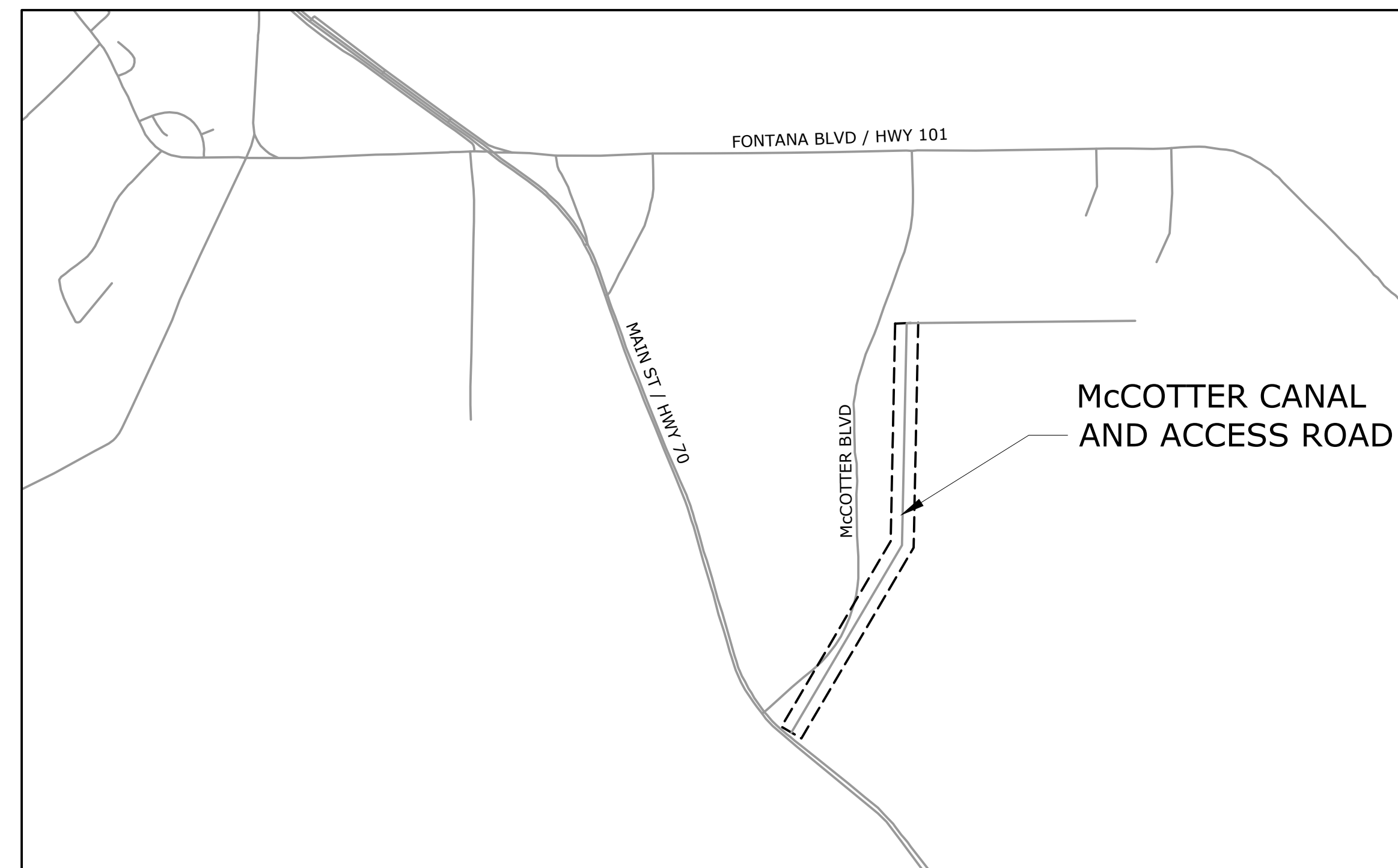


CITY OF HAVELOCK, NORTH CAROLINA



McCOTTER CANAL UTILITY ACCESS STABILIZATION

HAZEN PROJECT NO 30906-004
PROJECT FILE NO: FY2017-140
JULY 2018



LOCATION MAP
SCALE: 1" = 2000'



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381



DRAWING LIST	
NUMBER	TITLE
GENERAL	
G-01	COVER SHEET
G-02	GENERAL NOTES, LEGEND, AND SHEET INDEX
G-03	OVERALL PLAN
SITE PLANS	
C-01	AREA 1
C-02	AREA 2 - 1 OF 2
C-03	AREA 2 - 2 OF 2
C-04	AREA 3
C-05	AREA 4
C-06	AREA 5 - 1 OF 2
C-07	AREA 5 - 2 OF 2
EROSION & SEDIMENT CONTROL PLANS	
ESC-01	AREA 1
ESC-02	AREA 2 - 1 OF 2
ESC-03	AREA 2 - 2 OF 2
ESC-04	AREA 3
ESC-05	AREA 4
ESC-06	AREA 5 - 1 OF 2
ESC-07	AREA 5 - 2 OF 2
ESC-08	DETAILS AND NOTES
STANDARD DETAILS	
D-01	BANK STABILIZATION DETAILS
D-02	STORMWATER DETAILS

GENERAL NOTES

- THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL VERIFY EXISTING ELEVATIONS AND DIMENSIONS WHERE NEW WORK WILL MATCH EXISTING. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
- THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FROM THE APPROPRIATE AUTHORITIES, DEPARTMENTS, AND / OR AGENCIES HAVING JURISDICTION PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
- THE CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PAVEMENT, TREES, VEGETATION, STRUCTURES, UTILITIES, ETC NOT INDICATED TO BE DEMOLISHED OR REMOVED. DAMAGE TO FEATURES NOT INDICATED TO BE DEMOLISHED OR REMOVED, WHETHER WITHIN OR OUTSIDE THE LIMIT OF DISTURBANCE, SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL PROVIDE PRE- AND POST-CONSTRUCTION PHOTOGRAPHS OF ALL DISTURBED AREAS.
- UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEY INFORMATION. KNOWN WATER LINE AND FIBER OPTIC LINES LOCATED ALONG THE ACCESS ROAD HAVE NOT BEEN PREVIOUSLY LOCATED AND ARE NOT SHOWN ON THE CONTRACT DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION OF ALL UTILITIES AND AVOID DAMAGE TO THEM. THE CONTRACTOR SHALL REQUEST UNDERGROUND UTILITY LOCATION MARK-OUT FOR ALL SUBSURFACE UTILITIES AT LEAST THREE (3) WORKING DAYS BUT NO MORE THAN TWELVE (12) WORKING DAYS PRIOR TO EXCAVATION, INCLUDING SOIL DRILLING.
- WHERE PROPOSED WORK IS IN THE VICINITY OF UTILITY POLES, SUCH THAT SUPPORT OF THE POLE(S) WILL BE REQUIRED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE UTILITY, PUBLIC OR PRIVATE, OF THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE UTILITY FOR SUPPORT AND / OR RELOCATION.
- WHERE OVERHEAD POWER LINES ARE PRESENT, THE CONTRACTOR MUST CONTACT THE UTILITY PRIOR TO THE COMMENCEMENT OF CONSTRUCTION TO DETERMINE THE MINIMUM REQUIRED EQUIPMENT CLEARANCE (MEC) DISTANCE BASED UPON LINE STRENGTH.
- DURING EXCAVATION AND PLACEMENT OF UTILITIES, THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY REGULATIONS AND SHALL SUBMIT TO THE ENGINEER FOR REVIEW SHEET PILING, SHORING, AND / OR BRACING DESIGNS PREPARED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NORTH CAROLINA, AS MAY BE NECESSARY TO COMPLY WITH THESE REGULATIONS.
- DISCHARGE FROM ALL DEWATERING AND PUMPING OPERATIONS SHALL BE DISCHARGED TO AN ENVIRONMENTALLY ACCEPTABLE LOCATION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND ALL APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS.
- THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL DEBRIS GENERATED DURING THE PROJECT AT AN OFFSITE AND PROPERLY PERMITTED DISPOSAL FACILITY.
- THE CONTRACTOR SHALL MAKE EVERY EFFORT TO SAVE AND MAINTAIN ALL PROPERTY IRONS, MONUMENTS, OTHER PERMANENT POINTS AND LINES OF REFERENCE AND CONSTRUCTION STAKES. A NORTH CAROLINA REGISTERED LAND SURVEYOR, AT THE CONTRACTOR'S EXPENSE, SHALL REPLACE PROPERTY IRONS, MONUMENTS, AND OTHER PERMANENT POINTS OF REFERENCE.
- THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING TEMPORARY SHORING NEEDS. SHORING PLANS SHALL BE PREPARED BY A NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER AND SUBMITTED TO THE ENGINEER.
- THE CONTRACTOR SHALL COORDINATE WITH UTILITY OWNERS FOR THE TEMPORARY SUPPORT AND / OR RELOCATION OF UTILITIES THAT CONFLICT WITH CONSTRUCTION, INCLUDING BUT NOT LIMITED TO: SUBSURFACE UTILITY LINES, OVERHEAD UTILITY LINES, UTILITY POLES, AND GUY WIRES.
- THE ACCESS ROAD SHALL BE REGRADED AND RESURFACED WITHIN THE LIMITS OF DISTURBANCE, AS SHOWN ON THE CONTRACT DRAWINGS. DAMAGE CAUSED BY THE CONTRACTOR TO THE ACCESS ROAD OUTSIDE OF THE LIMITS OF DISTURBANCE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
- NO TREES SHALL BE REMOVED UNLESS OTHERWISE DIRECTED IN THE FIELD BY THE ENGINEER OR CITY.

SURVEY NOTES

- SITE SURVEY, DATED AUGUST 2017, PREPARED BY COOPER AND ASSOCIATES SURVEYORS, PA (800 PINNER WEALD WAY, SUITE 201, CARY, NC 27513 (919) 469-1760).
- HORIZONTAL CONTROL REFERENCED TO NORTH CAROLINA STATE GRID (NAD83). VERTICAL CONTROL REFERENCED TO NAVD88.
- ONLY VISIBLE UTILITIES OBTAINED DURING SITE SURVEY. SUBSURFACE AND AERIAL UTILITY INFORMATION SHALL BE CONFIRMED AND / OR OBTAINED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- BOUNDARY SURVEY NOT CONDUCTED. EASEMENTS AND PROPERTY LINES SHOWN ON THE CONTRACT DRAWINGS OBTAINED FROM AVAILABLE GIS DATA AND SHALL BE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL VERIFY PROPERTY AND EASEMENT LINES PRIOR TO CONSTRUCTION.

ABBREVIATIONS

ABC	AGGREGATE BASE COURSE
BOT	BOTTOM
CL	CENTERLINE
DB	DRAIN BASIN
DET	DETAIL
DWG	DRAWING
E	EASTING
EG	EXISTING GRADE
EL	ELEVATION
EOG	EDGE OF GRAVEL
EQPT	EQUIPMENT
EX	EXISTING
FB	FILTER BAG
HDPE	HIGH DENSITY POLYETHYLENE PIPE
INV	INVERT
LF	LINEAR FEET
LOD	LIMIT OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
N	NORTHING
OC	ON CENTER
OHE	OVERHEAD ELECTRIC
P	PUMP
PID	PROPERTY IDENTIFICATION NUMBER
PT	POINT
RD	ROAD
REF	REFERENCE
ROP	ROCK OUTLET PROTECTION
SF	SILT FENCE
SL	SOIL LIFT
STA	STATION
TEMP	TEMPORARY
TPA	TEMPORARY PUMP AROUND
TRM	TURF REINFORCEMENT MAT
TYP	TYPICAL
UTIL	UTILITY
W/	WITH

EXISTING LEGEND

	PROPERTY LINE
	EASEMENT LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	GRAVEL ROAD
	CHAIN LINK FENCE
	STORM DRAIN PIPE
	OVERHEAD ELECTRIC
	RIPRAP
	SURVEY CONTROL POINT
	WATER VALVE
	UTILITY POLE
	GUY WIRE
	IRON PIPE

PROPOSED LEGEND

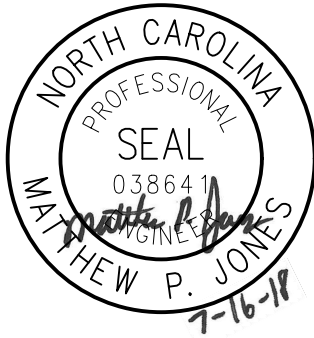
	LIMIT OF DISTURBANCE
	CANAL CENTERLINE
	STORM DRAIN PIPE
	DOUBLE LAYER SOIL LIFT
	GRAVEL ROAD / PARKING AREA
	GRASS SHOULDER
	GRASS ROADSIDE SWALE
	DRAIN BASIN

EROSION AND SEDIMENT CONTROL LEGEND

	SILT FENCE
	TEMPORARY PUMP AROUND
	CLEARWATER DIVERSION PIPE
	FILTER BAG
	LAYDOWN AREA
	PUMP
	ROCK OUTLET PROTECTION
	SAND BAG DIVERSION

				PROJECT ENGINEER: M. JONES
				DESIGNED BY: J. MCSWAIN / W. PRICE
				DRAWN BY: S. KANE
				CHECKED BY: T. SCHUELER
				IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE
1	ISSUED FOR BID	07-2018	MPJ	
REV	ISSUED FOR	DATE	BY	

ISSUED FOR BID



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CITY OF HAVELOCK, NORTH CAROLINA

McCOTTER CANAL
ACCESS ROAD STABILIZATION

CIVIL
GENERAL NOTES, LEGEND,
AND SHEET INDEX

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	G-02

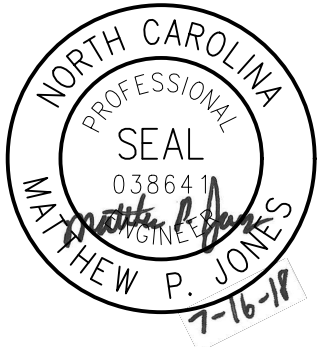


PLAN
SCALE: 1" = 400'

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				PROJECT ENGINEER:	M. JONES
				DESIGNED BY:	J. MCSWAIN / W. PRICE
				DRAWN BY:	S. KANE
				CHECKED BY:	T. SCHUELER
				IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
1	ISSUED FOR BID	07-2018	MPJ	0 1/2" 1"	
REV	ISSUED FOR	DATE	BY		

ISSUED FOR BID



Hazen

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RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CITY OF HAVELOCK, NORTH CAROLINA

