CFVH HARNETT MOB

225 BRIGHTWATER DR. LILLINGTON, NC 27546

CONSTRUCTION DOCUMENTS

WATER COMPANY
HARNETT REGIONAL WATER
700 McKINNEY PARKWAY
LILLINGTON, NC 27546
(910) 893-7575

POWER COMPANY
DUKE ENERGY
P.O. BOX 1090
CHARLOTTE, NC 28201
(800) 454-3853

SANITARY SEWER COMPANY
HARNETT REGIONAL WATER
700 McKINNEY PARKWAY
LILLINGTON, NC 27546
(910) 893-7575

NATURAL GAS COMPANY
DUKE ENERGY
P.O. BOX 1090
CHARLOTTE, NC 28201
(800) 454-3853

EROSION CONTROL
NCDENR - FAYETTEVILLE REGIONAL OFFICE
225 GREEN ST. SUITE 714
FAYETTEVILLE, NC 28301
(910) 433-3300

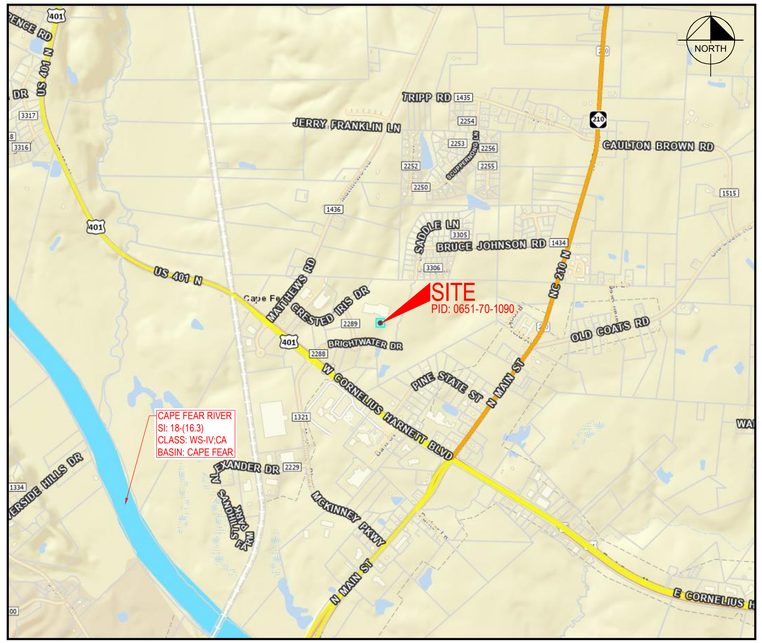
DEPARTMENT OF TRANSPORTATION
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
600 SOUTHERN AVE.
FAYETTEVILLE, NC 28306
(910) 364-0601

ENGINEERING
DM2 ENGINEERING
211 EAST QUAILWOOD DR.
FUQUAY VARIANA, NC 27526
(919) 818-2235

PLANNING DEPARTMENT
HARNETT COUNTY PLANNING SERVICES
420 McKINNEY PARKWAY
LILLINGTON, NORTH CAROLINA 27546
(910) 893-7525

SITE INSPECTION
CENTRAL PERMITTING
420 McKINNEY PARKWAY
LILLINGTON, NC 27546
(910)893-7525

FIRE MARSHAL
HARNETT COUNTY FIRE MARSHAL
1005 EDWARDS BROTHERS DR.
LILLINGTON, NC 27546
(910) 893-7580



VICINITY MAP
NTS

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ESTIMATED CONSTRUCTION START:	09.01.23
ESTIMATED CONSTRUCTION COMPLETION:	09.01.24

BANKS ENGINEERING
1927 S. TRYON ST.
SUITE 106
CHARLOTTE, NC 28203
T: 704.780.4972
NC License #P-1370

NORTH CAROLINA PROFESSIONAL SEAL 28307 ENGINEER JAY D. BANKS
04.26.23
C-SERIES SHEETS ONLY

Know what's below. Call before you dig.

-	04.26.23	1st municipality review	ALL
REV.	DATE	REVISION DESCRIPTION	SHEETS

OWNER:
Harnett Health System, Inc.
215 Brightwater Dr.
LILLINGTON, NC 27546
CONTACT: MIKE JONES
PHONE: 919.630.4600
EMAIL: MJones3@capefearvalley.com

DEVELOPER:
The Keith Corp. (TKC)
4500 CAMERON VALLEY PKWY, SUITE 400
CHARLOTTE, NC 28211
CONTACT: ERIC LARSON
PHONE: 704.319.8160
EMAIL: elarson@thekeithcorp.com

ENGINEER:
BANKS ENGINEERING, PLLC.
1927 S. TRYON ST., SUITE 106
CHARLOTTE, NC 28203
CONTACT: JAY D. BANKS, PE
PHONE: 704.780.4972
EMAIL: jbanks@civilbanks.com

SURVEYOR:
CHANDLER LAND SURVEYING
119 COMMERCE PARKWAY, SUITE 101
GARNER, NC 27529
CONTACT: JOHN CHANDLER, PLS
PHONE: 919.291.9163
EMAIL: jchandler@chandlerlandsurveying.com

CFVH HARNETT MOB

PROJECT: 1054013

C0-1

ALL WORK AND MATERIALS SHALL COMPLY WITH ALL COUNTY AND STATE REGULATIONS AND CODES AND O.S.H.A. STANDARDS.

NO WORK WITHIN NCDOT RIGHT OF WAY SHALL TAKE PLACE WITHOUT ALL PERMITS.

AREAS TO BE DISTURBED SHALL BE IMPROVED PER THE CIVIL PLANS OR RESTORED TO THEIR ORIGINAL OR BETTER CONDITION. CONTRACTOR SHALL REPAIR ANY EXISTING FEATURES THAT ARE DAMAGED DURING CONSTRUCTION TO THE EXISTING OR BETTER CONDITION.

SITE BOUNDARY, TOPOGRAPHY, UTILITY AND ROAD INFORMATION TAKEN FROM A SURVEY DEVELOPED BY CHANDLER SURVEY. ALL INFORMATION IS TO BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

THE CONTRACTOR SHALL EMPLOY ALL NECESSARY BARRICADES, SIGNS, FENCES, FLASHING LIGHTS, TRAFFIC MEN, ETC. FOR MAINTENANCE AND PROTECTION OF TRAFFIC AS REQUIRED BY THE NORTH CAROLINA DEPT. OF TRANSPORTATION (NCDOT).

THE CONTRACTOR SHALL PROTECT ALL MONUMENTS, IRON PINS, AND PROPERTY CORNERS DURING CONSTRUCTION.

APPROVAL OF THIS PLAN IS NOT AN AUTHORIZATION TO GRADE ADJACENT PROPERTIES. ANY GRADING BEYOND THE LIMITS OF CONSTRUCTION AS SHOWN ON THE GRADING AND DRAINAGE PLAN WITHOUT AUTHORIZATION IS SUBJECT TO A FINE. WHEN FIELD CONDITIONS WARRANT OFF-SITE GRADING, PERMISSION MUST BE OBTAINED FROM THE AFFECTED PROPERTY OWNERS .

CONTRACTOR AGREES TO REPAIR ANY DAMAGE TO THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE STANDARDS OF THE NCDOT AND HARNETT COUNTY.

THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE OWNER ANY DISCREPANCIES FOUND BETWEEN THE ACTUAL FIELD CONDITIONS AND THE CONSTRUCTION DOCUMENTS AND SHALL WAIT FOR INSTRUCTION PRIOR TO PROCEEDING.

THE CONTRACTOR SHALL MAINTAIN EACH STREAM, CREEK, OR BACKWASH CHANNEL IN A UNOBSTRUCTED STATE AND SHALL REMOVE FROM THE CHANNEL AND BANKS OF THE STREAM ALL DEBRIS, LOGS, TIMBER, JUNK AND OTHER ACCUMULATIONS.

CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY AND AT NO ADDITIONAL COST TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.

CONTRACTOR SHALL POST ASSIGNED BUILDING PERMIT NUMBER AND ADDRESS ON BUILDING.

ANY MUNICIPALITY REQUIRED AS-BUILT DRAWINGS WILL BE PREPARED BY A NC LICENSED PROFESSIONAL SURVEYOR. COSTS FOR THESE SERVICES SHALL BE INCLUDED IN CONTRACTORS BASE BID.

THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

THE CONTRACTOR SHALL CLEAR AND GRUB THE SITE AND PLACE, COMPACT, AND MOISTURE CONDITION ALL FILL PER THE PROJECT GEOTECHNICAL ENGINEERS SPECIFICATIONS. FILL MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.

THE CONTRACTOR SHALL COORDINATE WITH THE GEOTECHNICAL ENGINEER FOR APPROPRIATE SLOPE STABILIZATION ON ALL SLOPES STEEPER THAN 3:1.

THE CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED FOR BLASTING ROCK IF BLAST ROCK IS ENCOUNTERED. CONTRACTOR SHALL BE SOLEY RESPONSIBLE FOR COMPLYING WITH ALL BLASTING AND SAFETY REQUIREMENTS

ALL CUT OR FILL SLOPES SHALL BE 3:1 OR FLATTER UNLESS OTHERWISE NOTED.

EXISTING AND PROPOSED GRADE CONTOUR INTERVALS SHOWN AT 1 FOOT.

CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.

ALL PROPOSED CONTOURS AND SPOT ELEVATIONS REFLECT FINISHED GRADES.

ALL ELEVATIONS ARE IN REFERENCE TO THE BENCHMARK AND THIS MUST BE VERIFIED BY THE GENERAL CONTRACTOR PRIOR TO GROUND BREAKING.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING EXISTING UTILITIES, AND SHALL REPAIR ALL DAMAGE TO EXISTING UTILITIES THAT OCCUR DURING CONSTRUCTION.

CONTRACTOR SHALL BLEND NEW EARTHWORK SMOOTHLY TO TRANSITION BACK TO EXISTING GRADE.

LIMITS OF CLEARING SHOWN ON GRADING AND DRAINAGE PLAN ARE BASED UPON THE APPROXIMATE CUT AND FILL SLOPE LIMITS, OR OTHER GRADING REQUIREMENTS.

THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF ALL SHEETING, SHORING, BRACING AND SPECIAL EXCAVATION MEASURES REQUIRED TO MEET OSHA, FEDERAL, STATE AND LOCAL REGULATIONS PURSUANT TO THE INSTALLATION OF THE WORK INDICATED ON THESE DRAWINGS. THE DESIGN ENGINEER ACCEPTS NO RESPONSIBILITY FOR THE DESIGN(S) TO INSTALL SAID ITEMS.

THE CONTRACTOR SHALL INCLUDE IN THE CONTRACT PRICE ANY DEWATERING AND MOISTURE CONDITIONING NECESSARY TO CONSTRUCT THE PROJECT AS SHOWN ON THE PLANS.

GRADES, ELEVATIONS AND LOCATIONS SHOWN ARE APPROXIMATE. AS DIRECTED BY THE ENGINEER, THEY MAY BE ADJUSTED TO ACCOMMODATE UNFORESEEN CONDITIONS. STATIONS, OFFSETS AND ELEVATIONS REFER TO THE RIM OF DROP INLETS, MANHOLES, JUNCTION BOXES, AND THE MIDPOINT OF THE LIP/RIM FOR CATCH BASINS.

ANY CONSTRUCTION OR USE WITHIN THE AREAS DELINEATED AS FLOODWAY DISTRICT FRINGE BOUNDARY LINE OR FLOODWAY DISTRICT ENCROACHMENT BOUNDARY LINE IS SUBJECT TO THE RESTRICTIONS IMPOSED BY THE FLOODWAY REGULATIONS OF THE CITY OF CHARLOTTE.

UTILITY NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR HORIZONTALLY AND VERTICALLY LOCATING AND PROTECTING ALL PUBLIC OR PRIVATE UTILITIES (SHOWN OR NOT SHOWN) WHICH LIE IN OR ADJACENT TO THE CONSTRUCTION SITE. AT LEAST 48 HOURS PRIOR TO ANY DEMOLITION, GRADING, OR CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE ONE-CALL UTILITIES LOCATION SERVICE 811 FOR PROPER IDENTIFICATION OF EXISTING UTILITIES WITHIN THE SITE.
2. SHOULD ANY UNCHARTED OR INCORRECTLY CHARTED UTILITIES BE ENCOUNTERED, THE CONTRACTOR SHALL CONTACT THE OWNER IMMEDIATELY FOR DIRECTIONS.
3. CONTRACTOR SHALL COORDINATE ANY INTERRUPTION OF UTILITY SERVICE WITH OWNER AND RESPECTIVE UTILITY COMPANY REPRESENTATIVE.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. AT LEAST 48 HOURS PRIOR TO ANY DEMOLITION, GRADING, OR CONSTRUCTION ACTIVITY THE CONTRACTOR SHALL NOTIFY THE UTILITY PROVIDER FOR PROPER IDENTIFICATION OF EXISTING UTILITIES WITHIN THE PROJECT SITE.
5. ANY PLANNED INTERRUPTION OF UTILITY SERVICE SHALL BE GIVEN A 48 HOUR NOTICE TO THE UTILITY COMPANY AND THE OWNER.
6. CONTRACTOR SHALL SAW CUT, REMOVE, AND REPLACE ASPHALT PAVEMENT AS NECESSARY TO INSTALL UNDERGROUND ELECTRIC,TELEPHONE, SEWER, WATER, AND COMMUNICATION CONDUITS.
7. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH LOCAL POWER COMPANY STANDARDS.

TOTAL AREA DISTURBED = AS SHOWN ON THE EROSION CONTROL / GRADING PLANS

LIMITS OF GRADING SHOWN ON THE PLAN ARE MAXIMUM LIMITS FOR EROSION CONTROL PURPOSES ONLY. SURVEYOR TO DETERMINE ACTUAL LIMIT.

CONTRACTOR SHALL COORDINATE ALL WORK WITH HARNETT COUNTY.

ON-SITE BURIAL PITS REQUIRE AN ON-SITE DEMOLITION LANDFILL PERMIT FROM THE COUNTY.

ANY GRADING BEYOND THE DENUDED LIMITS SHOWN ON THE PLAN IS A VIOLATION OF THE COUNTY EROSION CONTROL ORDINANCE AND IS SUBJECT TO A FINE.

GRADING MORE THAN ONE ACRE WITHOUT AN APPROVED EROSION CONTROL PLAN IS A VIOLATION OF THE COUNTY EROSION CONTROL ORDINANCE AND IS SUBJECT TO A FINE.

ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.

ADDITIONAL MEASURES TO CONTROL EROSION AND SEDIMENT MAY BE REQUIRED BY A REPRESENTATIVE OF NCDENR.

SLOPES SHALL BE GRADED NO STEEPER THAN 3:1. FILL SLOPES GREATER THAN 10' REQUIRE ADEQUATE TERRACING.

A GRADING PLAN MUST BE SUBMITTED FOR ANY LOT GRADING EXCEEDING ONE ACRE THAT WAS NOT PREVIOUSLY APPROVED.

DRIVEWAY PERMIT FOR CONSTRUCTION ENTRANCES IN NCDOT RIGHT OF WAY MUST BE PRESENTED AT PRE-CONSTRUCTION MEETING

DEVIATION FROM THESE PLANS AND NOTES WITHOUT THE PRIOR CONSENT OF THE OWNER, HIS REPRESENTATIVE, OR THE ENGINEER MAY BE CAUSE FOR THE WORK TO BE UNACCEPTABLE.

EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO CONSTRUCTION IN ACCORDANCE WITH THE REQUIREMENTS OF THE NORTH CAROLINA SEDIMENTATION POLLUTION CONTROL ACT OF 1973, THE LOCAL JURISDICTIONAL AGENCY, THE APPROVED EROSION CONTROL PERMIT, AND THESE PLANS AND SPECIFICATIONS.

THE SEDIMENT TRAPS AND DIVERSION DITCHES SHALL BE CLEANED OUT WHEN THE STORAGE CAPACITY HAS BEEN APPROXIMATELY 50% FILLED. GRAVEL SHALL BE CLEANED OR REPLACED WHEN THE SEDIMENT POOL NO LONGER DRAINS PROPERLY.

ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSPECTED WEEKLY AND AFTER EVERY 0.5 INCH RAINFALL EVENT, BUT IN NO CASE LESS THAN ONCE EVERY WEEK. NEEDED REPAIRS SHALL BE MADE IMMEDIATELY. KEEP WRITTEN REPORTS OF EACH INSPECTION ON FILE AND READILY AVAILABLE TO NCDENR INSPECTOR.

SEDIMENT WILL BE REMOVED FROM BEHIND THE SILT FENCING WHEN IT BECOMES 6-INCHES DEEP AT THE FENCE. THE FENCING WILL BE REPAIRED AS NECESSARY TO MAINTAIN SUFFICIENT BARRIER.

ALL SEEDED AREAS WILL BE FERTILIZED, RE-SEEDED AS NECESSARY, AND MULCHED ACCORDING TO THE PLANS AND SPECIFICATIONS TO MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER.

ALL DRAINAGE SWALES MUST BE GRASSED AND RIP-RAP MUST BE REPLACED AS REQUIRED TO CONTROL EROSION. RIP-RAP WILL CONSIST OF 50 TO 125 POUND STONES PLACED AT ALL HEADWALLS, AND WHERE NOTED ON CONSTRUCTION DRAWINGS. (SEE DETAIL SHEET FOR OUTFALL PIPE SIZE CHART)

ADDITIONAL EROSION CONTROL MEASURES OR SILT BARRIERS TO BE PLACED AS DIRECTED BY THE LOCAL JURISDICTIONAL INSPECTOR.

WHEN ANY CONSTRUCTION BORDERS A DRAINAGE COURSE:

A. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ANY BUILDING OR OTHER EXCAVATION SPOIL DIRT, CONSTRUCTION TRASH OR DEBRIS, ETC., FROM THE DRAINAGE AREA SHOWN HEREON IN A EXPEDITIOUS MANNER AS CONSTRUCTION PROGRESSES.
B. THE CONTRACTOR HEREBY AGREES TO STOP ALL WORK AND RESTORE THESE IMMEDIATELY UPON NOTIFICATION BY THE LOCAL JURISDICTIONAL INSPECTOR AND/OR THE OWNER.

FOR ALL CONSTRUCTION ALONG AND/OR ACROSS WATERWAYS, BANK PROTECTION AND STABILIZATION SHALL BE REQUIRED AS PER LOCAL JURISDICTIONAL EROSION CONTROL LAWS.

ALL TREE PROTECTION AND EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO COMMENCING CONSTRUCTION AND SHALL BE MAINTAINED IN PROPER WORKING ORDER UNTIL ALL DISTURBED AREAS ARE STABILIZED AND GROUND COVER IS ESTABLISHED. CONSTRUCTION ENTRANCE PADS SHALL BE INSTALLED BY THE CONTRACTOR AT CONSTRUCTION ACCESS POINTS PRIOR TO LAND DISTURBANCE.

THE CONTRACTOR SHALL KEEP A COPY OF THE APPROVED LAND DISTURBANCE PLAN AND PERMIT ON SITE WHENEVER LAND DISTURBING ACTIVITY IS IN PROGRESS.

INSTALL SILT FENCE ALONG THE DOWNSTREAM SIDE OF ALL PROPOSED CUT AND FILL CONSTRUCTION AND AS INDICATED ON PLANS.

A TEMPORARY DIVERSION SWALE MAY BE USED IN LIEU OF SILT FENCE WHERE RUNOFF CAN BE DIRECTED TO A TEMPORARY SEDIMENT TRAP.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO PERFORM REQUIRED MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL DEVICES TO ENSURE THEIR FUNCTION AT ALL TIMES.

CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES UNTIL PERMANENT VEGETATION HAS BEEN ESTABLISHED.

WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.

WHEN A CRUSHED STONE CONSTRUCTION ENTRANCE HAS BEEN COVERED WITH SOIL OR OR HAS BEEN PUSHED INTO THE SOIL BY CONSTRUCTION TRAFFIC, IT SHALL BE REPLACED WITH A DEPTH OF STONE EQUAL TO THAT OF THE ORIGINAL APPLICATION.

PERFORM A FINAL DEMUCKING OF ALL SEDIMENT CONTROL DEVICES BEFORE DEMOBILIZATION.

SEDIMENT & EROSION CONTROL PROCEDURES

1. PRIOR TO CLEARING AND EARTHWORK ACTIVITIES THE CONTRACTOR SHALL HAVE A PRE-CONSTRUCTION CONFERENCE WITH NCDENR INSPECTOR; INSTALL EROSION CONTROL DEVICES SPECIFIED AND AS INDICATED ON THE DRAWINGS, AND THEN OBTAIN AN APPROVED GRADING PERMIT. DURING EACH PHASE OF SITE CONSTRUCTION THE CONTRACTOR SHALL ADJUST, RELOCATE AND/OR REINSTALL AS APPLICABLE ALL EROSION CONTROL DEVICES AND SEDIMENT DISCHARGE FROM THE SITE.
2. SILT FENCE SHALL BE MAINTAINED AROUND THE PERIMETER OF ALL EARTHWORK AREAS TO PREVENT SEDIMENT TRANSPORT ONTO ADJACENT PROPERTIES OR OFFSITE ROADWAYS, AS APPLICABLE.
3. SILT FENCE FILTER BARRIERS SHALL BE INSTALLED AND MAINTAINED UNTIL CONSTRUCTION IS COMPLETE AND LANDSCAPING IS INSTALLED.
4. THE CONTRACTOR SHALL IMMEDIATELY CLEANUP AND REPAIR ALL EROSION DAMAGE AFTER DISCOVERY AND REINSTALL ADEQUATE CONTROL MEASURES AS NECESSARY TO PREVENT REOCCURRENCE OF DAMAGE.
5. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSPECTED WEEKLY AND AFTER EVERY 0.5 INCH RAINFALL EVENT, BUT IN NO CASE LESS THAN ONCE EVERY WEEK. NEEDED REPAIRS SHALL BE MADE IMMEDIATELY. KEEP WRITTEN REPORTS OF EACH INSPECTION ON FILE AND READILY AVAILABLE TO NCDENR INSPECTOR.
6. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS BEEN TEMPORARILY OR PERMANENTLY CEASED, UNLESS ACTIVITY IN THAT PORTION OF THE SITE WILL RESUME WITHIN 21 DAYS. CONTRACTOR SHALL INSTALL TEMPORARY GRAVEL DRIVEWAY AT EACH CONSTRUCTION ENTRANCE AS SHOWN ON THESE PLANS.
7. CONSTRUCTION POINT OF ACCESS TO LIMIT DEPOSITS OF EARTH AND OTHER HAULED MATERIALS ONTO THE ADJACENT LOT. THE CONTRACTOR SHALL ROUTINELY CLEAN ALL SEDIMENT DEPOSITS AND DEBRIS FROM ROADWAY AS THEY OCCUR.
8. CONTRACTOR WILL TAKE MEASURES TO CONTROL DUST FROM THE WORK SITE AS NECESSARY OR PER THE OWNERS DIRECTION.

BANKS ENGINEERING
1927 SOUTH TRYON ST.
SUITE 106
CHARLOTTE, NC 28203
T: 704.780.4972
NC License #P-1370

CLIENT:
THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT:
CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET:
GENERAL NOTES

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C0-2

– SURVEYOR'S CERTIFICATE –

I, JOHN H. CHANDLER, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION, (DEED DESCRIPTION RECORDED IN BOOKS AND PAGE AS NOTED; THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION FOUND IN BOOKS AND PAGE AS NOTED; THAT THE RATIO OF PRECISION OR POSITIONAL ACCURACY AS CALCULATED IS 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS ____ DAY OF __________ A.D., ______.

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4389 JOHN H. CHANDLER

JOHN H. CHANDLER L-4389
PROFESSIONAL LAND SURVEYOR

– CURVE TABLE –

CURVE	RADIUS	LENGTH	TANGENT	BEARING	CHORD	DELTA
C1	905.00	252.55	127.10	S79°41'42"E	251.73	15°59'20"
C2	905.04	16.91	8.46	S71°09'55"E	16.91	1°04'14"
C3	580.23	177.36	89.38	N79°23'29"W	176.67	17°30'51"
C4	580.00	174.91	88.12	S83°06'07"W	174.25	17°16'44"
C5	25.93	28.92	16.17	S81°21'37"E	27.44	63°53'30"
C6	75.00	28.19	14.26	N59°39'41"W	28.02	21°31'56"
C7	25.00	24.71	13.47	S42°06'42"E	23.72	56°38'26"
C8	530.00	274.13	140.20	N28°36'45"W	271.08	29°38'04"
C9	35.00	21.79	11.26	S63°44'11"W	21.44	35°39'50"
C10	45.00	95.61	80.74	N20°42'10"E	78.61	121°43'53"
C11	75.00	168.77	157.00	S27°44'36"W	135.35	128°55'59"
C12	25.00	24.71	13.47	N08°24'34"W	23.72	56°38'26"
C13	60.00	113.30	82.87	S25°48'44"W	97.20	108°11'31"
C14	30.00	25.23	13.41	N04°11'16"W	24.49	48°10'46"
C15	518.00	184.41	93.19	S09°42'30"W	183.44	20°23'52"
C16	25.00	40.49	26.25	N45°54'36"E	36.21	92°48'17"
C17	250.00	77.05	38.84	S00°21'19"E	76.75	17°39'35"

– SEWER INVERTS –

SSMH#1
RIM=179.01'
INV IN(E)=166.51'
INV OUT(NW)=166.41'

SSMH#2
RIM=173.61'
INV IN(SE)=164.11'
INV OUT(NW)=164.01'

SSMH#3
RIM=172.82'
INV IN(SE)=163.52'
INV OUT(W)=163.42'

– LINE TABLE –

LINE	BEARING	LENGTH
L1	N70°37'48"W	32.93
L2	N46°40'32"W	1.21
L3	N00°21'45"W	24.92
L4	S88°44'03"E	28.88
L5	S01°13'21"W	57.39
L6	S19°54'25"W	3.13
L7	S00°29'26"E	102.36
L8	S83°41'48"E	21.59
L9	S89°52'08"E	24.29

YI#1
TOP=188.51'
INV=183.91'

YI#2
TOP=188.63'
INV=184.43'

YI#3
TOP=182.11'
INV=176.10'

– STORM INVERTS –

CB#1
TOP= 172.68'
INV= 167.28'

CB#2
TOP=175.00
INV=170.70'

CB#3
TOP=175.20'
INV=171.80'

CB#4
TOP=173.55'
INV=168.15'

CB#5
TOP=181.19'
INV=175.69'

CB#6
TOP=181.15'
INV=176.15'

CB#7
TOP=183.74'
INV=178.34'

CB#8
TOP=183.66'
INV=178.66'

CB#9
TOP=189.06'
INV=181.36'

CB#10
TOP=189.12'
INV=181.92'

CB#11
TOP=189.66'
INV=182.16'

CB#12
TOP=190.75'
INV=183.25'

CB#13
TOP=193.03'
INV=185.13'

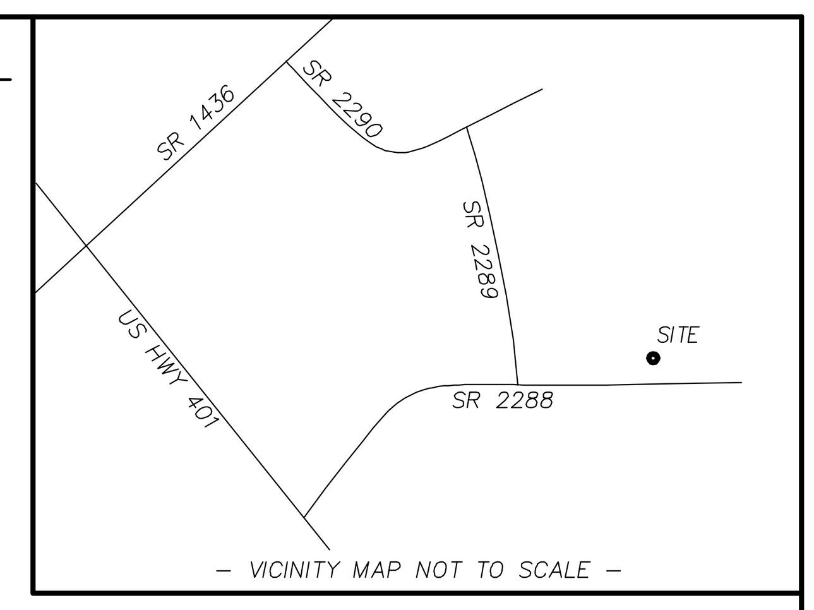
CB#14
TOP=193.08'
INV=188.78'

CB#15
TOP=190.26'
INV=186.46'

CB#16
TOP=173.58'
INV=167.68'

CB#17
TOP=172.67'
INV=166.97'

