

Drawings

Colon Mine Site Structural Fill

Charah, Inc.

Sanford, NC

March 2015

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HDR Engineering, Inc. of the Carolinas
 440 S. Church St.
 Suite 1000
 Charlotte, NC 28202-2075
 704.338.6700
 N.C.B.E.L.S. F-0116

Owner/Permittee: Green Meadow, LLC
 Operator: Charah, Inc.
 Engineer of Record: HDR Engineering, Inc. of the Carolinas



Permit Drawings For

Colon Mine Site Structural Fill

Civil

HDR Project No.
00000000235691

Sanford, North Carolina
November 2014

Revised December 2014

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GENERAL

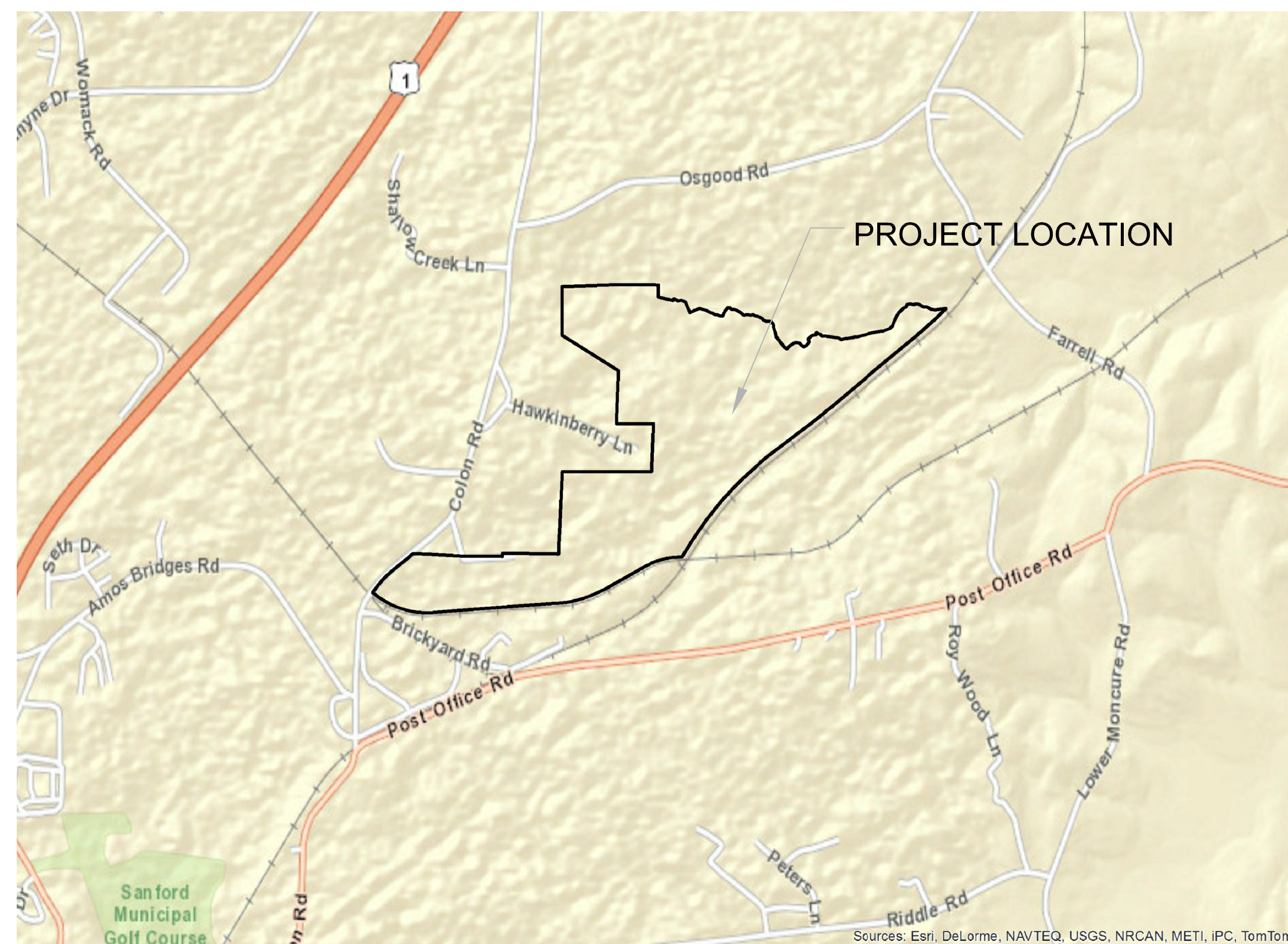
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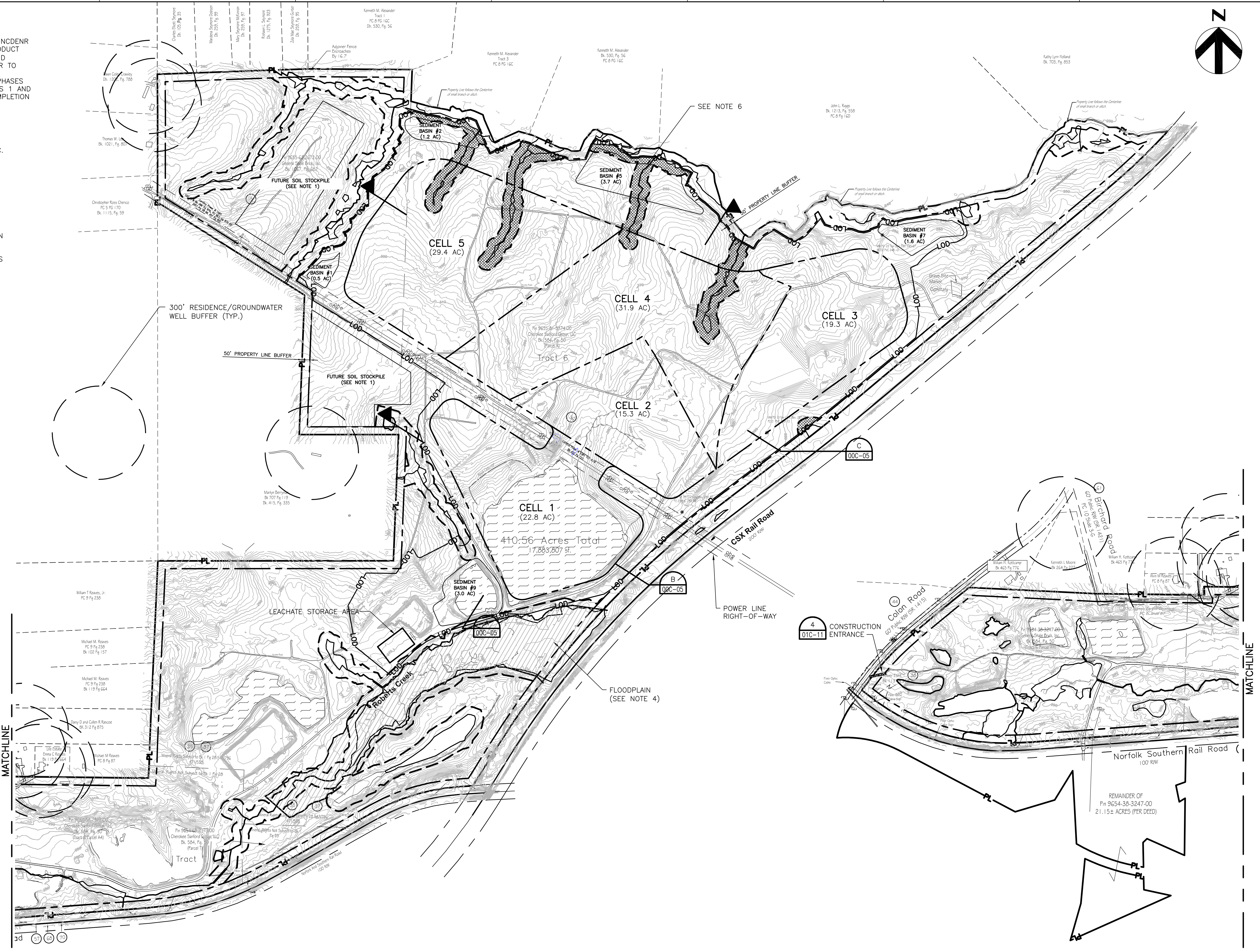
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SCOPE:
 THE PURPOSE OF THIS PERMIT APPLICATION IS TO OBTAIN A PERMIT FROM NCDENR TO CONSTRUCT A 118.4 ACRE STRUCTURAL FILL OF COAL COMBUSTION PRODUCT (CCP). THIS PROJECT CONSISTS OF EXCAVATING SOIL WITHIN CELLS 1-5 AND INSTALLATION OF A LINER SYSTEM AND LEACHATE COLLECTION SYSTEM PRIOR TO CCP PLACEMENT. AFTER CCP PLACEMENT, A CAP SYSTEM AND STORMWATER DRAINAGE SYSTEM WILL BE INSTALLED. DEVELOPMENT WILL OCCUR IN TWO PHASES TO ALLOW FOR STREAM AND WETLAND MITIGATION. PHASE 1 INCLUDES CELLS 1 AND 2. THE REMAINING CELLS 3-5 WILL BE DEVELOPED IN PHASE 2 AFTER COMPLETION OF STREAM AND WETLAND MITIGATION.

- NOTES:**
- TOPOGRAPHIC SURVEY PROVIDED BY AVIO IMAGE MAPPING SERVICES, INC. ALTA SURVEY COMPLETED BY LAWRENCE ASSOCIATES DATED AUGUST 14, 2014. CLEARWATER ENVIRONMENTAL PROVIDED WETLAND LOCATIONS TO LAWRENCE ASSOCIATES FOR INCLUSION INTO THEIR SURVEY.
 - PROPERTY BOUNDARY PROVIDED BY LAWRENCE ASSOCIATES DATED SEPTEMBER 5, 2014.
 - GROUNDWATER WELL LOCATIONS PROVIDED BY LAWRENCE ASSOCIATES DATED SEPTEMBER 5, 2014.
 - FLOODPLAIN LOCATION IS FROM LAWRENCE ASSOCIATES AS IDENTIFIED ON FLOOD INSURANCE RATE MAP FOR LEE COUNTY NORTH CAROLINA, COMMUNITY PANEL NUMBER 3710965400J, DATED SEPTEMBER 6, 2006. LAWRENCE ASSOCIATES CERTIFIES THAT A PORTION OF THIS PROPERTY IS LOCATED IN A SPECIAL FLOOD HAZARD AREA AS DETERMINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
 - WETLANDS DELINEATED BY CLEARWATER ENVIRONMENTAL ON JULY 21, 22, 23, 24, 30, 31, 2014 AND JANUARY 6, 2015.
 - THE WETLANDS AND STREAMS THAT ARE IMPACTED BY THIS PROJECT WILL BE PERMITTED THROUGH NC DIVISION OF WATER QUALITY AND MITIGATED AS REQUIRED PRIOR TO LAND DISTURBANCE. ESTIMATED IMPACTS INCLUDE:
 - 2,158 LINEAR FEET OF STREAMS
 - 108,510 SQ. FT. (2.49 ACRES) OF WETLANDS
 - ACCORDING TO LAWRENCE ASSOCIATES SURVEY, LEE COUNTY PUBLIC WORKS PROVIDED THE ADDRESSES FOR DRINKING WATER WELL LOCATIONS AND WATER SERVICES TO ADJOINING PARCELS WITHIN 500 FEET OF THE PROPERTY LINE. LEE COUNTY PUBLIC WORKS PROVIDED PARCELS SERVED BY COUNTY WATER. PUBLIC WATER SUPPLY (WATERLINE) IS LOCATED ALONG COLON ROAD.
 - THE LEACHATE STORAGE WILL BE ABOVE GROUND STORAGE TANKS.
 - THE PRIMARY SITE ENTRANCE IS FROM COLON ROAD.
 - SOIL STOCKPILE AREAS TO BE DESIGNED AND PERMITTED AS NEEDED FOR OPERATIONS.



LEGEND

	PROPERTY LINE
	50' PROPERTY LINE BUFFER
	50' WETLANDS/STREAM BUFFER
	LIMITS OF DISTURBANCE
	300' RESIDENCE/GROUNDWATER WELL BUFFER
	EXISTING TOPOGRAPHY
	EXISTING ROAD
	IMPACTED WETLANDS/STREAMS
	OVERHEAD ELECTRIC
	PARCEL BOUNDARIES
	RAILROAD
	CELL BOUNDARIES
	PLANIMETRICS
	OPEN WATER
	STORMWATER BASIN FROM PRIOR MINING ACTIVITIES
	FLOODPLAIN



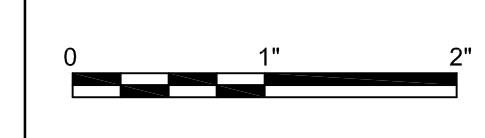
HDR Engineering, Inc.
 of the Carolinas
 440 S. Church St. Suite 1000
 Charlotte, NC 28202-2075
 704.338.6700
 N.C.B.E.L.S. License Number F-0116

ISSUE	DATE	DESCRIPTION
C	01/15/15	REVISED PER NCDENR COMMENTS
B	12/31/14	REVISED PER NCDENR COMMENTS
A	11/2014	ISSUED FOR APPROVAL

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	P. WESTMORELAND, P.E.
DRAWN BY	J. GAUL
CHECKED BY	J. READLING, P.E.
PROJECT NUMBER	453925-235691-018



Charah
 COLON MINE SITE STRUCTURAL FILL
 SANFORD, NC



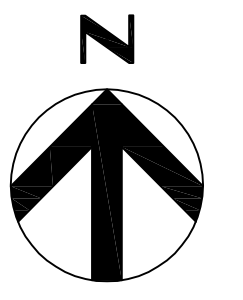
FACILITY PLAN AND BUFFERS

FILENAME | 00G-02.dwg
 SCALE | 1"=300'

SHEET
00G-02

NOTES:

1. TOPOGRAPHIC SURVEY AND EXTENT OF WETLANDS PROVIDED BY AVIO IMAGE MAPPING SERVICES, INC. ALTA SURVEY COMPLETED BY LAWRENCE ASSOCIATES DATED AUGUST 14, 2014.
2. PROPERTY BOUNDARY PROVIDED BY LAWRENCE ASSOCIATES DATED SEPTEMBER 5, 2014.



