



CITY OF REHOBOTH BEACH, DELAWARE

FORCE MAIN PROJECT

PROJECT NUMBER: 2017-002

PERMIT SUBMITTAL



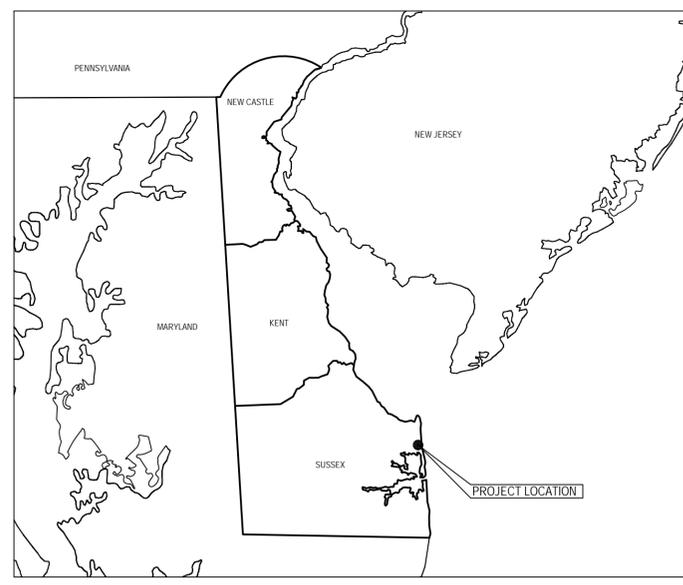
FOR UTILITY LOCATIONS
CALL AT LEAST 48 HOURS
BEFORE BEGINNING CONSTRUCTION

GENERAL NOTES:

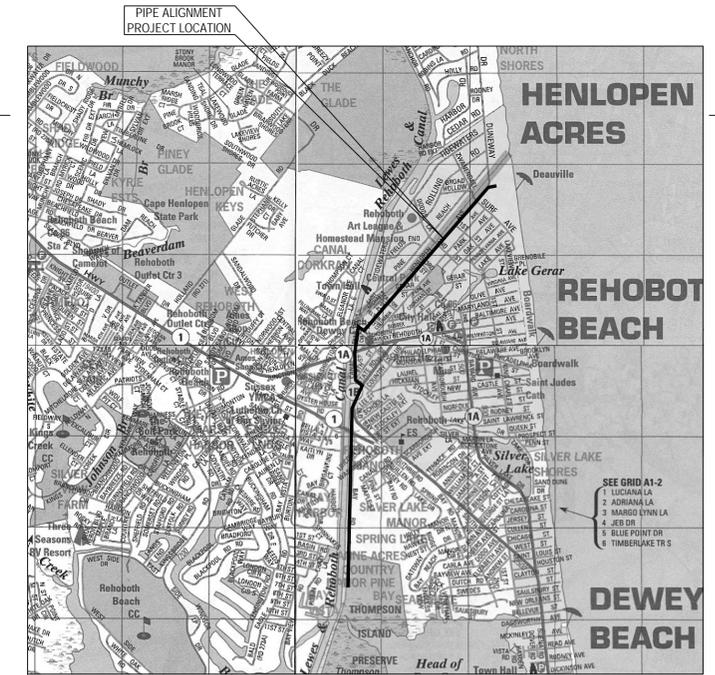
1. LOT ADDRESS: BAY ROAD
REHOBOTH BEACH, DE 19971
2. OWNER: CITY OF REHOBOTH BEACH
3. TAX MAP/ GRID/
PARCEL/ BLOCK: TAX MAP ----, GRID ----
PARCEL ----, BLOCK ----
4. DEED REFERENCES: SEE PLANS
5. TAX ACCOUNT ID: SEE PLANS
6. ADC MAP: MAP 27, GRID A2
7. HORIZONTAL DATUM: NAD 88
8. VERTICAL DATUM: NAVD 83
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



VICINITY MAP
NOT TO SCALE

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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NOT FOR CONSTRUCTION



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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 **FORCE MAIN PROJECT**
Title **COVER SHEET**

Contract No. _____
Original Size _____
Ansi D Drawing No: **86-18690-G001**

LIST OF DRAWINGS

GENERAL			
1	G	001	COVER SHEET
2	G	002	LIST OF DRAWINGS, GENERAL NOTES
CIVIL			
3	C	001	OVERALL SITE AND KEY PLAN
4	C	002	PIPELINE PLAN AND PROFILE 1
5	C	003	PIPELINE PLAN AND PROFILE 2
6	C	004	PIPELINE PLAN AND PROFILE 3
7	C	005	PIPELINE PLAN AND PROFILE 4
8	C	006	PIPELINE PLAN AND PROFILE 5
9	C	007	PIPELINE PLAN AND PROFILE 6
10	C	008	PIPELINE PLAN AND PROFILE 7
11	C	009	PIPELINE PLAN AND PROFILE 8
12	C	010	PIPELINE PLAN AND PROFILE 9
13	C	011	PIPELINE PLAN AND PROFILE 10
14	C	012	PARTIAL ESC AND STG AREA PLANS 1
15	C	013	PARTIAL ESC AND STG AREA PLANS 2 AND PLANTING PLAN
16	C	014	EROSION AND SEDIMENT CONTROL NOTES
17	C	015	EROSION AND SEDIMENT CONTROL DETAILS 1
18	C	016	EROSION AND SEDIMENT CONTROL DETAILS 2
19	C	017	EROSION AND SEDIMENT CONTROL DETAILS 3
20	C	018	MILL AND PAVEMENT REPAIR PLANS 1
21	C	019	MILL AND PAVEMENT REPAIR PLANS 2
22	C	020	TRAFFIC CONTROL PLAN
23	C	021	TRAFFIC CONTROL DETAILS
24	C	022	MISCELLANEOUS CIVIL DETAILS 1
25	C	023	MISCELLANEOUS CIVIL DETAILS 2
26	C	024	MISCELLANEOUS CIVIL DETAILS 3
27	C	025	MISCELLANEOUS CIVIL DETAILS 4
STRUCTURAL			
28	S	001	PLAN, SECTIONS AND DETAILS
MECHANICAL			
29	M	001	VALVE VAULT DETAILS

LIST OF PIPING DESIGNATIONS

ELEC	ELECTRICAL
GAS	GAS
TE	TREATED EFFLUENT
TEL	TELEPHONE
SAN	SANITARY SEWER
SD	STORM DRAIN
W	WATER

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
FM	FORCE MAIN
HDD	HORIZONTAL DIRECTIONAL DRILL
HDPE	HIGH DENSITY POLYETHYLENE
MJ	MECHANICAL JOINT
PHC	POINT OF HORIZONTAL CONTACT
PHT	POINT OF HORIZONTAL TANGENCY
PV	PLUG VALVE
PVC	POINT OF VERTICAL CONTACT
PVT	POINT OF VERTICAL TANGENCY
MH	MANHOLE
RP	ROAD CONSTRUCTION POINT
SAN	SANITARY SEWER
SD	STORM DRAIN
STD	STANDARD
STA	STATION
TEL	TELEPHONE CABLE
TM	TAX MAP

GENERAL NOTES (APPLIES TO ALL DRAWINGS)

- CONSTRUCTION SHALL BE IN ACCORDANCE WITH PLAN AND SPECIFICATIONS.
- ANY NECESSARY LANE CLOSURES SHALL FOLLOW GUIDELINES OUTLINED IN THE DELAWARE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- CONTRACTOR SHALL COORDINATE WITH DELMARVA POWER COMPANY TO PROTECT, RELOCATE OR REPLACE EXISTING POWER POLES WHEN NECESSARY. THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY UTILITY POLE IN ADVANCE OF ANY EXCAVATION WORK THAT WILL TAKE PLACE WITHIN 5'-0" OF THE UTILITY POLE. THE CONTRACTOR SHALL INCLUDE THE COST OF TEMPORARY POLE SUPPORT IN THE APPROPRIATE BID ITEM. WHERE UTILITY POLES ARE REQUIRED TO BE SUPPORTED DURING CONSTRUCTION, THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS WITH THE UTILITY COMPANY.
- EXISTING CONDITIONS SHOWN ON THESE CONTRACT DRAWINGS WERE OBTAINED FROM FIELD SURVEY, RECORD DOCUMENTS AND AVAILABLE MAPPING AND THEREFORE THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
- 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 TO BE REPAIRED.
- CONTRACTOR TO FIELD VERIFY LOCATIONS OF EXISTING PIPING AND STRUCTURES.
- CONTRACTOR SHALL CONFORM WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES DURING TRENCHING ACTIVITIES.
- ALL EXISTING PIPING, EQUIPMENT, AND STRUCTURES MUST BE FULLY SUPPORTED DURING CONSTRUCTION AGAINST VERTICAL, HORIZONTAL, AND OVERTURNING FORCES AND MOVEMENT.
- PIPE JOINTS AND FITTING SHALL BE RESTRAINED PER PLANS AND DETAILS.
- POWER LINE POLES TO BE PROTECTED AS REQUIRED DURING CONSTRUCTION OF THE FORCE MAINS.
- COMBINATION SEWAGE AIR/ VACUUM VALVE VAULTS AND BLOW OFF CHAMBER LOCATIONS ARE SHOWN APPROXIMATE. THE AIR RELEASE VALVE SHALL BE FIELD LOCATED AT THE HIGH POINT AND THE BLOW OFF AT THE LOW POINT BASED UPON AS CONSTRUCTED ELEVATIONS.
- CONTRACTOR SHALL SUPPLY ALL BENDS REQUIRED TO MAINTAIN SMOOTH FLOW LINES, CHANGES IN ELEVATION AND TO MEET ALL TRANSITIONS.
- CONTRACTOR SHALL REPLACE ALL PAVEMENT AND ROADWAYS THAT IS 1) SHOWN AS REPLACED ON THE CONTRACT DRAWINGS, 2) IMPACTED BY NEW CONSTRUCTION, AND 3) IMPACTED BY CONTRACTOR'S OPERATIONS.
- SURVEY INFORMATION PROVIDED 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.
- FORCE MAIN SHALL BE INSTALLED USING CONVENTIONAL CUT AND COVER TECHNIQUES UNLESS OTHERWISE SPECIFIED.
- THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND FURNISH COPIES TO THE ENGINEER PRIOR TO COMMENCING WORK.
- THE CONTRACTOR'S WORK AREA SHALL BE CONFINED TO THE LIMITS OF THE RIGHT-OF-WAYS AND EASEMENTS. THE CONTRACTOR SHALL OBTAIN ANY ADDITIONAL EASEMENTS OR WORK RELEASES SHOULD THE CONTRACTOR REQUIRE ADDITIONAL AREA TO ACCOMMODATE HIS OPERATIONS.
- THE LOCATIONS AND DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THE PLANS AND PROFILES ARE APPROXIMATE. OTHER UNDERGROUND UTILITIES NOT SHOWN MAY BE ENCOUNTERED. THE CONTRACTOR SHALL PERFORM TEST PITS TO VERIFY THE LOCATION AND ELEVATION OF UTILITIES AT INTERCONNECTIONS AND CROSSINGS AS SHOWN, DIRECTED OR REQUIRED. THE CONTRACTOR SHALL EXCAVATE IN ADVANCE OF THE PIPE LAYING OPERATION AND EXPOSE ALL EXISTING UNDERGROUND UTILITIES TO PREVENT DAMAGE DURING CONSTRUCTION AND TO DETERMINE REQUIRED CHANGES IN GRADE NECESSARY TO INSTALL THE SEWER MAIN TO AVOID CONFLICTS.
- THE CONTRACTOR SHALL INSTALL THOSE MEASURES REQUIRED TO LIMIT EROSION OF AREAS DISTURBED BY THE WORK. CLEARING SHALL BE PERFORMED ON AN AS NEEDED BASIS, PHASED TO REDUCE EROSION POTENTIAL AND VISUAL IMPACT.
- IF THE MATERIAL AT THE DESIGN GRADE IS UNSUITABLE AS DETERMINED BY THE ENGINEER, THE CONTRACTOR, WHEN ORDERED IN WRITING, SHALL EXCAVATE ADDITIONAL MATERIAL TO THE DEPTH NECESSARY AND SHALL BACKFILL TO THE PROPOSED GRADE WITH SELECT GRANULAR BACKFILL MATERIAL.
- THE CONTRACTOR SHALL SUBMIT PROCEDURES FOR TESTING OF THE SEWER TO THE ENGINEER FOR APPROVAL.
- TO FACILITATE INSTALLATION OF PIPE AND APPURTENANCES, THE CONTRACTOR SHALL REMOVE AND REINSTALL OR RELOCATE EXISTING MAILBOXES, SIGNS, GUIDE RAILS, OR OTHER STRUCTURES AND OBSTACLES ENCOUNTERED DURING THE WORK. NO SEPARATE PAYMENT SHALL BE PAID FOR THIS WORK.
- ALL OPEN EXCAVATED AREAS SHALL BE ADEQUATELY FILLED AND/OR COVERED WITH STEEL PLATE AT THE END OF EACH WORK DAY. THE CONTRACTOR SHALL LIMIT THE AMOUNT OF OPEN TRENCH AT ANY ONE TIME. IF UNSAFE CONDITIONS EXIST THE ENGINEER AND OWNER RETAIN THE RIGHT TO LIMIT THE AMOUNT OF OPEN EXCAVATION AT ANY ONE TIME.
- ALL SURFACES DISTURBED BY THE CONTRACTOR WHICH ARE OUTSIDE THE WORK LIMITS OR WORK SCOPE, OR ARE SURFACES DISTURBED WITHOUT PRIOR AUTHORIZATION BY THE ENGINEER, SHALL BE RESTORED TO ORIGINAL CONDITIONS OR BETTER, AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY, WITHOUT INTERRUPTION TO EXISTING SANITARY SERVICES. THE CONTRACTOR SHALL UTILIZE APPROVED BYPASSING TECHNIQUES IN ORDER TO PERFORM SAID WORK UNDER SAID CONDITIONS. ALL PROPOSED BYPASSING TECHNIQUES AND EQUIPMENT SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE START OF THIS WORK. THE COST FOR THIS WORK SHALL BE INCLUDED IN THE UNIT PRICES BID FOR THIS PROJECT. NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR THIS WORK.
- IN THE EVENT THAT A SERVICE MUST BE INTERRUPTED, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE TO NOTIFY THE RESIDENT OF SAID INTERRUPTION. IN NO CASE SHALL ANY SERVICE BE INTERRUPTED FOR MORE THAN 6-HOURS, AND IN NO CASE SHALL THE INTERRUPTION EXTEND BEYOND THE END OF THE WORKING DAY. IN THE EVENT THAT ANY INTERRUPTION CONTINUES FOR MORE THAN 6-HOURS, THE CONTRACTOR SHALL PROVIDE TEMPORARY SERVICES. NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR WORK ASSOCIATED WITH ALL SUCH TEMPORARY SERVICES.
- SUBSURFACE INVESTIGATIONS HAVE BEEN PERFORMED IN THE AREAS IN WHICH WORK IS PROPOSED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE IF ANY ADDITIONAL SUBSURFACE INVESTIGATIONS ARE NECESSARY. NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR ANY SUCH WORK.
- ALL PAVEMENT MARKINGS SHALL BE RECORDED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION AND REPLACED TO PRE CONSTRUCTION LAYOUT AS APPROVED BY THE ENGINEER AND OWNER.

GENERAL LEGEND

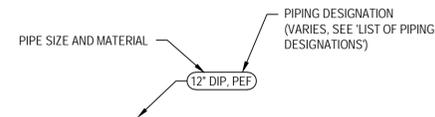
NEW GRAPHICS: EQUIPMENT, STRUCTURES, ETC., ARE SHOWN AS BOLD LINEWORK AND IN THIS TEXT FORMAT.

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

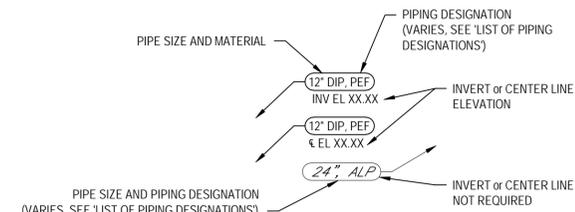
EXISTING PIPE CALLOUT (FOR PLANS)



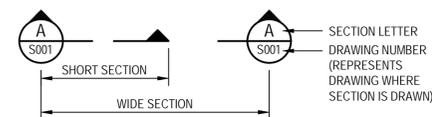
NEW PIPE CALLOUT (FOR PLANS)



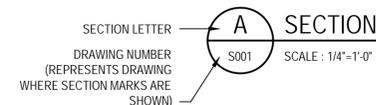
NEW/EXIST PIPE CALLOUT (FOR PROFILES)



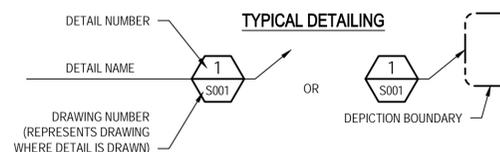
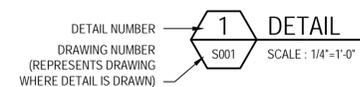
TYPICAL SECTION MARKS (FOR PLANS)



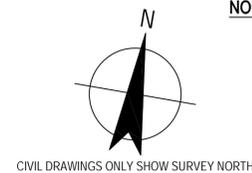
TYPICAL SECTION SUB-TITLE (FOR SECTIONS)



TYPICAL DETAIL MARKS



NORTH ARROWS



CIVIL LEGEND

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

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Approved (Project Director)	KSG		
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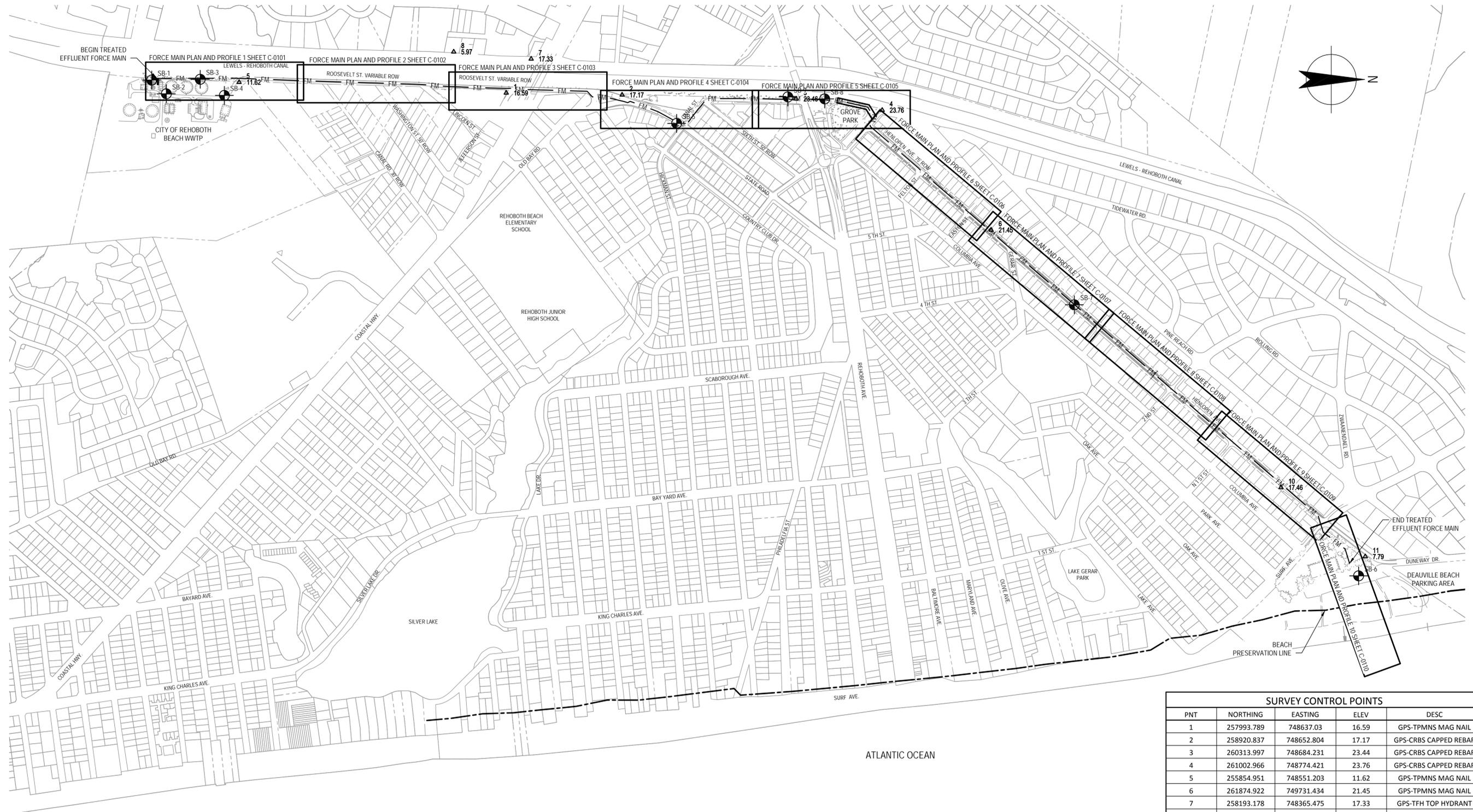
Client **CITY OF REHOBOTH BEACH, DELAWARE**
Project **FORCE MAIN PROJECT**
Title **LIST OF DRAWINGS, GENERAL NOTES**

Contract No.