CB#18
TOP=172.18'
INV=166.18'

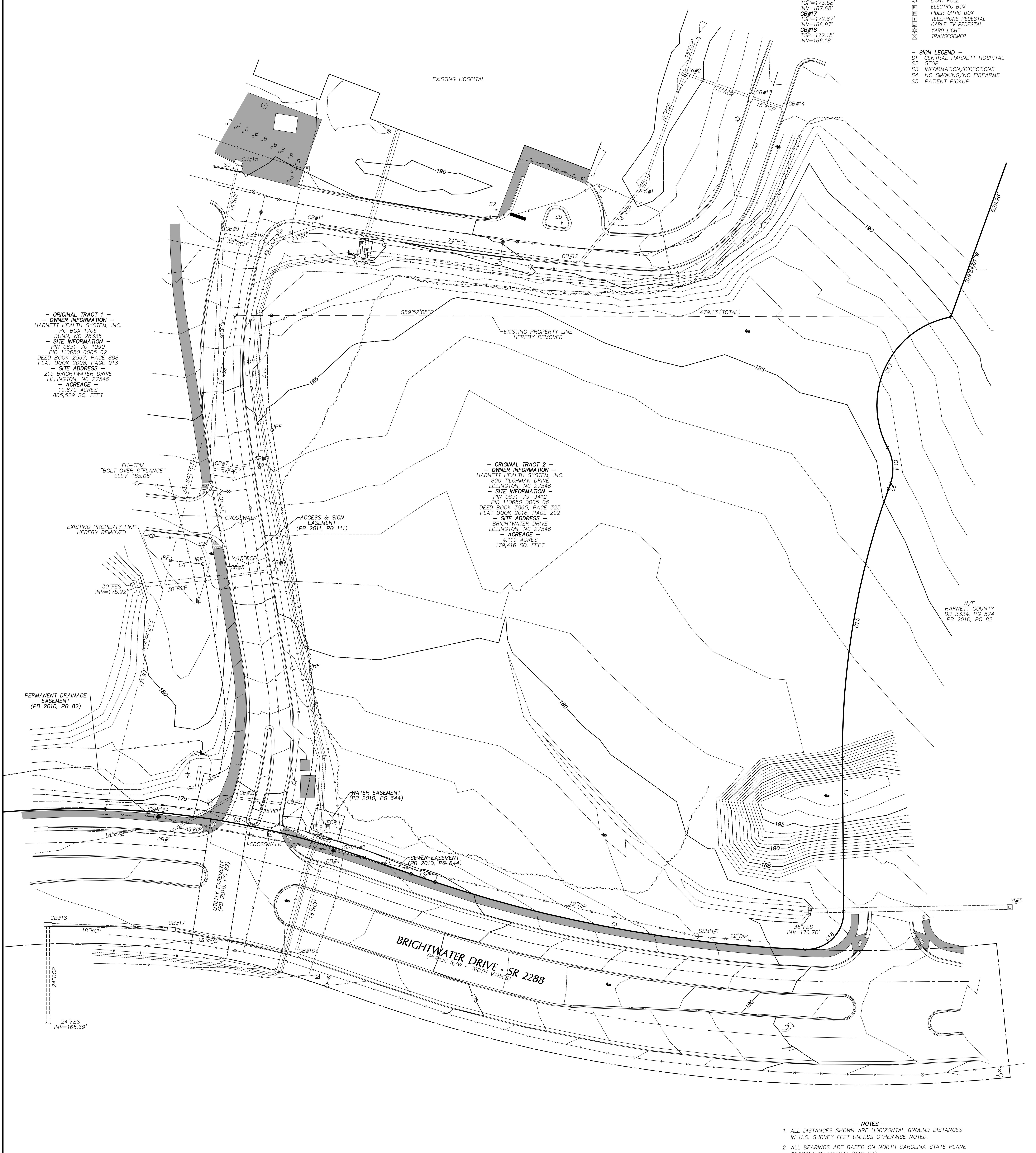


– LEGEND –

		CONCRETE
		RUMBLE STRIP
IPF		IRON PIPE FOUND
IRF		IRON ROD FOUND
R/W		RIGHT-OF-WAY
RCP		REINFORCED CONCRETE PIPE
DIP		DUCTILE IRON PIPE
CB		CATCH BASIN
YI		YARD INLET
FH		FIRE HYDRANT
TBM		TEMPORARY BENCHMARK
SSMH		SANITARY SEWER MANHOLE
FES		FLARED END SECTION
UFOP		UNDERGROUND FIBER OPTIC POST
	○	UTILITY STUB
		WATER METER
	⊗	SEWER CLEAN OUT
		WATER VALVE
	☼	LIGHT POLE
		ELECTRIC BOX
		FIBER OPTIC BOX
		TELEPHONE PEDESTAL
		CABLE TV PEDESTAL
	☼	YARD LIGHT
	⊠	TRANSFORMER

– SIGN LEGEND –

S1 CENTRAL HARNETT HOSPITAL
S2 STOP
S3 INFORMATION/DIRECTIONS
S4 NO SMOKING/NO FIREARMS
S5 PATIENT PICKUP



– NOTES –

1. ALL DISTANCES SHOWN ARE HORIZONTAL GROUND DISTANCES IN U.S. SURVEY FEET UNLESS OTHERWISE NOTED.
2. ALL BEARINGS ARE BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM (NAD 83).
3. THE SURVEY WAS COMPLETED ON NOVEMBER 29, 2021.
4. ALL ELEVATIONS ARE BASED ON NAVD 88.

DATE	REVISION	INITIAL

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

chandler land surveying
83 Adams Point Drive, Garner, North Carolina, 27529
Phone: 919-291-9163

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4389 JOHN H. CHANDLER
DATE: __________

TOPOGRAPHIC SURVEY
OF
CENTRAL HARNETT HOSPITAL
FOR
HARNETT HEALTH SYSTEM, INC.

SCALE: 1" = 30' DATE: NOVEMBER 29, 2021
NEILLS CREEK TOWNSHIP HARNETT COUNTY NORTH CAROLINA

PROJECT # 2021164
SURVEYED BY JHC
DRAWN BY DBR
DRAWING NAME 2021164-TOPO
SHEET NUMBER 1 OF 1

C0-3

ZONING CODE SUMMARY

PROJECT NAME:	CFVH HARNETT MOB
OWNER:	HARNETT HEALTH SYSTEM, INC.
DEVELOPER:	THE KEITH CORP. (TKC)
PHONE:	704.319.8160
PLANS PREPARED BY:	BANKS ENGINEERING, PLLC.
PHONE:	704.780.4972
TAX PARCEL PIN / DEED:	0651-70-1090.000 DB: 3865 PG: 0325
STREET ADDRESS:	225 BRIGHTWATER DR., LILLINGTON, NC 27546
ZONING:	O&I (OFFICE & INSTITUTIONAL)
EXISTING USE:	VACANT
PROPOSED USE:	MEDICAL OFFICE BUILDING
BUILDING HEIGHT:	3-STORIES
BUILDING COVERAGE:	21,500 SF + 1,500 SF (IMAGING)
GROSS FLOOR AREA:	66,000 SF
LOT SIZE:	4.32 AC
JURISDICTION / TOWNSHIP:	HARNETT COUNTY / NEILLS CREEK
WATERSHED:	CAPE FEAR RIVER WS-IV-P

YARD REQUIREMENTS:

SETBACK (SOUTH):	25'	YARD (EAST):	10'
YARD (WEST):	N/A	YARD (NORTH):	N/A

REQUIRED BUFFERS:

SETBACK (FRONT-SOUTH):	15' STREETSCAPE	SIDE YARD (EAST):	N/A
REAR YARD (EAST):	N/A	SIDE YARD (WEST):	N/A

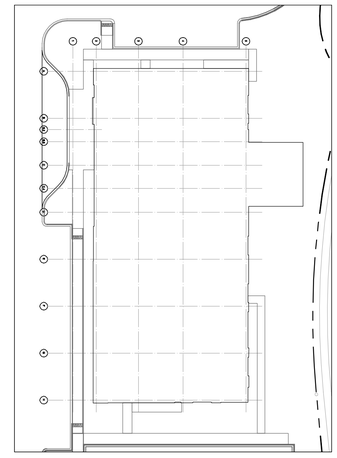
IMPERVIOUS / OPEN SPACE SUMMARY:

PROPOSED IMPERVIOUS:	121,702 SF	
EXISTING IMPERVIOUS:	0 SF	
NET IMPERVIOUS INCREASE:	121,702 SF	
OPEN SPACE:	66,580 SF / 188,282 SF =	35%
IMPERVIOUS (PROTECTED WATERSHED 70% MAX.):		65%

SITE LEGEND	
(A)	PROPOSED SITE NOTE
	PROPOSED STRUCTURE
	PROPOSED CURB (BOC, FOC, EOP)
	PROPOSED SIGNAGE
(20)	PROPOSED PARKING SPACES
	PROPOSED SIDEWALK HATCH
	PROPOSED HEAVY DUTY ASPHALT
	PROPOSED HEAVY DUTY CONCRETE
	PROPOSED STD. DUTY CONC. PAVMT
	PROPOSED STD. DUTY ASPH. PAVMT
	PROPOSED LIGHTING SYMBOLOGY

DETAIL LEGEND

- (A) 1'-6" STANDARD CURB & GUTTER
- (B) VERTICAL CURB
- (C) CONCRETE SIDEWALK (SEE SITE DETAIL SHEETS)
- (D) DUMPSTER / RECYCLE / GENERATOR AREA WITH SOLID WALLS & GATES (SEE ARCHITECTURAL PLANS FOR ENCLOSURE DETAILS)
- (E) BOLLARD - 6"Ø SCH. 40 STEEL PIPE FILLED W/ CONC.
- (F) ACCESSIBLE PARKING SIGNAGE
- (G) HEAVY DUTY CONCRETE PAVEMENT
- (H) HEAVY DUTY ASPHALT
- (I) ADA ACCESSIBLE RAMP - SEE DETAIL SHEETS
- (J) REFERENCE MUTCD-R1-1 STOP SIGN (24"x24")
- (K) CONCRETE STOP BLOCK



PARKING SUMMARY

PARKING REQUIREMENT: 1 SPACE / 300 SF PER HARNETT UDO ART V - TABLE 1.2 "HEALTH CARE SERVICES"

STANDARD PARKING

PARKING REQUIRED (CODE MIN.):	220 SPACES		
PARKING SHOWN (TOTAL):	231 SPACES**		

** PARKING COUNT INCLUDES ADA SPACES

ACCESSIBLE PARKING

ACCESSIBLE SPACES REQUIRED :	7 SPACES	PROVIDED:	12 SPACES
VAN ACCESSIBLE SPACES REQ'D :	2 SPACES	PROVIDED:	3 SPACES

SITE NOTES

1. ALL DIMENSIONS ARE BASED FROM FACE OF CURB TO FACE OF CURB UNLESS OTHERWISE NOTED. BUILDING GRID LINES (IF SHOWN) ARE FOR REFERENCE ONLY. SEE ARCHITECTURAL/STRUCTURAL DRAWING FOR OFFICIAL GRID LOCATIONS.
2. FOR ADA ACCESSIBILITY, SLOPES EXCEEDING 5% BUT LESS THAN 8% WILL REQUIRE A RAMP AND MUST CONFORM TO THE REQUIREMENTS FOR RAMP AND/OR CURB RAMP DESIGN (HANDRAILS, CURBS, LANDINGS). NO RAMP SHALL EXCEED AN 8.3% RUNNING SLOPE OR 2% CROSS SLOPE. IT WILL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO ENSURE THAT THE HANDICAP PARKING SPACES, ACCESSIBLE ROUTES, AND SIDEWALK/CROSSWALKS ARE CONSTRUCTED TO MEET ADA REQUIREMENTS.
3. MAXIMUM CROSS SLOPE ON SIDEWALKS IS 2% REGARDLESS OF SPOT ELEVATIONS OR CONTOURS. CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO INSTALLING SIDEWALK IF PROVIDED SITE INFO IS IN CONFLICT WITH THIS MANDATE.
4. ALL RADII 2.00' UNLESS OTHERWISE NOTED.
5. SEE EXISTING CONDITIONS, SHEET 0-3, FOR COMPLETE BOUNDARY DESCRIPTION, ADJOINING PROPERTIES, ZONING AND USE.
6. IF APPLICABLE, ALL SIDEWALK AND/OR CURB & GUTTER NOTED FOR REMOVAL AND REPLACEMENT SHALL BE TO NEXT EXISTING JOINT BEYOND REMOVAL LIMITS - REGARDLESS OF REMOVAL LIMITS SHOWN.
7. CURB CROSS-SECTION SHALL FOLLOW "LOW-SIDE" DETAIL WHEN PAVEMENT AREA SLOPES TOWARD CURB AND "HIGH-SIDE" DETAIL WHEN SLOPING AWAY. TRANSITION FROM LOW TO HIGH CROSS-SECTION SHALL BE UNIFORM OVER A DISTANCE OF NOT LESS THAN 8 FEET.
8. MAKE USE (NOT ABUSE) OF RFI PROCESS EITHER FORMALLY OR INFORMALLY IF PLAN ELEMENTS SHOWN ARE IN CONFLICT WITH PLAN INTENT. ALLOW A MINIMUM OF 72 HOURS ADVANCE NOTICE TO DETERMINE IF CORRECTIVE ACTION TO PLAN DOCUMENTS WILL BE REQUIRED. FAILURE TO MAKE INQUIRES AND/OR ADVANCE NOTICE REGARDING OBVIOUS DISCREPANCIES MAY REQUIRE REMOVAL & REPLACEMENT AT CONTRACTORS EXPENSE.
9. SETBACKS SHOWN ARE BASED ON BRIGHTWATER DEVELOPMENT PLAN & HARNETT COUNTY UDO.

Know what's below. Call before you dig.

SCALE: 1"= 30'
0 15 30 60

NORTH

BANKS ENGINEERING
1927 SOUTH TRYON ST.
SUITE 106
CHARLOTTE, NC 28203
T: 704.780.4972
NC License #P-1370

CLIENT: THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

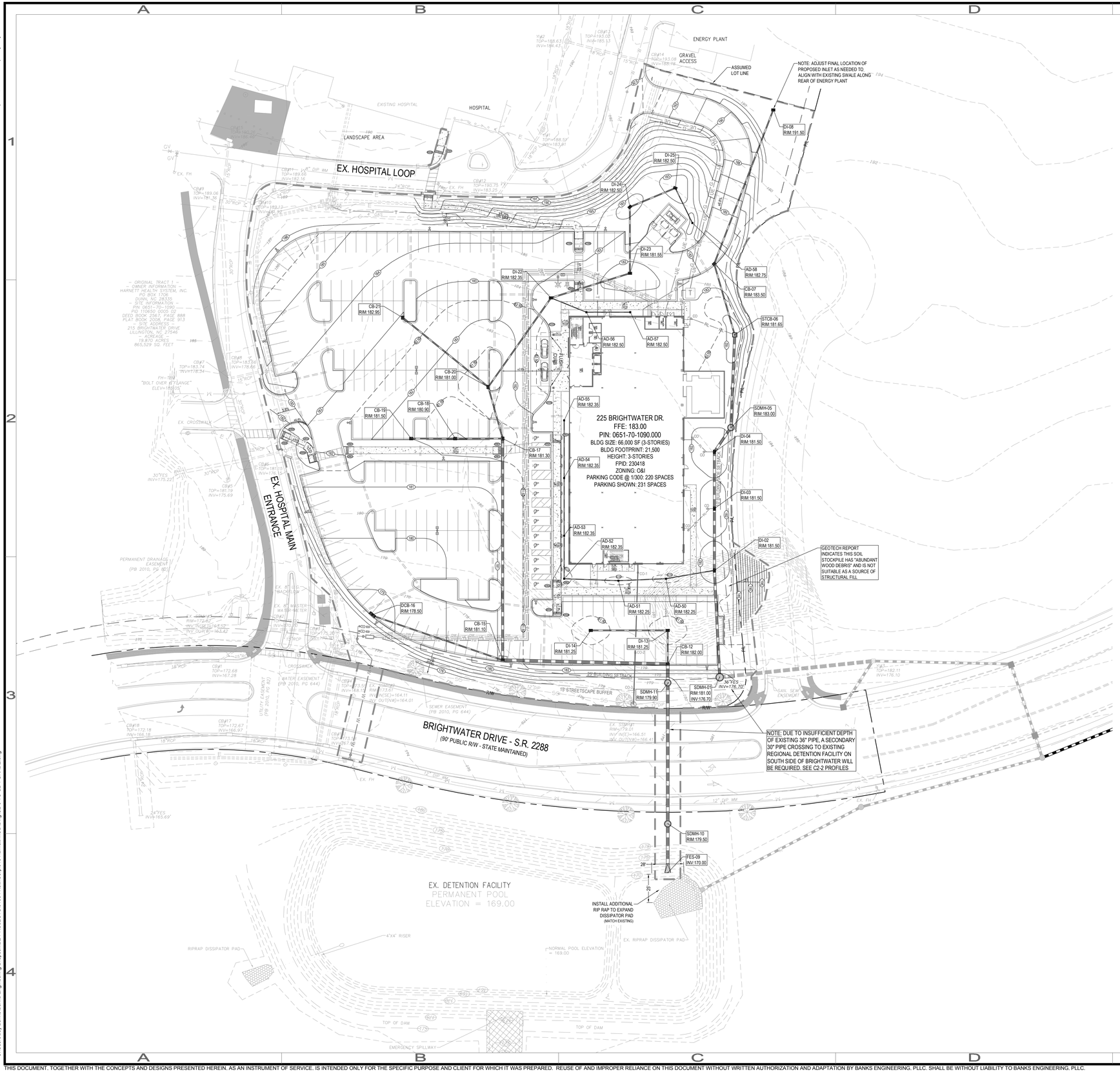
PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: SITE

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C1-0



GRADING LEGEND

	PROPOSED CONSTRUCTION LIMITS
799	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
25.5	PROPOSED INTER. CONTOUR
GT: 100.00 (GRADE TOP) GB: 100.00 (GRADE BOTTOM)	PROPOSED GRADE @ WALL(S) * SEE RETAINING WALL NOTE BELOW
597.00 TC: 100.00 (TOP OF CURB) BC: 100.00 (BOTTOM OF CURB)	PROPOSED SPOT ELEVATION
597.00	EXISTING SPOT ELEVATION
2%	PROPOSED GRADING ARROW (POINTS DOWN GRADIENT UNLESS NOTED OTHERWISE)
CB-01 RIM *100.00 * RIM TO BE ADJUSTED FLUSH WITH INSTALLED PAVEMENT WHEN IN NON-SUMP CONDITION	PROPOSED STORM STRUCTURE ID
	PROPOSED GRADE BREAK
CT6.25	PROPOSED CURB TAPER + LENGTH
CR6.25	PROPOSED CURB RETURN + LENGTH
6"CI STUB	PROPOSED STORM
RL RL RL RL RL STUB	PROPOSED ROOF LEADER
2"-2" PVC	PROPOSED IRRIGATION SLEEVE

GRADING NOTES

1. SEE GENERAL NOTES SHEET C0-2 FOR GRADING NOTES.
2. CONTRACTOR SHALL REVIEW, UNDERSTAND AND IMPLEMENT ALL REQUIRED EROSION AND SEDIMENTATION CONTROL MEASURES PRIOR TO ANY DISTURBANCE.
3. SEE THE EROSION CONTROL PLANS AND DETAILS FOR THE LOCATION AND SIZING OF ALL RIP-RAP APRONS AND SLOPE AND CHANNEL LININGS.
4. ON ALL SLOPES STEEPER THAN 3:1, CONTRACTOR SHALL INSTALL NORTH AMERICAN GREEN PRODUCT SC-250 EROSION CONTROL MATTING. REFER TO NAG FOR INSTALLATION GUILDELINES. FOR TEMPORARY SLOPES STEEPER THAN 3:1, SC-150 EC MATTING MAY BE USED.
5. ALL SPOT ELEVATIONS ALONG CURB AND GUTTER LINE REPRESENT FLOW LINE ELEVATIONS UNLESS OTHERWISE NOTED.
6. CONTRACTOR AND/OR CONSTRUCTION SURVEYOR TO VERIFY THAT CONSTRUCTION STAKING BASED ON CONTOURS AND SPOT ELEVATIONS DOES NOT CONFLICT WITH SLOPE CALL-OUTS OR ADA REQUIREMENTS. NOTIFY SITE ENGINEER OF ANY DISCREPANCIES AND AWAIT FURTHER INSTRUCTION.
7. AT ALL DOORWAYS, SITE SHALL BE GRADED TO PROVIDE A 5'x5' AREA ABUTTING DOORWAY THAT HAS NO SLOPE GREATER THAN 2%. IF THIS REQUIREMENT CANNOT BE ACHIEVED DUE TO GRADING / CONTOUR INFORMATION SHOWN, NOTIFY SITE ENGINEER PRIOR TO ANY PAVEMENT PLACEMENT AND AWAIT FURTHER INSTRUCTION. FAILURE TO FOLLOW THIS DIRECTIVE MAY REQUIRE REMOVAL & REPLACEMENT AT CONTRACTORS EXPENSE.
8. CONSTRUCTION STAKING, REQUIRED AS-BUILT(S) & INTERIM AS-BUILT SURVEY THAT MAY BE NECESSARY TO RESOLVE SITE RELATED ISSUES SHALL BE PROVIDED BY CONTRACTOR AT THEIR EXPENSE.
9. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL VERIFY THE ACCURACY OF ALL STORM/UTILITY TIE-IN INVERTS SHOWN AND NOTIFY THE SITE ENGINEER IMMEDIATELY IF THERE IS A DISCREPANCY.
10. SITE CIVIL WORK SCOPE IS UP TO A 5' OFFSET FROM BUILDING / STRUCTURE EXTERIOR. ROOF LEADER SIZES SHALL BE LARGE ENOUGH TO PHYSICALLY ACCOMMODATE PLUMBING / ARCHITECTURAL DOWNSPOUT(S) DESIGN/SIZING. ALL DOWN STREAM PIPING DIAMETERS SHALL BE EQUAL TO OR GREATER THAN PIPING USED FOR DOWNSPOUT CONNECTION. SEE ADDITIONAL NOTES IN STORM PIPE TABLE UNDER "ROOF LEADER" DEFINITION.
11. ALL STORM & SANITARY (GRAVITY LINES) MUST BE INSTALLED PRIOR TO FRANCHISE UTILITY INSTALLATION (I.E. WATER, POWER, GAS, TELECOM, ETC.) TO AVOID POTENTIAL CONFLICTS AND INADEQUATE COVER MATERIAL.
12. AFTER VERIFICATION, ALL GRAVITY PIPE INSTALLATION(S) SHALL BEGIN AT THE LOWEST ELEVATION OUTFALL AND/OR TIE-IN POINT(S) INDICATED AND PROCEED UPSTREAM UNLESS OTHERWISE INDICATED ON THE PLANS. INSTALLATION(S) NOT FOLLOWING THIS SEQUENCE WILL BE CONSIDERED A CONTRACTOR "MEANS AND METHODS" AND WILL SUBSEQUENTLY ASSUME ALL RISKS ASSOCIATED WITH MEETING INDICATED TIE-OUT ELEVATION, NECESSARY PIPE ADJUSTMENTS DUE TO CONFLICTS AND PIPE SLOPES AS INDICATED. ALL ADDITIONAL COSTS (INCLUDING ENGINEERING) ASSOCIATED WITH RE-WORKING PIPE SYSTEM TO FUNCTION PROPERLY WILL BE AT THE CONTRACTORS EXPENSE.
13. CONTRACTOR SHALL BLEND NEW EARTHWORK TO PROVIDE FOR A SMOOTH TRANSITION TO EXISTING GRADE.
14. STORM STRUCTURES SHALL NOT HAVE SUMPS. BOTTOM OF STRUCTURE(S) TO BE FILLED WITH CONCRETE UP TO THE OUTLET INVERT.
15. IF EXISTING STORM STRUCTURES ARE SHOWN, PRIOR TO COMMENCING STORM SEWER INSTALLATION, CONTRACTOR SHALL VERIFY THAT EACH STRUCTURE HAS ADEQUATE SIZE & STRUCTURAL INTEGRITY TO ACCEPT NEW PIPE(S). IF EITHER ISSUE IS ENCOUNTERED, STRUCTURE SHALL BE REPLACED OR RE-CONSTRUCTED.
16. IF PROVIDED - SEE CONSTRUCTION SEQUENCE INCLUDED ON EROSION CONTROL SHEETS WHICH MAY INCLUDE SPECIFIC INSTRUCTION REGARDING STORM DRAINAGE INSTALLATION SEQUENCING.
17. ADDITIONAL SPOT ELEVATIONS BEYOND THE MINIMUM HAVE BEEN PROVIDED FOR CONTRACTOR ASSISTANCE. MANY ARE MANUALLY CALCULATED BECAUSE THEY FALL WITHIN THE 1' CONTOUR INTERVAL. ON OCCASION, THERE MAY BE A QUESTIONABLE SPOT OR RIM ELEVATION SHOWN COMPARED TO SPOT ELEVATION OR CONTOURS IN THE NEAR VICINITY. IF THIS CONDITION IS ENCOUNTERED, STOP WORK IMMEDIATELY AND SUBMIT A VERIFICATION REQUEST TO ENGINEER. CONTINUING WORK WITHOUT VERIFICATION WILL BE AT CONTRACTORS RISK & EXPENSE IF REMEDIATION BECOMES NECESSARY.
18. UNLESS APPROVED BY OWNER OR NOTED OTHERWISE, ALL EXPOSED CAST-IN-PLACE FOUNDATIONS EXCEEDING 9" AND/OR CMU BLOCK WALLS OF ANY HEIGHT SHALL RECEIVE A CEMENTITIOUS PARGE COAT.
19. ALL FOOTINGS ARE ASSUMED TO BE RECESSED TO A DEPTH WHERE THE STORM DRAINAGE PIPES ARE NOT WITHIN THE STRUCTURAL ZONE OF INFLUENCE. REFER TO STRUCTURAL PLANS FOR DETAILS.

Know what's below. Call before you dig.

