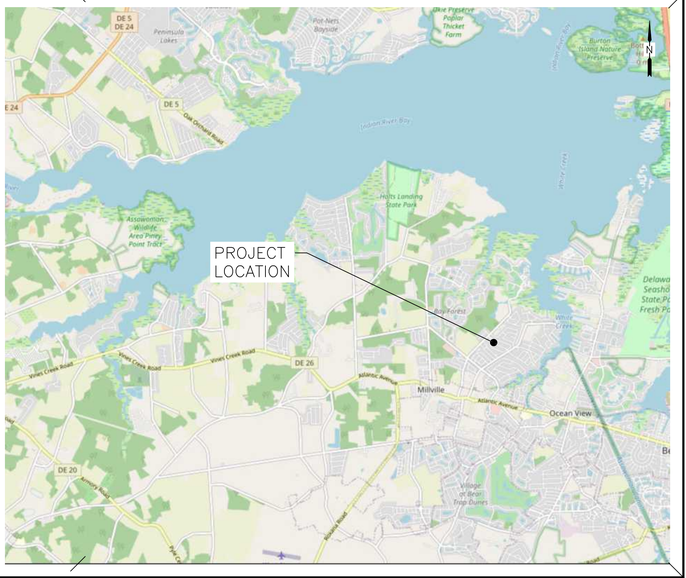
DENTON MANOR

DRAINAGE IMPROVEMENTS

WHITE CREEK / INDIAN RIVER BAY WATERSHED
SUSSEX COUNTY, DELAWARE



LOCATION MAP

SHEET INDEX

PERMITTEE CERTIFICATION:

I, THE UNDERSIGNED, CERTIFY THAT ALL LAND CLEARING AND CONSTRUCTION SHALL BE DONE PURSUANT TO THE APPROVED PLAN AND THAT RESPONSIBLE PERSONNEL (I.E., BLUE CARD HOLDER) INVOLVED IN THE LAND DISTURBANCE WILL HAVE A CERTIFICATION OF TRAINING PRIOR TO INITIATION OF THE PROJECT, AT A DNREC SPONSORED OR APPROVED TRAINING COURSE FOR THE CONTROL OF EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION. IN ADDITION, I GRANT THE DEPARTMENT OR DELEGATED INSPECTION AGENCY THE RIGHT TO CONDUCT ON-SITE INSPECTIONS, AND I UNDERSTAND MY RESPONSIBILITIES UNDER THE NPDES CONSTRUCTION GENERAL PERMIT.

NAME _____ TITLE _____

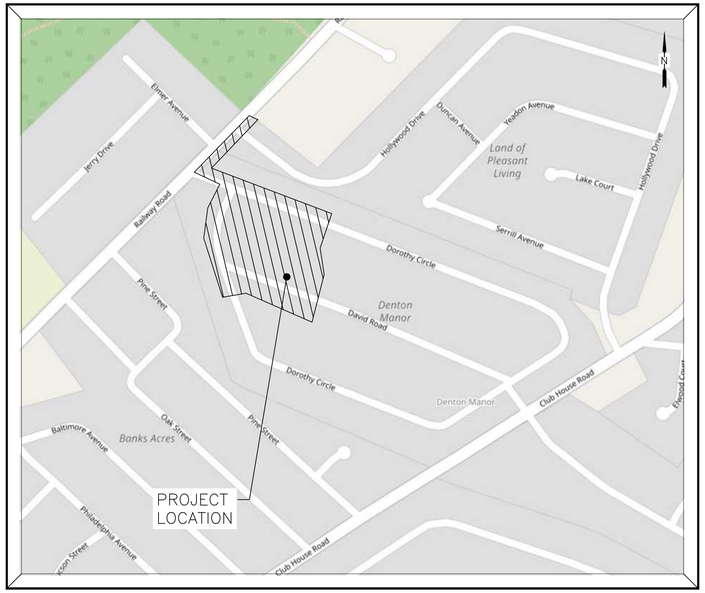
SIGNATURE _____ DATE _____

LEGEND

EXISTING	PROPOSED
BUILDING	BUILDING
BRIDGE	BRIDGE
BOTTOM WIDTH LEFT	BOTTOM WIDTH LEFT
BOTTOM WIDTH RIGHT	BOTTOM WIDTH RIGHT
CENTERLINE DITCH	CENTERLINE DITCH
CENTERLINE DITCH STATION MAJOR	CENTERLINE DITCH STATION MAJOR
CENTERLINE DITCH STATION MINOR	CENTERLINE DITCH STATION MINOR
CENTERLINE ROAD	CONTOUR MAJOR
CONTOUR MAJOR	CONTOUR MINOR
CONTOUR MINOR	CONCRETE
CONCRETE	EASEMENT
EASEMENT	EDGE OF PAVEMENT
EDGE OF PAVEMENT	EDGE OF GRAVEL
EDGE OF GRAVEL	FENCELINE
FENCELINE	GEOMORPHOLOGY FEATURE
GEOMORPHOLOGY FEATURE	GRADE PROFILE
HYDROLOGIC DRAINAGE AREA	HYDROLOGIC DRAINAGE AREA
HYDROLOGIC SOIL TYPE	HYDROLOGIC DRAINAGE AREA HATCH
HYDROLOGIC SOIL GROUP	HYDROLOGIC DRAINAGE AREA LANDUSE
HYDROLOGIC TIME OF CONCENTRATION	HYDROLOGIC TIME OF CONCENTRATION
MAILBOX	NORMAL WATER SURFACE ELEVATION
MARSHLINE	RIPRAP
ORDINARY HIGH WATER	SIDEWALK
PROPERTY LINE	SIGN
RAILROAD TRACKS	STORMWATER PIPE
RIPRAP	STORMWATER STRUCTURE
SHEETPILE	TAX DITCH RIGHT-OF-WAY
SIDEWALK	TAX DITCH SPECIAL RIGHT-OF-WAY
SIGN	TOP OF BANK LEFT
STORMWATER PIPE	TOP OF BANK RIGHT
STORMWATER STRUCTURE	TREE
TAX DITCH RIGHT-OF-WAY	TEXT
TAX DITCH SPECIAL RIGHT-OF-WAY	WATERSHED DRAINAGE AREA
TOP OF BANK RIGHT	WOODSLINE
TOP OF BANK LEFT	ESTIMATED CUT
TREE	ESTIMATED FILL
TEXT	COMPOST LOG
UTILITY: COMMUNICATION CABLE	LIMIT OF DISTURBANCE
UTILITY: OVERHEAD WIRE	TEMPORARY CONSTRUCTION - EASEMENT
UTILITY POLE	SILT FENCE
UTILITY: ELECTRIC	SUPER SILT FENCE
UTILITY: GAS	PLANTING AREA
UTILITY: SANITARY SEWER	SEEDING AREA
UTILITY: WATER	
WATERSHED DRAINAGE AREA	
WETLAND	
WOODSLINE	

MISCELLANEOUS

MATCHLINE
SOIL BORING
CROSS-SECTION



LOCATION MAP

LICENSED PROFESSIONAL CERTIFICATION:

I HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF DELAWARE, THAT THE INFORMATION SHOWN HEREON HAS BEEN PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLIES WITH THE APPLICABLE STATE AND LOCAL REGULATIONS AND ORDINANCES.

NAME _____ TITLE _____

SIGNATURE _____ DATE _____

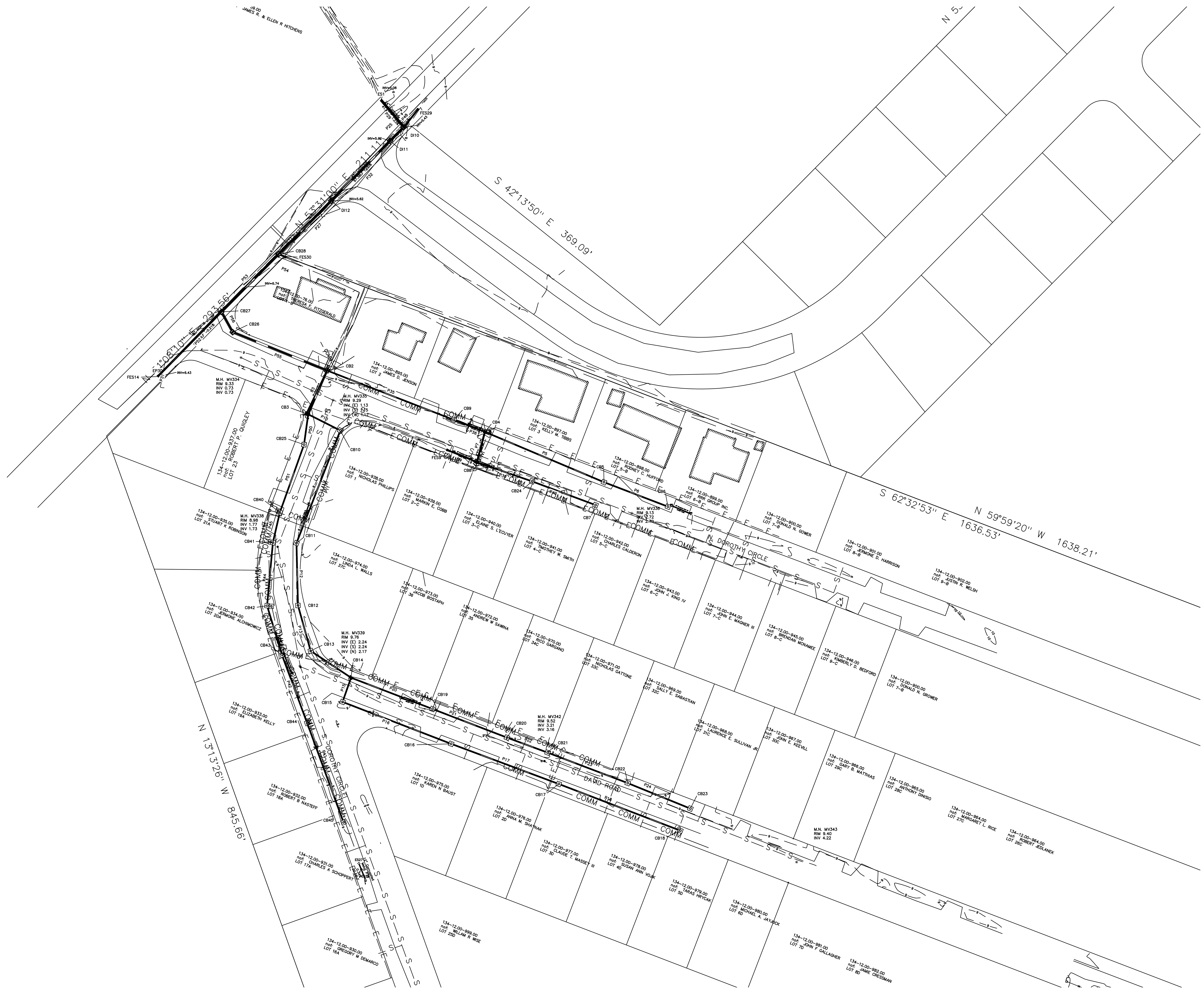
REVISIONS

DATE	DESCRIPTION
06/2021	Response to DelDOT 3rd review comments
05/2021	Response to DelDOT 2nd review comments
04/2021	Response to DelDOT 1st review comments
07/2021	Response to DNREC 1st review comments
	PLAN REVISION DUE TO LOA
10/21	DELDOT COMMENTS

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
Division of Watershed Stewardship
Drainage Program
Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724
Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7059

DENTON MANOR
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE
COVERSHEET

Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C001



PLAN MAP
1" = 60'

0' 30' 60' 120' 180'

SCALE: 1" = 60'

REVISIONS	
DATE	DESCRIPTION

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Division of Watershed Stewardship
Drainage Program

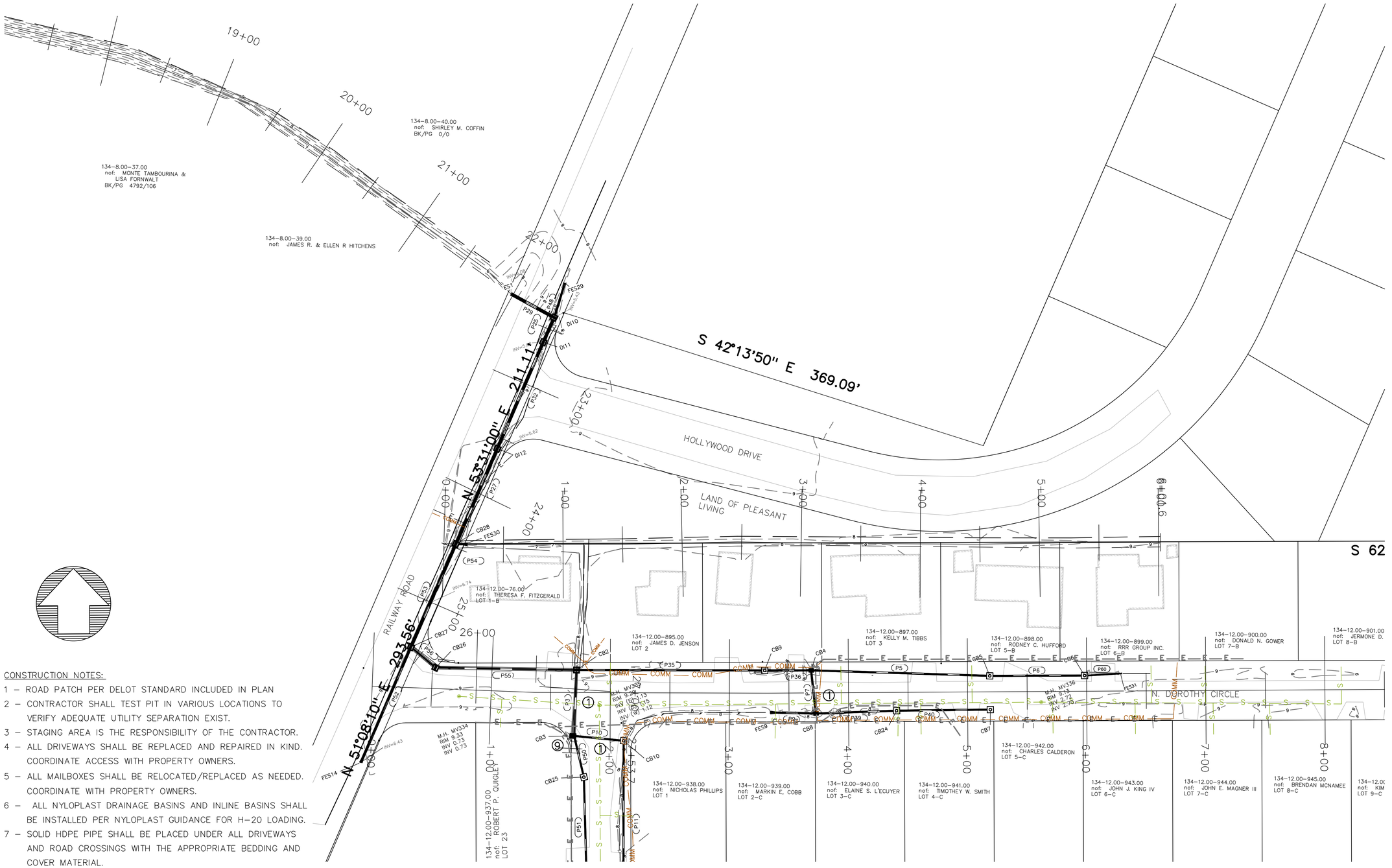
Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724

Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7059

DENTON MANOR
DRAINAGE IMPROVEMENTS , # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

OVERALL SITE PLAN

Date:	9.20.2021
Designed:	JLE / AR
Planned:	TS/TB/KW
Drawn:	JLE
Sheet No.	C100



CONSTRUCTION NOTES:

1 – ROAD PATCH PER DELOT STANDARD INCLUDED IN PLAN
2 – CONTRACTOR SHALL TEST PIT IN VARIOUS LOCATIONS TO VERIFY ADEQUATE UTILITY SEPARATION EXIST.
3 – STAGING AREA IS THE RESPONSIBILITY OF THE CONTRACTOR.
4 – ALL DRIVEWAYS SHALL BE REPLACED AND REPAIRED IN KIND. COORDINATE ACCESS WITH PROPERTY OWNERS.
5 – ALL MAILBOXES SHALL BE RELOCATED/REPLACED AS NEEDED. COORDINATE WITH PROPERTY OWNERS.
6 – ALL NYLOPLAST DRAINAGE BASINS AND INLINE BASINS SHALL BE INSTALLED PER NYLOPLAST GUIDANCE FOR H-20 LOADING.
7 – SOLID HDPE PIPE SHALL BE PLACED UNDER ALL DRIVEWAYS AND ROAD CROSSINGS WITH THE APPROPRIATE BEDDING AND COVER MATERIAL.
8 – ALL AREAS BETWEEN DRIVEWAYS SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE TO THE INLETS.
9 – ALL FES SHALL BE FITTED WITH SAFETY GRATES

THE PHASE LINE/LOD IS LARGER THAN NEED, PULLED PURPOSEFULLY BEYOND THE STATION NUMBERS FOR CLARITY.