Original Size
Ansi D Drawing No: 86-18690-G002

Sheet **2** of **29**

Rev: **A**

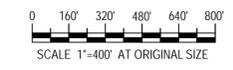


OVERALL SITE PLAN AND KEY PLAN
SCALE 1"=400'-0"

SURVEY CONTROL POINTS				
PNT	NORTHING	EASTING	ELEV	DESC
1	257993.789	748637.03	16.59	GPS-TPMNS MAG NAIL
2	258920.837	748652.804	17.17	GPS-CRBS CAPPED REBAR
3	260313.997	748684.231	23.44	GPS-CRBS CAPPED REBAR
4	261002.966	748774.421	23.76	GPS-CRBS CAPPED REBAR
5	255854.951	748551.203	11.62	GPS-TPMNS MAG NAIL
6	261874.922	749731.434	21.45	GPS-TPMNS MAG NAIL
7	258193.178	748365.475	17.33	GPS-TFH TOP HYDRANT
8	257572.933	748308.579	5.97	GPS-MNS MAG NAIL
10	264195.193	751787.755	17.46	GPS-RBS CAPPED REBAR
11	264869.523	752340.146	7.79	GPS-CRBS CAPPED REBAR

PRELIMINARY

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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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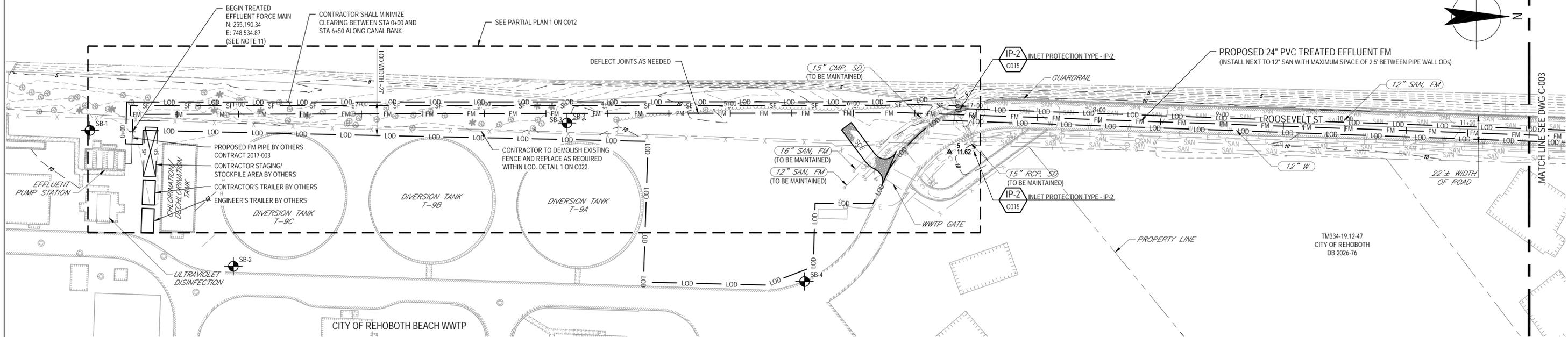


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Drawn	CTF	Designer	JM
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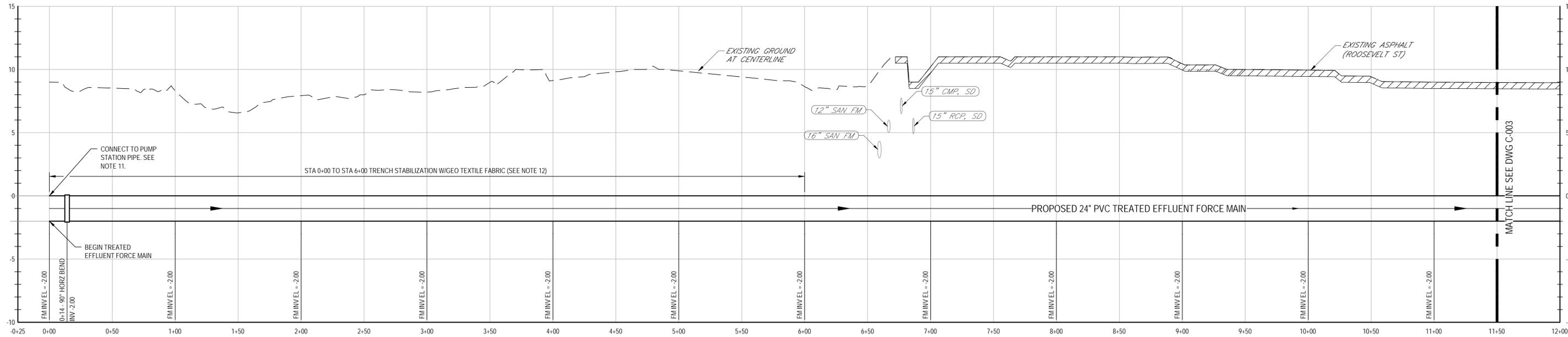
Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	FORCE MAIN PROJECT		
Title	OVERALL SITE AND KEY PLAN		
Contract No.	Original Size		
ANSI D	Drawing No:	86-18690-C001	
Sheet	3	of	29
Revision	A		

LEWES-REHOBOTH CANAL



FORCE MAIN PLAN 1

SCALE: 1" = 40'-0"



FORCE MAIN PROFILE 1

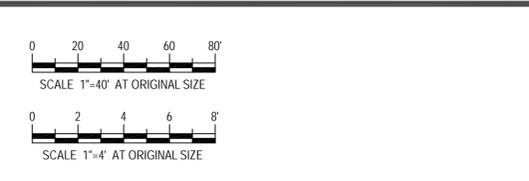
HORIZ SCALE: 1" = 40'-0"
VERT SCALE: 1" = 4'-0"

NOTES:

- THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION AND AHEAD OF PIPE LAYING TO MAKE ADJUSTMENTS TO LINE AND GRADE BEFORE CONFLICT.
- CONTRACTOR SHALL REWORK ALL CURB AND GUTTERS, SIDEWALK, AND ROADS DISTURBED BY CONSTRUCTION ACCORDING TO THE SPECIFICATIONS.
- CONTRACTOR SHALL MAINTAIN ACCESS TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
- REMOVE AND RECONSTRUCT EXISTING UTILITY PIPES AS NEEDED.
- CONTRACTOR SHALL MAINTAIN WATER AND SEWER SERVICE TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
- CONTRACTOR SHALL REPLACE DAMAGED LANDSCAPED AREAS TO THEIR ORIGINAL OR BETTER STATE.
- CONTRACTOR SHALL SAW-CUT, REMOVE AND REPLACE PAVEMENT WITH PERMANENT ASPHALT PATCH TO MATCH EXISTING GRADE. SEE DETAILS.
- CONTRACTOR SHALL LOCATE AND SUPPORT EXISTING UNDERGROUND TELEPHONE DURING CONSTRUCTION. SERVICE SHALL NOT BE INTERRUPTED.
- CONTRACTOR SHALL CONSTRUCT ALL SEDIMENTATION AND EROSION CONTROL DEVICES IN ACCORDANCE WITH THE STATE OF DELAWARE EROSION CONTROL STANDARD DETAILS TO CONTAIN SEDIMENT WITHIN THE BOUNDARIES OF THE CONSTRUCTION SITE.
- ALL UTILITY CROSSINGS ARE LOCATED AT AN APPROXIMATE DEPTH, CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSING PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL MAKE CONNECTION TO PUMP STATION PIPE AT THIS LOCATION UPON TESTING AND ACCEPTANCE. CONTRACTOR SHALL PROVIDE CAP OR PLUG FOR USE WITH SPECIFIED PIPE TO PROTECT PIPE DURING CONSTRUCTION. CONTRACTOR SHALL PROVIDE RESTRAINED JOINT COUPLING FOR FINAL CONNECTION BETWEEN PUMP STATION PIPE AND FORCE MAIN.
- REINFORCING GEOTEXTILE FABRIC SHALL BE USED BETWEEN STATION 0+00 AND STATION 6+00 FOR STABILIZATION IN LANDFILL AREA. FABRIC SHALL WRAP TRENCH BOTTOM TO A MINIMUM HEIGHT OF 6' ABOVE INITIAL BACKFILL.

PRELIMINARY

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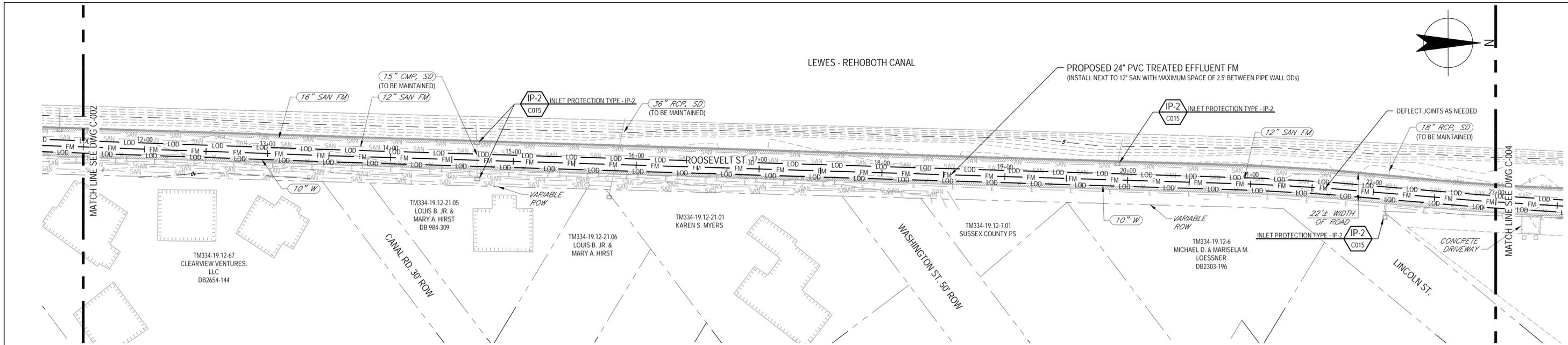
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Drawn CTF	Designer JM
Drafting JFM	Design Check BMG
Approved (Project Director) KSG	Date 06/2016
Scale AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction

Client **CITY OF REHOBOTH BEACH, DELAWARE**
Project **FORCE MAIN PROJECT**
Title **FORCE MAIN PLAN AND PROFILE 1**

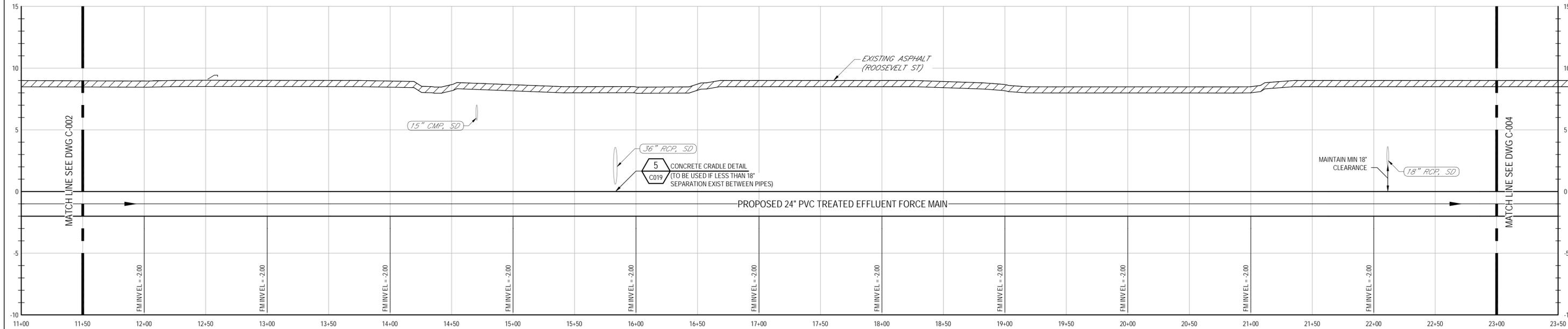
Contract No. **86-18690-C002**

Original Size **Ansi D** Drawing No: **86-18690-C002** Sheet 4 of 29 Rev: A



FORCE MAIN PLAN 2

SCALE: 1" = 40'-0"



FORCE MAIN PROFILE 2

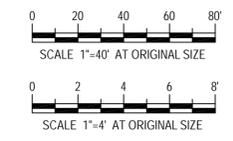
HORZ SCALE: 1" = 40'-0"
VERT SCALE: 1" = 4'-0"

NOTES:

1. THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION AND AHEAD OF PIPE LAYING TO MAKE ADJUSTMENTS TO LINE AND GRADE BEFORE CONFLICT.
2. CONTRACTOR SHALL REWORK ALL CURB AND GUTTERS, SIDEWALK, AND ROADS DISTURBED BY CONSTRUCTION ACCORDING TO THE SPECIFICATIONS.
3. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
4. REMOVE AND RECONSTRUCT EXISTING UTILITY PIPES AS NEEDED.
5. CONTRACTOR SHALL MAINTAIN WATER AND SEWER SERVICE TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
6. CONTRACTOR SHALL REPLACE DAMAGED LANDSCAPED AREAS TO THEIR ORIGINAL OR BETTER STATE.
7. CONTRACTOR SHALL SAW-CUT, REMOVE AND REPLACE PAVEMENT WITH PERMANENT ASPHALT PATCH TO MATCH EXISTING GRADE. SEE DETAILS.
8. CONTRACTOR SHALL LOCATE AND SUPPORT EXISTING UNDERGROUND TELEPHONE DURING CONSTRUCTION. SERVICE SHALL NOT BE INTERRUPTED.
9. CONTRACTOR SHALL CONSTRUCT ALL SEDIMENTATION AND EROSION CONTROL DEVICES IN ACCORDANCE WITH THE STATE OF DELAWARE EROSION CONTROL STANDARD DETAILS TO CONTAIN SEDIMENT WITHIN THE BOUNDARIES OF THE CONSTRUCTION SITE.
10. ALL UTILITY CROSSINGS ARE LOCATED AT AN APPROXIMATE DEPTH, CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSING PRIOR TO CONSTRUCTION.

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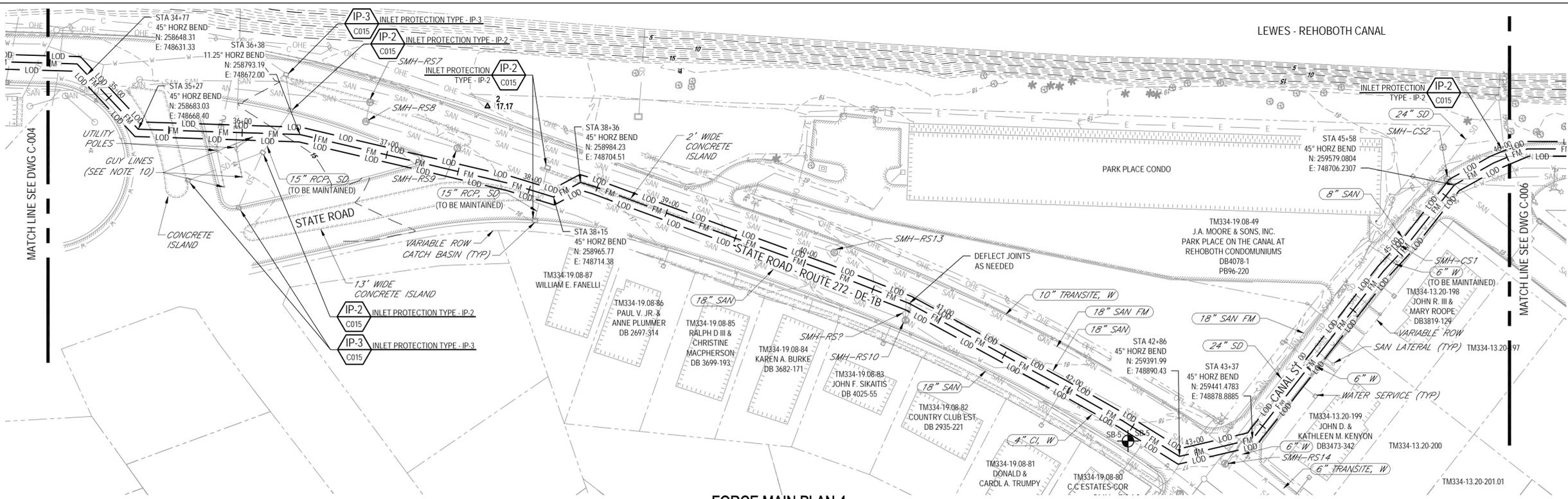
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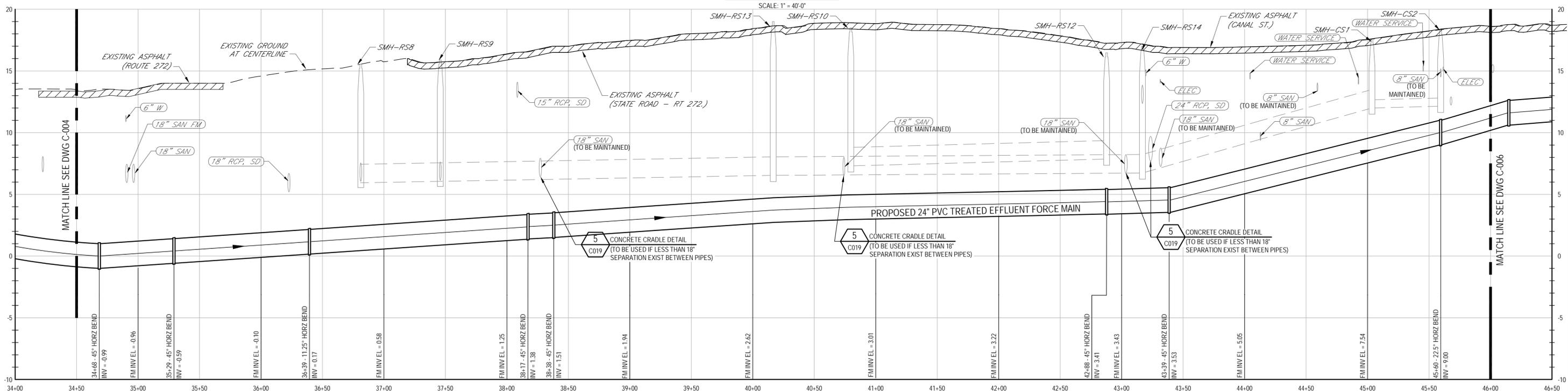
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Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG	Date	06/2016
Scale	AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	FORCE MAIN PROJECT		
Title	FORCE MAIN PLAN AND PROFILE 2		
Contract No.	Original Size		
ANSI D	Drawing No:	86-18690-C003	
Sheet	5	of	29
Revision	A		



FORCE MAIN PLAN 4

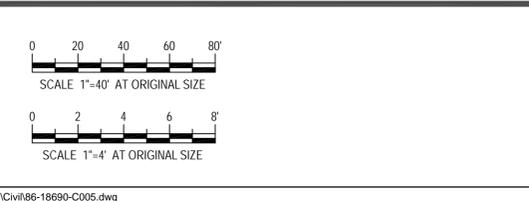


FORCE MAIN PROFILE 4

NOTES:

- THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION AND AHEAD OF PIPE LAYING TO MAKE ADJUSTMENTS TO LINE AND GRADE BEFORE CONFLICT.
- CONTRACTOR SHALL REWORK ALL CURB AND GUTTERS, SIDEWALK, AND ROADS DISTURBED BY CONSTRUCTION ACCORDING TO THE SPECIFICATIONS.
- CONTRACTOR SHALL MAINTAIN ACCESS TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
- REMOVE AND RECONSTRUCT EXISTING UTILITY PIPES AS NEEDED.
- CONTRACTOR SHALL MAINTAIN WATER AND SEWER SERVICE TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
- CONTRACTOR SHALL REPLACE DAMAGED LANDSCAPED AREAS TO THEIR ORIGINAL OR BETTER STATE.
- CONTRACTOR SHALL SAW-CUT, REMOVE AND REPLACE PAVEMENT WITH PERMANENT ASPHALT PATCH TO MATCH EXISTING GRADE. SEE DETAILS.
- CONTRACTOR SHALL LOCATE AND SUPPORT EXISTING UNDERGROUND TELEPHONE DURING CONSTRUCTION. SERVICE SHALL NOT BE INTERRUPTED.
- CONTRACTOR SHALL CONSTRUCT ALL SEDIMENTATION AND EROSION CONTROL DEVICES IN ACCORDANCE WITH THE STATE OF DELAWARE EROSION CONTROL STANDARD DETAILS TO CONTAIN SEDIMENT WITHIN THE BOUNDARIES OF THE CONSTRUCTION SITE.
- CONTRACTOR SHALL COORDINATE WITH DELMARVA POWER COMPANY FOR RELOCATION OF POWER POLE GUY LINES.
- ALL UTILITY CROSSINGS ARE LOCATED AT AN APPROXIMATE DEPTH, CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSING PRIOR TO CONSTRUCTION.