McCOTTER CANAL
ACCESS ROAD STABILIZATION

CIVIL
OVERALL PLAN

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	G-03

NOTES

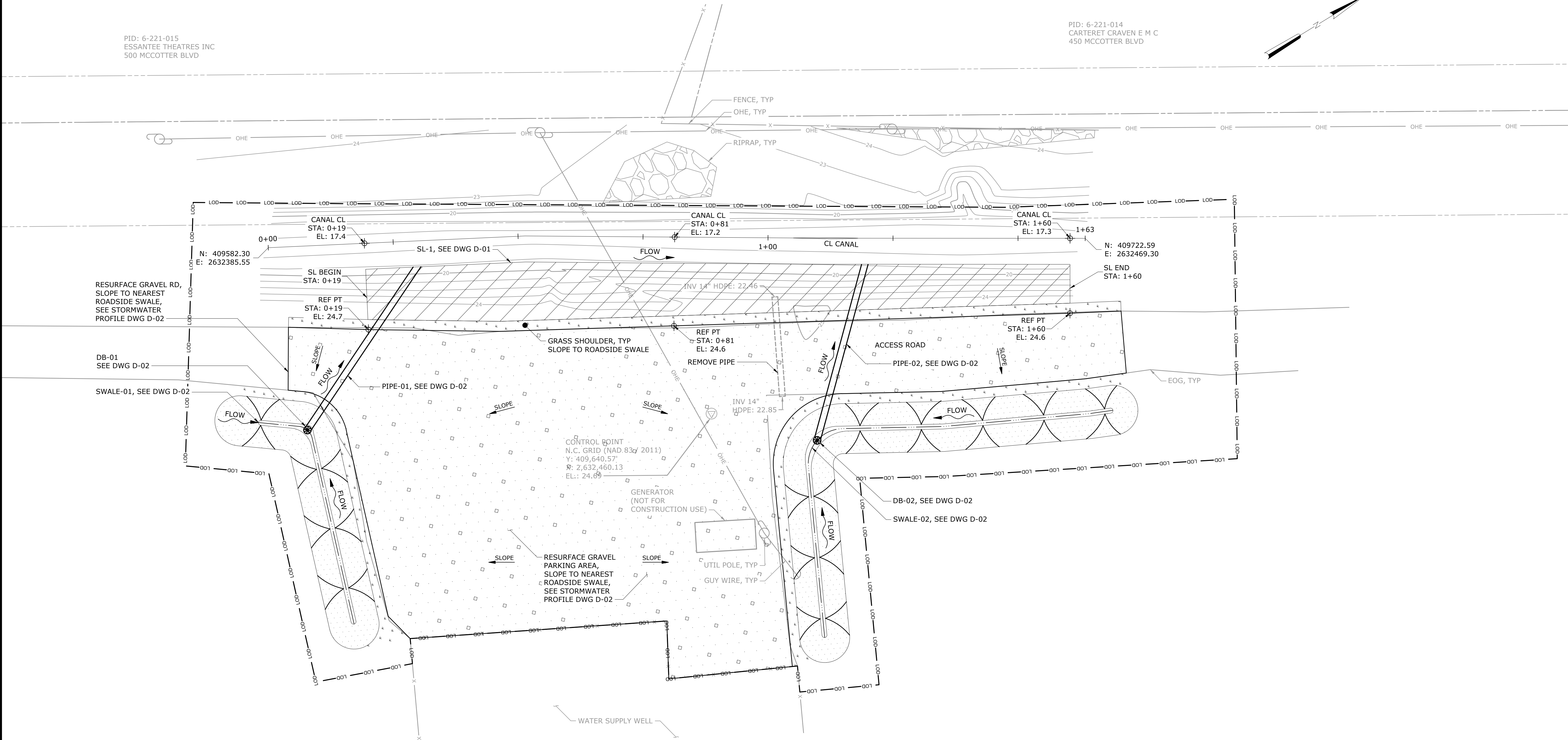
1.

THE CANAL CENTERLINE (CANAL CL) AND PROPOSED ROAD EDGE ON THE CANAL-SIDE OF THE ROAD (REF PT) ARE USED AS REFERENCE POINTS FOR CONSTRUCTION OF THE DOUBLE LAYER SOIL LIFT BANK STABILIZATION. SEE DETAILS ON DRAWING D-01. NOTE THAT PROVIDED ROAD EDGE ELEVATIONS ARE EXISTING ELEVATIONS AT THE PROPOSED ROAD EDGE LOCATION. ROAD EDGE ELEVATIONS ARE SUBJECT TO CHANGE AS A RESULT OF CONSTRUCTION.
2.

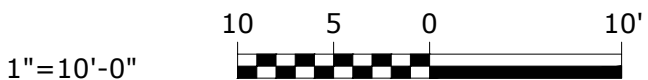
THE CANAL INVERT AND PROPOSED ROAD EDGE ON THE LANDWARD-SIDE OF THE ROAD ARE USED AS REFERENCE ELEVATIONS FOR CONSTRUCTION OF STORM DRAINAGE INFRASTRUCTURE AND ROADSIDE SWALES. SEE DETAILS ON DRAWING D-02
3.

THE PROPOSED ROADSIDE SWALE BOUNDARIES REPRESENT THE APPROXIMATE MAXIMUM EXTENTS OF SWALE GRADING. THE CONTRACTOR SHALL ADJUST GRADING TO ACCOMMODATE CONSTRAINTS SPECIFIC TO EACH WORK AREA. CONSTRAINTS INCLUDE BUT ARE NOT LIMITED TO: AVOIDANCE OF OPEN WATER, WETLANDS, UTILITIES, AND SIGNIFICANT EXCAVATIONS OF EXISTING EARTHEN BERMS. THE CONTRACTOR SHALL INCLUDE SWALE GRADING LIMITS IN THE PRE-CONSTRUCTON STAKE-OUT FOR APPROVAL BY THE ENGINEER.
4.

PROPOSED STORMWATER DRAINAGE ELEVATIONS SHALL BE CONSIDERED APPROXIMATE. CONSTRUCTION SHALL ADHERE TO THE MINIMUM DIMENSIONS AND STANDARDS PROVIDED ON DRAWING D-02.

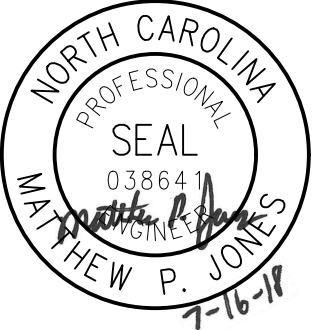


PLAN VIEW
1" = 10'



				PROJECT ENGINEER:	M. JONES
				DESIGNED BY:	J. MCSWAIN / W. PRICE
				DRAWN BY:	S. KANE
				CHECKED BY:	T. SCHUELER
1	ISSUED FOR BID	07-2018	MPJ	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
REV	ISSUED FOR	DATE	BY		

ISSUED FOR BID



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CITY OF HAVELOCK, NORTH CAROLINA

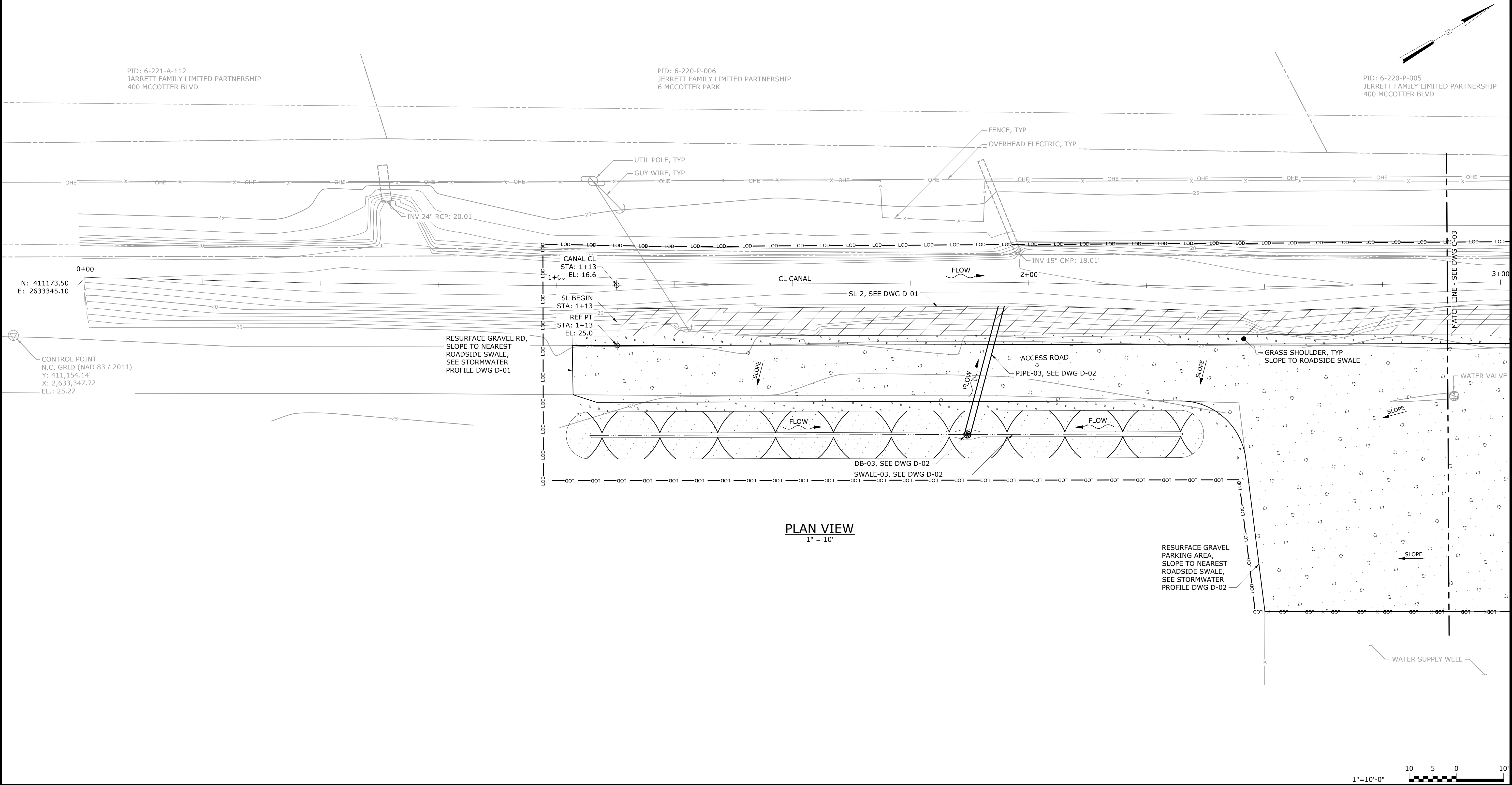
McCOTTER CANAL
ACCESS ROAD STABILIZATION

SITE PLANS
CIVIL
AREA 1

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	C-01

NOTE

SEE NOTES ON DRAWING C-01.



				PROJECT ENGINEER:	M. JONES
				DESIGNED BY:	J. MCSWAIN / W. PRICE
				DRAWN BY:	S. KANE
				CHECKED BY:	T. SCHUELER
1	ISSUED FOR BID	07-2018	MPJ	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
REV	ISSUED FOR	DATE	BY		

ISSUED FOR BID

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CITY OF HAVELOCK, NORTH CAROLINA

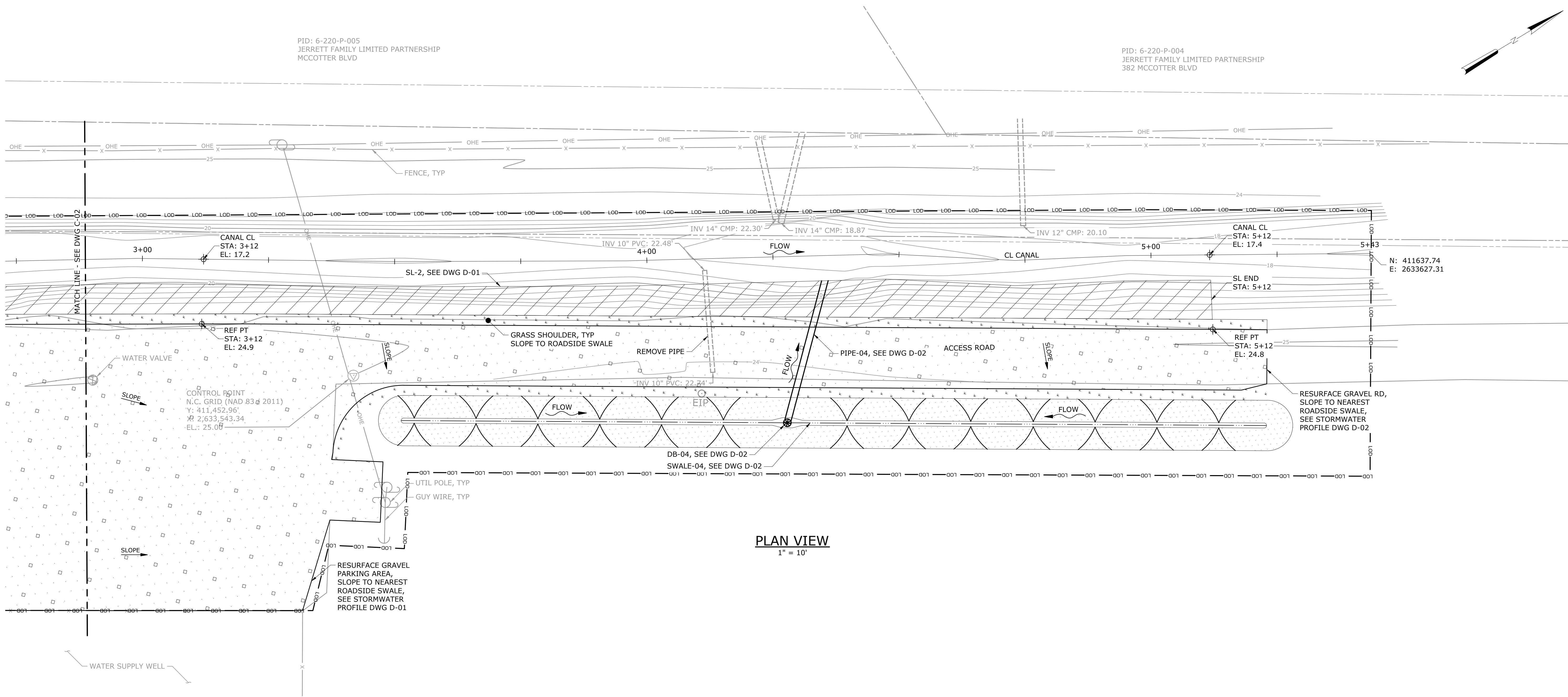
McCOTTER CANAL
ACCESS ROAD STABILIZATION

SITE PLANS
CIVIL
AREA 2 - 1 OF 2

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	C-02

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NOTE
SEE NOTES ON DRAWING C-01.



PLAN VIEW
1" = 10'



				PROJECT ENGINEER:	M. JONES
				DESIGNED BY:	J. MCSWAIN / W. PRICE
				DRAWN BY:	S. KANE
				CHECKED BY:	T. SCHUELER
				IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
1	ISSUED FOR BID	07-2018	MPJ	0 1/2" 1"	
REV	ISSUED FOR	DATE	BY		

ISSUED FOR BID



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4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

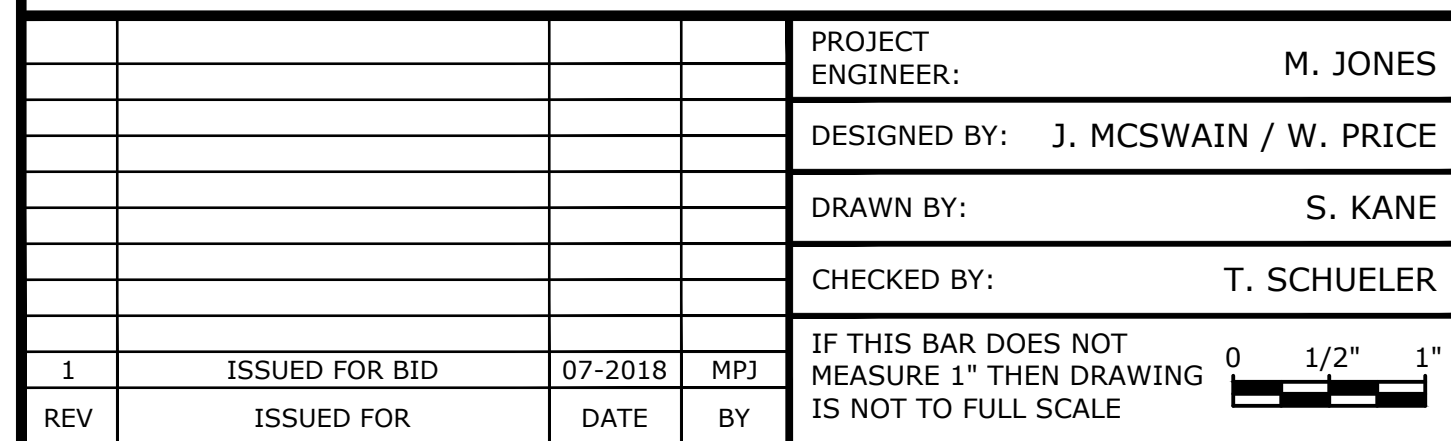
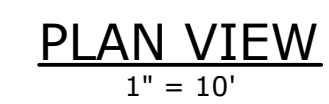
CITY OF HAVELOCK, NORTH CAROLINA

McCOTTER CANAL
ACCESS ROAD STABILIZATION

SITE PLANS
CIVIL
AREA 2 - 2 OF 2

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	C-03

SEE NOTES ON DRAWING C-01.