NORTH

SCALE: 1"= 40'
0 20 40 80

BANKS ENGINEERING
1927 SOUTH TRYON ST.
SUITE 106
CHARLOTTE, NC 28203
T: 704.780.4972
NC License #P-1370

CLIENT: THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: PRELIM GRADE-OVERALL

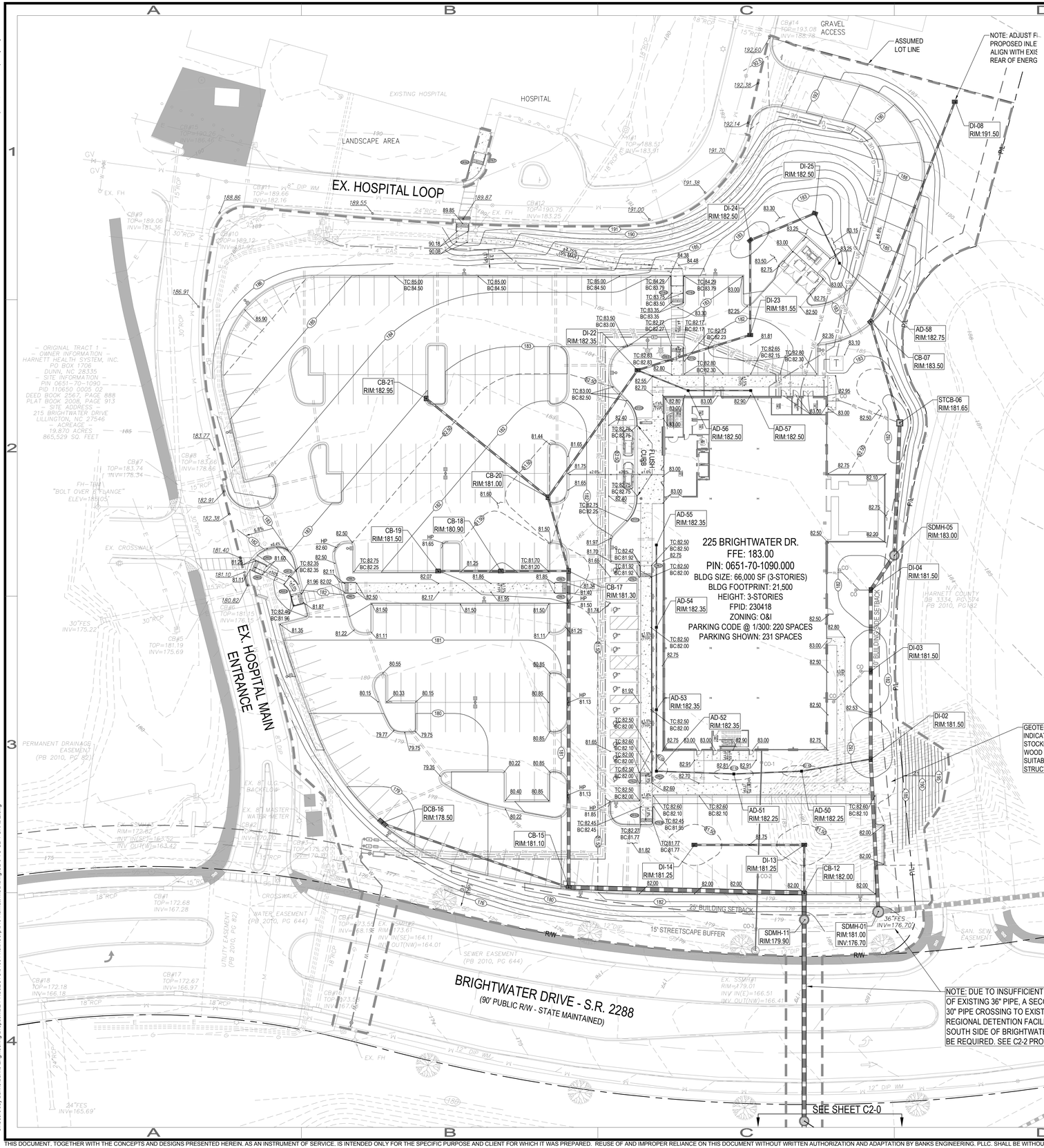
REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C2-0

April 25, 2023 - 5:34pm By: Jay Banks

C:\Users\Jay Banks\Banks Engineering Dropbox\BE PROJECTS\01054 KeithCorp\013 Harnett MOB\Dwg\C2-0 TO C2-1 GRADE.dwg



STORM STRUCTURE TABLE

STRUCTURE	RIM ELEV (ft)	INVERT IN (1) (ft)	INVERT IN (2) (ft)	INVERT IN (3) (ft)	INVERT OUT (ft)
CB-21	182.95	(N/A)	(N/A)	(N/A)	179.95
AD-58	182.75	(N/A)	(N/A)	(N/A)	181.25
DI-25	182.50	180.83	(N/A)	(N/A)	180.33
DI-24	182.50	180.12	(N/A)	(N/A)	180.12
DI-23	181.55	179.30	(N/A)	(N/A)	179.30
AD-57	182.50	(N/A)	(N/A)	(N/A)	181.17
AD-56	182.50	180.79	(N/A)	(N/A)	180.79
DI-22	182.35	178.83	180.46	(N/A)	178.83
CB-20	181.00	178.00	178.00	(N/A)	178.00
CB-19	181.50	(N/A)	(N/A)	(N/A)	178.50
CB-18	180.90	177.90	(N/A)	(N/A)	177.90
CB-17	181.30	177.56	177.56	(N/A)	177.56
DCB-16	178.50	(N/A)	(N/A)	(N/A)	175.79
CB-15	181.10	175.19	175.19	(N/A)	174.19
DI-14	181.25	(N/A)	(N/A)	(N/A)	178.25
DI-13	181.25	177.92	(N/A)	(N/A)	177.92
CB-12	182.00	173.48	177.77	(N/A)	173.48
SDMH-11	179.90	173.40	(N/A)	(N/A)	170.82
SDMH-10	179.50	170.21	(N/A)	(N/A)	170.21
DI-08	191.50	(N/A)	(N/A)	(N/A)	188.50
CB-07	183.50	180.50	(N/A)	(N/A)	180.50
STCB-06	181.65	179.40	(N/A)	(N/A)	178.40
SDMH-05	183.00	178.00	(N/A)	(N/A)	178.00
DI-04	181.50	177.87	(N/A)	(N/A)	177.87
DI-03	181.50	177.61	(N/A)	(N/A)	177.61
AD-55	182.35	(N/A)	(N/A)	(N/A)	181.02
AD-54	182.35	180.52	(N/A)	(N/A)	180.52
AD-53	182.35	180.02	(N/A)	(N/A)	180.02
AD-52	182.35	179.64	(N/A)	(N/A)	179.64
AD-51	182.25	179.17	(N/A)	(N/A)	179.17
AD-50	182.25	178.76	(N/A)	(N/A)	178.76
DI-02	181.50	177.35	178.34	(N/A)	177.35
FES-09	178.00	170.00	(N/A)	(N/A)	170.00
SDMH-01	181.00	176.88	(N/A)	(N/A)	176.88

GRADING LEGEND

	PROPOSED CONSTRUCTION LIMITS
799	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
25.5	PROPOSED INTER. CONTOUR
GT: 100.00 GB: 100.00 (GRADE TOP/BOTTOM)	PROPOSED GRADE @ WALL(S) * SEE RETAINING WALL NOTE BELOW
597.00 TC: 100.00 (TOP OF CURB) BC: 100.00 (BOTTOM OF CURB)	PROPOSED SPOT ELEVATION
597.00	EXISTING SPOT ELEVATION
2%	PROPOSED GRADING ARROW (POINTS DOWN GRADIENT UNLESS NOTED OTHERWISE)
CB-01 RIM *100.00	PROPOSED STORM STRUCTURE ID * RIM TO BE ADJUSTED FLUSH WITH INSTALLED PAVEMENT WHEN IN NON-SUMP CONDITION
	PROPOSED GRADE BREAK
CT6.25	PROPOSED CURB TAPER + LENGTH
CR6.25	PROPOSED CURB RETURN + LENGTH
	PROPOSED STORM
RL RL RL RL RL RL	PROPOSED ROOF LEADER
2-2" PVC	PROPOSED IRRIGATION SLEEVE

STORM PIPE TABLE

START NODE	STOP NODE	US INVERT (ft)	DS INVERT (ft)	DIAMETER (in)	MATERIAL	LENGTH (ft)	SLOPE (ft/ft)
CB-21	CB-20	179.95	178.00	12	HDPE	95.272	0.020
AD-58	DI-25	181.25	180.83	6	HDPE	33.663	0.012
DI-25	DI-24	180.33	180.12	12	HDPE	42.744	0.005
DI-24	DI-23	180.12	179.30	12	HDPE	57.402	0.014
DI-23	DI-22	179.30	178.83	15	RCP	71.623	0.007
AD-57	AD-56	181.17	180.79	4	HDPE	38.058	0.010
AD-56	DI-22	180.79	180.46	4	HDPE	33.07	0.010
DI-22	CB-20	178.83	178.00	15	RCP	94.366	0.009
CB-20	CB-17	178.00	177.56	18	RCP	46.451	0.010
CB-19	CB-18	178.50	177.90	12	HDPE	38.161	0.016
CB-18	CB-17	177.90	177.56	12	HDPE	41.125	0.008
CB-17	CB-15	177.56	175.19	18	RCP	192.09	0.012
DCB-16	CB-15	175.79	175.19	18	RCP	119.684	0.005
CB-15	CB-12	174.19	173.48	30	O-RING RCP	142.982	0.005
DI-14	DI-13	178.25	177.92	12	HDPE	66.711	0.005
DI-13	CB-12	177.92	177.77	12	HDPE	29.275	0.005
CB-12	SDMH-11	173.48	173.40	30	O-RING RCP	16.123	0.005
SDMH-11	SDMH-10	170.82	170.21	30	O-RING RCP	122.251	0.005
SDMH-10	FES-09	170.21	170.00	30	O-RING RCP	42.368	0.005
DI-08	CB-07	188.50	180.50	12	HDPE	142.798	0.056
CB-07	STCB-06	180.50	179.40	12	HDPE	63.987	0.017
STCB-06	SDMH-05	178.40	178.00	24	RCP	80.436	0.005
SDMH-05	DI-04	178.00	177.87	24	RCP	25.522	0.005
DI-04	DI-03	177.87	177.61	24	RCP	49.159	0.005
DI-03	DI-02	177.61	177.35	30	RCP	53.487	0.005
AD-55	AD-54	181.02	180.52	4	HDPE	50.01	0.010
AD-54	AD-53	180.52	180.02	4	HDPE	50.006	0.010
AD-53	AD-52	180.02	179.64	4	HDPE	37.301	0.010
AD-52	AD-51	179.64	179.17	4	HDPE	47.076	0.010
AD-51	AD-50	179.17	178.76	4	HDPE	41.191	0.010
AD-50	DI-02	178.76	178.34	6	HDPE	42.576	0.010
DI-02	SDMH-01	177.35	176.88	30	RCP	92.723	0.005

CB = CATCH BASIN (WITH FRAME, GRATE, AND HOOD) PER NCDOT STD 840.01/02
DCB = DOUBLE CATCH BASIN (WITH FRAME, GRATE, AND HOOD) PER NCDOT STD 840.01/02
DI = DROP INLET (WITH FRAME AND GRATE) PER NCDOT STD 840.14~16 w/ 2" WEEP HOLES (ALL SIDES) @ BOTTOM OF BASE COURSE
CDI & CJCT = CONVERT EX STRUCTURE TO DROP INLET OR JUNCTION. SEE CB & JCT FOR STANDARDS
VG - VALLEY GUTTER / ROLLED CURB INLET - TYPE USF 6283
SDMH = MANHOLE JUNCTION (WITH SOLID LID) PER NCDOT STD 840.31/54
STCB = SLAB TOP CATCH BASIN PER NCDOT 840.04
JB = ROOF LEADER/SMALL DIA. DRAIN STRUCTURE - SEE NYOPLAST 12" CAST IRON H-20 SOLID COVER AND DRAIN BASIN DETAILS
YI = YARD INLET - SEE NYOPLAST 15" CAST IRON H-20 GRATE 1599CGS AND DRAIN BASIN DETAILS
AD = AREA DRAIN - SEE NYOPLAST 12" CAST IRON H-10 GRATE 1299CGP AND DRAIN BASIN DETAILS (PED GRATE)
TD = TRENCH DRAIN - ACO K100 4" W/ BOTTOM OUTLET AND 476D D.I. PED GRATE
JCT - PRECAST CONCRETE JUNCTION BOX - NO "KNOCK-OUT" OR "WAFFLE" TYPE BOXES ARE PERMITTED. ALT. NCDOT STD. 840.31/54
[EXCB]-X# - INDICATES AN EXISTING STRUCTURE THAT IS TO REMAIN
RCP = REINFORCED CONCRETE PIPE-CLASS III IF NOT SPECIFIED. JOINT TO CONFORM WITH AASHTO M198
PVC = POLYVINYL CHLORIDE PIPE - SCHEDULE 40
HDPE = HIGH DENSITY POLYETYLENE-CORR. EXTERIOR/SMOOTH INT.(TYPE S) AASHTO M294/M252 SOIL TIGHT W/BELL & SPIGOT
CMP = CORRUGATED METAL PIPE - ALUMINIZED TYPE II, 14 GAUGE, HEL-COR W/ HUGGER JOINTS OR EQUAL
DIP = DUCTILE IRON PIPE - PC 350 W/ TYPE S BEDDING. USE 16" DIA. PIPE IF TABLE ABOVE INDICATES 15". PRESSURE RATED JOINTS
RL = ROOF LEADER- HDPE SMOOTH WALL (TYPE S). "ROOF LEADER" INCLUDES ALL APPURTENANCES TO CONNECT DOWNSPOUT TO STORM SYSTEM INCLUDING BUT NOT LIMITED TO: ADAPTER, ELBOWS, TEES, ETC.. PIPE SIZING TO MATCH ARCH./PLUMB. DWGS. UNLESS SHOWN OTHERWISE, PIPE DIA. TO MATCH DOWNSPOUT DIA. OR 6" MIN. DIA. @1.0% SLOPE-SEE PLUMB/ARCH. PLANS.
FES = FLARED END SECTION - CONCRETE WITH ADAPTER IF NECESSARY FOR CONNECTION TO HDPE STORM PIPE-NO HDPE OR CMP.
EW = PRECAST CONCRETE ENDWALL PER NCDOT STD 838.80
O-RING - WATER TIGHT GASKETED PIPE. RCP (ASTM C443) HDPE (ASTM D3212). GASKETS MEET ASTM F477 STDS.
CO - PVC CLEAN-OUT WITH TRAFFIC RATED BRASS CAP
**ALL PIPE MATERIALS AND STRUCTURES TO BE INSTALLED PER MANUFACTURES SPECIFICATIONS, GEOTECHNICAL ENGINEER AND/OR LOCAL REGULATIONS, WHICHEVER IS MORE STRINGENT.
*** PERIMETER PIPING AROUND BUILDING TO PICK UP ROOF LEADERS OR SMALL AREA DRAINS SHALL NOT COMMENCE UNTIL AFTER BUILDING FOOTINGS HAVE BEEN INSTALLED. ADJUSTMENT TO THESE LINES MAY BE NECESSARY TO AVOID FOOTING CONFLICTS.

BANKS ENGINEERING
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NC License #P-1370

CLIENT: THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS 04.26.23

PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: GRADE

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

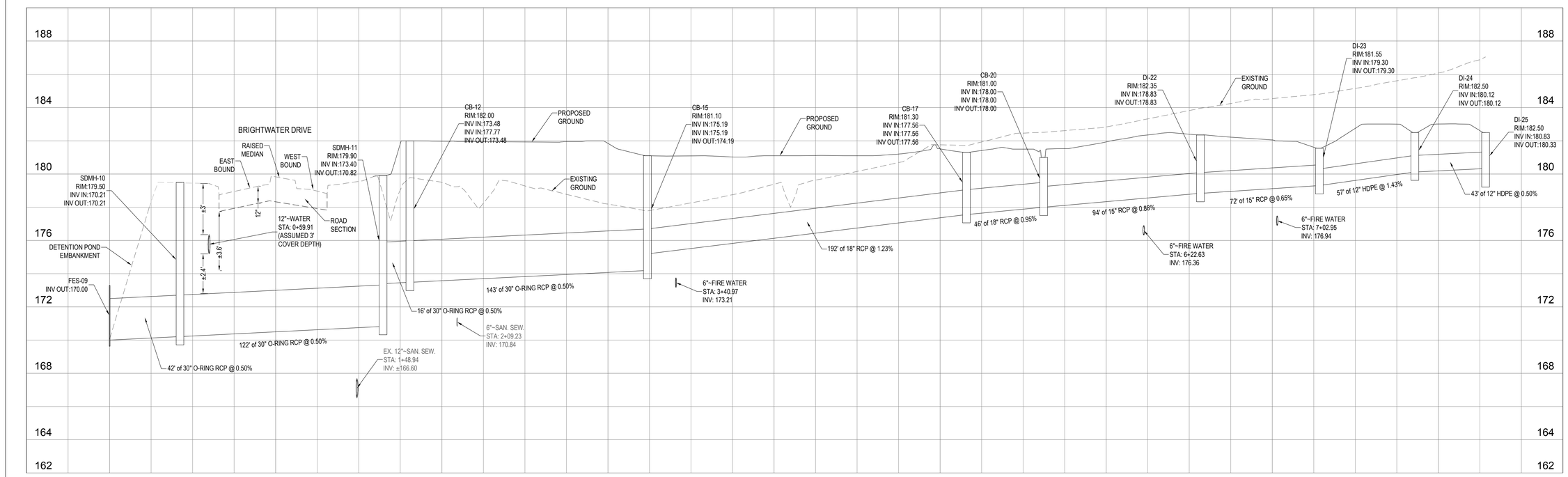
C2-1

Know what's below. Call before you dig.

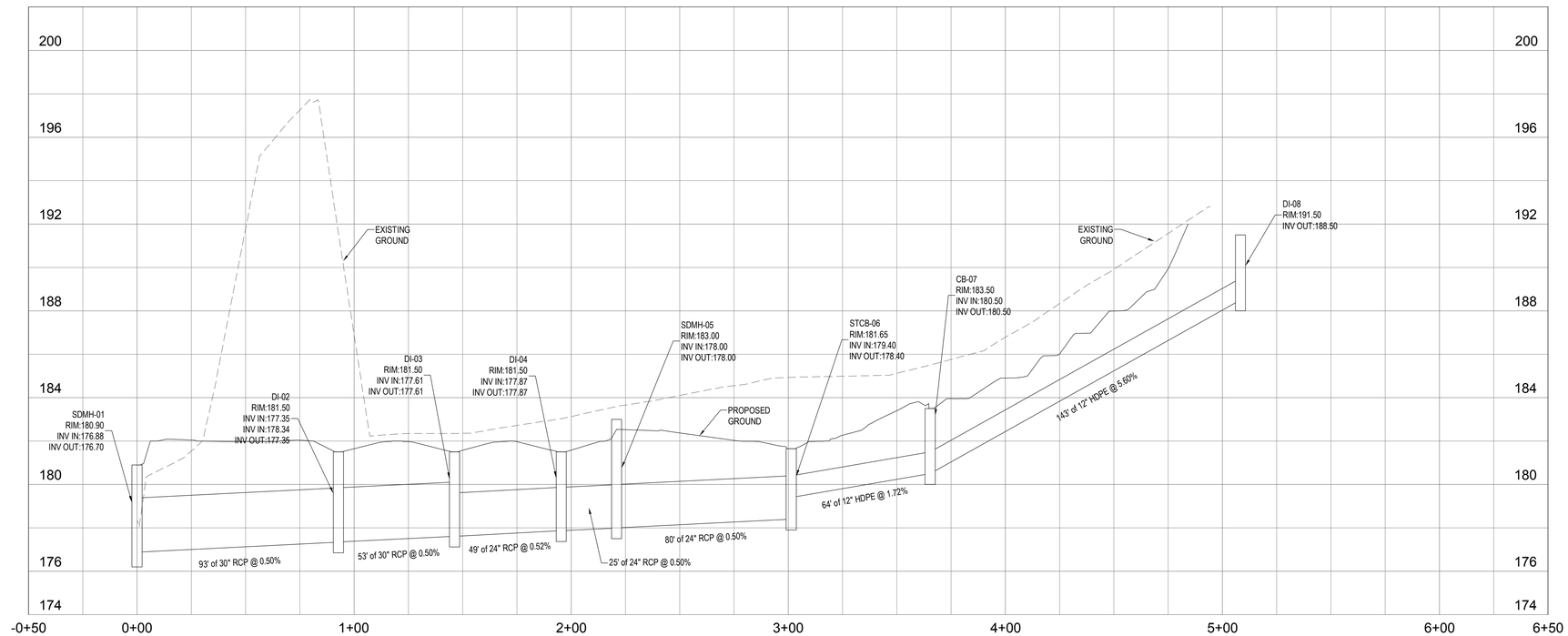
SCALE: 1"= 30'
0 15 30 60

April 25, 2023 - 5:35pm By - Jay Banks

FES-09 TO DI-25 STORM PROFILE



SDMH-01 TO DI-08 STORM PROFILE



Know what's below. Call before you dig.

SCALE: 1"= 30'
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SCALE (V): 1"= 3'
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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: STORM PROFILES

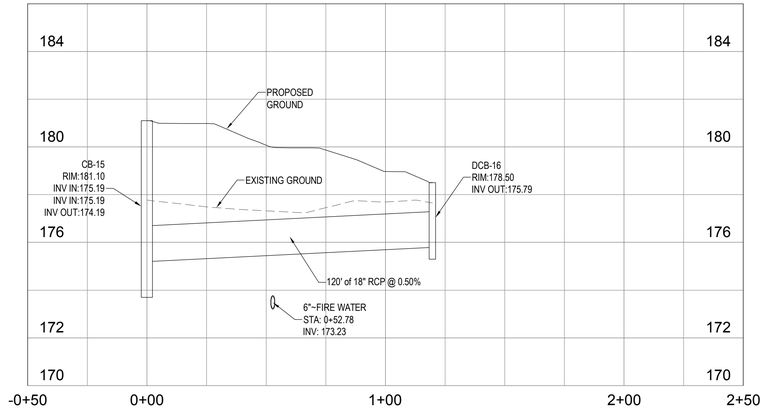
REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

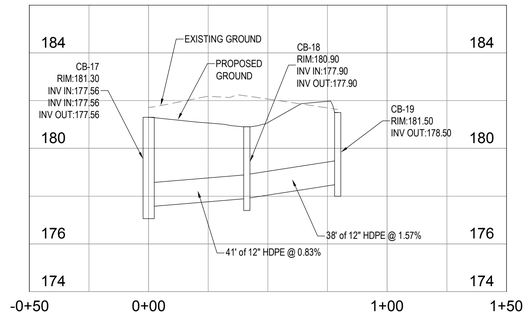
C2-2

C:\Users\Jay Banks\Banks Engineering Dropbox\BE PROJECTS\01054 KeithCorp\013 Harnett MOB\Dwg\C2-2 TO C2-3 STORM PROFILES.dwg

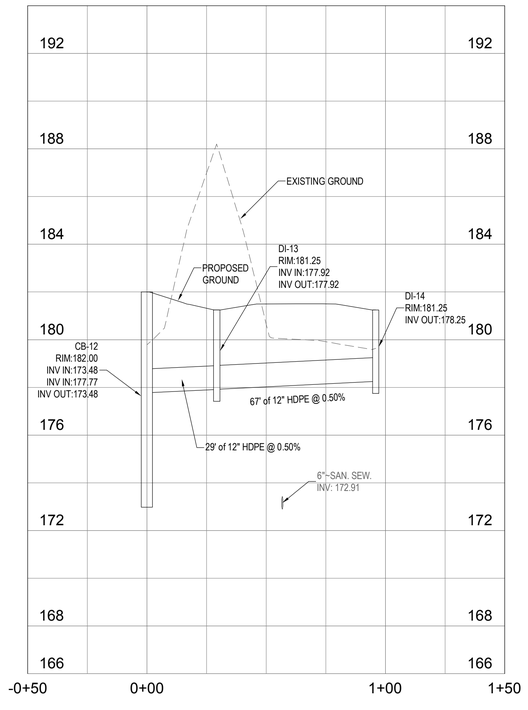
CB-15 TO DCB-16 PROFILE



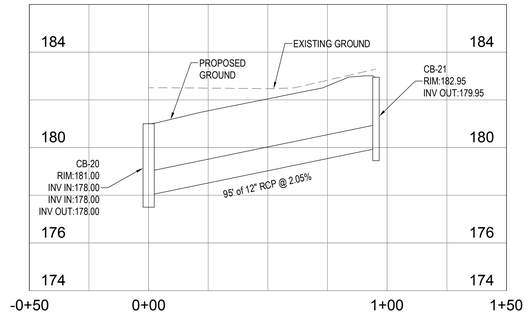
CB-17 TO CB-19 PROFILE



CB-12 TO DI-14 PROFILE



CB-20 TO CB-21 PROFILE



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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT:
CFVH HARNETT MOB
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Lillington, NC 27546

SHEET:
STORM PROFILES

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
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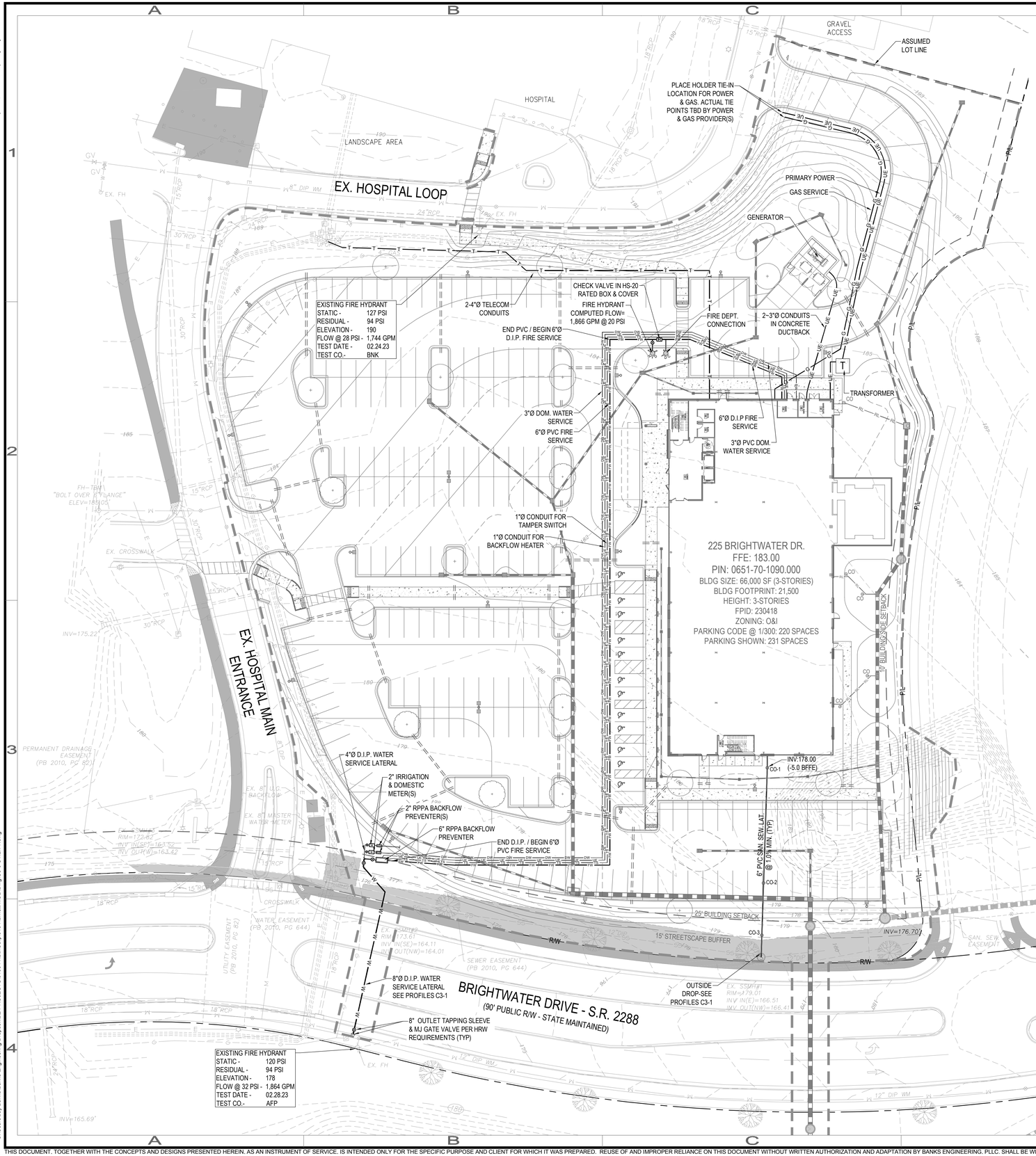
PROJECT:	1024007
DATE:	04.26.23

C2-3

Know what's below. Call before you dig.