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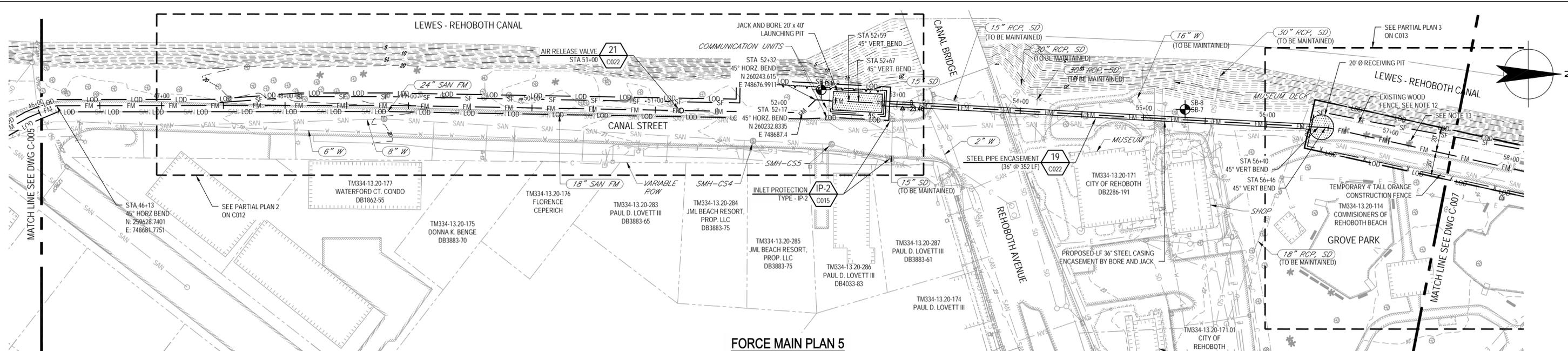
Drawn	CTF	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG	Date	06/2016
Scale	AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

PRELIMINARY

Client **CITY OF REHOBOTH BEACH, DELAWARE**
Project **FORCE MAIN PROJECT**
Title **FORCE MAIN PLAN AND PROFILE 4**

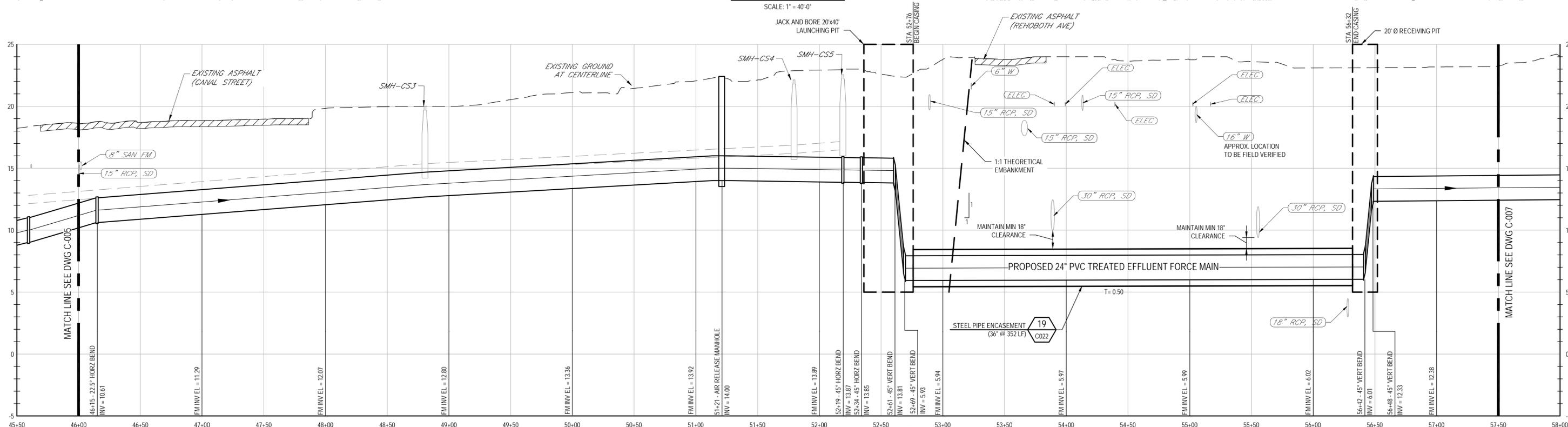
Contract No. _____
Original Size _____
Ansi D Drawing No: **86-18690-C005**

Scale 7 of 29
Rev: **A**



FORCE MAIN PLAN 5

SCALE: 1" = 40'-0"



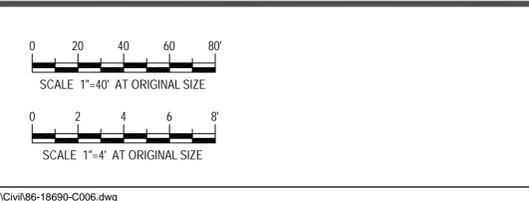
FORCE MAIN PROFILE 5

HORZ SCALE: 1" = 40'-0"
VERT SCALE: 1" = 4'-0"

- NOTES:**
- THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION AND AHEAD OF PIPE LAYING TO MAKE ADJUSTMENTS TO LINE AND GRADE BEFORE CONFLICT.
 - CONTRACTOR SHALL REWORK ALL CURB AND GUTTERS, SIDEWALK, AND ROADS DISTURBED BY CONSTRUCTION ACCORDING TO THE SPECIFICATIONS.
 - CONTRACTOR SHALL MAINTAIN ACCESS TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
 - REMOVE AND RECONSTRUCT EXISTING UTILITY PIPES AS NEEDED.
 - CONTRACTOR SHALL MAINTAIN WATER AND SEWER SERVICE TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
 - CONTRACTOR SHALL REPLACE DAMAGED LANDSCAPED AREAS TO THEIR ORIGINAL OR BETTER STATE.
 - CONTRACTOR SHALL SAW-CUT, REMOVE AND REPLACE PAVEMENT WITH PERMANENT ASPHALT PATCH TO MATCH EXISTING GRADE. SEE DETAILS.
 - CONTRACTOR SHALL LOCATE AND SUPPORT EXISTING UNDERGROUND TELEPHONE DURING CONSTRUCTION. SERVICE SHALL NOT BE INTERRUPTED.
 - CONTRACTOR SHALL CONSTRUCT ALL SEDIMENTATION AND EROSION CONTROL DEVICES IN ACCORDANCE WITH THE STATE OF DELAWARE EROSION CONTROL STANDARD DETAILS TO CONTAIN SEDIMENT WITHIN THE BOUNDARIES OF THE CONSTRUCTION SITE.
 - ALL UTILITY CROSSINGS ARE LOCATED AT AN APPROXIMATE DEPTH. CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSING PRIOR TO CONSTRUCTION.
 - BORE PITS SHALL BE ENCLOSED AND SECURED WITH MIN. 6' TALL FENCING. CONCRETE JERSEY BARRIERS SHALL BE UTILIZED TO PROTECT OPEN EXCAVATIONS AND AUGURE BORE WORK AREAS FROM TRAFFIC AND PEDESTRIANS.
 - CONTRACTOR SHALL DEMOLISH EXISTING WOOD FENCE AS NEEDED TO FACILITATE CONSTRUCTION. EXISTING WOOD FENCE TO BE REPLACED IN-KIND FOLLOWING CONSTRUCTION.
 - REPLACE TREES IN-KIND WITH SAME SPECIES AND SIZE FOR ALL TREES REMOVED. TREES SHALL BE REPLACED OUTSIDE OF PIPE TRENCH LIMITS.

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

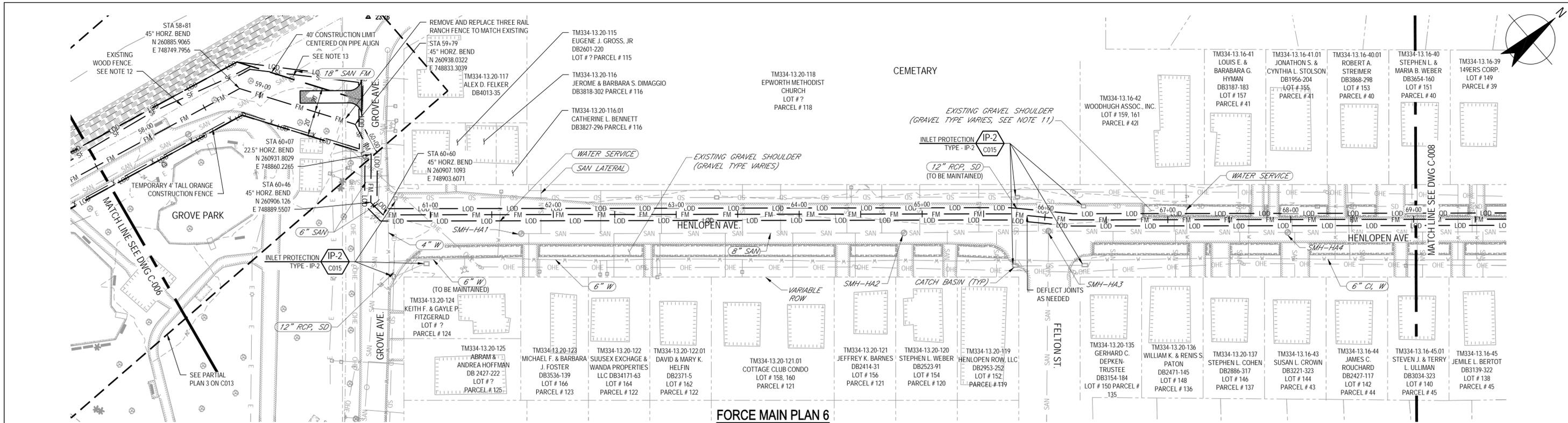


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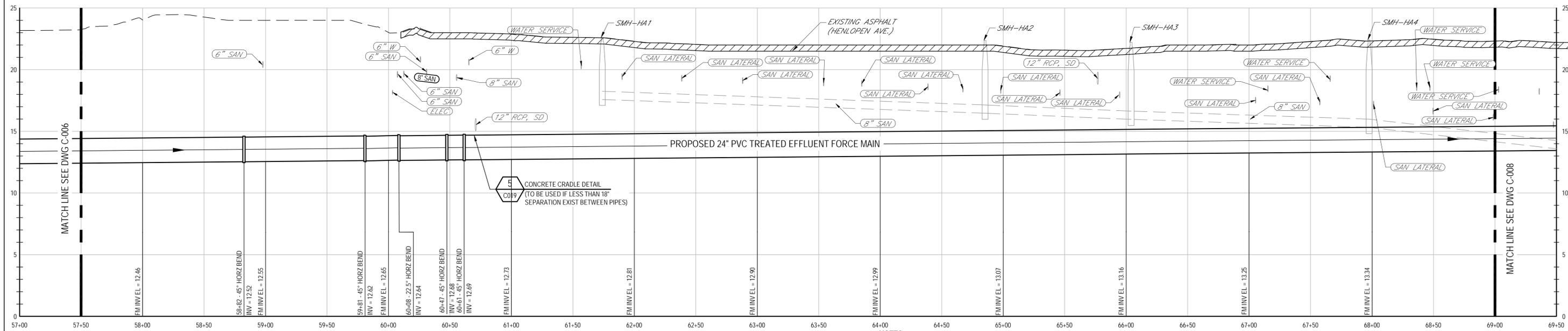
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Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG	Date	06/2016
Scale	AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	FORCE MAIN PROJECT		
Title	FORCE MAIN PLAN AND PROFILE 5		
Contract No.	Original Size Ansi D Drawing No: 86-18690-C006		
Sheet	8	of	29
Revision	Rev: A		



FORCE MAIN PLAN 6
SCALE: 1" = 40'-0"

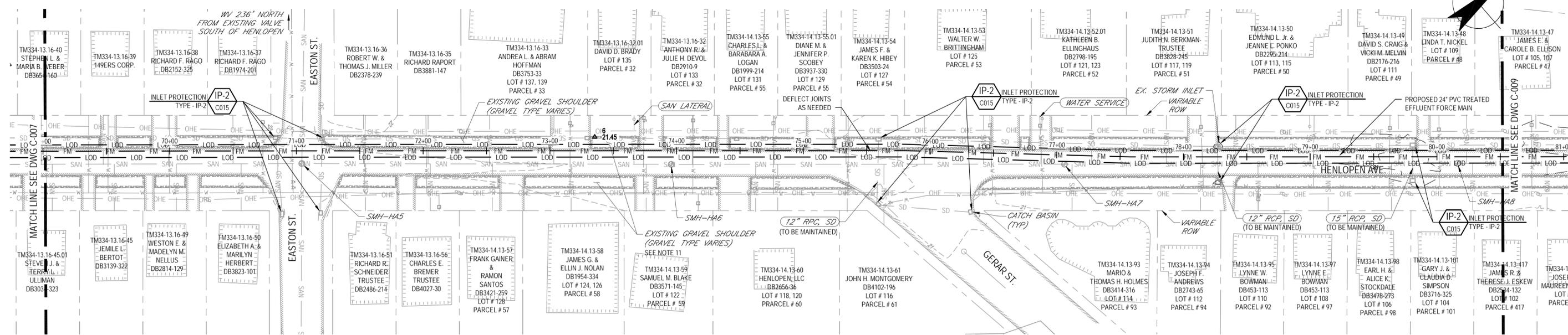
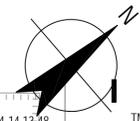


FORCE MAIN PROFILE 6
HORZ SCALE: 1" = 40'-0"
VERT SCALE: 1" = 4'-0"

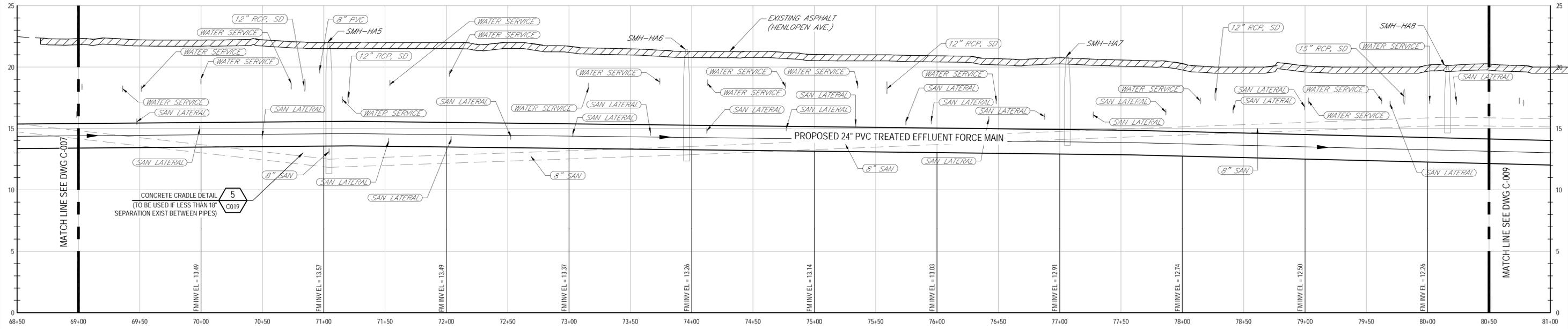
- NOTES:**
- THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION AND AHEAD OF PIPE LAYING TO MAKE ADJUSTMENTS TO LINE AND GRADE BEFORE CONFLICT.
 - CONTRACTOR SHALL REWORK ALL CURB AND GUTTERS, SIDEWALK, AND ROADS DISTURBED BY CONSTRUCTION ACCORDING TO THE SPECIFICATIONS.
 - CONTRACTOR SHALL MAINTAIN ACCESS TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
 - REMOVE AND RECONSTRUCT EXISTING UTILITY PIPES AS NEEDED.
 - CONTRACTOR SHALL MAINTAIN WATER AND SEWER SERVICE TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
 - CONTRACTOR SHALL REPLACE DAMAGED LANDSCAPED AREAS TO THEIR ORIGINAL OR BETTER STATE.
 - CONTRACTOR SHALL SAW-CUT, REMOVE AND REPLACE PAVEMENT WITH PERMANENT ASPHALT PATCH TO MATCH EXISTING GRADE. SEE DETAILS.
 - CONTRACTOR SHALL LOCATE AND SUPPORT EXISTING UNDERGROUND TELEPHONE DURING CONSTRUCTION. SERVICE SHALL NOT BE INTERRUPTED.
 - CONTRACTOR SHALL CONSTRUCT ALL SEDIMENTATION AND EROSION CONTROL DEVICES IN ACCORDANCE WITH THE STATE OF DELAWARE EROSION CONTROL STANDARD DETAILS TO CONTAIN SEDIMENT WITHIN THE BOUNDARIES OF THE CONSTRUCTION SITE.
 - ALL UTILITY CROSSINGS ARE LOCATED AT AN APPROXIMATE DEPTH. CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSING PRIOR TO CONSTRUCTION.
 - GRAVEL SHOULDER AREAS ALONG HENLOPEN AVENUE DISTURBED AND/OR USED DURING CONSTRUCTION ACTIVITIES SHALL BE REPAIRED AND REPLACED IN KIND WITH GRAVEL MATERIAL. NOTE THAT VARIOUS GRAVEL SHOULDERS EXIST INCLUDING RED, WHITE AND GRAY. CONSULT WITH PROPERTY OWNER FOR MATERIAL PRIOR TO REPLACEMENT.
 - CONTRACTOR SHALL DEMOLISH EXISTING WOOD FENCE AS NEEDED TO FACILITATE CONSTRUCTION. EXISTING WOOD FENCE TO BE REPLACED IN-KIND FOLLOWING CONSTRUCTION.
 - REPLACE TREES IN-KIND WITH SAME SPECIES AND SIZE FOR ALL TREES REMOVED. TREES SHALL BE REPLACED OUTSIDE OF POPIE TRENCH LIMITS.

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<p>FOR PERMIT SUBMITTAL NOT FOR CONSTRUCTION</p>				<p>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</p>		<p>Drawn CTF Designer JM Drafting JFM Design Check BMG Approved (Project Director) KSG Date 06/2016</p>		<p>Client CITY OF REHOBOTH BEACH, DELAWARE Project FORCE MAIN PROJECT Title FORCE MAIN PLAN AND PROFILE 6</p>	
<p>A PERMIT SUBMITTAL CTF BMG KSG 06/16</p>				<p>Scale AS NOTED</p>		<p>Contract No. 86-18690-C007</p>		<p>Original Size Ansi D Drawing No: 86-18690-C007</p>	
<p>No Revision Note: * indicates signatures on original issue of drawing or last revision of drawing</p>				<p>Scale 1"=40' AT ORIGINAL SIZE</p>		<p>This Drawing shall not be used for Construction unless Signed and Sealed For Construction</p>		<p>9 of 29 Rev: A</p>	



FORCE MAIN PLAN 7
SCALE: 1" = 40'-0"

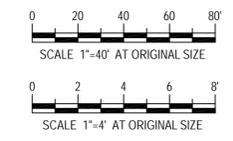


FORCE MAIN PROFILE 7
HORZ SCALE: 1" = 40'-0"
VERT SCALE: 1" = 4'-0"

- NOTES:**
1. THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION AND AHEAD OF PIPE LAYING TO MAKE ADJUSTMENTS TO LINE AND GRADE BEFORE CONFLICT.
 2. CONTRACTOR SHALL REWORK ALL CURB AND GUTTERS, SIDEWALK, AND ROADS DISTURBED BY CONSTRUCTION ACCORDING TO THE SPECIFICATIONS.
 3. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
 4. REMOVE AND RECONSTRUCT EXISTING UTILITY PIPES AS NEEDED.
 5. CONTRACTOR SHALL MAINTAIN WATER AND SEWER SERVICE TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
 6. CONTRACTOR SHALL REPLACE DAMAGED LANDSCAPED AREAS TO THEIR ORIGINAL OR BETTER STATE.
 7. CONTRACTOR SHALL SAW-CUT, REMOVE AND REPLACE PAVEMENT WITH PERMANENT ASPHALT PATCH TO MATCH EXISTING GRADE. SEE DETAILS.
 8. CONTRACTOR SHALL LOCATE AND SUPPORT EXISTING UNDERGROUND TELEPHONE DURING CONSTRUCTION. SERVICE SHALL NOT BE INTERRUPTED.
 9. CONTRACTOR SHALL CONSTRUCT ALL SEDIMENTATION AND EROSION CONTROL DEVICES IN ACCORDANCE WITH THE STATE OF DELAWARE EROSION CONTROL STANDARD DETAILS TO CONTAIN SEDIMENT WITHIN THE BOUNDARIES OF THE CONSTRUCTION SITE.
 10. ALL UTILITY CROSSINGS ARE LOCATED AT AN APPROXIMATE DEPTH. CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSING PRIOR TO CONSTRUCTION.
 11. GRAVEL SHOULDER AREAS ALONG HENLOPEN AVENUE DISTURBED AND/OR USED DURING CONSTRUCTION ACTIVITIES SHALL BE REPAIRED AND REPLACED IN KIND WITH GRAVEL MATERIAL. NOTE THAT VARIOUS GRAVEL SHOULDERS EXIST INCLUDING RED, WHITE AND GRAY. CONSULT WITH PROPERTY OWNER FOR MATERIAL PRIOR TO REPLACEMENT.

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No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date



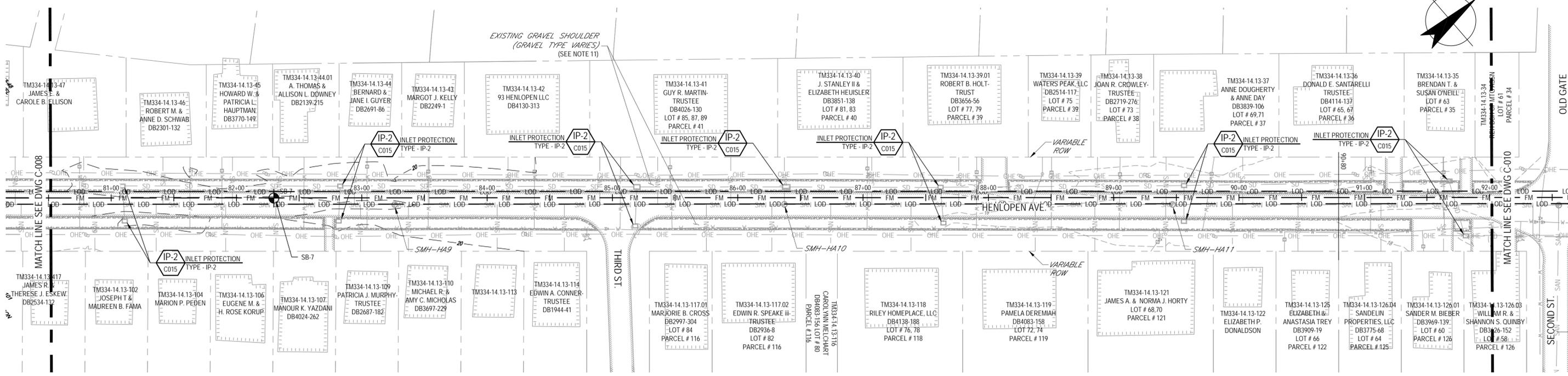
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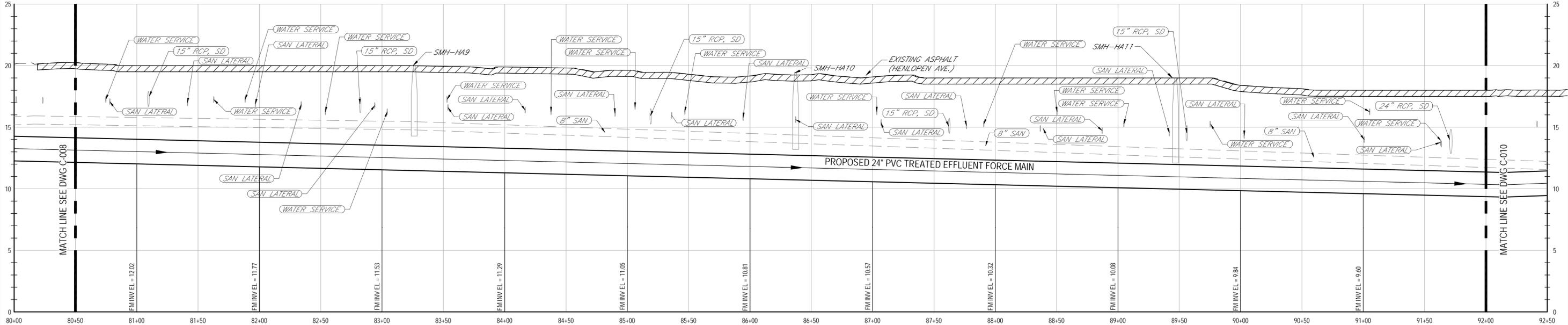
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Drawn	CTF	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG	Date	06/2016
Scale	AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	FORCE MAIN PROJECT		
Title	FORCE MAIN PLAN AND PROFILE 7		
Contract No.	Original Size Ansi D Drawing No: 86-18690-C008		
Sheet	10	of	29
Revision	Rev: A		



FORCE MAIN PLAN 8
SCALE: 1" = 40'-0"



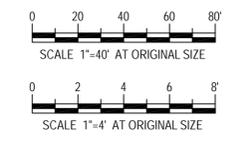
FORCE MAIN PROFILE 8
HORZ SCALE: 1" = 40'-0"
VERT SCALE: 1" = 4'-0"

NOTES:

1. THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION AND AHEAD OF PIPE LAYING TO MAKE ADJUSTMENTS TO LINE AND GRADE BEFORE CONFLICT.
2. CONTRACTOR SHALL REWORK ALL CURB AND GUTTERS, SIDEWALK, AND ROADS DISTURBED BY CONSTRUCTION ACCORDING TO THE SPECIFICATIONS.
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8. CONTRACTOR SHALL LOCATE AND SUPPORT EXISTING UNDERGROUND TELEPHONE DURING CONSTRUCTION. SERVICE SHALL NOT BE INTERRUPTED.
9. CONTRACTOR SHALL CONSTRUCT ALL SEDIMENTATION AND EROSION CONTROL DEVICES IN ACCORDANCE WITH THE STATE OF DELAWARE EROSION CONTROL STANDARD DETAILS TO CONTAIN SEDIMENT WITHIN THE BOUNDARIES OF THE CONSTRUCTION SITE.
10. ALL UTILITY CROSSINGS ARE LOCATED AT AN APPROXIMATE DEPTH. CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSING PRIOR TO CONSTRUCTION.
11. GRAVEL SHOULDER AREAS ALONG HENLOPEN AVENUE DISTURBED AND/OR USED DURING CONSTRUCTION ACTIVITIES SHALL BE REPAIRED AND REPLACED IN KIND WITH GRAVEL MATERIAL. NOTE THAT VARIOUS GRAVEL SHOULDERS EXIST INCLUDING RED, WHITE AND GRAY. CONSULT WITH PROPERTY OWNER FOR MATERIAL PRIOR TO REPLACEMENT.