LEGEND

- CELL LIMITS
- PROPERTY LINE
- EXISTING TOPOGRAPHY
- EXISTING ROAD
- OVERHEAD ELECTRIC
- PARCEL BOUNDARIES
- RAILROAD
- CELL BOUNDARIES
- PLANIMETRICS
- OPEN WATER
- FLOODPLAIN



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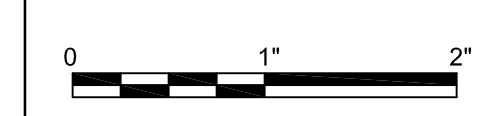
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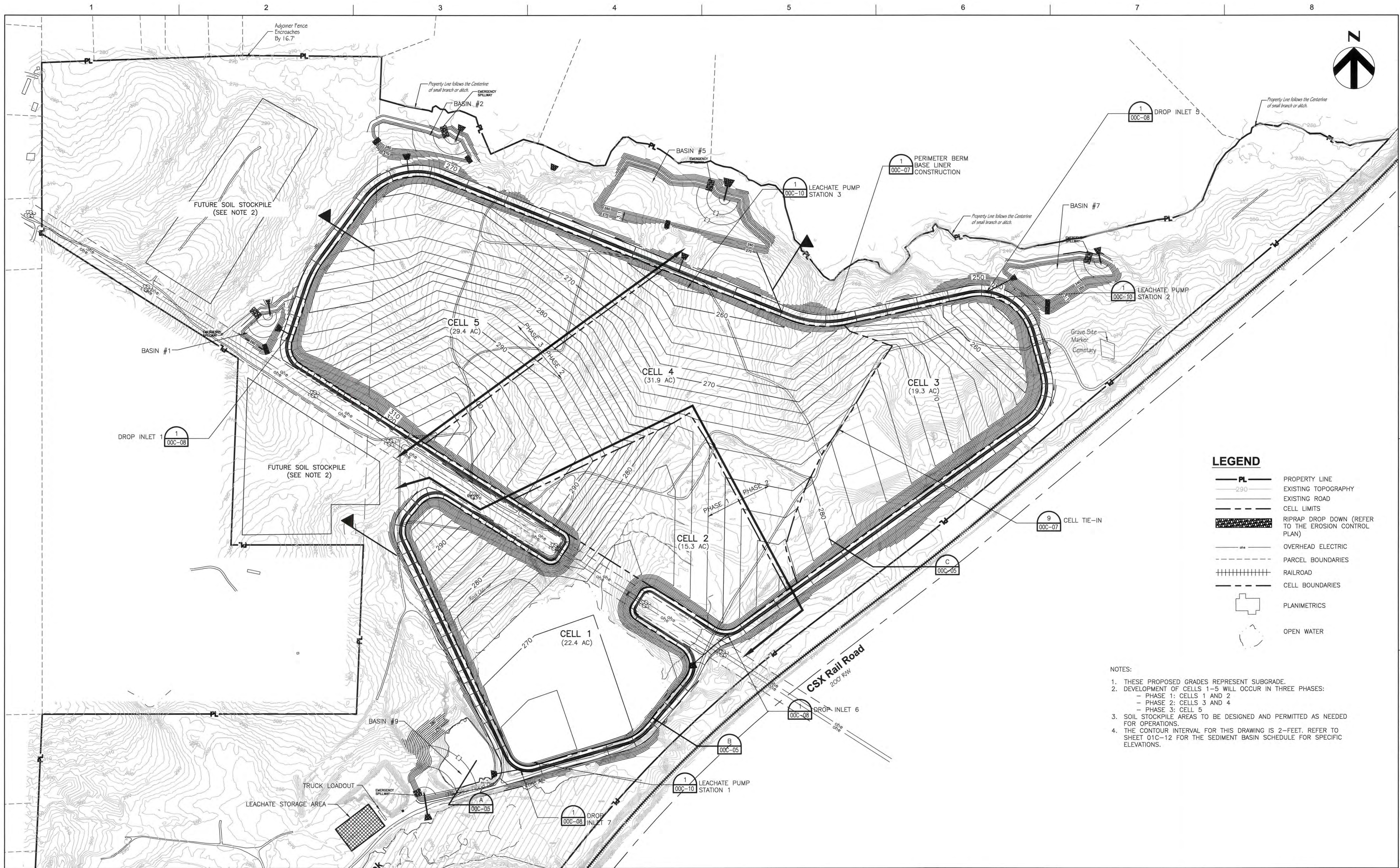
COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

EXISTING CONDITIONS



FILENAME | 00C-01.dwg
SCALE | 1" = 300'

SHEET
00C-01



LEGEND

- PL PROPERTY LINE
- 290 EXISTING TOPOGRAPHY
- EXISTING ROAD
- CELL LIMITS
- RIPRAP DROP DOWN (REFER TO THE EROSION CONTROL PLAN)
- OVERHEAD ELECTRIC
- PARCEL BOUNDARIES
- RAILROAD
- CELL BOUNDARIES
- PLANIMETRICS
- OPEN WATER

- NOTES:
1. THESE PROPOSED GRADES REPRESENT SUBGRADE.
 2. DEVELOPMENT OF CELLS 1-5 WILL OCCUR IN THREE PHASES:
 - PHASE 1: CELLS 1 AND 2
 - PHASE 2: CELLS 3 AND 4
 - PHASE 3: CELL 5
 3. SOIL STOCKPILE AREAS TO BE DESIGNED AND PERMITTED AS NEEDED FOR OPERATIONS.
 4. THE CONTOUR INTERVAL FOR THIS DRAWING IS 2- FEET. REFER TO SHEET 01C-12 FOR THE SEDIMENT BASIN SCHEDULE FOR SPECIFIC ELEVATIONS.



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ISSUE	DATE	DESCRIPTION
C	03/2015	RAISED FLOOR GRADES 6"
B	12/31/14	REVISED PER NCDENR COMMENTS
A	11/2014	ISSUED FOR APPROVAL

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	P. WESTMORELAND, P.E.
DRAWN BY	J. GAUL
CHECKED BY	J. READLING, P.E.
PROJECT NUMBER	453925-235691-018

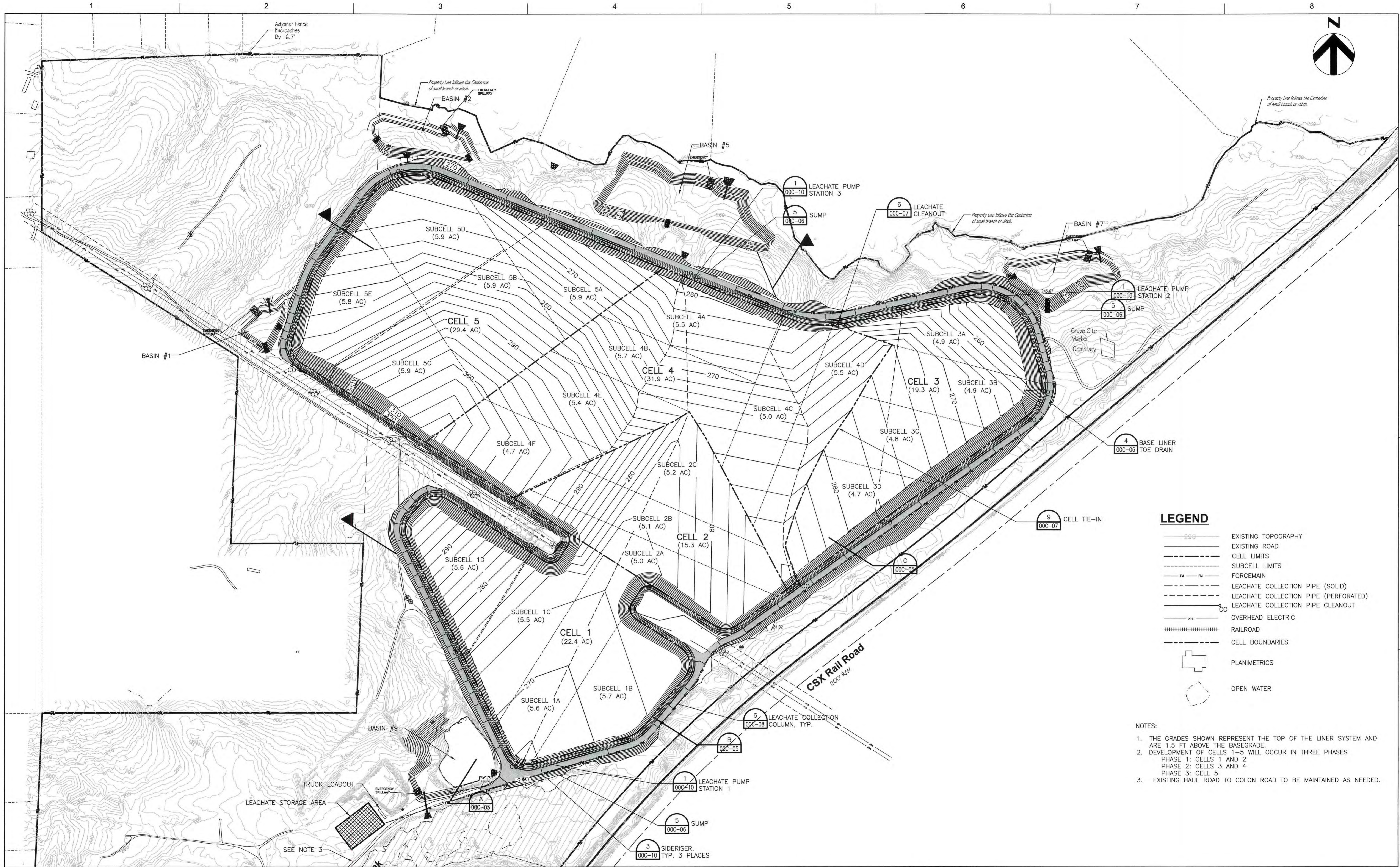


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COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

**BASEGRADE PLAN
(BOTTOM OF SOIL LINER)**

SCALE 1"=200'
FILENAME 00C-02.dwg
SHEET 00C-02

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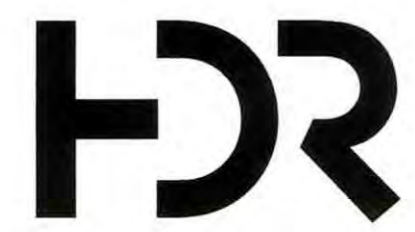


LEGEND

- EXISTING TOPOGRAPHY
- EXISTING ROAD
- CELL LIMITS
- SUBCELL LIMITS
- FORCEMAIN
- LEACHATE COLLECTION PIPE (SOLID)
- LEACHATE COLLECTION PIPE (PERFORATED)
- LEACHATE COLLECTION PIPE CLEANOUT
- OVERHEAD ELECTRIC
- RAILROAD
- CELL BOUNDARIES
- PLANIMETRICS
- OPEN WATER

NOTES:

- THE GRADES SHOWN REPRESENT THE TOP OF THE LINER SYSTEM AND ARE 1.5 FT ABOVE THE BASEGRADE.
- DEVELOPMENT OF CELLS 1-5 WILL OCCUR IN THREE PHASES
 PHASE 1: CELLS 1 AND 2
 PHASE 2: CELLS 3 AND 4
 PHASE 3: CELL 5
- EXISTING HAUL ROAD TO COLON ROAD TO BE MAINTAINED AS NEEDED.



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ISSUE	DATE	DESCRIPTION
C	03/2015	RAISED FLOOR GRADES 6", RESIZED SUBCELLS
B	12/31/14	REVISED PER NCDENR COMMENTS
A	11/2014	ISSUED FOR APPROVAL

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	P. WESTMORELAND, P.E.
DRAWN BY	J. GAUL
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PROJECT NUMBER	453925-235691-018

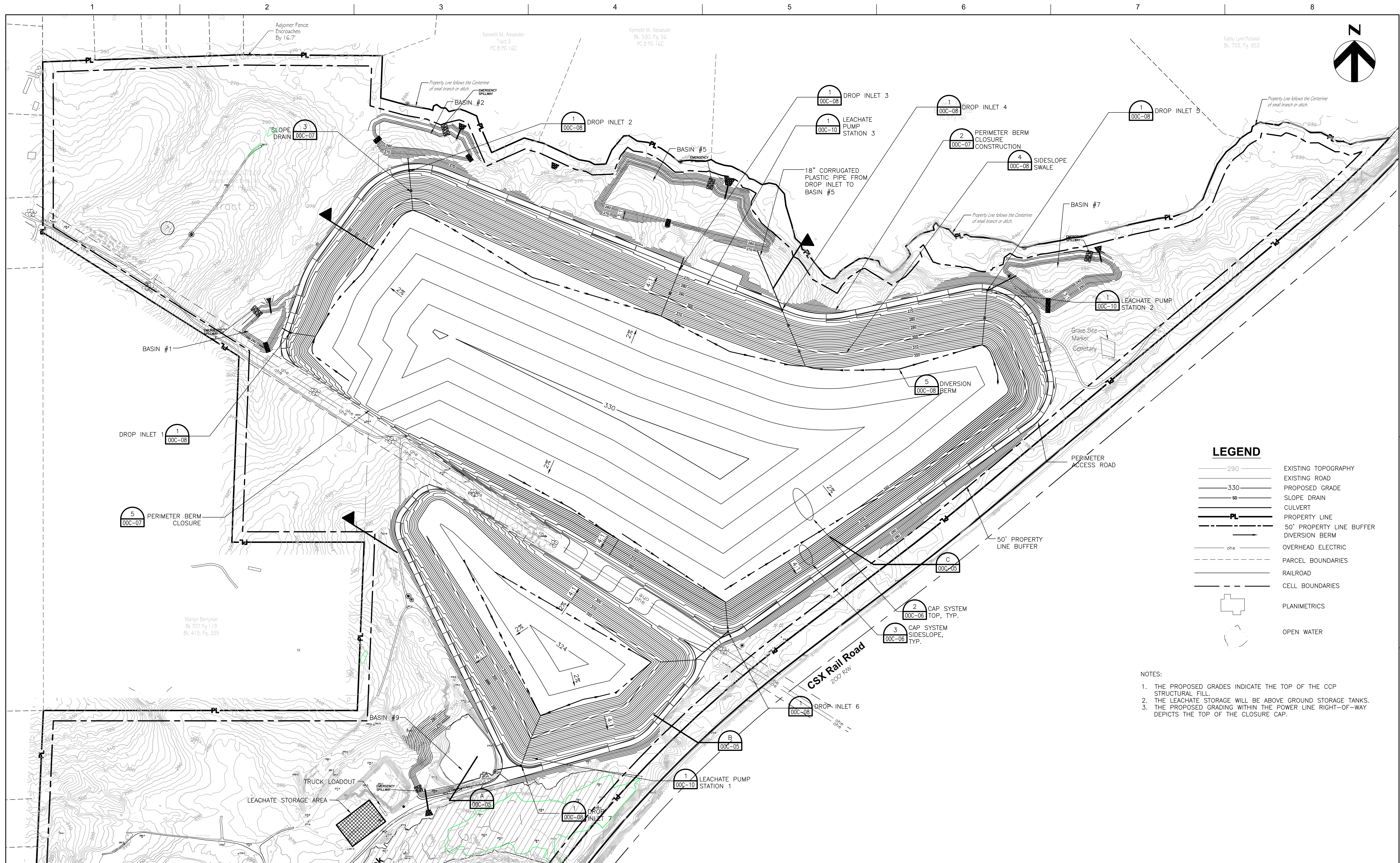


Charah
COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

TOP OF LINER

FILENAME: OOC-03.dwg
SCALE: 1"=200'
SHEET: OOC-03

C:\working\p146528300\CD.dwg, Plot: 10/20/15 1:03:05 PM, jgall



LEGEND

	EXISTING TOPOGRAPHY
	EXISTING ROAD
	PROPOSED GRADE
	SLOPE DRAIN
	CULVERT
	PROPERTY LINE
	50' PROPERTY LINE BUFFER
	DIVERSION BERM
	OVERHEAD ELECTRIC
	PARCEL BOUNDARIES
	RAILROAD
	CELL BOUNDARIES
	PLANIMETRICS
	OPEN WATER

- NOTES:**
1. THE PROPOSED GRADES INDICATE THE TOP OF THE CCP STRUCTURAL FILL.
 2. THE LEACHATE STORAGE WILL BE ABOVE GROUND STORAGE TANKS.
 3. THE PROPOSED GRADING WITHIN THE POWER LINE RIGHT-OF-WAY DEFICTS THE TOP OF THE CLOSURE CAP.