SCALE: 1"= 30'
0 15 30 60
SCALE (V): 1"= 3'
0 1.5 3 6



UTILITY LEGEND

W W W W	PROPOSED PUBLIC WATER
DW DW DW	PROPOSED DOMESTIC WATER
FH G.V. C.V. FDC WV FW FW	PROPOSED FIRE WATER
TS TS TS	PROPOSED TAMPER SWITCH
IR IR IR IR	PROPOSED IRRIGATION
2-2" PVC	PROPOSED IRRIGATION SLEEVE
S	PROPOSED SANITARY
UE UE T UE	PROPOSED U.G. ELECTRIC
OE OE OE	PROPOSED O.H. ELECTRIC
UE UE UE	PROPOSED LIGHTING POWER
G G G G	PROPOSED GAS
T T T T	PROPOSED TELEPHONE

UTILITY NOTES

1. SEE GENERAL NOTES SHEET FOR UTILITY PLAN NOTES.
2. SPECIFICATIONS FOR WATER & SEWER SERVICES SHALL FOLLOW CITY OF GASTONIA, GASTON COUNTY & SERVICE PROVIDER REQUIREMENTS.
3. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES AND NOTIFYING OWNER / ENGINEER OF POTENTIAL CONFLICTS PRIOR TO THE START OF CONSTRUCTION. ALL EXISTING UTILITY RELOCATIONS WILL BE AT CONTRACTORS EXPENSE IF OWNER / ENGINEER IS NOT NOTIFIED IN ADVANCE.
4. ALL CHANGES IN DIRECTION OF THE CONDUIT SHALL UTILIZE STANDARD SWEEPS WITH A MINIMUM BENDING RADIUS LISTED IN THE NEC. NO MORE THAN (2) 90-DEGREE BENDS WILL BE ALLOWED BETWEEN PULLING POINTS, OR A TOTAL OF 180 DEGREES COMBINED IN SEVERAL BENDS. PULL BOXES SHALL BE LOCATED EVERY 400 FEET UNLESS THE COMBINED TOTAL OF BENDS REQUIRE ADDITIONAL MANHOLES.
5. ALL CONDUITS SHALL BE INSTALLED WITH SOLID COPPER 12-GUAGE TRACER WIRE, 30 MILS ORANGE HDPE INSULATION

SANITARY SEWER NOTES

1. PROPOSED SANITARY SEWER LATERAL & CONNECTIONS ARE INSTALLED BY SITE CONTRACTOR. UNLESS DEVELOPER HAS INDICATED OTHERWISE, CONTRACTOR IS RESPONSIBLE FOR APPLICATION AND PAYING ALL MUNICIPALITY FEES REQUIRED FOR SERVICE ACTIVATION.
2. CONTRACTOR TO LOCATE LATERAL CONNECTIONS TO BUILDING PER PLUMBING PLANS.
3. PLACE CLEAN-OUTS ON SANITARY SEWER LATERALS AS REQUIRED BY PLUMBING CODE OR UTILITY PLAN - WHICHEVER IS MORE RESTRICTIVE.
4. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AN ENCROACHMENT AGREEMENT PERMIT AS REQUIRED TO CONSTRUCT UTILITY CONNECTIONS IF CONNECTION LOCATION IS WITHIN PUBLIC RIGHT-OF-WAY.
5. TRENCHES FOR SEWER LATERALS AND WATER SERVICE MUST REMAIN OPEN FOR PLUMBING INSPECTION.
6. SANITARY SEWER LATERAL MATERIAL TO BE PVC SDR 35 ASTM D-2665 & D-1785.
7. UNLESS OTHERWISE INDICATED, SANITARY SEWER LATERALS SHALL BE INSTALLED AT 1% SLOPE MINIMUM WITH CLEANOUTS SPACED 80' ON-CENTER MAX. & 3 FEET OF COVER ABOVE TOP OF PIPE.
8. ALL SEWER MAINS AND SANITARY SEWER LATERALS SHALL BE INSTALLED WITH SOLID COPPER 12-GUAGE TRACER WIRE, 30 MILS GREEN HDPE INSULATION

BACKFLOW NOTES

1. THERE SHALL BE NO TAPS, PIPING BRANCHES, UNAPPROVED BYPASS PIPING, HYDRANTS, FIRE DEPT. CONNECTION POINTS, OR OTHER WATER USING EQUIPMENT/DEVICES CONNECTED TO THE SUPPLY LINE BETWEEN ANY WATER METER AND REQUIRED BACKFLOW PREVENTER.
2. EACH REQUIRED BACKFLOW PREVENTION ASSEMBLY IS REQUIRED TO BE TESTED BY A CERTIFIED TESTER PRIOR TO PLACING THE WATER SYSTEM IN SERVICE.
3. ENCLOSURE AND BACKFLOW TO BE INSTALLED BY DEVELOPER'S CONTRACTOR IF APPLICABLE, FIRE BACKFLOW ENCLOSURE TO BE HEATED.
4. PERMANENT INSULATION SHALL NOT BE INSTALLED ON BACKFLOW ASSEMBLY.
5. BACKFLOW ASSEMBLY SERVING A FIRE LINE SHALL BE HEATED TO MAINTAIN A MINIMUM OF 40° F.
6. IF BUILDING HAS FIRE SPRINKLER, TAMPER SWITCHES TO BE INSTALLED ON THE FIRE LINE BACKFLOW PREVENTER. INSTALL 1" CONDUIT FROM FIRE LINE BACKFLOW ENCLOSURE TO BUILDING ALARM SYSTEM INSIDE BUILDING. COORDINATE WITH ALARM SYSTEM MANUFACTURER / INSTALLER.
7. RPPA BACKFLOW ASSEMBLY TO BE INSTALLED ABOVE-GROUND WITHIN INSULATED ENCLOSURE TO INCLUDE DRAIN PORT(S) FOR DISCHARGE WATER.

WATER DISTRIBUTION NOTES

1. CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ALL WATER SERVICES. CONNECTION(S) TO PUBLIC WATER MAIN AS WELL AS COMPLETION OF REQUIRED APPLICATION(S), COORDINATING WITH HARNETT REGIONAL WATER AND PAYING APPLICABLE TAP / SYSTEM DEVELOPMENT FEES. CONTACT HARNETT REGIONAL WATER AT 910.893.7575 TO INITIATE SERVICE REQUEST.
2. CONTRACTOR TO LOCATE TIE-INS TO ALL BUILDINGS BASED ON PLUMBING PLANS.
3. ALL WATER MAINS 6" AND LARGER SHALL BE PVC IN ACCORDANCE WITH AWWA C-900. THE PIPE SHALL BE PRESSURE CLASS 200 WITH SDR OF 14 UNLESS INDICATED OTHERWISE. DUCTILE IRON PIPE (NO PVC) TO BE USED WITHIN 5 FT. OF BACKFLOW PREVENTION DEVICES.
4. WHERE INDICATED, DUCTILE IRON PIPE SHALL BE PRESSURE CLASS 350 CONFORMING TO ANSI / AWWA C151/A21.51-02 WITH CEMENT-MORTAR LINING.
5. UNLESS NOTED OTHERWISE, WATER LINES 1-1/2" - 6" IN DIAMETER SHALL BE PVC 1120 IN ACCORDANCE WITH ASTM D-2241. THE PIPE SHALL BE A MINIMUM PRESSURE CLASS 200 & SDR OF 21 OR LESS. PIPE JOINTS SHALL BE SOLVENT WELD.
6. UNLESS NOTED OTHERWISE, WATER LINES 1" IN DIAMETER & SMALLER SHALL BE SOFT COPPER TUBE, TYPE K, PER ASTM B-88 OR SDR 9 HDPE (POLY) PER ASTM D-2737.
7. WHERE WATER LINES CONFLICT WITH STORM & SANITARY SEWER, THE WATER LINE SHALL BE LOWERED DURING CONSTRUCTION. INSTALL 45° BENDS AS NECESSARY TO OBTAIN A MINIMUM CLEARANCE OF 18 INCHES.
8. ALL WATER MAIN FITTINGS (TEES, BENDS, VALVES) SHALL BE STABILIZED VIA RESTRAINED JOINTS OR THRUST BLOCKING.
9. CONTRACTOR SHALL CONDUCT APPLICABLE TESTING ON ALL NEWLY INSTALL WATER DISTRIBUTION SYSTEM PIPING AND APPURTENANCES PER NCDENR & NFPA 24 REQUIREMENTS. TESTS INCLUDE FLUSHING OF PIPES, HYDROSTATIC TESTS & OPERATIONAL TESTS. CONTRACTOR SHALL PROVIDE DOCUMENTATION IN COMPLIANCE WITH NFPA 24.
10. DISINFECTION OF THE WATER DISTRIBUTION SYSTEM SHALL BE PERFORMED IN ACCORDANCE WITH ALL NCDENR STANDARDS & REGULATIONS. CONTRACTOR SHALL SUBMIT WATER SAMPLES TO AN INDEPENDENT LABORATORY & PROVIDE RESULTS TO ENGINEER.
11. CONTRACTOR SHALL SCHEDULE ALL TESTING TO ALLOW THE ENGINEER'S ATTENDANCE. FAILURE TO PROPERLY NOTIFY THE ENGINEER MAY RESULT IN RETESTING AT THE ENGINEERS OPTION AND AT THE CONTRACTOR'S EXPENSE.
12. IF APPLICABLE, CONTRACTOR IS RESPONSIBLE FOR OBTAINING AN ENCROACHMENT AGREEMENT PERMIT TO CONSTRUCT UTILITY CONNECTIONS.
13. ALL WATER LINES SHALL HAVE A MINIMUM 3 FEET OF COVER ABOVE TOP OF PIPE.
12. ALL WATER AND SERVICE LINES SHALL BE INSTALLED WITH SOLID COPPER 12-GUAGE TRACER WIRE, 30 MILS BLUE HDPE INSULATION.
13. TRENCHES FOR WATER MAINS & SERVICE(S) MUST REMAIN OPEN FOR MUNICIPALITY PLUMBING INSPECTION.

NOTICE TO CONTRACTOR:

SITE CONTRACTOR IS RESPONSIBLE FOR COORDINATING SITE WORK WITH UTILITY PROVIDER(S) AND PROVIDING / INSTALLING ALL UTILITIES & SERVICE PROVIDER / CODE REQUIRED APPURTENANCES FOR DELIVERY OF A FULLY FUNCTIONAL BUILDING REGARDLESS OF WHETHER SHOWN. THIS INCLUDES BUT IS NOT LIMITED TO:

- WATER SERVICE CONNECTION TO PUBLIC WATER MAIN INCLUDING LINE STOPS IF NECESSARY.
- WATER METER VAULT, VALVES, METER YOKE, PIPING, FITTINGS, BLOCKING, TRACER WIRE, BACKFLOW, BACKFLOW ENCLOSURE & METER IF NOT PROVIDED BY MUNICIPALITY.
- SANITARY SEWER CONNECTION TO PUBLIC MAIN, PIPING, CLEAN-OUTS & TRACER WIRE.
- COORDINATION OF TRANSFORMER, GAS METER AND POWER / GAS / TELECOM SERVICE ROUTING.
- CONDUITS, BENDS, FITTINGS, HANDHOLES, JUNCTIONS BOXES, ETC. FOR POWER & TELECOM. NOTE: CONDUIT QUANTITY & SIZE HAVE BEEN ESTIMATED. CONTRACTOR TO COORDINATE WITH RESPECTIVE SERVICE PROVIDERS FOR VERIFICATION PRIOR TO CONSTRUCTION.
- CONDUCTOR(S) (I.E. WIRING / CABLE) FOR POWER AND TELECOM SERVICE SHALL BE INCLUDED IN BASE BID AS AN ADD ALT UNLESS FURNISHED BY UTILITY PROVIDER.
- SITE LIGHTING FIXTURES, POLES, POLE BASES, CONDUITS (IF NOT DIRECT BURY), WIRING & PHOTO SENSORS / TIMERS. LOCATIONS & QUANTITIES SHOWN ARE ESTIMATED. SEE PENDING OWNER / ARCHITECT PROVIDED SITE LIGHTING PLAN / ELECTRICAL DRAWINGS FOR DETAILS. POLE BASES TO EXTEND 18" ABOVE FINISHED GRADE WITHIN PARKING AREAS AND 6" AT ALL OTHER LOCATIONS.

Know what's below. Call before you dig.

SCALE: 1"= 30'
0 15 30 60

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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT: CFV/H HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: UTILITY

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C3-0

April 25, 2023 - 5:36pm By: Jay Banks
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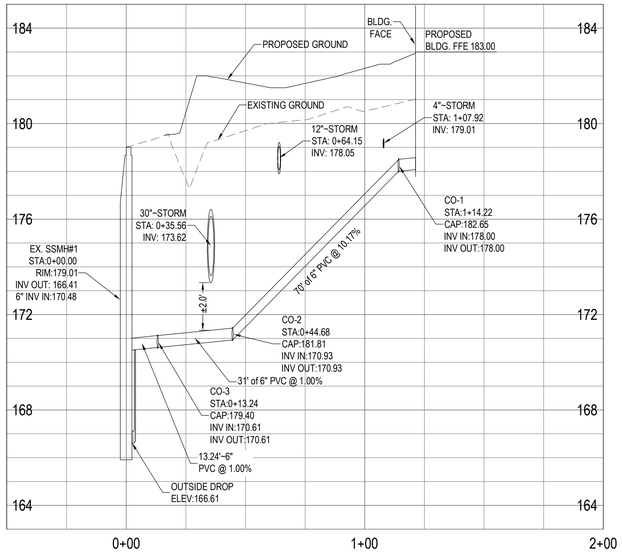
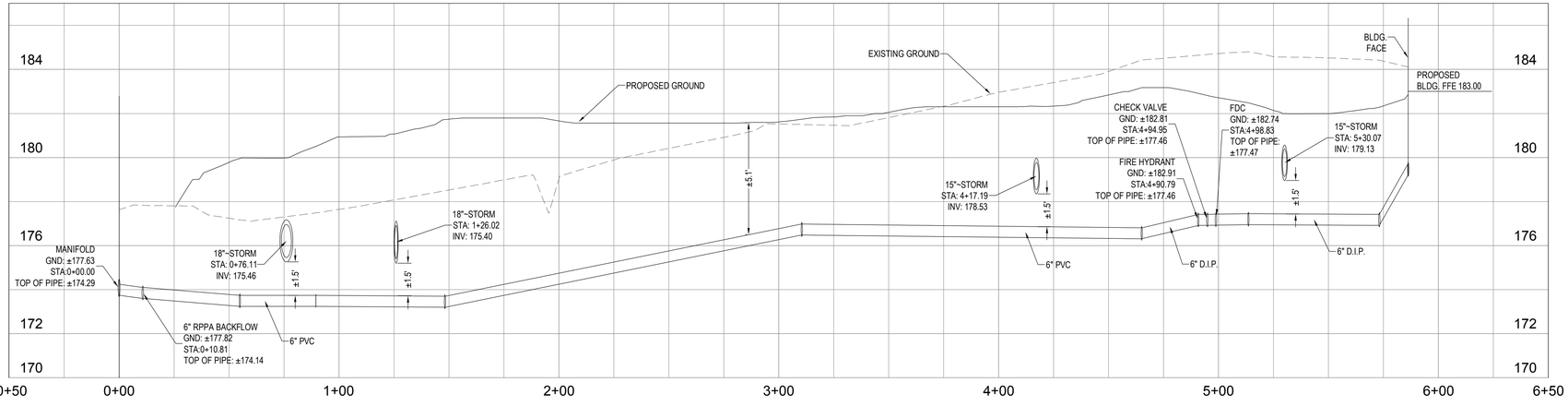
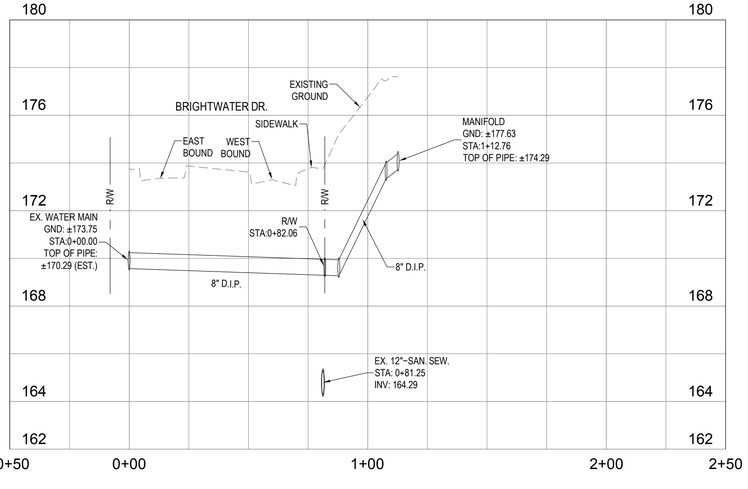
SANITARY SEWER LATERAL PROFILE



FIRE WATER SERVICE PROFILE



BRIGHTWATER WATER MAIN CROSSING PROFILE



SCALE: 1"= 30'
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SCALE (V): 1"= 3'
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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: WATER & SANITARY PROFILES

REV.	DATE	DESCRIPTION
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DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C3-1

2022 HRW REQUIRED UTILITY NOTES
(Revision 10- April 19, 2022)

WATER

A. The Fire Marshal's Office shall approve all hydrant types and locations in new subdivisions. However, Harnett Regional Water (HRW) prefers the contractors to install one of the following fire hydrants:

1. Mueller - Super Centurion 250 A-423 model with a 5¼" main valve opening three way (two hose nozzles and one pumper nozzle);
2. American Darling - Mark B-84-B model with a 5¼" main valve opening three way (two hose nozzles and one pumper nozzle);
3. Waterous - Pacer B-67-250 model with a 5¼" main valve opening three way (two hose nozzles and one pumper nozzle) or approved equal for standardization.

*All fire hydrants listed above must have "American National Fire Hose Connection Screw Threads" NST/NH hose threads.

B. Fire hydrants are installed at certain elevations. Any grade change near any fire hydrant, which impedes its operation, shall become the responsibility of the Utility Contractor for correction. Corrections will be monitored by the HRW Utility Construction Inspector and the Harnett County Fire Marshal.

C. The Professional Engineer (PE) shall obtain and provide the NCDEQ "Authorization to Construct" permit to the Utility Contractor before the construction of the water line shall begin. The Utility Contractor must post a copy of the NCDEQ "Authorization to Construct" permit issued by the North Carolina Department of Environmental Quality (NCDEQ) on site prior to the start of construction. The permit must be maintained on site throughout the entire construction process of the proposed water lines that will serve this project.

D. The Utility Contractor shall notify Harnett Regional Water (HRW) and the Professional Engineer (PE) at least two days prior to construction commencing. The Utility Contractor must schedule a pre-construction conference with Mr. Chad Everette, HRW Utility Construction Inspector at least two (2) days before construction will begin and the Utility Contractor must coordinate with HRW for regular inspection visitations and acceptance of the water system(s). Construction work shall be performed only during the normal working hours of HRW which is 8:00 am - 5:00 pm Monday through Friday. Holiday and weekend work are not permitted by HRW.

E. The Professional Engineer (PE) shall provide HRW and the Utility Contractor with a set of NCDEQ approved plans marked "Released for Construction" at least two days prior to construction commencing. The Registered Land Surveyor (RLS) should stake out all lot corners and the grade stakes for the proposed finish grade for each street before the Utility Contractor begins construction of the water line(s). The grade stakes should be set with a consistent offset from the street centerline so as not to interfere with the street grading and utility construction.

F. The Utility Contractor shall provide the HRW Utility Construction Inspector with material submittals and shop drawings for all project materials prior to the construction of any water line extension(s), and associated water services in Harnett County. The materials to be used on the project must meet the established specifications of HRW and be approved by the Engineer of Record prior to construction. All substandard materials or materials not approved for use in Harnett County found on the project site must be removed immediately when notified by the HRW Utility Construction Inspector.

G. The water main(s), fire hydrants, service lines, meter setters and all associated appurtenances shall be constructed in strict in accordance with the standard specifications of the Harnett Regional Water (HRW). The Utility Contractor shall be responsible to locate the newly installed water main(s), water service lines and all associated meter setters and meter boxes for other utility companies and their contractors until the new water main(s) have been approved by the North Carolina Department of Environmental Quality, Division of Environmental Health, Public Water Supply Section (NCDEQ, DEH, PWS) and accepted by HRW.

H. Prior to acceptance, all services will be inspected to ensure that they are installed at the proper depth. All meter boxes must be flush with the ground level at finish grade and the meter setters must be a minimum of 8" below the meter box lid. Meter setters shall be centered in the meter box and supported by brick, block or stone.

I. The Utility Contractor shall provide the Professional Engineer (PE) and HRW Utility Construction Inspector with a set of red line drawings identifying the complete water system installed for each project. The red line drawings should identify the materials, pipe sizes and approximate depths of the water lines as well as the gate valves, fire hydrants, meter setters, blow off assemblies and all associated appurtenances for all water line(s) constructed in Harnett County. The red line drawings should clearly identify any deviations from the NCDEQ approved plans. All change orders must be approved by HRW and the Professional Engineer (PE) in writing and properly documented in the red line field drawings.

J. Potable water mains crossing other utilities and non-potable water lines (sanitary sewer, storm sewer, RCP, etc.) shall be laid to provide a minimum vertical distance of twenty-four (24") inches between the potable water main and all other utilities. NCDOT requires the new water mains to be installed under the storm water lines. The potable water main shall be installed with twenty-four (24") inches of vertical separation and with ductile iron pipe when designed to be placed under a non-potable water line such as sanitary sewer or storm sewer lines. If these separations cannot be maintained then the water main shall be installed with ductile iron pipe. Both the potable water main and the non-potable water line must be cast iron or ductile iron pipe (DIP) if the state minimum separations cannot be maintained. The ductile iron pipe must be laid so the mechanical joints are at least (10') feet from the point where the potable water main crosses the non-potable water line.

K. Potable water mains installed parallel to non-potable water lines (sanitary sewer, storm sewer, RCP, etc.) shall be laid to provide a minimum horizontal distance of ten (10') feet between the potable water main and sanitary sewer mains, sewer laterals and services. The horizontal separation between the potable water main and any other utility or storm sewer shall not be less than five (5') feet. The potable water main must be ductile iron pipe if this horizontal separation of ten (10') feet cannot be maintained. The ductile iron pipe shall extend at least ten (10') feet beyond the point where the minimum required horizontal separation of ten (10') feet can be re-established.

L. Meter setters shall be installed in pairs on every other lot line where possible to leave adequate space for other utilities to be installed at a later time. The meter setters shall be installed at least one (1') foot inside the right-of-way and at least three (3') to five (5') feet from the property line between the lots.

M. HRW requires that meter boxes for ¾" services shall be 12" wide x 17" long ABS plastic boxes at least 18" in height with cast iron lids/covers. Meter boxes for 1" services shall be 17" wide x 21" long ABS plastic boxes at least 18" in height with plastic lids and cast-iron flip covers in the center of the lids. Meter boxes for 2" services shall be 20" wide x 32" long ABS plastic boxes at least 20" in height with plastic lids and cast-iron flip covers in the center of the lids.

N. Master meters must be installed in concrete vaults sized for the meter assembly and associated appurtenances so as to provide at least eighteen (18") inches of clearance between the bottom of the concrete vault and the bottom of the meter setter. The master meter must be provided test ports if the meter is not equipped with test ports from the manufacturer in accordance with the HRW established standard specifications and details. Ductile iron pipe must be used for the master meter vault piping and valve vault piping. The Utility Contractor must provide shop drawings for the meter vaults to HRW prior to ordering the concrete vaults.

O. The Utility Contractor will install polyethylene SDR-9 water service lines that cross under the pavement inside a schedule 40 PVC conduit to allow for removal and replacement in the future. Two (2) independent ¾" water service lines may be installed inside one (1) - two (2") inch schedule 40 PVC conduit or two (2) independent 1" water service lines may be installed inside one (1) - three (3") inch schedule 40 PVC conduit, but each water service shall be tapped directly to the water main. Split services are not allowed by HRW. If sidewalks are proposed, the conduit must extend past the sidewalk.

P. The water main(s), fire hydrants, gate valves, service lines, meter setters and associated appurtenances must be rated for 200 psi and hydrostatically pressure tested to 200 psi. The hydrostatic pressure test(s) must be witnessed by the HRW Utility Construction Inspector. The Utility Contractor must notify HRW when they are ready to begin filling in lines and coordinate with Harnett Regional Water to witness all pressure testing.

Q. The Utility Contractor shall conduct a pneumatic pressure test using compressed air or other inert gas on the stainless-steel tapping sleeve(s) prior to making the tap on the existing water main. This pneumatic pressure test must be witnessed by the HRW Utility Construction Inspector. The Utility Contractor shall use Romac brand stainless-steel tapping sleeve(s) or approved equal for all taps made in Harnett County. All new water line extensions must begin with a resilient wedge type gate valve sized equal to the diameter of the new water line extension in order to provide a means of isolation between Harnett Regional Water's existing water mains and the new water line extensions under construction.

R. All water mains will be constructed with SDR-21 PVC Pipe or Class 50 Ductile Iron Pipe rated for at least 200 psi or greater. All pipes must be protected during loading, transport, unloading, staging, and installation. PVC pipe must be protected from extended exposure to sunlight prior to installation.

S. All water mains will be flushed and disinfected in strict accordance with the standard specifications of the Harnett Regional Water. All water samples collected for bacteria testing will be collected by the HRW Utility Construction Inspector and tested in the HRW Laboratory.

T. All fittings larger than two (2") inches diameter shall be ductile iron. HRW requires that mechanical joints be assembled with grip rings as "Megalug" fittings are not approved by Harnett Regional Water for pipe sizes smaller than twelve inches (12") diameter. PVC pipe used for water mains shall be connected by slip joint or mechanical joint with grip rings. Glued pipe joints are not allowed on PVC pipe used for water mains in Harnett County.

U. HRW requires that the Utility Contractor install tracer wire in the trench with all water lines. The tracer wire shall be 12 ga. insulated, solid copper conductor and it shall be terminated at the top of the valve boxes or manholes. No spliced wire connections shall be made underground on tracer wire installed in Harnett County. The tracer wire may be secured with duct tape to the top of the pipe before backfilling.

V. The Utility Contractor will provide Professional Engineer (PE) and the HRW Utility Construction Inspector with a set of red line field drawings to identify the installed locations of the water line(s) and all associated services. All change orders must be pre-approved by HRW and the Professional Engineer (PE) in writing and properly documented in the red line field drawings.

W. The Utility Contractor shall spot dig to expose each utility pipe or line which may conflict with construction of proposed water line extensions well in advance to verify locations of the existing utilities. The Utility Contractor shall provide both horizontal and vertical clearances to the Professional Engineer (PE) to allow the PE to adjust the water line design in order to avoid conflicts with existing underground utilities. The Utility Contractor shall coordinate with the utility owner and be responsible for temporary relocation and/or securing existing utility poles, pipes, wires, cables, signs and/or utilities including services in accordance with the utility owner requirements during water line installation, grading and street construction.

X. Prior to the commencement of any work within established utility easements or NCDOT rights-of-way the Utility Contractor is required to have a signed NCDOT encroachment agreement posted on site and notify all concerned utility companies in accordance with G.S. 87-102. The Utility Contractor must call the NC One Call Center at 811 or (800) 632-4949 to verify the location of existing utilities prior to the beginning of construction. Existing utilities shown in these plans are taken from maps furnished by various utility companies and have not been physically located or verified by the P.E. (i.e. TELEPHONE, CABLE, WATER, SEWER, ELECTRICAL POWER, FIBER OPTIC, NATURAL GAS, ETC.). The Utility Contractor will be responsible to repair any and all damages to the satisfaction of the related utility company.

Y. The Utility Contractor shall provide HRW with at least one (1) fire hydrant wrench and one (1) break-away flange kit for every subdivision with fire hydrants developed in Harnett County. These items must be provided to HRW before the final inspection will be scheduled by the HRW Utility Construction Inspector. In addition, the Utility Contractor shall install a 4" x 4" concrete valve marker at the edge of the right-of-way to identify the location of each gate valve installed in the new water system with the exception of the fire hydrant isolation valves. The contractor shall measure the distance from the center of the concrete marker to the center of the valve box. This distance (in linear feet) shall be stamped on the brass plate located on the top of the concrete valve marker. In lieu of installing the concrete valve markers, the Utility Contractor may provide at least two measurements from two independent permanent above ground structures to the Professional Engineer (PE) in the red line drawings to identify the valve locations. The Professional Engineer (PE) must include these measurements in the As-Built Record Drawings submitted to HRW.

Z. The Utility Contractor will be responsible for any and all repairs due to leakage damage from poor workmanship during the one 1) year warranty period once the water system improvements have been accepted by Harnett Regional Water. Harnett Regional Water will provide maintenance and repairs when requested and bill the Developer and/or Utility Contractor if necessary due to lack of response within 48 hours of notification of warranty work. The Utility Contractor will be responsible for any and all repairs due to damages resulting from failure to locate the new water lines and associated appurtenances for other utilities and their contractors until the water lines have been approved by NCDEQ and accepted by HRW. The final inspection of water system improvements cannot be scheduled with HRW until the streets have been paved; the rights-of-way and utility easements have been seeded and stabilized with an adequate stand of grass in place to prevent erosion issues on site.

AA. The Engineer of Record is responsible to ensure that construction is, at all times, in compliance with accepted sanitary engineering practices and approved plans and specifications. No field changes to the approved plans are allowed without prior written approval by HRW. A copy of each engineer's field report is to be submitted to HRW as each such inspection is made on system improvements or testing is performed by the contractor. Water and sewer infrastructure must pass all tests required by HRW specifications and those of all applicable regulatory agencies. These tests include, but are not limited to: air test, vacuum test, mandrel test, visual test, pressure test, bacteriological test, etc. An HRW Inspector must be present during testing and all test results shall be submitted to HRW. All tests must be satisfied before the final inspection will be scheduled with the HRW Inspector. The Engineer of Record must request in writing to schedule the final inspection once all construction is complete. The Developer's Engineer of Record and the HRW Utility Construction Inspector shall prepare a written punch list of any defects or deficiencies noted during the final inspection, should any exist. Upon completion of the punch list, the Developer's Engineer of Record will schedule another inspection. In the event the number of inspections performed by the HRW exceeds two, additional fees may be assessed to the Developer.

SANITARY SEWER

A. The Professional Engineer (PE) shall obtain and supply a copy of the sewer permit for the construction and operation of the wastewater collection system to the Utility Contractor before the construction of the sanitary sewer line, sewer lift station and associated force main shall begin. The Utility Contractor must post a copy of the sewer permit issued by the North Carolina Department of Environmental Quality (NCDEQ) on site prior to the start of construction. The permit must be maintained on site during the construction of the sewer system improvements.

B. The Utility Contractor shall notify Harnett Regional Water (HRW) and the Professional Engineer (PE) at least two days prior to construction commencing. The Utility Contractor must schedule a pre-construction conference with Mr. Chad Everette, HRW Utility Construction Inspector at least two (2) days before construction will begin and the Utility Contractor must coordinate with HRW for regular inspection visitations and acceptance of the wastewater system(s). Construction work shall be performed only during the normal working hours of HRW which is 8:00 am - 5:00 pm Monday through Friday. Holiday and weekend work is not permitted by HRW.