PLAN MAP
1" = 40'

0' 20' 40' 80' 120'
SCALE: 1" = 40'

REVISIONS

DATE	DESCRIPTION

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Division of Watershed Stewardship
Drainage Program

Dover Office
89 Kings Highway Phone:(302) 739 - 9921 Fax: (302) 739 - 6724
Dover DE, 19901

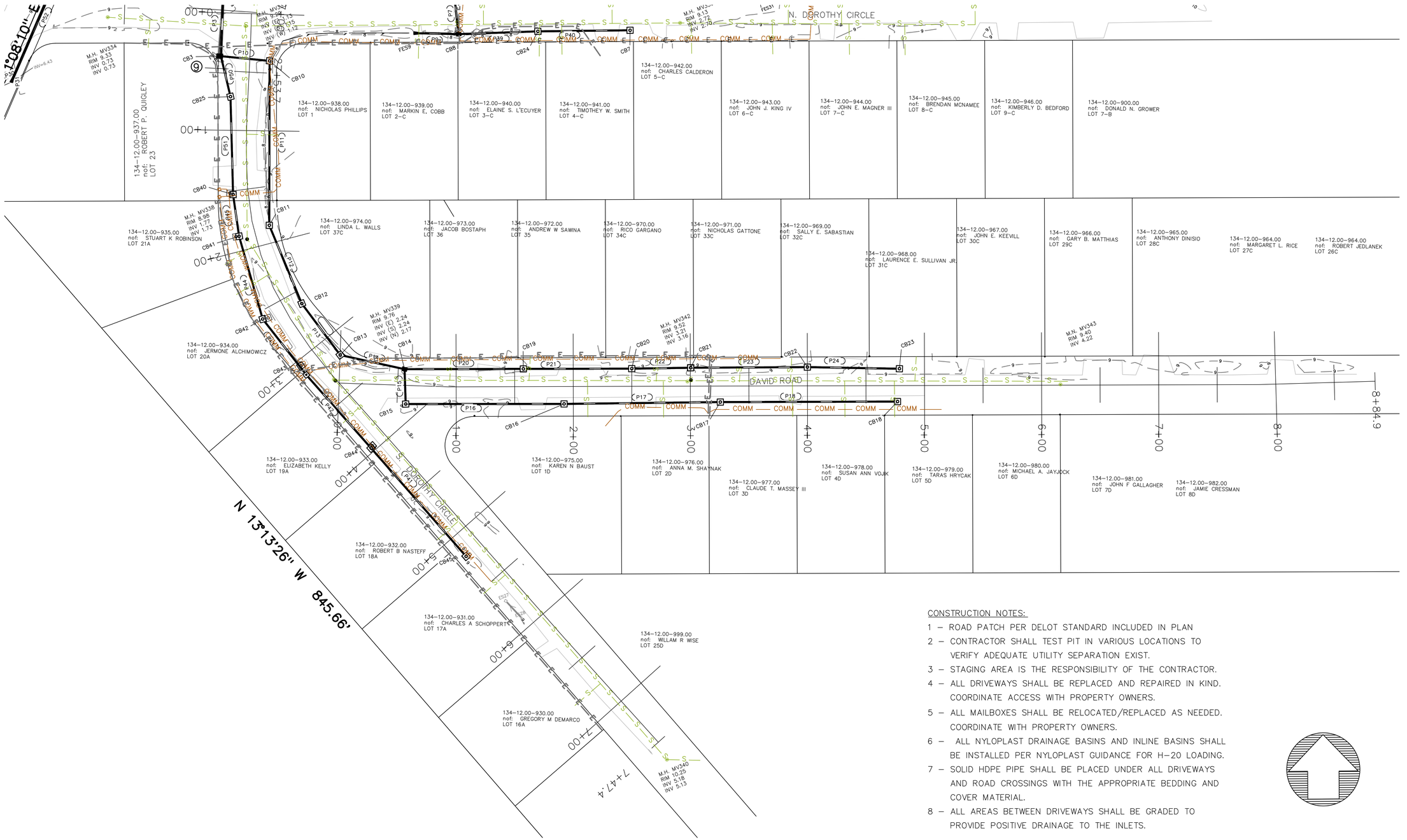
Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7059

DENTON MANOR
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

NORTH SITE PLAN

Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C101

File Location: G:\Equipment Section\Projects\DENTON MANOR, 21-139\DWG\DENTON MNR REV 2- 3.3.2022.dwg Layout:SITE PLAN 2 C101 User: james.elliott Plot time: 03-03-22 @ 11:00am



THE PHASE LINE/LOD IS LARGER THAN NEED, PULLED PURPOSEFULLY BEYOND THE STATION NUMBERS FOR CLARITY.

CONSTRUCTION NOTES:

1 – ROAD PATCH PER DELOT STANDARD INCLUDED IN PLAN
2 – CONTRACTOR SHALL TEST PIT IN VARIOUS LOCATIONS TO VERIFY ADEQUATE UTILITY SEPARATION EXIST.
3 – STAGING AREA IS THE RESPONSIBILITY OF THE CONTRACTOR.
4 – ALL DRIVEWAYS SHALL BE REPLACED AND REPAIRED IN KIND. COORDINATE ACCESS WITH PROPERTY OWNERS.
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6 – ALL NYLOPLAST DRAINAGE BASINS AND INLINE BASINS SHALL BE INSTALLED PER NYLOPLAST GUIDANCE FOR H-20 LOADING.
7 – SOLID HDPE PIPE SHALL BE PLACED UNDER ALL DRIVEWAYS AND ROAD CROSSINGS WITH THE APPROPRIATE BEDDING AND COVER MATERIAL.
8 – ALL AREAS BETWEEN DRIVEWAYS SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE TO THE INLETS.

PLAN MAP
1" = 40'

0' 20' 40' 80' 120'
SCALE: 1" = 40'

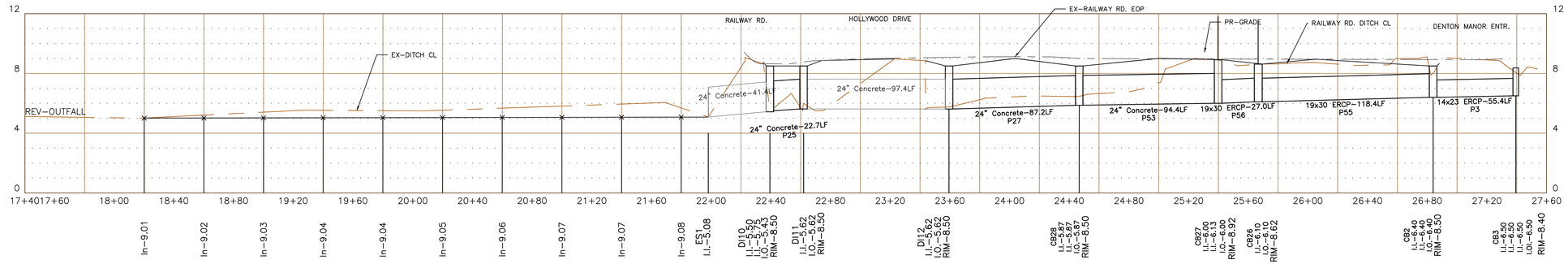
REVISIONS

DATE	DESCRIPTION

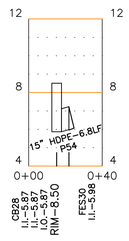
DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
Division of Watershed Stewardship
Drainage Program
Dover Office
89 Kings Highway Phone:(302) 739 - 9921 Fax: (302) 739 - 6724
Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7059

DENTON MANOR
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE
SOUTH SITE PLAN

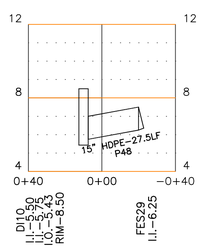
Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C102



OUTFALL CONVEYANCE PROFILE
SCALE H: 1"=40', V: 1"=4'



FES30 TO CB28
PROFILE
SCALE H: 1"=40', V: 1"=4'



FES29 to DI10
PROFILE
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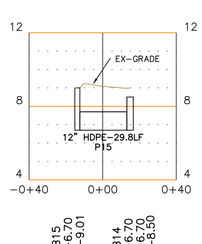

CB15 to CB14
PROFILE
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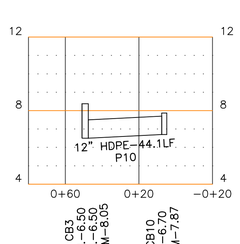
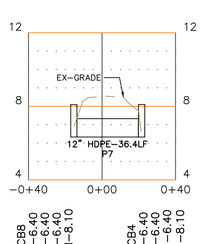


CB3 to CB10
PROFILE
SCALE H: 1"=40', V: 1"=4'



CB4 to CB8
PROFILE
SCALE H: 1"=40', V: 1"=4'

0' 15' 30' 60' 90'
SCALE: 1" = 30'

REVISIONS

DATE	DESCRIPTION

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Division of Watershed Stewardship
Drainage Program

Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724

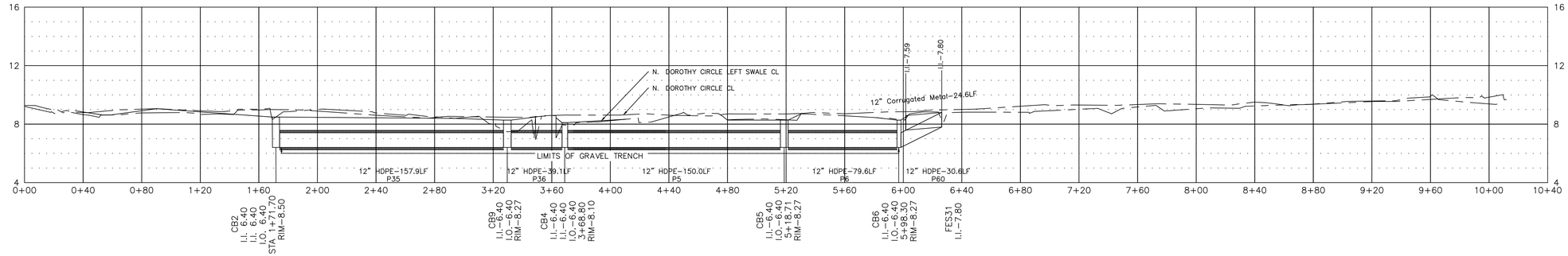
Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7059

DENTON MANOR

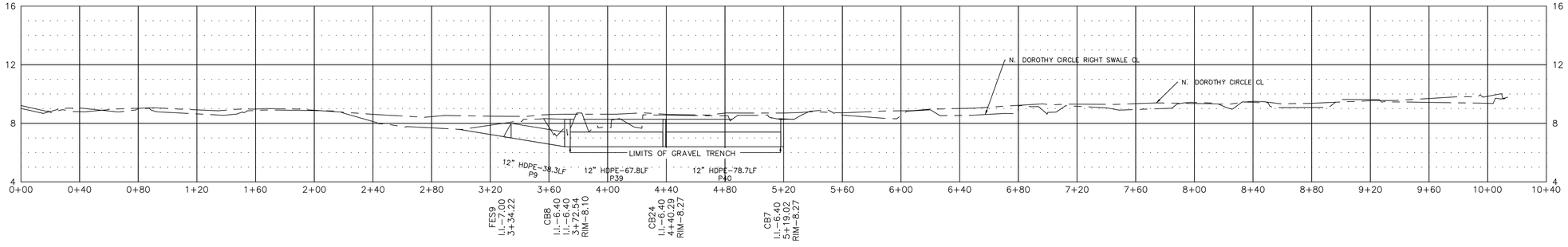
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

OUTFALL PROFILE PLAN

Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C200



N. DOROTHY CIRCLE LEFT SWALE
PROFILE
SCALE H: 1"=40', V: 1"=4'



N. DOROTHY CIRCLE RIGHT SWALE
PROFILE
SCALE H: 1"=40', V: 1"=4'

0' 20' 40' 80' 120'
SCALE: 1" = 40'

REVISIONS

DATE	DESCRIPTION

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Division of Watershed Stewardship
Drainage Program

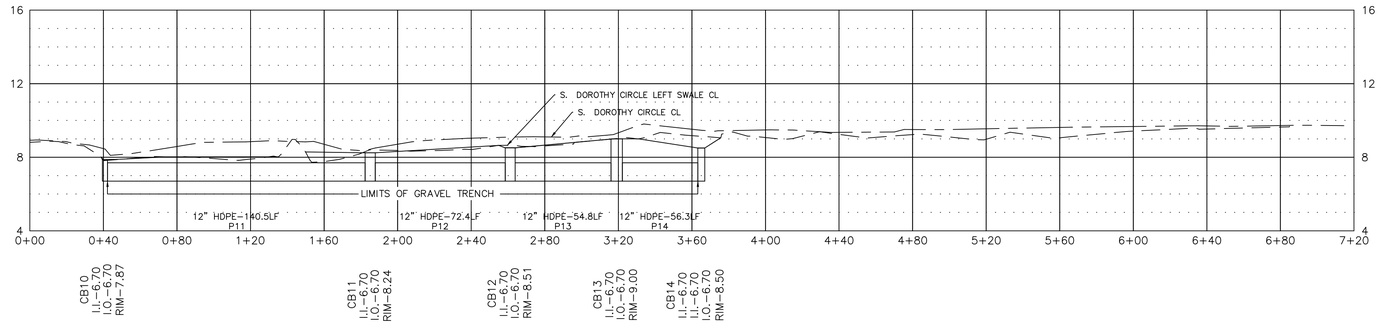
Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724

Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 855 - 7899

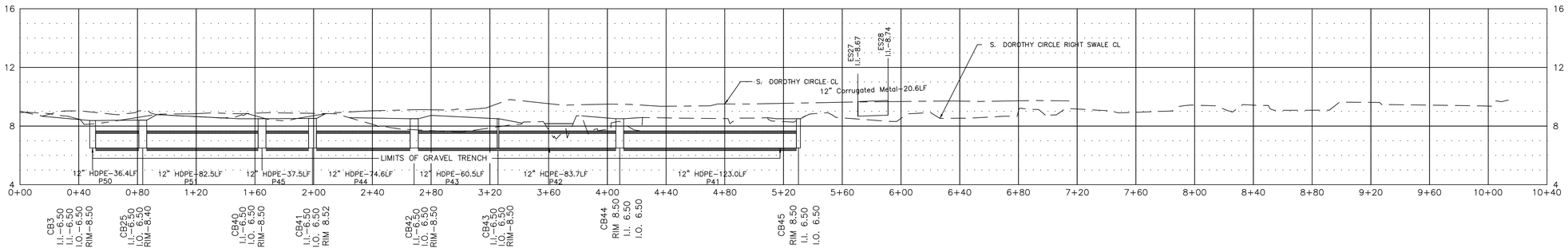
DENTON MANOR
DRAINAGE IMPROVEMENTS, #21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

N. DOROTHY CIR. PROFILE PLAN

Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C201



S. DOROTHY CIRCLE LEFT SWALE
PROFILE
SCALE H: 1"=40', V: 1"=4'



S. DOROTHY CIRCLE RIGHT SWALE
PROFILE
SCALE H: 1"=40', V: 1"=4'

0' 20' 40' 80' 120'
SCALE: 1" = 40'

REVISIONS

DESCRIPTION	DATE

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

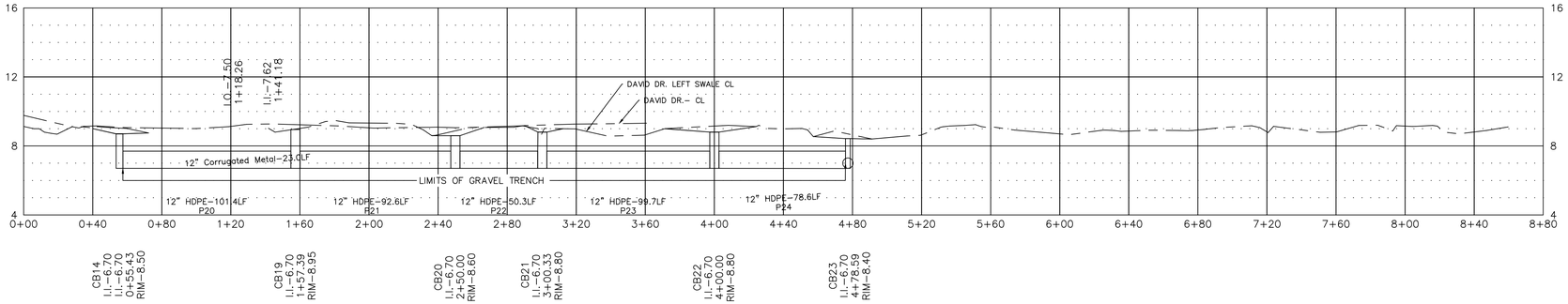
Division of Watershed Stewardship
Drainage Program

Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724

Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7059

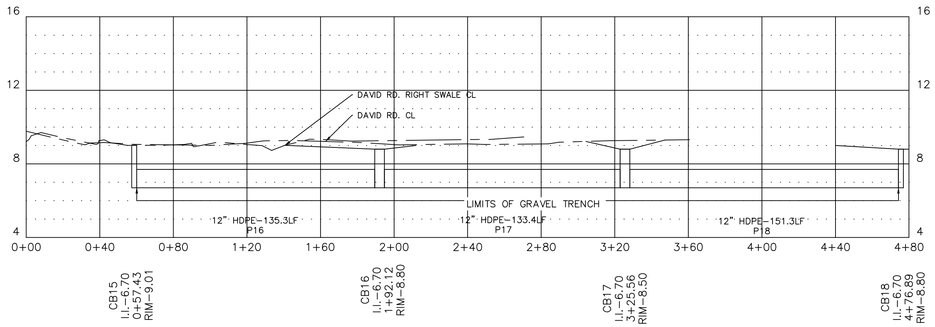
DENTON MANOR
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE
S. DOROTHY CIR. PROFILE PLAN