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DESIGNED BY	P. WESTMORELAND, P.E.	
DRAWN BY	J. GAUL	
CHECKED BY	J. READLING, P.E.	
PROJECT NUMBER	453925-235691-018	
ISSUE	DATE	DESCRIPTION
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Charah
COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

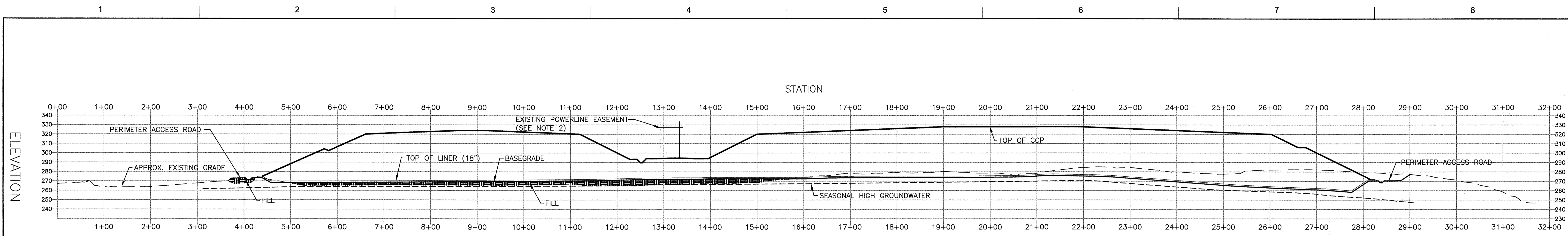
RECLAMATION PLAN

SCALE 1"=200'

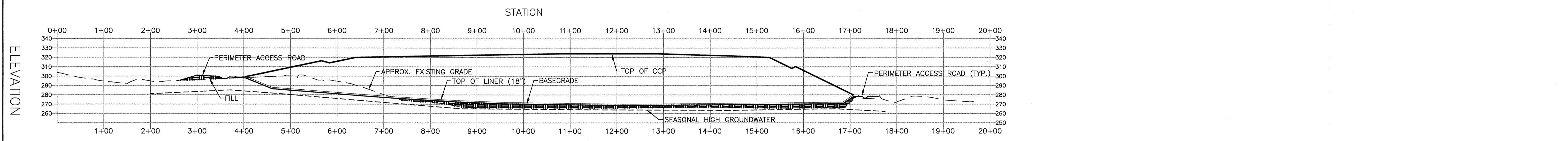
FILENAME 00C-04.dwg

SHEET 00C-04

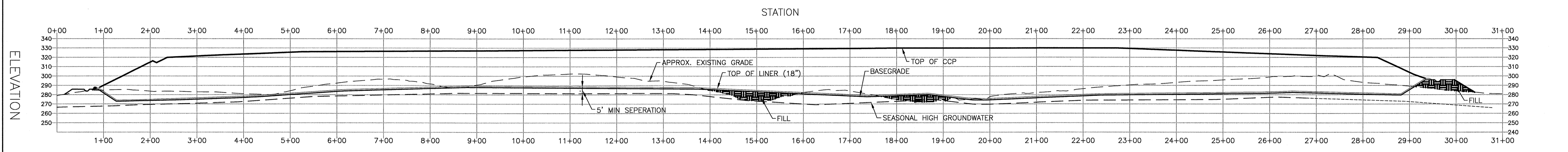
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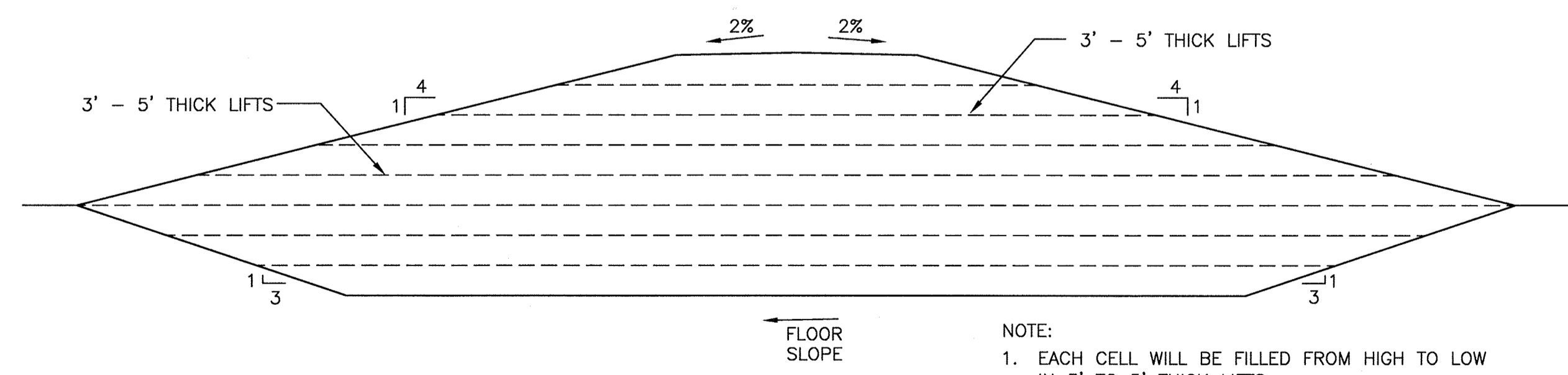
SECTION A
HORIZONTAL: 1"=100'; VERTICAL: 1"=50'



SECTION B
HORIZONTAL: 1"=100'; VERTICAL: 1"=50'

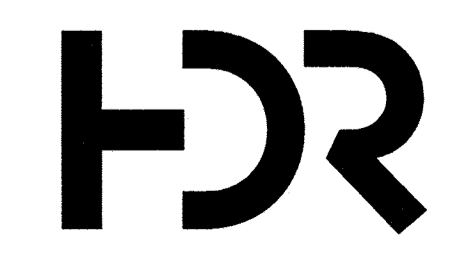


SECTION C
HORIZONTAL: 1"=100'; VERTICAL: 1"=50'



FILL SEQUENCE
3/4"=1'-0"

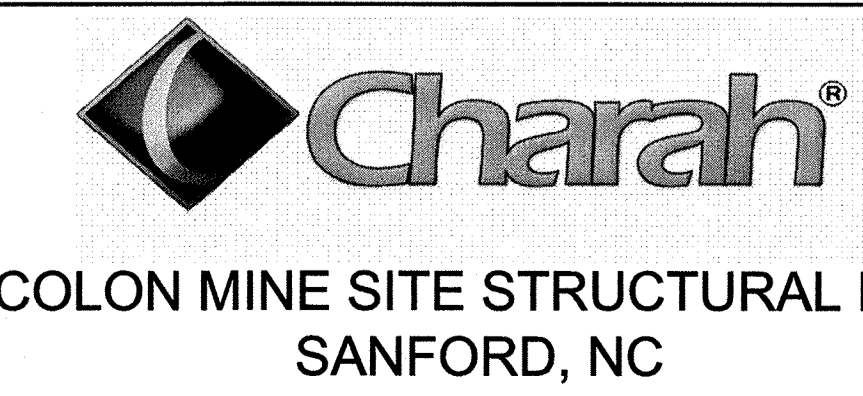
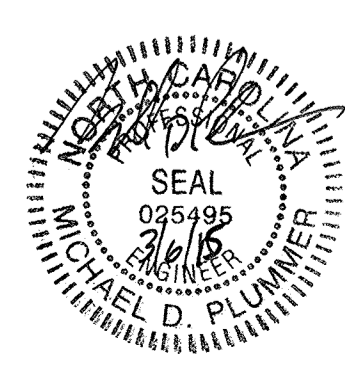
- NOTES:**
1. IN THE AREAS WHERE SUBGRADE IS HIGHER THAN EXISTING GRADE, CLEAN SOIL WILL BE USED TO BRING EXISTING GRADE TO SUBGRADE. THE CLEAN SOIL WILL BE COMPACTED AS REQUIRED.
 2. THE SEPARATION BETWEEN THE TOP OF THE CAP SYSTEM AND THE OVERHEAD ELECTRICAL WILL BE MAINTAINED.
 3. REFER TO SHEET 00C-04 FOR SLOPE OF THE TOP OF THE CCP.



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ISSUE	DATE	DESCRIPTION	PROJECT NUMBER
C	03/2015	RAISED SUBGRADE AND LINER 6"	453925-235691-018
B	12/31/14	REVISED PER NCDENR COMMENTS	
A	11/2014	ISSUED FOR APPROVAL	

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	P. WESTMORELAND, P.E.
DRAWN BY	J. GAUL
CHECKED BY	J. READLING, P.E.
PROJECT NUMBER	453925-235691-018



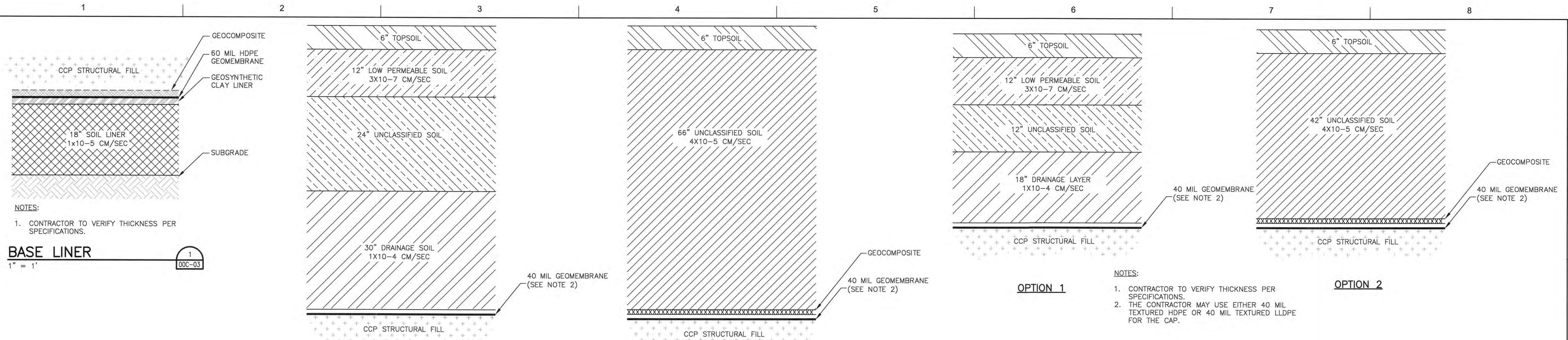
SITE CROSS SECTIONS

SCALE 1"=100'

FILENAME 00C-05.dwg

SHEET 00C-05

C:\working\jga\05020500\00C-05.dwg, Plot: 3/30/2015 10:41:38 AM, jga



BASE LINER
1" = 1' (00C-03)

NOTES:
1. CONTRACTOR TO VERIFY THICKNESS PER SPECIFICATIONS.

OPTION 1

OPTION 2

OPTION 1

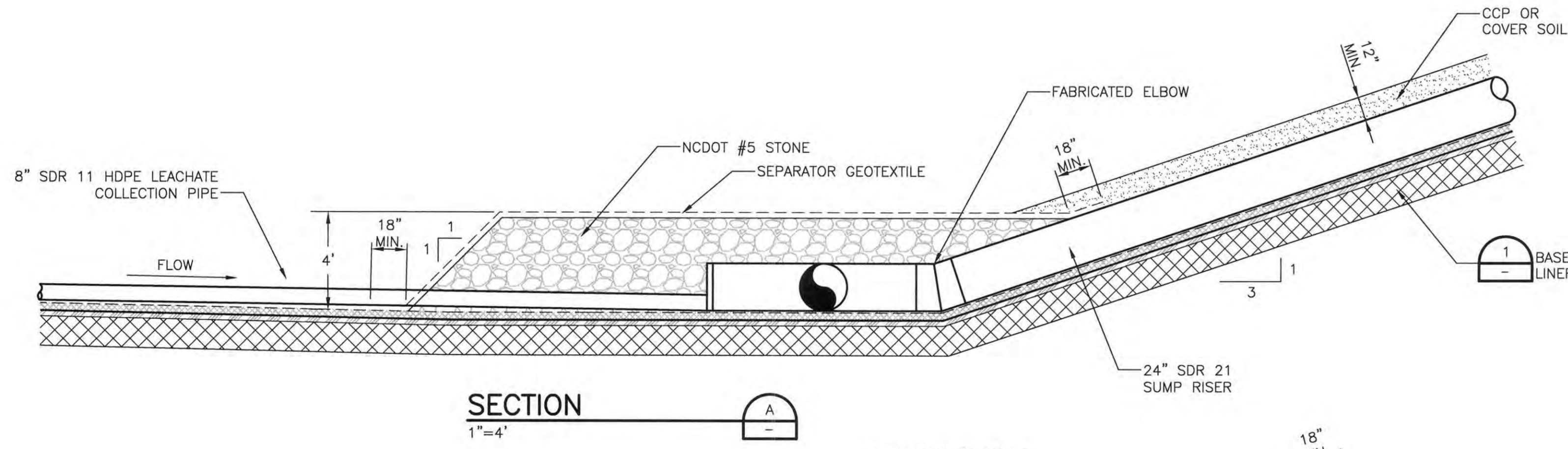
OPTION 2

NOTES:
1. CONTRACTOR TO VERIFY THICKNESS PER SPECIFICATIONS.
2. THE CONTRACTOR MAY USE EITHER 40 MIL TEXTURED HDPE OR 40 MIL TEXTURED LLDPE FOR THE CAP.

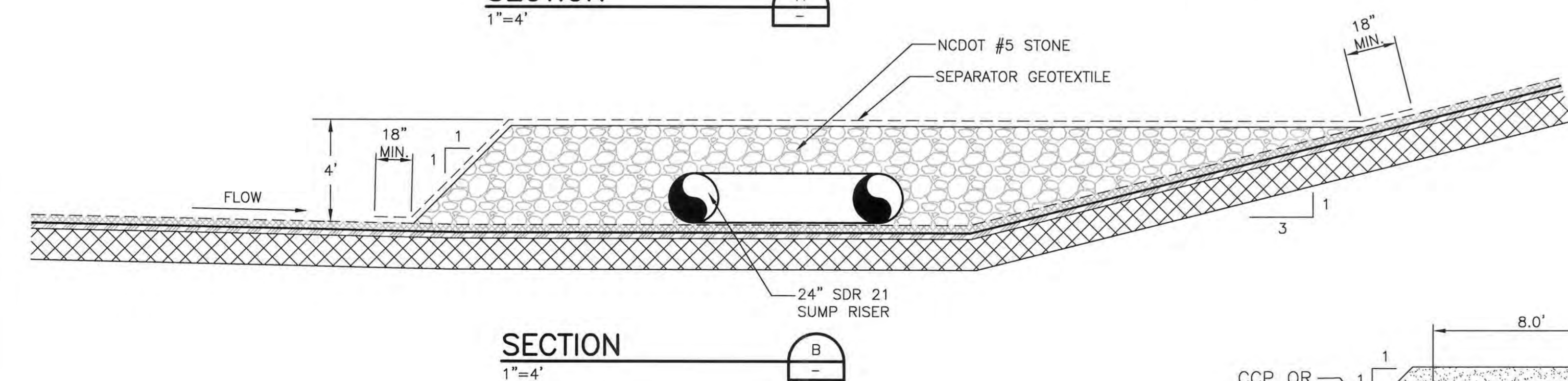
NOTES:
1. CONTRACTOR TO VERIFY THICKNESS PER SPECIFICATIONS.
2. THE CONTRACTOR MAY USE EITHER 40 MIL TEXTURED HDPE OR 40 MIL TEXTURED LLDPE FOR THE CAP.

CAP SYSTEM - TOP
1" = 1' (00C-04)

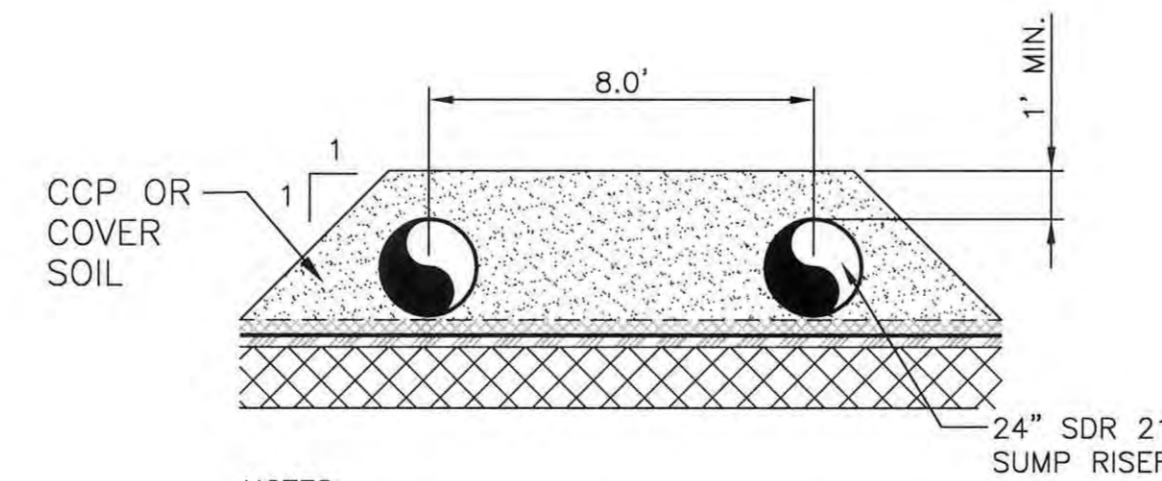
CAP SYSTEM - SIDESLOPE
1" = 1' (00C-04)



SECTION
1" = 4' (A)