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No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date



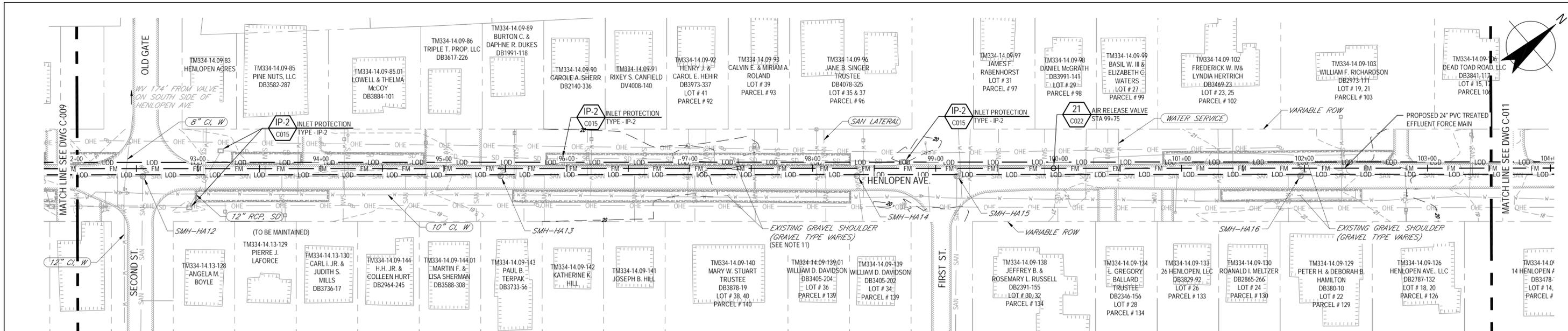
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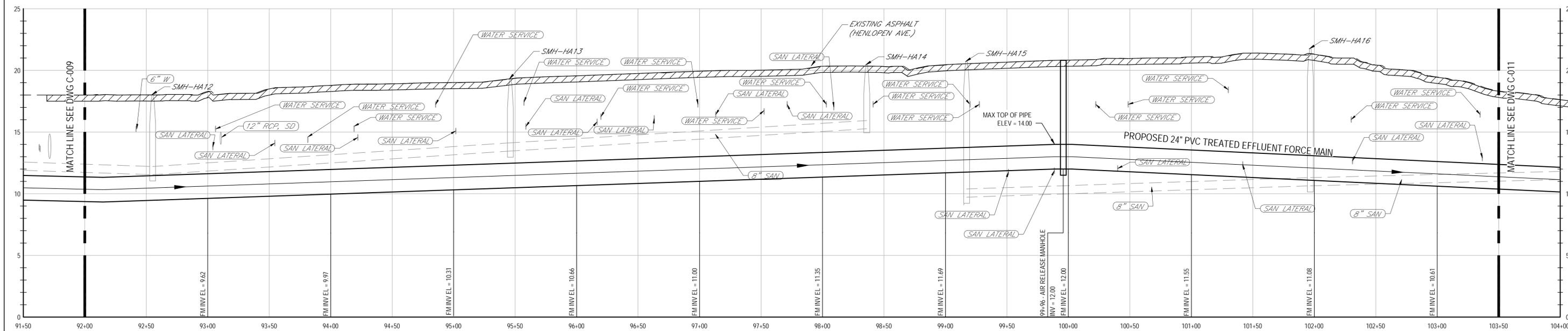
Drawn	CTF	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG	Date	06/2016
Scale	AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	FORCE MAIN PROJECT		
Title	FORCE MAIN PLAN AND PROFILE 8		
Contract No.	Original Size Ansi D Drawing No: 86-18690-C009		
Scale	AS NOTED	Sheet	11 of 29
Revision	Rev: A	Date	



FORCE MAIN PLAN 9

SCALE: 1" = 40'-0"



FORCE MAIN PROFILE 9

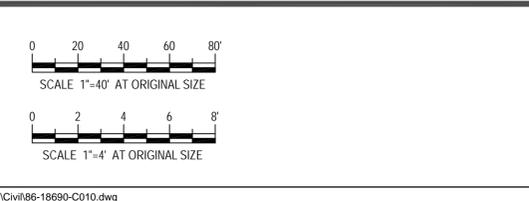
HORZ SCALE: 1" = 40'-0"
VERT SCALE: 1" = 4'-0"

NOTES:

- THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION AND AHEAD OF PIPE LAYING TO MAKE ADJUSTMENTS TO LINE AND GRADE BEFORE CONFLICT.
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- CONTRACTOR SHALL CONSTRUCT ALL SEDIMENTATION AND EROSION CONTROL DEVICES IN ACCORDANCE WITH THE STATE OF DELAWARE EROSION CONTROL STANDARD DETAILS TO CONTAIN SEDIMENT WITHIN THE BOUNDARIES OF THE CONSTRUCTION SITE.
- ALL UTILITY CROSSINGS ARE LOCATED AT AN APPROXIMATE DEPTH, CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSING PRIOR TO CONSTRUCTION.
- GRAVEL SHOULDER AREAS ALONG HENLOPEN AVENUE DISTURBED AND/OR USED DURING CONSTRUCTION ACTIVITIES SHALL BE REPAIRED AND REPLACED IN KIND WITH GRAVEL MATERIAL. NOTE THAT VARIOUS GRAVEL SHOULDERS EXIST INCLUDING RED, WHITE AND GRAY. CONSULT WITH PROPERTY OWNER FOR MATERIAL PRIOR TO REPLACEMENT.

PRELIMINARY

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No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date

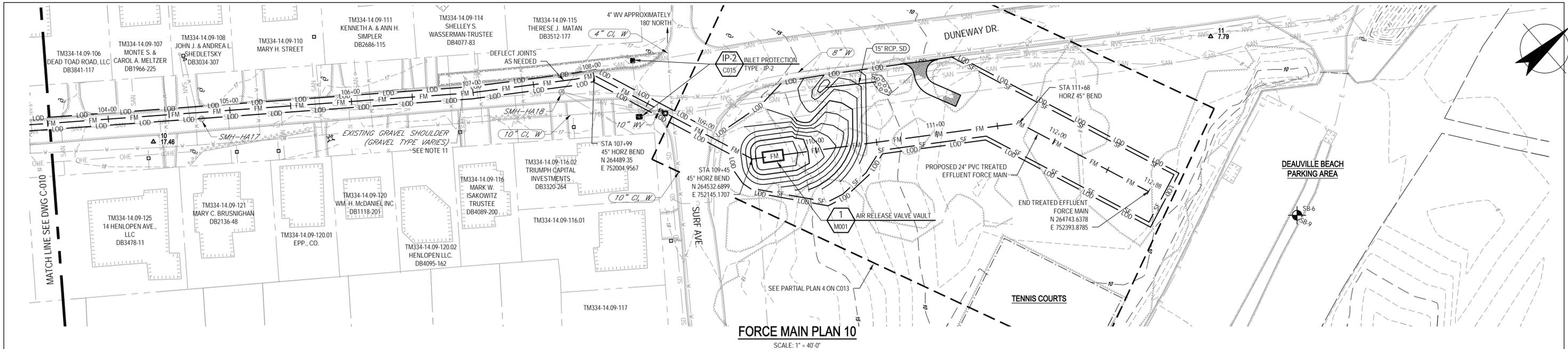


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NOT FOR CONSTRUCTION

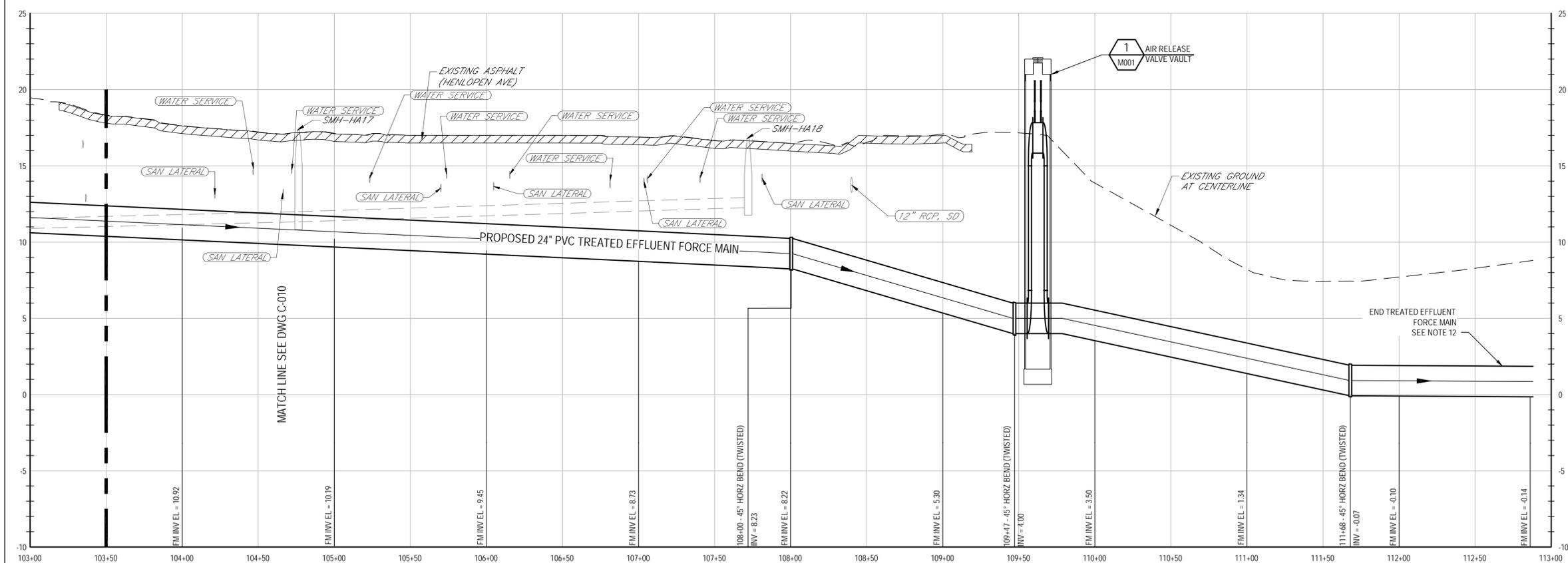
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Drawn	CTF	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG	Date	06/2016
Scale	AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	FORCE MAIN PROJECT		
Title	FORCE MAIN PLAN AND PROFILE 9		
Contract No.	Original Size Ansi D Drawing No: 86-18690-C010		
Sheet	12	of	29
Revision	Rev: A		



FORCE MAIN PLAN 10
SCALE: 1" = 40' 0"

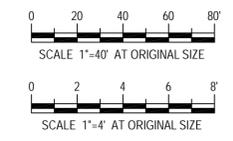


FORCE MAIN PROFILE 10
HORZ SCALE: 1" = 40' 0"
VERT SCALE: 1" = 4' 0"

- NOTES:**
1. THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION AND AHEAD OF PIPE LAYING TO MAKE ADJUSTMENTS TO LINE AND GRADE BEFORE CONFLICT.
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 10. ALL UTILITY CROSSINGS ARE LOCATED AT AN APPROXIMATE DEPTH. CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CROSSING PRIOR TO CONSTRUCTION.
 11. GRAVEL SHOULDER AREAS ALONG HENLOPEN AVENUE DISTURBED AND/OR USED DURING CONSTRUCTION ACTIVITIES SHALL BE REPAIRED AND REPLACED IN KIND WITH GRAVEL MATERIAL. NOTE THAT VARIOUS GRAVEL SHOULDERS EXIST INCLUDING RED, WHITE AND GRAY. CONSULT WITH PROPERTY OWNER FOR MATERIAL PRIOR TO REPLACEMENT.
 12. CONTRACTOR SHALL MAKE CONNECTION TO OUTFALL 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	
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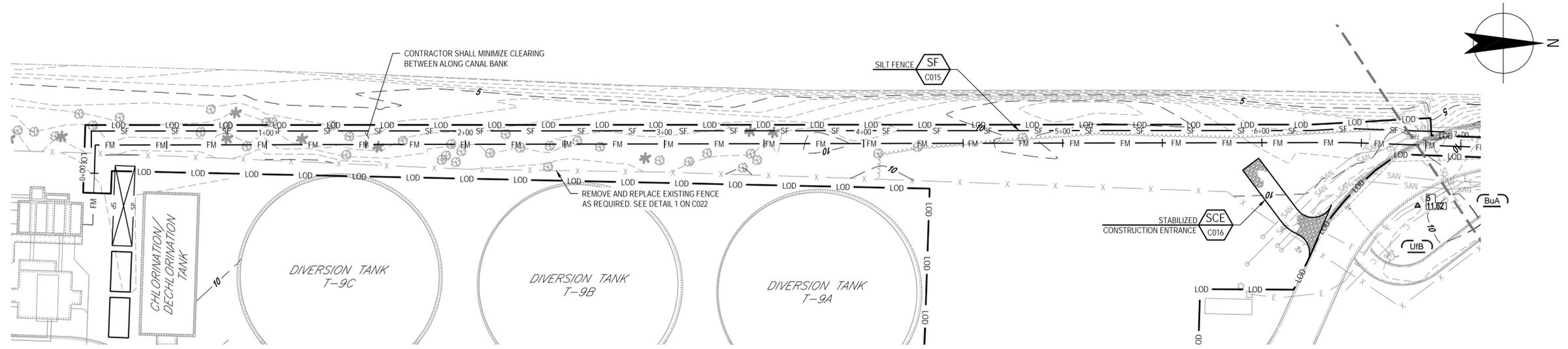
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NOT FOR CONSTRUCTION



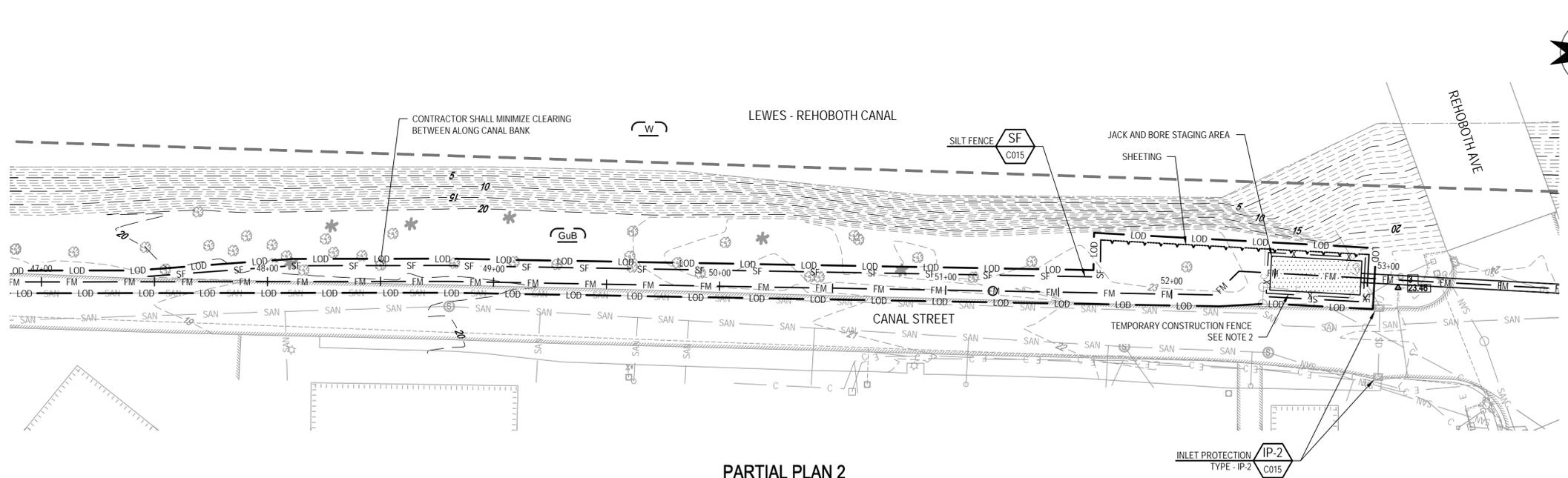
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Drawn	CTF	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG	Date	06/2016
Scale	AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	FORCE MAIN PROJECT		
Title	FORCE MAIN PLAN AND PROFILE 10		
Contract No.	Original Size		
ANSI D	Drawing No:	86-18690-C011	
Sheet	13	of 29	
Revision	A		



PARTIAL PLAN 1
SCALE: 1"=30'-0"



PARTIAL PLAN 2
SCALE: 1"=30'-0"

- NOTES:**
- CONTRACTOR SHALL RESTORE ALL PAVEMENT LOCATED WITHIN THE LOD THAT IS IMPACTED BY CONSTRUCTION.
 - PROVIDE TEMPORARY FENCING AROUND JACK AND BORE ENTRY AND EXIT PIT STAGING AREAS.

LEGEND:

	SOIL TYPE		15% - 25% SLOPE
	SOIL DIVISION LINE		>25% SLOPE
	DRAINAGE DIVIDE		LIMIT OF DISTURBANCE
	100-YEAR FLOODPLAIN		SILT FENCE
	PROPERTY LINE		WETLAND
			25' WETLAND BUFFER

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



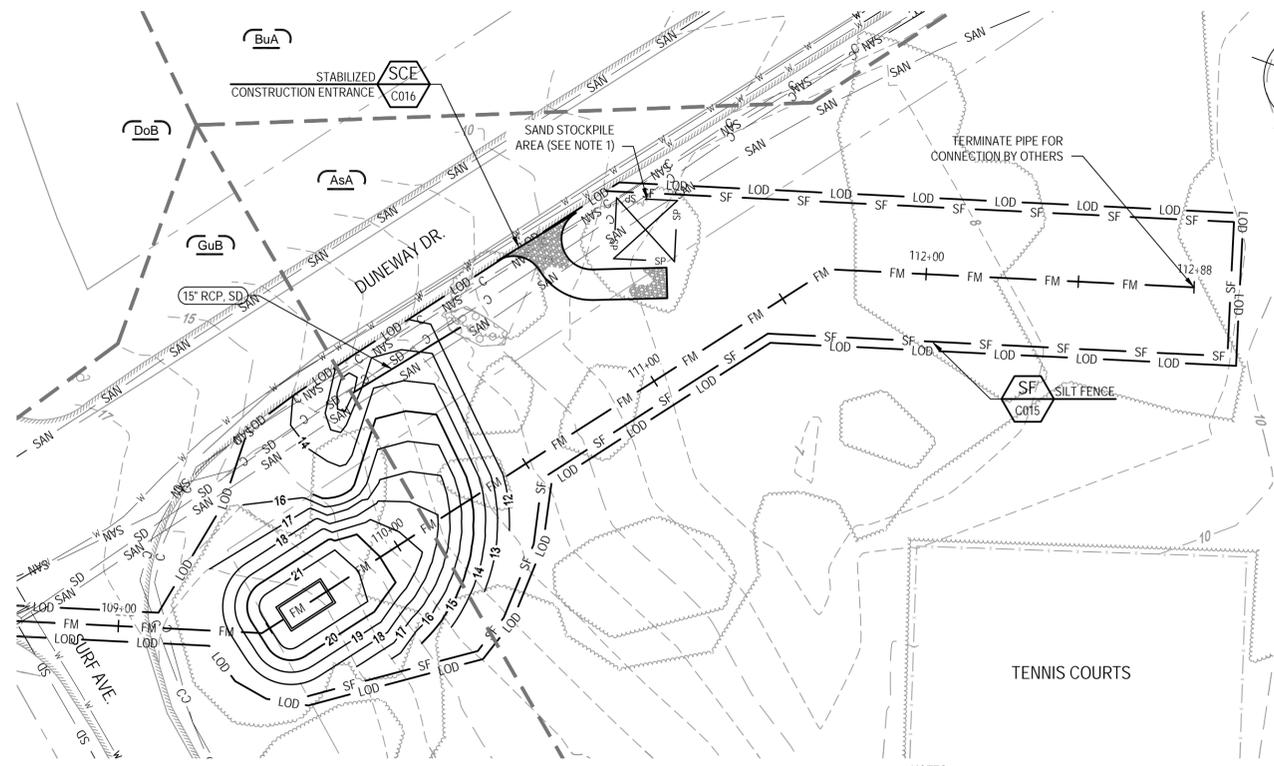
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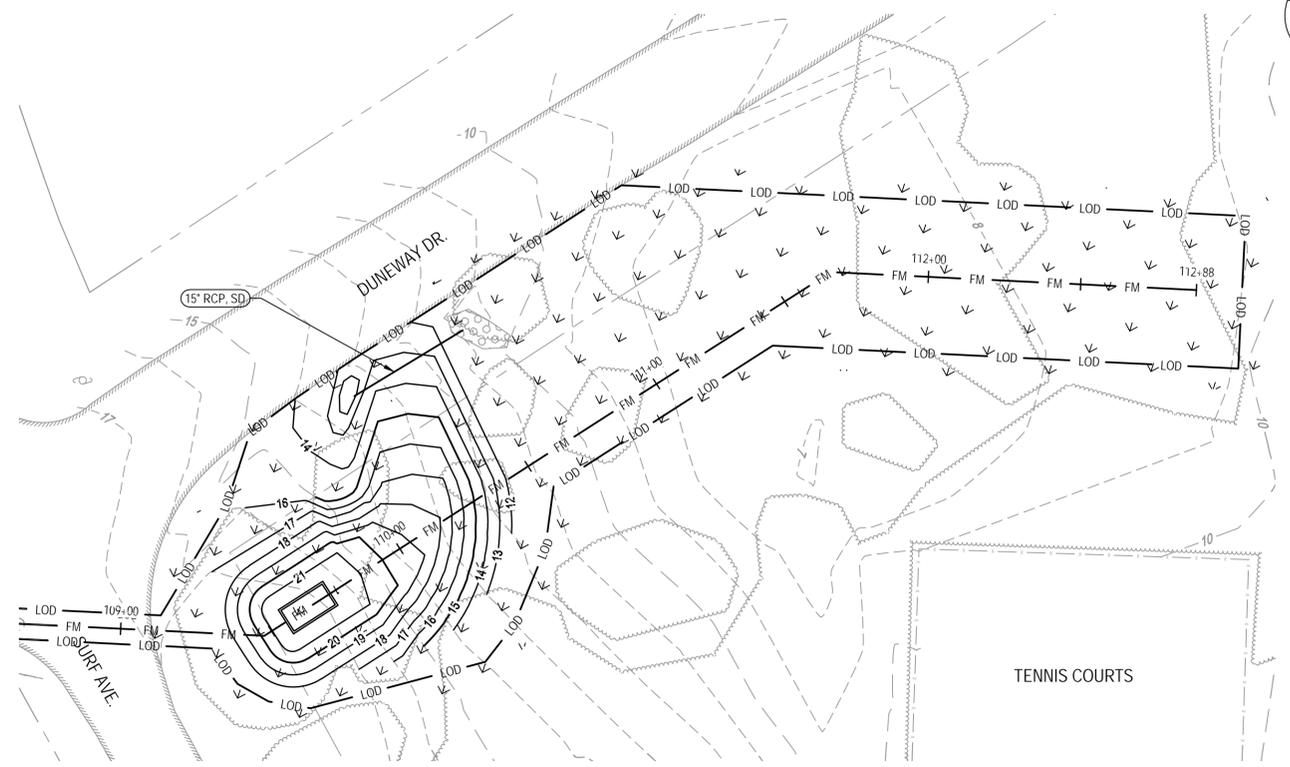
Drawn	CTF	Designer	JM
Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG	Date	06/2016
Scale	AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	FORCE MAIN PROJECT		
Title	PARTIAL ESC AND STAGING AREA PLANS 1		
Contract No.	Original Size		
Ansi D	Drawing No:	86-18690-C012	
Sheet	14	of	29
Revision	A		