Date:	9.20.2021
Designed:	JLE / AR
Planned:	TS/TB/KW
Drawn:	JLE
Sheet No.	C202



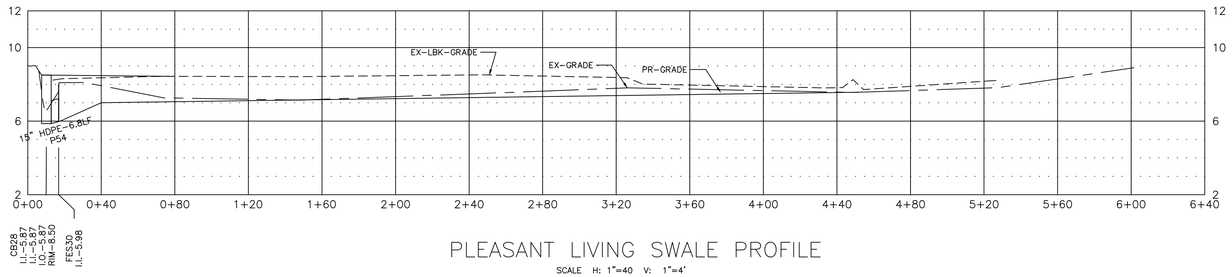
DAVID RD. LEFT SWALE PROFILE

SCALE H: 1"=40', V: 1"=4'



DAVID RD. RIGHT SWALE PROFILE

SCALE H: 1"=40', V: 1"=4'



PLEASANT LIVING SWALE PROFILE

SCALE H: 1"=40 V: 1"=4'

0' 20' 40' 80' 120'

SCALE: 1" = 40'

REVISIONS

DESCRIPTION	DATE

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Division of Watershed Stewardship
Drainage Program

Dover Office
89 Kings Highway Phone:(302) 739 - 9921 Fax: (302) 739 - 6724
Dover DE, 19901

Georgetown Office
21300 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7859

DENTON MANOR

DRAINAGE IMPROVEMENTS, # 21-139

BROADKILL RIVER / DELAWARE BAY WATERSHED

DAVID RD. PROFILE PLAN

PLEASANT LIVING & MISC. PROFILE

Date: 9.20.2021

Designed: JLE / AR

Planned: TS/TB/KW

Drawn: JLE

Sheet No. C203

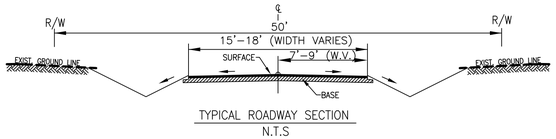
EXISTING CONDITIONS PLAN VIEW

PROPOSED CONDITIONS PLAN VIEW

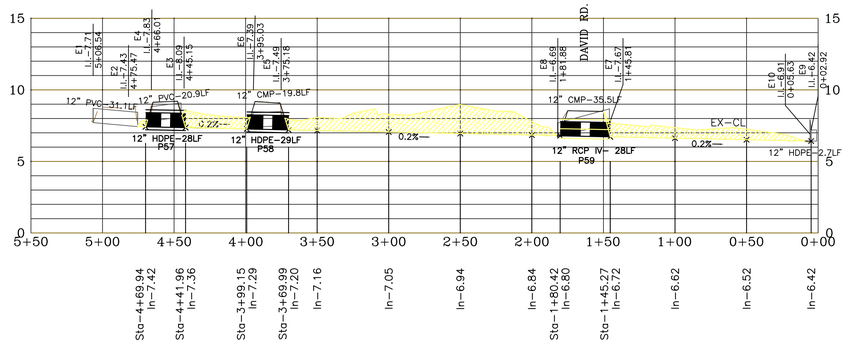
PLAN VIEW
SCALE: 1" = 50'

CONSTRUCTION NOTES

A. SAW CUT AND REMOVE ASPHALT AND EXISTING CULVERT. DISPOSE OF IN A DNREC APPROVED MANNER
B. PATCH ROAD AND DRIVEWAYS IN ACCORDANCE TO DELDOT ROAD PATCH SPEC.
C. SAW CUT AND SQUARE UP EXISTING OPENING TO A UNIFORM MINIMUM 15" WIDTH.



TYPICAL ROADWAY SECTION
N.T.S



H: 1"=50
V: 1"=5

0' 25' 50' 100' 150'
SCALE: 1" = 50'

REVISIONS

DATE	DESCRIPTION

SUSSEX CONSERVATION DISTRICT
23818 SHORTLY RD. GEORGETOWN, DE. 19957
PHONE: (302)-856-2105 FAX: (302-856-0951

DNREC - Division of Watershed Stewardship
Drainage Program
Dover Office
89 Kings Highway Phone:(302) 739 - 9921 Fax: (302) 739 - 6724
Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Dover DE, 19901 Georgetown DE, 19947 Fax:(302) 677 - 7059

DENTON MANOR

DRAINAGE IMPROVEMENTS, # 21-139
WHITES CREEK / INDIAN RIVER BAY WATERSHED
SUSSEX COUNTY, DELAWARE

EAST DAVID RD. PLAN VIEW AND PROFILE

Date:	8/6/2021
Designed:	JLE / AR
Planned:	TS / TB/ KW
Drawn:	JLE
Sheet No.	C204

File Location: G:\Equipment Section\Projects\DENTON MANOR, 21-139\dwg east\Denton Manor EAST.dwg Layout:DENTON MANOR PP 5 User: james.elliott Plot time: 10-29-21 @ 8:06am

CONSTRUCTION NOTES:

1. EXISTING UTILITIES ARE SHOWN IN ACCORDANCE WITH THE BEST AVAILABLE INFORMATION. COMPLETENESS OR CORRECTNESS THEREOF IS NOT GUARANTEED. IT SHALL BE THE CONTRACTORS' RESPONSIBILITY TO CONTACT THE UTILITY COMPANIES INVOLVED IN ORDER TO SECURE THE MOST ACCURATE INFORMATION AVAILABLE AS TO UTILITY LOCATION AND ELEVATION. NO CONSTRUCTION AROUND OR ADJACENT TO UTILITIES SHALL BEGIN WITHOUT NOTIFYING THEIR OWNERS AT LEAST 48 HOURS IN ADVANCE. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE AND ANY DAMAGE DONE TO THEM DUE TO HIS NEGLIGENCE SHALL BE IMMEDIATELY AND COMPLETELY REPAIRED AT THE CONTRACTOR'S EXPENSE. TO LOCATE EXISTING UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL CONTACT MISS UTILITY OF DELMARVA AT 1-800-282-8555.

2. THE SITE SHALL BE GRADED TO THE FINAL ELEVATIONS SHOWN ON THE STORMWATER MANAGEMENT, GRADING, EROSION AND SEDIMENT CONTROL PLAN PREPARED BY SCD. THE CONTRACTOR SHALL PERFORM GRADING TO PROVIDE POSITIVE DRAINAGE AND PRECLUDE PONDING OF WATER.

3. THE CONTRACTOR WILL BE RESPONSIBLE FOR CLEARING AND GRADING AND GRUBBING THE SITE TO LIMITS SHOWN ON THE PLANS. THIS WILL INCLUDE THE REMOVAL AND DISPOSAL OF ANY EXISTING PAVEMENT, FENCES, BUILDING DEBRIS AND TRASH ON THE SITE. DISPOSAL WILL BE OFFSITE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS; AND AT THE CONTRACTOR'S EXPENSE.

4. THE CONTRACTOR SHALL EXERCISE CARE AND CONSIDERATION IN CONSTRUCTION IN THE VICINITY OF ADJACENT PROPERTY OWNERS.

5. ALL DISTURBED R.O.W./PROPERTY CORNER MONUMENTS ARE TO BE VERIFIED BY A PROFESSIONAL ENGINEER OR A REGISTERED PROFESSIONAL LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE AND REPLACED/RESET IF NEEDED.

6. RIPRAP ROCK SHALL AS A MINIMUM: D50 STONE SIZE = 6", DEPTH = 18".

7. ALL REMAINING SPOILS AFTER BULK GRADING IS COMPLETED SHALL BE REMOVED OFF SITE IN AN APPROVED MANNER.

8. DUST CONTROL DURING DEMOLITION AND CONSTRUCTION – CONTRACTOR IS RESPONSIBLE FOR WETTING DUST GENERATING DEBRIS FROM TIME OF FIRST CONTACT UNTIL PLACING INTO APPROPRIATE WASTE OR HAULING CONTAINERS OR TRUCKS. DEBRIS SHALL NOT BE ALLOWED TO DRY BEFORE REMOVED FROM SITE. REFER TO DETAIL DE-ESC 3.4.8 SHEET CS8502 FOR ADDITIONAL INFORMATION. THIS PRACTICE SHALL ALSO BE FOLLOWED FOR ANY BARE SOIL LEFT EXPOSED PRIOR TO PROPER VEGETATION OCCURS.

9. ALL MATERIALS AND WORKMANSHIP WITHIN THE STATE OF DELAWARE RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH CURRENT STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SUPPLEMENTAL SPECIFICATIONS, STANDARD CONSTRUCTION DETAILS, SPECIAL PROVISIONS, PAS MANUAL AND DESIGN GUIDANCE MEMORANDUMS.

10. ALL NYLOPLAST BASINS AND INLINE DRAIN BASINS INSTALLED W/IN THE DelDOT RIGHT-A-WAY SHALL BE INSTALL PER THE NYLOPLAST H-20 TRAFFIC LOADING INSTALLATION DETAIL W/ CONC. COLLAR.

11. ALL DRIVEWAYS SHALL BE REPLACED AND OR REPARIED IN KIND. CORRDINATE WITH OWNER TO MAINTAIN ACCESS TO RESPECTIVE PROPERTIES.

12. ALL MAILBOXES SHALLE BE REPLACED AND OR REPARIED IN KIND. CORRDINATE WITH OWNER TO MAINTAIN MAIL SERVICE DURING CONSTRUCTION.

1. ELEVATIONS ARE BASED ON NAVD 88, AND DE STATE PLANE COORDINATE SYSTEM NAD 83 HORIZONTAL DATUM.

2. UNLESS SPECIFICALLY STATED OR SHOWN HEREON TO THE CONTRARY, THIS SURVEY IS MADE SUBJECT TO AND DOES NOT LOCATE OR DELINEATE:

   2.1. RIGHTS OR INTEREST OF THE UNITED STATES OF AMERICA OR STATE OF DELAWARE OVER LANDS NOW OR FORMERLY FLOWED BY TIDEWATER, BUT NO LONGER VISIBLE OR PHYSICALLY EVIDENT, OR LANDS CONTAINING ANY ANIMAL, MARINE OR BOTANICAL SPECIES REGULATED BY OR UNDER THE JURISDICTION OR ANY FEDERAL, STATE, OR LOCAL AGENCY.

   2.2. BUILDING SETBACK LINES, ZONING REGULATIONS OR LINES ESTABLISHED BY ANY FEDERAL, STATE OR LOCAL AGENCY WHICH MAY AFFECT THE BUILDING OR DEVELOPMENT POTENTIAL OF THE SUBJECT PROPERTY.

   2.3. ANY SUBSURFACE OR SUBTERRANEAN CONDITION, EASEMENTS OR RIGHTS, INCLUDING, BUT NOT LIMITED TO MINERAL OR MINING RIGHTS, OR THE LOCATION OF OR RIGHTS TO ANY SUBSURFACE STRUCTURES, CONTAINERS OR FACILITIES OR ANY OTHER NATURAL OR MAN-MADE SUBSURFACE CONDITION WHICH MAY OR MAY NOT AFFECT THE USE OR DEVELOPMENT POTENTIAL OF THE SUBJECT PROPERTY.

3. UTILITY NOTES:

   3.1. THE LOCATION OF THE EXISTING UNDERGROUND UTILITIES SHOWN ON THIS PLAN HAVE BEEN TAKEN FROM EXISTING UTILITY RECORDS AVAILABLE AT THE TIME THESE PLANS WERE PREPARED AND FROM SURFACE OBSERVATION OF THE SITE. LOCATIONS OF UTILITIES AS SHOWN AND MAY OR MAY NOT BE COMPLETE. THE NATURE AND EXACT LOCATION OF EXISTING UTILITIES SHOULD BE VERIFIED PRIOR TO INITIATING ANY ACTIVITY THAT MAY AFFECT THEIR USE OR LOCATION.

   3.2. COMPLETENESS OR ACCURACY OF LOCATION AND DEPTH OF UNDERGROUND UTILITIES AND STRUCTURES IS NOT GUARANTEED.

   3.3. MISS UTILITY SHALL BE NOTIFIED THREE (3) DAYS PRIOR TO EXCAVATION.

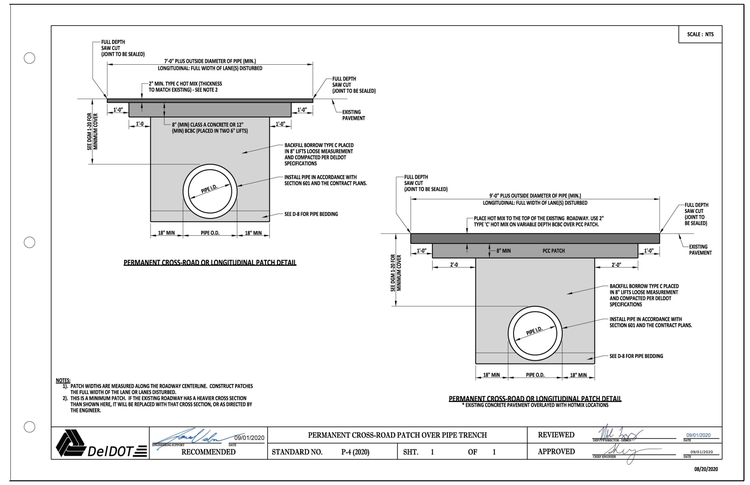
   3.4. THE CONTRACTORS SHALL TEST PIT TO VERIFY LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES AND STRUCTURES BEFORE THE START OF WORK.

   3.5. IF CONFLICTS ARE FOUND THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND DESIGN ENGINEER FOR INSTRUCTION BEFORE PROCEEDING WITH WORK.

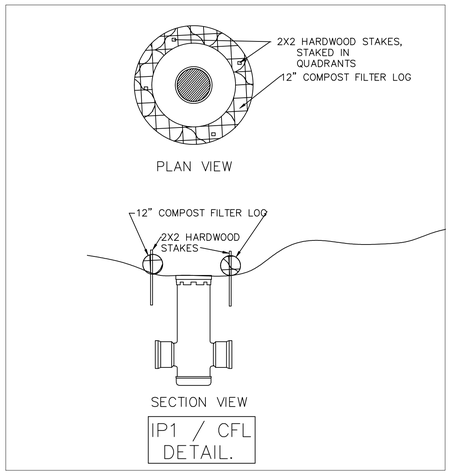
4. STATE WETLAND FLAG SHOWN WAS PER DNREC DRAINAGE SECTION DELINEATION.

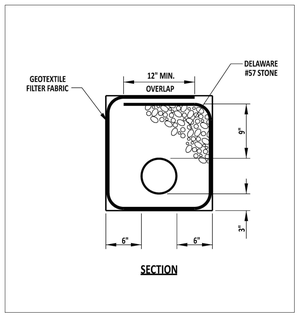
REFERENCE:
1. EXISTING CONDITIONS SURVEY PERFORMED BY DNREC DRAINAGE SECTION AUGUST 2020.

2. THE PARCEL BOUNDARY LINES ARE FROM BEST AVAILABLE GIS DATA.
3. THE COUNTY SEWER INVERTS ARE FROM SCE PROVIDED SEWER AS-BUILT DATA.



DELDOT PERMANENT CROSS ROAD PATCH OVER PIPE TRENCH DETAIL P-4

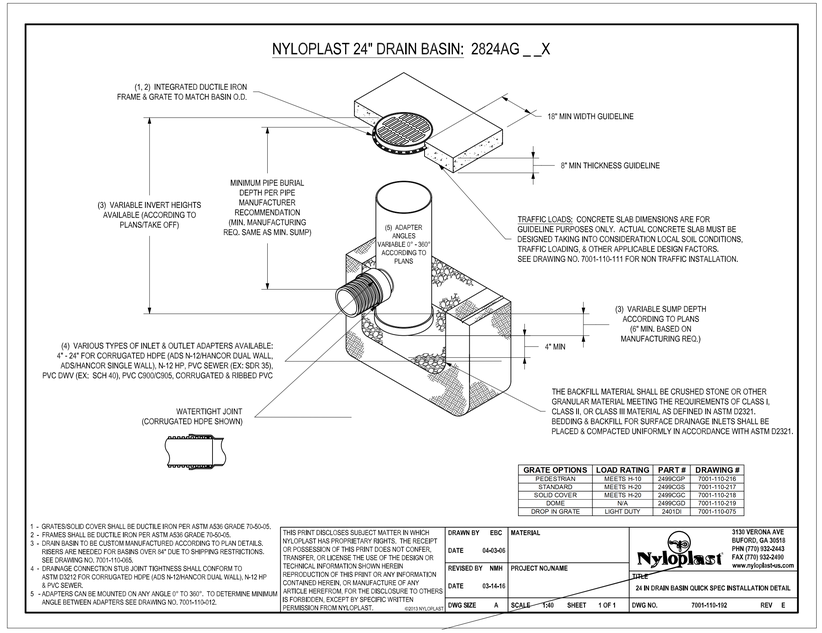




DELDOT PERFORATED UNDER DRAIN PIPE DETAIL D-9

DETAIL NOTES

- DE #57 STONE SHALL BE WASHED
- USE MIRAFI FW402 OR APPROVED EQUIVALENT
- EXTEND THE #57 STONE W/IN 6" OF THE SURFACE AND CAP WITH 6" OF RIVER ROCK SIZE 2-4", TO MATCH EX. GRADE.