C. The Professional Engineer (PE) shall provide HRW with a set of NCDEQ approved plans marked "Released for Construction" at least two days prior to construction commencing. HRW will stamp the approved plans as "Released for Construction" and provide copies to the utility contractor. The Registered Land Surveyor (RLS) shall stake out all lot corners and establish grade stakes for the proposed finish grade for each street and sewer line before the Utility Contractor begins construction or installation of the manholes, sanitary sewer gravity line(s), sewer lift stations and/or sanitary sewer force main(s). The grade stakes should be set with a consistent offset from the street centerline so as not to interfere with the street grading or utility construction.

D. The Utility Contractor shall provide the HRW Utility Construction Inspector with material submittals and shop drawings for all project materials prior to the construction of any gravity sewer line(s), manhole(s), sewer lift station(s) and associated force main(s) in Harnett County. The materials to be used on the project must meet the established specifications of HRW and be approved by the Engineer of Record prior to construction. All substandard materials or materials not approved for use in Harnett County found on the project site must be removed immediately when notified by the HRW Utility Construction Inspector.

E. The sanitary sewer lateral connections should be installed 90° (perpendicular) to the sanitary sewer gravity lines with schedule 40 PVC pipe. HRW requires the Utility Contractor to provide the Professional Engineer (PE) with accurate measurements for locating sanitary sewer service lateral and associated each sanitary sewer clean-out. These measurements should be taken from the nearest downstream manhole up along the sanitary sewer main to the in-line wye fitting (or tapping saddle) and then another measurement from the in-line wye fitting (or tapping saddle) to the 4" x 4" long sweep combination wye fitting at the bottom of the sewer clean-out stack. These field measurements must be provided to the Professional Engineer (PE) in the red line drawings from the Utility Contractor for proper documentation in the As-Built Record Drawings submitted to HRW.

F. The Utility Contractor shall be responsible to locate the newly installed sanitary sewer gravity line(s), sanitary sewer force main(s), sanitary sewer service lateral(s) and all associated sewer clean-out(s) in the proposed sanitary sewer system for other utility companies and their contractors until the new sanitary sewer line(s) and associated appurtenances have been approved by the North Carolina Department of Environmental Quality (NCDEQ) and accepted by HRW. All new sanitary sewer lines must have at least three (3 ft.) feet of cover and extend under all existing water main and storm water lines with a least 24" of vertical clearance below the bottom of the existing water main and storm water lines. ALL ductile iron sewer piping must be 401 epoxy coated or approved equal.

G. The sanitary sewer gravity line(s), manhole(s), sanitary sewer service lateral(s) and associated clean-out(s) shall be constructed in strict accordance with the standard specifications of the Harnett Regional Water. The sanitary sewer gravity line(s) must pneumatically pressure tested with compressed air at 5 psi and the sanitary sewer force main(s) must hydrostatically pressure tested with water or air at 200 psi. Sanitary sewer manholes must be vacuum tested to 10 inches of mercury and cannot drop below 9 inches in 60 seconds for 4 ft. diameter manholes, 75 seconds for 5 ft. diameter manholes. The test must be in accordance with the following standards: For ductile iron pipelines test in accordance with the applicable requirements of ASTM C924. For PVC pipelines test in accordance with ASTM F1417-98 and UBPPA UNI-B-6. Vacuum testing shall be performed in accordance with ASTM C1244. The HRW Utility Construction Inspector and Engineer must witness all tests mentioned above.

H. Prior to acceptance, all sewer service laterals will be inspected to ensure that they are installed at the proper depth. All sewer clean-outs must be installed so the 4" x 4" long sweep combination wye is at least three (3') feet but no more than four (4') feet below the finish grade unless otherwise approved in writing by HRW. The sewer cleanouts shall have a four (4") schedule 40 PVC pipe stubbed up from both ends of the 4" x 4" long sweep combination wye to be at least two (2') feet above the finish grade and cover each end with a four (4") inch temporary cap to keep out dirt, sand, rocks, water and construction debris. The vertical stack on each clean-out must be provided with a concrete donut for protection.

I. Once the sanitary sewer gravity line(s) have been installed, pneumatically pressure tested and in place for at least 30 days, the Utility Contractor must contact the HRW Utility Construction Inspector to witness the mandrel test on each PVC sanitary sewer gravity line. The Utility Contractor will notify HRW to schedule the mandrel testing. The mandrel and proving ring must be supplied by the Utility Contractor. Closed circuit video camera inspections (at the Utility Contractor's expense) may be required by the HRW Utility Construction Inspector if the mandrel and mirror tamping testing cannot be completed with satisfactory results. The sanitary sewer lines should be flushed clean using a sewer ball of the proper diameter before any mandrel testing can be performed. The Utility Contractor is responsible to remove all dirt, sand, silt, gravel, mud and debris from the newly constructed sewer lines exercising care to keep the Harnett Regional Water's existing sanitary sewer systems clean. Sanitary sewer force main(s) shall be pressure tested to 200 psi for at least 2 hours like water lines.

J. The Utility Contractor shall be responsible to locate the newly installed sanitary sewer system(s) for other utility companies and their contractors until the new sanitary sewer system(s) have been approved by the North Carolina Department of Environmental Quality (NCDEQ) and accepted by HRW.

K. HRW requires that the Utility Contractor install tracer wire in the trench with all sanitary sewer force mains. The tracer wire shall be 12 ga. insulated, solid copper conductor and it shall be terminated at the top of the valve boxes or manholes. No spliced wire connections shall be made underground on tracer wire installed in Harnett County. The tracer wire may be secured with duct tape to the top of the pipe before backfilling. The tracer wire is not required for the gravity sewer line(s) between manholes.

L. The Utility Contractor shall provide the Professional Engineer (PE) and HRW Utility Construction Inspector with a set of red line drawings identifying the complete sewer system installed for each project. The red line drawings should identify the materials, pipe sizes and approximate depths of the sewer lines as well as the installed locations of the manhole(s), sanitary sewer gravity line(s), sanitary sewer service laterals, clean-outs, sewer lift station(s) and associated force main(s). The red line drawings should clearly identify any deviations from the NCDEQ approved plans. All change orders must be approved by HRW and the Professional Engineer (PE) in writing and properly documented in the red line field drawings.

M. Prior to the commencement of any work within established utility easements or NCDOT rights-of-way the Utility Contractor is required to notify all concerned utility companies in accordance with G.S. 87-102. The Utility Contractor must call the NC One Call Center at 811 or (800) 632-4949 to verify the location of existing utilities prior to the beginning of construction. Existing utilities shown in these plans are taken from maps furnished by various utility companies and have not been physically located by the P.E. (i.e. TELEPHONE, CABLE, WATER, SEWER, ELECTRICAL POWER, FIBER OPTIC, NATURAL GAS, ETC.).

N. The Utility Contractor shall spot dig to expose each existing utility pipe or line which may conflict with construction of proposed sanitary sewer line extensions well in advance to verify locations of the existing utilities. The Utility Contractor shall provide both horizontal and vertical clearances to the Professional Engineer (PE) to allow the PE to adjust the sanitary sewer line design in order to avoid conflicts with existing underground utilities. The Utility Contractor shall coordinate with the utility owner and be responsible for temporary relocation of existing utilities and/or securing existing utility poles, pipes, wires, cables, signs and/or utilities including services in accordance with the utility owner's requirements during sanitary sewer line installation, grading and street construction.

O. When making a tap on an existing sewer force main, the Utility Contractor must have a permit from the North Carolina Department of Environmental Quality (NCDEQ) prior to begin the tap work. The Utility Contractor shall conduct a pneumatic pressure test using compressed air or other inert gas on the stainless-steel tapping sleeve and gate valve prior to making the tap on an existing sanitary sewer force main. This pneumatic pressure test must be witnessed by the HRW Utility Construction Inspector. The Utility Contractor shall use Romac brand stainless-steel tapping sleeve(s) or approved equal for all taps made on sanitary sewer force mains in Harnett County. The Utility Contractor shall use Romac brand Style "CB" sewer saddles with stainless steel bands or approved equal for all taps made on existing sanitary sewer gravity lines in Harnett County.

P. The Utility Contractor shall provide a grease trap for each sanitary sewer service lateral that will be connected to a restaurant, food processing facility and any other commercial or industrial facility as required by the Harnett County Fat, Oil & Grease Ordinance. The grease trap must be rated for a minimum capacity of at least 1,000 gallons unless otherwise approved in writing by the HRW Pre-Treatment Coordinator. Garbage disposals should not be installed in homes and businesses that discharge wastewater to the Harnett Regional Water's Sanitary Sewer System as they are not approved by HRW.

Q. Each sewer lift station must be provided with three phase power (at least 480 volts) and constructed to meet the minimum requirements of the latest version of the National Electrical Code (NEC) and Harnett Regional Water standard specifications and details. If three phase power is not available from the power company other arrangements must be approved by HRW Engineering prior to the start of construction.

R. Where a new sanitary sewer force main is connected to an existing manhole in the Harnett Regional Water sewer collections system, the Utility Contractor must provide a protective coating (epoxy) for the interior surfaces of the manhole to protect it against corrosion, erosion and deterioration from the release of sewer gases such as methane and hydrogen sulfide.

S. The sewer lift station design and associated equipment must meet or exceed the MINIMUM REQUIREMENTS FOR HARNETT COUNTY SEWER LIFT STATIONS. Each sanitary sewer lift station must be constructed with an all-weather access road that is at least 20 feet wide. The lift station site must be covered with weed blocking material and at least six (6") inches of ABC stone (crush and run).

T. Once a sewer lift station has been installed, the Utility Contractor is responsible to schedule a draw down test with HRW Engineering and Collections staff, the Professional Engineer (PE), the Electrician, the original equipment manufacturers (OEM) representatives [For both the Pumps and the Generator]. This draw down test must be completed with power supplied from the electrical utility company and with power supplied by the emergency generator with satisfactory results before final inspections are conducted by the HRW Utility Construction Inspector.

U. Once the Utility Contractor completes the installation of a sewer lift station, the Professional Engineer (PE) must submit the sewer permit certification and As-Built Record Drawings to the North Carolina Department of Environmental Quality (NCDEQ) and HRW for final approval. The Utility Contractor must supply HRW Engineering staff with three original Operation & Maintenance (O&M) Manuals along with the associated pump curves and electrical schematics for the associated sewer lift station equipment including all warranty information and documentation.

V. Once the Utility Contractor completes the installation of a sewer lift station, the Developer must pay HRW the established System Control and Data Acquisition (SCADA) fees before the SCADA system will be installed at the new sewer lift station. The SCADA system must be installed and operational before the utilities may be accepted by HRW and placed into operation.

W. HRW requires the Utility Contractor to provide all necessary equipment and devices for the testing and inspection of the sanitary sewer system. The equipment and devices may include but not limited to lamping with mirrors, mandrels, sewer balls, plugs, air compressors and associated compressed air lines. If the HRW Utility Construction Inspector deems that a closed-circuit video camera inspection of the newly constructed sewer system is necessary, then all costs for the closed-circuit camera inspection will be the responsibility of the Utility Contractor. All closed-circuit video camera inspections must be recorded on VHS tapes that will released to HRW for record keeping, review and approval of the sewer system.

X. Any use of sewer plugs to temporarily block Harnett Regional Water's existing sanitary sewer lines must be coordinated with the HRW Collections Supervisor at least two (2) days in advance of installing the plugs. The sewer plugs must be removed as soon as possible once the new sanitary sewer lines have been inspected, pressure tested, mandrel tested, approved by the North Carolina Department of Environmental Quality (NCDEQ) and accepted by HRW to allow the sewer to flow as designed in Harnett Regional Water's existing sanitary sewer lines or when so ordered by the HRW Collections Supervisor to limit interruptions to the normal flow of the sanitary sewer collection system(s). The Utility Contractor must provide the pumps hoses and necessary connectors for a temporary pump around setup if required by the HRW Collections Supervisor. Mr. Randolph Clegg, HRW Collections Supervisor may be contacted between 8:00 am and 5:00 pm Monday through Friday at (910) 893-7575 extension 3241.

Y. The Utility Contractor will be responsible for any and all repairs due to leakage or damage resulting from poor workmanship during the one (1) year warranty period once the sewer system improvements have been approved by the North Carolina Department of Environmental Quality (NCDEQ) and accepted by HRW. The Utility Contractor will be responsible for any and all repairs due to damages resulting from failure to locate the new sanitary sewer lines and associated appurtenances for other utilities and their contractors until the sanitary sewer lines have been approved by NCDEQ and accepted by HRW. HRW will provide maintenance and warranty repairs if necessary due to lack of response within 48 hours of notification of warranty work. HRW will invoice the Developer and/or Utility Contractor for materials and labor in such cases.

Z. In developments and projects that require utility easements to be established for future HRW right-of-way, the Registered Land Surveyor (RLS) must provide the HRW Right-of-Way Agent with an official copy of the recorded plat and legal description of the said easement as recorded with the Harnett County Register of Deeds. The recorded documents must be provided to the HRW Right-of-Way Agent before the utility improvements within the said easement can be placed into operation. Any and all easements that must be obtained from adjoining property owners must be provided to HRW by the Developer at no cost to Harnett County. The final inspection of all sanitary sewer system improvements cannot be scheduled with HRW until the streets have been paved; the rights-of-way and utility easements have been seeded and stabilized with an adequate stand of grass in place to prevent erosion issues on site.

AA. The Engineer of Record is responsible to ensure that construction is, at all times, in compliance with accepted sanitary engineering practices and approved plans and specifications. No field changes to the approved plans are allowed without prior written approval by HRW. A copy of each engineer's field report is to be submitted to HRW as each such inspection is made on system improvements or testing is performed by the contractor. Water and sewer infrastructure must pass all tests required by HRW specifications and those of all applicable regulatory agencies. These tests include, but are not limited to: air test, vacuum test, mandrel test, visual test, pressure test, bacteriological test, etc. An HRW Inspector must be present during testing and all test results shall be submitted to HRW. All tests must be satisfied before the final inspection will be scheduled with the HRW Inspector. The Engineer of Record must request in writing to schedule the final inspection once all construction is complete. The Developer's Engineer of Record and the HRW Utility Construction Inspector shall prepare a written punch list of any defects or deficiencies noted during the final inspection, should any exist. Upon completion of the punch list, the Developer's Engineer of Record will schedule another inspection. In the event the number of inspections performed by the HRW exceeds two, additional fees may be assessed to the Developer.

BANKS ENGINEERING
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NC License #P-1370

CLIENT: THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER MAY D. BANKS JR.
04.26.23

PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: HRW STANDARD NOTES

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C3-2

April 25, 2023 - 5:37pm By: Jay Banks

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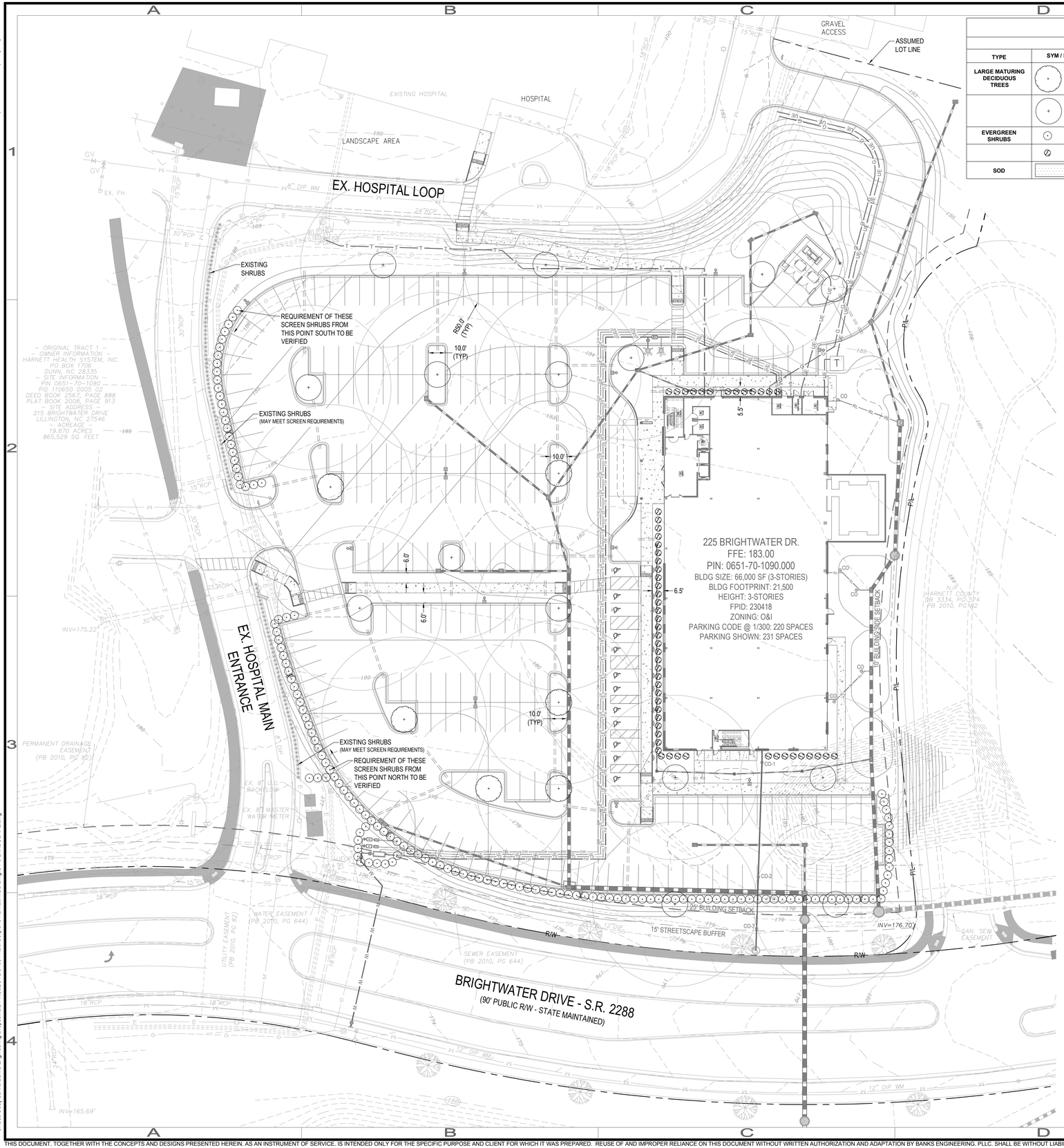


PLANT SCHEDULE & LEGEND

TYPE	SYM / KEY	QTY.	BOTANICAL NAME	COMMON NAME	SPECIFICATIONS: CAL.	HEIGHT	SPREAD	ROOT	SPACING	NOTES
LARGE MATURING DECIDUOUS TREES	QL	6	Quercus Lyrata	Overcup Oak	3" MIN.	12'-14'	6'-8'	B&B	AS SHOWN	
	QS	15	Quercus shumardii	Shumard Oak	3" MIN.	12'-14'	6'-8'	B&B	AS SHOWN	
EVERGREEN SHRUBS	IB	148	Ilex cornuta burfordi nana	Dwarf burford holly		36" MIN.		CONT.	AS SHOWN	18" MIN. @ PLANTING
	IC	56	Ilex crenata 'Convexa'	Convex-leaved Japanese Holly		24" MIN.		CONT.	AS SHOWN	
SOD		TBD SF		TBD						

Soil Specifications:

Amended Soil (AS):
The AS requirement may be met in one of the following ways:

1. Preparing the existing soil for planting by tilling to a depth of 18", and adding some new planting mix and/or organic matter. This option may also require the removal of some existing soil along with other mitigation work and soil amendments to improve soil structure.
2. Removing all existing soil from a required planting area and replacing it with new planting mix and other soil amendments.
3. AS requirements may be waived by Owner / Developer and/or Project Landscape Architect if applicable.

Planting mix used to meet AS requirements shall have uniform composition throughout, with a mixture of subsoil. It shall be free of stones, lumps, live plants and their roots, sticks, and other extraneous matter. It shall contain no man-made materials unless otherwise specified. Planting mix shall not be used while in a frozen or muddy condition.
Unless otherwise specified in the contract documents, new/added planting mix shall contain the following specified percentages of constituents:

CLAY	Minimum 10%/ Maximum 40%
SAND	Minimum 20%/ Maximum 50%
SILT	Minimum 20%/ Maximum 50%
ORGANIC MATTER	Minimum 5%/ Maximum 10%

Organic Matter is defined as compost/humus such as sawdust or leaf mold that has completed the decomposition process. Percentage of organic matter shall be determined by loss on ignition of moisture free samples dried at 65 degrees.

AS shall have a have an acidity range of pH 5.5 to 7.0.

AS shall have a Cation Exchange Capacity (CEC) from 5 to 25 cmol+/kg(meq/100g)

AS shall have normal contents of nitrogen, phosphorus, potassium, calcium, magnesium, sulfur and proper micronutrient levels. Nutrient levels must satisfy growing needs (as recommended by lab report) of the existing or planned plant material.

Lab testing may be required to verify the quality of existing soil, AS and other soil amendments.

ADDITIONAL NOTES

ALL DISTURBED AREAS TO BE SEEDED AS NEEDED FOR STABILIZATION FOLLOWED BY SOD (PER OWNER DIRECTION) FOR FINAL COMPLETION.

RE-SEEDING

INSPECT PERMANENTLY SEEDED AREAS FOR FAILURE. MAKE NECESSARY REPAIRS AND RE-SEED OR OVERSEED WITHIN THE SAME GROWING SEASON IF POSSIBLE.
IF THE GRASS COVER IS SPARSE OR PATCHY, REEVALUATE THE CHOICE OF GRASS AND QUANTITIES OF LIME AND FERTILIZER APPLIED. IF THE PERMANENT SEEDING HAS LESS THAN 40% COVER, HAVE THE SOIL TESTED TO DETERMINE ANY ACIDITY OR NUTRIENT DEFICIENCY PROBLEMS.
FINAL STABILIZATION BY PERMANENT SEEDING OF THE SITE REQUIRES THAT IT BE COVERED BY A 70% COVERAGE RATE.

SEEDING SCHEDULE

Description of Area from Planting Plan Legend	Pennington Seed Specification
Temporary Stabilization	Browntop Millet
	Rye Grain
Permanent Lawn	Greystone Turf Type Tall Fescue Blend

SODDING

PROVIDE SOD SPECIES SUITABLE AS LAWN TURF FOR THE REGION. SOD SHALL BE STRONGLY ROOTED, WEED, DISEASE, PEST FREE AND UNIFORM IN THICKNESS.
CUT AND LAY SOD ON SAME DAY. ONLY HEALTHY VIGOROUS GROWING SOD SHALL BE LAID.
LAY SOD ACROSS SLOPE AND TIGHTLY TOGETHER TO RESULT IN SOLID COVERAGE FREE OF GAPS.
ROLL OR FIRMLY BUT LIGHTLY TAMP NEW SOD WITH SUITABLE WOODEN OR METAL TAMPER SUFFICIENTLY TO SET OR PRESS SOD INTO UNDERLYING SOIL.
ALL FINISHED SODDING SHALL BE SMOOTH AND FREE OF LUMPS AND DEPRESSIONS.
AFTER SODDING HAS BEEN COMPLETED, CLEAN UP AND THOROUGHLY WATER NEWLY-SODDED AREAS.

MULCHING

ALL PERMANENT SEEDED AREAS SHOULD BE COVERED WITH MULCH IMMEDIATELY UPON COMPLETION OF THE SEEDING APPLICATION TO RETAIN SOIL MOISTURE AND REDUCE EROSION DURING ESTABLISHMENT OF VEGETATION.

THE MULCH SHOULD BE APPLIED EVENLY IN SUCH A MANNER THAT IT PROVIDES A MINIMUM OF 75% COVERAGE. TYPICAL MULCH APPLICATIONS INCLUDE STRAW, WOOD CHIPS, BARK, WOOD FIBER, AND HYDROMULCHES.

ALL TREES WITHIN SODDED AREAS TO HAVE 4' DIAMETER MULCH RINGS.

THE MOST COMMONLY ACCEPTED MULCH USED IN CONJUNCTION WITH PERMANENT SEEDING IS SMALL GRAIN STRAW. THIS STRAW SHOULD BE DRY AND FREE FROM MOLD DAMAGE AND NOXIOUS WEEDS. THE STRAW MAY NEED TO BE ANCHORED WITH NETTING OR ASPHALT EMULSIONS TO PREVENT IT FROM BEING BLOWN OR WASHED AWAY. THE STRAW MULCH MAY BE APPLIED BY HAND OR MACHINE AT THE RATE 2 TONS PER ACRE (90 POUNDS PER 1000 SQUARE FEET). FREQUENT INSPECTIONS ARE NECESSARY TO CHECK THAT CONDITIONS FOR GROWTH ARE GOOD.

NOTE: ADDING 10 PARKING SPACES OR MORE REQUIRES THAT THE ENTIRE SITE MUST BE BROUGHT INTO COMPLIANCE WITH THE TREE ORDINANCE

IRRIGATION NOTES

1. IRRIGATION SYSTEM SHALL BE DESIGN-BUILD BY CONTRACTOR ENGAGED SUB-CONTRACTOR. ALL COSTS FOR IRRIGATION SYSTEM DESIGN, MATERIALS, AND INSTALLATION SHALL BE INCLUDED IN BASE BID OR NEGOTIATED WITH THE OWNER / ARCHITECT. CONTRACTOR SHALL COORDINATE WITH OWNER FOR LOCATION OF THE PROPOSED IRRIGATION CONTROLLER.
2. UNLESS NOTED OTHERWISE, ALL PROPOSED TURF & PLANTING AREAS TO BE IRRIGATED. NATURAL OR UNDISTURBED AREAS MAY BE EXCLUDED.
3. THE IRRIGATION SYSTEM SHALL BE DESIGNED SUCH THAT LAWN AREAS, SHRUB AREAS, ANNUAL/PERENNIAL BEDS, AND PARKING AREA TREES ARE IRRIGATED BY SEPARATE ZONES. ALL IRRIGATION COMPONENTS TO BE COMMERCIAL GRADE.
4. CONTRACTOR SHALL SUBMIT DESIGN-BUILD CONSTRUCTION DOCUMENTS TO OWNER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION AS WELL AS ALL OWNERS MANUALS FOR SYSTEM OPERATION.
5. THE CONTRACTOR IS ADVISED OF THE PRESENCE OF UNDERGROUND UTILITIES AND SHALL VERIFY THEIR EXISTENCE AND LOCATION PRIOR TO COMMENCEMENT OF ANY DIGGING. SEE CONSTRUCTION DOCUMENTS FOR LIMITS OF IRRIGATION. CONTRACTOR SHALL DESIGN
6. ALL PROPOSED IRRIGATION SLEEVING SHALL BE TWO LINES OF 2" SCHEDULE 40 PVC.
7. CONTRACTOR SHALL RESOD LAWN AREAS DAMAGED DUE TO INSTALLATION.

NOTICE TO CONTRACTOR

1. CONTRACTOR IS FULLY RESPONSIBLE FOR CONTACTING APPROPRIATE PARTIES AND ASSURING THAT EXISTING UTILITIES ARE LOCATED PRIOR TO CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR PLACING BARRICADES USING FLAG MEN, ETC. AS NECESSARY TO ENSURE SAFETY TO THE PUBLIC PER MUTCD.
3. ALL PAVEMENT CUTS, CONCRETE OR ASPHALT, ARE TO BE REPLACED ACCORDING TO THE STANDARDS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION AND CHARLOTTE-MECKLENBURG UTILITIES SPECIFICATIONS.
4. SHORING WILL BE ACCORDING TO OSHA TRENCHING STANDARDS PART 1926 SUBPART P, OR AS AMENDED.

Know what's below. Call before you dig.