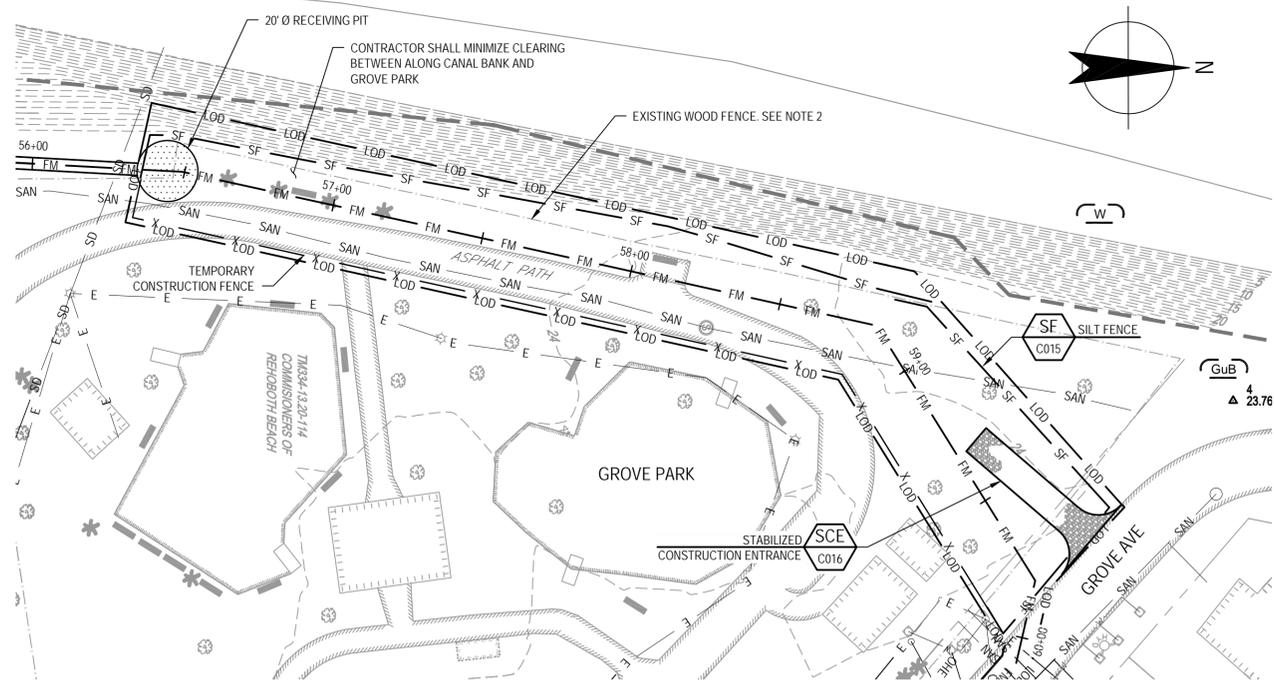


PARTIAL PLAN 4
SCALE: 1"=30'-0"

NOTES:
1. ALL EXCAVATED MATERIAL FROM THIS AREA SHALL REMAIN ON-SITE AND BE STOCKPILED AND PROTECTED FOR SITE RESTORATION. NO SAND FROM DUNE AREAS SHALL BE PERMITTED TO LEAVE SITE.



PLANTING PLAN
SCALE: 1"=30'-0"



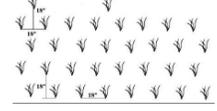
PARTIAL PLAN 3
SCALE: 1"=30'-0"

NOTES:
1. CONTRACTOR SHALL REPLACE ASPHALT PATH, LANDSCAPING, PARK BENCHES, ETC LOCATED IN CONSTRUCTION AREA.
2. CONTRACTOR SHALL DEMOLISH EXISTING WOOD FENCE AS NEEDED TO FACILITATE CONSTRUCTION. EXISTING WOOD FENCE TO BE REPLACED IN-KIND FOLLOWING CONSTRUCTION

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 BRUVILIGULATA	GRASS	AMERICAN BEACH GRASS	RANDOM SPACING

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.)

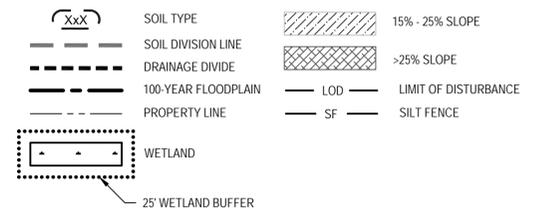


STEP 1: OPEN A HOLE 10 TO 12 INCHES DEEP WITH A POINTED STICK OR SPADE. PLACE 2 STEMS, WITH ROOTS FACING DOWN, IN THE HOLE TO A DEPTH OF 8 INCHES. IF PLANTS ARE NOT PLANTED 8 INCHES DEEP, THEY MAY DRY OUT OR BE BLOWN OUT BY THE WIND.

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.

LEGEND:



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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	

Client **CITY OF REHOBOTH BEACH, DELAWARE**
Project **FORCE MAIN PROJECT**
Title **PARTIAL ESC AND STAGING AREA PLANS 2 AND PLANTING PLAN**
Contract No. _____
Original Size _____
Ansi D Drawing No: 86-18690-C013
Sheet **15** of **29**
Rev: **A**

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

Standard Detail & Specifications Silt Fence

Section

Plan

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

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-I
- 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 Inlet Protection - Type 3

Plan View - Concrete Block Option

Isometric View - Wire Mesh Option

Source: Adapted from Filtrix International
Symbol: **IP-3**
Detail No. **DE-ESC-3.1.5.3**
Sheet 1 of 3
Date: 03/13

Standard Detail & Specifications Inlet Protection - Type 3

Notes:

- This practice shall only be used in situations in which Inlet Protection - Type 1 cannot be used due to site constraints. These include, but are not limited to partially complete parking areas, streets, roads, etc., having a throat or curb opening. It should be used in conjunction with Type 2 Inlet Protection when a grate is also present.
- The filter log sock fabric shall be high durability netting material to resist puncture and wear in the traffic areas. If compost media is used to fill the sock it must meet the Standards and Specifications for Compost Material in the Appendix, except that the maximum pass through for a 3/8" screen shall be 20% to allow for higher flow through. Additives, such as soluble phosphorus and petroleum hydrocarbons, can be mixed with the compost media to aid in pollutant removal, if desired. Reference the Compost Filter Log design guidelines for additional requirements on the high durability netting material, compost media, and sock filling and installation procedures. Reference the design alternatives below for additional log media options.
- The maximum contributing drainage area shall be 3 acres, or as recommended by the manufacturer. 8" diameter socks shall be used for standard roadway applications. If in a highly disturbed area, the Engineer or Site Reviewer may opt for larger socks, either 12" or 18" depending on the need. If used as a replacement for Type 1 Inlet Protection with special approval, minimum 12" diameter socks shall be used. The top of the log may need to be flattened so that it is always below the top of curb elevation with a minimum 1" opening in order to prevent localized flooding.
- Concrete blocks shall be used to aid in the log shape and prevent it from entering into the throat. They should be placed between the log and the throat opening, and used to secure the ends of the log against the curb if needed. The end of the log shall extend a minimum of 2 feet past the end of the throat opening. If a grate is also present in addition to the throat opening, the concrete blocks can either be laid perpendicular to the curb (recommended) so that the log lies on the outside of the grate, or parallel to the curb so that the log lies on top of the grate. Type 2 Inlet Protection is also used in conjunction with Type 3 if a grate is present. Sand bags can be used as an alternate to the concrete blocks at the end of the log to secure the log against the curb.

Source: Adapted from Filtrix International
Symbol: **IP-3**
Detail No. **DE-ESC-3.1.5.3**
Sheet 2 of 3
Date: 03/13

Standard Detail & Specifications Inlet Protection - Type 3

- If concrete blocks are not desired due to high traffic volumes, a welded wire screen in an "S" shape can be fitted over the length of the opening and secured to the log with straps, such as zip-ties. This will prevent the sock from falling into the opening. In this case, the log only needs to extend past the curb opening a minimum of 1 foot.
- In all cases, the log shall provide a physical barrier to the catchbasin to allow for ponding and sedimentation along the upstream side of the log. The logs shall be placed on flat surfaces and maintain constant contact with the paved surface. Any daylight will allow for untreated discharge and is not permitted.
- All structures must be inspected frequently (24 hours after a storm event and weekly for proper function). Accumulated sediment shall be removed to avoid future failure, and must not exceed half of the effective height of the log. Reference manufacturer's recommendations for additional maintenance.

Alternatives:

- In lieu of the compost filter log, crushed DE #3 stone with a fractured face on all sides that is double wrapped in 1" chicken wire made from 10 gauge wire may be used. The wire should be secured using hog rings or wire ties on 6" centers along the length of the joint, and on 1" center on the ends of the rock sock. All installation and maintenance criteria are the same as the compost log above.
- In lieu of the compost filter media, 100% shredded rubber (typically from tires) can be used.
- For applications that have a grate and a throat inlet, some Type 2 Inlet Protection manufacturers have developed a catchbasin sock insert that also has a tubular attachment which rests above the grate and against the throat. As long as the sock meets the requirements of Type 2 Inlet Protection, and the provided throat protection extends a minimum of 1' past the limits of the curb opening, without any daylight along the edges, this combination Type 2 and Type 3 devices may be used upon approval of the Department or Delegated Agency.

Source: Adapted from Filtrix International
Symbol: **IP-3**
Detail No. **DE-ESC-3.1.5.3**
Sheet 3 of 3
Date: 03/13

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.
- 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 Inlet Protection - Type 2

Bag Detail

Perspective

Source: Adapted from ACF Products, Inc.
Symbol: **IP-2**
Detail No. **DE-ESC-3.1.5.2**
Sheet 1 of 2
Date: 12/03

Standard Detail & Specifications Inlet Protection - Type 2

Notes:

- This practice shall only be used in situations in which Inlet Protection - Type 1 cannot be used due to site constraints. These include, but are not limited to partially completed parking areas, streets, roads, etc.
- It may be necessary to transition from Type 1 to Type 2 Inlet Protection as construction proceeds.
- For areas where there is a concern for oil run-off or spills, insert shall meet one of the above specifications with an oil-absorbent pillow or shall be made completely from an oil-absorbent material with a woven pillow.

Materials:

The geotextile inlet insert shall meet or exceed the specifications of Type GD-III geotextile in accordance with Appendix A-3 of the Delaware Erosion & Sediment Control Handbook.

Source: Adapted from ACF Products, Inc.
Symbol: **IP-2**
Detail No. **DE-ESC-3.1.5.2**
Sheet 2 of 2
Date: 12/03

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	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Drawn</td><td>CTF</td> <td>Designer</td><td>JM</td> </tr> <tr> <td>Drafting Check</td><td>JFM</td> <td>Design Check</td><td>BMG</td> </tr> <tr> <td>Approved (Project Director)</td><td>KSG</td> <td>Date</td><td>06/2016</td> </tr> </table>	Drawn	CTF	Designer	JM	Drafting Check	JFM	Design Check	BMG	Approved (Project Director)	KSG	Date	06/2016	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Client</td><td>CITY OF REHOBOTH BEACH, DELAWARE</td> </tr> <tr> <td>Project</td><td>FORCE MAIN PROJECT</td> </tr> <tr> <td>Title</td><td>EROSION AND SEDIMENT CONTROL DETAILS 1</td> </tr> <tr> <td>Contract No.</td><td>Original Size</td> </tr> <tr> <td>Ansi D</td><td>Drawing No: 86-18690-C015</td> </tr> <tr> <td></td><td style="text-align: right;">Sheet 17 of 29</td> </tr> <tr> <td></td><td style="text-align: right;">Rev: A</td> </tr> </table>	Client	CITY OF REHOBOTH BEACH, DELAWARE	Project	FORCE MAIN PROJECT	Title	EROSION AND SEDIMENT CONTROL DETAILS 1	Contract No.	Original Size	Ansi D	Drawing No: 86-18690-C015		Sheet 17 of 29		Rev: A
Drawn	CTF	Designer	JM																											
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No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date																								

Plot Date: 16 June 2016 - 9:00 AM Plotted by: Cody Ford Cad File No: G:\86\18690\CADD\Drawings\Civil\86-18690-C015.dwg

Standard Detail & Specifications Vegetative Stabilization

TEMPORARY SEEDING BY RATES, DEPTHS AND DATES										
Mix #	Species ⁵	Seeding Rate	Optimum Seeding Dates ¹						Planting Depth ²	
			Coastal Plain		Piedmont		All ³			
O = Optimum Planting Period; A = Acceptable Planting Period										
Certified Seed	lb/Ac ⁴	lb/1000 sq. ft.	2/1-4/30	1/31-3/14	3/15-10/31	1/1-4/30	1/1-10/31	10/1-2/1		
1	Barley	125	4	O	A	O	O	A	O	1-2 inches
2	Oats	125	4	O	A	A	O	A	A	2-3" sandy soils
3	Rye	125	4	O	A	O	O	A	O	1-2 inches
4	Perennial Ryegrass	125	4	O	A	O	O	A	O	2-3" sandy soils
5	Annual Ryegrass	125	4	O	A	O	O	A	A	0.5 inches
6	Winter Wheat	125	4	O	A	O	O	A	A	1-2 inches
7	Foxtail Millet	30 PLS	0.7	O			O			0.5 inches
8	Pearl Millet	20 PLS	0.5	O			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 seeding area can be irrigated.
 3. Applicable on slopes 3:1 or less.
 4. Fifty pounds per acre of Annual Lespedeza may be added to 1/2 the seed 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: _____
 Detail No. **DE-ESC-3.4.3**
 Sheet 1 of 4
 Date: 12/03

Standard Detail & Specifications Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES															
Mix No.	Certified Seed ¹	Seeding Rate ²	Optimum Seeding Dates ³												Remarks
			Coastal Plain				Piedmont				All ⁴				
O = Optimum Planting Period; A = Acceptable Planting Period															
Well Drained Soils	lb/Ac	lb/1000 sq. ft.	2/1-4/30	1/31-3/14	3/15-10/31	1/1-4/30	1/1-10/31	10/1-2/1							
1	Fall Fescue	140	3.2	O	A	O	O	A	O	A	O	A	O	A	Good erosion control mix. Tolerant of low fertility soils. Lowgrass very difficult to mow. Generations only in best seedbed.
2	Downy Fescue	30	0.69	O	A	O	O	A	O	A	O	A	O	A	Good erosion control mix. Tolerant of low fertility soils. Good wildlife cover and food.
3	Fall Fescue (Turf-type) or Strong Creeping Red Fescue or Perennial Ryegrass	50	1.15	O	A	O	O	A	O	A	O	A	O	A	Good erosion control mix. Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.
4	Strong Creeping Red Fescue	100	2.3	O	A	O	O	A	O	A	O	A	O	A	Subsist wet/moisture mix. Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.
5	Switchgrass ⁵ or Coastal Panicgrass	10	0.23	O			O				O				Native warm-season species. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N-fixing (microbial) - needs.
6	Fall Fescue (Turf-type) (blend of 3 cultivars)	100	3.5	O	A	O	O	A	O	A	O	A	O	A	Managed fair strip for nurseries.
7	Fall Fescue (Kentucky Bluegrass Blend) Perennial Ryegrass	120	3.5	O	A	O	O	A	O	A	O	A	O	A	Three cultivars of Kentucky Bluegrass. Traffic tolerant.
8	Big Bluestem ⁶ or Little Bluestem ⁷ or Crowing Red Fescue plus one of: Partridge Pea Bush Clover Wild Indigo Blondy Oak Trefoil	10	0.23	O	A	O	O	A	O	A	O	A	O	A	All species are native. Indian Grass and Bluestem have fluffy seed. Plant with a specialized native seed drill. Crowing 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 seed (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: _____
 Detail No. **DE-ESC-3.4.3**
 Sheet 2 of 4
 Date: 12/03

Standard Detail & Specifications Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES (cont.)															
Mix No.	Certified Seed ¹	Seeding Rate ²	Optimum Seeding Dates ³												Remarks
			Coastal Plain				Piedmont				All ⁴				
O = Optimum Planting Period; A = Acceptable Planting Period															
Poorly Drained Soils	lb/Ac	lb/1000 sq. ft.	2/1-4/30	1/31-3/14	3/15-10/31	1/1-4/30	1/1-10/31	10/1-2/1							
9	Redtop	75	1.72	O	A	O	O	A	O	A	O	A	O	A	Quick stabilization of disturbed sites and waterways.
10	Reed Canarygrass ⁵	10	0.23	A			O				O				Good erosion control, wildlife cover and wetland revegetation.
Residential Lawns															
11	Fall Fescue	100	2.3	O	A	O	O	A	O	A	O	A	O	A	High value, high maintenance, light traffic, irrigation necessary. Wet drained soils, full sun.
12	Perennial Ryegrass	100	2.3	O	A	O	O	A	O	A	O	A	O	A	Moderate value, low maintenance, traffic tolerant.
13	Creeping Red Fescue	50	1.15	O	A	O	O	A	O	A	O	A	O	A	Shade tolerant, moderate traffic tolerance, moderate maintenance.
14	Creeping Red Fescue	50	1.15	O	A	O	O	A	O	A	O	A	O	A	Shade tolerant, moisture tolerant.
15	K31 Tall Fescue	150	3.5	O	A	O	O	A	O	A	O	A	O	A	Monoculture, but performs well alone in lawn. Discouraged.

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

Standard Detail & Specifications Stabilized Construct. Entrance

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

DATA TO BE PROVIDED:
 Log Diameter
 Sock Material

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

Standard Detail & Specifications Geotextile Dewatering Bag

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

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

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Drawn	Job Manager	Project Director	Date

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	

PRELIMINARY

Client Project	CITY OF REHOBOTH BEACH, DELAWARE FORCE MAIN PROJECT
Title	EROSION AND SEDIMENT CONTROL DETAILS 2
Contract No.	Original Size Ansi D Drawing No: 86-18690-C016
Sheet	18 of 29 Rev: A

Standard Detail & Specifications
Sensitive Area Protection

Location of Sensitive Area Protection

*5' min. setback applies to all sensitive areas covered by this specification.

Method of Sensitive Area Protection

Source: Adapted from VA ESC Handbook	Symbol: SAP	Detail No. DE-ESC-3.7.2 Sheet 1 of 3 Date: 03/13
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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
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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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Standard Detail & Specifications
Soil Stockpile

Section A-A

Max. height 20' (10' on residential lot)

Stabilize per temporary vegetation specifications

3' 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
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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
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Standard Detail & Specifications
Stabilization Matting - Slope

Perspective

Note: Use manufacturer's recommendations for stapling patterns for slope installations.

Construction Notes:

- Prepare soil before installing matting, including application of lime, fertilizer, and seed.
- Begin at the top of the slope by anchoring the mat in a 6" deep X 6" wide trench. Backfill and compact trench after stapling.
- Roll the mats (A) down or (B) horizontally across the slope.
- The edges of parallel mats must be stapled with approx. 2" overlap.
- When mats must be spliced down the slope, place mats end over end (shingle style) with approx. 4" overlap. Staple through overlapped area, approx. 12" apart.

Source: Adapted from North American Green, Inc.	Symbol: SM-S	Detail No. DE-ESC-3.4.6.1 Sheet 1 of 2 Date: 6/06
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Standard Detail & Specifications
Stabilization Matting - Slope

Stapling Patterns

0.7 Staples per Sq. Yd.

1.2 Staples per Sq. Yd.

1.75 Staples per Sq. Yd.

3.5 Staples per Sq. Yd.

3.75 Staples per Sq. Yd.

NOTE: These patterns are provided for general guidance only. They shall not be used as a substitute for manufacturer's recommendations.

