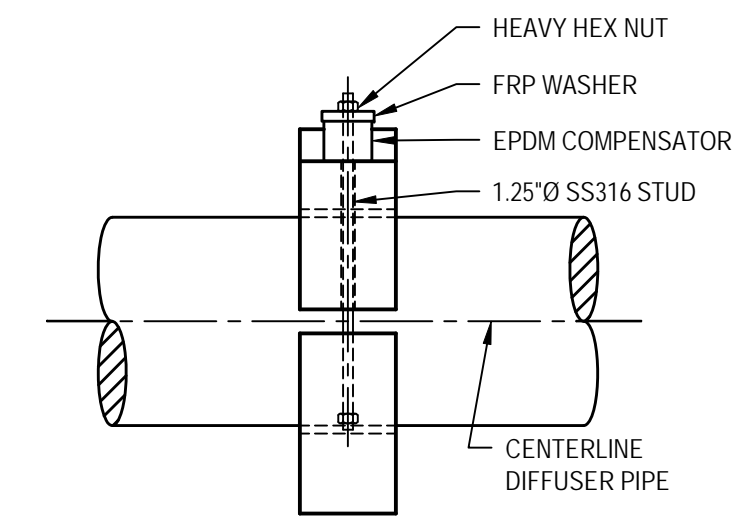
**ELEVATION**



**PROFILE**



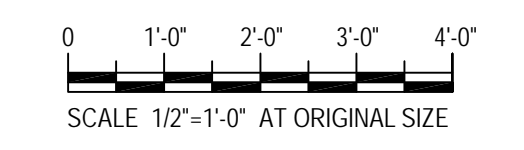
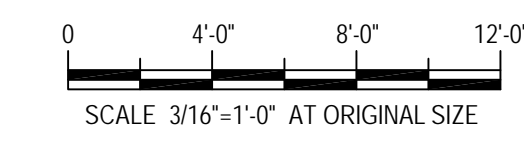
**ELEVATION**



**PROFILE**

**1 DETAIL**  
SCALE: 1/2"=1'-0"

**2 DETAIL**  
SCALE: 1/2"=1'-0"



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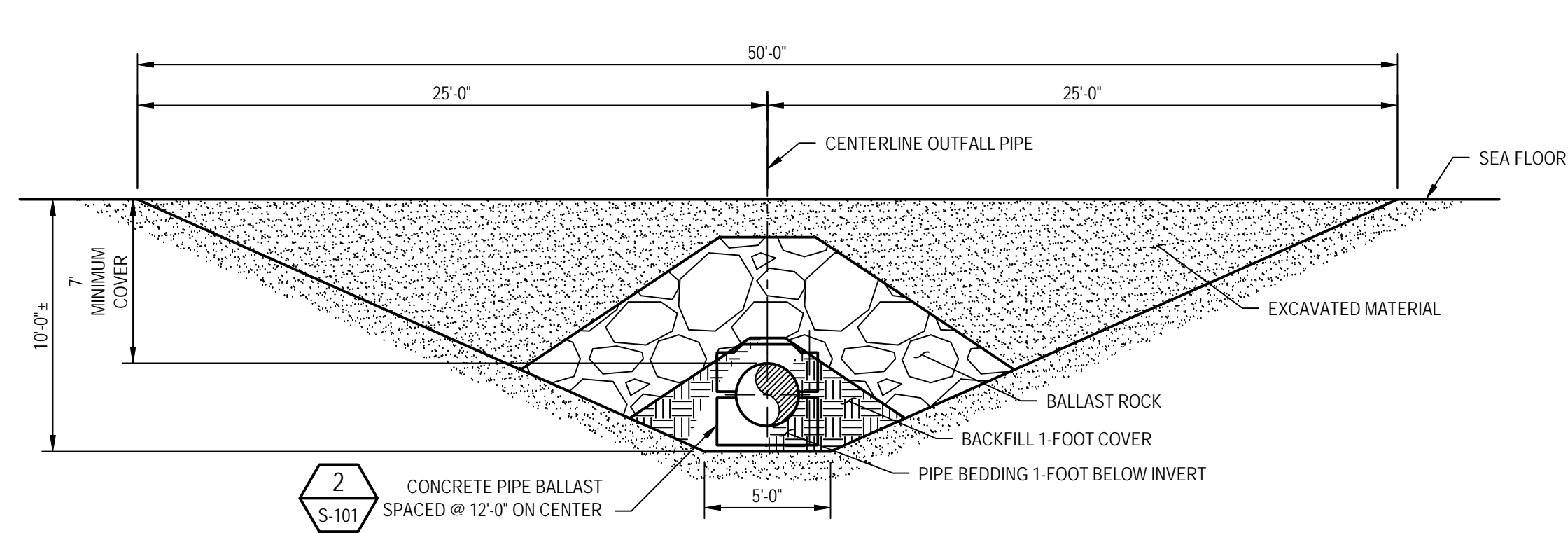
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Client	<b>CITY OF REHOBOTH BEACH, DELAWARE</b>		
Project	<b>OCEAN OUTFALL PROJECT</b>		
Title	<b>DIFFUSER SUPPORT STRUCTURE - ALTERNATE B PLAN AND ELEVATION</b>		
Contract No.	Original Size		
Scale	Ansi D Drawing No: <b>86-18693-S102</b>		
Sheet	of	23	Rev: <b>A</b>