SCALE: 1"= 30'
0 15 30 60

BANKS ENGINEERING
1927 SOUTH TRYON ST.
SUITE 106
CHARLOTTE, NC 28203
T: 704.780.4972
NC License #P-1370

CLIENT: THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

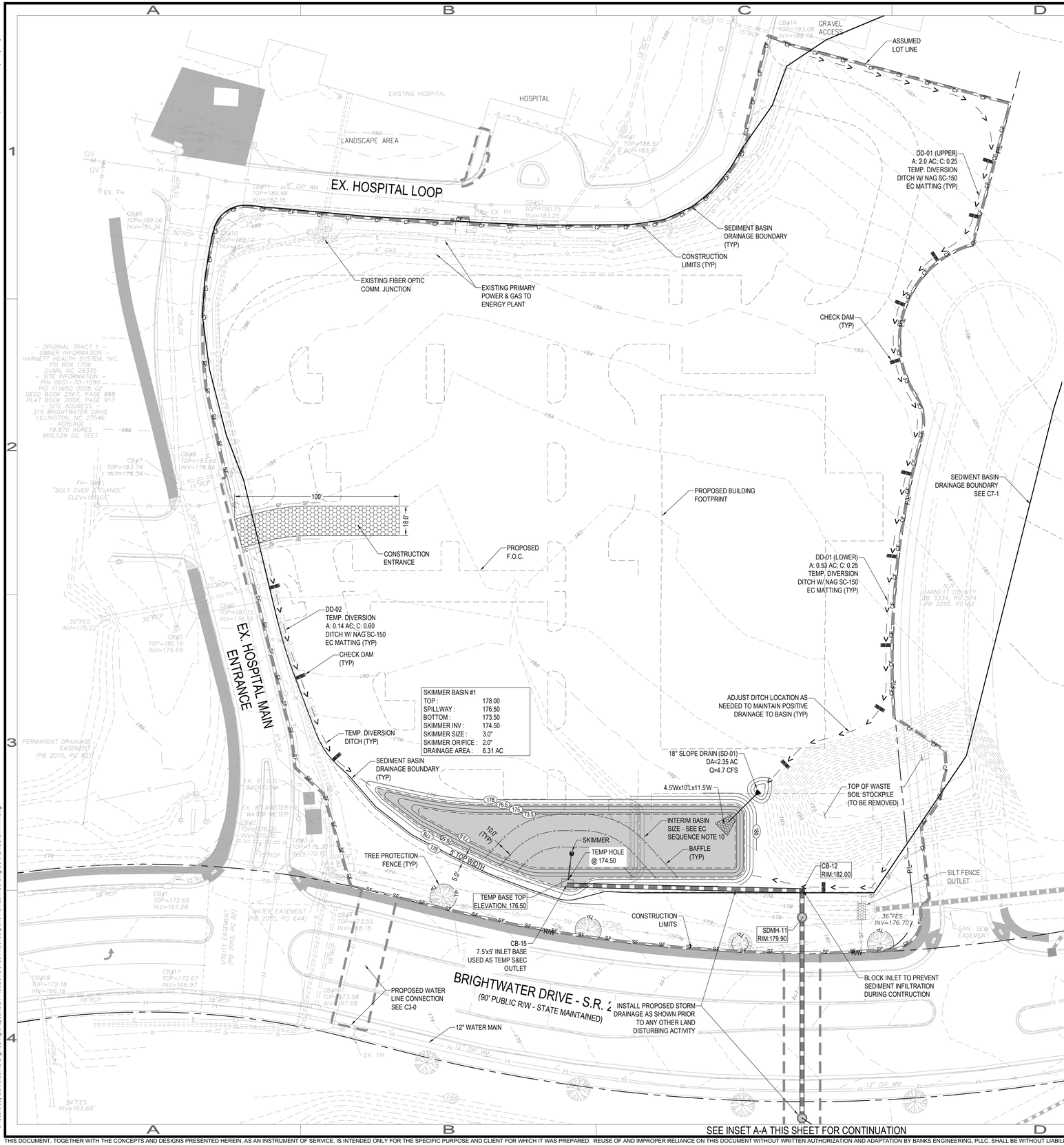
SHEET: LANDSCAPE

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C4-0

April 25, 2023 - 5:37pm By: Jay Banks
C:\Users\Jay Banks\Banks Engineering Dropbox\BE PROJECTS\01054 KeithCorp\013 Harnett MOB\Dwg\C4-0 LANDSCAPE.dwg



GENERAL EROSION CONTROL CONSTRUCTION SEQUENCE

PHASE 1

1. THE FOLLOWING "CONSTRUCTION SEQUENCE" IS FURNISHED AS A GENERAL GUIDE FOR PREPARATION OF A SEQUENCE OF CONSTRUCTION EVENTS. ADDITIONS, DELETIONS AND MODIFICATIONS SHOULD BE MADE AS APPROPRIATE.
2. OBTAIN GRADING/EROSION CONTROL PLAN APPROVAL FROM NCDENR & ENCROACHMENT AUTHORIZATION FROM NCDOT
3. SET UP A ON-SITE PRE-CONSTRUCTION CONFERENCE WITH NCDENR EROSION CONTROL INSPECTOR TO DISCUSS EROSION CONTROL MEASURES. FAILURE TO SCHEDULE SUCH CONFERENCE 48 HOURS PRIOR TO ANY LAND DISTURBING ACTIVITY IS A VIOLATION.
4. INSTALL TREE PROTECTION & STORM SYSTEM FROM FES-09 AT EXISTING DETENTION FACILITY TO CB-15 CLEARING ONLY AS NECESSARY TO INSTALL THIS SYSTEM. NOTE: CB-15 CALLS FOR A LARGER INLET BASE THAN NORMAL SO IT MAY BE USED AS AN INTERIM OUTLET STRUCTURE. IN ADDITION, THE BASE RISER WILL NEED TO BE FABRICATED TO YIELD A TEMPORARY TOP ELEVATION AS SHOWN. ONCE SITE IS STABILIZED & BASIN REMOVED IN LATER PROJECT PHASE, SECOND RISER SECTION TO BE ADDED TO ACHIEVE FINAL RIM ELEVATION.
5. UPON COMPLETION OF STORM EXTENSION, CONTINUE EROSION CONTROL MEASURE INSTALLATION: SILT FENCE, DIVERSION DITCHES, CHECK DAMS, SKIMMER BASIN, AND OTHER MEASURES AS SHOWN ON PLANS, CLEARING ONLY AS NEEDED TO INSTALL THESE DEVICES.
6. CALL FOR ON-SITE INSPECTION BY NCDENR INSPECTOR. WHEN APPROVED, INSPECTOR ISSUES THE GRADING PERMIT AND OVERALL CLEARING AND GRUBBING MAY BEGIN.
7. THE CONTRACTOR SHALL DILIGENTLY AND CONTINUOUSLY MAINTAIN ALL EROSION CONTROL DEVICES AND STRUCTURES.
8. FOR PHASED EROSION CONTROL PLANS, CONTRACTOR SHALL MEET WITH EROSION CONTROL INSPECTOR PRIOR TO COMMENCING WITH EACH PHASE OF EROSION CONTROL MEASURES.

PHASE 2

9. BEGIN EARTHWORK/GRADING ACTIVITIES. BEGIN GRADING OF FILL SLOPES. MAINTAIN AND VERTICALLY ADJUST ALL TEMPORARY DIVERSION DITCHES, ROCK CHECK DAMS, SLOPE DRAINS, AND SILT FENCE THROUGHOUT GRADING ACTIVITIES TO MAINTAIN DRAINAGE PATTERNS TO TEMPORARY SEDIMENT BASIN.
10. PRIOR TO STARTING WORK ON BUILDING PAD BUT AFTER WASTE SOIL PILE HAS BEEN REMOVED, INSTALL STORM PIPE AND STRUCTURES FROM STMH-01 TO DI-08 AND GRADE SUMPS AS SHOWN ON GRADE PLAN. INSTALL HARDWARE CLOTH INLET PROTECTION AT EACH LOCATION. THIS APPROACH WILL PREVENT OFF-SITE RUNOFF FROM ENCROACHING ON THE PAD AREA. ONCE COMPLETE, SEDIMENT BASIN SIZE MAY BE REDUCED TO "INTERIM" CONTOURS SHOWN. ADJUST SLOPE DRAIN, DITCHES & BAFFLE LOCATIONS ACCORDINGLY.
11. DUE TO PROPOSED FILL, SPECIAL ATTENTION NEEDS TO BE GIVEN ADJUSTING DIVERSION DITCHES AS FILL IS PLACED TO RE-DIRECT SEDIMENT LADEN RUNOFF TO SEDIMENT BASIN AND REDUCING SILT FENCE LOADING AT TOE OF SLOPE.
12. AS SITE IS BROUGHT TO GRADE, CONTRACTOR TO DREDGE SEDIMENT BASINS AND TRAPS TO MAINTAIN CAPACITY. DREDGE MATERIAL MUST BE REMOVED FROM SITE.
13. DILIGENTLY AND CONTINUOUSLY MAINTAIN ALL EROSION CONTROL DEVICES AND STRUCTURES TO MINIMIZE EROSION. THE CONTRACTOR SHALL MAINTAIN CLOSE CONTACT WITH THE INSPECTOR SO THAT PERIODIC INSPECTIONS CAN BE PERFORMED AT APPROPRIATE STAGES OF CONSTRUCTION.
14. ONCE THE CONTRIBUTING DRAINAGE AREA(S) HAVE BEEN STABILIZED (STONE BASE INSTALLED IN PARKING / DRIVE AISLES AND BUILDING PAD) SKIMMER BASIN MAY BE REDUCED IN SIZE ACCORDINGLY.
15. ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
16. AS CONSTRUCTION PROGRESSES, INSTALL PERMANENT EROSION CONTROL FABRIC / MATTING / SEEDING AS SOON AS POSSIBLE.
17. STABILIZE SITE AS AREAS ARE BROUGHT TO FINISHED GRADE.
18. COORDINATE WITH EROSION CONTROL INSPECTOR PRIOR TO REMOVAL OF EROSION CONTROL MEASURES.
19. PRIOR TO DEMOBILIZATION, SDMH-10 WILL BE TEMPORARILY PLUGGED AND ENTIRE UPSTREAM STORM SYSTEM CLEANED TO REMOVE ACCUMULATED SEDIMENT & DEBRIS. A VAC-TRUCK SHALL BE IN-PLACE DURING CLEANING OPERATION AND USED TO COMPLETELY REMOVE CLEANING WATER FROM SYSTEM PRIOR TO TEMPORARY PLUG REMOVAL.
20. PERIMETER SILT FENCE SHALL BE REMOVED IN ITS ENTIRETY PRIOR TO DEMOBILIZATION.
21. ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE N.C. EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

EROSION CONTROL LEGEND

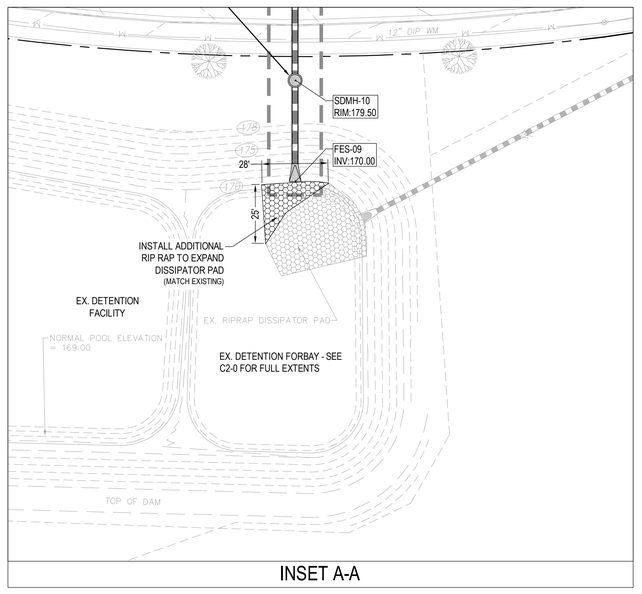
SF SF SF	SILT FENCE
CF CF CF	CONSTRUCTION FENCE
TP TP TP	TREE PROTECTION FENCE
	CONSTRUCTION LIMITS
	CONSTRUCTION ENTRANCE
	HARDWARE CLOTH INLET SED.TRAP
	FILTER BAG INLET PROTECTION
	SILT FENCE OUTLET
	ROCK CHECK DAM
100	SEDIMENT BASIN
x x x x x	BAFFLES
	SKIMMER
	RIP RAP APRON
	EROSION DRAINAGE AREA
> > >	TEMPORARY DIVERSION DITCH

ACREAGE SUMMARY
PROJECT CONSTRUCTION LIMITS = ± 4.50 ACRES

NOTE TO REVIEWER / CONTRACTOR:
SEE GENERAL NOTES SHEET C0-2 FOR ADDITIONAL EROSION CONTROL NOTES.

NOTE TO REVIEWER / CONTRACTOR:

PROPOSED SEDIMENT BASIN HAS BEEN POSITIONED TO TAKE ADVANTAGE OF PROPOSED STORM INFRASTRUCTURE. THIS LOCATION SHOULD ALLOW BASIN TO REMAIN IN SERVICE THROUGHOUT THE PROJECT WITHOUT RELOCATION AND REDUCED INCREMENTALLY AS UPSTREAM AREAS ARE STABILIZED AND OFF-SITE RUNOFF IS INTERCEPTED BY SDMH-01 TO DI-08 STORM SYSTEM.



INSET A-A

Know what's below. Call before you dig.

SCALE: 1"= 30'
0 15 30 60

NORTH

BANKS ENGINEERING
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CLIENT: THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
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Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

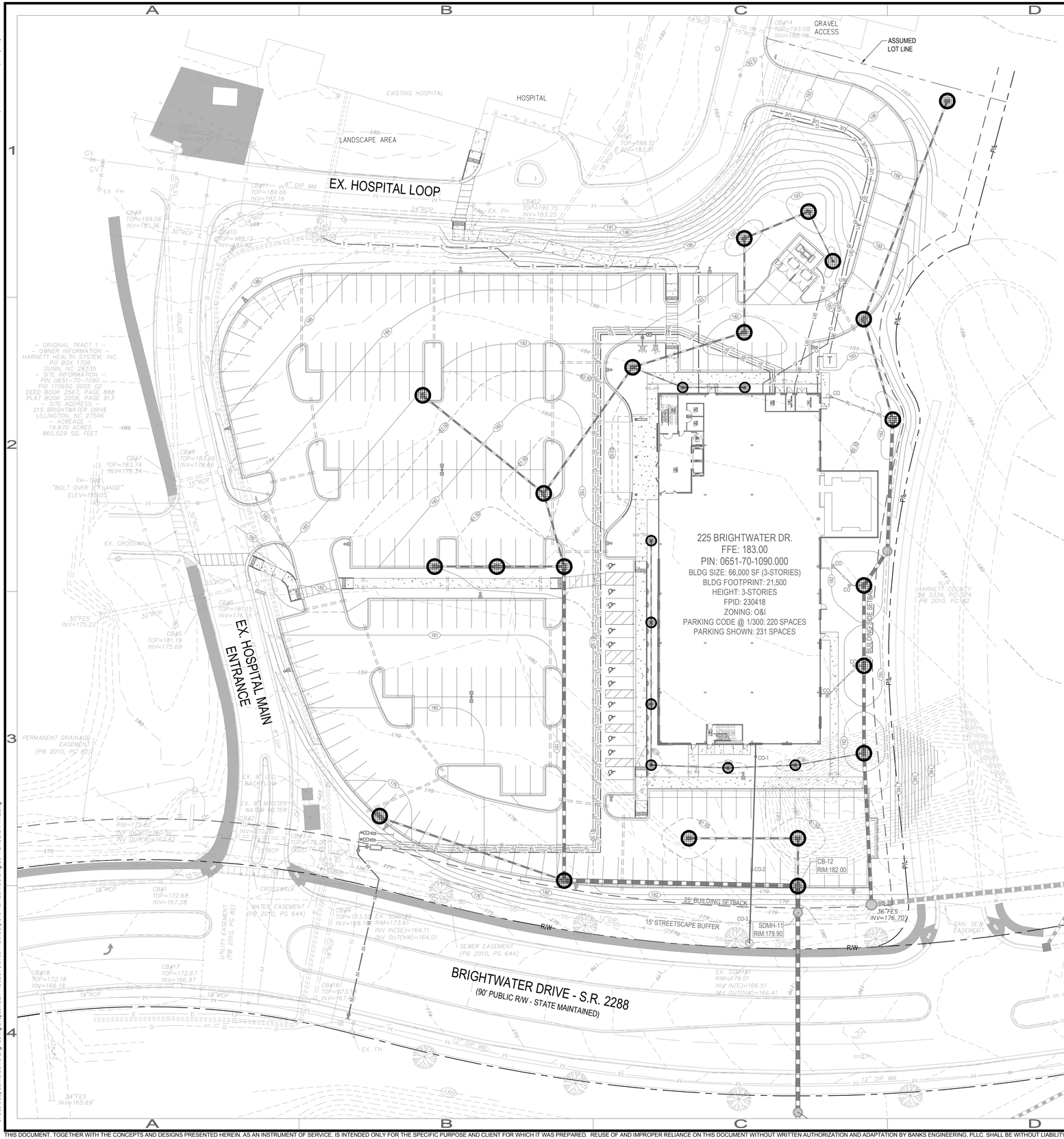
SHEET: EROSION - PH1

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C5-0

April 25, 2023 - 5:37pm By: Jay Banks
C:\Users\Jay Banks\Banks Engineering Dropbox\BE PROJECTS\01054 KeithCorp\013 Harnett MOB\Dwg\C5-0 EROSION PH1.dwg



EROSION CONTROL LEGEND

SF SF SF	SILT FENCE
CF CF CF	CONSTRUCTION FENCE
TP TP TP	TREE PROTECTION FENCE
	CONSTRUCTION LIMITS
	CONSTRUCTION ENTRANCE
	HARDWARE CLOTH INLET SED.TRAP
	FILTER BAG INLET PROTECTION
	SILT FENCE OUTLET
	ROCK CHECK DAM
100	SEDIMENT BASIN
x x x x x	BAFFLES
	SKIMMER
	RIP RAP APRON
	EROSION DRAINAGE AREA
> > >	TEMPORARY DIVERSION DITCH

ACREAGE SUMMARY
PROJECT CONSTRUCTION LIMITS = ± 4.50 ACRES

NOTE TO REVIEWER / CONTRACTOR:
SEE GENERAL NOTES SHEET C0-2 FOR ADDITIONAL EROSION CONTROL NOTES.

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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: EROSION - PH2

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C5-1

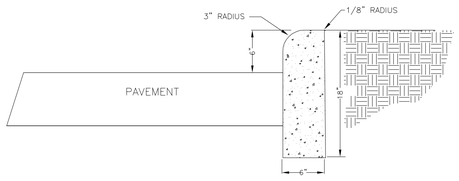
811 Know what's below. Call before you dig.

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

April 25, 2023 - 5:38pm By: Jay Banks
C:\Users\Jay Banks\Banks Engineering Dropbox\BE PROJECTS\01054 Keith\Corp\013 Harnett MOB\Dwg\C5-1 EROSION-PH2.dwg

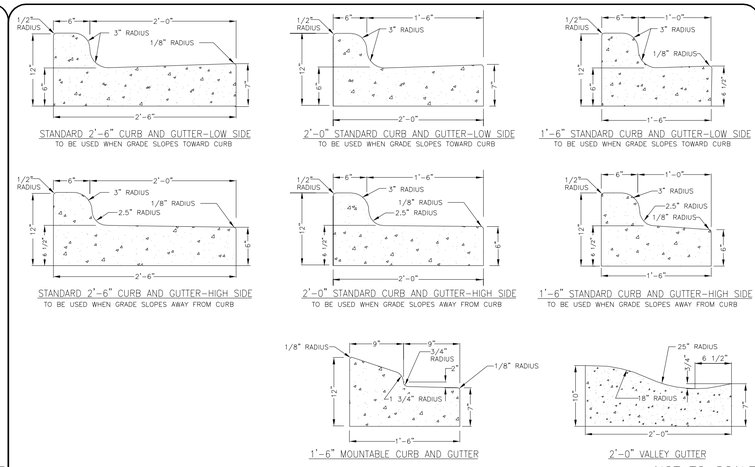
NOTES:

1. CONTRACTION JOINTS SHALL BE SPACED AT 10-FOOT INTERVALS. JOINT SPACING MAY BE ALTERED BY THE ENGINEER TO PREVENT UNCONTROLLED CRACKING.
2. CONTRACTION JOINTS MAY BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1 1/2" SHALL BE OBTAINED.
3. ALL EXPANSION JOINTS SHALL BE SPACED AT 90-FOOT INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ABUTTING SIDEWALK.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 P.S.I. IN 28 DAYS.
5. CURB SHALL BE DEPRESSED AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS.
6. TOP 6" OF SUBGRADE BENEATH THE CURB SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
7. DETAIL MAY BE USED FOR PRIVATE DRIVES, PARKING LOTS, AND INTERIOR CIRCULATION DRIVE.



NOT TO SCALE

18" VERTICAL CURB



STANDARD 2'-6" CURB AND GUTTER-LOW SIDE
TO BE USED WHEN GRADE SLOPES TOWARD CURB

2'-0" STANDARD CURB AND GUTTER-LOW SIDE
TO BE USED WHEN GRADE SLOPES TOWARD CURB

1'-6" STANDARD CURB AND GUTTER-LOW SIDE
TO BE USED WHEN GRADE SLOPES TOWARD CURB

STANDARD 2'-6" CURB AND GUTTER-HIGH SIDE
TO BE USED WHEN GRADE SLOPES AWAY FROM CURB

2'-0" STANDARD CURB AND GUTTER-HIGH SIDE
TO BE USED WHEN GRADE SLOPES AWAY FROM CURB

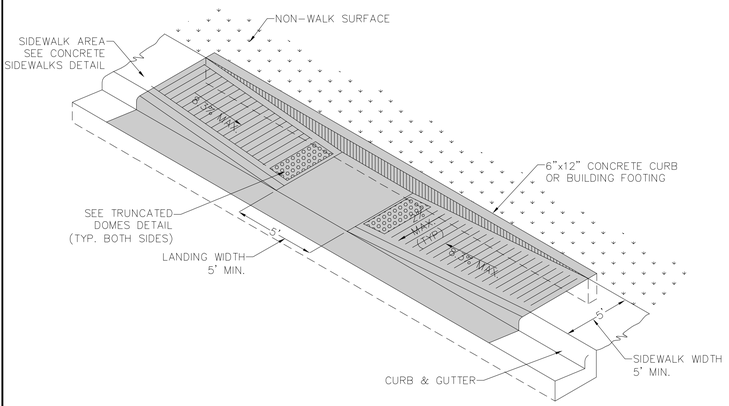
1'-6" STANDARD CURB AND GUTTER-HIGH SIDE
TO BE USED WHEN GRADE SLOPES AWAY FROM CURB

1'-6" MOUNTABLE CURB AND GUTTER

2'-0" VALLEY GUTTER

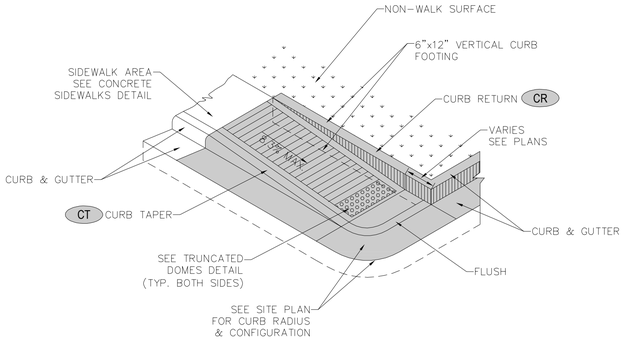
NOT TO SCALE

STANDARD CURB AND GUTTER



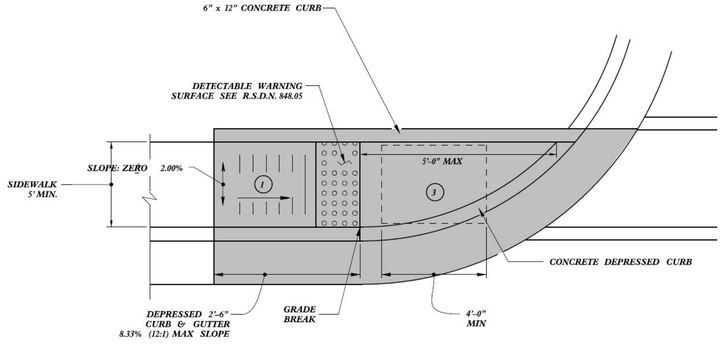
NOT TO SCALE

TYPE 2-ACCESSIBLE RAMP



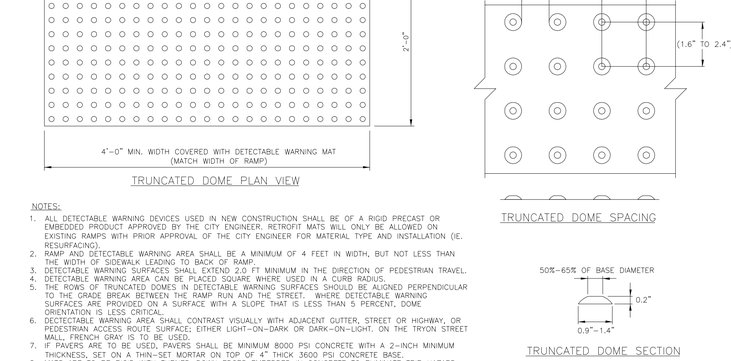
NOT TO SCALE

ADA RAMP ADJACENT TO C&G



TYPE 1

CONTRACT STANDARDS



NOTES:

1. ALL DETECTABLE WARNING DEVICES USED IN NEW CONSTRUCTION SHALL BE OF A RIGID PRECAST OR EMBEDDED PRODUCT APPROVED BY THE CITY ENGINEER. RETROFIT MATS WILL ONLY BE ALLOWED ON EXISTING RAMPS WITH PRIOR APPROVAL OF THE CITY ENGINEER FOR MATERIAL TYPE AND INSTALLATION (IE. RESURFACING).
2. RAMP AND DETECTABLE WARNING AREA SHALL BE A MINIMUM OF 4 FEET IN WIDTH, BUT NOT LESS THAN THE WIDTH OF SIDEWALK LEADING TO BACK OF RAMP.
3. DETECTABLE WARNING SURFACES SHALL EXTEND 2.0 FT MINIMUM IN THE DIRECTION OF PEDESTRIAN TRAVEL.
4. DETECTABLE WARNING AREA CAN BE PLACED SQUARE WHERE USED IN A CURB RADIUS.
5. THE ROWS OF TRUNCATED DOMES IN DETECTABLE WARNING SURFACES SHOULD BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP RUN AND THE STREET. WHERE DETECTABLE WARNING SURFACES ARE PROVIDED ON A SURFACE WITH A SLOPE THAT IS LESS THAN 5 PERCENT, DOME ORIENTATION IS LESS CRITICAL.
6. DECTECTABLE WARNING AREA SHALL CONTRAST VISUALLY WITH ADJACENT GUTTER, STREET OR HIGHWAY, OR PEDESTRIAN ACCESS ROUTE SURFACE; EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT, ON THE TRYON STREET MALL, FRENCH GRAY IS TO BE USED.
7. IF PAVERS ARE TO BE USED, PAVERS SHALL BE MINIMUM 8000 PSI CONCRETE WITH A 2-INCH MINIMUM THICKNESS, SET ON A THIN-SET MORTAR ON TOP OF 4" THICK 3600 PSI CONCRETE BASE.
8. MATS ARE TO BE RIGID WITH TURNED-DOWN EDGES EMBEDDED IN CONCRETE TO ELIMINATE TRIP HAZARD.
9. DIMENSIONS PER NCDOT 848.06

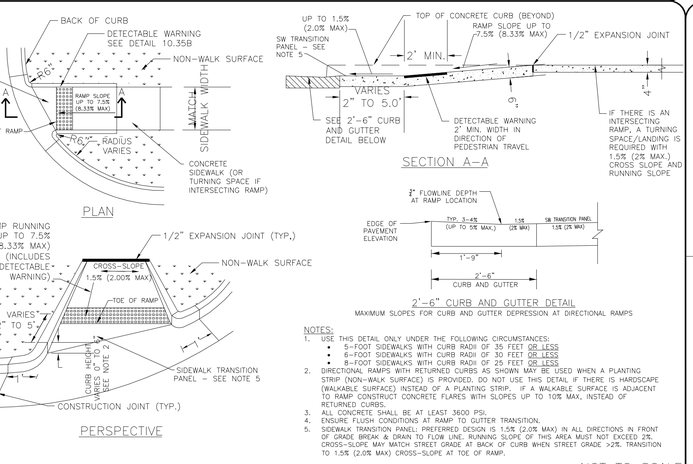
TRUNCATED DOME PLAN VIEW

TRUNCATED DOME SPACING

TRUNCATED DOME SECTION

NOT TO SCALE

TRUNCATED DOMES
PLAN AND CROSS-SECTION



NOTES:

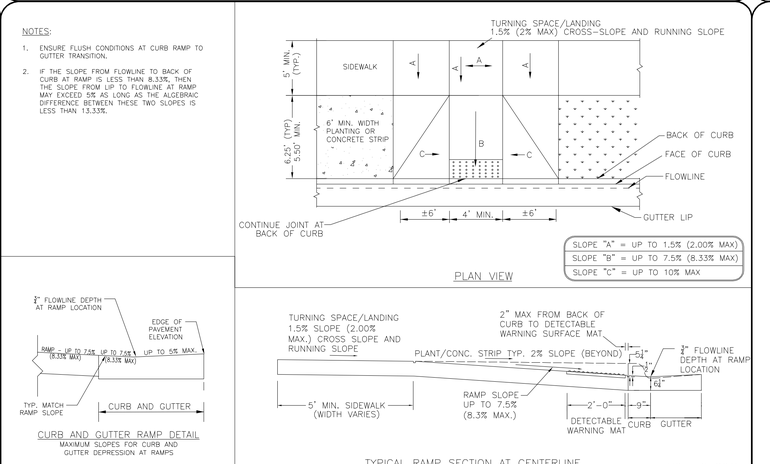
1. USE THIS DETAIL ONLY UNDER THE FOLLOWING CIRCUMSTANCES:
   - 5-FOOT SIDEWALKS WITH CURB RADII OF 35 FEET OR LESS
   - 6-FOOT SIDEWALKS WITH CURB RADII OF 30 FEET OR LESS
   - 8-FOOT SIDEWALKS WITH CURB RADII OF 25 FEET OR LESS
2. DIRECTIONAL RAMPS WITH RETURNED CURBS AS SHOWN MAY BE USED WHEN A PLANTING STRIP (NON-WALK SURFACE) IS PROVIDED. DO NOT USE THIS DETAIL IF THERE IS HARDSCAPE (WALKABLE SURFACE) INSTEAD OF A PLANTING STRIP. IF A WALKABLE SURFACE IS ADJACENT TO RAMP CONSTRUCT CONCRETE FLARES WITH SLOPES UP TO 10% MAX, INSTEAD OF RETURNED CURBS.
3. ALL CONCRETE SHALL BE AT LEAST 3600 PSI.
4. ENSURE FLUSH CONDITIONS AT RAMP TO GUTTER TRANSITION.
5. SIDEWALK TRANSITION PANEL: PREFERRED DESIGN IS 1.5% (2.0% MAX) IN ALL DIRECTIONS IN FRONT OF GRADE BREAK & DRAIN TO FLOW LINE. RUNNING SLOPE OF THIS AREA MUST NOT EXCEED 2% CROSS-SLOPE MAY MATCH STREET GRADE AT BACK OF CURB WHEN STREET GRADE >2%. TRANSITION TO 1.5% (2.0% MAX) CROSS-SLOPE AT TOE OF RAMP.