Source: Adapted from North American Green, Inc.	Symbol: SM-S	Detail No. DE-ESC-3.4.6.1 Sheet 2 of 2 Date: 6/06
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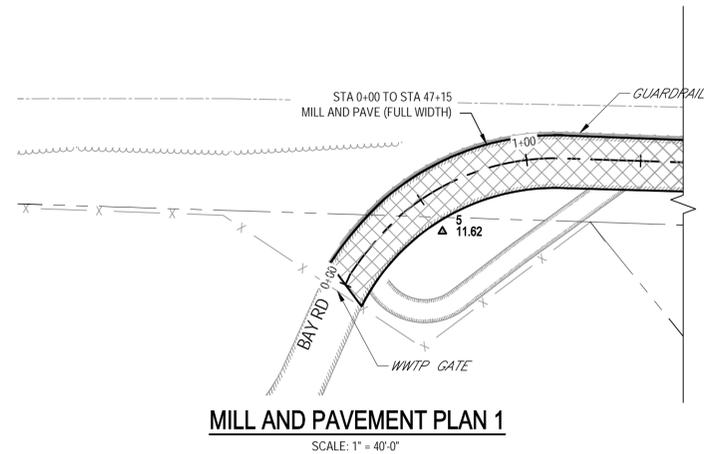
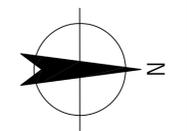
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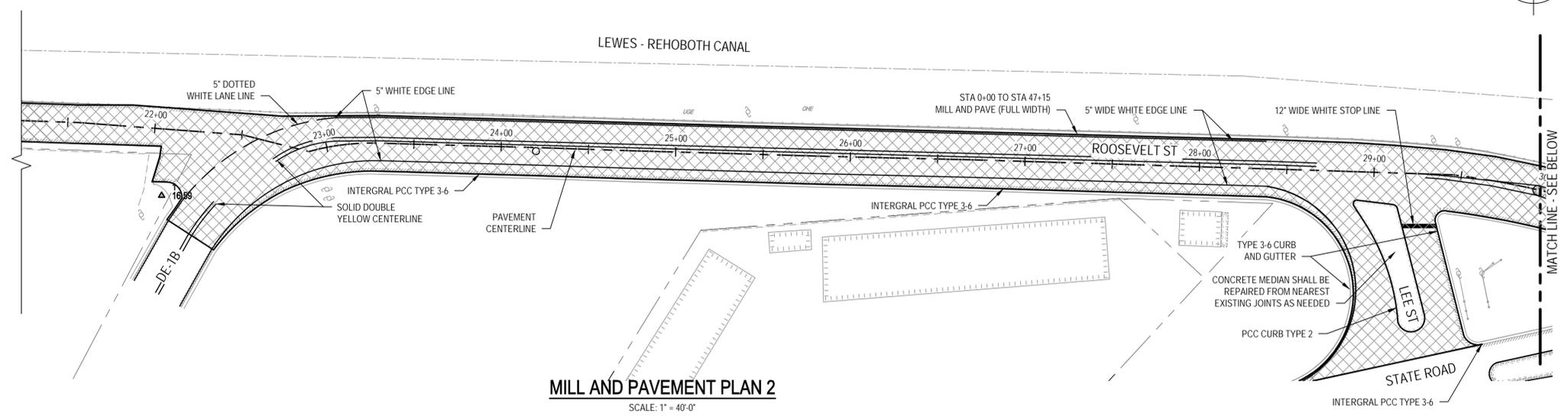
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Project	FORCE MAIN PROJECT		
Title	EROSION AND SEDIMENT CONTROL DETAILS 3		
Contract No.	Original Size		
ANSI D	Drawing No:	86-18690-C017	
		Sheet	19 of 29
		Rev:	A

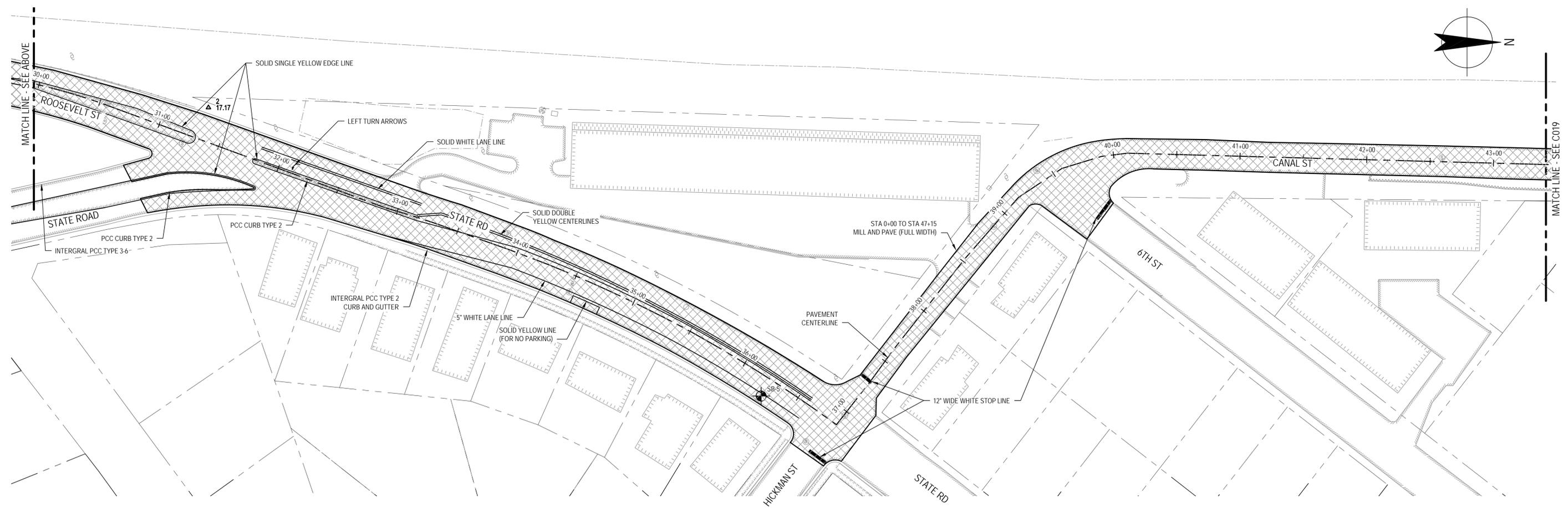
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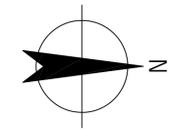
MILL AND PAVEMENT PLAN 1
SCALE: 1" = 40'-0"



MILL AND PAVEMENT PLAN 2
SCALE: 1" = 40'-0"



MILL AND PAVEMENT PLAN 3
SCALE: 1" = 40'-0"



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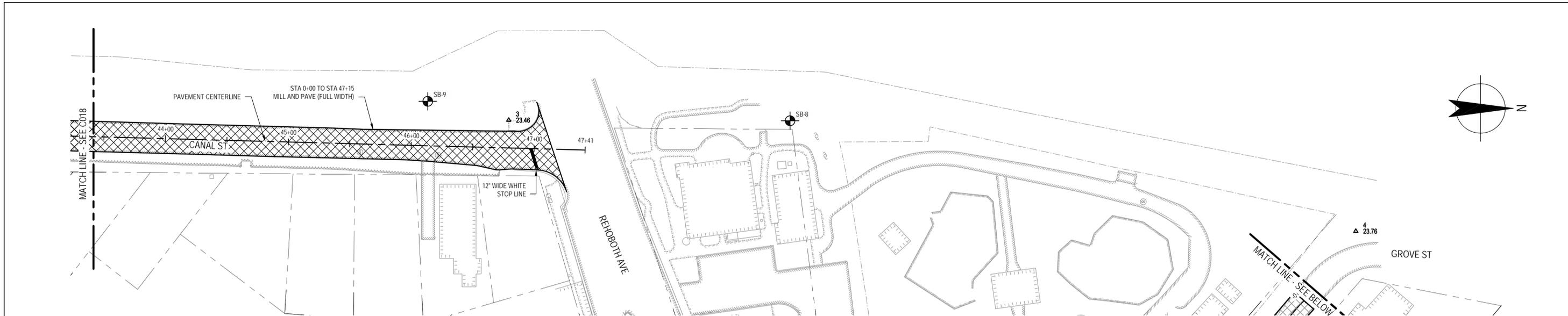
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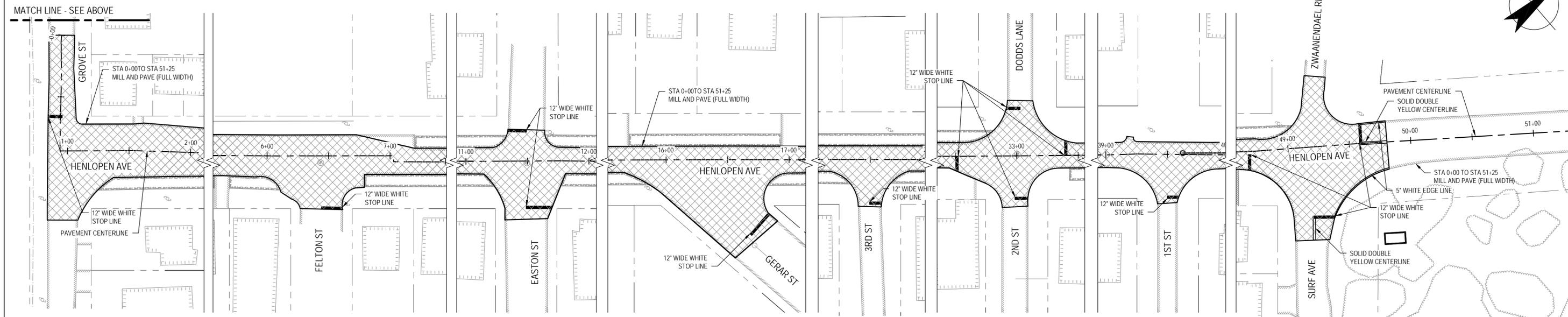
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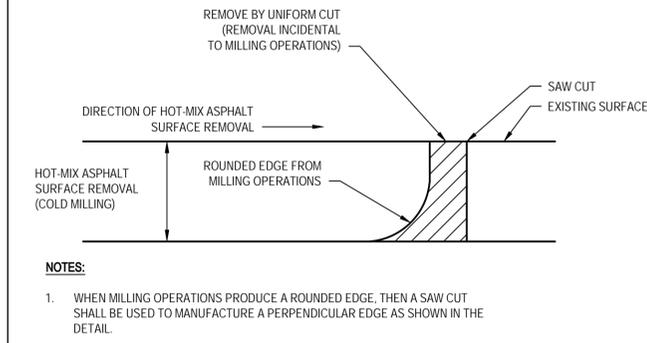
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Project	FORCE MAIN PROJECT		
Title	MILL AND PAVEMENT REPAIR PLANS 1		
Contract No.	Original Size		
ANSI D	Drawing No:	86-18690-C018	Sheet 20 of 29
			Rev: A



MILL AND PAVEMENT PLAN 4
SCALE: 1" = 40'-0"

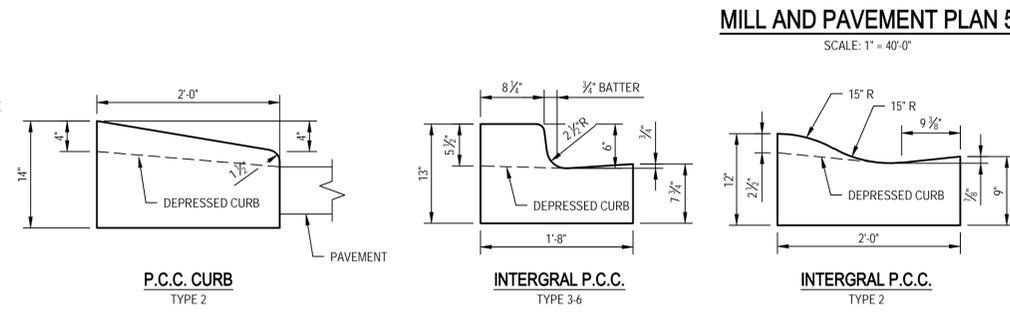


MILL AND PAVEMENT PLAN 5
SCALE: 1" = 40'-0"



- NOTES:**
1. WHEN MILLING OPERATIONS PRODUCE A ROUNDED EDGE, THEN A SAW CUT SHALL BE USED TO MANUFACTURE A PERPENDICULAR EDGE AS SHOWN IN THE DETAIL.

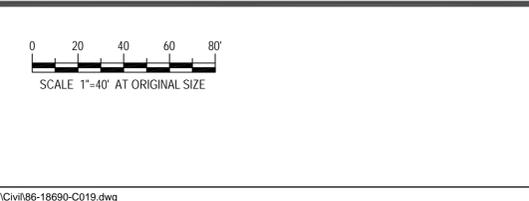
HOT MIX ASPHALT AT BUTT JOINTS
SCALE: NOT TO SCALE



CURB AND GUTTER DETAILS
SCALE: NOT TO SCALE

- CURB AND GUTTER NOTES:**
1. WHEN P.C.C. CURB OR INTEGRAL P.C.C. CURB AND GUTTER IS PLACED ADJACENT TO PORTLAND CEMENT CONCRETE PAVEMENT, CONSTRUCT THE JOINT AS PER THE LONGITUDINAL JOINT SEALANT DETAIL. USE APPROVED JOINT FILLER TO SEAL. WORK TO BE PAID UNDER RESPECTIVE CURB AND GUTTER ITEM.
 2. DEPRESS CURB AT ENTRANCES AS DETAILED ON THESE DETAILS.
 3. DEPRESS CURB FLUSH WITH PAVEMENT AT CURB RAMPS. MAXIMUM SLOPE OF CURB AT RAMPS IS 20:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL.
 4. DEPRESS CURB FLUSH WITH PAVEMENT OR ADJACENT AREA AT LEADING EDGE OF TRIANGULAR ISLANDS, TAPERING BACK TO FULL HEIGHT AT A SLOPE OF 4:1.
 5. 4" OF G.A.B.C. TYPE B SHALL BE PLACED UNDER ALL P.C.C. CURB AND P.C.C. CURB AND GUTTER.
 6. DEPRESS END OF CURB RUNS NOT PART OF AN ISLAND OR MEDIAN FLUSH WITH PAVEMENT OR ADJACENT AREA AT A SLOPE OF 12:1.

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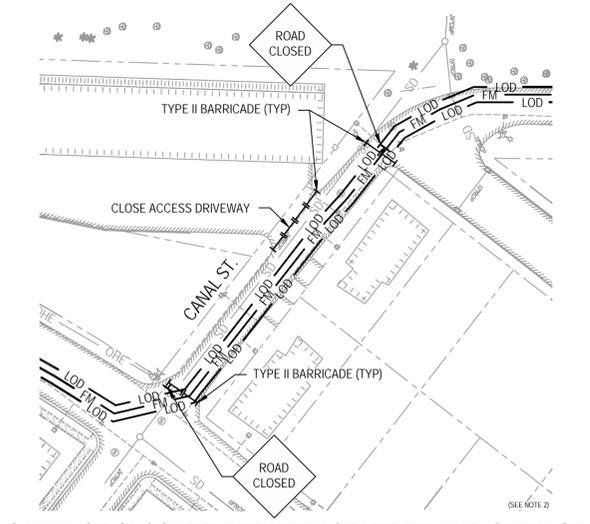
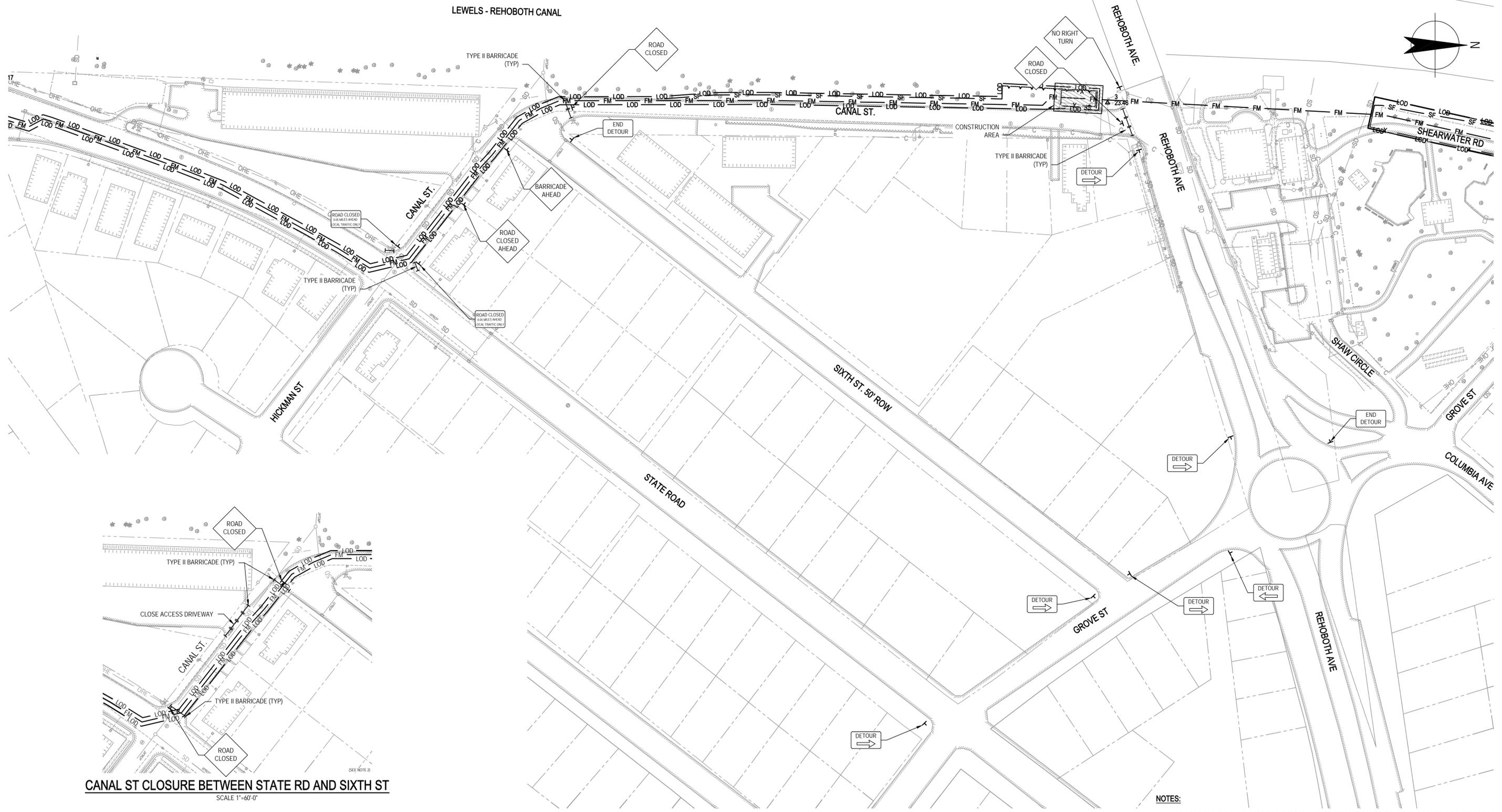
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Client **CITY OF REHOBOTH BEACH, DELAWARE**
Project **FORCE MAIN PROJECT**
Title **MILL AND PAVEMENT REPAIR PLANS 2 AND DETAILS**

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Original Size _____
Ansi D Drawing No: **86-18690-C019**

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Sheet 21 of 29
Rev: A



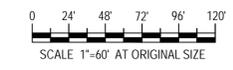
CANAL ST CLOSURE BETWEEN STATE RD AND SIXTH ST
SCALE 1"=60'-0"

TRAFFIC CONTROL PLAN - CANAL STREET CLOSURE
SCALE 1"=60'-0"

- NOTES:**
1. PRIOR TO CLOSING CANAL STREET, CONTRACTOR SHALL ESTABLISH DETOUR SIGNAGE AND WARNINGS. ALL DETOUR SIGNS AND BARRICADES SHALL BE REMOVED AFTER COMPLETION OF THE CANAL STREET FORCE MAIN SEGMENT AND REHOBOTH AVENUE CROSSING.
 2. CONTRACTOR SHALL PROVIDE ACCESS FOR HOMES BETWEEN STATE ROAD AND CANAL STREET DURING SHUT DOWN OF CANAL STREET FOR FORCE MAIN CONSTRUCTION.