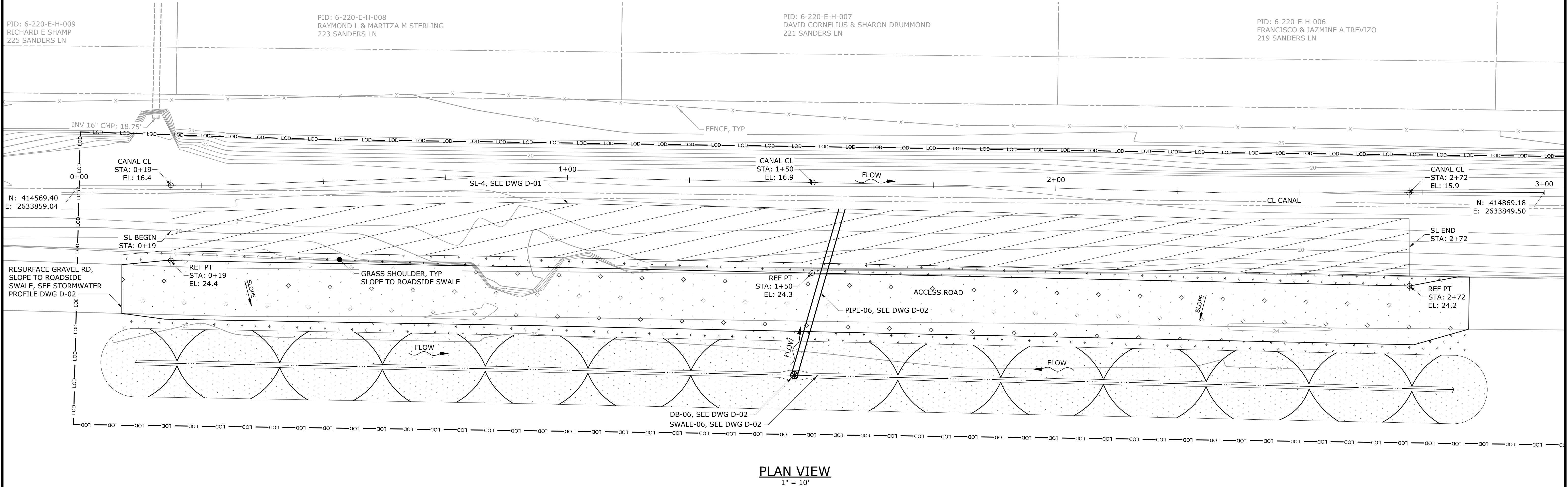


HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

McCOTTER CANAL
ACCESS ROAD STABILIZATION

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	C-04

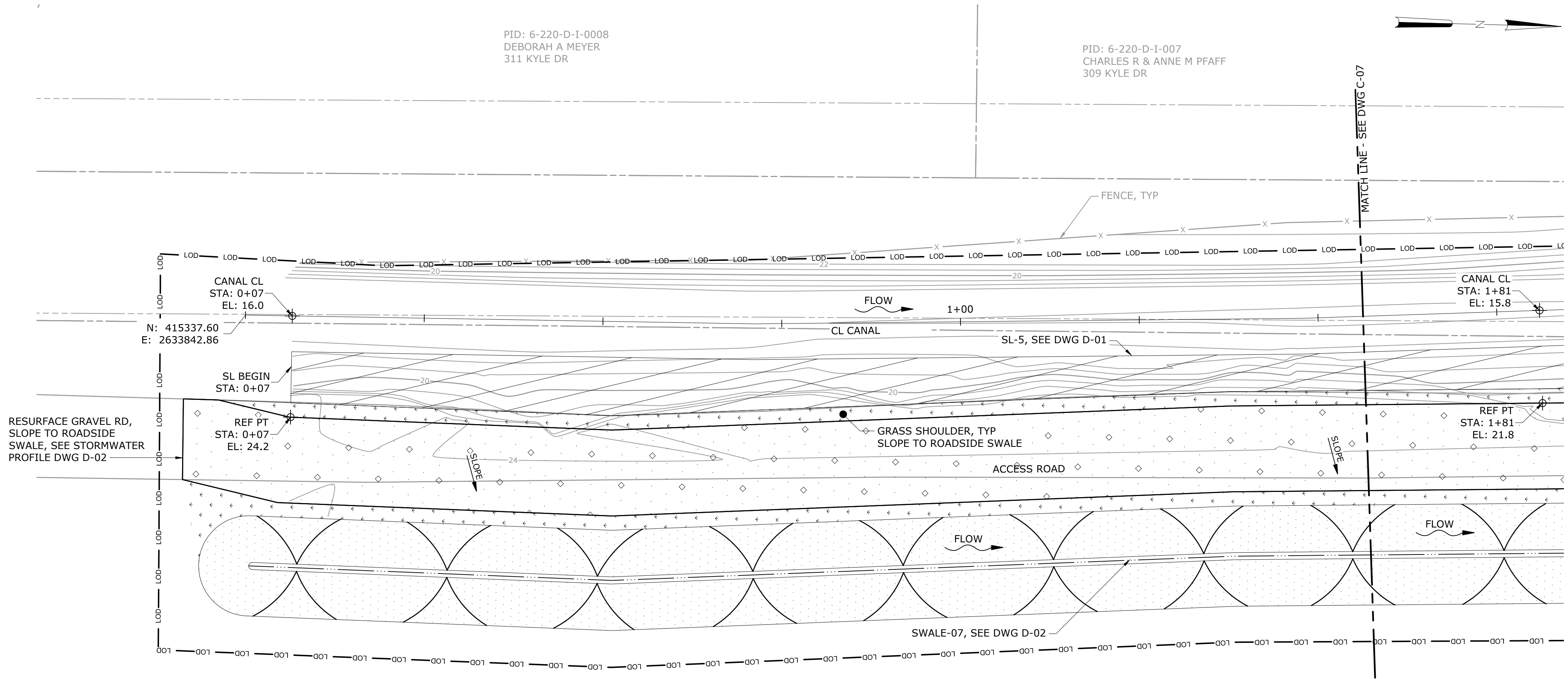
NOTE
SEE NOTES ON DRAWING C-01.



PLAN VIEW
1" = 10'



					PROJECT ENGINEER: M. JONES	ISSUED FOR BID		Hazen HAZEN AND SAWYER 4011 WESTCHASE BOULEVARD, SUITE 500 RALEIGH, NORTH CAROLINA 27607 LICENSE NO. : C-0381	CITY OF HAVELOCK, NORTH CAROLINA	SITE PLANS CIVIL AREA 4	DATE: JULY 2018
					DESIGNED BY: J. MCSWAIN / W. PRICE						HAZEN NO.: 30906
					DRAWN BY: S. KANE				CONTRACT NO.: 004		
					CHECKED BY: T. SCHUELER				DRAWING NUMBER: C-05		
1	ISSUED FOR BID	07-2018	MPJ	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE							
REV	ISSUED FOR	DATE	BY								



PLAN VIEW
1" = 10'

				PROJECT ENGINEER:	M. JONES
				DESIGNED BY:	J. MCSWAIN / W. PRICE
				DRAWN BY:	S. KANE
				CHECKED BY:	T. SCHUELER
				IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
1	ISSUED FOR BID	07-2018	MPJ	0 1/2" 1"	
REV	ISSUED FOR	DATE	BY		

ISSUED FOR BID



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

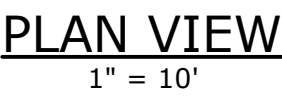
CITY OF HAVELOCK, NORTH CAROLINA

McCOTTER CANAL
ACCESS ROAD STABILIZATION

SITE PLANS
CIVIL
AREA 5 - 1 OF 2

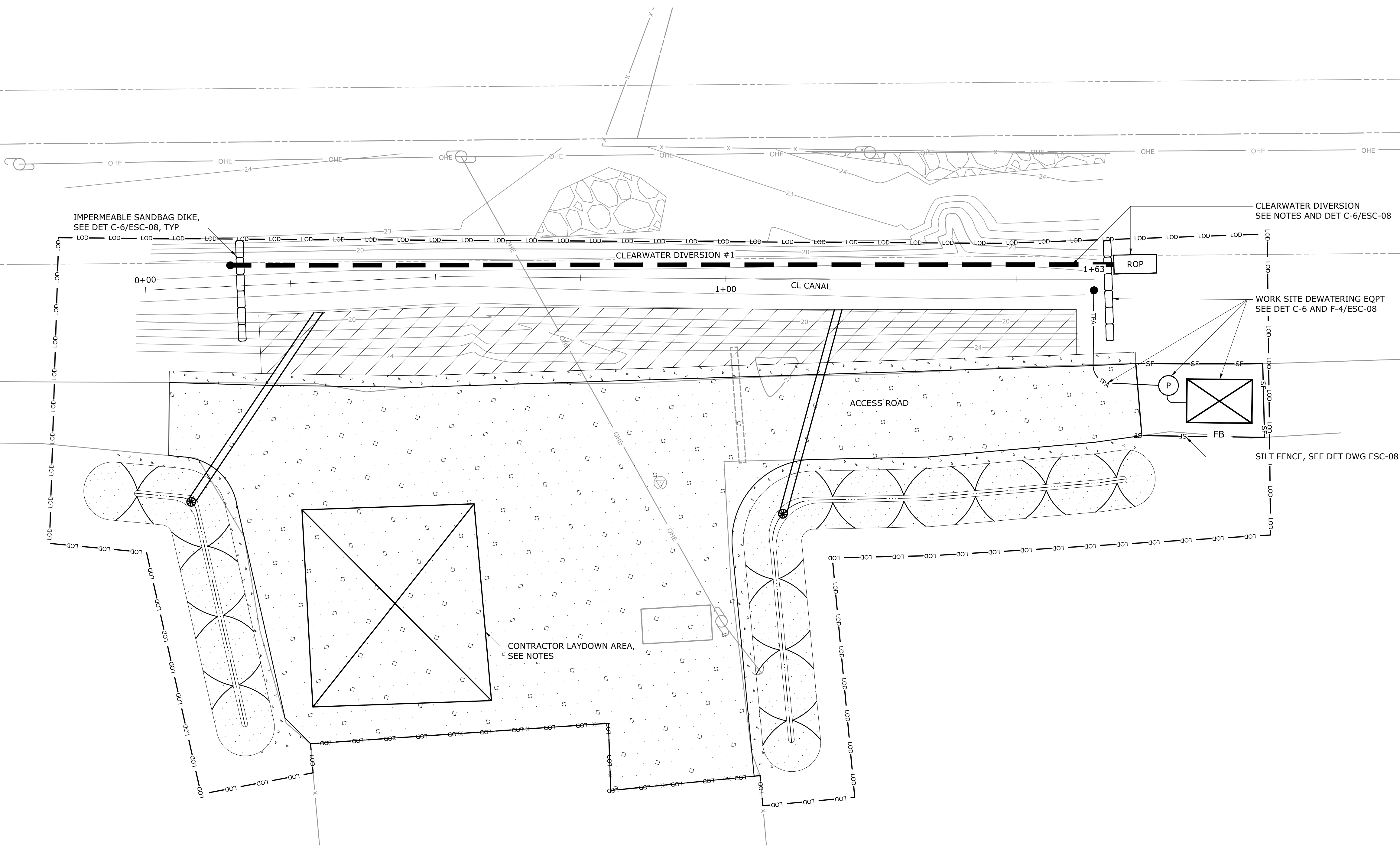
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HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	C-06

SEE NOTES ON DRAWING C-01.



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- NOTES
- SEE EROSION AND SEDIMENT CONTROL, CONTROL OF WATER, CONSTRUCTION SEQUENCE, AND SEEDING NOTES AND DETAILS ON DRAWING ESC-08.
 - CLEARWATER DIVERSION PIPES SHALL BE 18" MINIMUM. PUMPING OF CLEARWATER DIVERSION MAY BE REQUIRED.
 - THE CONTRACTOR SHALL NOT BLOCK ACCESS TO THE WELL, GENERATOR, ETC.
 - INSTALL PERIMETER SILT FENCING AS SHOWN AND AROUND ERODIBLE STOCKPILED MATERIALS IF UNDISTURBED FOR MORE THAN 14 CALENDAR DAYS.