REVISIONS

DATE	DESCRIPTION

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Division of Watershed Stewardship
Drainage Program

Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724

Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7059

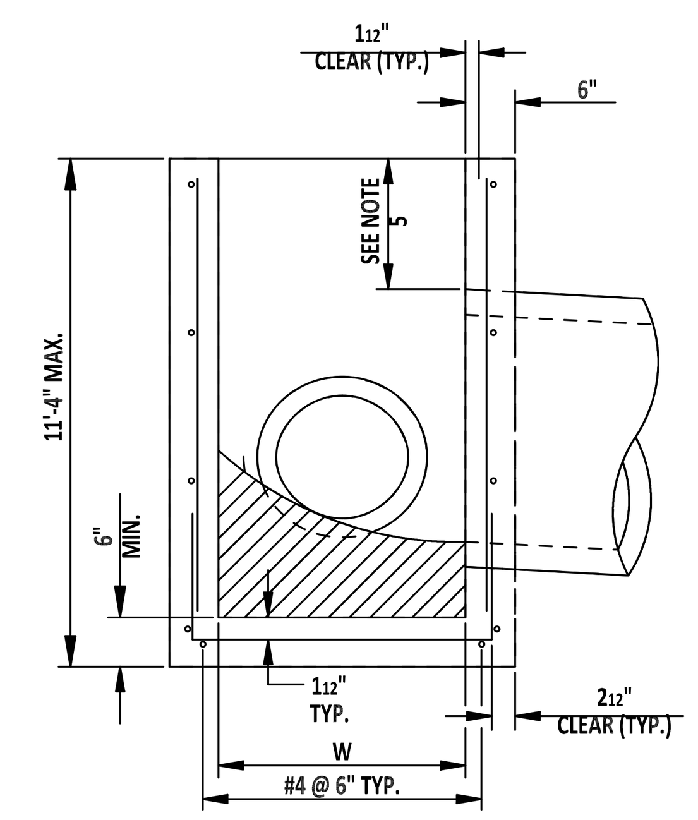
DENTON MANOR
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

CONSTRUCTION DETAILS AND NOTES

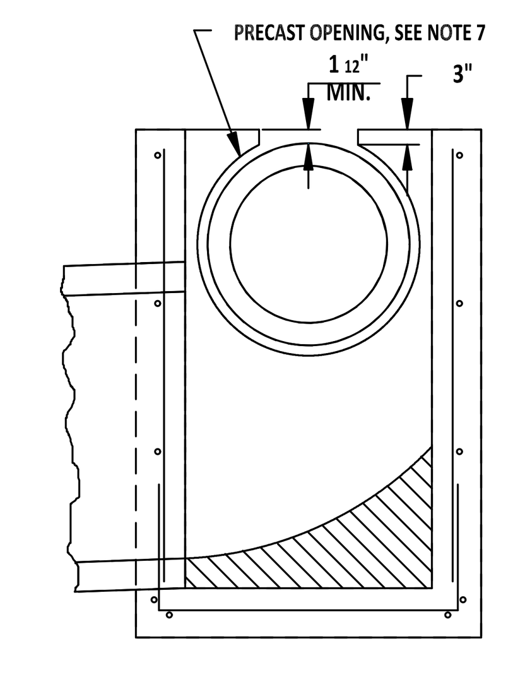
Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C500

GRADING NOTES:

1. BEDDING REQUIREMENTS SPECIFIED HEREIN ARE TO BE CONSIDERED AS MINIMUMS FOR RELATIVELY DRY, STABLE EARTH CONDITIONS. ADDITIONAL BEDDING SHALL BE REQUIRED FOR ROCK TRENCHES AND WET AREAS. CONTRACTOR SHALL HAVE THE RESPONSIBILITY TO PROVIDE SUCH ADDITIONAL BEDDING AS MAY BE REQUIRED TO PROPERLY CONSTRUCT THE WORK.
2. COMPACTION OF THE BACKFILL OF ALL TRENCHES SHALL BE COMPACTED TO THE DENSITY OF 95% OF THEORETICAL MAXIMUM DRY DENSITY (ASTM D698). BACKFILL MATERIAL SHALL BE FREE FROM ROOTS, STUMPS, OR OTHER FOREIGN DEBRIS AND SHALL BE PLACED IN LIFTS NOT TO EXCEED 8 INCHES IN COMPACTED FILL THICKNESS. CORRECTION OF ANY TRENCH SETTLEMENT WITHIN A YEAR FROM THE DATE OF APPROVAL WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. MATERIAL THAT CANNOT BE COMPACTED AS REQUIRED SHALL BE BROUGHT TO THE ATTENTION OF A GEOTECHNICAL ENGINEER, OVER EXCAVATED, AND THEN REPLACED WITH SUITABLE FILL
3. THE CONTRACTOR WILL INSURE THAT POSITIVE AND ADEQUATE DRAINAGE IS MAINTAINED AT ALL TIMES WITHIN THE PROJECT LIMITS. THIS MAY INCLUDE, BUT NOT BE LIMITED TO, REPLACEMENT OR RECONSTRUCTION OF EXISTING DRAINAGE STRUCTURES THAT HAVE BEEN DAMAGED OR REMOVED OR REGRADING AS REQUIRED BY THE ENGINEER, EXCEPT FOR THOSE DRAINAGE ITEMS SHOWN AT SPECIFIC LOCATIONS AND HAVING SPECIFIC PAY ITEMS IN THE DETAILED ESTIMATE. NO SEPARATE PAYMENT WILL BE MADE FOR ANY COSTS INCURRED TO COMPLY WITH THIS REQUIREMENT.
4. THE CONTRACTOR SHALL PROVIDE ANY AND ALL EXCAVATION AND MATERIAL SAMPLES NECESSARY TO CONDUCT REQUIRED SOIL TESTS. ALL ARRANGEMENTS AND SCHEDULING FOR THE TESTING SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
5. SOILS TESTING AND ON–SITE INSPECTION SHALL BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER. THE SOILS ENGINEER SHALL PROVIDE COPIES OF TEST REPORTS TO THE CONTRACTOR, THE OWNER AND THE OWNER'S REPRESENTATIVE AND SHALL PROMPTLY NOTIFY THE OWNER, HIS REPRESENTATIVE AND THE CONTRACTOR, SHOULD WORK PERFORMED BY THE CONTRACTOR FAIL TO MEET BUILDING STANDARDS.
6. CONTRACTOR SHALL FURNISH AND MAINTAIN ALL NECESSARY BARRICADES AROUND THE WORK AREA AND SHALL PROVIDE PROTECTION AGAINST WATER DAMAGE AND SOIL EROSION.
7. VERTICAL ELEVATIONS ARE BASED ON NAVD 88.
8. ALL SLOPES MAXIMUM 3:1 UNLESS OTHERWISE NOTED.
9. HDPE PIPE SHALL COMPLY WITH AASHTO M252, M294, MP7, AND ASTM 3350. PIPE SHALL BE INSTALLED PER ASTM D2321 AND AS RECOMMENDED BY THE MANUFACTURER. ALL HDPE SHALL HAVE SOIL TIGHT CONNECTIONS.
10. ALL MATERIALS AND WORKMANSHIP WITHIN THE STATE OF DELAWARE RIGHT–OF–WAY SHALL BE IN ACCORDANCE WITH CURRENT STATEOF DELAWARE DEPARtMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SUPPLEMENTAL SPECIFICATIONS, STANDARD CONSTRUCTION DETAILS, SPECIAL PROVISIONS, PAS MANUAL AND DESIGN GUIDANCE MEMORANDUMS.
11. DRAINAGE INLETS SHALL BE MANUFACTURED IN ACCORDANCE WITH THE LATEST STANDARDS OF DELDOT'S STANDARD CONSTRUCTION DETAILS UNLESS NOTED OTHERWISE ON THE PLANS.
12. ALL HDPE PIPE SHALL MEET OR EXCEED THAT AASHTO M–330 PIPE SPECIFICATION.
13. CONTRACTOR IS RESPONSIBLE FOR REMOVING AND DISPOSING OF EXCESS DIRT FROM THE SITE. THIS CAN BE COORDINATED WITH OWNER TO DETERMINE IF LONG TERM STORAGE ON SITE IS APPLICABLE.
14. CONTRACTOR IS RESPONSIBLE TO ENSURE POSITIVE DRAINAGE AND PREVENT PONDING FOR ALL PROPOSED IMPROVEMENTS ALONG WITH NOT NEGATIVE IMPACTING EXISTING CONDITIONS. CONTRACTOR MUST DISCUSS WITH THE DESIGN ENGINEER IF FIELD ISSUES ARISE, IF AT TIME OF STAKEOUT. IF NOT HE OWNS IT.



SECTION A-A

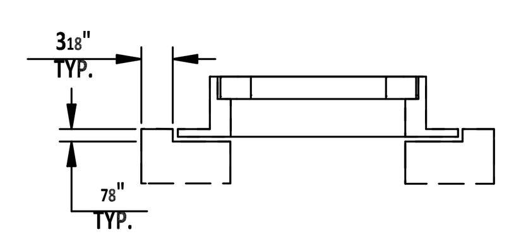


OPTIONAL PIPE OPENING DETAIL
SEE NOTE 5

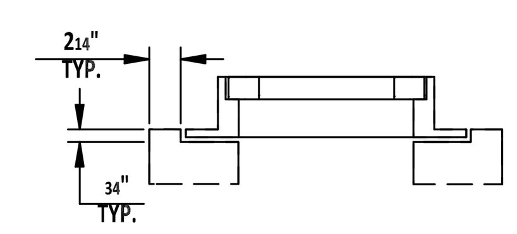
INLET BOX SCHEDULE			
L	W	FABRICATION TOLERANCE	
17 5/8"	11 5/8"	+1"	*
24"	24"	+1"	*
34"	18"	-1"	**
34"	24"	-1"	
48"	30"	+6"	
48"	48"	+6"	
66"	30"	+6"	
66"	48"	+6"	
66"	66"	+6"	
72"	24"	-1"	
72"	48"	-1"	
72"	72"	-1"	

* - THESE SIZES ARE TO BE USED FOR LAWN INLETS AND ARE NOT INTENDED TO BE USED IN THE TRAVELWAY. THE MAX DEPTH FOR THESE INLETS IS 4'. SEE NOTE 8 FOR REINFORCEMENT.
** - MAX DEPTH IS 4' FOR THIS DRAINAGE INLET.

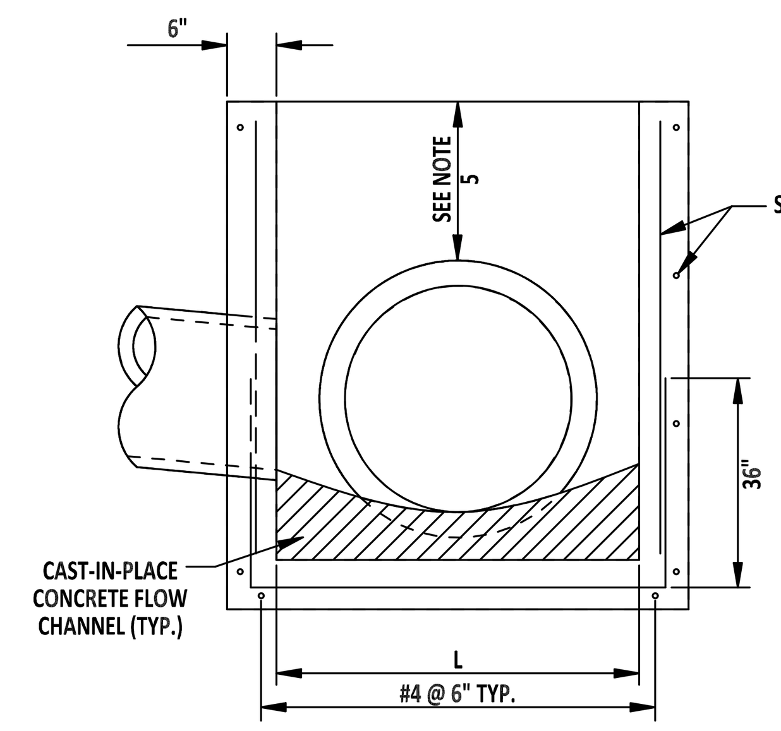
WALL REINFORCEMENT SCHEDULE		
INTERIOR WALL DIMENSION	AREA OF HORIZONTAL REINFORCEMENT PER FOOT	AREA OF VERTICAL REINFORCEMENT PER FOOT
	IN^2	IN^2
LESS THAN 4'	0.132	0.132
≥ 4'	0.163	0.132
≥ 4.5'	0.198	0.132
≥ 5'	0.239	0.132
≥ 5.5'	0.284	0.132