NOT TO SCALE

DIRECTIONAL CURB RAMP
WITH SMALL/MEDIUM CURB RADII

NOTES:

1. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.
2. IF THE SLOPE FROM FLOWLINE TO BACK OF CURB AT RAMP IS LESS THAN 8.33%, THEN THE SLOPE FROM UP TO FLOWLINE AT RAMP MAY EXCEED 5% AS LONG AS THE ALGEBRAIC DIFFERENCE BETWEEN THESE TWO SLOPES IS LESS THAN 13.33%.

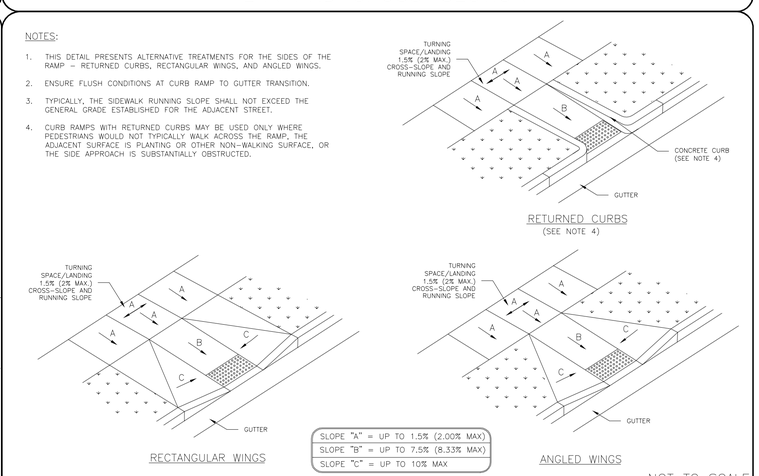


NOT TO SCALE

STANDARD ADA RAMP - TYPE A

NOTES:

1. THIS DETAIL PRESENTS ALTERNATIVE TREATMENTS FOR THE SIDES OF THE RAMP - RETURNED CURBS, RECTANGULAR WINGS, AND ANGLED WINGS.
2. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.
3. TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.
4. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT TYPICALLY WALK ACROSS THE RAMP, THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE, OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.



NOT TO SCALE

PERPENDICULAR CURB RAMP WITH
2'-6" CURB AND GUTTER

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Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

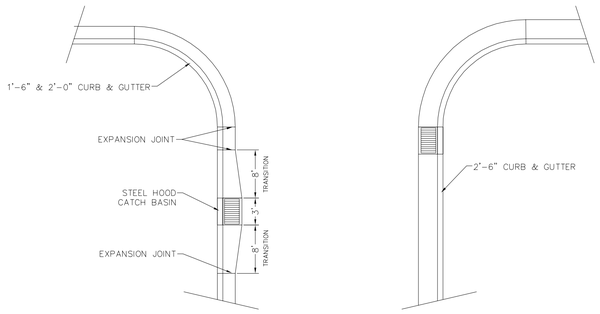
PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: SITE DETAILS - 1

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

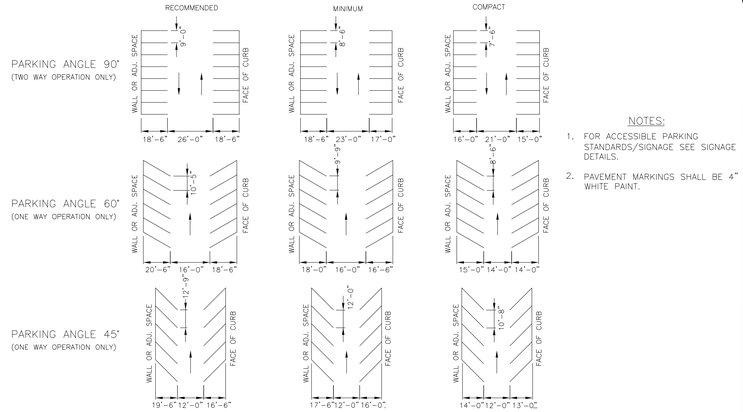
C6-0



NOTE:
WHERE 2'-6 CURB & GUTTER IS USED, GUTTER TRANSITION IS NOT NECESSARY

NOT TO SCALE

GUTTER TRANSITION AT CATCH BASINS



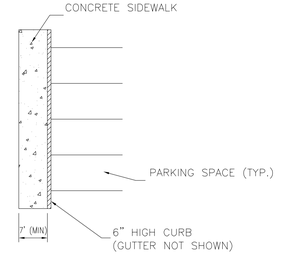
NOTES:
1. FOR ACCESSIBLE PARKING STANDARDS/SIGNAGE SEE SIGNAGE DETAILS.
2. PAVEMENT MARKINGS SHALL BE 4" WHITE PAINT.

NOT TO SCALE

PARKING STANDARDS

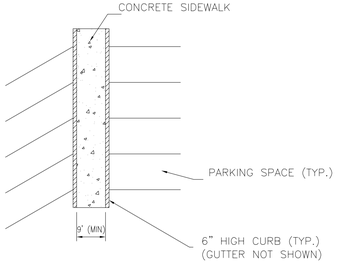
SIDEWALK ADJACENT TO HEAD-IN OR BACK-IN PARKING SHALL BE AT LEAST 7 FEET WIDE.

PARKING ON ONE SIDE OF A SIDEWALK



SIDEWALK BETWEEN TWO ROWS OF HEAD-IN OR BACK-IN PARKING SHALL BE AT LEAST 9 FEET WIDE.

PARKING ON BOTH SIDES OF A SIDEWALK



NOTES:
1. A 2-FOOT-WIDE PLANTING STRIP LOCATED AT THE BACK OF CURB CAN BE USED IN LIEU OF 2 FEET OF SIDEWALK WIDTH.
2. PARKING AT ANY ANGLE OTHER THAN PARALLEL SHALL BE SUBJECT TO THIS STANDARD.
3. IF MONOLITHIC CURB & SIDEWALK IS USED, ADD 6" TO ALL DIMENSIONS (1' IF PARKING ON BOTH SIDES).
4. IF SHOWN ON THE PLANS, WHEELSTOPS SHALL BE PLACED AT 2 FEET FROM THE EDGE OF SIDEWALK OR OBSTRUCTION MEASURED FROM THE VEHICLE SIDE OF THE WHEELSTOP TO SIDEWALK / OBSTRUCTION.

NOT TO SCALE

PARKING STANDARDS (CONTINUED)

BANKS ENGINEERING
1927 SOUTH TRYON ST.
SUITE 106
CHARLOTTE, NC 28203
T: 704.780.4972
NC License #P-1370

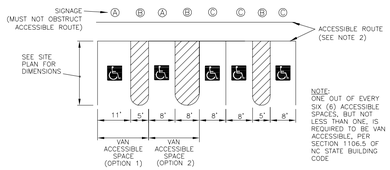
CLIENT: THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

ACCESSIBLE PARKING REQUIREMENTS

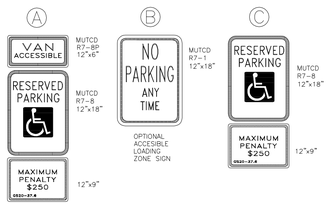
TOTAL PARKING SPACES PROVIDED	MINIMUM NUMBER OF ACCESSIBLE SPACES SPACES REQUIRED	MINIMUM NUMBER OF ACCESSIBLE SPACES REQUIRED TO BE VAN ACCESSIBLE
1 TO 25	1	1
26 TO 50	2	1
51 TO 75	3	1
76 TO 100	4	1
101 TO 150	5	1
151 TO 200	6	1
201 TO 300	7	2
301 TO 400	8	2
401 TO 500	9	2
501 TO 1000	2% OF TOTAL	1 IN EVERY 6 ACCESSIBLE SPACES
1001 AND OVER	20 PLUS 1 FOR EACH 100 OVER 1000	1 IN EVERY 6 ACCESSIBLE SPACES
REFERENCE: SECTION 1106 OF NC BUILDING CODE		

NOTES:
1. ALL ACCESSIBLE SIGNS (R7-8P, R7-8, R7-1) SHALL BE MOUNTED AT 7 FEET FROM GRADE TO BOTTOM EDGE OF SIGN FACE (PER MUTCD). MOUNTING HEIGHT CAN BE REDUCED TO 5 FEET IF PLACED IN AN AREA BETWEEN SIDEWALK AND BUILDING FACE IN WHICH PEDESTRIANS ARE NOT EXPECTED TO USE.
2. IF ACCESSIBLE ROUTE IS A RAISED SIDEWALK AREA, THEN RAMPS ARE REQUIRED AT LOADING ZONE AREA, MAINTAIN MIN. 4' WIDE CONTINUOUS PASSAGE.
3. VERTICAL CLEARANCE FOR VANS MUST BE GREATER THAN 98-INCHES.
4. THIS DETAIL IS TO PROVIDE GENERAL GUIDANCE FOR PARKING LAYOUT AND DESIGN; REFER TO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) U.S. DEPARTMENT OF TRANSPORTATION AND NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SUPPLEMENT AND NC BUILDING CODE FOR ADDITIONAL INFORMATION.

PARKING SPACE PAVEMENT MARKINGS

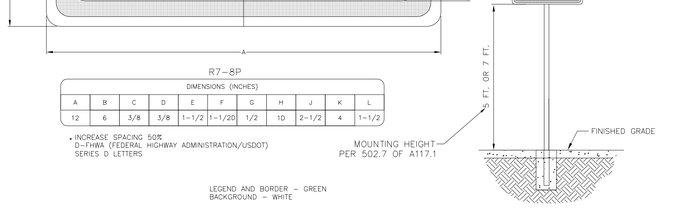


NOTE:
ONE OUT OF EVERY SIX (6) ACCESSIBLE SPACES, BUT NOT LESS THAN ONE, IS REQUIRED TO BE VAN ACCESSIBLE, PER SECTION 1106.5 OF NC STATE BUILDING CODE



NOT TO SCALE

ACCESSIBLE PARKING AND SIGNAGE STANDARDS



R7-8P

DIMENSIONS (INCHES)											
A	B	C	D	E	F	G	H	J	K	L
12	6	3/8	3/8	1-1/2	1-1/20	1/2	1D	2-1/2	4	1-1/2

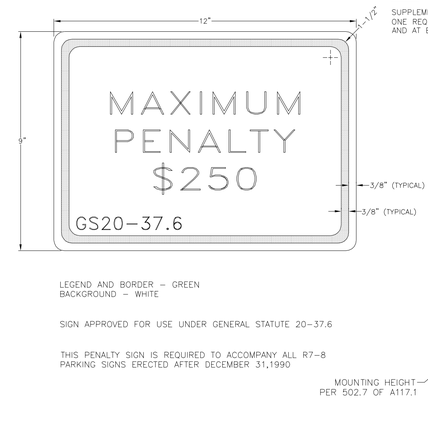
• INCREASE SPACING 50% D-FHWA (FEDERAL HIGHWAY ADMINISTRATION/USDOT) SERIES D LETTERS

LEGEND AND BORDER – GREEN
BACKGROUND – WHITE

NOT TO SCALE

SUPPLEMENTAL VAN ACCESSIBLE SIGN (R7-8P)

NOTE;
SUPPLEMENTAL VAN ACCESSIBLE SIGN (R7-8P) USED IF THERE IS ONLY ONE REQUIRED ACCESSIBLE PARKING SPACE (MUST BE VAN ACCESSIBLE) AND AT EACH ADDITIONAL REQUIRED VAN ACCESSIBLE SPACE.



LEGEND AND BORDER – GREEN
BACKGROUND – WHITE

SIGN APPROVED FOR USE UNDER GENERAL STATUTE 20-37.6

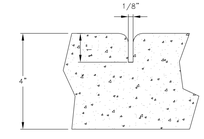
THIS PENALTY SIGN IS REQUIRED TO ACCOMPANY ALL R7-8 PARKING SIGNS ERECTED AFTER DECEMBER 31,1990

NOT TO SCALE

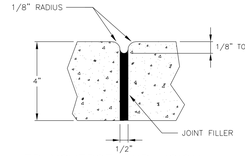
SUPPLEMENTAL ACCESSIBLE SIGN

GENERAL NOTES:

1. A GROOVE JOINT 1" DEEP WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT INTERVALS OF NOT MORE THAN 45' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
2. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6" THICK.
3. WIDTH OF SIDEWALK ON THOROUGHFARE STREETS SHALL BE A MINIMUM OF 6'. WIDTH OF SIDEWALKS IN THE CENTRAL BUSINESS DISTRICT WILL BE DETERMINED BY THE CITY OF GASTONIA
4. WIDTH OF SIDEWALKS ON NON-THOROUGHFARE STREETS SHALL BE BASED ON TYPICAL STREET SECTION, A MINIMUM OF 5'. SIDEWALK TO BE POURED TO END OF RADIUS AT INTERSECTING STREETS.
5. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI. IN 28 DAYS.
6. ZONING CONDITIONS MAY REQUIRE ADDITIONAL WIDTH SIDEWALKS WHICH SHALL SUPERSEDE THESE STANDARD DIMENSIONS SHOWN.
7. LIDS FOR JUNCTION BOXES AND UTILITY VAULTS SHALL BE NON-SKID AS SPECIFIED BY ENGINEER.
8. JOINT MATERIALS SHALL LIMIT SHRINK/SWELL SO POST CONSTRUCTION INSTALLATION RESULTS IN A MAXIMUM OF 1/4" FROM FLUSH.

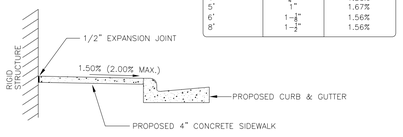


GROOVE JOINT IN SIDEWALK



TRANSVERSE EXPANSION JOINT IN SIDEWALK

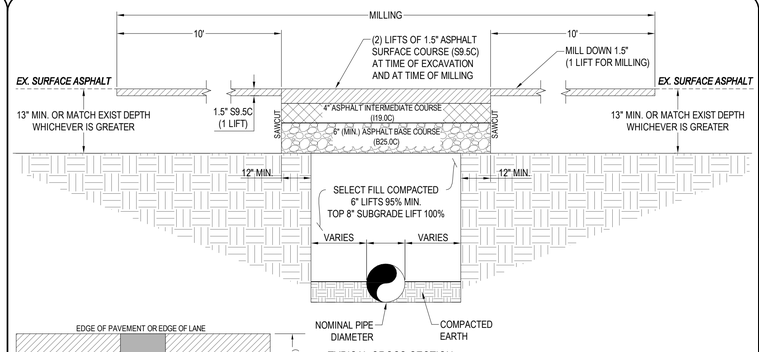
EXAMPLE SIDEWALK CONSTRUCTION DIMENSIONS:		
WIDTH	RISE	CROSS-SLOPE
4'	3/4"	1.56%
5'	1"	1.67%
6'	1-1/8"	1.56%
8'	1-1/2"	1.56%



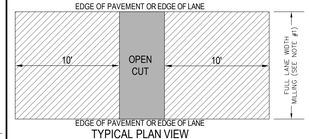
DETAILS SHOWING EXPANSION JOINTS IN CONCRETE SIDEWALK

NOT TO SCALE

CONCRETE SIDEWALKS



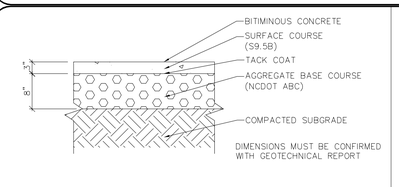
TYPICAL CROSS-SECTION



TYPICAL PLAN VIEW

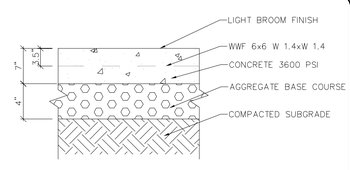
NOT TO SCALE

TRENCH / PAVEMENT REPAIR DETAIL WITHIN PUBLIC ROADWAYS



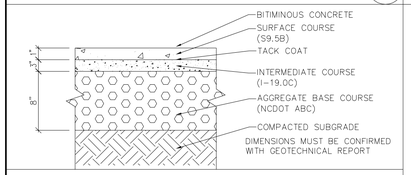
SEE GEOTECHNICAL REPORT FOR DETAILS, OTHERWISE, THE SECTIONS ABOVE ASSUME MINIMUM SUBGRADE BEARING CAPACITY OF 3,000 PSF AND HAS BEEN COMPACTED TO 100% MAXIMUM DENSITY PER STANDARD PROCTOR TEST TO A DEPTH OF 8" AND A DENSITY OF 95% STANDARD PROCTOR FOR DEPTHS GREATER THAN 8". IT IS ALSO ASSUMED THAT THE PAVEMENT AREAS HAVE BEEN PROOF ROLLED AND ANY EXPANSIVE (FAT) CLAY MATERIAL REMOVED. IT IS THE OWNER'S AND/OR THE CONTRACTOR'S RESPONSIBILITY TO ENGAGE GEOTECHNICAL SERVICES FOR PROPER TESTING AND DESIGN. IF AVAILABLE, DESIGNS PROVIDED BY GEOTECHNICAL ENGINEER WILL SUPERCEDE THESE DETAILS. BANKS ENGINEERING MAKES NO WARRANTIES OR GUARANTEES THE SECTIONS SHOWN ABOVE WILL PERFORM SATISFACTORILY IN ALL CONDITIONS.

LIGHT DUTY BITUMINOUS PAVEMENT (1)



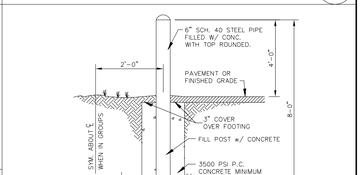
SEE GEOTECHNICAL REPORT FOR DETAILS, OTHERWISE, THE SECTIONS ABOVE ASSUME MINIMUM SUBGRADE BEARING CAPACITY OF 3,000 PSF AND HAS BEEN COMPACTED TO 100% MAXIMUM DENSITY PER STANDARD PROCTOR TEST TO A DEPTH OF 8" AND A DENSITY OF 95% STANDARD PROCTOR FOR DEPTHS GREATER THAN 8". IT IS ALSO ASSUMED THAT THE PAVEMENT AREAS HAVE BEEN PROOF ROLLED AND ANY EXPANSIVE (FAT) CLAY MATERIAL REMOVED. IT IS THE OWNER'S AND/OR THE CONTRACTOR'S RESPONSIBILITY TO ENGAGE GEOTECHNICAL SERVICES FOR PROPER TESTING AND DESIGN. IF AVAILABLE, DESIGNS PROVIDED BY GEOTECHNICAL ENGINEER WILL SUPERCEDE THESE DETAILS. BANKS ENGINEERING MAKES NO WARRANTIES OR GUARANTEES THE SECTIONS SHOWN ABOVE WILL PERFORM SATISFACTORILY IN ALL CONDITIONS.

HEAVY DUTY CONCRETE N.T.S. (2)



SEE GEOTECHNICAL REPORT FOR DETAILS, OTHERWISE, THE SECTIONS ABOVE ASSUME MINIMUM SUBGRADE BEARING CAPACITY OF 3,000 PSF AND HAS BEEN COMPACTED TO 100% MAXIMUM DENSITY PER STANDARD PROCTOR TEST TO A DEPTH OF 8" AND A DENSITY OF 95% STANDARD PROCTOR FOR DEPTHS GREATER THAN 8". IT IS ALSO ASSUMED THAT THE PAVEMENT AREAS HAVE BEEN PROOF ROLLED AND ANY EXPANSIVE (FAT) CLAY MATERIAL REMOVED. IT IS THE OWNER'S AND/OR THE CONTRACTOR'S RESPONSIBILITY TO ENGAGE GEOTECHNICAL SERVICES FOR PROPER TESTING AND DESIGN. IF AVAILABLE, DESIGNS PROVIDED BY GEOTECHNICAL ENGINEER WILL SUPERCEDE THESE DETAILS. BANKS ENGINEERING MAKES NO WARRANTIES OR GUARANTEES THE SECTIONS SHOWN ABOVE WILL PERFORM SATISFACTORILY IN ALL CONDITIONS.

HEAVY DUTY BITUMINOUS PAVEMENT (3)



NOTE:
ALL PIPES SHALL BE PAINTED TRAFFIC YELLOW

PIPE BOLLARD N.T.S. (4)

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS 04.26.23

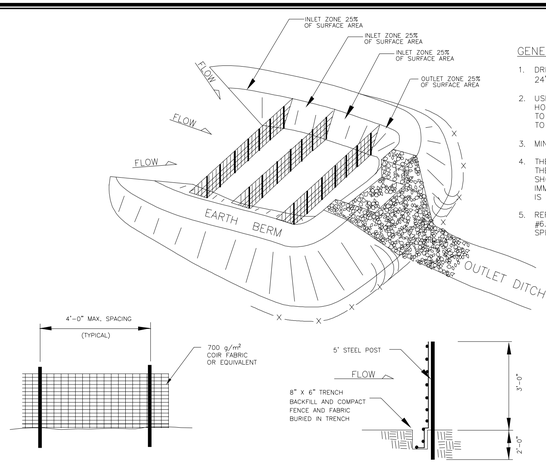
PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: SITE DETAILS - 2

REV	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C6-1

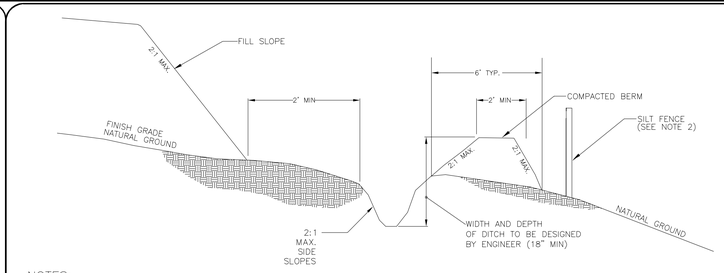


GENERAL NOTES:

1. DRIVE 5' STEEL POST AT LEAST 24" INTO SOLID GROUND.
2. USE STAPLES 1' APART HORIZONTALLY AND VERTICALLY TO ATTACH THE FILTER FABRIC TO THE WIRE FENCE.
3. MINIMUM BAFFLE SPACING IS 10'.
4. THE FLOOR OF THE BASIN IN THE OUTLET ZONE AND BERMS SHOULD BE SEEDED IMMEDIATELY AFTER THE BASIN IS CONSTRUCTED.
5. REFER TO NCESCPDM SECTION #6.65 FOR ADDITIONAL SPECIFIATIONS.

NOT TO SCALE

BAFFLE INSTALLATION



NOTES:

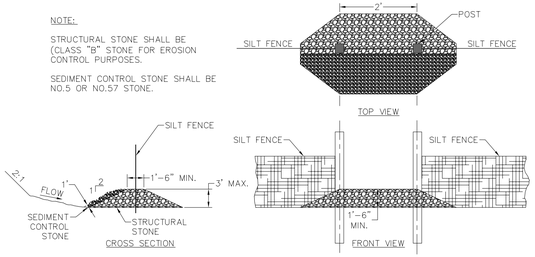
1. DITCH SHOULD HAVE LONGITUDINAL SLOPE OF 1%.
2. SILT FENCE MAY BE REQUIRED BEHIND BERM
3. DITCHES SHOULD BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY STABILIZATION REQUIREMENTS OF THE NCG010000 PERMIT.
4. WHERE DESIGN VELOCITIES EXCEED 2 FT/SEC, A CHANNEL LINER IS NECESSARY TO PREVENT DITCH EROSION.

DITCH NO.	AREA (AC)	DEPTH* (FT)	W(FT)	B(FT)	VELOCITY	ROLLED EROSION CONTROL PRODUCT / LINING TYPE
DD-01	0.58	1.5	7	1	5.00	NAG SC150
DD-02	0.91	1.5	7	1	7.20	NAG SC150
DD-03	1.3	1.5	7	1	7.10	NAG SC150
DD-04	0.61	1.5	7	1	5.20	NAG SC150

* = DEPTH INCLUDES 6" FREEBOARD

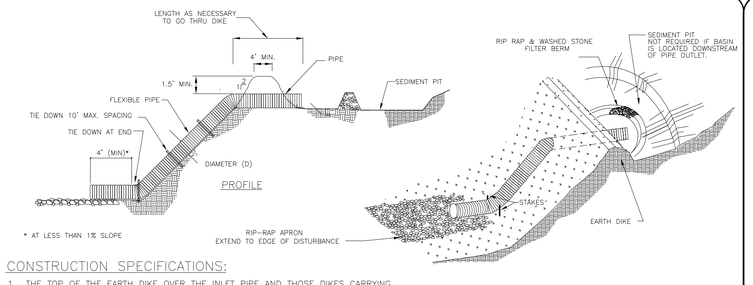
NOT TO SCALE

TEMPORARY SILT DITCH



NOT TO SCALE

NCDEQ STONE OUTLET



CONSTRUCTION SPECIFICATIONS:

1. THE TOP OF THE EARTH DIKE OVER THE INLET PIPE AND THOSE DIKES CARRYING WATER TO THE PIPE SHALL BE AT LEAST 1.5 FEET HIGHER AT ALL POINTS THAN THE TOP OF THE INLET PIPE.
2. THE PIPE SHALL BE FLEXIBLE WITH WATER TIGHT CONNECTING BANDS. FLEXIBLE PIPE SHOULD BE STAKED ON EITHER SIDE.
3. A RIP RAP APRON SHALL BE PROVIDED AT THE OUTLET, IF EMPTYING INTO A DISTURBED AREA.
4. THE SOIL AROUND AND UNDER THE INLET PIPE AND ENTRANCE SECTION SHALL BE HAND TAMPED IN 4" LIFTS TO THE TOP OF THE EARTH DIKE.
5. FOLLOW-UP INSPECTION AND ANY NEEDED MAINTENANCE SHALL BE PERFORMED AFTER EACH STORM BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT.
6. OUTLET PIPE SHOULD BE TAKEN OVER OR THROUGH ANY SILT FENCE, TAKING CARE NOT TO VOID THE EFFECTIVENESS OF THE SILT FENCE.