AREA 1 DISTURBED AREA = 0.35 AC

PLAN VIEW
1" = 10'

				PROJECT ENGINEER:	M. JONES
				DESIGNED BY:	J. MCSWAIN / W. PRICE
				DRAWN BY:	S. KANE
				CHECKED BY:	T. SCHUELER
				IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
1	ISSUED FOR BID	07-2018	MPJ	0 1/2" 1"	
REV	ISSUED FOR	DATE	BY		

ISSUED FOR BID



Hazen

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4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

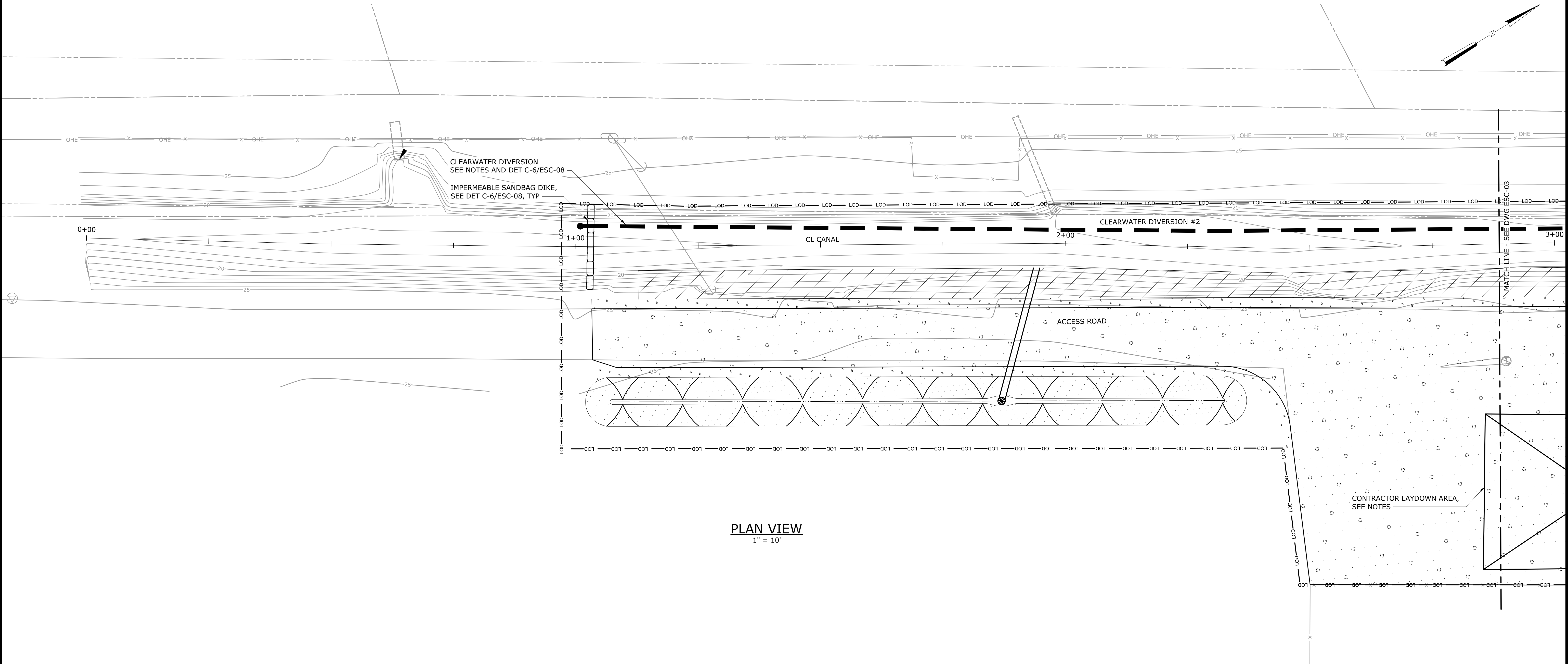
CITY OF HAVELOCK, NORTH CAROLINA

McCOTTER CANAL
ACCESS ROAD STABILIZATION

EROSION & SEDIMENT CONTROL
PLANS
CIVIL
AREA 1

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	ESC-01

NOTE
SEE NOTES ON DRAWING ESC-01.



PLAN VIEW
1" = 10'

AREA 2 DISTURBED AREA = 0.59 AC

				PROJECT ENGINEER:	M. JONES
				DESIGNED BY:	J. MCSWAIN / W. PRICE
				DRAWN BY:	S. KANE
				CHECKED BY:	T. SCHUELER
1	ISSUED FOR BID	07-2018	MPJ	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
REV	ISSUED FOR	DATE	BY		

ISSUED FOR BID



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

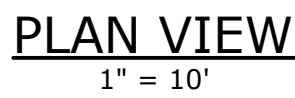
CITY OF HAVELOCK, NORTH CAROLINA

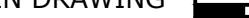
McCOTTER CANAL
ACCESS ROAD STABILIZATION

EROSION & SEDIMENT CONTROL
PLANS
CIVIL
AREA 2 - 1 OF 2

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	ESC-02

SEE NOTES ON DRAWING ESC-01.



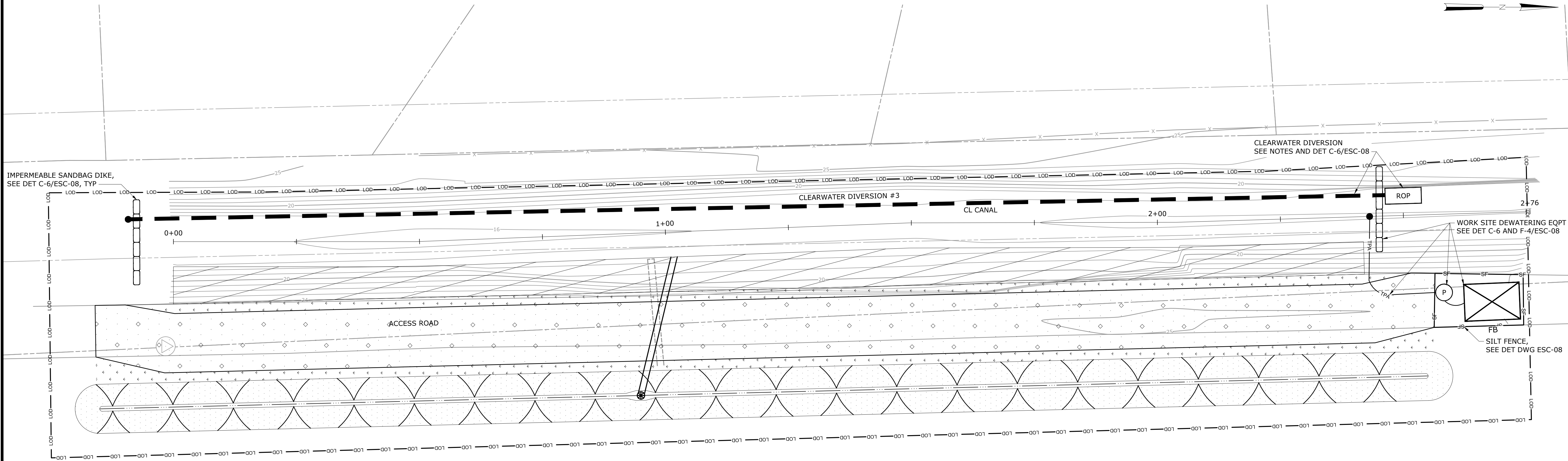
				PROJECT ENGINEER:	M. JONES
				DESIGNED BY:	J. MCSWAIN / W. PRICE
				DRAWN BY:	S. KANE
				CHECKED BY:	T. SCHUELER
1	ISSUED FOR BID	07-2018	MPJ	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
REV	ISSUED FOR	DATE	BY		

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

McCOTTER CANAL ACCESS ROAD STABILIZATION

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	ESC-03

NOTE
SEE NOTES ON DRAWING ESC-01.

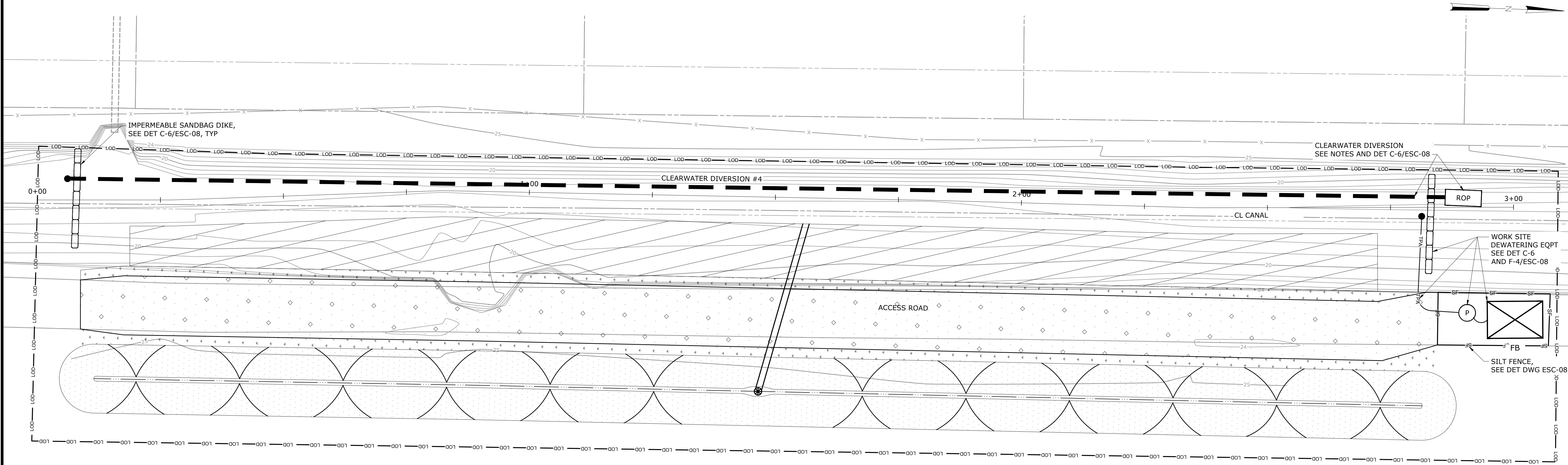


PLAN VIEW
1" = 10'

AREA 3 DISTURBED AREA = 0.36 AC

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NOTE
SEE NOTES ON DRAWING ESC-01.



PLAN VIEW
1" = 10'

AREA 4 DISTURBED AREA = 0.42 AC

				PROJECT ENGINEER:	M. JONES
				DESIGNED BY:	J. MCSWAIN / W. PRICE
				DRAWN BY:	S. KANE
				CHECKED BY:	T. SCHUELER
1	ISSUED FOR BID	07-2018	MPJ	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
REV	ISSUED FOR	DATE	BY		

ISSUED FOR BID



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

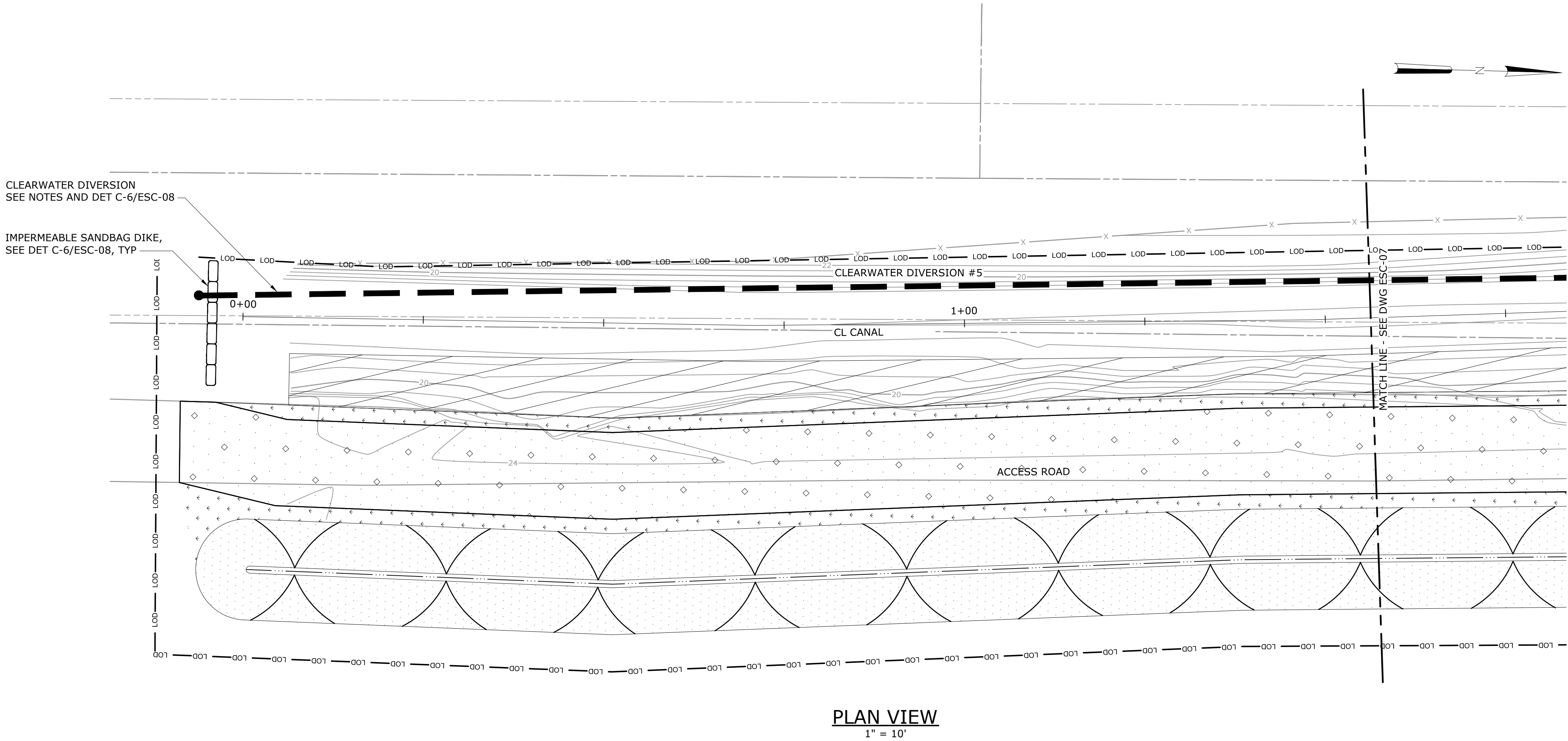
CITY OF HAVELOCK, NORTH CAROLINA

McCOTTER CANAL
ACCESS ROAD STABILIZATION

EROSION & SEDIMENT CONTROL
PLANS
CIVIL
AREA 4

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	ESC-05

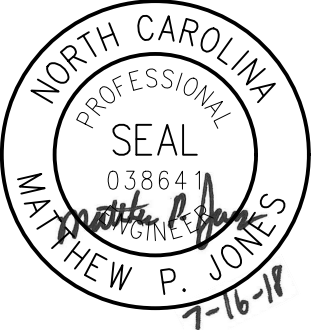
NOTE
SEE NOTES ON DRAWING ESC-01.



AREA 5 DISTURBED AREA = 0.64 AC

				PROJECT ENGINEER:	M. JONES
				DESIGNED BY:	J. MCSWAIN / W. PRICE
				DRAWN BY:	S. KANE
				CHECKED BY:	T. SCHUELER
				IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
1	ISSUED FOR BID	07-2018	MPJ	0 1/2" 1"	
REV	ISSUED FOR	DATE	BY		

ISSUED FOR BID



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

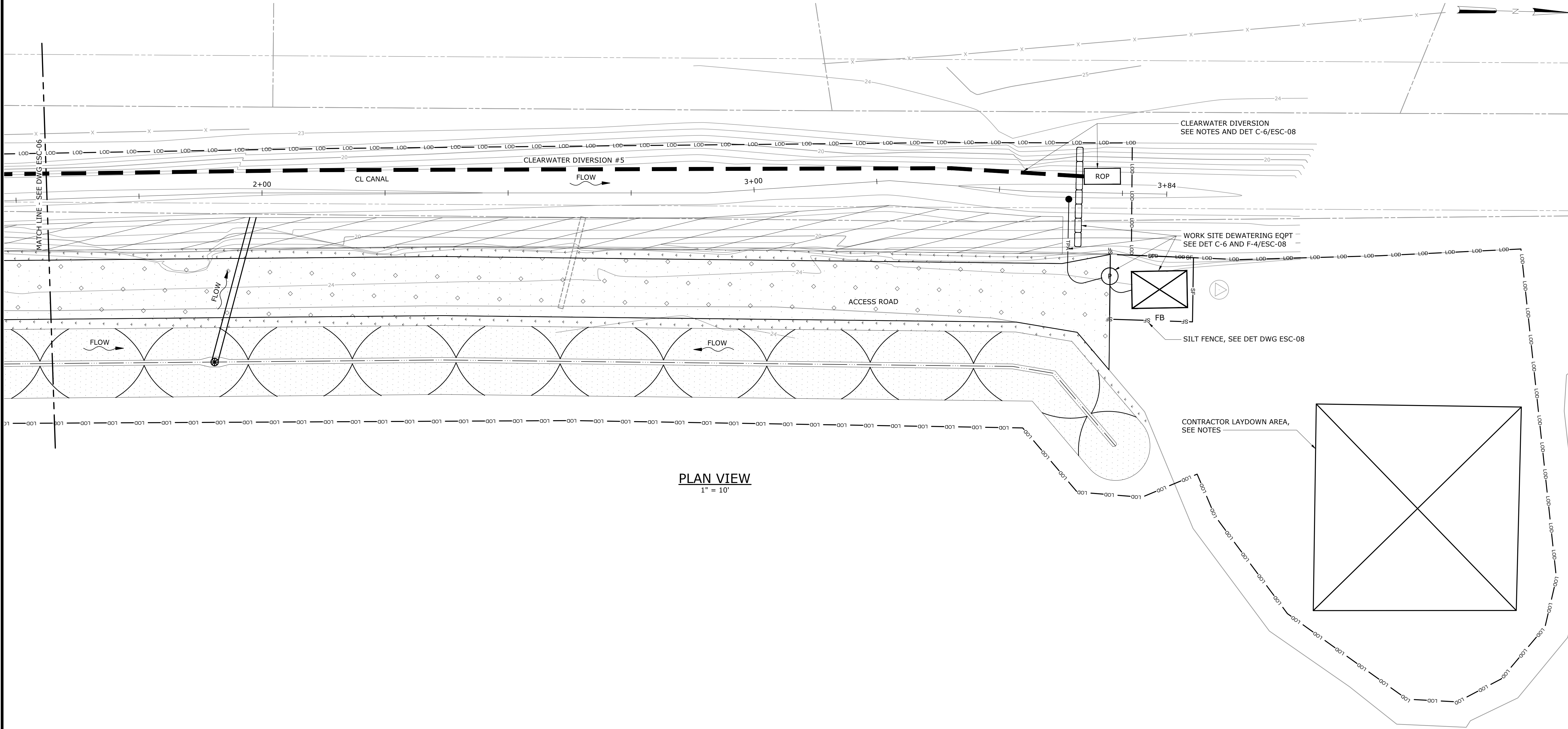
CITY OF HAVELOCK, NORTH CAROLINA

McCOTTER CANAL
ACCESS ROAD STABILIZATION

EROSION & SEDIMENT CONTROL
PLANS
CIVIL
AREA 5 - 1 OF 2

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	ESC-06

NOTE
SEE NOTES ON DRAWING ESC-01.