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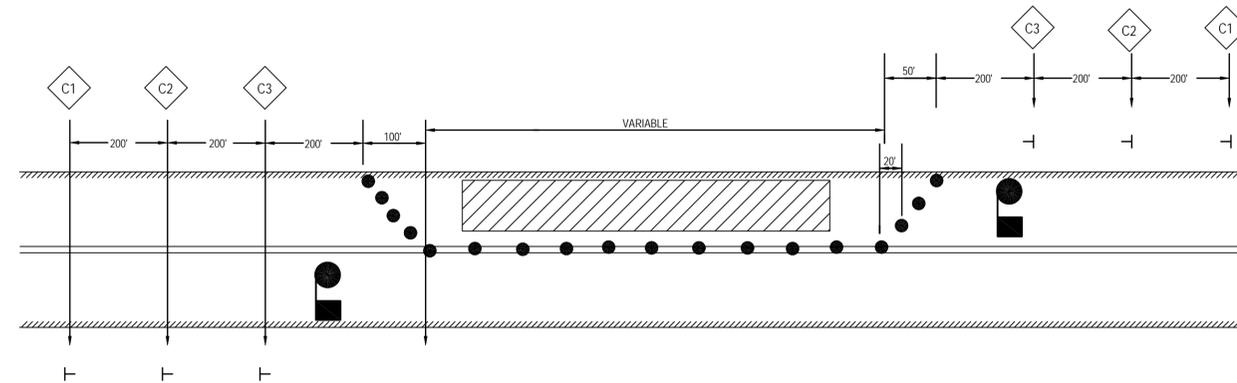
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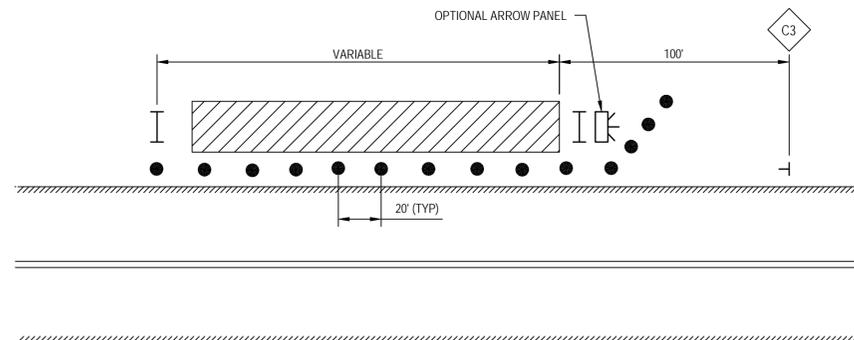
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Title	TRAFFIC CONTROL PLAN		
Contract No.	Original Size		
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			Rev: A

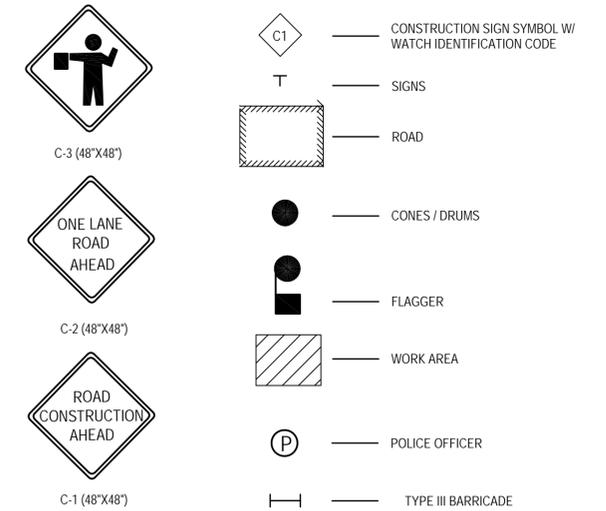


1 **TRAFFIC CONTROL - TWO WAY, ONE LANE TRAFFIC (FLAGGER CONTROL)**
NOT TO SCALE



2 **TRAFFIC CONTROL - TWO WAY, ONE LANE TRAFFIC SHOULDER CLOSURE (FLAGGER CONTROL)**
NOT TO SCALE

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 COUNTY'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

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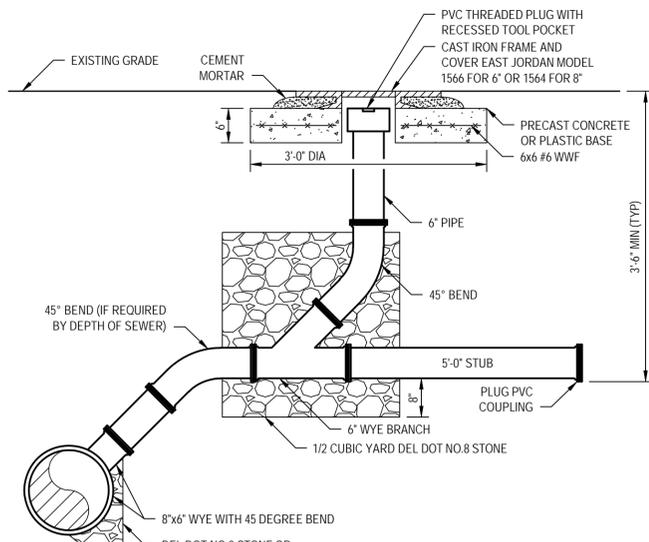
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Drawn CTF	Designer JM
Drafting Check JFM	Design Check BMG
Approved (Project Director) KSG	Date 06/2016
Scale AS NOTED	This Drawing shall not be used for Construction unless Signed and Sealed For Construction

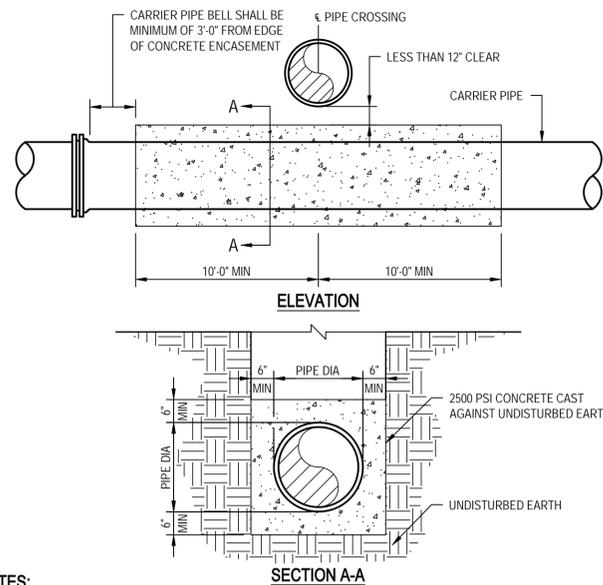
Client	CITY OF REHOBOTH BEACH, DELAWARE	
Project	FORCE MAIN PROJECT	
Title	TRAFFIC CONTROL DETAILS	
Contract No.	Original Size	
Ansi D	Drawing No: 86-18690-C021	Sheet 23 of 29
		Rev: A



NOTES:

- COORDINATE LATERAL LOCATIONS IN FIELD WITH CITY OF REHOBOTH BEACH AND PROPERTY OWNER, PIPE AND FITTINGS TO BE SDR 35 PVC, ASTM D-3034 AND D-2412.
- RECYCLED PLASTIC FOUNDATIONS FOR CLEAN OUT FRAME & COVER ARE AN ACCEPTABLE ALTERNATIVE TO PRECAST CONCRETE.
- EXISTING SERVICES ARE ASSUMED TO BE 4" IN ALL LOCATIONS.
- ONLY REMOVED AND DEMOLISHED ITEMS SHALL BE REPLACED WITH NEW MATERIALS. NO REMOVED OR DEMOLISHED ITEMS SHALL BE REINSTALLED.

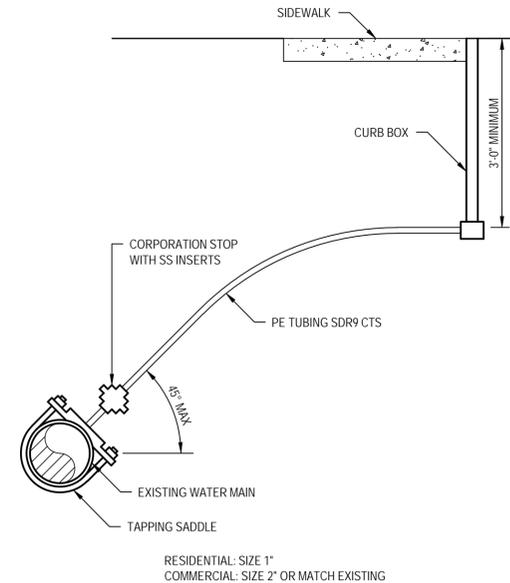
8 BUILDING LATERAL CLEANOUT DETAIL
NOT TO SCALE



NOTES:

- FOR ALL UTILITY CROSSINGS SEPARATED BY LESS THAN 12", LOWER UTILITY TO BE ENCASED UPON APPROVAL OF THE UTILITY OWNER.
- FOR ENCASEMENT OF SEWER MAIN WHICH CROSSES UNDER UTILITIES OTHER THAN WATER, ENCASEMENT LENGTH SHALL BE REDUCED TO 5 FEET ON EITHER SIDE OF THE UTILITY CROSSING.
- WHEN CONCRETE ENCASEMENT OF PVC MAIN IS REQUIRED, TRANSITION TO DUCTILE IRON PIPE FOR FULL LENGTH OF ENCASEMENT PLUS 3'-0" ON EACH SIDE. ENCASEMENT OF PVC MAIN IS UNACCEPTABLE.
- CONCRETE TO BE CLASS "D" CONCRETE, 2500 P.S.I.
- CONCRETE TO BE CAST AGAINST UNDISTURBED EARTH.

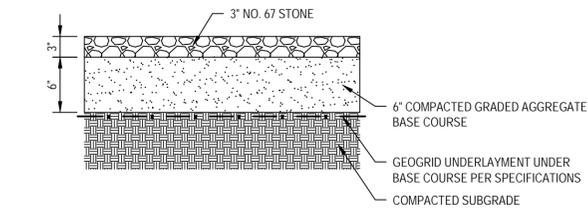
9 CONCRETE ENCASEMENT DETAIL
NOT TO SCALE



NOTES:

- ONLY REMOVED AND DEMOLISHED ITEMS SHALL BE REPLACED WITH NEW MATERIALS. NO REMOVED OR DEMOLISHED ITEMS SHALL BE REINSTALLED.

10 WATER SERVICE TAP AND RESTORATION DETAIL
NOT TO SCALE



11 GRAVEL PARKING LOT SECTION
NOT TO SCALE

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

FOR PERMIT SUBMITTAL
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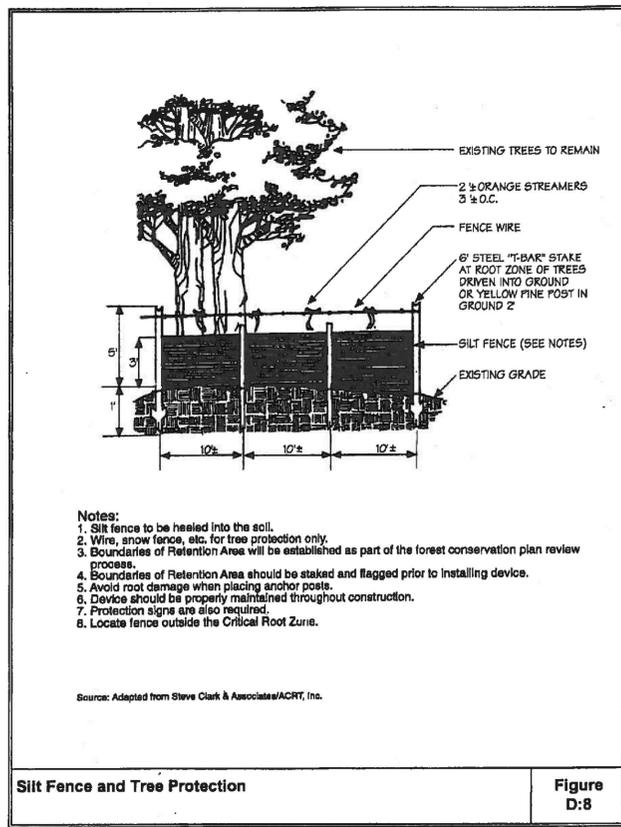
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Approved (Project Director)	KSG		
Date	06/2016		
Scale	NOT TO SCALE		

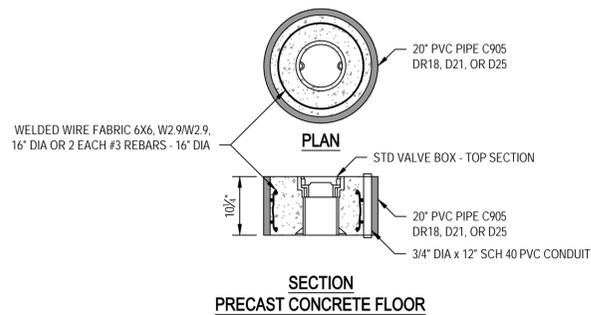
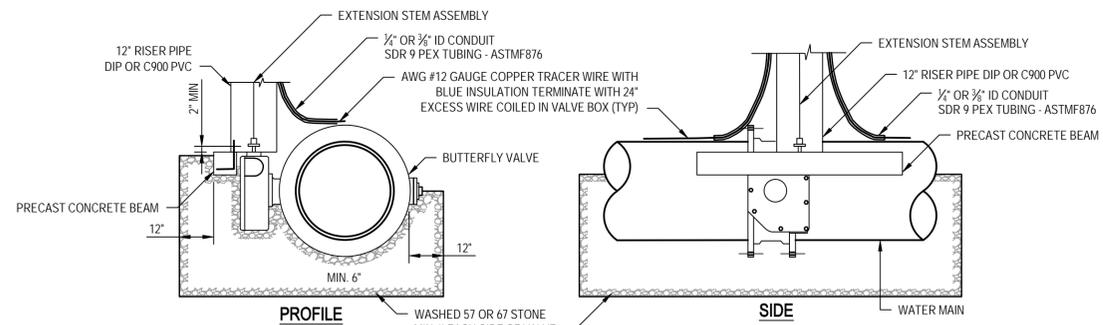
Client	CITY OF REHOBOTH BEACH, DELAWARE
Project	FORCE MAIN PROJECT
Title	MISCELLANEOUS CIVIL DETAILS 2
Contract No.	
Original Size	
This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

Contract No.	
Original Size	
Ansi D	Drawing No: 86-18690-C023
Sheet	25 of 29
Rev:	A



Silt Fence and Tree Protection

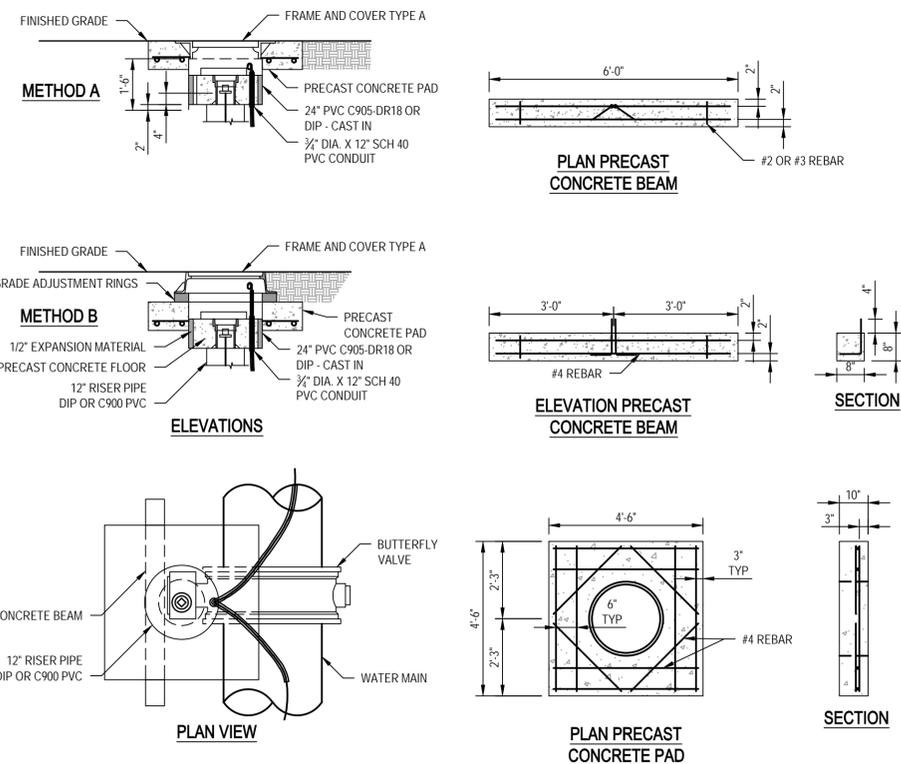
Figure D:8



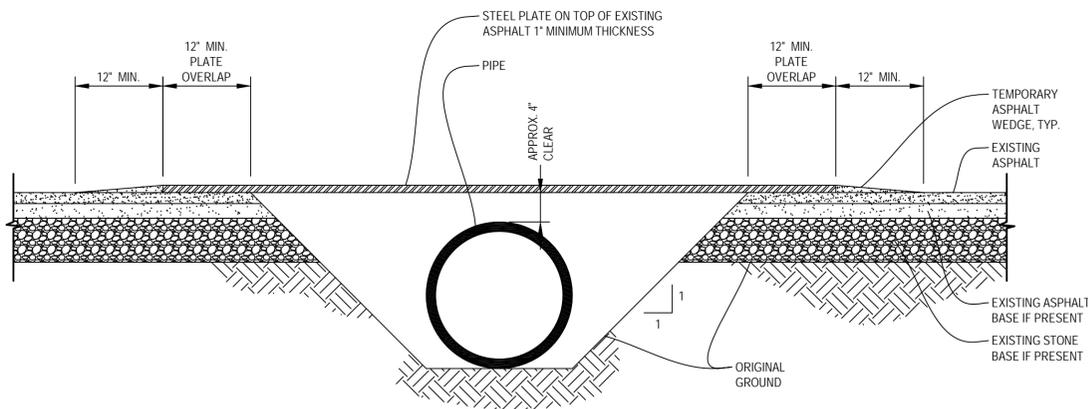
NOTES:

- METHOD A SHALL BE REQUIRED IN EASEMENTS, OR WHEN VALVE IS BACK OF ROAD DITCH.
- METHOD B SHALL BE REQUIRED WHEN VALVE IS IN MAINTAINED LAWNS, ON ROAD SHOULDER, IN PAVEMENT DRIVEWAYS, OR SIDEWALKS.
- DIAMETER OF RISER MAY VARY AS REQUIRED BY VALVE ACTUATOR, AS APPROVED BY ENGINEER.
- FOR 24" AND SMALLER VALVES - WHEN OPERATING NUT DEPTH EXCEEDS 3' BELOW FINISHED GRADE, PROVIDE EXTENSION STEM WITH STD 2" NUT IN TOP SECTION AS SHOWN.
- FOR 30" AND LARGER VALVES, EXTENSION STEM REQUIRED REGARDLESS OF DEPTH.
- PROVIDE 2" CLEARANCE IN ALL DIRECTIONS BETWEEN RISER AND VALVE/ACTUATOR (SEE NOTE 3).
- DESIGN REQUIREMENTS
 - A. CONCRETE - $f_c = 4000$ PSI (MIN)
 - B. REBARS - GRADE 60, ASTM A 615
 - C. WELDED WIRE FABRIC - ASTM A 185, A 82

12 BUTTERFLY VALVE DETAIL
NOT TO SCALE



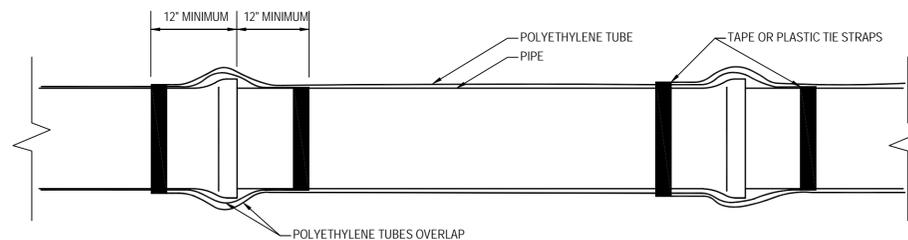
12 BUTTERFLY VALVE DETAIL
NOT TO SCALE



13 ROADWAY ACCESS TRENCH AND PLATE
NOT TO SCALE

NOTE

- CONTRACTOR MUST MAINTAIN ROADWAY ACCESS AT ALL TIMES. CONTRACTOR CAN ONLY CLOSE OFF ONE HALF OF THE ROADWAY AT ANY ONE TIME. IF VEHICLE TRAFFIC IS RESTRICTED TO ONE LANE, THE CONTRACTOR MUST PROVIDE TRAFFIC CONTROL.



NOMINAL PIPE DIAMETER (IN.)	MINIMUM POLYETHYLENE WIDTH (IN.)	
	FLAT TUBE	SHEET
24"	54"	108"

- ALL LUMPS OF CLAY, MUD, CINDERS, ETC., ON THE PIPE SHALL BE REMOVED PRIOR TO INSTALLATION OF POLYETHYLENE ENCASUREMENT. DURING INSTALLATION, SOIL OR EMBEDMENT MATERIAL SHALL NOT BE TRAPPED BETWEEN THE PIPE AND THE POLYETHYLENE. THE POLYETHYLENE FILM SHALL BE FITTED TO CONTOUR OF THE PIPE CREATING A SNUG, BUT NOT TIGHT, ENCASUREMENT WITH MINIMUM SPACE BETWEEN THE POLYETHYLENE AND THE PIPE. SUFFICIENT SLACK SHALL BE PROVIDED IN CONTOURING TO PREVENT STRETCHING THE POLYETHYLENE WHERE IT BRIDGES IRREGULAR SURFACES, SUCH AS BELL-SPIGOT INTERFACES, BOLTED JOINTS, OR FITTINGS AND TO PREVENT DAMAGE TO THE POLYETHYLENE CAUSED BY BACKFILLING OPERATIONS. OVERLAPS AND ENDS SHALL BE SECURED WITH ADHESIVE TAPE, OR PLASTIC TIE STRAPS.
- CUT POLYETHYLENE TUBE OR SHEET TO A LENGTH APPROXIMATELY 2 FT LONGER THAN THE PIPE SECTION. CENTER THE TUBE OR CUT LENGTH TO PROVIDE A 1 FT OVERLAP ON EACH ADJACENT PIPE SECTION, BUNCHING IT UNTIL IT CLEARS THE PIPE ENDS. FOR POLYETHYLENE SHEETS, SECURE THE CUT EDGE AT INTERVALS OF APPROXIMATELY 3 FT.
- LOWER THE PIPE INTO THE TRENCH AND MAKE UP THE PIPE JOINT WITH THE PRECEDING SECTION OF PIPE. A SHALLOW BELL HOLE MUST BE MADE AT JOINTS TO FACILITATE INSTALLATION OF POLYETHYLENE.
- FOR POLYETHYLENE TUBES, PULL THE BUNCHED POLYETHYLENE FROM THE PRECEDING LENGTH OF PIPES AND OVER THE END OF THE NEW LENGTH OF PIPE, AND SECURE IT IN PLACE. THEN SLIP THE END OF THE POLYETHYLENE FROM THE NEW PIPE SECTION OVER THE END OF THE FIRST WRAP UNTIL IT OVERLAPS THE JOINT AT THE END OF THE PRECEDING LENGTH OF PIPE. SECURE THE OVERLAP IN PLACE.