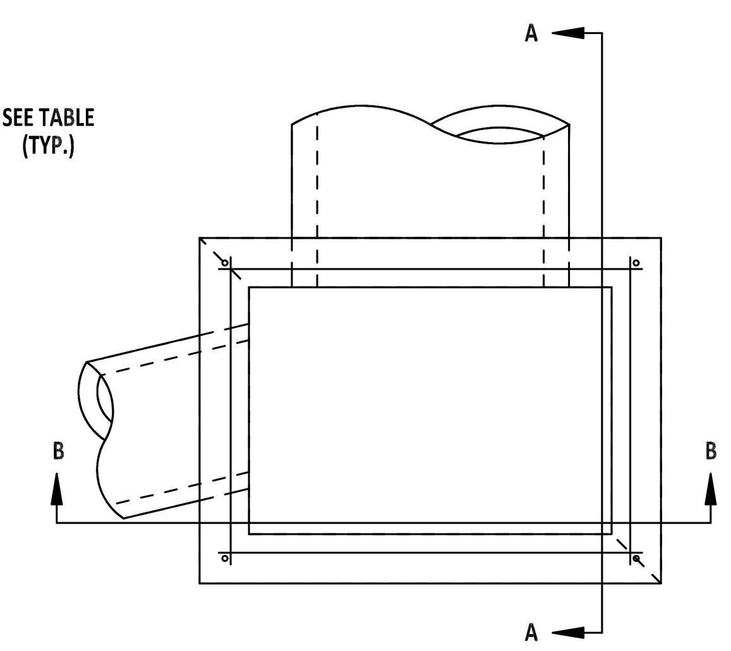
24" X 24" LAWN INLET BOX DETAIL



17 5/8" X 11 5/8" LAWN INLET BOX DETAIL



SECTION B-B



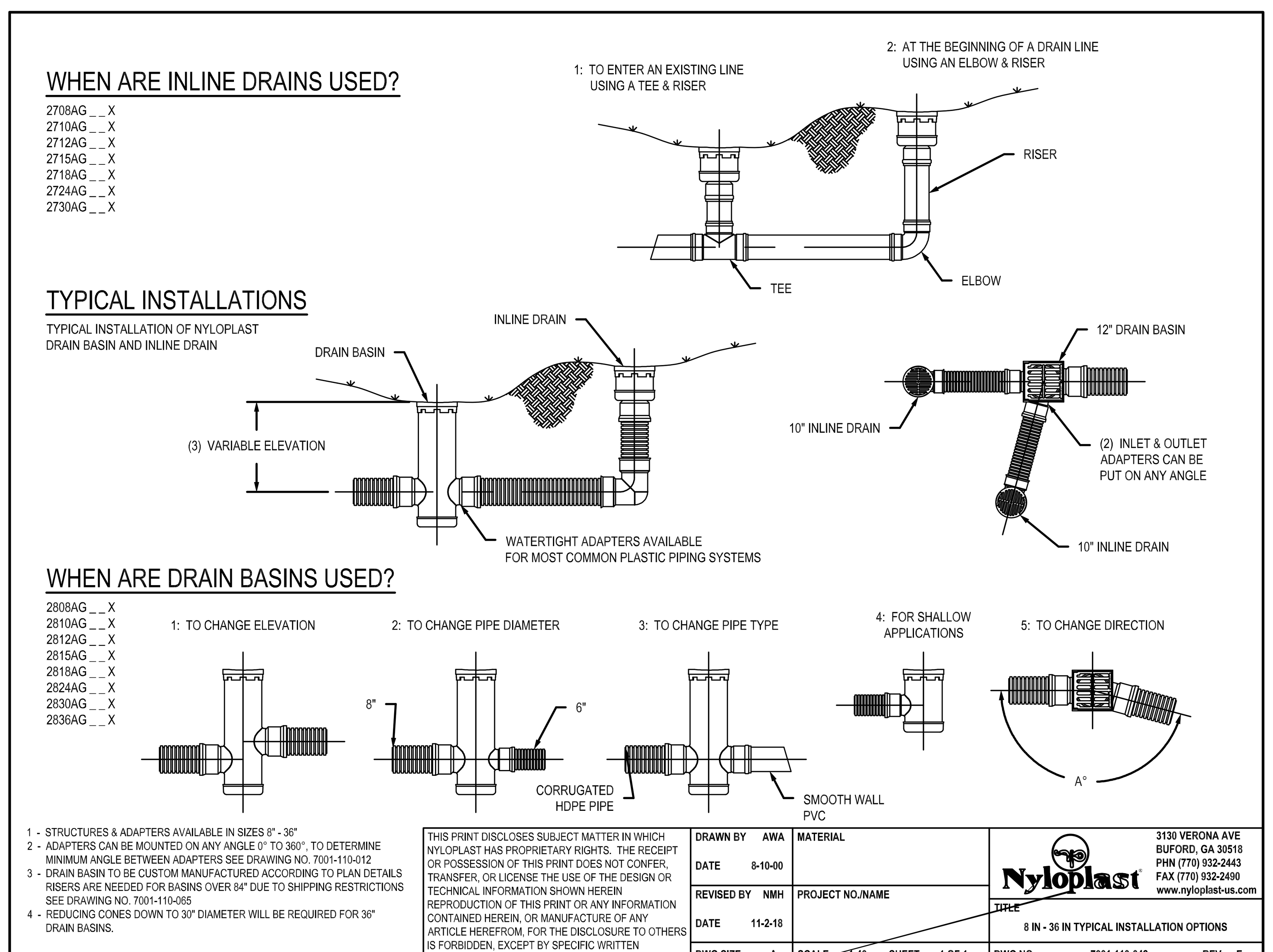
TOP VIEW

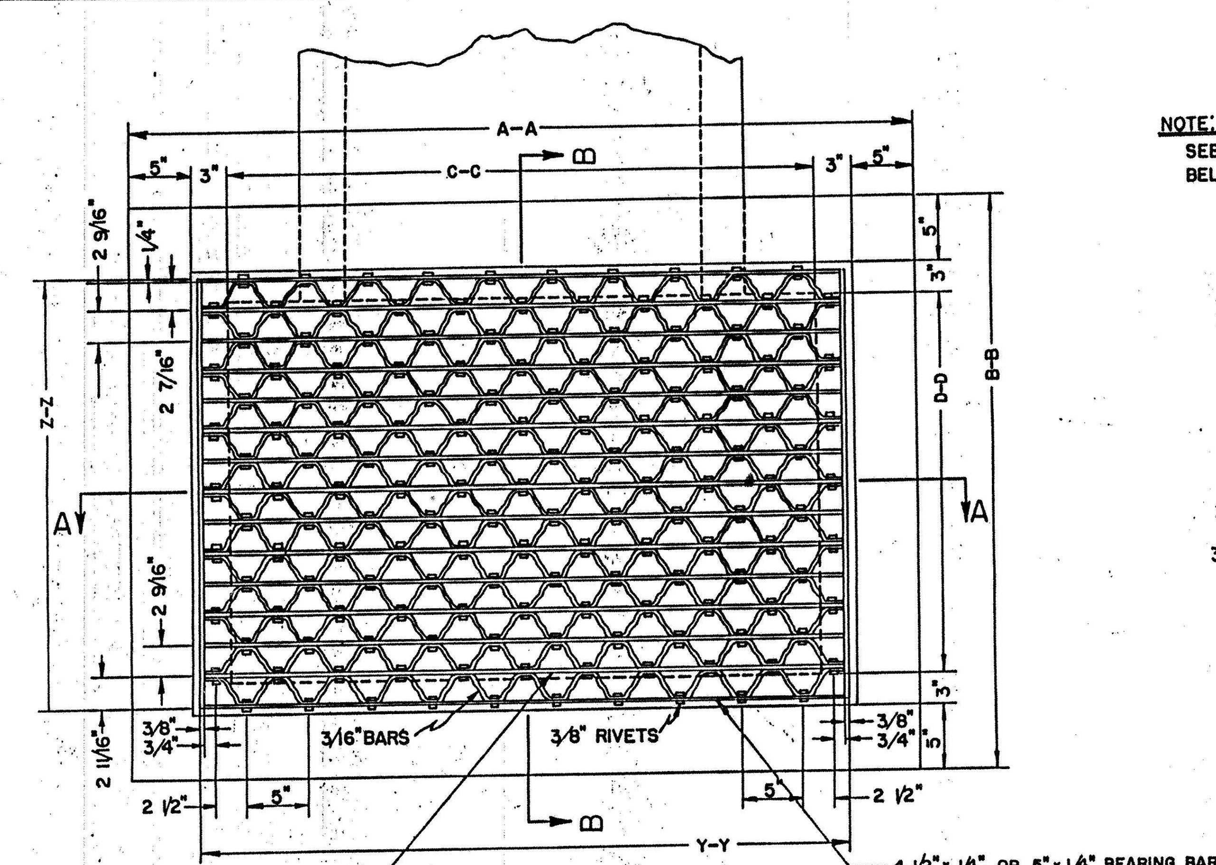
NOTES:

1). PROVIDE PRECAST OR CAST-IN-PLACE INLET BOXES IN ACCORDANCE WITH SECTION 602 .
2). DO NOT INSTALL PIPES THROUGH ANY CORNER OF THE INLET BOX.
3). RISER SECTIONS MAY BE USED FOR DEEP INLET BOXES.
4). PIPES MAY BE INSTALLED NEAR OR THROUGH JOINTS FOR RISER SECTIONS.
5). WHEN THE COVER ABOVE THE PIPE IS LESS THAN 4" TO THE COVER SLAB OR TOP UNIT OPENING, THE PORTION OF BOX WALL ABOVE THE PIPE MAY BE REMOVED AS SHOWN IN THE OPTIONAL PIPE OPENING DETAIL. FORM AND FILL THE AREA ABOVE THE PIPE WITH HIGH-STRENGTH, NON-SHRINK GROUT MIXED WITH COARSE AGGREGATE IN A 1:1 RATIO BY WEIGHT.
6). ENSURE POSITIVE FLOW WHEN CONSTRUCTING THE FLOW CHANNEL.
7). WHEN INLET BOX IS PRECAST, PROVIDE A PIPE OPENING DIAMETER BETWEEN 3" AND 4" LARGER THAN OUTSIDE DIAMETER OF PIPE.
8). USE 4" X 4", W4 X W4 WELDED WIRE AS REINFORCEMENT FOR LAWN INLET BOXES.
9). EXTEND PIPE TO BE FLUSH WITH THE INSIDE WALL OF THE INLET BOX IN ACCORDANCE WITH SECTION 602.3.B OF THE STANDARD SPECIFICATIONS.
10).PIPE SHALL NOT ENCROACH ON ADJACENT WALL.
11).INSTALL STEPS IN ACCORDANCE WITH SECTION 602.3.B WHEN INLETS ARE 4' OR DEEPER FROM THE TOP OF GRATE TO THE INVERT OF THE LOWEST PIPE.

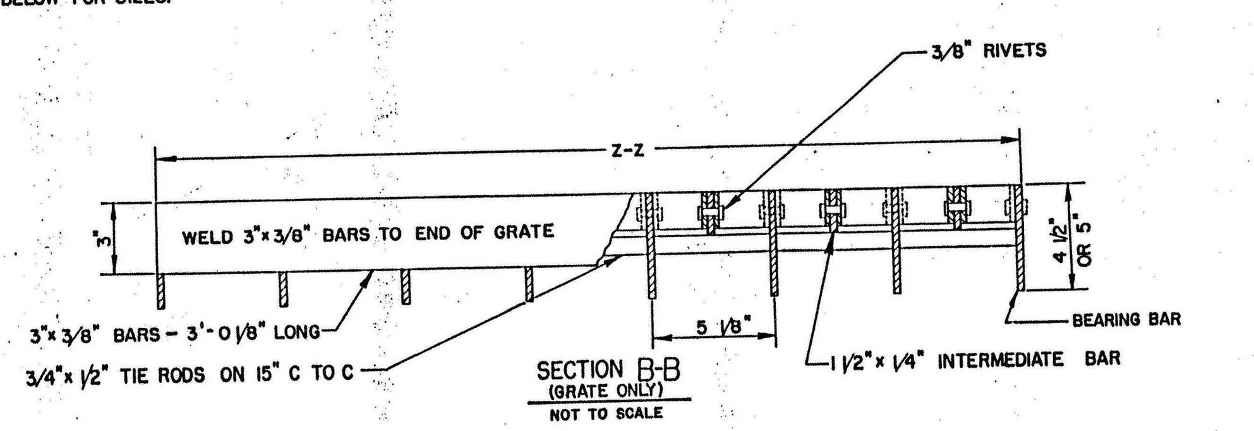
INLET BOX

D-4 (2020) 1 1

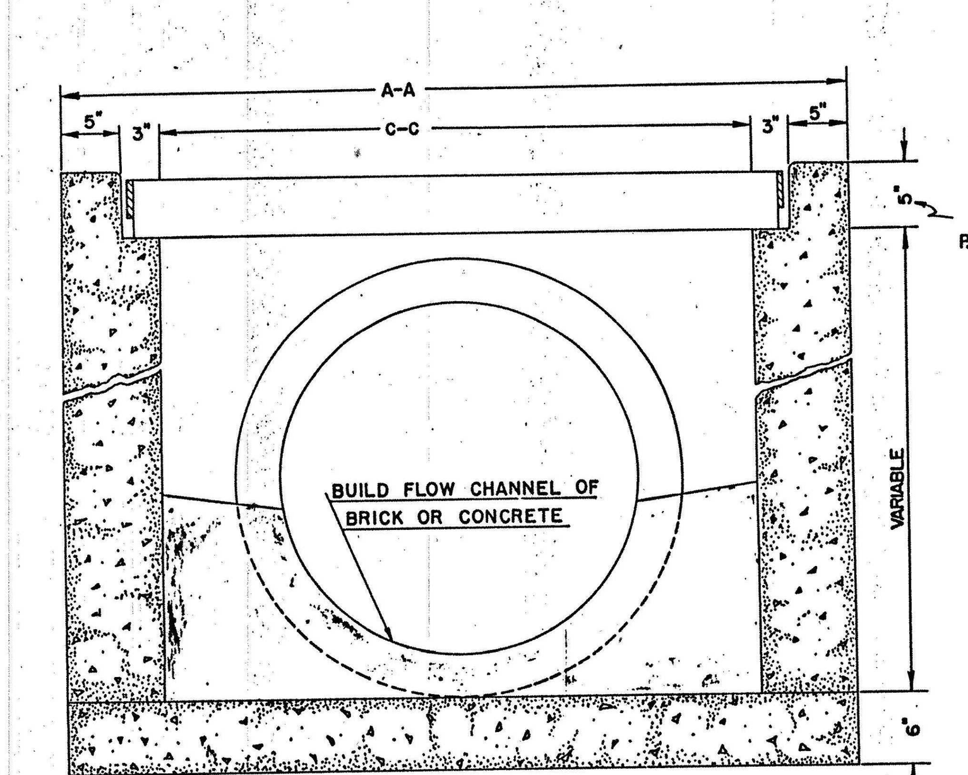




NOTE: SEE CATCH BASIN AND GRATING DATA BELOW FOR SIZES.

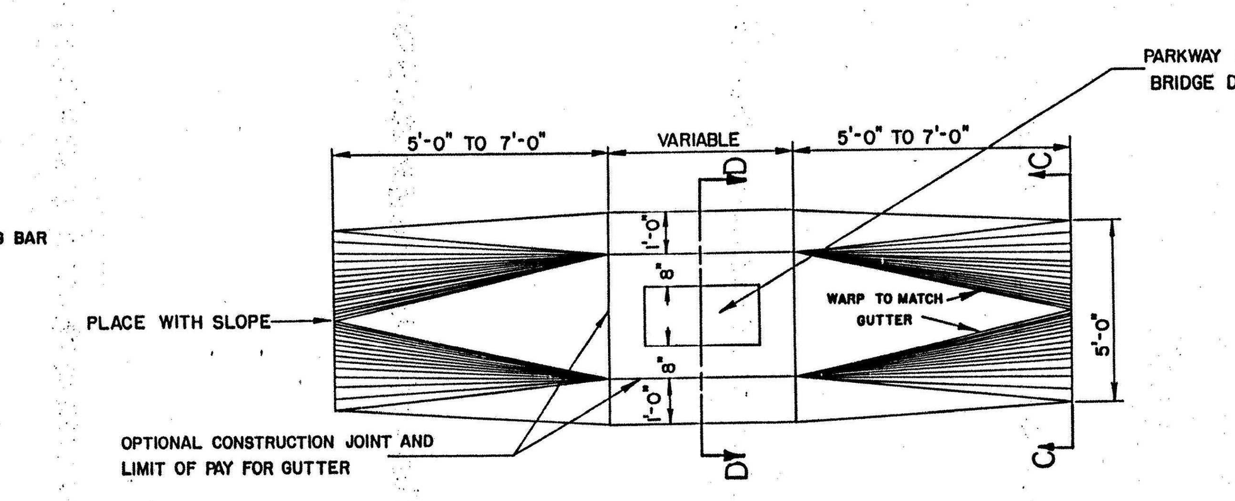


SECTION B-B
(GRATE ONLY)
NOT TO SCALE

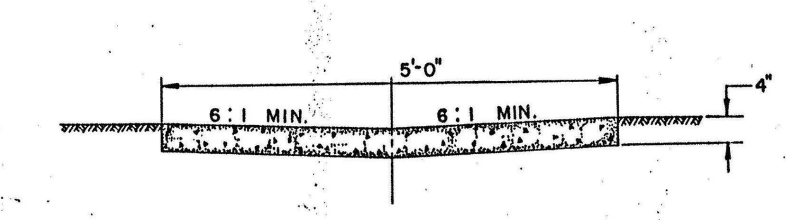


NOTE: P.W.-B.D.3 AND P.W.-B.D.4 TO BE 5 1/2".

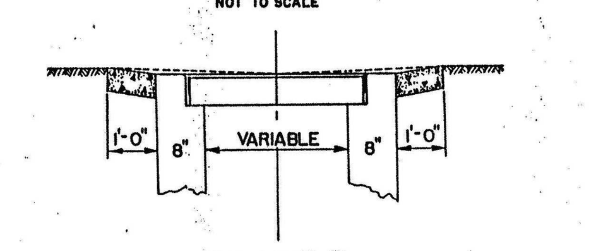
SECTION A-A
NOT TO SCALE



CONC. GUTTER TO BE USED WITH PARKWAY CATCH BASINS.
NOT TO SCALE



SECTION C-C
NOT TO SCALE



SECTION D-D
NOT TO SCALE

COUNTY	CONTRACT	F.A.P. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
		2	DEL.			

STANDARD SHEET D-2-4
PARKWAY CATCH BASINS
PREL. TRACING J. WHITE DESIGN E. L. W. CHKD. J. T. B.

REVISIONS
1. CLARIFIED GRATE AND BASIN DIMENSIONS AND ADDED NOTE TO GUTTER. 12-2-75 R.F.R.
2. REPLACED NOTE (6) 5-11-76 R.F.R.
3. ADDED NOTE (7) 1-31-77 R.F.R.
4. REVISED NOTE (5) ADDED NOTE (8) 1-30-81 R.F.R.

APPROVED [signature] 6-22-70
DIRECTOR OF OPERATIONS DATE
Joe S. Robinson 6/22/70
DEPUTY DIRECTOR-CHIEF ENGINEER DATE

PARKWAY CATCH BASINS
P.W.-B.D. 1
P.W.-B.D. 2
P.W.-B.D. 3
P.W.-B.D. 4

NOTES:
(1) GUTTER USED ONLY WHEN NOTED ON PLANS.
(2) P.W.-B.D. C. BASIN WALLS TO BE BRICK, CONCRETE, OR SOLID CONCRETE BLOCK, EXCEPT FOR UPPER 12" WHICH IS TO BE OF CEMENT CONCRETE MASONRY.
(3) COST OF CONCRETE MASONRY TO BE INCLUDED IN UNIT PRICE BID FOR STRUCTURE COMPLETE.
(4) GRATING INCLUDED IN UNIT PRICE BID FOR P.W.-B.D. CATCH BASIN GRATINGS TO BE GALVANIZED.
(5) PARGET BRICK OR BLOCK WITH 1/2" OF PORTLAND CEMENT MORTAR.
(6) P.C.C. GUTTER WILL BE PAID FOR UNDER SECTION 704, PORTLAND CEMENT CONCRETE GUTTER.
(7) CATCH BASINS MAY BE PRECAST. CONTRACTOR SHALL SUBMIT DETAILED PLANS SHOWING SECTIONS, JOINTS, REINFORCING AND OTHER PERTINENT INFORMATION FOR APPROVAL.
(8) STEPS ARE TO BE PLACED IN ALL CATCH BASINS & MANHOLE OVER 4' DEEP, SEE STANDARD SHEET D-1. COST OF STEPS TO BE INCLUDED IN COST OF CATCH BASIN OR MANHOLE.

PARKWAY CATCH BASIN AND DRAIN GRATE DATA

NUMBER OF CATCH BASIN	LARGEST PIPE SIZE		CATCH BASIN DATA					GRATING DATA			
	A-A	B-B	WALL THICK.	A-A OUTSIDE	B-B OUTSIDE	C-C INSIDE	D-D INSIDE	BEARING BAR SIZES	Y-Y	Z-Z	GRATING AREA & WEIGHT
P.W.-B.D. 1	30"	15"	8"	4'-5 1/2"	3'-3 7/8"	3'-1 1/2"	1'-11 7/8"	4 1/2" x 1/4"	3'-6 1/4"	2'-4 7/16"	8.39□' 178 LBS.
P.W.-B.D. 2	36"	24"	8"	5'-3 1/4"	3'-11 1/2"	3'-11 1/4"	2'-7 1/2"	4 1/2" x 1/4"	4'-4 1/4"	3'-0 1/8"	13.11□' 273 LBS.
P.W.-B.D. 3	42"	24"	8"	5'-8 1/4"	3'-11 1/2"	4'-4 1/4"	2'-7 1/2"	5" x 1/4"	4'-9 1/4"	3'-0 1/8"	14.36□' 311 LBS.
P.W.-B.D. 4	48"	24"	8"	6'-1 1/4"	3'-11 1/2"	4'-9 1/4"	2'-7 1/2"	5" x 1/4"	5'-2 1/4"	3'-0 1/8"	15.62□' 336 LBS.