PLAN VIEW
1" = 10'

AREA 5 DISTURBED AREA = 0.64 AC

				PROJECT ENGINEER:	M. JONES
				DESIGNED BY:	J. MCSWAIN / W. PRICE
				DRAWN BY:	S. KANE
				CHECKED BY:	T. SCHUELER
1	ISSUED FOR BID	07-2018	MPJ	IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
REV	ISSUED FOR	DATE	BY		

ISSUED FOR BID



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CITY OF HAVELOCK, NORTH CAROLINA

McCOTTER CANAL
ACCESS ROAD STABILIZATION

EROSION & SEDIMENT CONTROL
PLANS
CIVIL
AREA 5 - 2 OF 2

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	ESC-07

EROSION & SEDIMENTATION CONTROL NOTES

1. THE CONTRACTOR SHALL PHASE CONSTRUCTION TO MINIMIZE EXPOSED SOIL AREAS THROUGHOUT THE PROJECT.
2. ALL ONSITE ACTIVITIES SHALL BE MANAGED TO ENSURE NO ADVERSE IMPACTS TO WATER QUALITY OCCUR DURING AND AFTER CONSTRUCTION.
3. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY EROSION CONTROL MEASURES WHETHER OR NOT SHOWN ON THE PLANS TO PROTECT ADJACENT CREEKS, RIVERS, ROADWAYS, ETC FROM SILTATION AND EROSION.
4. EACH EROSION AND SEDIMENTATION CONTROL MEASURE SHALL BE INSPECTED ON A WEEKLY BASIS AND WITHIN 24 HOURS FOLLOWING A STORM EVENT GREATER THAN ONE INCH. EACH MEASURE SHALL BE MAINTAINED AS REQUIRED TO ENSURE PROPER FUNCTIONING OF THE MEASURE.
5. ALL PIPE WORK SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD CONSTRUCTION TECHNIQUES. ONLY THE LENGTH OF TRENCH IN WHICH PIPE CAN BE INSTALLED IN ONE DAY'S TIME SHALL BE OPEN AT ANY TIME, WITH SPOIL MATERIAL PLACED ON THE UPHILL SIDE OF THE TRENCH. PIPING SHALL BE CAPPED AT THE END OF EACH WORK DAY TO PREVENT SEDIMENT FROM ENTERING PIPE. TRENCH SHALL BE BACKFILLED AT THE END OF EACH WORK DAY AND DISTURBED AREA SEEDED WITH TEMPORARY OR PERMANENT SEEDING MEASURES, AS APPROPRIATE.
6. ALL EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE, PERMANENT VEGETATION IS ESTABLISHED ON ALL DISTURBED AREAS, AND APPROVAL BY THE ENGINEER IS GIVEN. AREAS WHERE EROSION AND SEDIMENTATION CONTROL MEASURES ARE REMOVED SHALL BE REGRADED AND SEEDED TO MATCH ORIGINAL SITE CONDITIONS.

EROSION & SEDIMENTATION CONTROL CONSTRUCTION SEQUENCING NOTES

1. NO CONSTRUCTION OR LAND DISTURBANCE ACTIVITIES SHALL BEGIN UNTIL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED. CONTRACTOR SHALL INSTALL SILT FENCE AS SHOWN ON THE DRAWING FOR TEMPORARY PERIMETER EROSION CONTROL.
2. ONCE ALL SILT FENCE HAS BEEN INSTALLED ALL CONSTRUCTION ACTIVITIES MAY THEN BEGIN.
3. TEMPORARY SEEDING MEASURES SHALL BE EMPLOYED THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES ON ANY AREA WHICH WILL REMAIN UNDISTURBED FOR MORE THAN 7 WORKING DAYS OR 14 CALENDAR DAYS, WHICHEVER IS SHORTER. ALL SLOPES STEEPER THAN 3H:1V SHALL BE PLANTED OR OTHERWISE PROVIDED WITH TEMPORARY OR PERMANENT GROUND COVER, DEVICES, OR STRUCTURES SUFFICIENT TO RESTRAIN EROSION WITHIN 7 CALENDAR DAYS. ALL OTHER SLOPES OF 3H:1V OR FLATTER, EXCEPT THOSE GREATER THAN 50 FT IN LENGTH, SHALL BE PROVIDED WITH TEMPORARY OR PERMANENT GROUND COVER, DEVICES, OR OTHER STRUCTURES SUFFICIENT TO RESTRAIN EROSION WITHIN 14 CALENDAR DAYS.
4. PERMANENT SEEDING SHALL BE IMMEDIATELY INSTALLED, FOR ALL AREAS REACHING FINAL GRADE WHICH WILL NOT BE DISTURBED AGAIN.
5. UPON COMPLETION OF FINAL GRADING, PERMANENT STRUCTURAL OR VEGETATIVE STABILIZATION SHALL BE ESTABLISHED.
6. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES AND THE SITE HAS BEEN PERMANENTLY STABILIZED WITH STRUCTURAL AND/OR PERMANENT VEGETATIVE MEASURES.
7. CONTRACTOR SHALL PERFORM SITE INSPECTION AND MAINTENANCE ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 1/2 INCH OF RAIN PER 24 HOUR PERIOD.
8. ONCE PERMANENT STABILIZATION HAS OCCURRED, TEMPORARY SEDIMENT CONTROL MEASURES MAY BE REMOVED UPON APPROVAL FROM THE CITY. ANY AREAS DISTURBED BY THE REMOVAL OF EROSION CONTROL MEASURES SHALL BE RETURNED TO THE ORIGINAL, OR BETTER, CONDITION, THEN SEEDED, MULCHED, AND FERTILIZED.
9. THE NORTH CAROLINA SEDIMENTATION POLLUTION CONTROL ACT REQUIRES PEOPLE RESPONSIBLE FOR LAND DISTURBING ACTIVITIES TO INSPECT EROSION AND SEDIMENTATION CONTROL MEASURES AFTER EACH PHASE OF THE PROJECT UNTIL PERMANENT GROUND COVER IS ESTABLISHED. THE SELF INSPECTION PROGRAM IS SEPARATE FROM THE WEEKLY MONITORING PROGRAM OF THE NPDES STORMWATER PERMIT FOR CONSTRUCTION ACTIVITIES. THE FOCUS OF THE SELF-INSPECTION REPORT IS TO ENSURE THE INSTALLATION OF EROSION AND SEDIMENTATION CONTROL MEASURES ARE CONTINUALLY PERFORMING AS INTENDED.

CONTROL OF WATER NOTES

1. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL EQUIPMENT, SUPPLIES, AND MATERIALS NECESSARY FOR THE CONTROL OF WATER, INCLUDING BUT NOT LIMITED TO: PUMPS, HOSE, SANDBAGS, DEWATERING DEVICES.
2. THE CONTRACTOR SHALL IMPLEMENT A CLEARWATER DIVERSION PLAN TO TEMPORARILY BYPASS FLOWS AROUND WORK AREAS. PUMPING MAY BE REQUIRED TO BYPASS FLOWS.
3. THE CONTRACTOR SHALL IMPLEMENT A WORK SITE DEWATERING PLAN TO DEWATER WORK AREAS AND TREAT WATER COLLECTED FROM DISTURBED AREAS. FLOWS COLLECTED FROM DISTURBED AREAS SHALL BE TREATED WITH AN APPROVED SEDIMENT CONTROL DEVICE PRIOR TO DISCHARGE.
4. ALL PUMPED FLOWS SHALL BE DISCHARGED IN A NON-EROSIVE MANNER TO A STABILIZED WATERCOURSE.
5. THE CONTRACTOR SHALL REMOVE OR MODIFY SANDBAG DIKES OR OTHER WATER CONTROL BARRIERS PRIOR TO FORECASTED RAIN EVENTS TO ALLOW FLOW THROUGH THE CANAL AS NEEDED TO MAINTAIN UPSTREAM FLOW WITHIN CANAL BANKS.
6. THE CONTRACTOR SHALL REMOVE CONSTRUCTION EQUIPMENT FROM THE CANAL AT THE END OF EACH WORK DAY AND PRIOR TO FORECASTED RAIN EVENTS. THE CITY IS NOT RESPONSIBLE FOR DAMAGE TO CONSTRUCTION EQUIPMENT.

SEEDING NOTES

SEED BED PREPARATION

1. CONTRACTOR SHALL PREPARE ALL AREAS TO RECEIVE TEMPORARY OR PERMANENT SEEDING MEASURES PRIOR TO PLANTING.
2. TOPSOIL SHALL BE PLACED IN AREAS TO BE SEEDED AND ROUGHENED WITH TRACKED EQUIPMENT OR OTHER SUITABLE MEASURES. SLOPES STEEPER THAN 3:1 MAY BE ROUGHENED BY GROOVING, FURROWING, TRACKING, OR STAIRSTEP GRADING. SLOPES FLATTER THAN 3:1 SHOULD BE GROOVED BY DISKING, HARROWING, RAKING, OPERATING PLANTING EQUIPMENT ON THE CONTOUR.
3. SOIL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, LIME AND FERTILIZER SHALL BE SPREAD AS NECESSARY, AND AT THE RATES SHOWN IN THE SEEDING SCHEDULE. SEEDING SHALL BE PER TYPE AND RATES SHOWN IN THE SEEDING SCHEDULE. SEED SHALL BE BROADCAST AS SOON AS POSSIBLE FOLLOWING ROUGHENING, BEFORE SURFACE HAS BEEN SEALED BY RAINFALL.

MULCHING AND TACKING AGENTS

1. MULCH MUST COVER A MINIMUM OF 80 PERCENT OF THE SOIL SURFACE AND MUST BE SECURED BY TACKING, CRIMPING, OR NETTING.
2. WOOD CELLULOSE FIBER MULCH SHALL BE USED IN HYDROSEEDING GRASS SEED IN COMBINATION WITH FERTILIZERS AND OTHER APPROVED ADDITIONS.
3. NO NETTING WITH PLASTIC MESH AND / OR PLASTIC TWINE SHALL BE USED IN WETLAND AND RIPARIAN BUFFERS TO PROTECT SMALL ANIMALS.

HYDROSEEDING

1. HYDROSEEDING SHALL BE CARRIED OUT IN THREE STEPS. STEP ONE SHALL CONSIST OF THE APPLICATION OF LIME. IN STEP TWO THE SEED MIXTURE SHALL BE MIXED WITH THE FERTILIZER, WOOD CELLULOSE FIBER MULCH, AND ANY REQUIRED INOCULANTS AND APPLIED TO THE SEED BED. STEP THREE SHALL CONSIST OF APPLICATION OF TOP DRESSING DURING THE FIRST SPRING OR FALL, WHICHEVER COMES FIRST, AFTER STEP TWO.
2. INGREDIENTS FOR THE MIXTURE AND STEPS SHOULD BE DUMPED INTO A TANK OF WATER AND THOROUGHLY MIXED TO A HOMOGENEOUS SLURRY AND SPRAYED OUT UNDER A MINIMUM OF 300-350 POUNDS PRESSURE, IN SUITABLE PROPORTIONS TO ACCOMMODATE THE TYPE AND CAPACITY OF THE HYDRAULIC MACHINE TO BE USED. APPLICATIONS SHALL BE EVENLY SPRAYED OVER THE GROUND SURFACE. THE CONTRACTOR SHALL FREE THE TOPSOIL OF STONES, ROOTS, RUBBISH AND OTHER DELETERIOUS MATERIALS AND DISPOSE OF SAME OFF THE SITE. THE BARE SOIL, EXCEPT EXISTING STEEP EMBANKMENT AREA, SHALL BE ROUGH RAKED TO REMOVE STONES, ROOTS, AND RUBBISH OVER 4-INCH IN SIZE, AND OTHER DELETERIOUS MATERIALS AND DISPOSE OF SAME OFF THE SITE.
3. NO SEEDING SHOULD BE UNDERTAKEN IN WINDY OR UNFAVORABLE WEATHER, WHEN THE GROUND IS TOO WET TO RAKE EASILY, WHEN IT IS IN A FROZEN CONDITIONS, OR TOO DRY. ANY BARE SPOTS SHOWN IN TWO TO THREE WEEKS SHALL BE RE-CULTIVATED, FERTILIZED AT HALF THE RATE, RAKED, SEEDED, AND MULCHED AGAIN BY MECHANICAL OR HAND BROADCAST METHOD ACCEPTABLE TO THE OWNER.

TEMPORARY SEEDING SCHEDULE:

SPECIES	RATE (LB/AC)	SEEDING DATES
GERMAN MILLET	40	SUMMER: APRIL 15TH - AUGUST 15TH
RYE (GRAIN)	120	FALL: AUGUST 15TH - DECEMBER 30TH (SEE NOTE 1)
RYE (GRAIN)	120	WINTER: JANUARY 1ST - APRIL 15TH

NOTES:

1. TOP DRESS WITH 50 LB/AC NITROGEN IN MARCH.
2. APPLY 2,000 LB/AC GROUND AGRICULTURAL LIMESTONE AND 750 - 1,000 LB/AC 10-10-10 FERTILIZER. APPLICATION RATES AND CHEMICAL ANALYSIS SHALL BE CONFIRMED OR ESTABLISHED BY SOIL TEST.
3. APPLY 4,000 LB/AC SMALL GRAIN STRAW MULCH.
4. TACK MULCH BY APPLYING ASPHALT TACK AT A RATE OF 0.10 GAL/YR² (10 GAL/1,000 FT²).
5. RE-FERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, RE-FERTILIZE, AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER VISIBLE SIGNS OF DAMAGE.