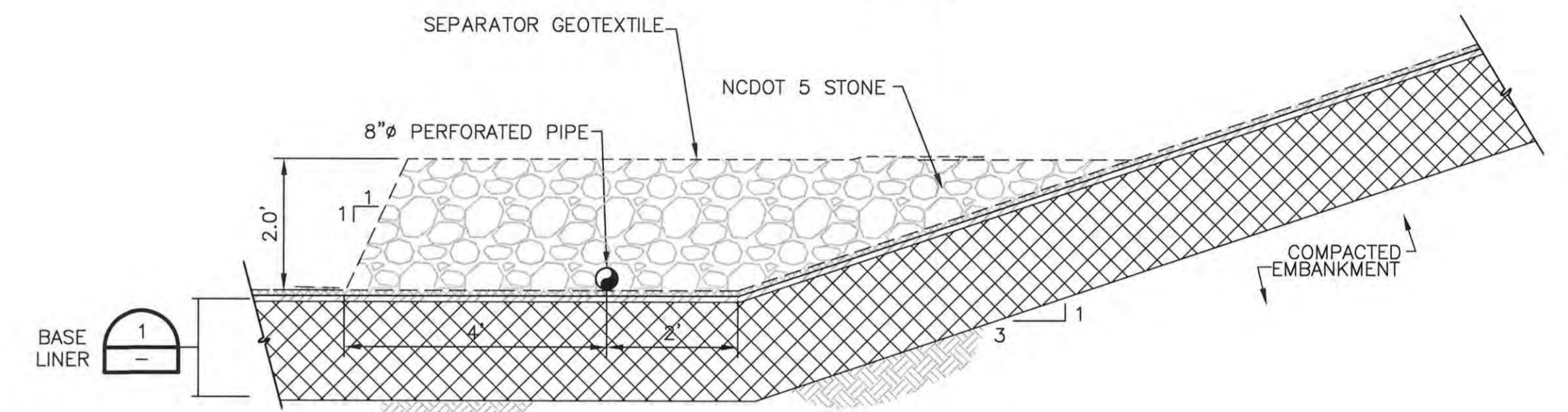


SECTION
1" = 4' (B)



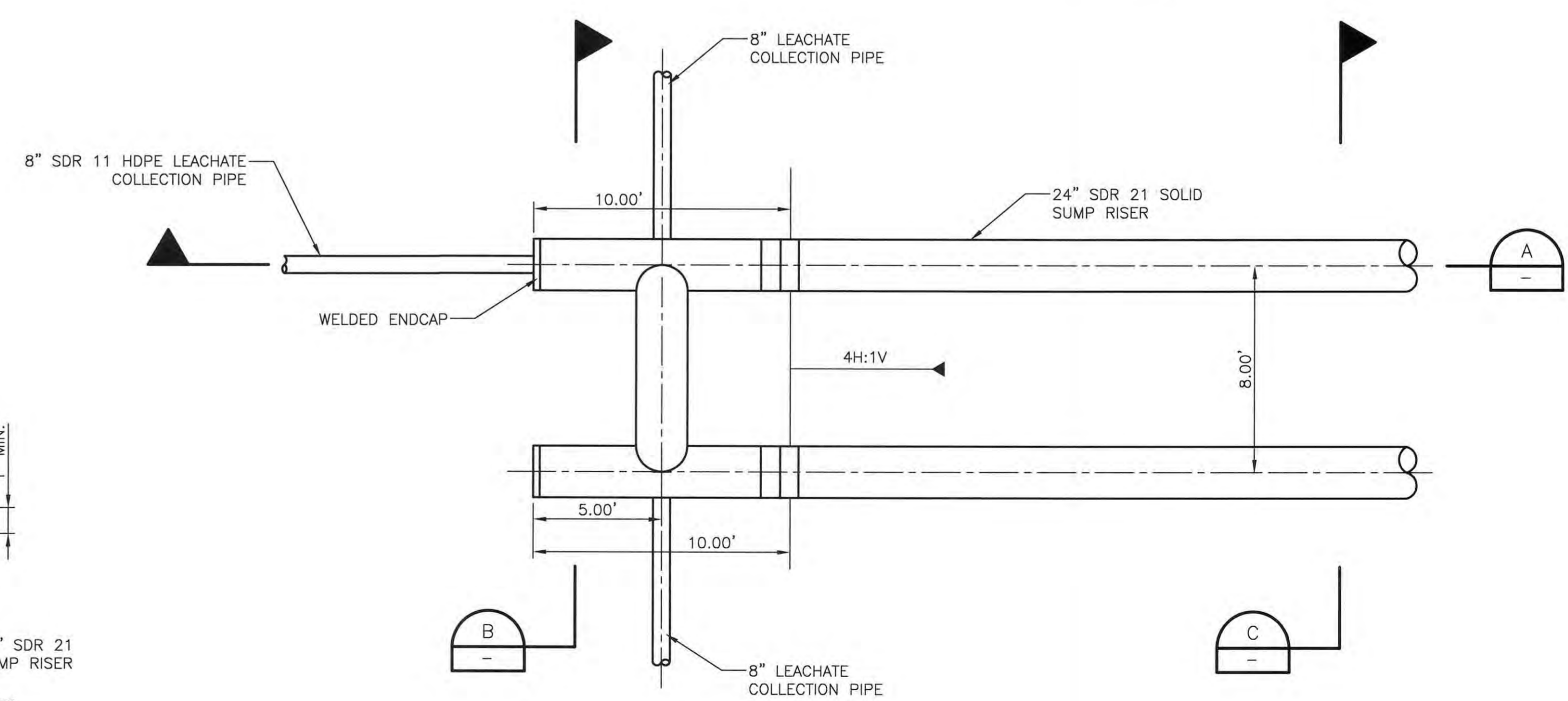
NOTES:
1. PROVIDE A MINIMUM COVER OF 1' OVER ALL PIPES.

SECTION
1" = 4' (C)



NOTES:
1. THE SEPARATOR GEOTEXTILE WRAPS THE NCDOT #5 STONE.

BASE LINER TOE DRAIN
1" = 2' (00C-03)



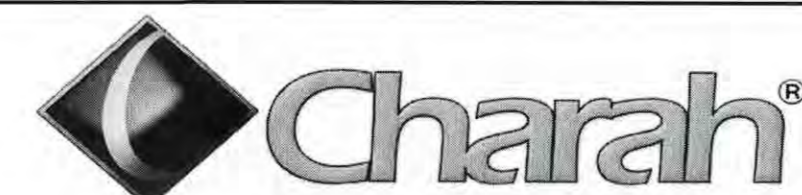
SUMP
1" = 4' (00C-03)



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ISSUE	DATE	DESCRIPTION
C	03/2015	REVISED LEACHATE COLLECTION PIPE
B	12/31/14	REVISED PER NCDENR COMMENTS
A	11/2014	ISSUED FOR APPROVAL

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	P. WESTMORELAND, P.E.
DRAWN BY	L. MCCAUL
CHECKED BY	J. READLING, P.E.
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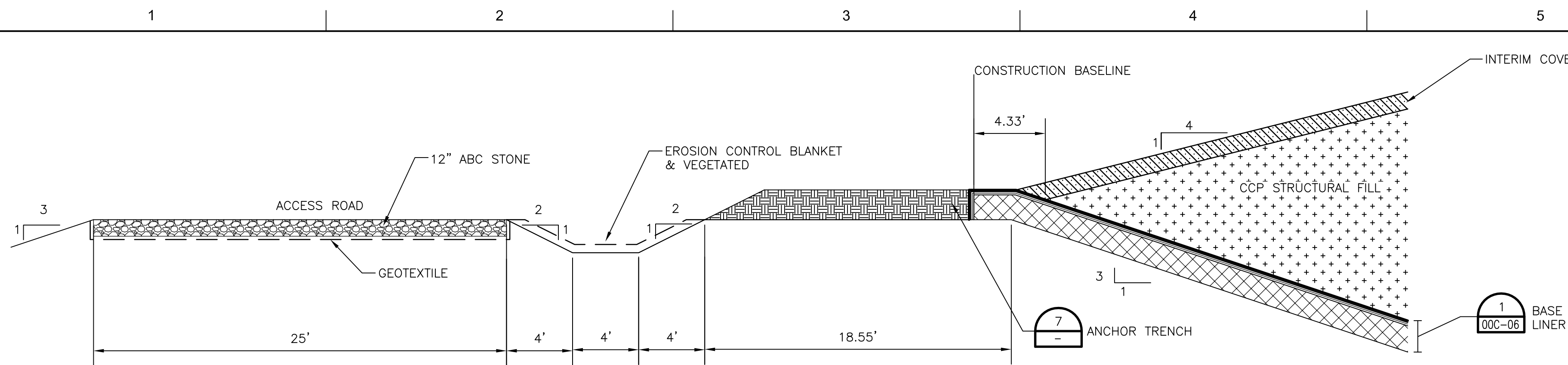
COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

LINER SYSTEM AND SUMP

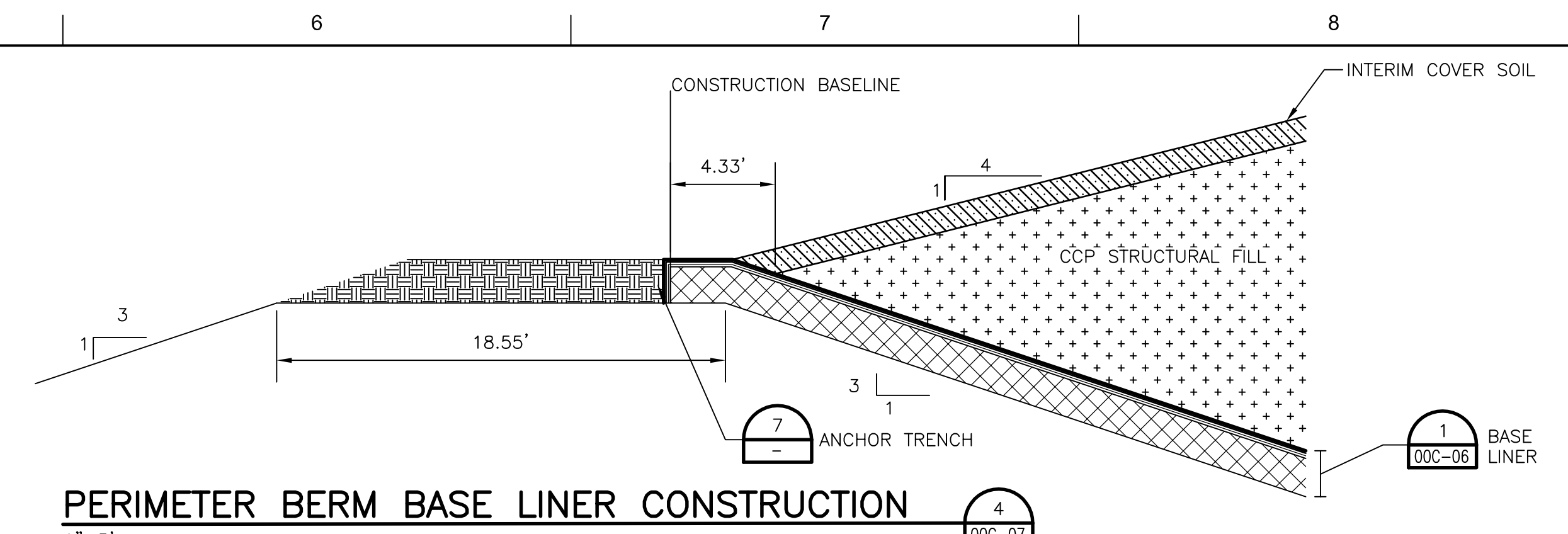


FILENAME | 00C-06.dwg
SCALE | AS SHOWN

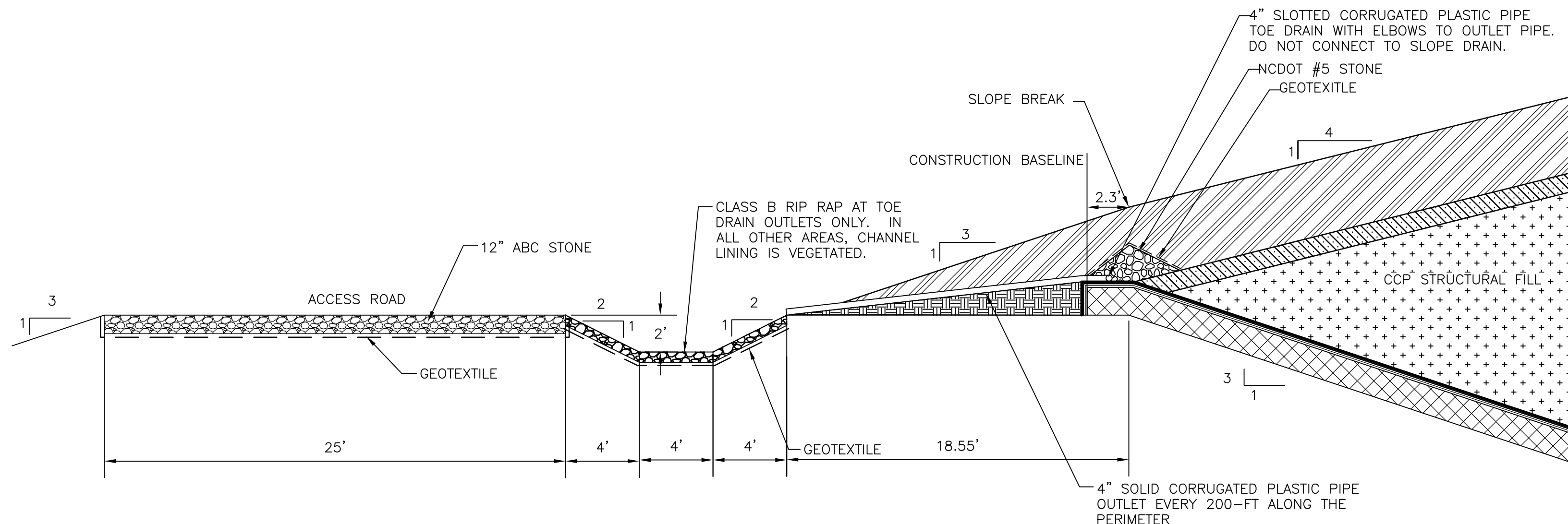
SHEET
00C-06



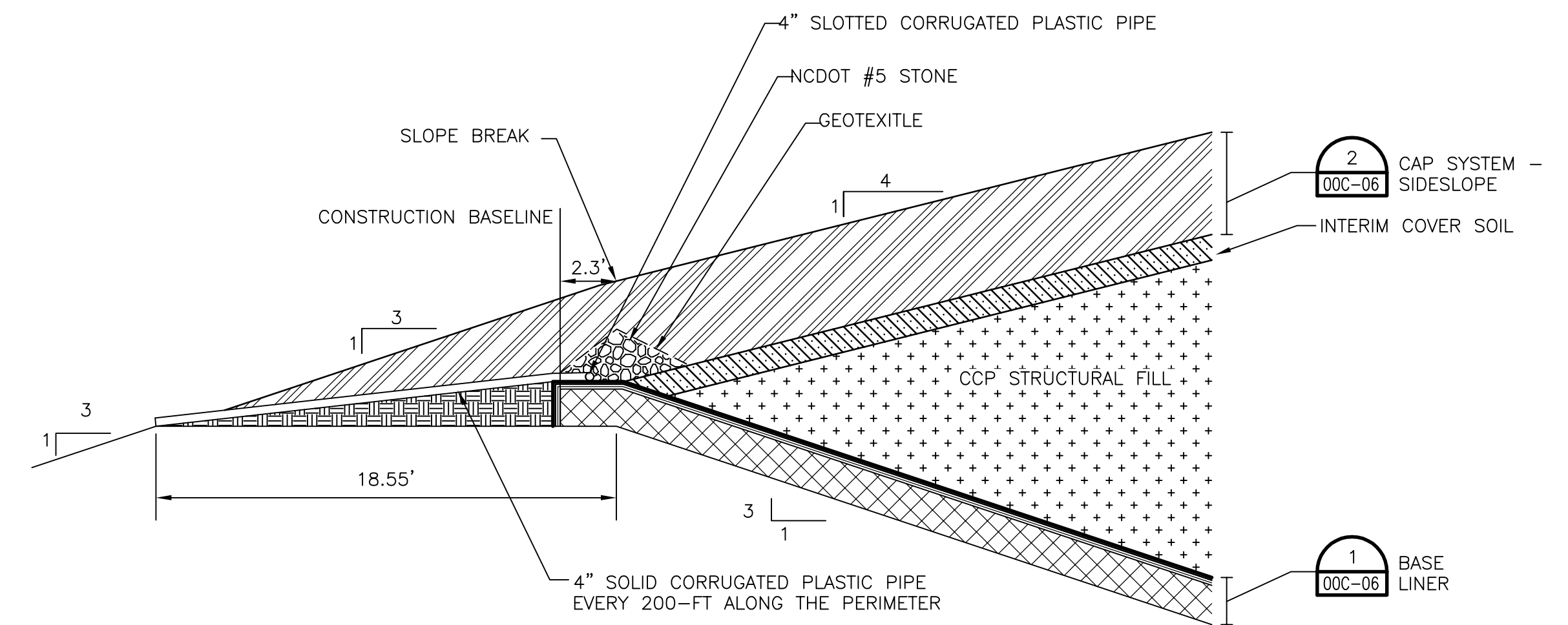
PERIMETER BERM BASE LINER CONSTRUCTION
1"=5'