REVISIONS

DATE	DESCRIPTION

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
Division of Watershed Stewardship
Drainage Program
Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724
Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7059

DENTON MANOR
DRAINAGE IMPROVEMENTS , # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

CONSTRUCTION DETAILS AND NOTES

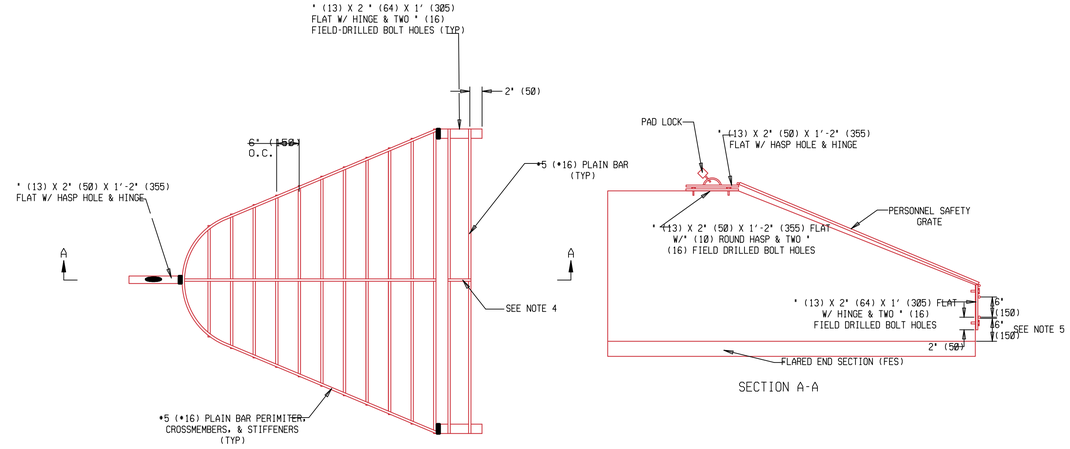
Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C501

STRUCTURE SCHEDULE								
NAME	NORTHING	EASTING	RIM ELEV(FT)	INV-IN ELEV(FT) (1)	INV-IN ELEV(FT) (2)	INV-OUT ELEV(FT)	STRUCTURE ID	TYPE
ES1	204268.42	744280.30	n/a	5.08	N/A	N/A	OUTFALL	
DI10	204236.75	744306.95	8.50	5.75	5.50	5.43	PWBD-2	
DI11	204220.80	744290.87	8.50	5.62	N/A	5.62	PWBD-2	
DI12	204151.30	744222.66	8.50	5.62	N/A	5.62	PWBD-2	
DI13	204089.29	744160.98	8.50	6.00	6.00	6.00	PWBD-2	
CB2	203953.92	744217.72	8.50	6.40	6.40	6.40	PWBD-2	
CB3	203903.04	744195.78	8.50	6.50	6.50	6.50	PWBD-2	
CB4	203882.56	744401.27	8.10	6.40	6.40	6.40	PWBD-2	
CB5	203824.16	744539.44	8.27	6.40	N/A	6.40	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB6	203795.71	744613.77	8.27	N/A	N/A	6.40	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB7	203797.56	744529.67	8.27	N/A	N/A	6.40	NYLOPLAST	24 DRAIN BASIN W/STD GRTE
CB8	203847.37	744391.90	8.10	6.40	6.40	6.40	PWBD-1	
CB9	203896.63	744364.83	8.27	6.40	N/A	6.40	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB10	203884.24	744233.10	7.87	6.70	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB11	203753.29	744182.14	8.24	6.70	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB12	203680.89	744183.91	8.51	6.70	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB13	203628.06	744198.63	9.00	6.70	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB14	203596.93	744245.54	8.50	6.70	6.70	6.70	PWBD-1	
CB15	203568.79	744235.70	9.01	6.70	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB16	203520.08	744361.88	8.50	6.70	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB17	203473.42	744486.91	8.50	6.70	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB18	203419.20	744628.19	8.80	N/A	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB19	203560.57	744340.22	8.95	6.70	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB20	203527.34	744426.66	8.60	6.70	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB21	203509.91	744473.88	8.80	6.70	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB22	203474.46	744567.03	8.80	6.70	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB23	203444.81	744639.84	8.40	N/A	N/A	6.70	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB24	203825.11	744455.92	8.27	6.40	N/A	6.40	PWBD-1	
CB25	203867.80	744190.92	8.40	6.50	N/A	6.50	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB26	203998.55	744108.01	8.62	6.10	N/A	6.00	DelDOT 48x48	
CB27	204022.15	744094.94	8.92	6.13	6.00	6.00	DelDOT 48x48	
CB28	204089.24	744161.36	8.50	5.87	5.87	5.87	PWBD-2	
CB40	203788.98	744162.81	8.50	6.50	N/A	6.50	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB41	203753.87	744154.73	8.52	6.50	N/A	6.50	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB42	203680.62	744147.99	8.50	6.50	N/A	6.50	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB43	203622.74	744165.51	8.50	6.50	N/A	6.50	NYLOPLAST	12 INLINE DRAIN W/STD GRTE
CB44	203544.26	744194.55	8.50	6.50	N/A	6.50	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
CB45	203428.77	744236.83	8.50	N/A	N/A	6.50	NYLOPLAST	24" DRAIN BASIN W/STD GRTE
FES9	203861.96	744356.44	N/A	N/A	N/A	7.00	FES	W/ SAFETY GRATE
FES14	203946.84	744020.73	N/A	N/A	6.43	N/A	FES	W/ SAFETY GRATE
FES29	204244.45	744313.32	N/A	N/A	N/A	6.25	FES	W/ SAFETY GRATE
FES30	204086.64	744167.55	N/A	N/A	N/A	5.98	FES	W/ SAFETY GRATE
FES31	203787.27	744640.48	N/A	N/A	N/A	7.80	FES	W/ SAFETY GRATE

PIPE SCHEDULE								
NAME	UP STRUCTURE	DN STRUCTURE	UP INVERT (FT)	DOWN INVERT (FT)	LENGTH (FT)	SLOPE (%)	MATERIAL	SIZE (IN)
P3	CB3	CB2	6.50	6.40	51.04	0.20	ERCP	14x23
P5	CB5	CB4	6.40	6.40	145.36	0.00	HDPE-PERF	12.0
P6	CB6	CB5	6.40	6.40	74.29	0.00	HDPE-PERF	12.0
P7	CB8	CB4	6.40	6.40	33.41	0.00	HDPE-PERF	12.0
P9	ES9	CB8	7.00	6.40	36.48	1.64	HDPE	12.0
P10	CB10	CB3	6.70	6.50	37.65	0.53	HDPE	12.0
P11	CB11	CB10	6.70	6.70	135.21	0.00	HDPE-PERF	12.0
P12	CB12	CB11	6.70	6.70	66.89	0.00	HDPE-PERF	12.0
P13	CB13	CB12	6.70	6.70	49.46	0.00	HDPE-PERF	12.0
P14	CB14	CB13	6.70	6.70	50.96	0.00	HDPE-PERF	12.0
P15	CB15	CB14	6.70	6.70	25.59	0.00	HDPE	12.0
P16	CB16	CB15	6.70	6.70	129.95	0.00	HDPE-PERF	12.0
P17	CB17	CB16	6.70	6.70	128.15	0.00	HDPE-PERF	12.0
P18	CB18	CB17	6.70	6.70	146.03	0.00	HDPE-PERF	12.0
P20	CB19	CB14	6.70	6.70	96.74	0.00	HDPE-PERF	12.0
P21	CB20	CB19	6.70	6.70	87.31	0.00	HDPE-PERF	12.0
P22	CB21	CB20	6.70	6.70	45.03	0.00	HDPE-PERF	12.0
P23	CB22	CB21	6.70	6.70	94.37	0.00	HDPE-PERF	12.0
P24	CB23	CB22	6.70	6.70	73.31	0.41	HDPE	12.0
P25	DI11	DI10	5.62	5.50	17.53	0.68	RCP IV	24.0
P27	CB28	DI12	5.87	5.62	82.23	0.30	RCP IV	24.0
P29-EXISTING	DI10	ES1	5.43	5.08	38.81	0.90	CONCRETE	24.0
P32-EXISTING	DI12	DI11	5.62	5.62	92.54	0.00	CONCRETE	24.0
P35	CB9	CB2	6.40	6.40	152.80	0.00	HDPE-PERF	12.0
P36	CB4	CB9	6.40	6.40	34.57	0.00	HDPE-PERF	12.0
P39	CB24	CB8	6.40	6.40	63.13	0.00	HDPE-PERF	12.0
P40	CB7	CB24	6.40	6.40	75.08	0.00	HDPE-PERF	12.0
P41	CB45	CB44	6.50	6.50	117.68	0.00	HDPE-PERF	12.0
P42	CB44	CB43	6.50	6.50	80.53	0.00	HDPE-PERF	12.0
P43	CB43	CB42	6.50	6.50	57.12	0.00	HDPE-PERF	12.0
P44	CB42	CB41	6.50	6.50	68.24	0.00	HDPE-PERF	12.0
P45	CB41	CB40	6.50	6.50	30.70	0.00	HDPE-PERF	12.0
P48	FES29	DI10	6.25	5.75	27.5	0.18	HDPE	15.0
P50	CB25	CB3	6.50	6.50	30.86	0.00	HDPE	12.0
P51	CB40	CB25	6.50	6.50	78.33	0.00	HDPE	12.0
P52	FES14	CB27	6.43	6.13	103.15	0.29	RCP IV	18.0
P53	CB27	CB28	6.00	5.87	89.40	0.15	RCP IV	24.0
P54	CB29	CB28	5.98	5.87	4.08	2.73	HDPE	15.0
P55	CB2	CB26	6.40	6.10	113.10	0.27	ERCP	19x30
P56	CB26	CB27	6.10	6.00	21.78	0.46	ERCP	19x30
P57			7.42	7.30	28	0.2	HDPE	12.0
P58			7.29	7.20	30	28	HDPE	12.0
P59			6.70	6.70	30	0.2	RCP IV	12.0
P60	FES31	CB6	7.80	6.40	21.78	0.46	HDPE	12.0

* PIPE LENGTHS SHOWN IN PROFILES ARE FROM STRUCTURE CENTER TO STRUCTURE CENTER

* PIPE LENGHTS SHOWN IN PIPE SCHEDULE ARE FROM STRUCTURE FACE TO STRUCTURE FACE



NOTES:
1). PERSONNEL SAFETY GRATES (PSG) SHALL ONLY BE INSTALLED ON THE INLETS OF STORM WATER PIPES 12" (300) OR LARGER IN DIAMETER THAT ARE NOT STRAIGHT FROM THE INLET TO THE OPEN OUTLET, REGARDLESS OF THE LENGTH.
2). THE GRATE SHALL BE MADE TO FIT THE OUTSIDE PERIMETER OF THE FLARED END SECTION (FES) ±' (13).
3). ALL BOLT HOLES ARE TO BE DRILLED IN THE FIELD.
4). A STIFFENER IS TO BE INSTALLED WHERE TWO OR MORE BARS ARE USED.
5). BOTTOM BAR SHALL BE 6' (150) ABOVE INVERT OF FES.
6). ALL HARDWARE ATTACHED TO CONCRETE SHALL BE ATTACHED USING APPROVED TAMPER PROOF ANCHORS.

SAFETY GRATES
D-3 (2007) 2 2

08/01/2007

CONSTRUCTION NOTES:

1 – ALL NYLOPLAST DRAINAGE BASINS AND INLINE BASINS SHALL BE INSTALLLED PER NYLOPLAST GUIDANCE FOR H-20 LOADING.
2 – USE NYLOPLAST 30" DIA. STANDARD H20 RATED GRATE FOR NYLOPLAST DRAINAGE BASINS.
3 – SOLID HDPE PIPE SHALL BE PLACED UNDER ALL DRIVEWAYS AND ROAD CROSSINGS WITH THE APPROPRIATE BEDDING AND COVER MATERIAL.
4 – ALL AREAS BETWEEN DRIVEWAYS SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE TO THE INLETS.
5 – ALL FES SHALL BE FITTED WITH A SAFETY GRATE.

REVISIONS

DESCRIPTION	DATE

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Division of Watershed Stewardship
Drainage Program

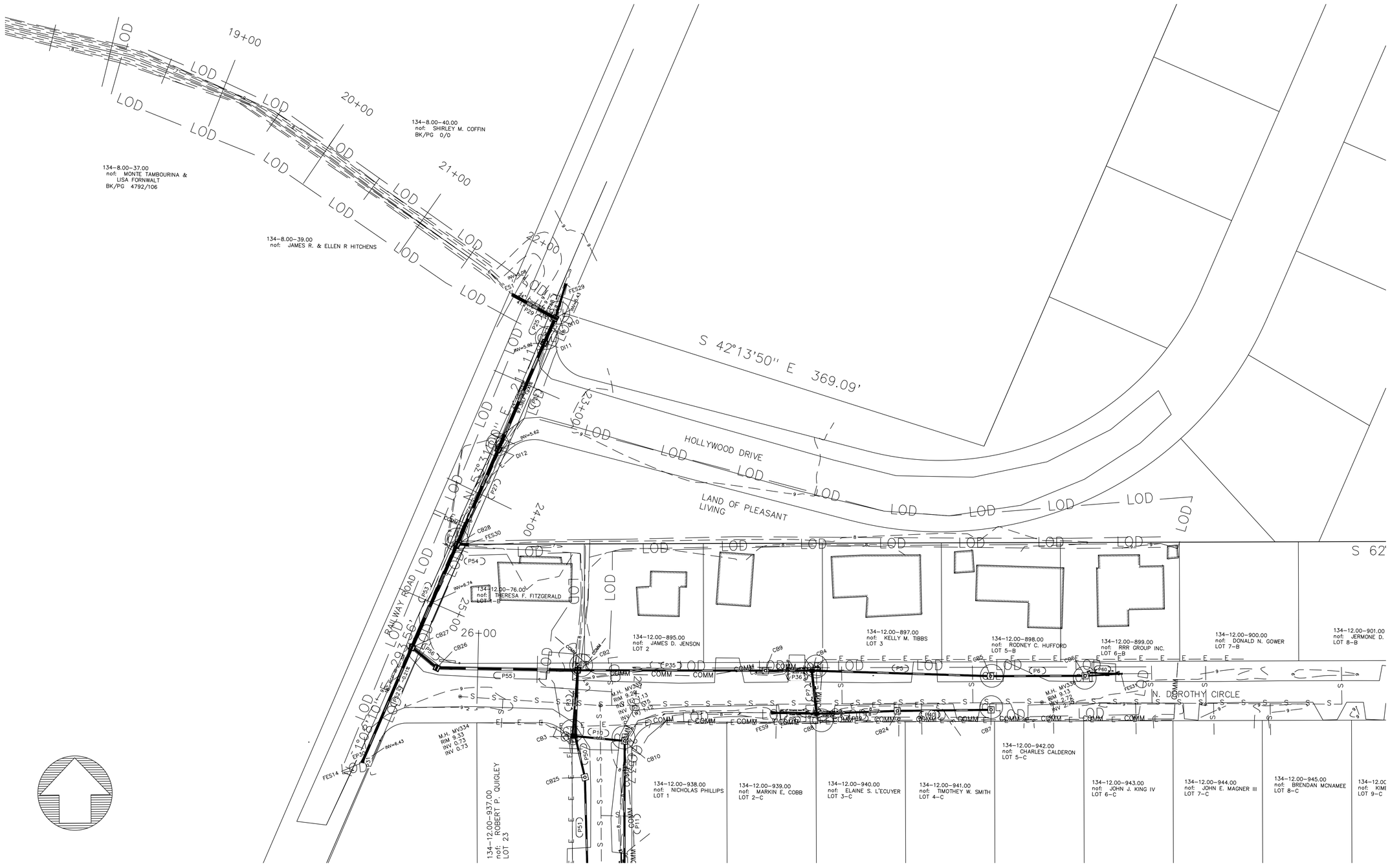
Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724

Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7659

DENTON MANOR
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

CONSTRUCTION DETAILS AND NOTES

Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C502



ESC NOTES

1. LOD ACREAGE–@ 2.0 AC.
2. SEE CFL– IP DETAIL

PLAN MAP
1" = 40'

0' 20' 40' 80' 120'
SCALE: 1" = 40'

REVISIONS

DATE	DESCRIPTION
	DNREC COMMENTS
4/26/21	DELDOT COMMENTS
5/10/21	DELDOT COMMENTS

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Division of Watershed Stewardship
Drainage Program

Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724

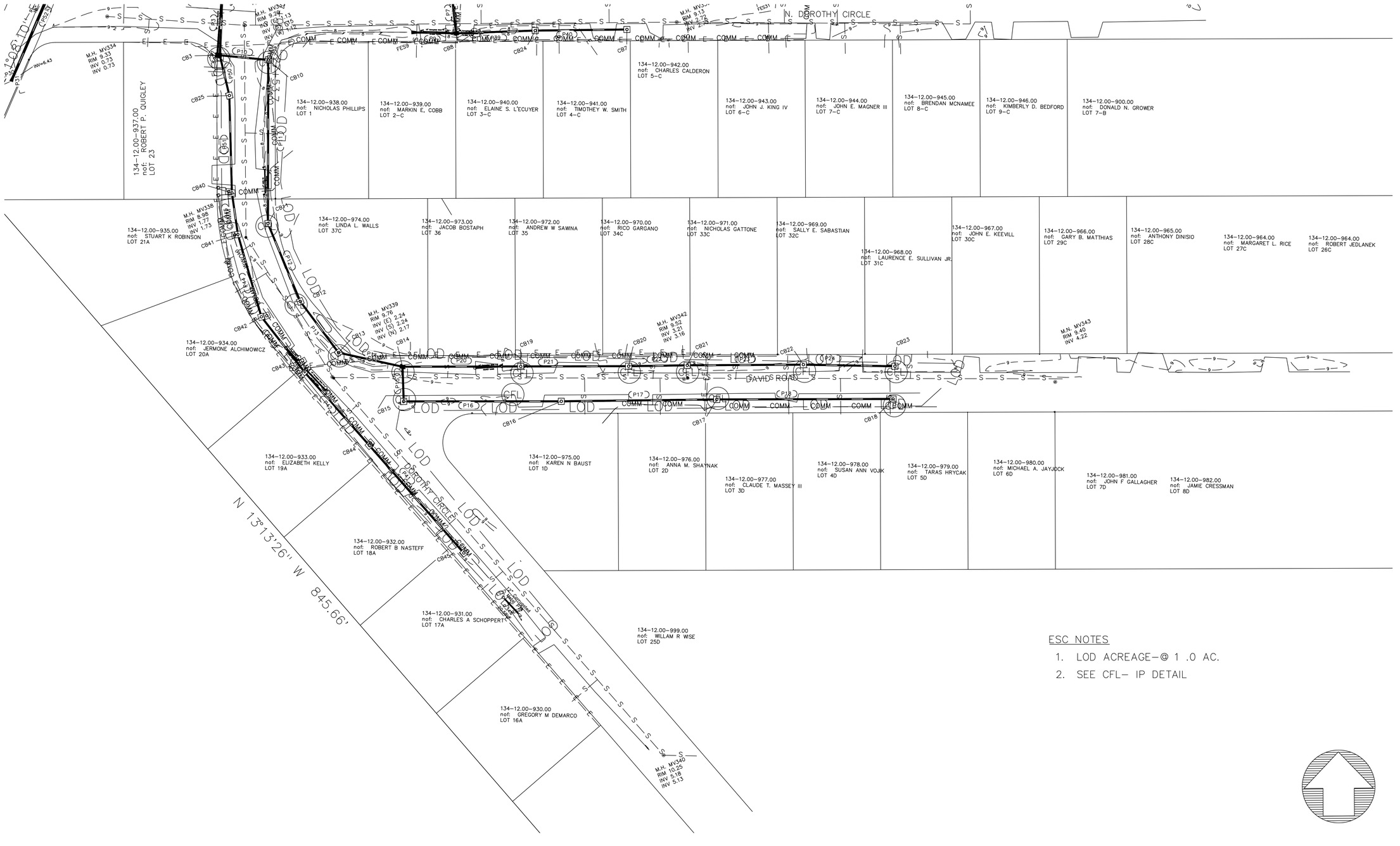
Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7069

DENTON MANOR
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

NORTH ESC SITE PLAN

Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C700

File Location: G:\Equipment Section\Projects\DENTON MANOR, 21-139\DWG\DENTON MNR REV 2- 3.3.2022.dwg Layout:ESC PLAN 11 C700 User: james.elliott Plot time: 03-03-22 @ 10:51am



ESC NOTES

1. LOD ACREAGE–@ 1 .0 AC.
2. SEE CFL– IP DETAIL

PLAN MAP
1" = 40'

0' 20' 40' 80' 120'
SCALE: 1" = 40'

REVISIONS

DATE	DESCRIPTION
	DNREC COMMENTS
4/26/21	DELDOT COMMENTS
5/10/21	DELDOT COMMENTS

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
Division of Watershed Stewardship
Drainage Program
Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724
Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7059

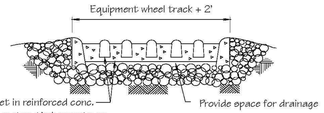
DENTON MANOR
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

SOUTH ESC SITE PLAN

Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C701

Standard Detail & Specifications

Stabilized Construct. Entrance



Section A-A (Opt.)

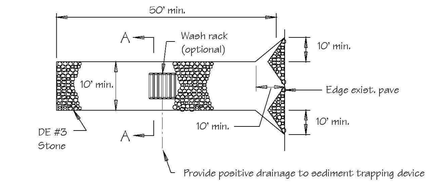
Construction Notes:

1. Stone size - Use DE #3 stone.
2. Length - As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
3. Thickness - Not less than size (6) inches.
4. Width - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
5. Geotextile - Type GS-I; placed over the entire area prior to placing of stone.
6. Surface Water - All surface water flowing or diverted toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.
7. Maintenance - The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
8. Washing - Vehicle wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
9. Inspection - Periodic inspection and needed maintenance shall be provided after each rain.

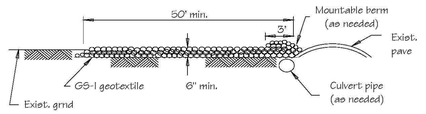
Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	DE-ESC-3.4.7 Sheet 2 of 2 Effective FEB 2019

Standard Detail & Specifications

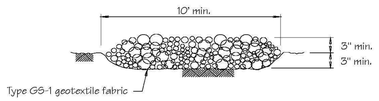
Stabilized Construct. Entrance



Plan



Profile



Section A-A (Std.)

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	DE-ESC-3.4.7 Sheet 1 of 2 Effective FEB 2019

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Pollution Prevention – Spill Prevention

1. Fueling should only take place in signed designated areas, away from downstream drainage facilities and watercourses.
2. Fueling must be with nozzles equipped with automatic shut-off to control drips. Do not top off.
3. Protect the areas where equipment or vehicles are being repaired, maintained, fueled or parked from storm water run-on and runoff.
4. Use barriers such as berms to prevent storm water run-on and runoff, and to contain spills.
5. Place a "Fueling Area" sign next to each fueling area.
6. Store hazardous materials such as fuel, solvents, oil and chemicals in secondary containment.
7. Inspect vehicles and equipment for leaks on each day of use. Repair fluid and oil leaks immediately.
8. Absorbent spill clean-up materials and spill kits must be available in fueling areas and on fuel trucks.
9. If fueling is to take place at night, make sure the fueling area is sufficiently illuminated.
10. Properly dispose of used oil, fluids, lubricants and spill clean-up materials.

CLEAN UP SPILLS

1. If it is safe to do so, immediately contain and clean up any chemical and/or hazardous material spills.
2. Properly dispose of used oil, fluids, lubricants and spill clean-up materials.
3. Do not bury spills or wash them down with water.

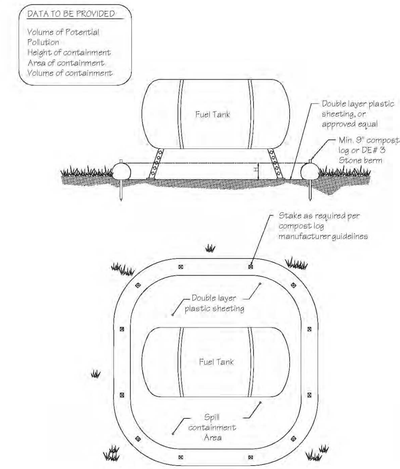
LEAKS AND DRIPS

1. Use drip pans or absorbent pads at all times. Place under and around leaky equipment.
2. Do not allow oil, grease, fuel or chemicals to drip onto the ground.
3. Have spill kits and clean up material on-site.
4. Repair leaky equipment promptly or remove problem vehicles and equipment from the site. Clean up contaminated soil immediately.
5. Store contaminated waste in sealed containers constructed of suitable material. Label these containers properly.
6. Clean up all spills and leaks. Promptly dispose of waste and spent clean up materials.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		DE-ESC-3.6.1 Sheet 2 of 5 Effective FEB 2019

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control



Source:	Symbol:	Detail No.
Delaware ESC Handbook		DE-ESC-3.6.1 Sheet 1 of 5 Effective FEB 2019

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes:

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

1. **Material Inventory**

   Document the storage and use of the following materials:
   a. Concrete
   b. Detergents
   c. Paints (enamel and latex)
   d. Cleaning solvents
   e. Pesticides
   f. Wood scraps
   g. Fertilizers
   h. Petroleum based products

2. **Good housekeeping practices**
   a. Store only enough product required to do the job.
   b. All materials shall be stored in a neat, orderly manner in their original labeled containers and covered.
   c. Substances shall not be mixed.
   d. When possible, all of a product shall be used up prior to disposal of the container.
   e. Manufacturers' instructions for disposal shall be strictly adhered to.
   f. The site foreman shall designate someone to inspect all BMPs daily.

3. **Waste management practices**
   a. All waste materials shall be collected and stored in securely lidded dumpsters in a location that does not drain to a waterbody.
   b. Waste materials shall be salvaged and/or recycled whenever possible.
   c. 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:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		DE-ESC-3.6.1 Sheet 3 of 5 Effective FEB 2019

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes (cont.)

d. Trash shall be disposed of in accordance with all applicable Delaware laws.
e. Trash cans shall be placed at all lunch spots and littering is strictly prohibited. Recycle bins shall be placed near the construction trailer.
f. 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.

4. **Equipment maintenance practices**
   a. If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
   b. If performed on-site, vehicles shall be washed with high-pressure water spray without detergents in an area contained by an impervious berm.
   c. Drip pans shall be used for all equipment maintenance.
   d. Equipment shall be inspected for leaks on a daily basis.
   e. Washout from concrete trucks shall be disposed of in a temporary pit for hardening and proper disposal.
   f. Fuel nozzles shall be equipped with automatic shut-off valves.
   g. All used products such as oil, antifreeze, solvents and tires shall be disposed of in accordance with manufacturers' recommendations and local, state and federal laws and regulations.

5. **Spill prevention practices**
   a. Potential spill areas shall be identified and contained in covered areas with no connection to the storm drain system.
   b. Warning signs shall be posted in hazardous material storage areas.
   c. Preventive maintenance shall be performed on all tanks, valves, pumps, pipes and other equipment as necessary.
   d. Low or non-toxic substances shall be prioritized for use.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		DE-ESC-3.6.1 Sheet 4 of 5 Effective FEB 2019

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes (cont.)

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

6. **Education**
   a. Best management practices for construction site pollution control shall be a part of regular progress meetings.
   b. 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 Management Section	**302-739-9403**

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		DE-ESC-3.6.1 Sheet 5 of 5 Effective FEB 2019

GENERAL NOTES

1. EXISTING CONDITIONS ARE PER THE SURVEY PROVIDED BY DNREC DRAINAGE SECTION, VERTICAL DATUM NAVD88 AND HORIZONTAL DATUM NAD83.
2. PROJECT LOCATION: THE PROPOSED WORK IS LOCATED ON RAILWAY RD., OCEAN VIEW, DE. LAT. 38.544812 LONG. -75.24432
3. PROJECT WATERSHED: INDIAN RIVER BAY
4. CONTACT INFORMATION: SUSSEX CONSERVATION DISTRICT
   JIM ELLIOTT
   23818 SHORTLY RD.
   GEORGETOWN, DE 19956
   302-856-2105 EXT. 105, JIM.ELLIOTT@SUSSEXCONSERVATION.ORG
   CCR: JASON STRAUSS, SUSSEX CONSERVATION DISTRICT
   302-396-7620, JASON.STRAUSS@SUSSEXCONSERVATION.ORG
5. PROPERTY BOUNDARIES ARE DIGITAL REPRESENTATIONS OF THE SUSSEX COUNTY PARCEL MAP AND ARE NOT INTENDED TO BE A LEGAL REPRESENTATION OF PROPERTY BOUNDARIES.
6. AERIAL PHOTO IS AN AERIAL IMAGE OBTAINED FROM GOOGLE EARTH PRO DATED 2017.
7. SPECIAL RIGHTS-OF-WAY ARE TO BE UTILIZED FOR ACCESS DURING CONSTRUCTION AND MAINTENANCE AND ARE FOR EQUIPMENT TRAVEL ONLY. NO CONSTRUCTION IS TO BE PERFORMED IN THESE AREAS.
8. THE LOCATION OF UTILITES ON THESE PLANS WERE TAKEN FROM BEST AVAILABLE INFORMATION INCLUDING SURVEY AND FIELD INVESTIGATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBLITY TO ACCURATELY LOCATE EXISTING UTILITIES PRIOR TO COMMENCING ANY WORK AND AVOID DAMAGE TO ANY EXISTING UTILITES. CONTACT MISS UTILITY (1-800-282-8555) A MINIMUM OF 2 DAYS PRIOR TO THE NEED FOR LOCATION ASSISTANCE. NOTIFY THE DESIGN TEAM IMMEDIATELY IF THERE ARE ANY DESIGN CONFLICTS.
9. THE CONTRACTOR IS RESPONSIBLE TO PROTECT DURING CONSTRUCTION AND TO MAINTAIN UNINTERRUPTED SERVICE. ANY DISRUPTION OF SERVICE DONE TO UTILITES SHALL BE IMMEDIATELY AND COMPLETELY REPARIED TO THE SATISFACTION OF THE INVOLOVED UTILITY CONPLANY AT THE SOLE EXPENSE OF THE CONTRACTOR.
10. PLAN LOCATIONS AND DIMENSIONS SHALL BE STRICTLY ADHERED TO UNLESS OTHERWISE DIRECTED BY THE DESIGN TEAM AND OR PROJECT MANAGER. IN THE CASE OF DISCREPANCIES ON THE DRAWING.
11. IT SHALL BE THE CONTRACTOR'S RESPONSIBLITY TO OBTAIN ALL PERMITS NECESSARY FOR THE SCOPE OF WORK PROPOSED WITHIN THIS PLAN.
12. THE CONTRACTOR SHALL ASSURE THAT ALL CONSTRUCTION PRACTICES ARE IN STRICT COMPLIANCE WITH FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970. THESE PLANS MAY NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
13. APPROVED PLANS SHALL NOT RELIEVE THE CONTRACTOR FROM HIS OR HER RESPONSIBLITY FOR COMPLIANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATIONS, NOR SHALL IT RELIEVE THE CONTRACTOR FROM ERRORS AND OMISSIONS IN THE APPROVED PLAN.
14. DELAWARE REGULATIONS PROHIBIT THE BURIAL OF CONSTRUCTION/DEMOLITION DEBRIS: INCLUDING TREES STUMPS AND OTHER WOODY DEBRIS ON THE CONSTRUCTION SITE. ANY SOLID WASTE FOUND DURING EXCAVATION MUST BE PROPERLY DISPOSED IN A DNREC APPROVED MANNER. ANY CHIPPING OF WOODY DEBRIS TO FORM MULCH MUST BE APPROVED BY THE LANDOWNER.
15. ALL EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE DELAWARE SEDIMENT AND EROSION CONTROL HANDBOOK.
16. IT IS THE CONTRACTOR'S RESPONSIBILTY TO INSPECT AND MAINTAIN THE PROJECT ESC COMPONENTS ON A WEEKLY BASIS AND AFTER EVERY RAIN EVENT UNTIL THE COMPLETION OF THE PROJECT AND TO THE SATISFACTION OF THE DEPARTMENT AND OR DELEGATED AGENCY.
17. CUT AND FILL QUANTITIES ARE NOT NOTED ON THIS PLAN AND ARE THE RESPONSIBLITY OF THE CONTRACTOR WHEN SUBMITTING THEIR BID.
18. ALL FILL UNLESS OTHERWISED NOTED ON THE PLAN SHALL BE CLEAN COMPACTABLE TYPE F BORROW. ALL FILL MATERIAL MUST BE APPROVED BY THE CCR PRIOR TO PLACEMENT.
19. ANY SPOILS THAT ARE DISPOSED OF ON SITE MUST RECEIVED LANDOWNER CONCURRENCE PRIOR TO PLACEMENT.
20. FINISH GRADING SHALL NOT IMPAIR THE VICINITY SURFACE DRAINAGE, CREATE AN EROSION HAZARD, OR CREATE A SOURCE OF SEDIMENT TO ANY ADJACENT WATERCOURSE OR PROPERTY.
21. ALL DISTURBED AREA SHALL BE STABILIZED IN AN ACCEPTABLE MANNER WITHIN 14 DAYS PER THE DSSR.

REVISIONS

DESCRIPTION	DATE

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
Division of Watershed Stewardship
Drainage Program
Georgetown Office
21309 Berlin Rd. Unit 6
Georgetown DE, 19947
Phone:(302) 855 - 1930
Fax:(302) 677 - 7059
Dover Office
89 Kings Highway
Dover DE, 19901
Phone:(302) 739 - 9921
Fax: (302) 739 - 6724

DENTON MANOR
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

ESC DETAILS

Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C702

Standard Detail & Specifications

Vegetative Stabilization

TEMPORARY SEEDING BY RATES, DEPTHS AND DATES

Mix #	Species[6]	Seeding Rate		Optimum Seeding Dates [1] O = Optimum Planting Period; A = Acceptable Planting Period							Planting Depth[5]
				Coastal Plain			Piedmont			All	
	Certified Seed	lb/Ac[2]	lb/1000 sq.ft.	2/1-4/30	[3] 5/1-8/14	8/15-10/31	3/1-4/30	[3] 5/1-7/31	8/1-10/31	10/31-2/1	
1	Barley	125	4	O	A	O	O	A	O		1-2 inches 2-3" sandy soils
2	Oats	125	4	O	A	A	O	A	A		1-2 inches 2-3" sandy soils
3	Rye	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
4	Perennial Ryegrass	125	4	O	A	O	O	A	O		0.5 inches 1-2" sandy soils
5	Annual Ryegrass	125	4	O	A	O	O	A	O	A	0.5 inches 1-2" sandy soils
6	Winter Wheat	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
7	Foxtail Millet	30 PLS	0.7		O			O			0.5 inches 1-2" sandy soils
8	Pearl Millet	20 PLS	0.5		O			O			0.5 inches 1-2" sandy soils

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

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 1 of 4 Effective FEB 2019

Standard Detail & Specifications

Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES

Mix No.	Seeding Mixtures: Certified Seed[2] / Well Drained Soils	Seeding Rate[1] lb/Ac	lb/1000 sq.ft.	Optimum Seeding Dates [2] O = Optimum Planting Period; A = Acceptable Planting Period: Coastal Plain 2/1-4/30	Coastal Plain 5/1-8/14	Coastal Plain 8/15-10/31	Piedmont 3/1-4/30	Piedmont 5/1-7/31	Piedmont 8/1-10/31	All[3] 10/31-2/1	Remarks
1	Tall Fescue	140	3.2	A	O	A	A	O	A	Add 100 lbs./ac. Winter Rye	Good erosion control mix. Tolerant of low fertility soils Lovegrass very difficult to mow; Germinates only in hot weather
	Weeping Lovegrass	10	0.23								
2	Deertongue	30	0.69	A	O	A	A	O	A	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tolerant of low fertility soils Good wildlife cover and food
	Sheep Fescue	30	0.69								
	Common Lespedeza[5] Inoculated	15	0.35								
3	Tall Fescue (Turf-type) **or**	50	1.15	O	A	O	O	A	O	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.
	Strong Creeping Red Fescue **or**	50	1.15								
	Perennial Ryegrass	50	1.15								
	plus Flatpea[5]	15	0.34								
4	Strong Creeping Red Fescue	100	2.3	O	A	O	O	A	O	Add 100 lbs./ac. Winter Rye	Suitable waterway mix. Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.
	Kentucky Bluegrass	70	1.61								
	Perennial Ryegrass **or**	15	0.35								
	Redtop	5	0.11								
	plus White Clover[5]	3	0.07								
5	Switchgrass[4] **or**	10	0.23		O				O		Native warm-season mixture. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N fertilizer discouraged - weeds
	Coastal Panicgrass	10	0.23								
	Big Bluestem	5	0.11								
	Little Bluestem	5	0.11								
	Indian Grass	5	0.1								
6	Tall Fescue (turf-type) (Blend of 3 cultivars)	150	3.5	O	A	O	O	A	O		Managed filter strip for nutrient uptake.
7	Tall Fescue	150	3.5	O	A	O	O	A	O		Three cultivars of Kentucky Bluegrass. Traffic tolerant.
	Ky. Bluegrass (Blend)	20	0.46								
	Perennial Ryegrass	20	0.46								
8	Big Bluestem[7]	10	0.23	O	A		O	A			All species are native. Indian Grass and Bluestem have fluffy seeds. Plant with a specialized native seed drill. Creeping Red Fescue will provide erosion protection while the warm season grasses get established.
	Indian Grass[7]	10	0.23								
	Little Bluestem[7]	9	0.18								
	Creeping Red Fescue	30	0.69								
	plus one of:										
	Partridge Pea	5	0.11								
	Bush Clover	3	0.07								
	Wild Indigo	3	0.07								
	Showy Tick-Trefoil	2	0.05								

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 2 of 4 Effective FEB 2019

Standard Detail & Specifications

Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES (cont.)