PERMANENT SEEDING SCHEDULE:

SPECIES	RATE (LB/AC)	SEEDING DATES
BERMUDA GRASS	25	APRIL 1ST - JULY 15TH
GERMAN MILLET	10	ADD BETWEEN APRIL 15TH AND AUGUST 15TH
RYE (GRAIN)	40	ADD BETWEEN AUGUST 15TH AND APRIL 15TH

NOTES:

1. APPLY LIME AND FERTILIZER ACCORDING TO SOIL TESTS, OR APPLY 4,000 LB/AC GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/AC 10-10-10 FERTILIZER.
2. LIME AND FERTILIZER ARE TO BE DISKED INTO THE SOIL SURFACE TO A MINIMUM DEPTH OF 4 INCHES.
3. APPLY 4,000 LB/AC GRAIN STRAW OR EQUIVALENT COVER OF ANOTHER SUITABLE MULCH.
4. ANCHOR BY TACKING WITH ASPHALT (0.10 GAL/YD²), ROVING, OR NETTING OR BY CRIMPING WITH A MULCH ANCHORING TOOL.
5. RESEED, FERTILIZE, AND MULCH DAMAGED AREAS IMMEDIATELY

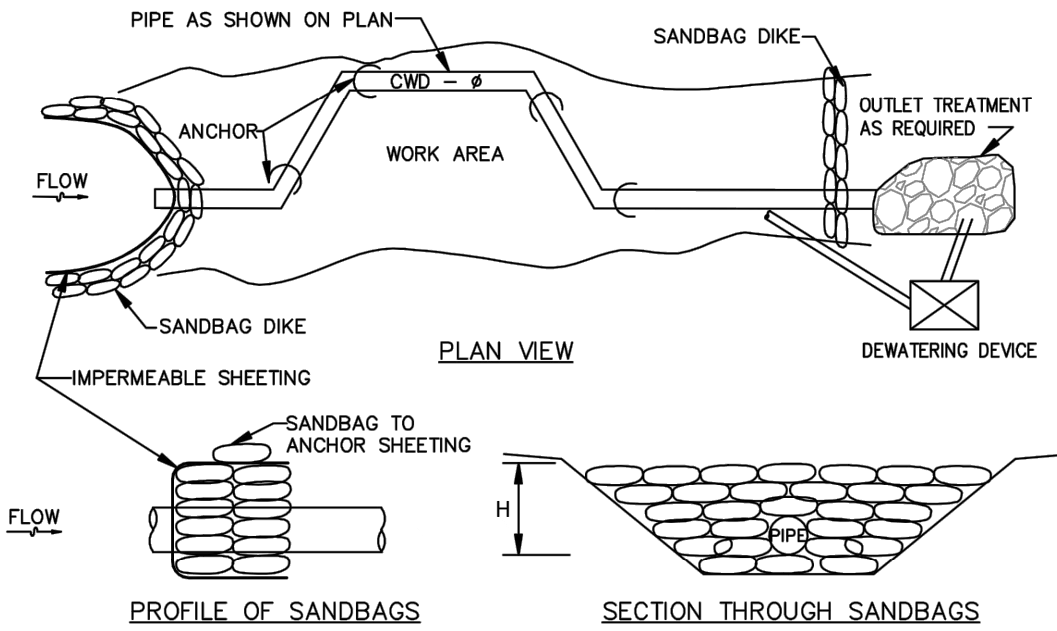
NPDES Stormwater Discharge Permit for Construction Activities (NC0301)

NCDENR/Division of Water Quality

NEW STABILIZATION TIMEFRAMES (Effective Aug. 3, 2011)		
SITE AREA DESCRIPTION	STABILIZATION	TIMEFRAME EXCEPTIONS
Perimeter dikes, swales, ditches, slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

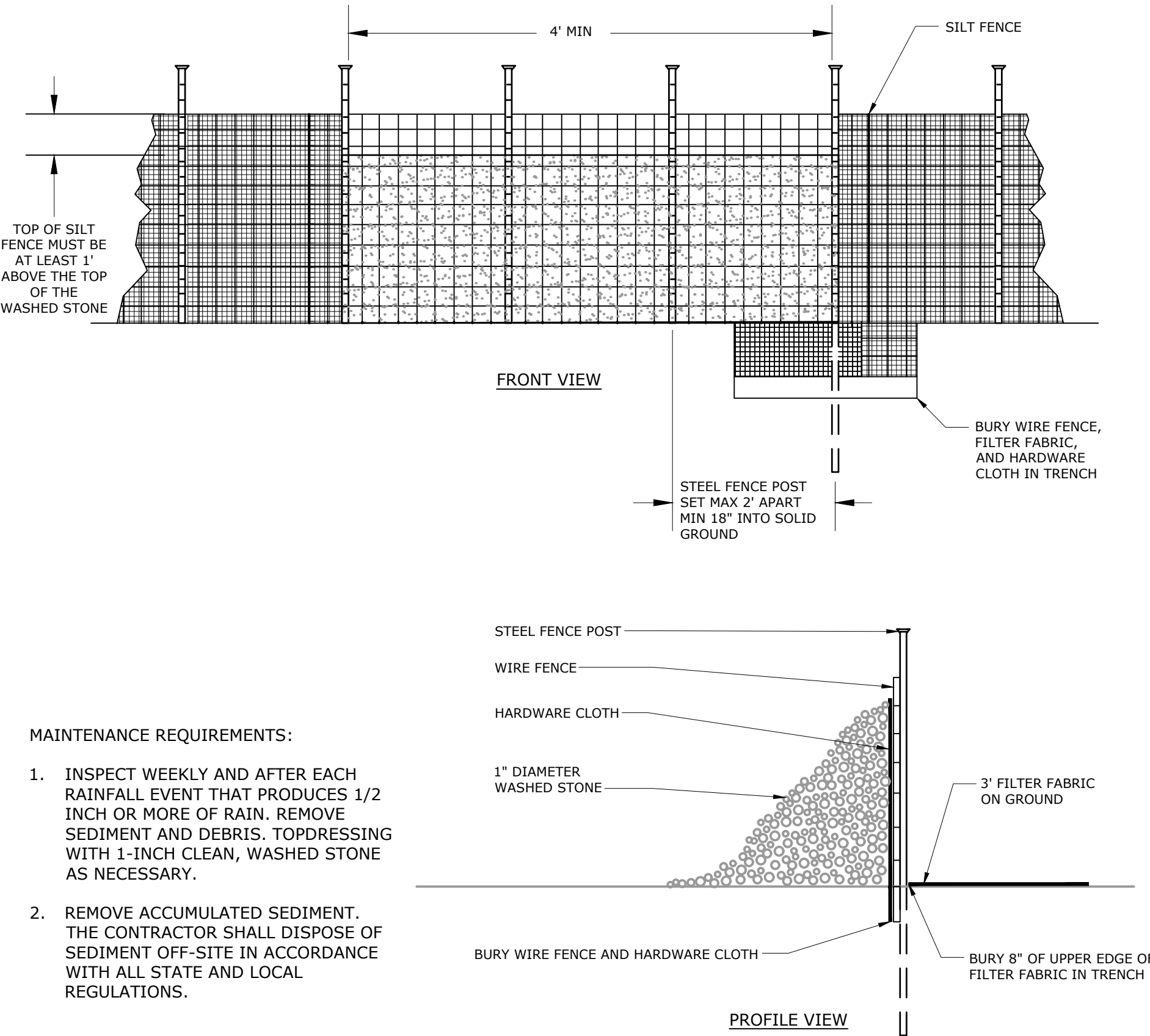
DETAIL C-6 CLEAR WATER DIVERSION PIPE

STANDARD SYMBOL
CWD - 12
DESIGNATION CWD-12 REFERS TO 12 INCH CLEAR WATER DIVERSION.



CONSTRUCTION SPECIFICATIONS

1. FLEXIBLE PIPE IS PREFERRED, HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. MAKE ALL JOINTS WATERTIGHT.
2. FOR SANDBAGS USE MATERIALS THAT ARE RESISTANT TO ULTRA-VIOLENT RADIATION, TEARING, AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL.
3. USE 10 MIL OR THICKER, UV RESISTANT, IMPERMEABLE SHEETING OR OTHER APPROVED MATERIAL THAT IS IMPERMEABLE AND RESISTANT TO PUNCTURING AND TEARING.
4. PLACE IMPERMEABLE SHEETING SUCH THAT UPGRADE PORTION OVERLAPS DOWNGRADE PORTION BY A MINIMUM OF 18 INCHES.
5. SET SANDBAG DIKE AT A TYPICAL HEIGHT OF 4 FEET. MAINTAIN HEIGHT ALONG LENGTH OF SANDBAG DIKE. PLACE DOUBLE ROW OF SANDBAGS.
6. AT A MINIMUM, SECURELY ANCHOR DIVERSION PIPE AT EACH DOWNGRADE JOINT.
7. SET OUTLET END OF DIVERSION PIPE LOWER THAN INLET END.
8. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
9. DEWATER WORK AREA USING AN APPROVED EROSION AND SEDIMENT CONTROL PRACTICE AS SPECIFIED ON APPROVED PLAN.
10. KEEP POINT OF DISCHARGE FREE OF EROSION. MAINTAIN WATER TIGHT CONNECTIONS AND POSITIVE DRAINAGE. REPLACE SANDBAGS AND IMPERMEABLE SHEETING IF TORN.



MAINTENANCE REQUIREMENTS:

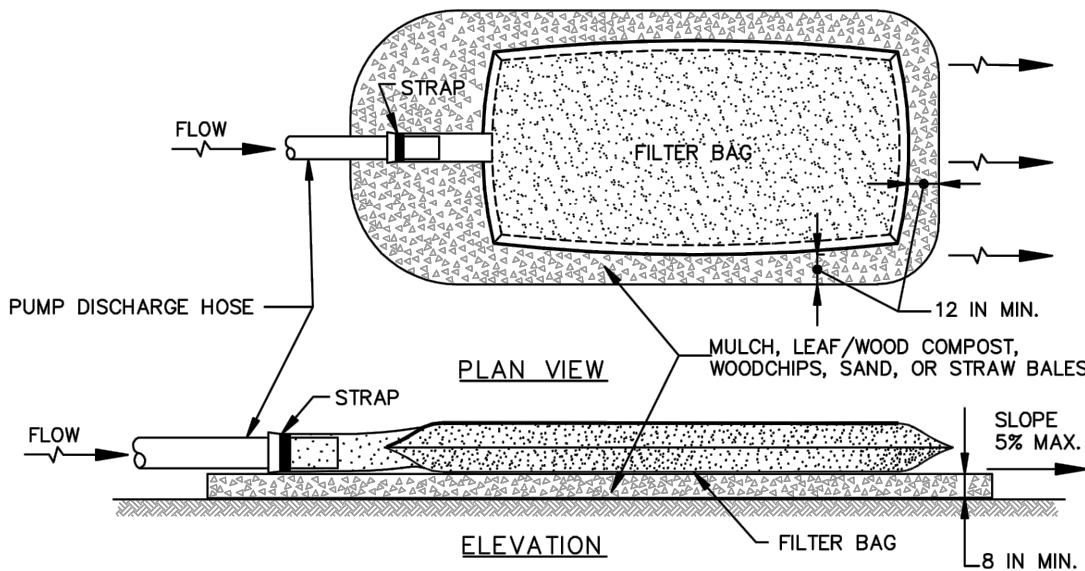
1. INSPECT WEEKLY AND AFTER EACH RAINFALL EVENT THAT PRODUCES 1/2 INCH OR MORE OF RAIN. REMOVE SEDIMENT AND DEBRIS. TOPDRESSING WITH 1-INCH CLEAN, WASHED STONE AS NECESSARY.
2. REMOVE ACCUMULATED SEDIMENT. THE CONTRACTOR SHALL DISPOSE OF SEDIMENT OFF-SITE IN ACCORDANCE WITH ALL STATE AND LOCAL REGULATIONS.

SILT FENCE

NTS

DETAIL F-4 FILTER BAG

STANDARD SYMBOL
FB



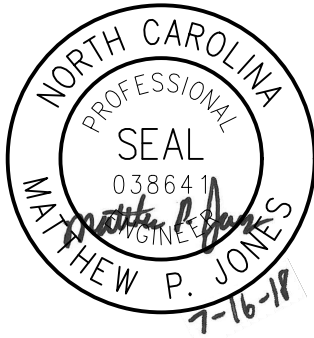
CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4633
FLOW RATE	70 GAL/MIN/FT ²	ASTM D-4491
PERMITTIVITY (SEC ⁻¹)	1.2 SEC	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632
6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

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REV	ISSUED FOR	DATE	BY		

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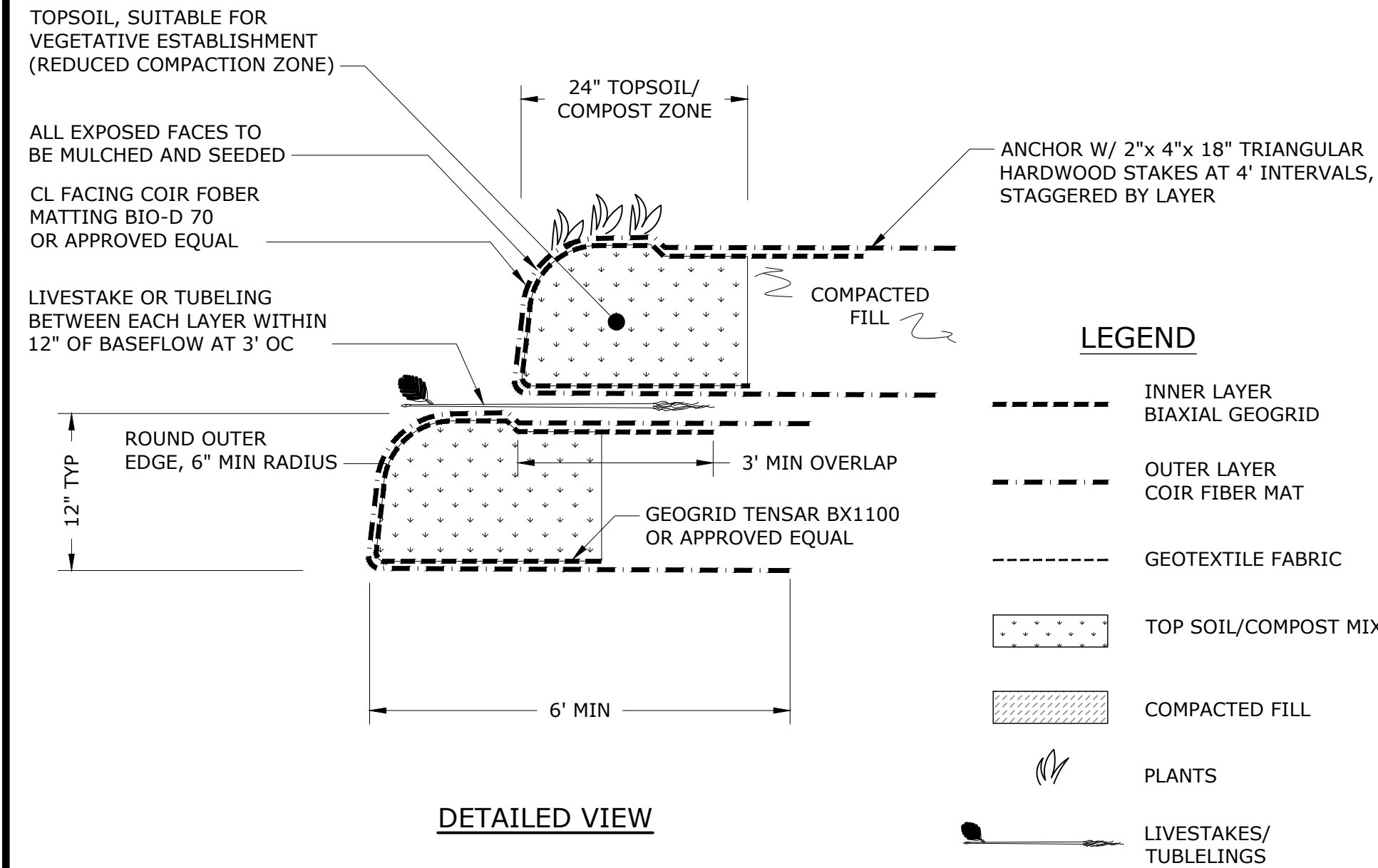
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LICENSE NO. : C-0381