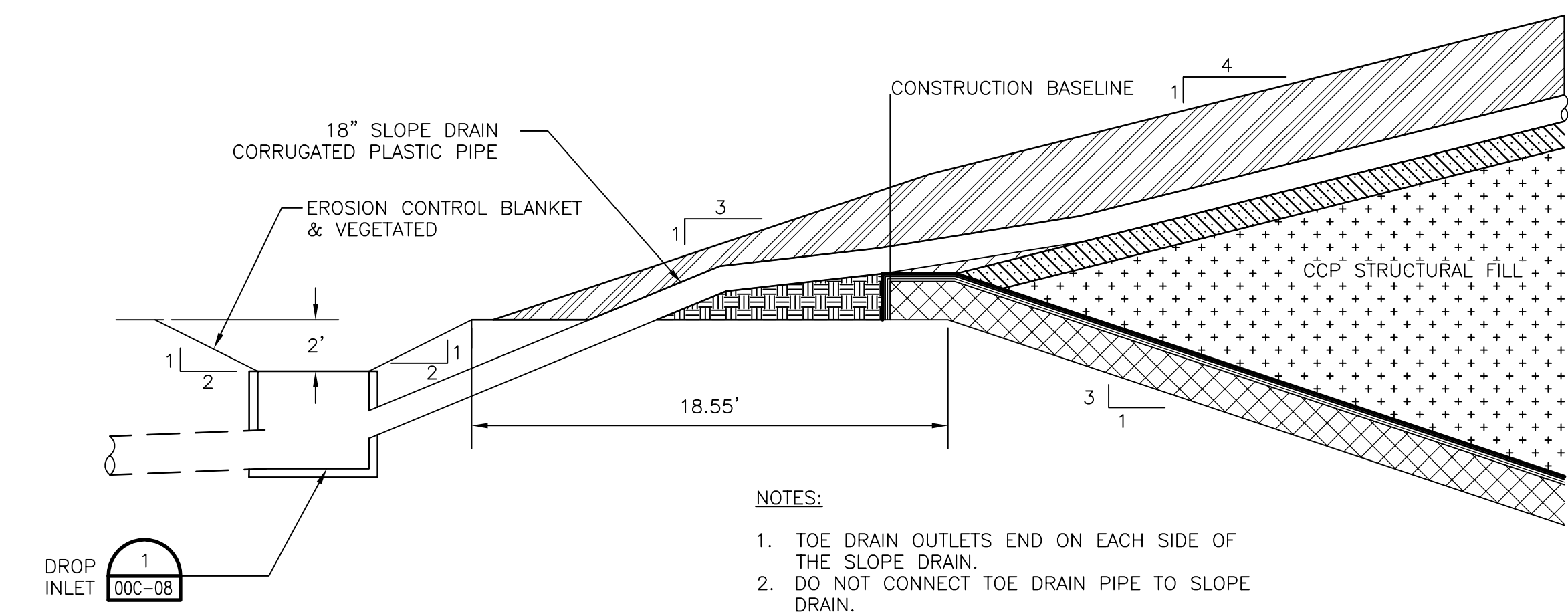
PERIMETER BERM BASE LINER CONSTRUCTION
1"=5'



PERIMETER BERM CLOSURE CONSTRUCTION
1"=5'

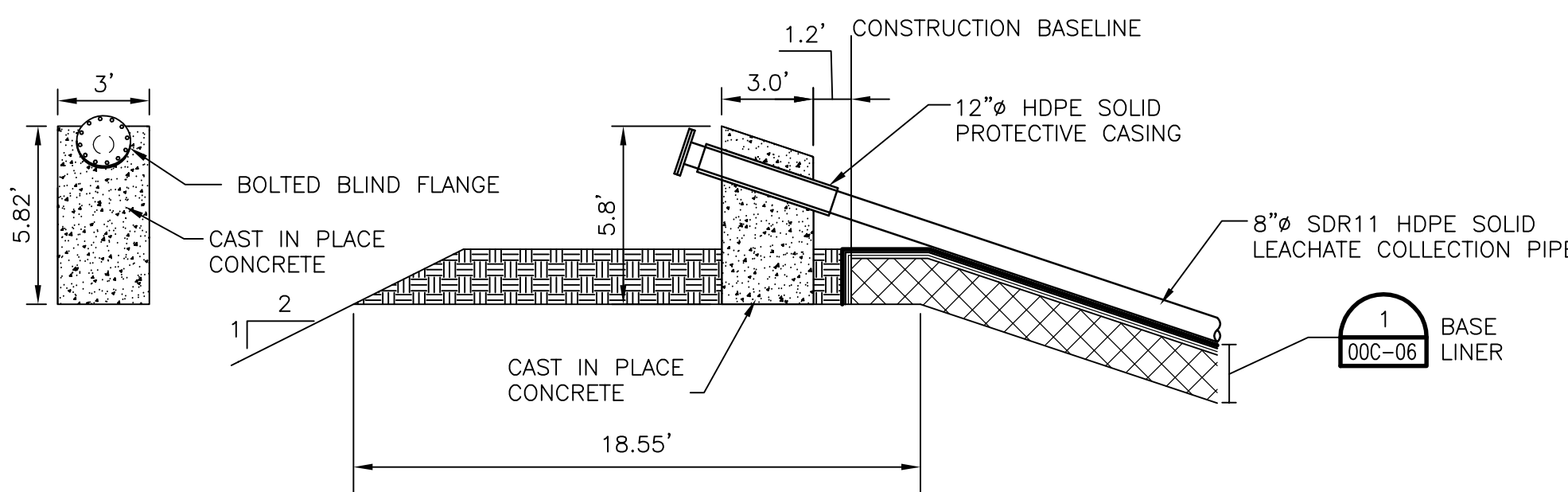


PERIMETER BERM CLOSURE CONSTRUCTION
1"=5'



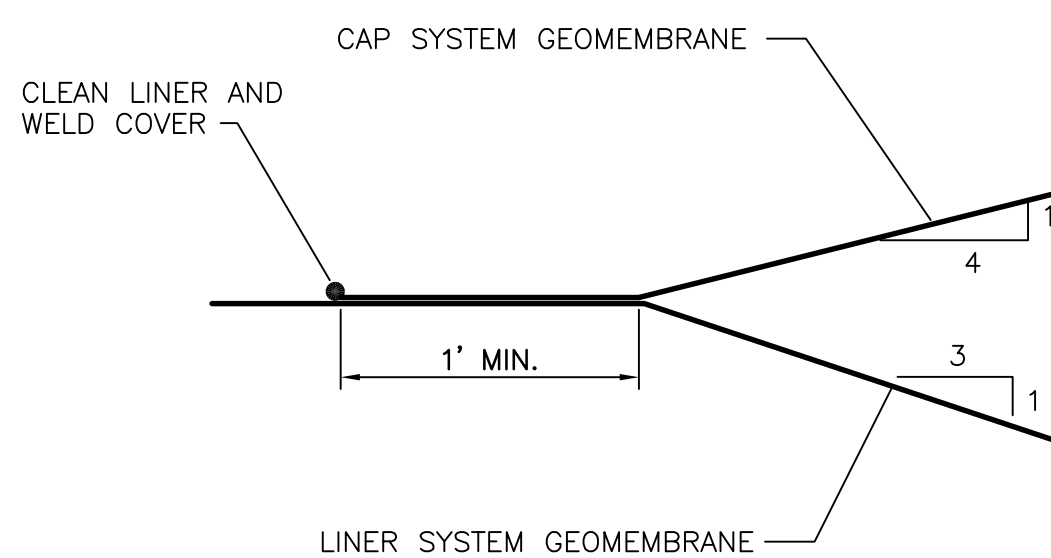
SLOPE DRAIN
1"=5'

- NOTES:
- TOE DRAIN OUTLETS END ON EACH SIDE OF THE SLOPE DRAIN.
 - DO NOT CONNECT TOE DRAIN PIPE TO SLOPE DRAIN.

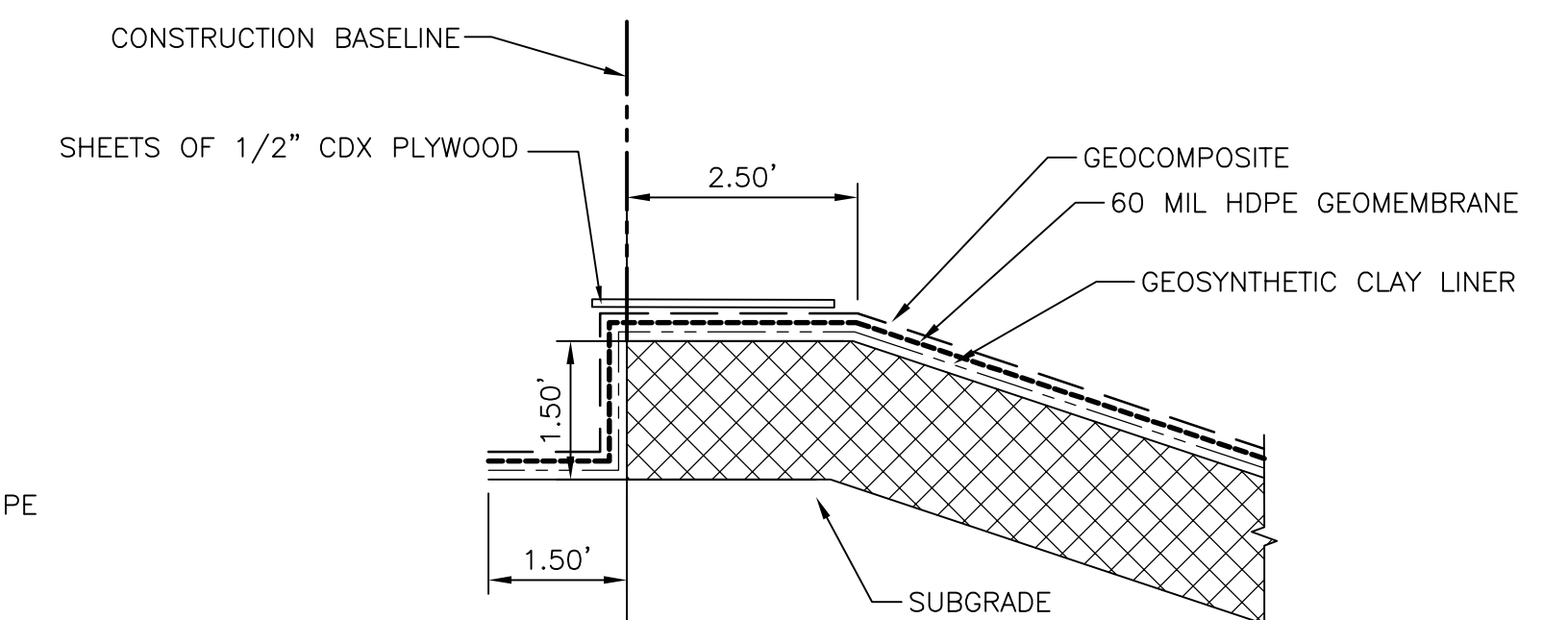


LEACHATE CLEANOUT
1"=5'

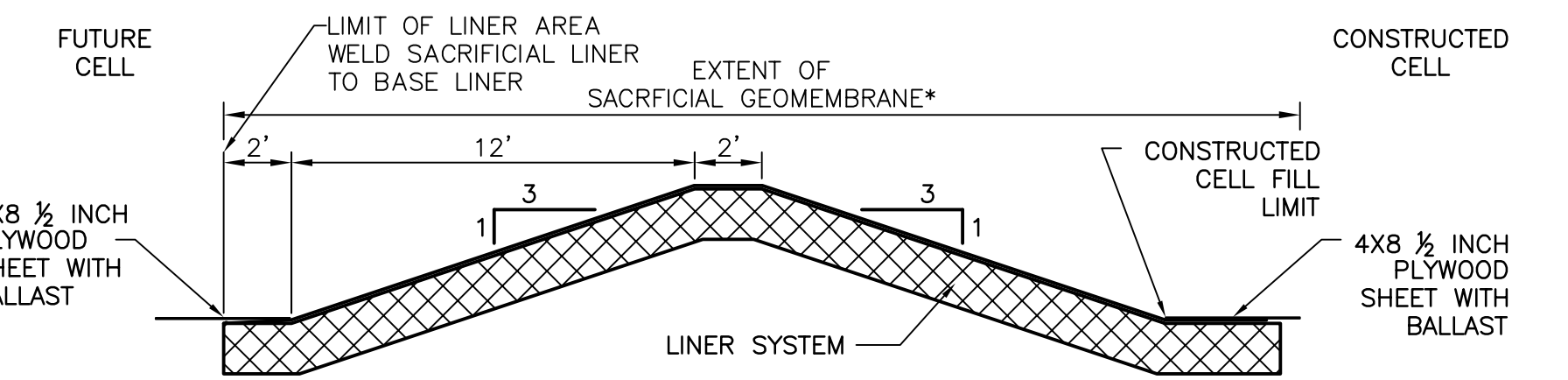
- NOTES:
- ALL LEACHATE CLEANOUT HARDWARE TO BE STAINLESS STEEL.



COVER TIE-IN
NTS



ANCHOR TRENCH
1"=2'



CELL TIE-IN
1"=5'

- NOTES:
- REMOVE PLYWOOD OUTSIDE OF CONSTRUCTED CELL FOR TIE IN WITH FUTURE CELL LINER.
 - INSPECT EXISTING MATERIALS AND MAKE TIE IN AT LOCATION OF COMPETENT MATERIALS MEETING DESIGN CRITERIA.
 - SACRIFICIAL GEOMEMBRANE TO BE REMOVED PRIOR TO FILLING FUTURE CELL.

*SACRIFICIAL GEOMEMBRANE IS USED TO PROTECT GEOCOMPOSITE UNTIL FUTURE CELL IS PLACED IN SERVICE.



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704.338.6700
N.C.B.E.L.S. License Number F-0116

ISSUE	DATE	DESCRIPTION	PROJECT NUMBER
B	12/31/14	REVISED PER NCDENR COMMENTS	453925-235691-018
A	11/2014	ISSUED FOR APPROVAL	

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	P. WESTMORELAND, P.E.
DRAWN BY	L. MCCAUL
CHECKED BY	J. READLING, P.E.
PROJECT NUMBER	453925-235691-018



COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

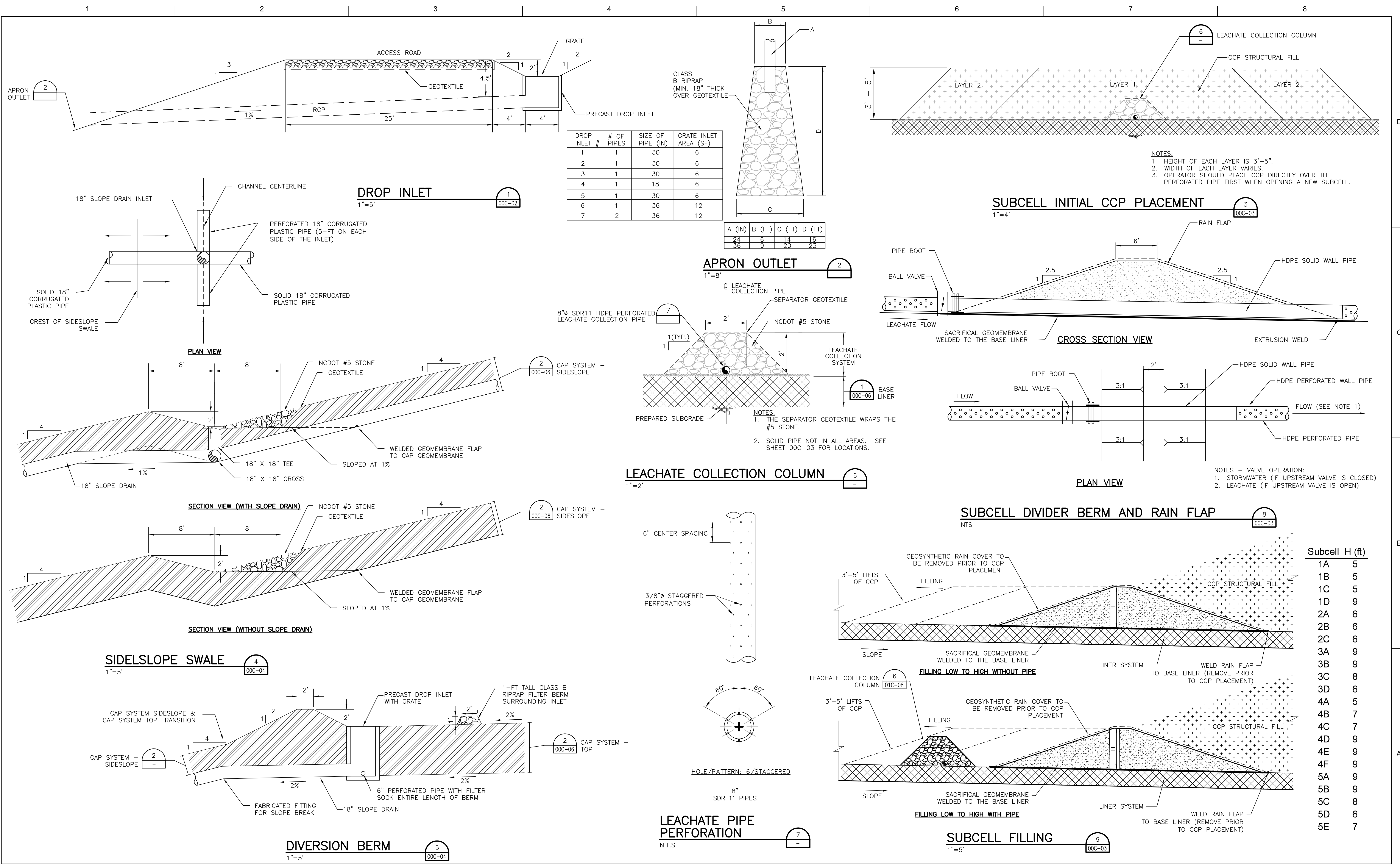


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SCALE | AS SHOWN

SHEET
00C-07

PERIMETER CONTAINMENT

D
C
B
A



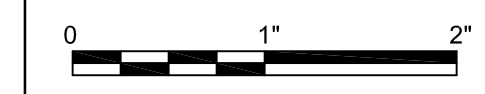
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ISSUE	DATE	DESCRIPTION
C	03/2015	REVISED SUBCELL & FILLING
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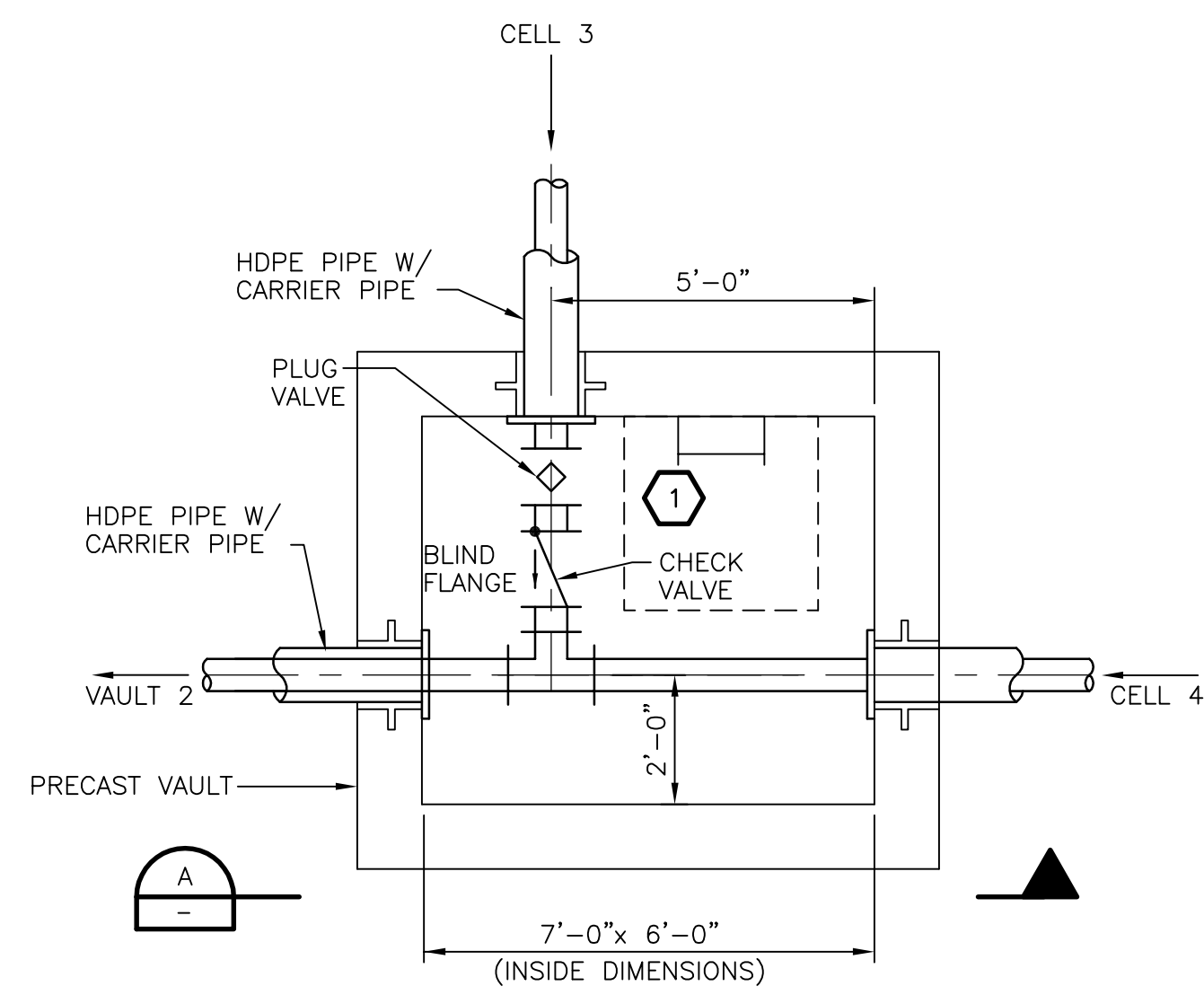


COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

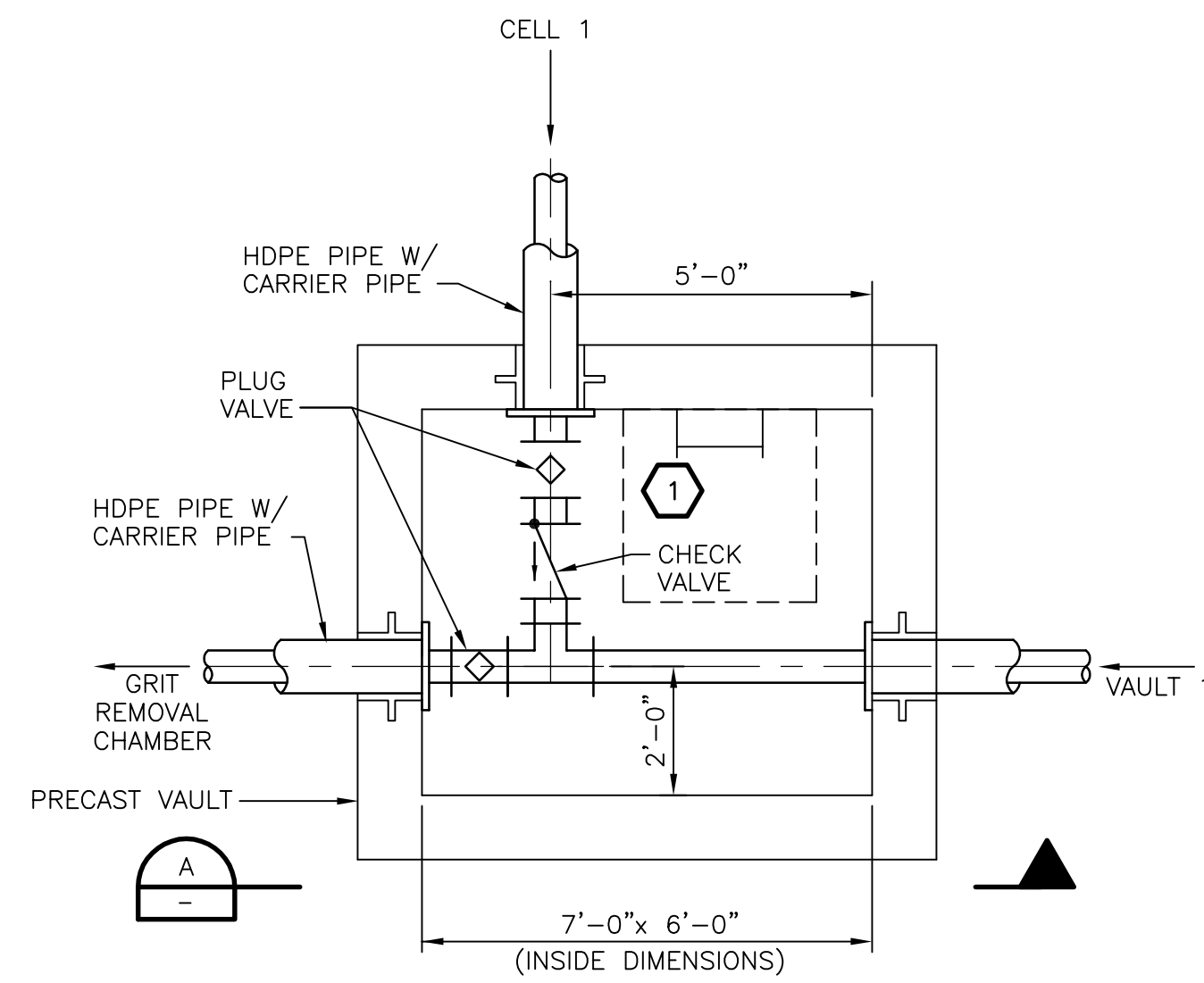


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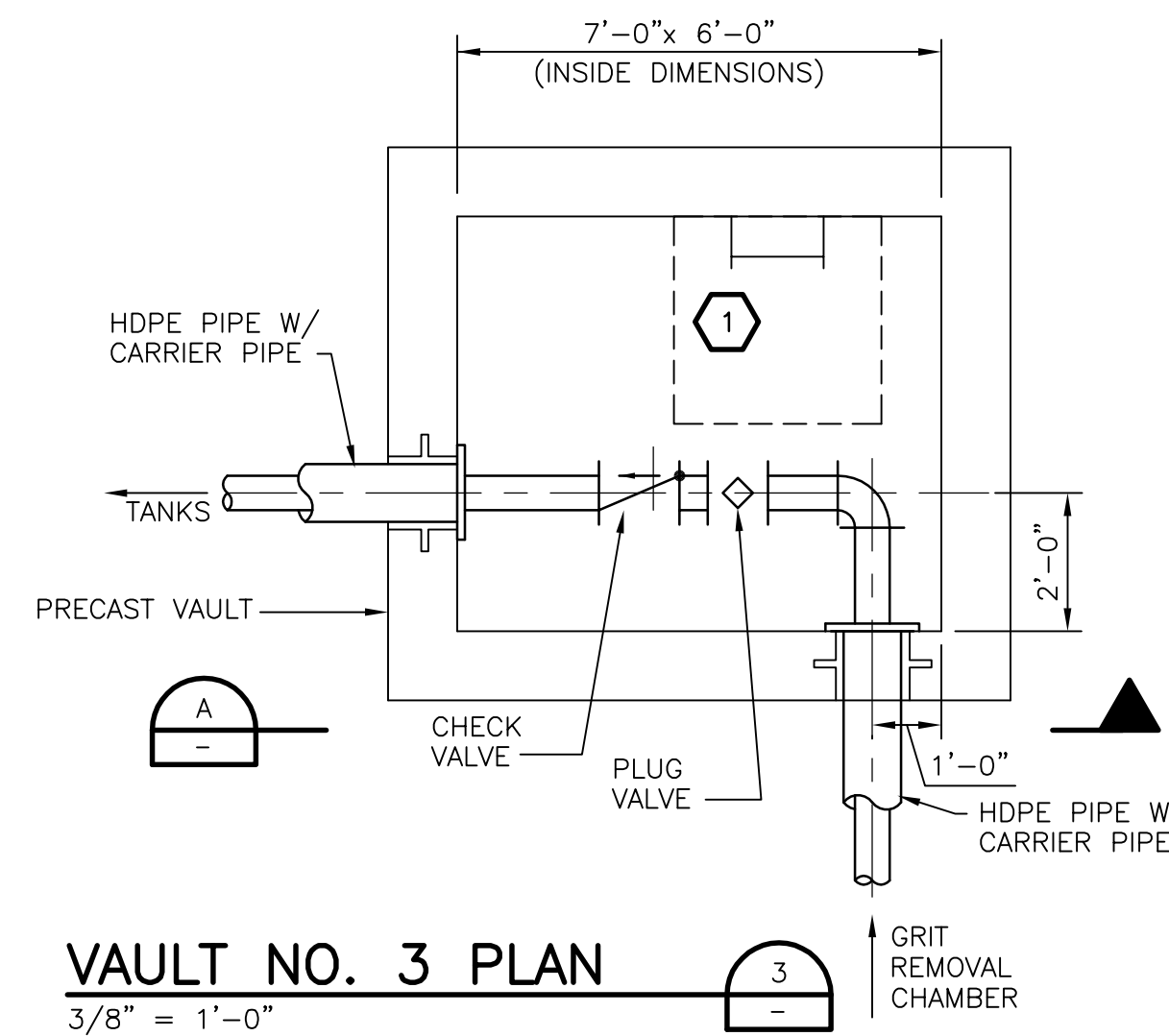
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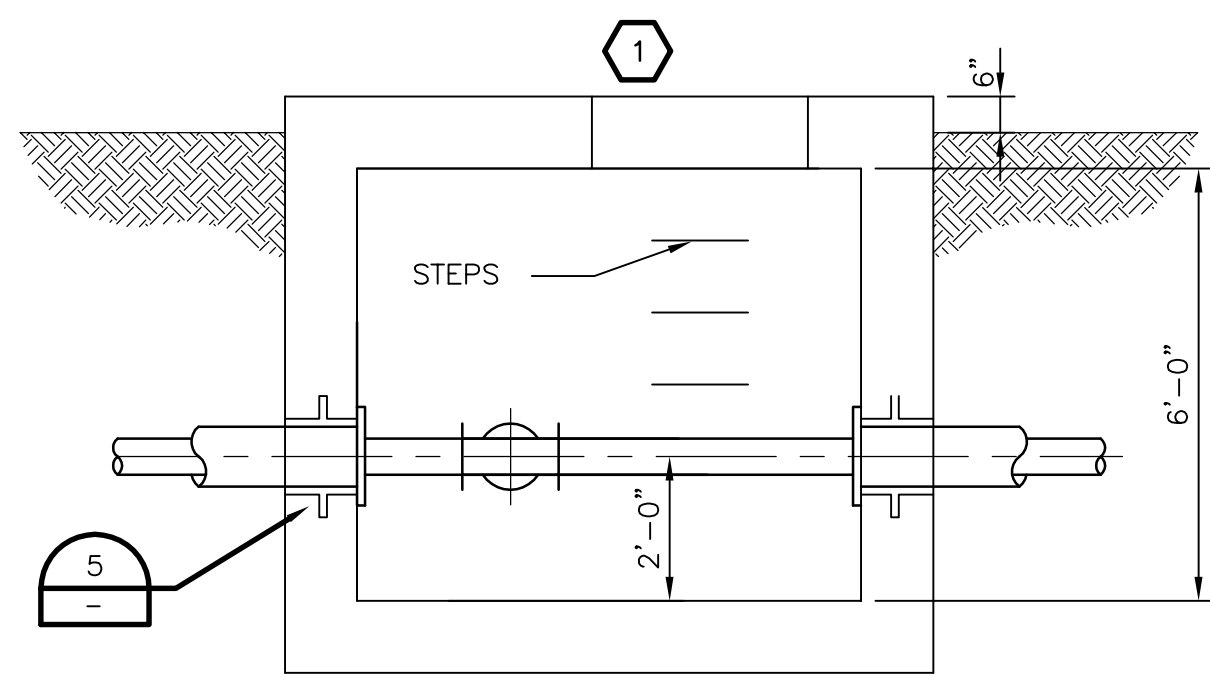
VAULT NO. 1 PLAN
3/8" = 1'-0"