Mix No.	Seeding Mixtures: Certified Seed[2] / Poorly Drained Soils	Seeding Rate[1] lb/Ac	lb/1000 sq.ft.	Optimum Seeding Dates [2] O = Optimum Planting Period; A = Acceptable Planting Period: Coastal Plain 2/1-4/30	Coastal Plain 5/1-8/14	Coastal Plain 8/15-10/31	Piedmont 3/1-4/30	Piedmont 5/1-7/31	Piedmont 8/1-10/31	All[3] 10/31-2/1	Remarks
9	Redtop	75	1.72	O	A	O	O	A	O	Add 100 lbs./ac. Winter Rye	Quick stabilization of disturbed sites and waterways
	Creeping Bentgrass	35	0.8								
	Sheep Fescue	30	0.69								
	Rough Bluegrass	45	1								
10	Reed Canarygrass[5]	10	0.23	A		O	A		O		Good erosion control, wildlife cover and wetland revegetation.
	Residential Lawns										
11	Tall Fescue	100	2.3	O	A	O	O	A	O		High value, high maintenance, light traffic, irrigation necessary. Well drained soils, full sun.
	Perennial Ryegrass	25	0.57								
	Kentucky Bluegrass Blend	30	0.69								
12	Tall Fescue	100	2.3	O	A	O	O	A	O		Moderate value, low maintenance, traffic tolerant.
	Perennial Ryegrass	25	0.57								
	Sheep Fescue	25	0.57								
13	Creeping Red Fescue	50	1.15	O	A	O	O	A	O		Shade tolerant, moderate traffic tolerance, moderate maintenance.
	Chewings Fescue	50	1.15								
	Rough Bluegrass	20	0.4								
	Kentucky Bluegrass	20	0.4								
14	Creeping Red Fescue	50	1.15	O	A	O	O	A	O		Shade tolerant, moisture tolerant.
	Rough Bluegrass **or**	90	2.1								
	Chewings Fescue										
15	K-31 Tall Fescue	160	3.6	O	A	O	O	A	O		Monoculture, but performs well alone in lawns. Discouraged.

1. When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.
2. Winter seeding requires 3 tons per acre of straw mulch. Planting dates listed above are average for Delaware. These dates may require adjustment to reflect local conditions.
3. All seed shall meet the minimum purity and minimum germination percentages recommended by the Delaware Department of Agriculture. The maximum % of weed seeds shall be in accordance with Section 1, Chapter 24, Title 3 of the Delaware Code.
4. Cool season species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
5. All leguminous seed must be inoculated.
6. Warm season grass mix and Reed 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.

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 3 of 4 Effective FEB 2019

Standard Detail & Specifications

Vegetative Stabilization

Construction Notes:

1. Site Preparation
   a. Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
   b. Final grading and shaping is not necessary for temporary seedings.
2. Seedbed Preparation

   It is important to prepare a good seedbed to insure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.
3. Soil Amendments
   a. 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.
   b. 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.
4. Seeding
   a. 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. Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.
   b. Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
   c. 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.
5. Mulching

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

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 4 of 4 Effective FEB 2019

Standard Detail & Specifications

Topsoiling

Construction Notes:

1. **Site Preparation** (Where Topsoil is to be added)

   Note: When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, waterways and sediment basins.
   a. Grading - Grades on the areas to be topsoiled which have been previously established shall be maintained.
   b. Liming - Where the topsoil is either highly acid or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet). Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.
   c. Tilling - After the areas to be topsoiled have been brought to grade, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by discing or by scarifying to a depth of a least 3 inches to permit bonding of the topsoil to the subsoil. Pack by passing a bulldozer up and down over the entire surface area of the slope to create horizontal erosion check slots to prevent topsoil from sliding down the slope.
2. **Topsoil Material and Application**

   Note:Topsoil salvaged from the existing site may often be used but it should meet the same standards as set forth in these specifications. The depth of topsoil to be salvaged shall be no more than the depth described as a representative profile for that particular soil type as described in the soil survey published by USDA-SCS in cooperation with Delaware Agricultural Experimental Station.

Source:	Symbol:	Detail No.
USDA - NRCS		**DE-ESC-3.4.1** Sheet 1 of 2 Effective FEB 2019

Standard Detail & Specifications

Topsoiling

Construction Notes (cont.)

a. Materials - Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand or other soil as approved by an agronomist or soil scientist. It shall not have a mixture of contrasting textured subsoil and contain no more than 5 percent by volume of cinders, stones, slag, coarse fragment, gravel, sticks, roots, trash or other extraneous materials larger than 1-1/2 inches in diameter. Topsoil must be free of plants or plant parts of bermudagrass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistles, or others as specified. All topsoil shall be tested by a reputable laboratory for organic matter content, pH and soluble salts. A pH of 6.0 to 7.5 and an organic content of not less than 1.5 percent by weight is required. If pH value is less than 6.0 lime shall be applied and incorporated with the topsoil to adjust the pH to 6.5 or higher. Topsoil containing soluble salts greater than 500 parts per million shall not be used.

Note: No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed to permit dissipation of toxic materials.

b. Grading - The topsoil shall be uniformly distributed and compacted to a minimum of four (4) inches. Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets. Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

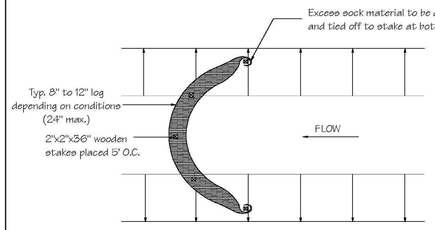
Note:Topsoil substitutes or amendments as approved by a qualified agronomist or soil scientist, may be used in lieu of natural topsoil. Compost material used to improve the percentage of organic matter shall be provided by a certified supplier.

Compost amendments that are intended to meet specific post-construction stormwater management goals shall further meet the requirements of **Appendix 3.06.2 Post Construction Stormwater Management BMP Standards and Specifications, Section 14.0 Soil Amendments.**

Source:	Symbol:	Detail No.
USDA - NRCS		**DE-ESC-3.4.1** Sheet 2 of 2 Effective FEB 2019

Standard Detail & Specifications

Compost Log Check Dam



Plan

DATA

Slope (S)
Spacing (X)
Log diameter (D)

Source:	Symbol:	Detail No.
Adapted from FILTREXX Technologies	CCD	**DE-ESC-3.3.6.2** Sheet 1 of 2 Effective FEB 2019

Standard Detail & Specifications

Compost Log Check Dam

Construction Notes:

1. Swales and channels shall be prepared in accordance with the construction specifications described in the **Standards and Specifications for Temporary Berm**, **Temporary Swale**, **Vegetated Channel**, or **Diversions**.
2. The check dam shall be constructed of compost filter log. The compost filter log shall be placed so that it extends across the full width of the channel.
3. The top of the check dam shall be constructed so that the center is approximately 6" lower than the outer edges, forming a weir that the water can flow across. The ends of the compost filter log shall wrap upslope to prevent end cutting.
4. The maximum height of the check dam at the center of the weir must not exceed two (2) feet.
5. Maximum spacing between dams should be the distance in the channel where the toe of the upstream dam is at the same elevation as the top of the downstream dam. (See **Standard & Specifications for Check Dams** for design chart.)

Source:	Symbol:	Detail No.
Adapted from FILTREXX Technologies	CCD	**DE-ESC-3.3.6.2** Sheet 2 of 2 Effective FEB 2019

REVISIONS

DESCRIPTION	DATE

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Division of Watershed Stewardship
Drainage Program

Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724

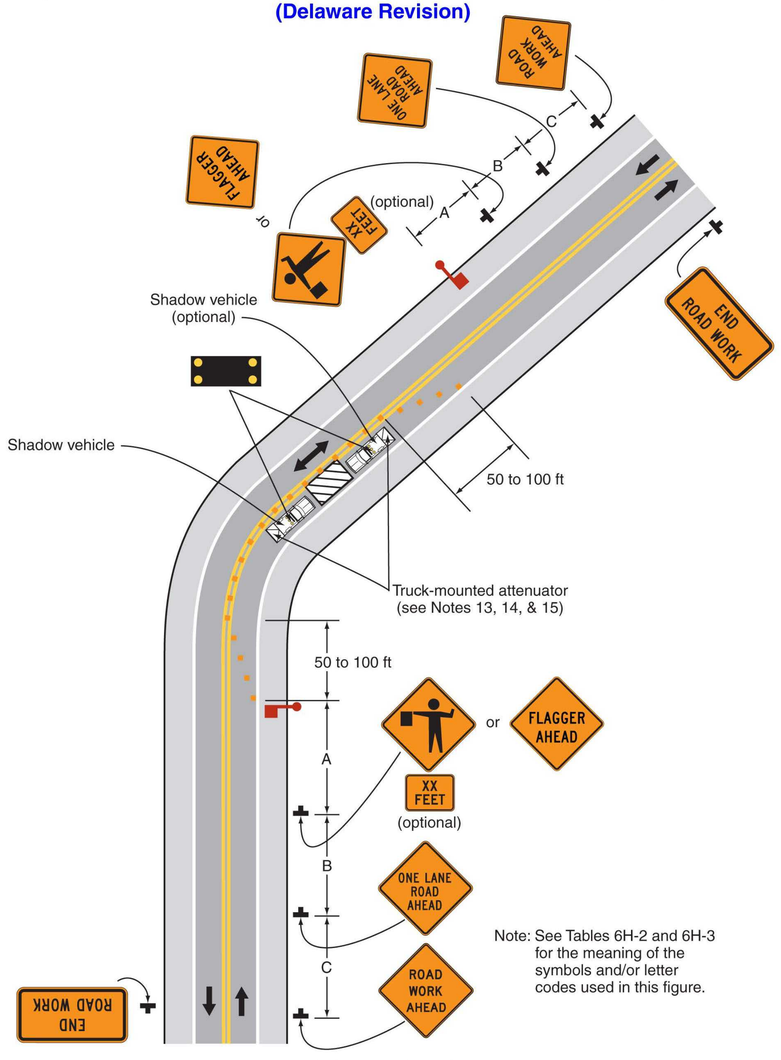
Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
Georgetown DE, 19947 Fax:(302) 677 - 7689

DENTON MANOR
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

ESC DETAILS

Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C703

Figure 6H-10. Lane Closure on a Two-Lane Road Using Flaggers (TA-10)
(Delaware Revision)



Typical Application 10

Revision 3, May 2018

SUBDIVISOIN MANUAL

TEMPORARY TRAFFICE CONTROL NOTES

1. All temporary traffic control and temporary traffic control devices shall be in accordance with: the contract documents, the latest version of the Delaware Manual on Uniform Traffic Control Devices (hereinafter referred to as the "Delaware MUTCD"), current State of Delaware Department of Transportation Standard Specifications for Road and Bridge Construction, and Supplemental Specifications, including all revisions as of the date of the entrance permit approval.
2. The Department reserves the right to stop the Contractor's operations, IF, in the opinion of the Department's Representative, the Contractor's operations are not in compliance with the Delaware MUTCD, the specifications or the plans or if the Contractor's operations are deemed unsafe.
3. The Contractor shall be responsible for notifying the local 911 center, local schools and DelDOT Community Relations of all roads and lanes to be closed a minimum of seven (7) calendar days before the closure.
4. The Contractor shall be responsible for ensuring that the Transportation Management Center is notified each and every day when work is being performed in State right-of-way. The Contractor shall identify the type of work, any lane(s) or shoulder(s) closed, the length of time for work, when the lane restrictions are in place and when lane restrictions are lifted, contact person/phone number and State Inspector. The Transportation Management Center can be reached at (302) 659-4600.
5. When side roads intersect the work zone, additional traffic control devices shall be erected including permanent warning signs.
6. All storage of equipment and material shall comply with the Delaware MUTCD, Section 6G.21.
7. The Contractor is responsible for the maintenance of existing pavement within the project limits for the duration of the contract or as directed by the Engineer.
8. Typical Applications per the Delaware MUTCD shall be incorporated to achieve required temporary traffic control and safety requirements. This project is subject to the following Typical Applications unless directed otherwise by the DelDOT District Safety Officer: Typical Application 10: "Work on XXXX (TA-XX)", etc.
9. Within the mainline work area, permanent advance warning signs with the legends ROAD WORK AHEAD shall be installed in advance of the work area in both directions.
10. An END ROAD WORK sign shall be located 500 feet downstream from the work area.
11. On intersecting roadways within the project limits, a ROAD WORK AHEAD sign shall be placed at a distance not less than 500 feet in advance of the work area.
12. All permanent advance warning signs shall be ground mounted on two NCHRP-350 or MASH approved breakaway posts and shall be mounted in compliance with the Delaware MUTCD. Permanent advance warning signs shall be mounted at a height of 7 feet, measured from the roadway to the bottom of the sign. The use of skid mounted sign supports is not allowed unless the Contractor can demonstrate that a utility conflict exists, which shall be verified by the District Safety Officer; or concrete medians prevent the installation of the permanent advance warning signs in the appropriate location.
13. The use of millings and graded aggregate base course (GABC) in the travel way, temporary travel way, high volume entrances and access ramp for the purpose of providing a temporary roadway surface, pothole repair, tapered edge for utilities, butt joints, and longitudinal drop-offs (milling and paving operations) is prohibited unless it is otherwise designated to be used in the contract plans. Use cold patch, bituminous concrete, bituminous concrete wedge, or taper mill, as noted in the contract documents or approved by the engineer. Millings or GABC shall be used at the following locations where access to a business, residence, or edge drop off needs to be maintained unless otherwise noted in the plans or directed by the engineer to use bituminous concrete or cold patch. All millings and GABC will be rolled and compacted to help prevent the material from unravelling in the following areas:
    - Driveways
    - Entrances
    - Low volume access ramps (identified in the contract documents)
    - Edge drop-offs adjacent to live roadway (lanes and shoulder) and the proposed road construction
    - Edge of roadway drop-off

    The base course material shall be placed at no greater than the slope specified in the Delaware MUTCD, Table 6G-1 and shall be compacted. Vertical differences shall be corrected in accordance with the Delaware MUTCD, Table 6G-1.
14. Access to all residence within the project area shall be maintained unless otherwised directed by the engineer.
15. The contractor shall provide all affected property owners 48 hours prior to starting construction. The notice shall include scope of work, work hours, and estimated start and stop dates for scope of work.
16. At the end of the day and before traffic is returned, the contractor shall correct all vertical differences in accordance with table 5G-1 of the Delaware MUTCD.
17. All flaggers shall comply with chapter 6E of the Delaware MUTCD.
18. All persons working within the State ROW shall wear a minimum of an ANSI saftery vest meeting or exceeding the ANSI 107-2004 requirements as specified in the Delaware MUTCD.
19. The contractor is responsible for the maintenance of the existing pavement within the project area for the duration of hte contract or as directed by the engineer.

REVISIONS

DESCRIPTION	DATE

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
Division of Watershed Stewardship
Drainage Program
Dover Office
89 Kings Highway Phone:(302) 739 - 9921
Dover DE, 19901 Fax: (302) 739 - 6724
Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855 - 1930
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DENTON MANOR
DRAINAGE IMPROVEMENTS, # 21-139
BROADKILL RIVER / DELAWARE BAY WATERSHED
SUSSEX COUNTY, DELAWARE

MOT PLAN

Date: 9.20.2021
Designed: JLE / AR
Planned: TS/TB/KW
Drawn: JLE
Sheet No. C800