CITY OF HAVELOCK, NORTH CAROLINA

McCOTTER CANAL
ACCESS ROAD STABILIZATION

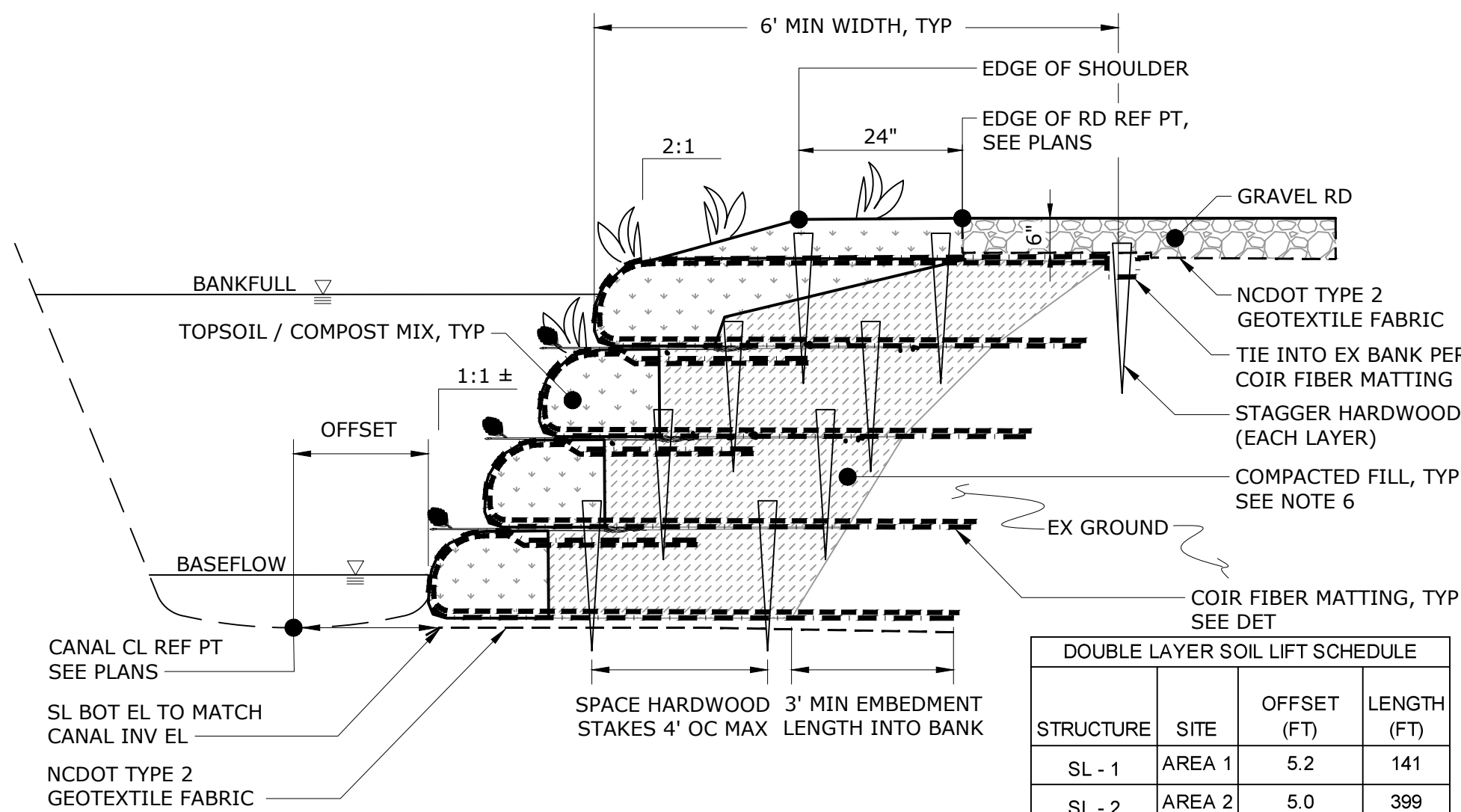
EROSION & SEDIMENT CONTROL
PLANS
CIVIL
DETAILS AND NOTES

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	ESC-08



NOTES

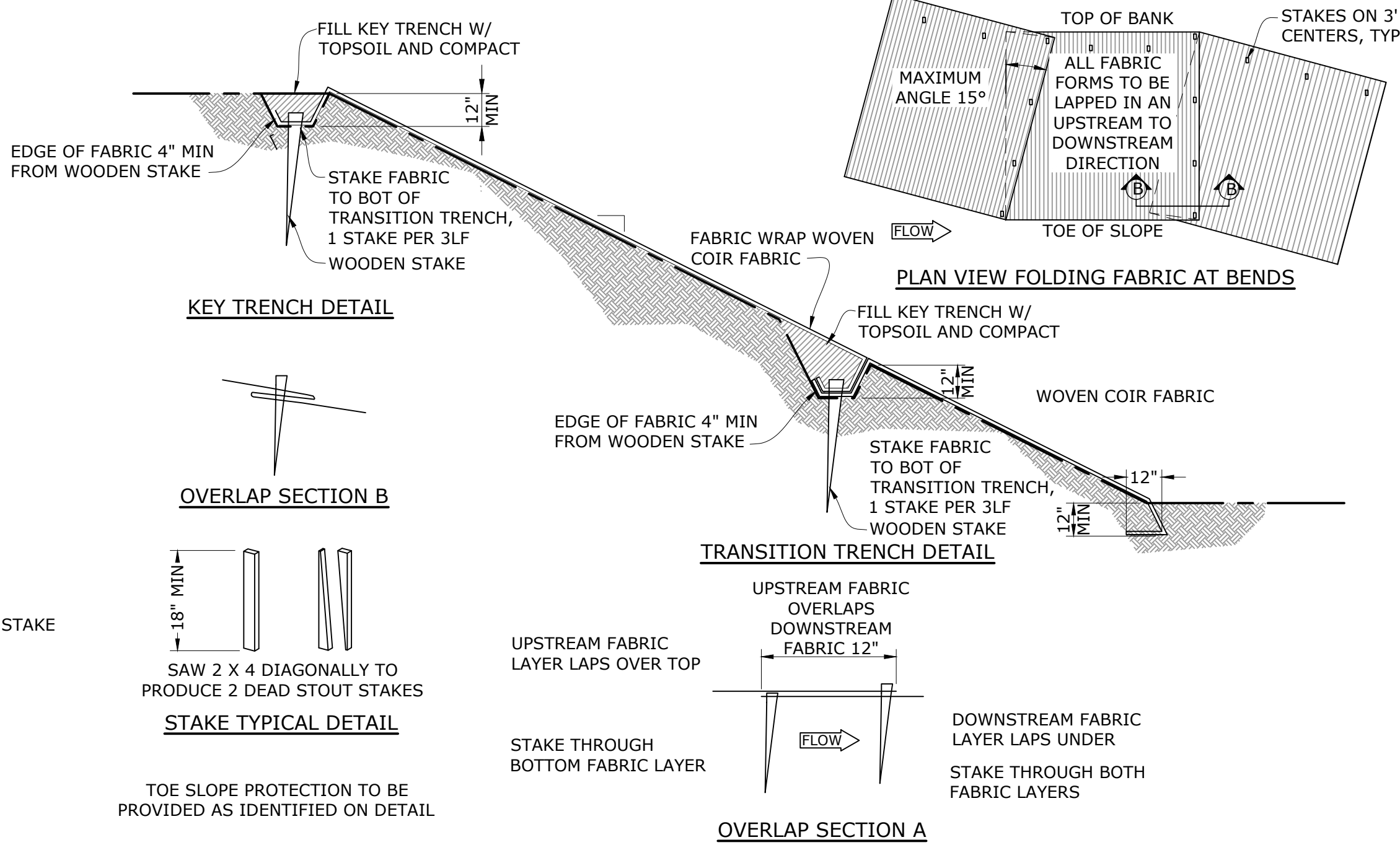
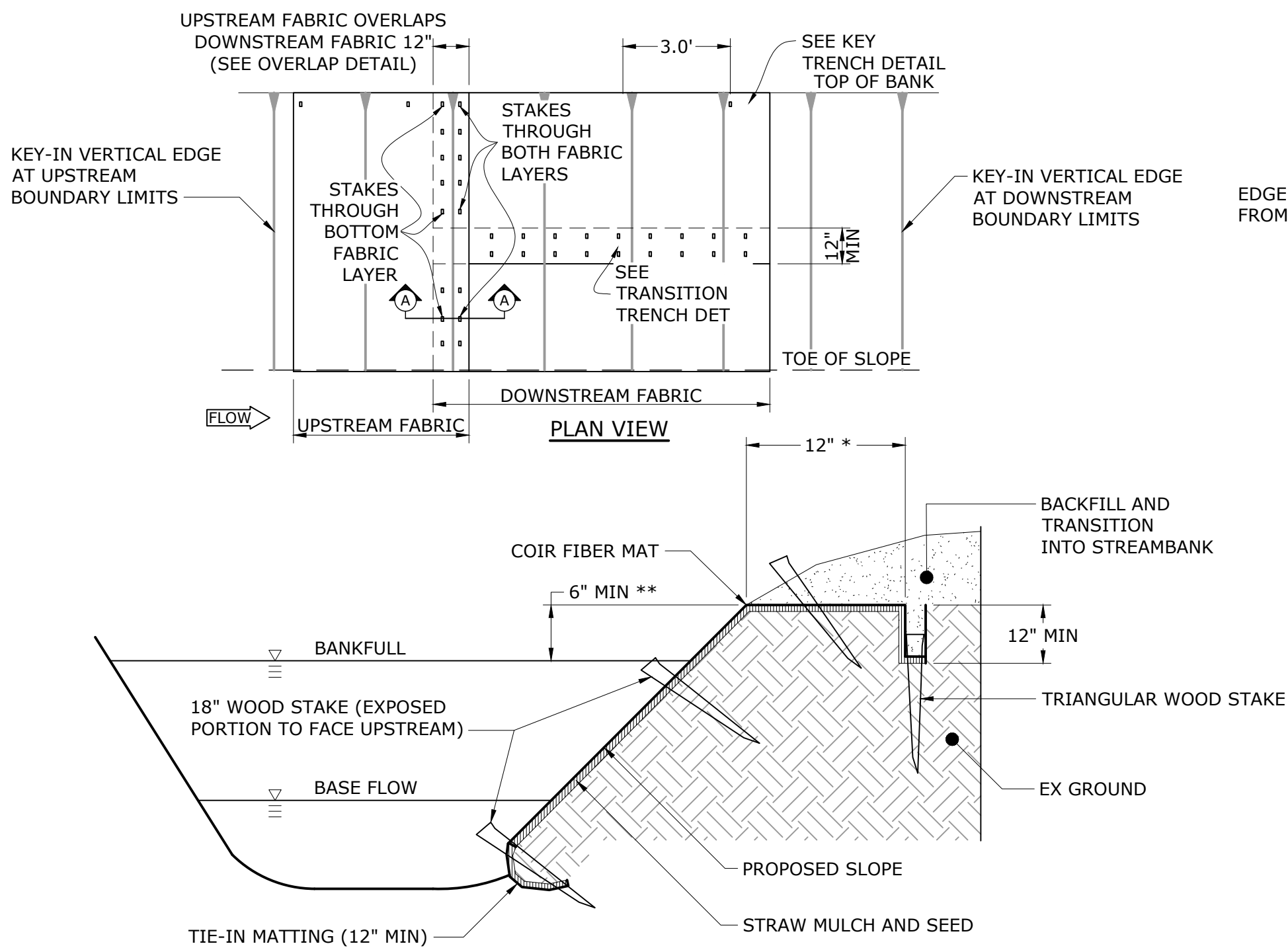
- DOUBLE SOIL LIFT SHALL CONSIST OF TWO LAYERS OF MATTING OF DIFFERENT MATERIALS. THE INNER MAT LAYER IS TO CONSIST OF A BIAXIAL GEOGRID (TENSAR BX1100 OR APPROVED EQUAL). THE OUTER MAT IS TO CONSIST OF A COCONUT FIBER COIR MAT (ROLANKA BIO-D 70 OR APPROVED EQUAL).
- SOIL LIFTS ARE TO BE FILLED WITH TOPSOIL AND SEED MIX.
- SOIL LIFTS ARE TO BE 12" HIGH PER LIFT.
- MATTING TO BE STRETCHED TIGHT AND WRINKLE FREE AROUND LIFT.
- 6" TOPSOIL SURFACE TO BE FREE OF STICKS, DEBRIS, AND TWIGS TO PREVENT CAVITATION.



- SATISFACTORY SOIL TYPES INCLUDE ASTM D 2487 SOIL CLASSIFICATION GROUPS GW, GP, GM, SW, SP AND SM OR A COMBINATION OF THESE SOIL GROUPS. SOIL SHALL BE FREE OF ROCK OR GRAVEL LARGER THAN 2" IN ANY DIMENSION DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER.
- SOIL LIFTS TO BE SEEDED AND PLANTED AS DESCRIBED ON THE CONTRACT DRAWINGS.
- PLAIN WOODEN STAKES SHALL CONSIST OF ROUGH SAWN HARDWOOD, TRIANGULAR IN SHAPE, 2" x 4" IN CROSS SECTION AND 18" IN LENGTH.
- ONCE PLACED, SOIL LIFTS SHALL NOT BE DRIVEN OVER WITH HEAVY EQUIPMENT.