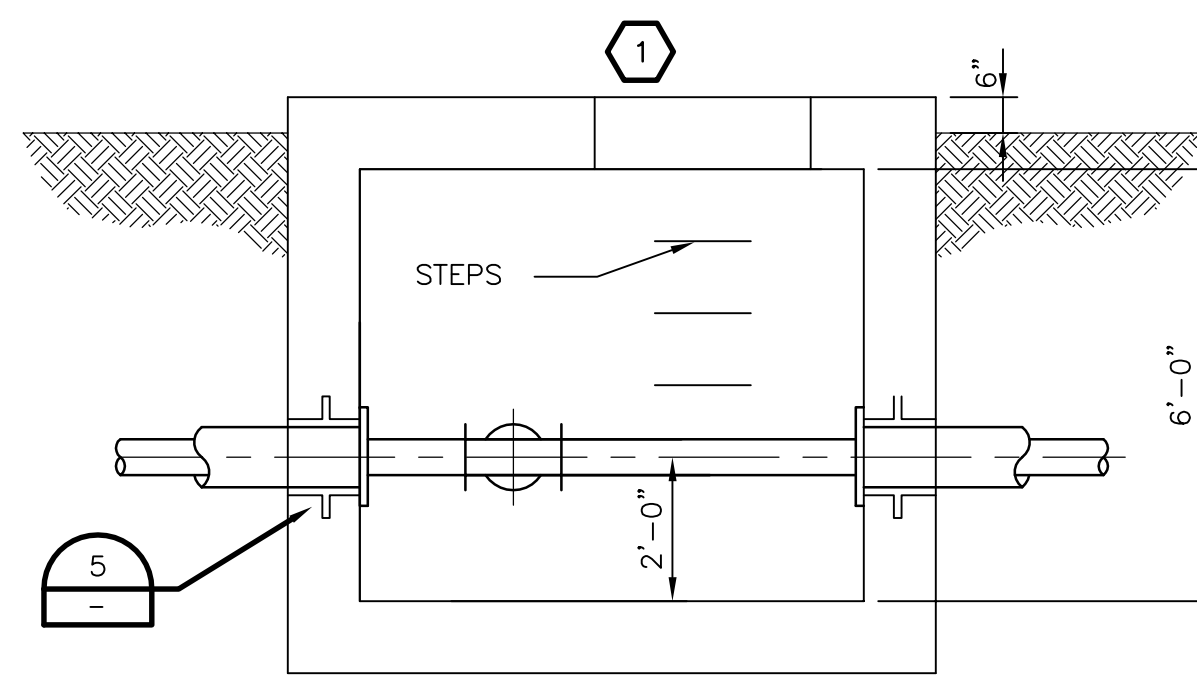
VAULT NO. 2 PLAN
3/8" = 1'-0"



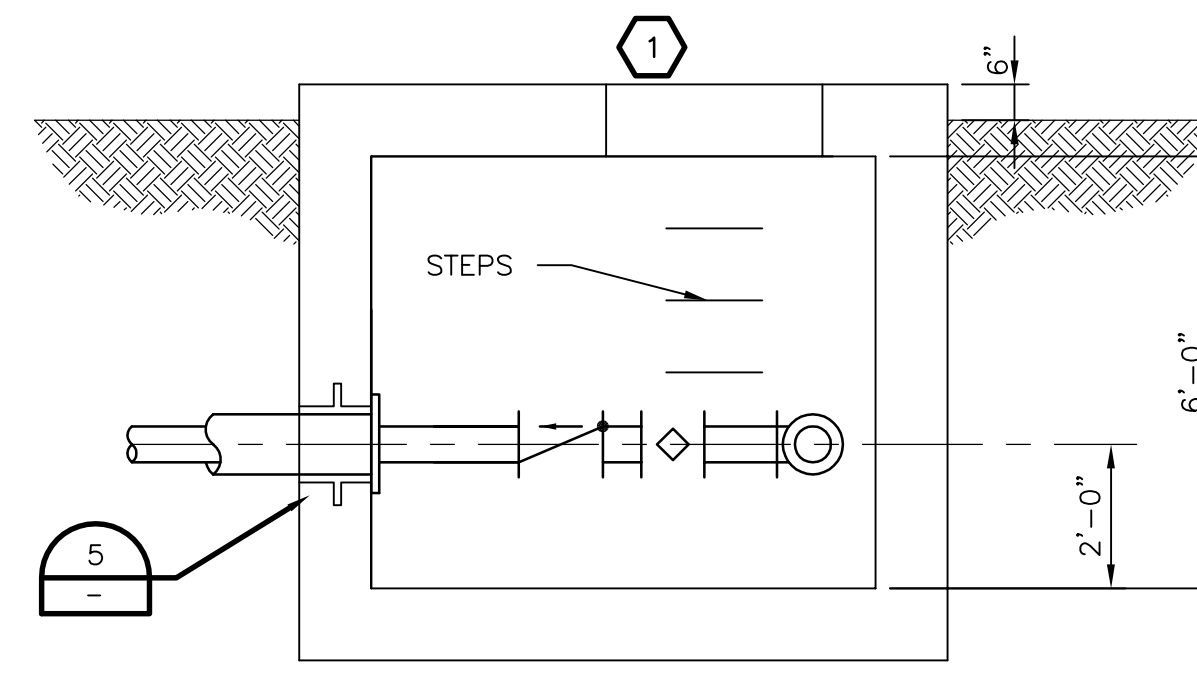
VAULT NO. 3 PLAN
3/8" = 1'-0"



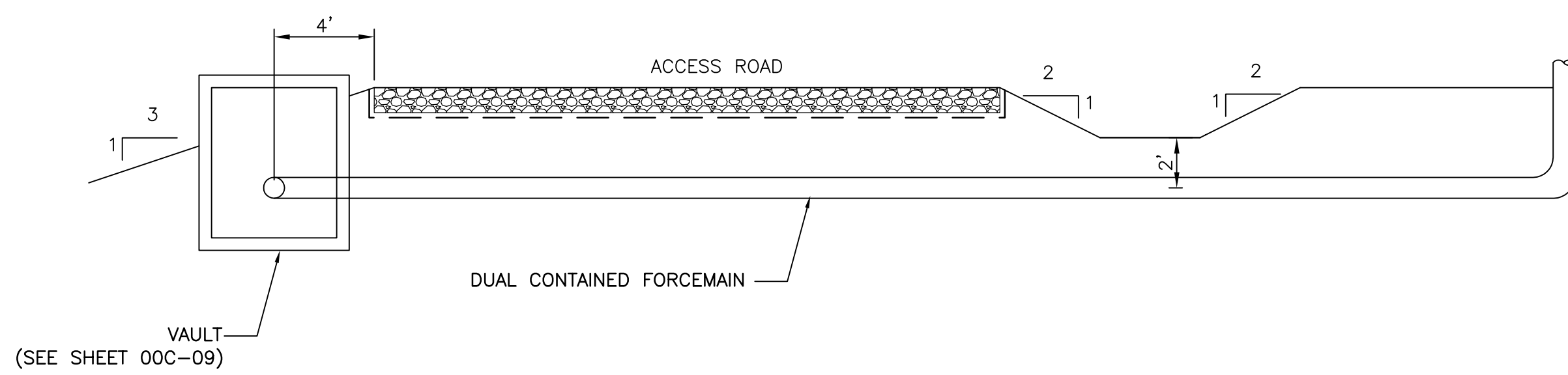
SECTION
3/8" = 1'-0"



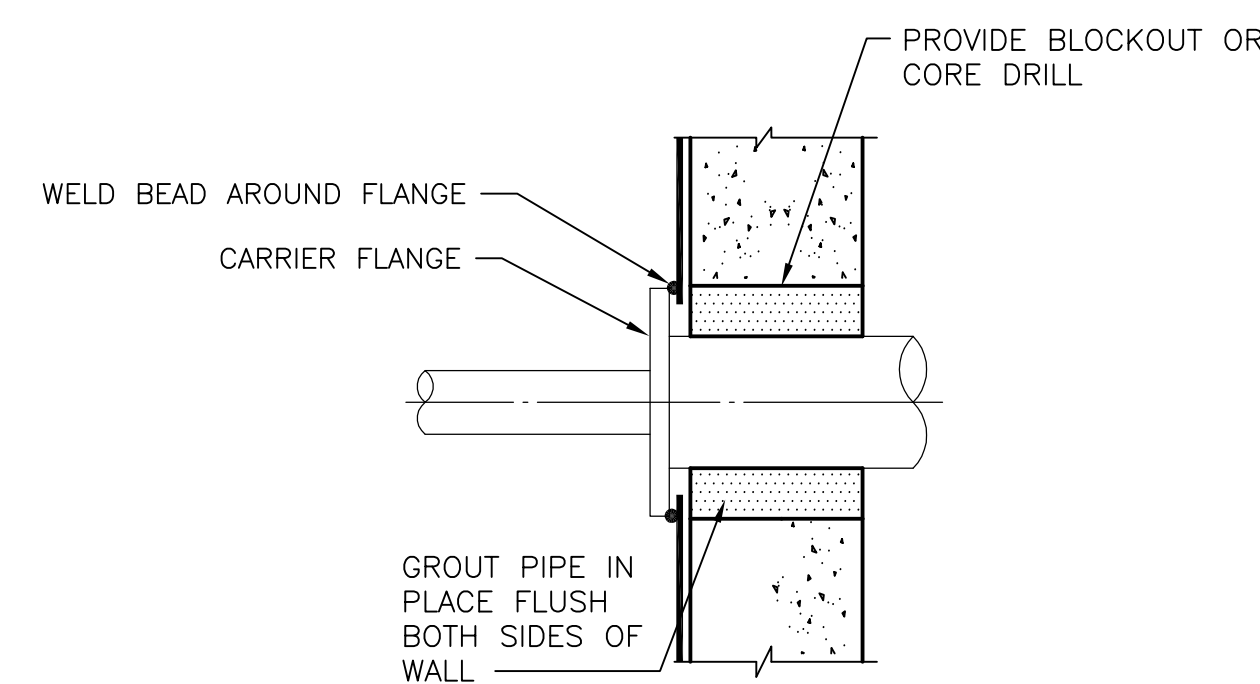
SECTION
3/8" = 1'-0"



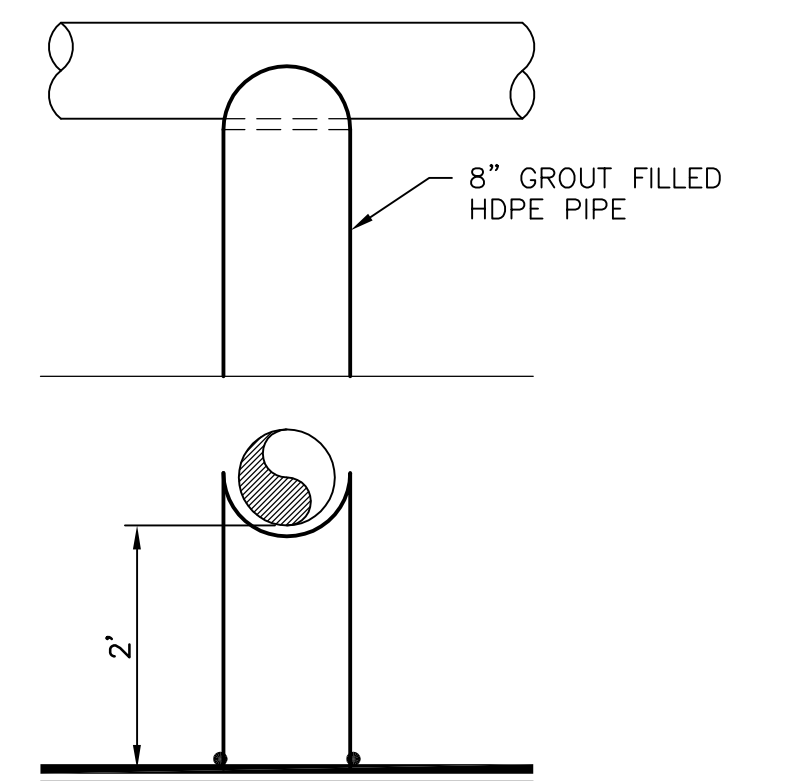
SECTION
3/8" = 1'-0"



VAULT & FORCE MAIN LOCATION
1" = 5'



PIPE PENETRATION
NO SCALE



PIPE SUPPORT
NO SCALE

KEY NOTE
1 ALL VAULTS AND HATCHES TO BE H-20 RATED.

NOTES
1. THESE DETAILS ARE PROVIDED FOR INFORMATION ONLY AND ARE NOT INTENDED FOR CONSTRUCTION. THESE DETAILS ARE TO BE EVALUATED PRIOR TO CONSTRUCTION.
2. LOCATIONS OF VAULTS ALONG FORCEMAIN TO BE EVALUATED DURING CONSTRUCTION.



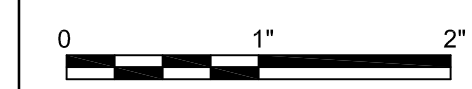
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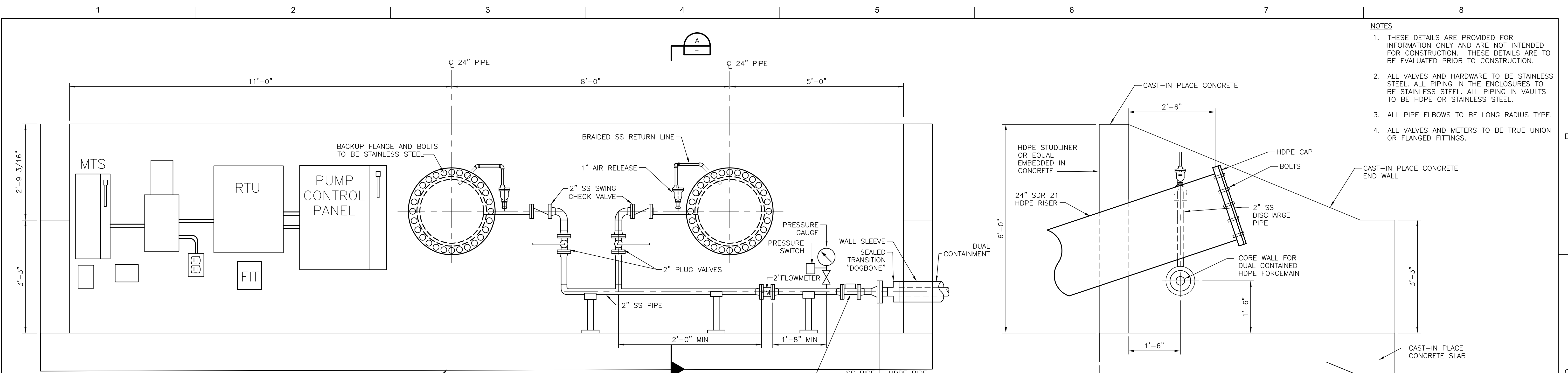