14 POLYETHYLENE ENCASUREMENT
NOT TO SCALE

PRELIMINARY

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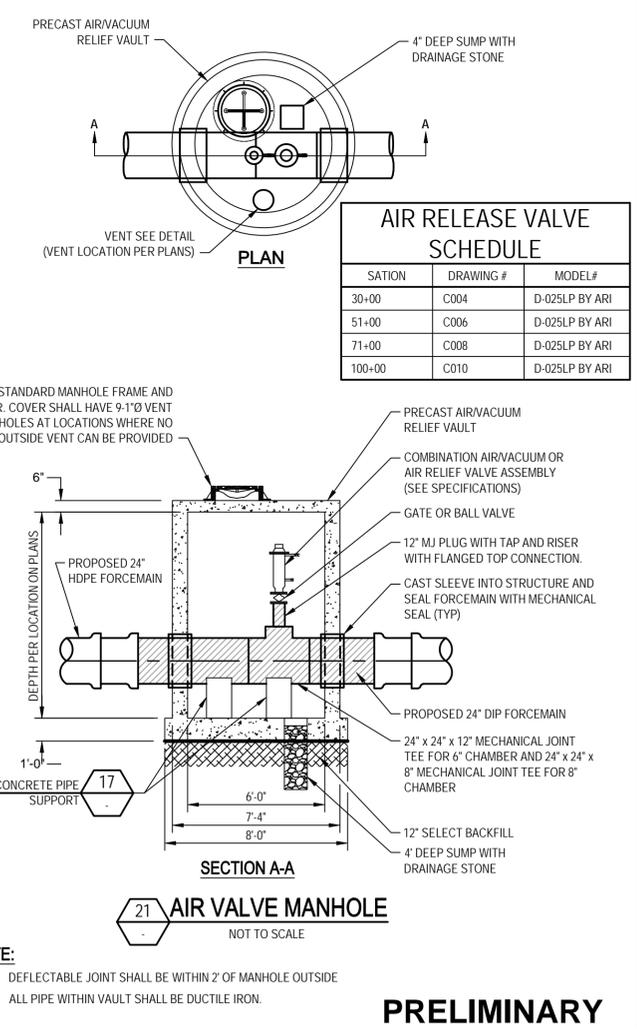
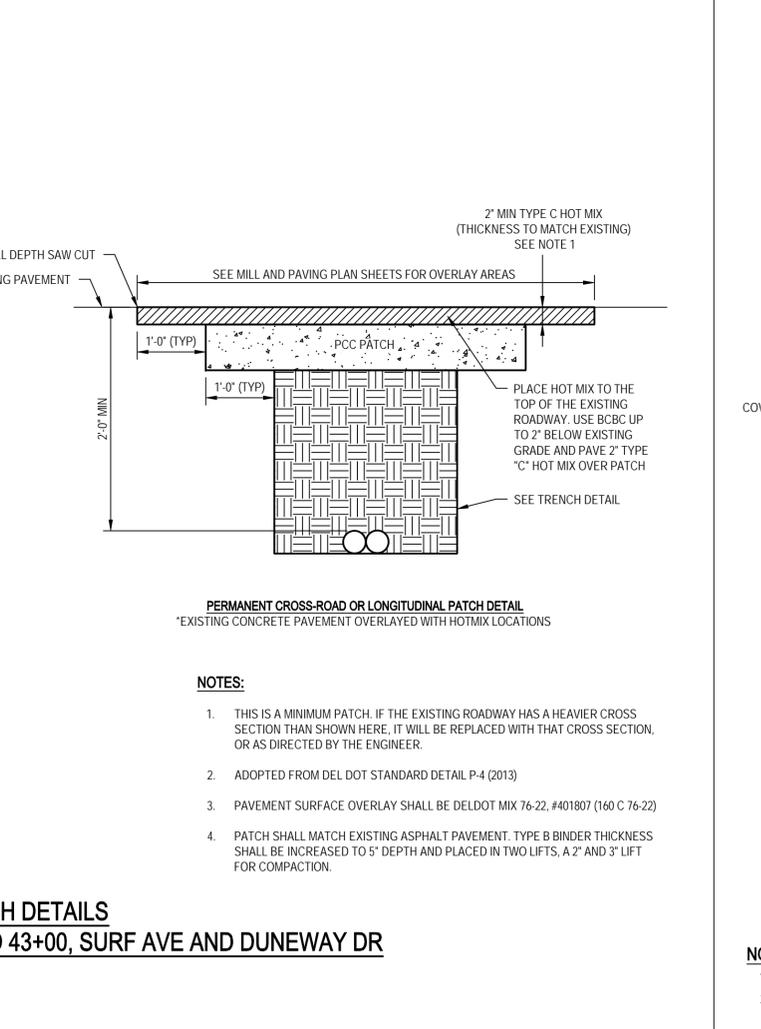
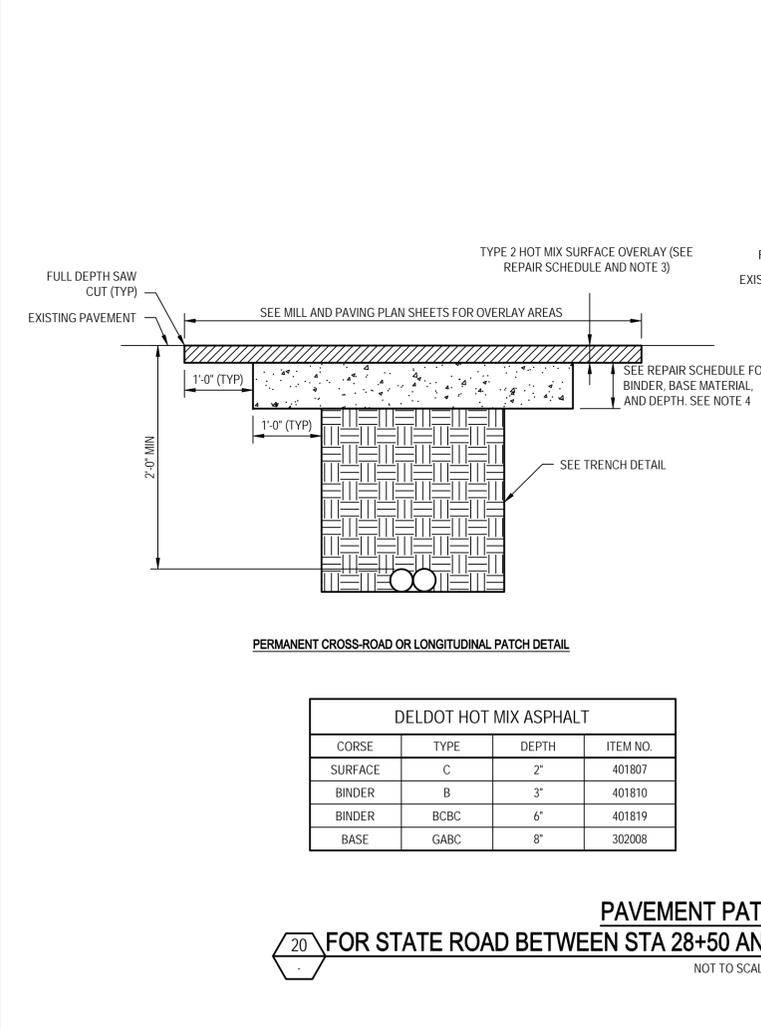
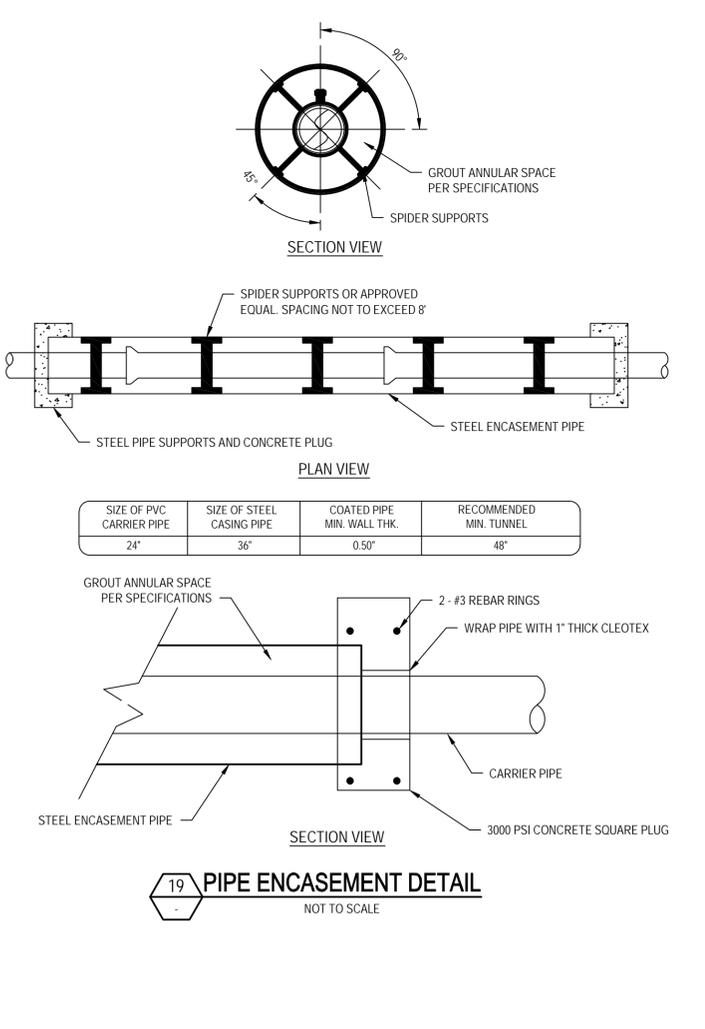
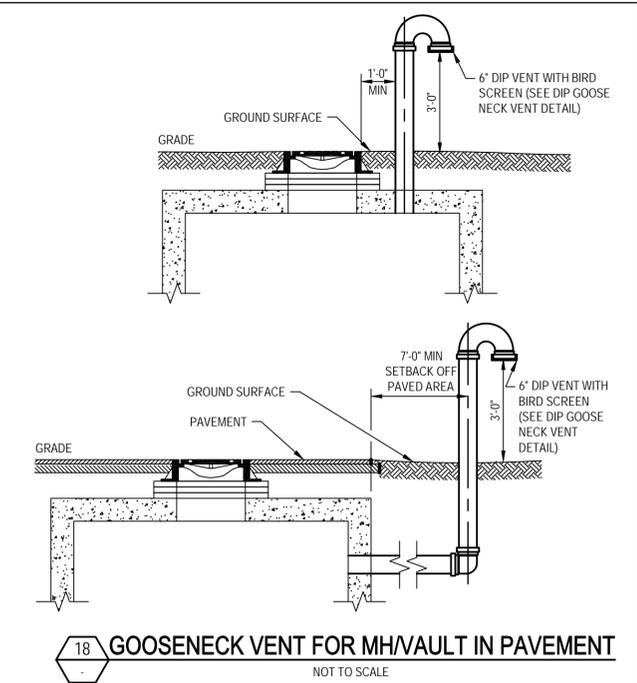
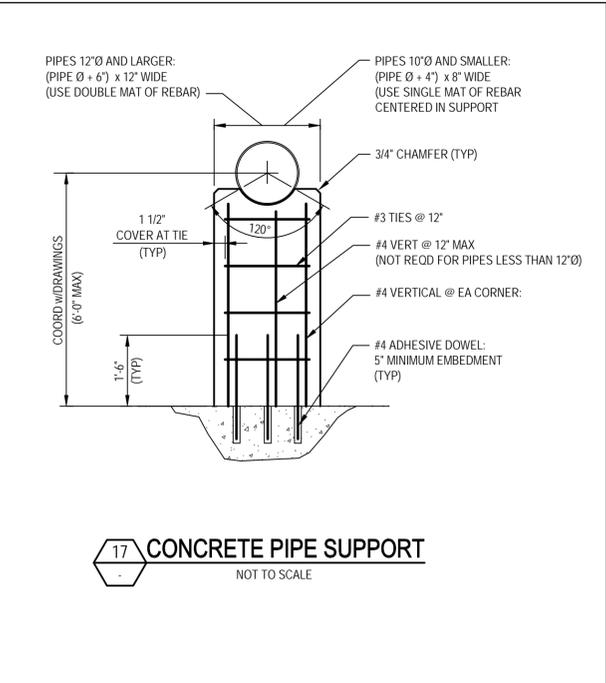
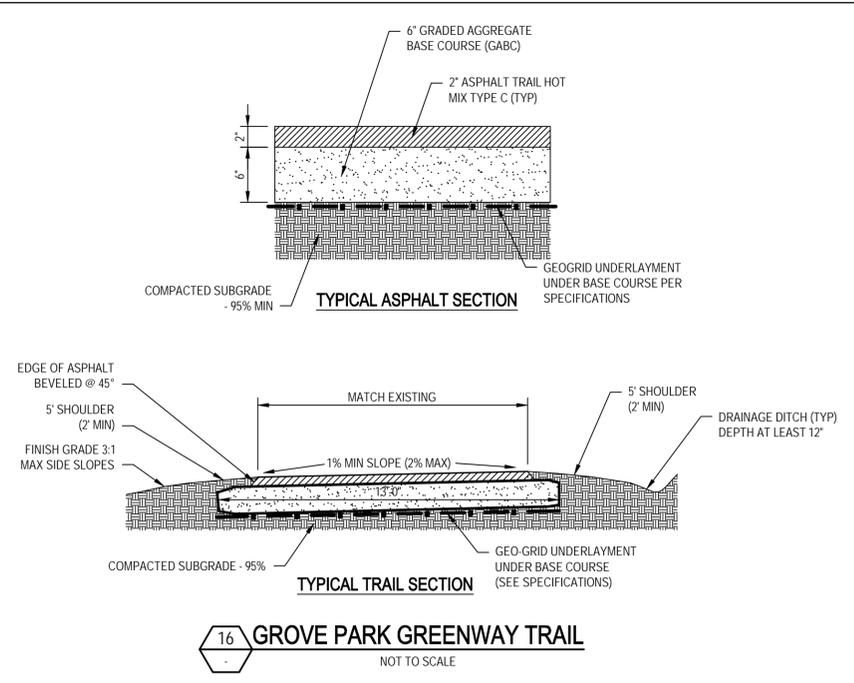
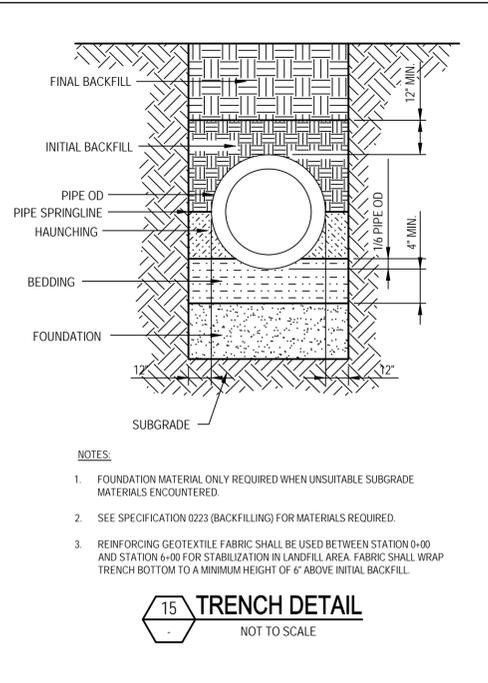
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Drafting Check	JFM	Design Check	BMG
Approved (Project Director)	KSG	Date	06/2016
Scale	NOT TO SCALE	This Drawing shall not be used for Construction unless Signed and Sealed For Construction	

Client **CITY OF REHOBOTH BEACH, DELAWARE**
Project **FORCE MAIN PROJECT**
Title **MISCELLANEOUS CIVIL DETAILS 3**

Contract No. **86-18690-C024**
Original Size **ANSI D**
Drawing No: **86-18690-C024**

Sheet **26** of **29**
Rev: **A**



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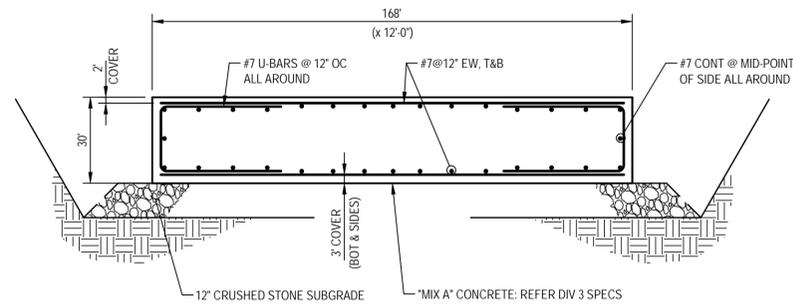
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Client **CITY OF REHOBOTH BEACH, DELAWARE**
Project **FORCE MAIN PROJECT**
Title **MISCELLANEOUS CIVIL DETAILS 4**

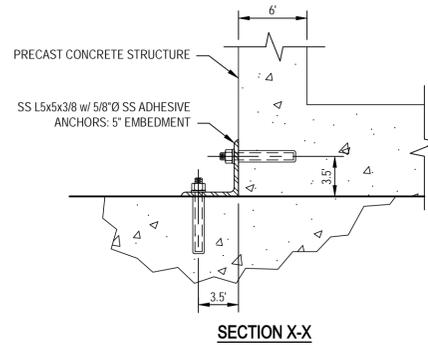
Contract No. **86-18690-C025**

Original Size **ANSI D** Drawing No: **86-18690-C025** Sheet **27** of **29** Rev: **A**

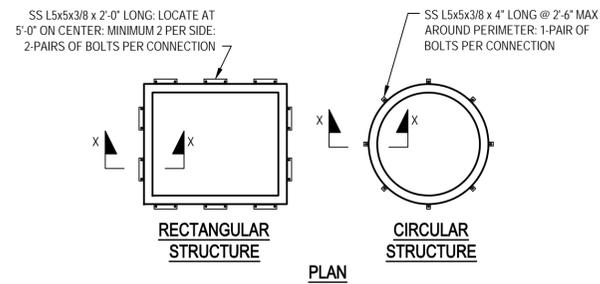
PRELIMINARY



1 VAULT BASE ANCHOR
NOT TO SCALE



SECTION X-X



2 PRECAST VAULT ANCHORAGE TO BASE SLAB
NOT TO SCALE

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. _____, EXPIRATION DATE: _____

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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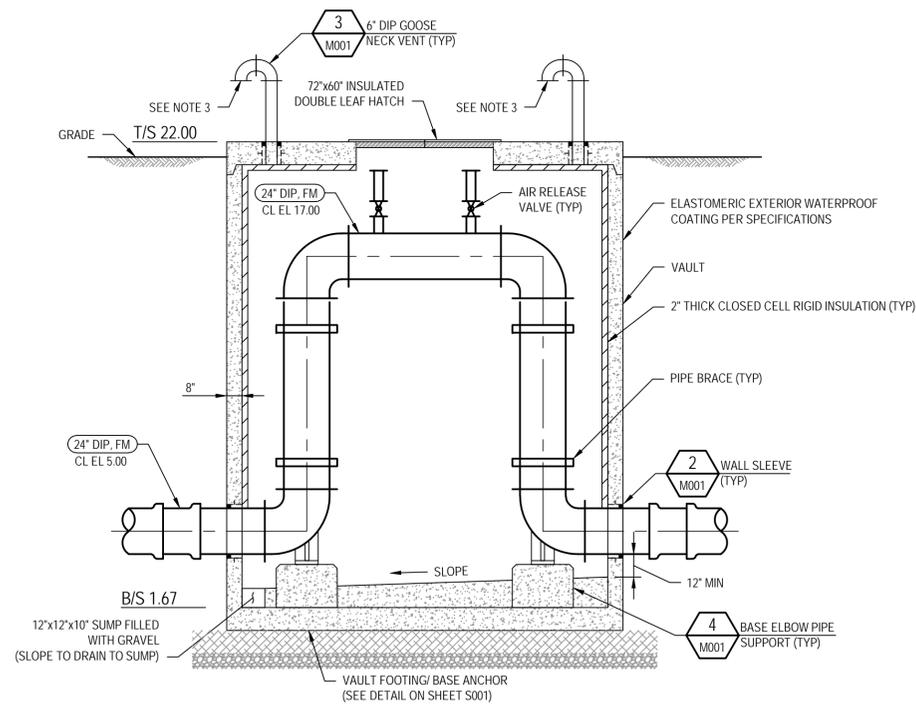
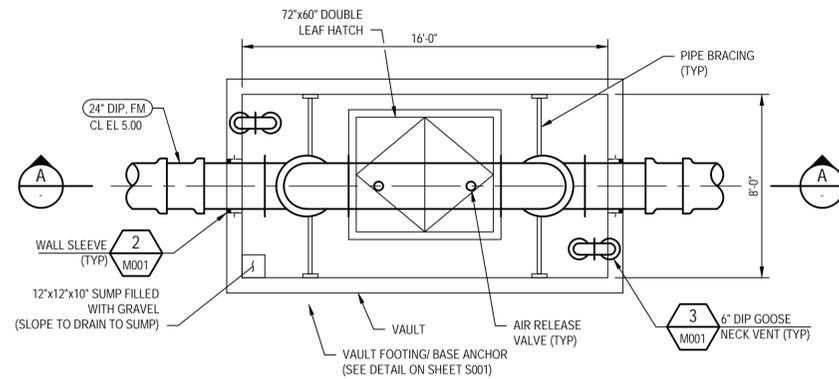


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Date	06/2016		
Scale	AS NOTED		

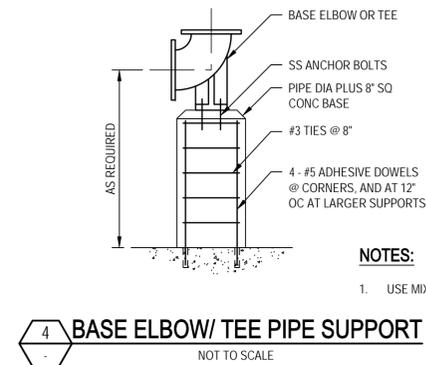
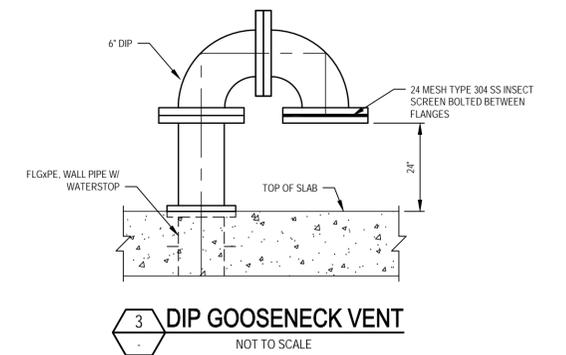
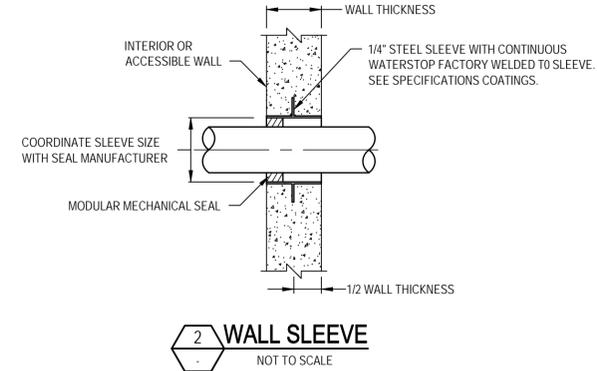
Client	CITY OF REHOBOTH BEACH, DELAWARE		
Project	FORCE MAIN PROJECT		
Title	PLAN, SECTIONS, AND DETAILS		
Contract No.			
Original Size	Ansi D Drawing No: 86-18690-S001		Sheet 28 of 29
			Rev: A



1 AIR RELEASE VALVE VAULT DETAIL
1/4" = 1'-0"

NOTES:

- BACK PRESSURE SUSTAINING VALVE SHALL BE ROSS 70SWR GLOBE STYLE OR APPROVED EQUAL.
- PRE-CAST VAULT AND APPURTENANCES SHALL CONFORM TO YORK COUNTY STANDARDS AND BE DESIGNED FOR H-20 LOADING. VAULT SHALL BE WATER TIGHT.
- VENTS SHALL INCLUDE FROST SAFE TWO-WAY AIR DAMPER WITH VENTS SAFE SECURITY CAGE AS MANUFACTURED BY VAL-MATIC VALVE & MFG. CORP. OR APPROVED EQUAL.
- AIR RELEASE VALVES SHALL BE MODEL D-060LP AS MANUFACTURED BY ARI, SEE SPECIFICATIONS.

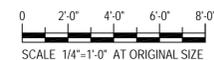


NOTES:

- USE MIX CONCRETE.

PRELIMINARY

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Date	06/2016		
Scale	NOT TO SCALE		

Client **CITY OF REHOBOTH BEACH, DELAWARE**
Project **FORCE MAIN PROJECT**
Title **SITE VAULT DETAILS**

Contract No. _____
Original Size _____
Ansi D Drawing No: 86-18690-M001

Sheet **29** of **29**
Rev: **A**