DOUBLE LAYER SOIL LIFT

NTS



NOTES

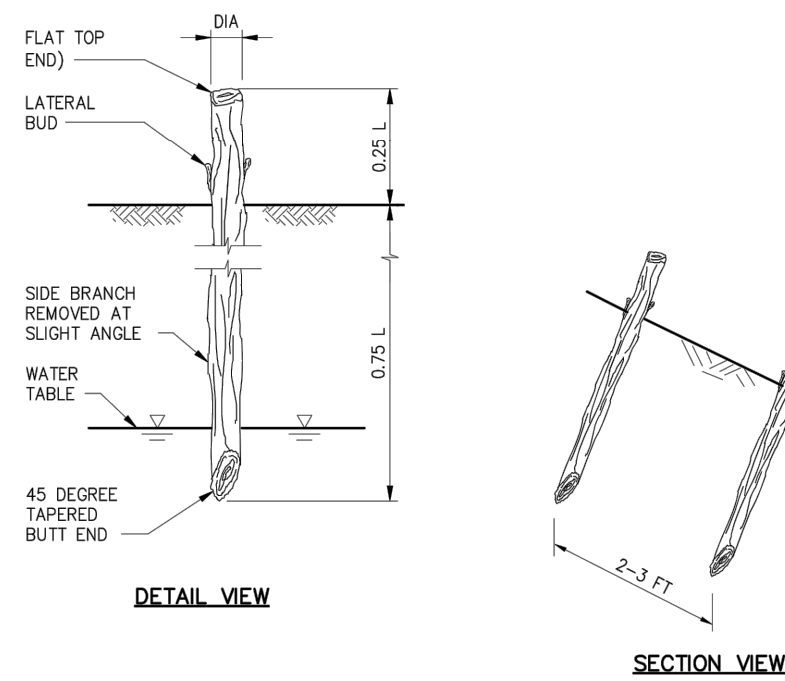
- COCONUT EROSION CONTROL BLANKET SHALL BE 'ROLANKA BIO-D 70' OR APPROVED EQUAL, ABLE TO WITHSTAND 12 FPS WATER VELOCITIES AND 4.5 PSF SHEAR STRESS. FABRIC EMBEDMENT 3.0 FT.
- PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP), INCLUDING ANY NECESSARY APPLICATION OF MULCH, LIME, FERTILIZER AND SEED.
- BEGIN AT THE BOTTOM OF THE SLOPE, WORKING FROM DOWNSTREAM UP, AND ANCHOR FIBER MATTING IN A 12" DEEP INITIAL ANCHOR TRENCH. BACKFILL TRENCH AND TAMP EARTH FIRMLY.
- OVERLAP EDGES OF ADJACENT PARALLEL ROLLS 12" AND ANCHOR AT 12" CENTERS WITH THE UPPER ROLL OVERLAPPING THE TOP OF THE LOWER ROLL.
- WHEN FIBER MAT MUST BE SPLICED, PLACE END OVER END (SHINGLE STYLE IN DIRECTION OF FLOW) WITH 12" OVERLAP AND ANCHOR USING TWO STAGGERED ROWS OF STAKES AT 6" CENTERS. ADDITIONAL FASTENING MAY BE REQUIRED WHERE MATTING IS CUT TO INSTALL PLANTINGS.
- LAY FIBER MAT LOOSELY AND ANCHOR SUFFICIENTLY TO MAINTAIN DIRECT CONTACT WITH THE SOIL - DO NOT STRETCH.
- FOR SLOPES 2:1 AND STEEPER USE A MINIMUM OF (3) 18-INCH WOOD STAKES PER SQUARE YARD AND FOR SLOPES FLATTER THAN 2:1 USE A MINIMUM OF (2) 18-INCH WOOD STAKES PER SQUARE YARD. PROVIDE ADDITIONAL STAKING ALONG CHANNEL BOTTOM WHERE COIR MAT FORMS TOE OF SLOPE.
- WOOD STAKES SHALL BE ANGLED SUCH THAT EXPOSED PORTION (2"-4") FACES UPSTREAM.
- ANCHOR, FILL, AND COMPACT END OF FIBER MATTING IN 12"x6" TERMINAL ANCHOR TRENCH (MIRROR IMAGE OF INITIAL TRENCH).
- * ANCHORING DIMENSIONS TO BE REDUCED IN AREAS OF NATURAL RESOURCES TO BE PROTECTED.
- ** EROSION CONTROL MATTING MAY BE EXTENDED UP STREAM BANK AS DIRECTED.
- REFER TO SOIL LIFT DETAIL FOR ADDITIONAL INFORMATION SPECIFIC TO THAT APPLICATION.

NOTES

- SOAK LIVE STAKES FOR A MINIMUM OF 24 HOURS AND RECUT ENDS AT 45 ANGLES PRIOR TO INSTALLATION.
- USE 1/2"-3/4" REBAR FOR PILOT HOLES PRIOR TO DRIVING LIVE STAKES INTO GROUND.
- DRIVE LIVE STAKE 3/4 OF ITS LENGTH INTO THE GROUND.
- RECUT ANY LIVE STAKE TIPS DAMAGED BY INSTALLATION.
- STAKES TO BE 1/2" TO 2" IN DIAMETER, 3' TO 4' LONG.
- SPACE LIVE STAKES 2'-3' ON CENTER (TRIANGULAR SPACING) FOR A DENSITY OF 2 TO 4 CUTTINGS PER SQUARE YARD.
- ANGLE AT 45 TO DOWNSTREAM FLOW.
- LIVE STAKES SHALL ONLY BE PLACED IN AREAS OF APPROPRIATE SUNLIGHT AND CONTACT WITH GROUNDWATER.

LIVE STAKES

NTS



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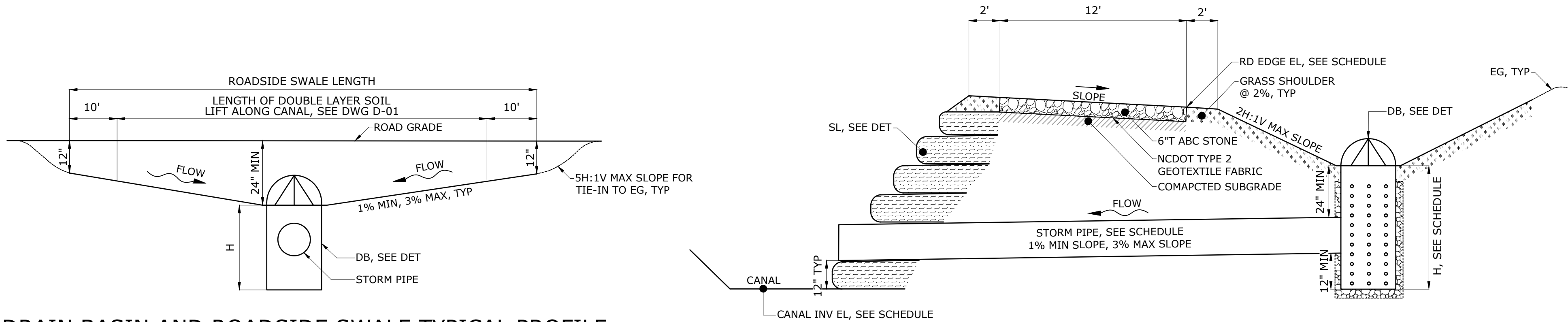
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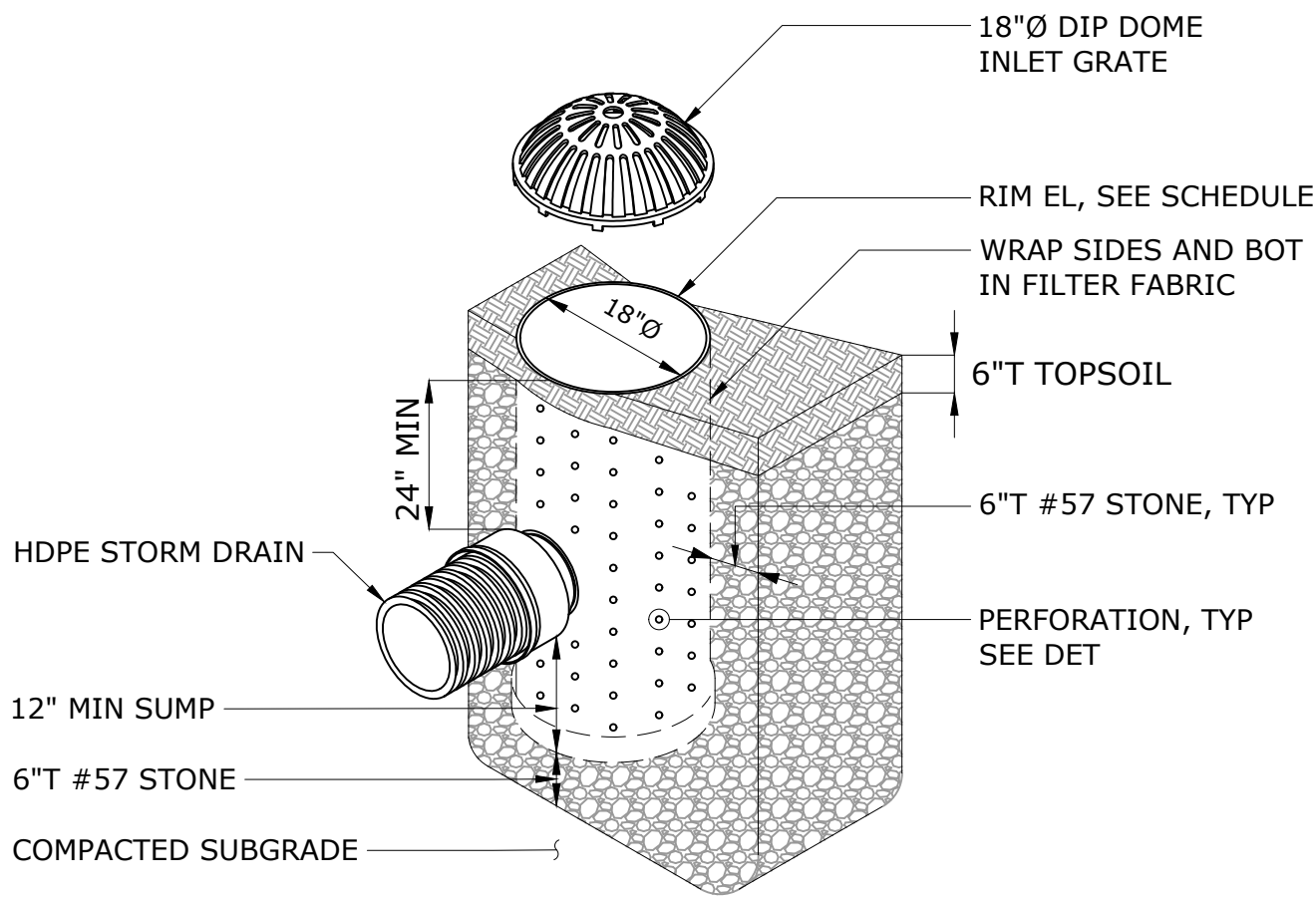
STANDARD DETAILS
CIVIL
BANK STABILIZATION DETAILS

DATE:	JULY 2018
HAZEN NO.:	30906
CONTRACT NO.:	004
DRAWING NUMBER:	D-01



DRAIN BASIN AND ROADSIDE SWALE TYPICAL PROFILE

DRAIN BASIN AND STORM DRAIN TYPICAL PROFILE

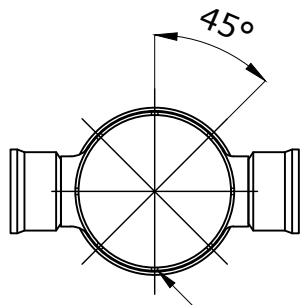


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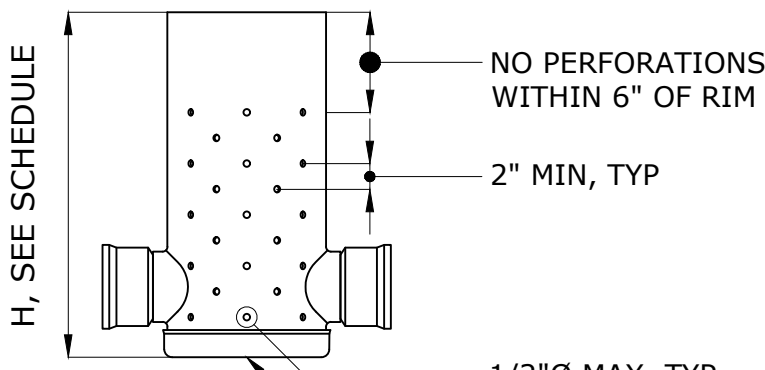
1. PROPOSED TOPSOIL AND STONE HATCHING SHOWN AS SCREENED FOR CLARITY.
2. DOME INLET FRAME AND GRATE SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS.
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212.

DRAIN BASIN

NTS



TOP VIEW



ELEVATION VIEW

NOTES:

1. PERFORATIONS SHALL NOT BE LOCATED WITHIN 1" OF ADAPTERS.
2. PERFORATIONS SHALL BE STAGGERED EVERY OTHER ROW AS SHOWN.
3. DRAIN BASIN SHALL BE WRAPPED IN GEOTEXTILE FILTER FABRIC.

DRAIN BASIN PERFORATIONS

NTS

ROADSIDE SWALE SCHEDULE			
FEATURE	SITE	SWALE LENGTH (FT)	FLOWS TO DRAIN BASIN
SWALE-01	AREA 1	50	DB-01
SWALE-02	AREA 1	100	DB-02
SWALE-03	AREA 2	125	DB-03
SWALE-04	AREA 2	170	DB-04
SWALE-05	AREA 3	270	DB-05
SWALE-06	AREA 4	270	DB-06
SWALE-07	AREA 5	380	DB-07

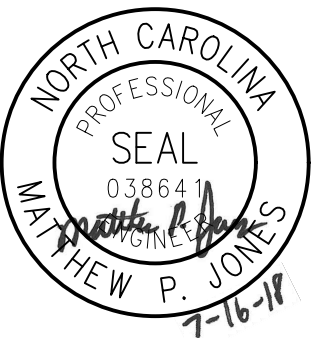
DRAIN BASIN AND PIPE SCHEDULE													
DRAIN BASIN	PIPE	SITE	PIPE DIAMETER AND MATERIAL	DRAIN BASIN CANAL STATION	PIPE OUTLET CANAL STATION	ROAD EDGE ELEVATION (FT)	CANAL INVERT ELEVATION (FT)	RIM ELEVATION (FT)	PIPE INVERT IN (FT)	PIPE INVERT OUT (FT)	PIPE LENGTH (FT)	PIPE SLOPE (%)	DRAIN BASIN HEIGHT, H (FT)
DB-01	PIPE-01	AREA 1	15" HDPE	0+06	0+30	24.8	17.4	22.8	18.9	18.4	39	1.3%	5.0
DB-02	PIPE-02	AREA 1	15" HDPE	1+10	1+19	24.9	17.0	22.9	18.5	18.0	36	1.3%	5.5
DB-03	PIPE-03	AREA 2	15" HDPE	1+87	1+94	24.5	17.2	22.5	18.6	18.2	28	1.5%	5.0
DB-04	PIPE-04	AREA 2	15" HDPE	4+27	4+35	23.4	16.3	21.4	17.6	17.3	29	1.0%	5.0
DB-05	PIPE-05	AREA 3	15" HDPE	0+94	1+02	24.6	16.0	22.6	17.7	17.0	29	2.5%	6.0
DB-06	PIPE-06	AREA 4	15" HDPE	1+47	1+56	24.5	17.0	22.5	18.6	18.0	35	1.8%	5.0
DB-07	PIPE-07	AREA 5	15" HDPE	1+89	1+98	24.1	15.9	22.1	17.2	16.9	30	1.2%	6.0

NOTES

1. ROAD EDGE REFERS TO THE EDGE LOCATED ON THE LANDWARD SIDE OF THE ROAD.
2. PROVIDED ROAD EDGE ELEVATIONS ARE EXISTING GROUND ELEVATIONS AT THE PROPOSED ROAD EDGE. ELEVATIONS ARE SUBJECT TO CHANGE AS A RESULT OF CONSTRUCTION.

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STANDARD DETAILS
CIVIL
STORMWATER DETAILS

DATE:	JULY 2018
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CONTRACT NO.:	004
DRAWING NUMBER:	D-02