COLON MINE SITE STRUCTURAL FILL
SANFORD, NC



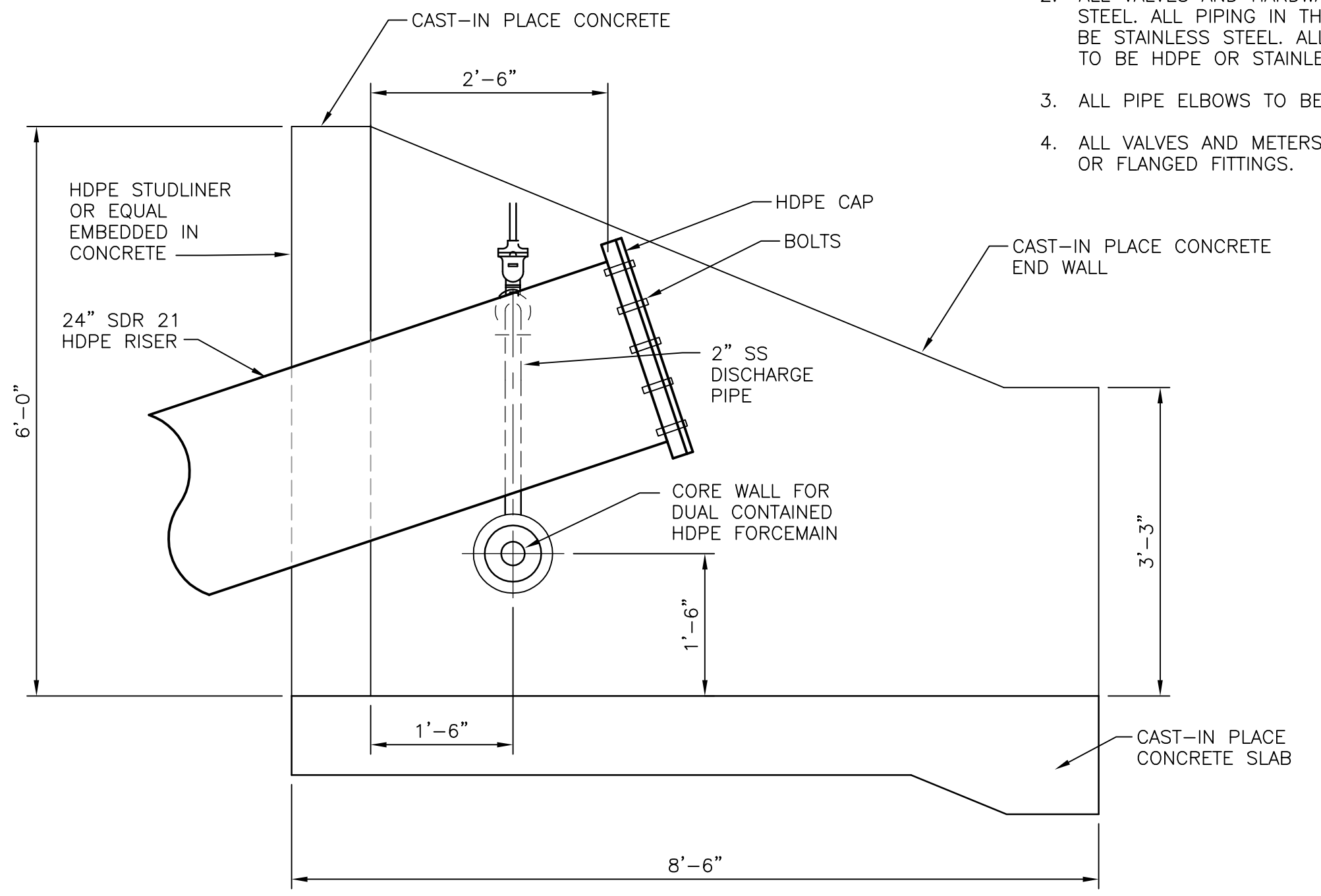
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SCALE | AS SHOWN

SHEET
00C-09

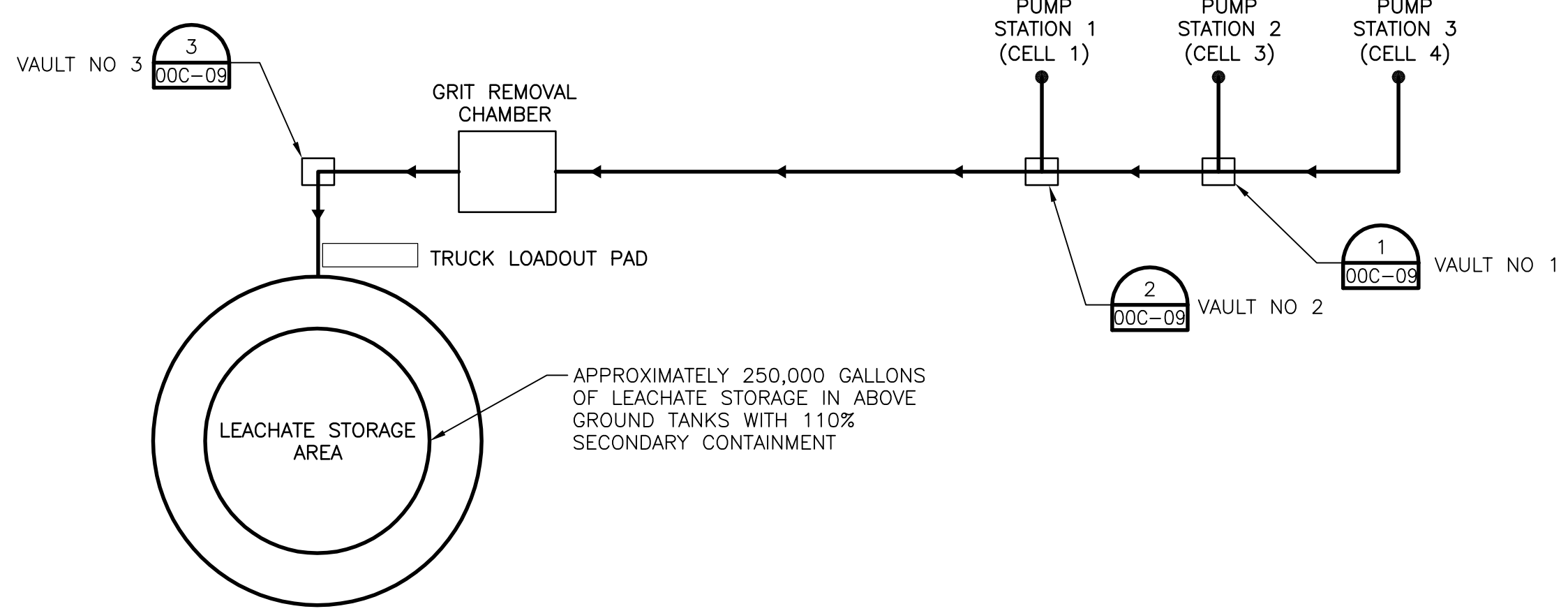


- NOTES:**
1. VERIFY EQUIPMENT DIMENSIONS AND LAYOUT PRIOR TO CONSTRUCTING THIS CAST IN PLACE CONCRETE STRUCTURE.
 2. HDPE CAPS TO BE FABRICATED FROM HDPE (NO BACKUP RING) WITH GASKET BETWEEN HDPE SURFACES. HARDWARE TO BE STAINLESS STEEL. USE STANDARD ANSI BOLT PATTERN.
 3. HEAT TRACE AND INSULATE ALL STAINLESS STEEL PIPE AND AIR RELEASE VALVE.
 4. PENETRATIONS FOR AIR RELEASE RETURN, POWER CABLE, SENSOR CABLE AND STAINLESS STEEL SECURITY CABLE TO BE IN UPPER HALF OF RISER PIPE. PENETRATIONS SHALL PROVIDE GAS TIGHT SEAL. ALLOW FOR REMOVAL OF CABLES AS REQUIRED.
 5. ATTACH PUMP TO STAINLESS STEEL CABLE THAT IS ATTACHED TO CONCRETE WALL TO AID IN RETRIEVAL OF PUMP.

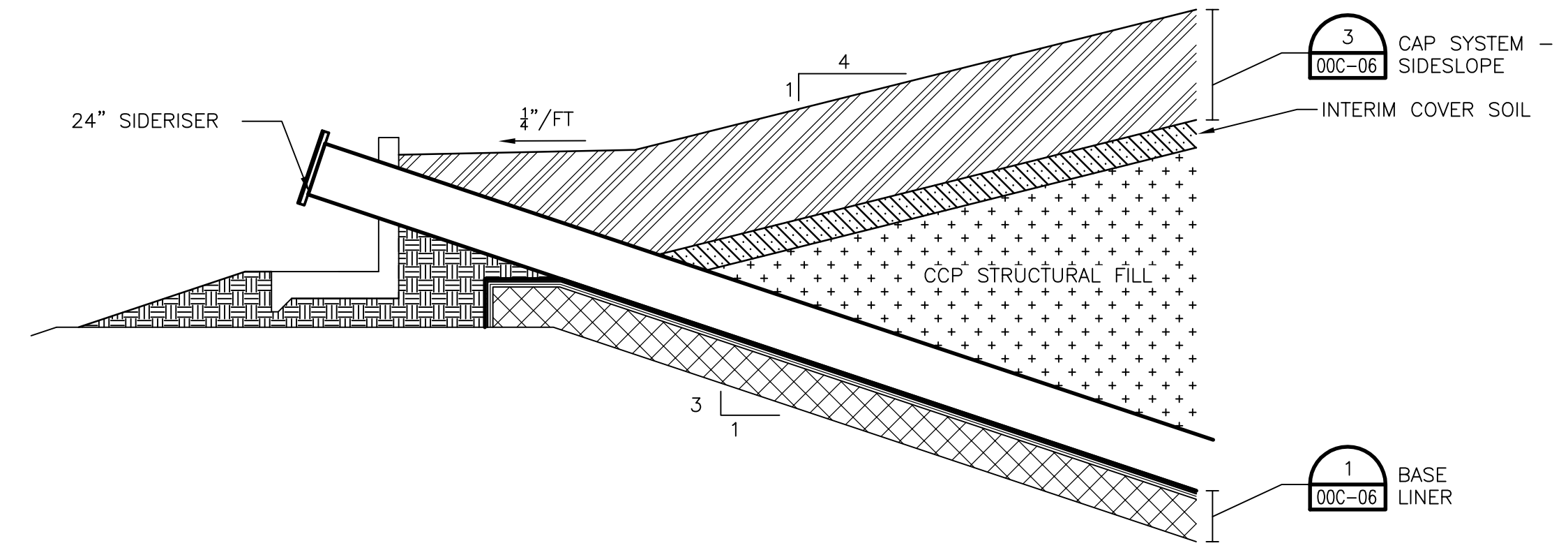
LEACHATE PUMP STATION
3/4"=1'-0"



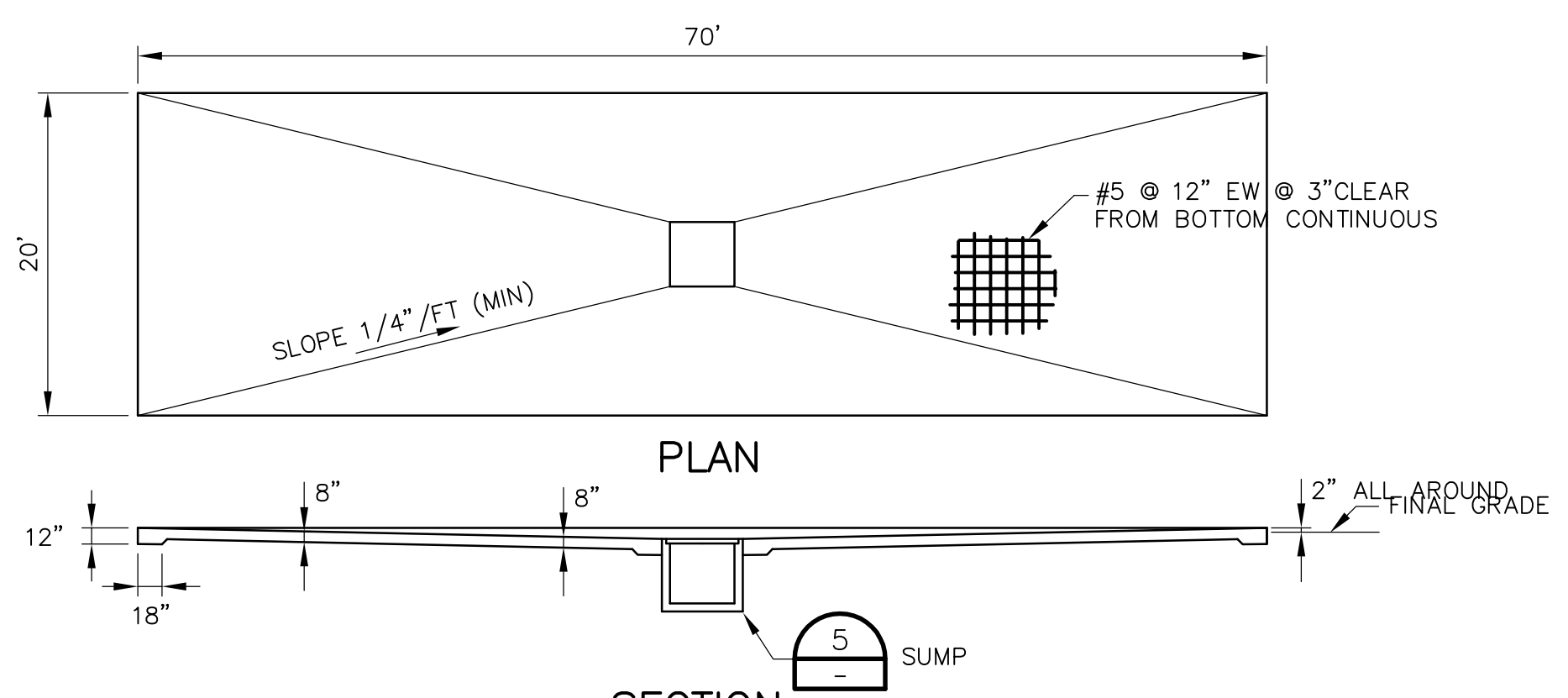
SECTION A
3/4"=1'-0"



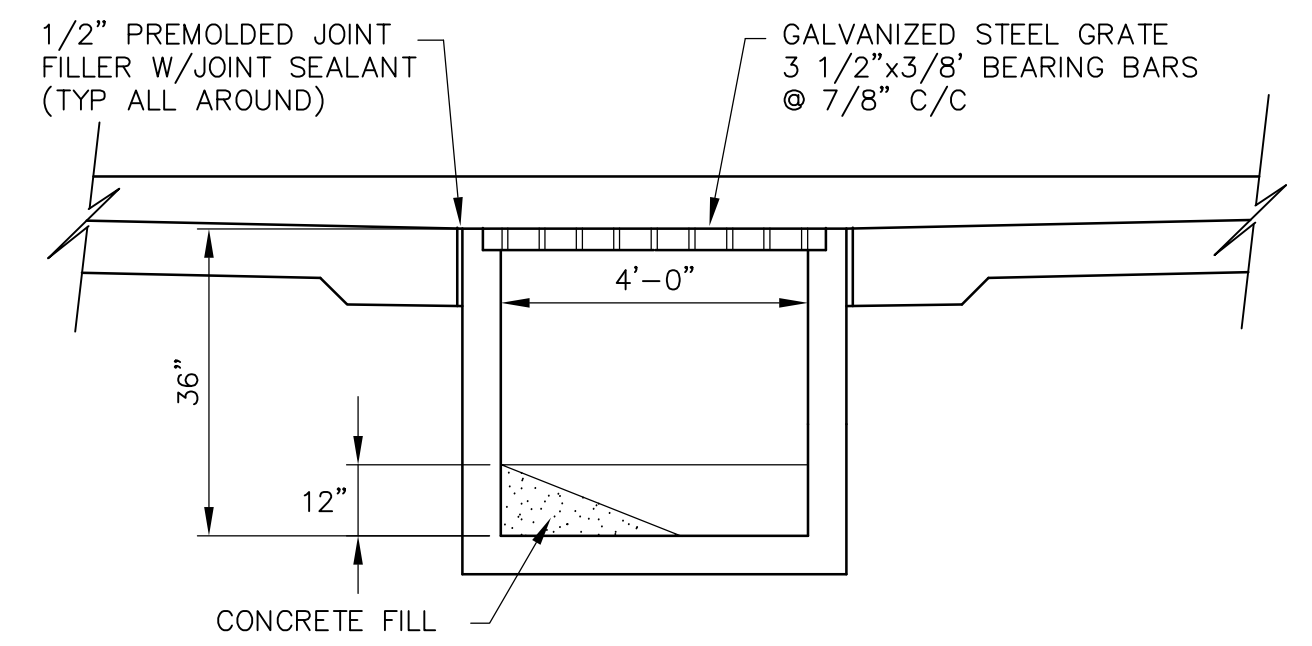
FORCEMAIN SCHEMATIC
NOT TO SCALE



SIDE RISER
1"=5'



LEACHATE TANK LOADOUT PAD
NO SCALE



SUMP
NO SCALE

- NOTES**
1. THESE DETAILS ARE PROVIDED FOR INFORMATION ONLY AND ARE NOT INTENDED FOR CONSTRUCTION. THESE DETAILS ARE TO BE EVALUATED PRIOR TO CONSTRUCTION.
 2. ALL VALVES AND HARDWARE TO BE STAINLESS STEEL. ALL PIPING IN THE ENCLOSURES TO BE STAINLESS STEEL. ALL PIPING IN VAULTS TO BE HDPE OR STAINLESS STEEL.
 3. ALL PIPE ELBOWS TO BE LONG RADIUS TYPE.
 4. ALL VALVES AND METERS TO BE TRUE UNION OR FLANGED FITTINGS.



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Charah
COLON MINE SITE STRUCTURAL FILL
SANFORD, NC

LEACHATE PUMP SYSTEM

SCALE: 0 1" 2"
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SHEET: 00C-10

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