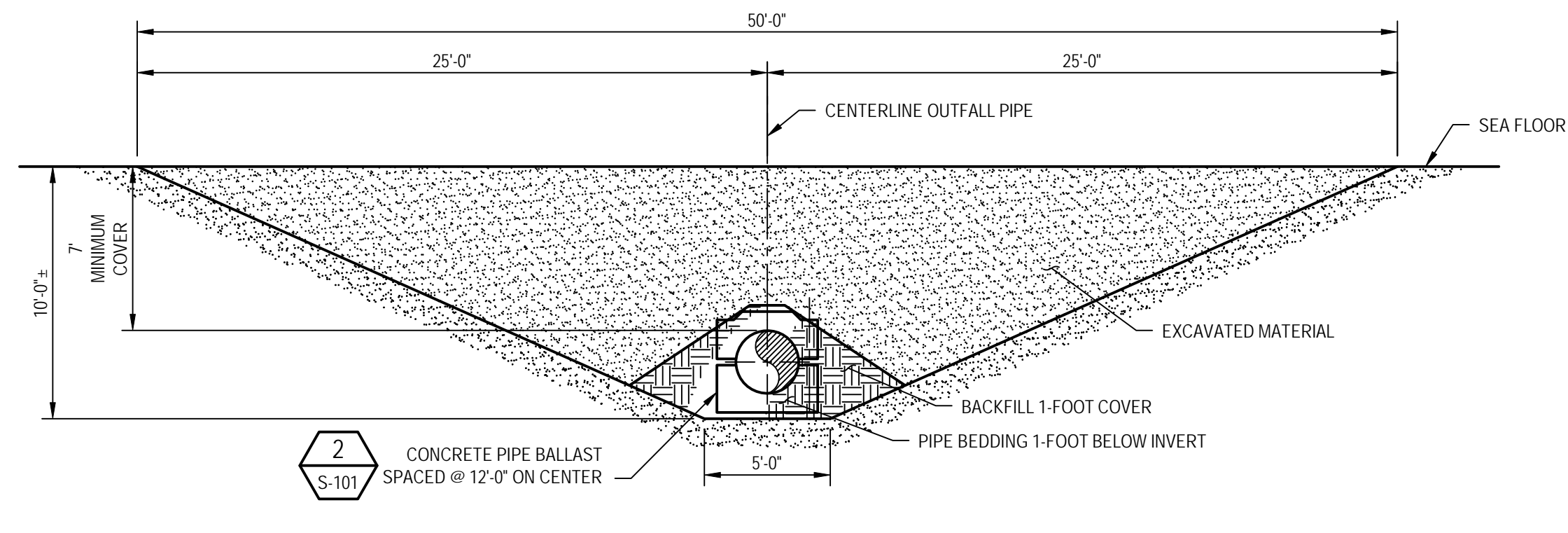
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Plot Date: Plotted by: Cad File No:

**PRELIMINARY**

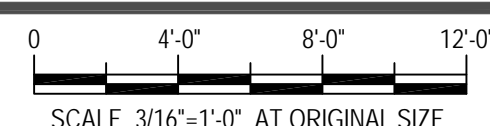


**1 TYPICAL OUTFALL TRENCH SECTION - ALTERNATE A**  
SCALE: 3/16"=1'-0"



**2 TYPICAL OUTFALL TRENCH SECTION - ALTERNATE B**  
SCALE: 3/16"=1'-0"

**PRELIMINARY**



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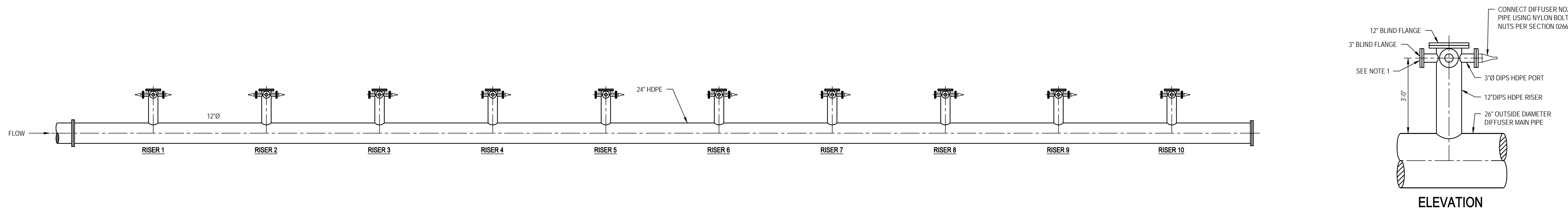
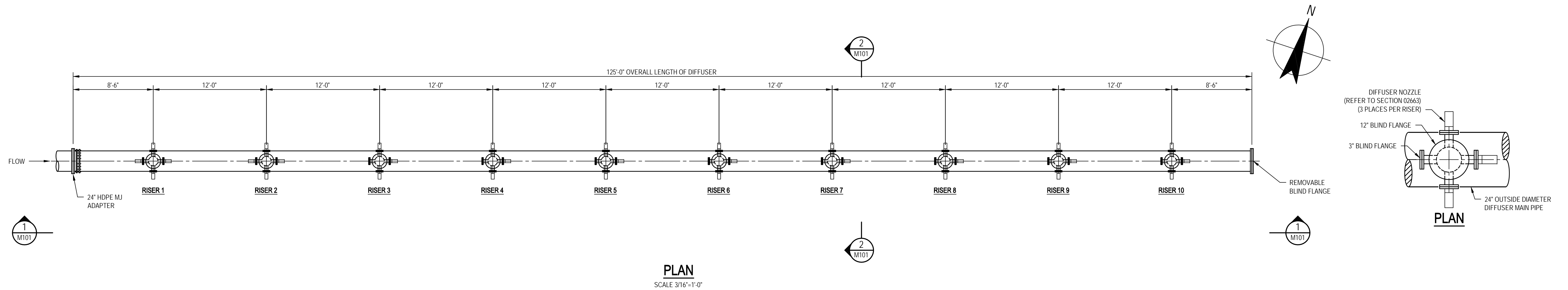
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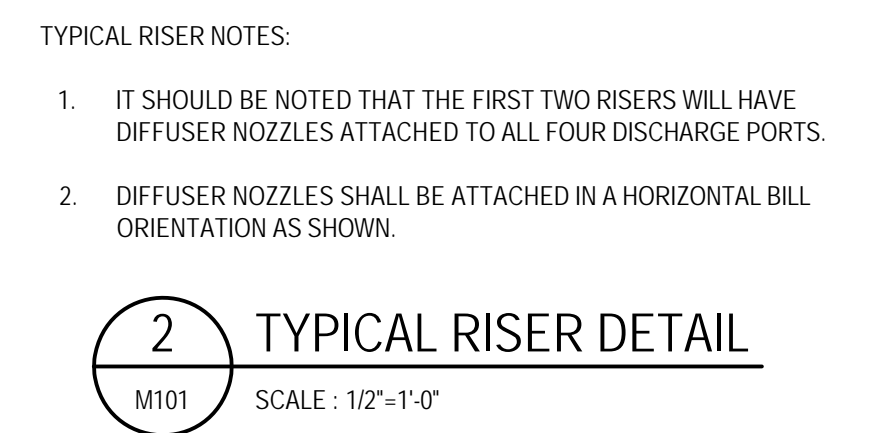
Client	<b>CITY OF REHOBOTH BEACH, DELAWARE</b>		
Project	<b>OCEAN OUTFALL PROJECT</b>		
Title	<b>STRUCTURAL DETAILS</b>		
Contract No.	Original Size		
<b>Ansi D</b>	<b>Drawing No: 86-18693-S103</b>	Sheet	of 23
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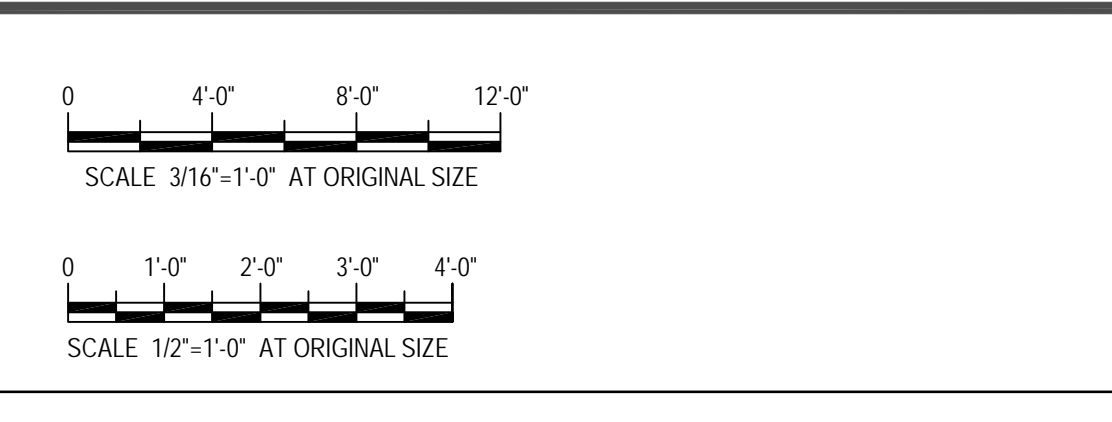
- DIFFUSER ASSEMBLY NOTES:**
1. DIFFUSER ASSEMBLY SHALL BE HDPE CONSTRUCTION AS SHOWN IN ACCORDANCE WITH SECTION XXXX. HDPE TO BE BUTT-FUSED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS UNLESS OTHERWISE NOTED.
  2. DIFFUSER SUPPORTS NOT SHOWN FOR CLARITY. REFER TO STRUCTURAL DRAWINGS FOR INFORMATION.



- TYPICAL RISER NOTES:**
1. IT SHOULD BE NOTED THAT THE FIRST TWO RISERS WILL HAVE DIFFUSER NOZZLES ATTACHED TO ALL FOUR DISCHARGE PORTS.
  2. DIFFUSER NOZZLES SHALL BE ATTACHED IN A HORIZONTAL BILL ORIENTATION AS SHOWN.

**PRELIMINARY**

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Client	<b>CITY OF REHOBOTH BEACH, DELAWARE</b>		
Project	<b>OCEAN OUTFALL PROJECT</b>		
Title	<b>DIFFUSER ASSEMBLY PLAN AND ELEVATION</b>		
Contract No.	Original Size		
Ans D	Drawing No:	<b>86-18693-M101</b>	
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