UNLESS THEY ARE INDIVIDUALLY DESIGNED, SIZE THE DRAINS AS FOLLOWS:

MAXIMUM DRAINAGE AREA PER PIPE (ACRES)	PIPE DIAMETER (INCHES)
0.5	12
0.75	15
1.00	18
>1.00	AS DESIGNED

NOT TO SCALE

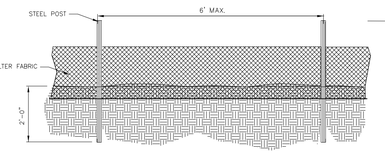
FLEXIBLE PIPE SLOPE DRAIN

GENERAL NOTES:

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION AND ROOT MATERIAL. THE BASIN AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVERSIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE BEING CONSTRUCTED. SPILLWAYS SHOULD NOT BE CONSTRUCTED THROUGH FILL SECTIONS. ALL SPILLWAYS SHOULD BE LINED AND/OR RIPRAPPED.
3. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO DEPTH SHOWN ON STANDARD. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA IN SUCH A MANNER THAT IT WILL NOT ERODE.
4. THE TRAP SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NECESSARY.
5. CONSTRUCTION OPERATION SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
6. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER, UNLESS CERTIFIED BY REGISTERED GEOTECHICAL ENGINEER.
7. SEDIMENT BASIN EMBANKMENTS SHOULD BE PROVIDED WITH EROSION CONTROL AND STABILIZATION.
8. STORAGE AREA MAY BE CONSTRUCTED IN ANY SHAPE PROVIDED THE MINIMUM STORAGE VOLUME REQUIREMENT IS MET. THE BASIN SHOULD ALSO BE ORIENTED SUCH THAT THE FILTER AND THE MAIN FLOW OF WATER AND SEDIMENT ARE ON OPPOSITE ENDS ON THE LONGER BASIN DIMENSIONS.
9. THE LENGTH OF THE STONE OUTLET (SPILLWAY) IS TO BE BASED ON A 10 YEAR STORM.
10. WHENEVER TOPOGRAPHY ALLOWS, THE BASIN LENGTH SHOULD BE TWICE (2X) THE BASIN WIDTH, TO ALLOW FOR SETTLING. BAFFLES SHALL BE INSTALLED IN ALL BASINS.
11. CLEANOUT STAKES SHALL BE PLACED IN ALL SEDIMENT BASINS AT THE LOW POINT IN THE BASIN. THE STAKES SHALL BE MARKED SHOWING THE HALF FULL, CLEANOUT POINT, OF THE BASIN.
12. SAFETY FENCING 3' HIGH SHOULD BE PLACED AROUND ALL SEDIMENT BASINS.
13. FOR DESIGN OF SEDIMENT BASINS, REFER TO THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
14. FOR SLOPES GREATER THAN 10' IN LENGTH AND PROTECTED BY SILT FENCE AT THE TOE OF THE SLOPE, SLOPE TERRACING WILL BE REQUIRED.
15. THE BERM ON SEDIMENT BASINS SHALL BE SEEDED ONCE FINAL GRADE HAS BEEN REACHED. THE SILT FENCE MAY BE REMOVED IF PERMISSION HAS BEEN GRANTED BY THE CITY LAND DEVELOPMENT INSPECTOR AFTER THE GRASS HAS GERMINATED AND STABLE GROUND HAS BEEN ESTABLISHED.
16. WASHED STONE AND WIRE BACKING SHALL BE USED WITH SILT FENCE WHENEVER SILT FENCE IS PLACED AT THE TOE OF A SLOPE >10' VERTICAL OR ALONG ANY CHANNEL OR WATER COURSE

NOT TO SCALE

GENERAL NOTES-SEDIMENT BASINS



GENERAL NOTES:

1. WOVEN FILTER FABRIC BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS.
2. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
3. TURN SILT FENCE UP SLOPE AT ENDS.
4. ORANGE SAFETY FENCE IS REQUIRED AT BACK OF SILT FENCE WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
5. DRAINAGE AREA CAN NOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.
6. SLOPE LENGTHS CAN NOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
7. DO NOT INSTALL SEDIMENT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

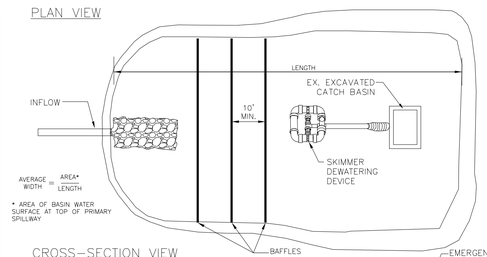
MAINTENANCE NOTES:

1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH APPROX. HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

NOT TO SCALE

TEMPORARY SILT FENCE

SKIMMER SEDIMENT BASIN DESIGN CRITERIA	
DRAINAGE AREA (ACRES)	< 10 AC.
MIN. LENGTH TO WIDTH RATIO	2:1
MAX. LENGTH TO WIDTH RATIO	6:1
MIN. VOLUME REQUIRED	1800 (CU. FT. PER AC. DISTURBED)
SURFACE AREA REQUIRED	325 (SQ. FT. PER CFS Q10)



NOTES:

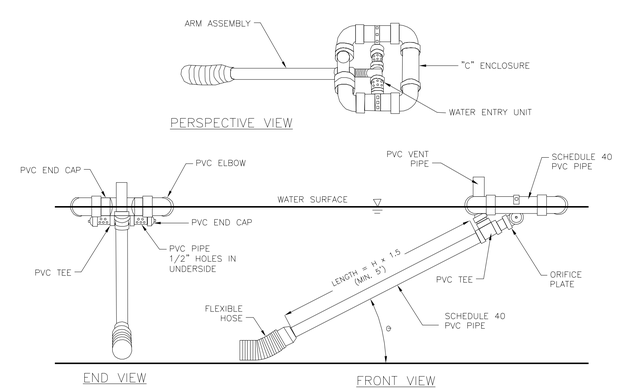
1. REFER TO NCESCPDM SECTION #6.64 FOR ADDITIONAL DESIGN SPECIFICATIONS REGARDING SKIMMER SEDIMENT BASINS.
2. SEE BAFFLE INSTALLATION FOR BAFFLE DETAILS
3. TURBIDITY CURTAIN MAY BE USED IN LIEU OF POROUS BAFFLES
4. SKIMMER INVERT ELEVATION = BASIN BOTTOM + SEDIMENT STORAGE
5. H = SPILLWAY ELEVATION - SKIMMER INVERT ELEVATION

DATA BLOCK

BASIN	DRAINAGE AREA (ACRES)	DEVLOED AREA (ACRES)	Q_{10}	BASIN VOLUME REQUIRED (CUBIC FT.)	BASIN VOLUME PROVIDED (CUBIC FT.)	BASIN SURFACE AREA REQUIRED (SQ. FT.)	BASIN SURFACE AREA PROVIDED (SQ. FT.)	CLEANOUT DEPTH (FT.) H/2	Z_1 (FEET)	Z_2 (FEET)	L (FEET)	T (FEET)	W (FEET)	SKIMMER PIPE DIAMETER	SKIMMER ORIFICE DIAMETER
#1	1.5	1.5	6.3	2,700	4,539	2,056	2,641	1.0	2.0	3.0	10	1.5	5' MIN.	2.0"	1.25"

NOT TO SCALE

SKIMMER SEDIMENT BASIN - EX. CB CONVERSION

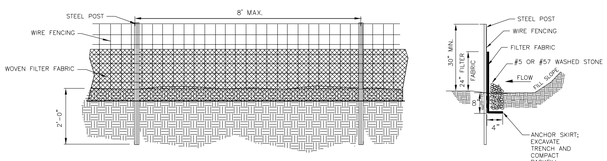


SCHEMATIC OF SKIMMER TAKEN FROM PENNSYLVANIA EROSION AND SEDIMENT POLLUTION CONTROL MANUAL, MARCH 2000.

"H" REFERS TO THE HEIGHT FROM INVERT OF FLEXIBLE HOSE ON SKIMMER TO THE INVERT OF THE PRIMARY SPILLWAY.

NOT TO SCALE

SKIMMER



GENERAL NOTES:

1. WIRE FENCING SHALL BE A MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
2. WOVEN FILTER FABRIC BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS.
3. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
4. WIRE FENCING SHALL BE AT LEAST #10 GAGE WITH A MINIMUM OF 6 LINE WIRES WITH 6" STAY SPACING.
5. TURN SILT FENCE UP SLOPE AT ENDS.
6. WIRE AND WASHED STONE IS REQUIRED TO BE SHOWN ON PLANS AT THE TOE OF SLOPES GREATER THAN 10 FEET VERTICAL (2:1 SLOPE)
7. ORANGE SAFETY FENCE IS REQUIRED AT BACK OF SILT FENCE WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
8. DRAINAGE AREA CAN NOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.
9. SLOPE LENGTHS CAN NOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
10. DO NOT INSTALL SEDIMENT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

MAINTENANCE NOTES:

1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

NOT TO SCALE

HIGH HAZARD TEMPORARY SILT FENCE

BANKS ENGINEERING
1927 SOUTH TRYON ST.
SUITE 106
CHARLOTTE, NC 28203
T: 704.780.4972
NC License #P-1370

CLIENT: THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS 04.26.23

PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: EROSION DETAILS - 1

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C6-2

FOR LATE WINTER:

LATE WINTER SEEDING MIXTURE:
SERICEA LESPEDEZA – 20 LB/ACRE
KOBE LESPEDEZA – 10 LB/ACRE
TALL FESCUE – 80 LB/ACRE

SEEDING DATES:
NOV 1 – FEB 15

NOTE:
FOLLOW-UP LATE WINTER SEEDING WITH TALL FESCUE PER FALL/SPRING SCHEDULE BELOW. OVERSEED FALL-SEEDED FESCUE WITH KOBE LESPEDEZA.

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 4,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, ROVING OR BY CRIMPING WITH A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR SUMMER (TEMPORARY ONLY):

SEEDING MIXTURE:
GERMAN MILLET – 40 LB/ACRE
(A SMALL-STEMMED SUDANGRASS MAY BE SUBSTITUTED AT A RATE OF 50 LB/ACRE)
TALL FESCUE – 80 LB/ACRE

SEEDING DATES:
APR 1 – AUG 31

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 4,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, ROVING OR BY CRIMPING WITH A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR FALL AND SPRING:

SEEDING MIXTURE:
TALL FESCUE – 80 LB/ACRE

SEEDING DATES:
SEP 1 – OCT 31
FEB 15 – MAR 31

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 4,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, ROVING OR BY CRIMPING WITH A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

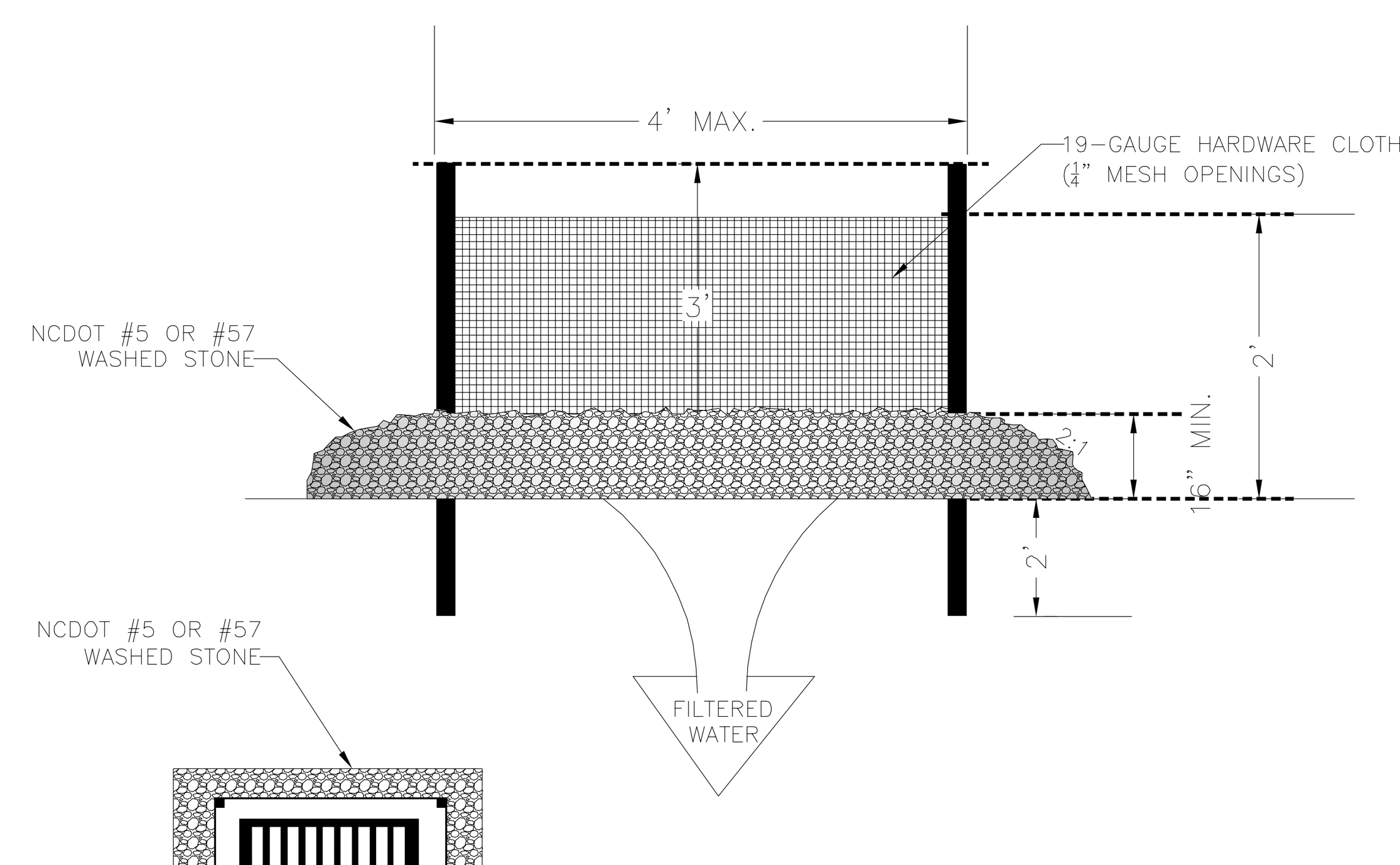
MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR ADDITIONAL INFORMATION, REFER TO NCDENR EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (ESCPDM) SECTION 6.11 – PERMANENT SEEDING. SPECIFICATIONS, THE ABOVE SEEDING SCHEDULE IS FOR TALL FESCUE AS THE DESIRED TURF PLANTING. IF WARM SEASON GRASSES I.E. BERMUDA / ZOYSIA SHOULD BE PLANTED MARCH 1 – JUNE 30. DATES OUTSIDE THIS RANGE SHALL FOLLOW TEMPORARY SEEDING SCHEDULE FOR INTERIM STABILIZATION.

PERMANENT SEEDING SCHEDULE

GENERAL NOTES:

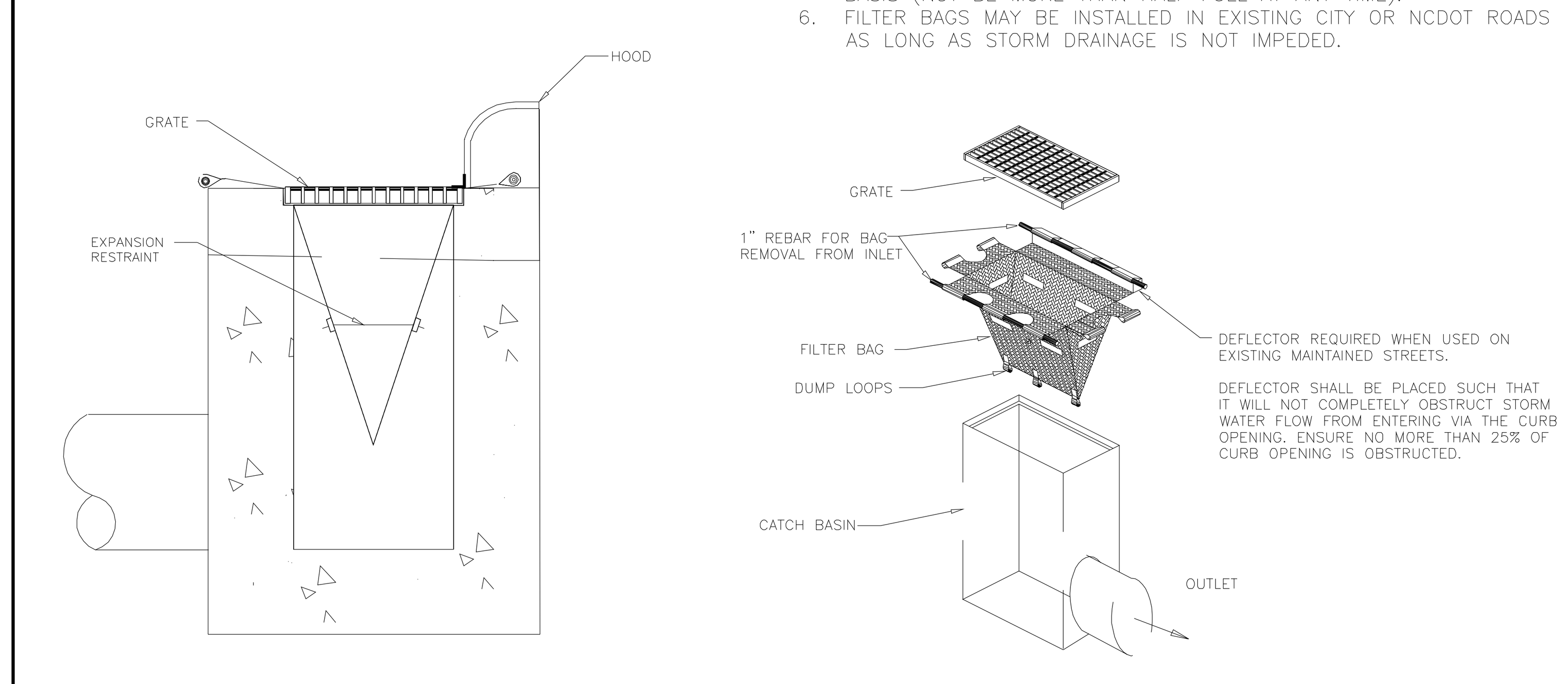
1. UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.
2. DRIVE 5-FOOT STEEL POSTS 2 FEET INTO THE GROUND SURROUNDING THE INLET. SPACE POSTS EVENLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.
3. SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE, AND BOTTOM. PLACING A 2-FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL FOR ANCHORING IS RECOMMENDED.
4. PLACE CLEAN GRAVEL (NC DOT #5 OR #57 STONE) ON A 2:1 SLOPE WITH A HEIGHT OF 16 INCHES AROUND THE WIRE, AND SMOOTH TO AN EVEN GRADE.
5. ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.
6. COMPACT THE AREA PROPERLY AND STABILIZED IT WITH GROUNDCOVER.



NOT TO SCALE

HARDWARE CLOTH AND GRAVEL INLET PROTECTION

NOTES:
1. INLET MAINTENANCE SHALL BE DOCUMENTED IN PROJECT LOG BOOK.
2. FILTER TYPES SHALL BE APPROVED BY THE INSPECTOR PRIOR TO INSTALLATION.
3. FILTER BAGS MAY BE REMOVED WHEN SITE IS STABILIZED AT THE DIRECTION OF THE ENGINEER.
4. FILTER BAGS SHALL BE REMOVED PRIOR TO STREET ACCEPTANCE AND/OR CLOSE OUT OF GRADING PERMIT.
5. FILTER BAGS SHALL BE CLEANED OR REPLACED ON A REGULAR BASIS (NOT BE MORE THAN HALF FULL AT ANY TIME).
6. FILTER BAGS MAY BE INSTALLED IN EXISTING CITY OR NCDOT ROADS AS LONG AS STORM DRAINAGE IS NOT IMPEDED.



SECTION

INSTALLATION

NOT TO SCALE

CATCH BASIN INLET PROTECTION

FOR LATE WINTER AND EARLY SPRING:

SEEDING MIXTURE:
RYE (GRAIN) – 120 LB/ACRE
ANNUAL LESPEDEZA (KOBE) – 50 LB/ACRE
(OMIT ANNUAL LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE)

SEEDING DATES:
JAN. 1 – MAY 1

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR SUMMER:

SEEDING MIXTURE:
GERMAN MILLET – 40 LB/ACRE
(A SMALL-STEMMED SUDANGRASS MAY BE SUBSTITUTED AT A RATE OF 50 LB/ACRE)

SEEDING DATES:
MAY 1 – AUG. 15

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR FALL:

SEEDING MIXTURE:
RYE (GRAIN) – 120 LB/ACRE

SEEDING DATES:
AUG. 15 – DEC 30

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:
REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 LB/ACRE OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/ACRE KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

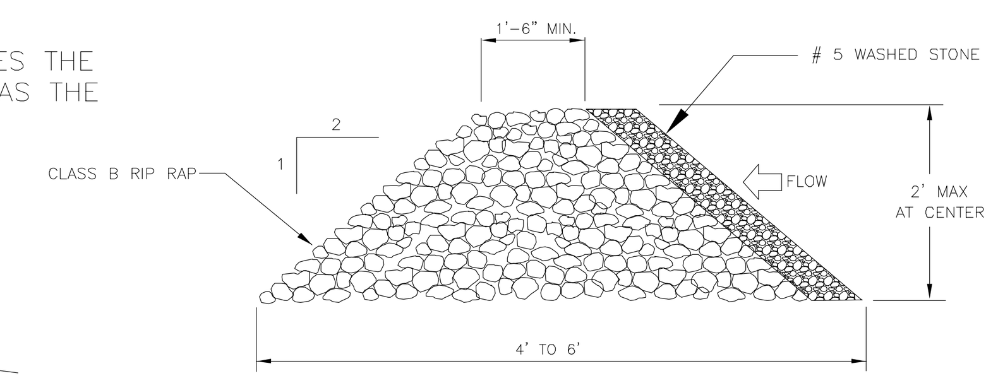
FOR ADDITIONAL INFORMATION, REFER TO NCDENR EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (ESCPDM), SECTION 6.10.
FOR PERMANENT SEEDING SPECIFICATIONS, INCLUDING SEED BED PREP, SEASONAL LIMITATIONS FOR SEEDING OPERATIONS, THE KINDS OF GRADES OF FERTILIZERS, THE KINDS OF SEED, AND THE RATES OF APPLICATION OF LIMESTONE, FERTILIZER, AND SEED, REFER TO NCDENR ESCPDM SECTION 6.11 SEEDING AND SODDING OF TURFGRASS.

TEMPORARY SEEDING SCHEDULE

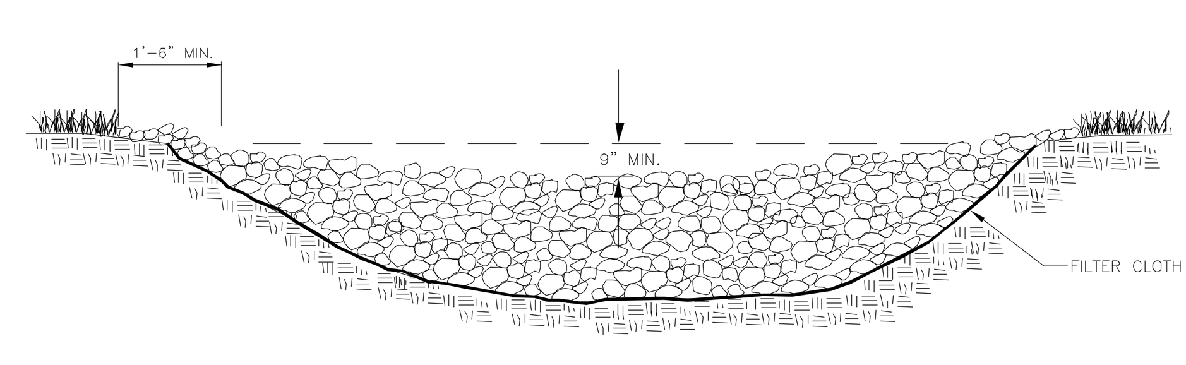
GENERAL NOTES:

1. RIPRAP SIZE TO BE DESIGNED BY ENGINEER.
2. CHECK DAMS MAY BE USED IN SLOPING DITCHES OR CHANNELS TO SLOW VELOCITY OR TO CREATE SEDIMENT TRAPS.
3. ENSURE THAT MAXIMUM SPACING BETWEEN DAMS PLACES THE TOE OF THE UPSTREAM DAM AT THE SAME ELEVATION AS THE DOWNSTREAM DAM (SEE DIAGRAM BELOW).

A AND B ARE AT EQUAL ELEVATIONS



CROSS SECTION



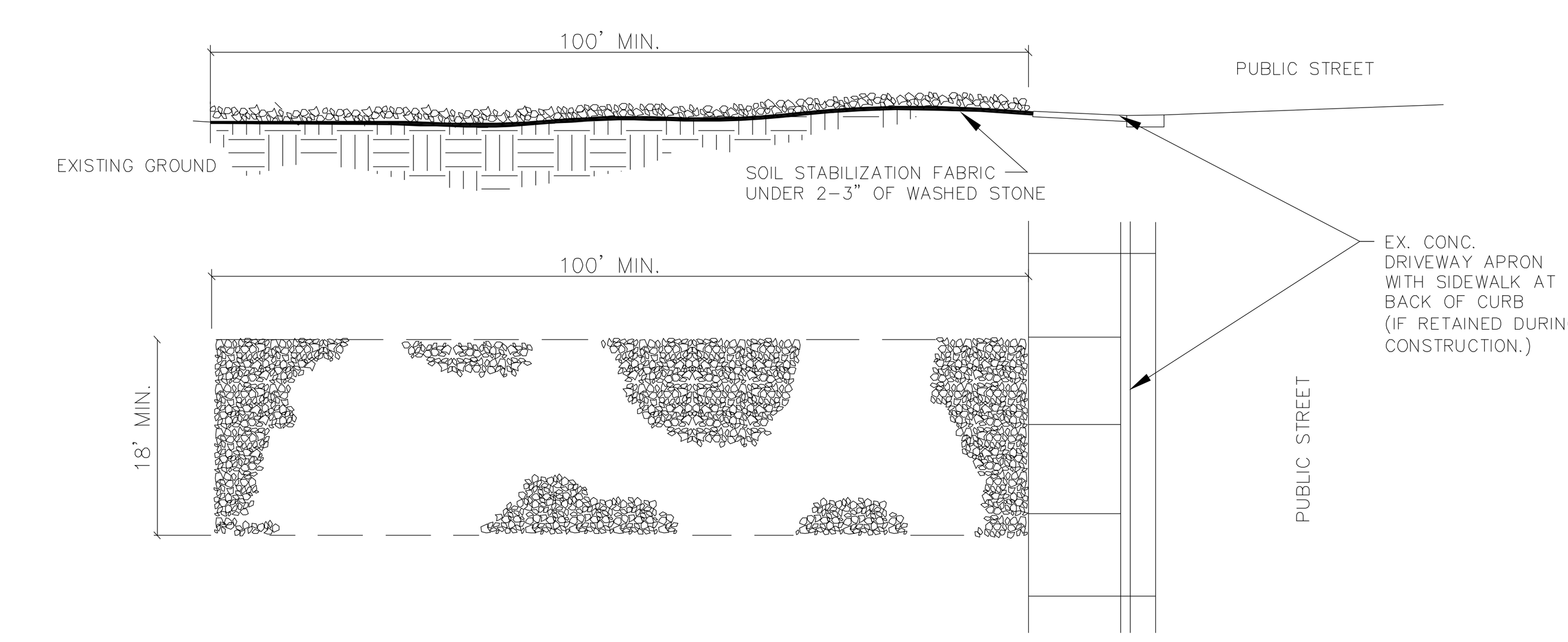
PLAN

NOT TO SCALE

TEMPORARY ROCK CHECK DAM

NOTES:

1. A STABILIZED ENTRANCE PAD OF 2-3" OF WASHED STONE AND/OR RAILROAD BALLAST SHALL BE LOCATED WHERE TRAFFIC WILL ENTER OR LEAVE THE CONSTRUCTION SITE ONTO A PUBLIC STREET.
2. FILTER FABRIC OR COMPACTED CRUSHER RUN STONE SHALL BE USED AS A BASE FOR THE CONSTRUCTION ENTRANCE.
3. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS OR EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS WARRANT AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
4. ANY SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC STREETS MUST BE REMOVED IMMEDIATELY. ANY AGGREGATE TRACKED INTO THE ROADWAY MUST BE SWEPT BACK ONSITE ON A NIGHTLY BASIS.
5. WHEN APPROPRIATE, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING A PUBLIC STREET. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN. .
6. NCDOT MAY REQUIRE A STANDARD COMMERCIAL DRIVEWAY TO ACCESS THE CONSTRUCTION SITE IF THE DRIVEWAY IS ON A THOROUGHFARE, OR ON ANY STREET WITH AN EXISTING SIDEWALK TO REMAIN OPEN DURING CONSTRUCTION.
7. FOLLOW NCDOT WORK AREA STD. DRAWINGS FOR SIDEWALK CLOSURE OR DETOUR/DIVERSION.



NOT TO SCALE

STABILIZED CONSTRUCTION ENTRANCE

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION
Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain guage maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those un-attended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero". The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event >= 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDOs)	At least once per 7 calendar days and within 24 hours of a rain event >= 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event >= 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event >= 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a) of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING
1. E&SC Plan Documentation
The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be kept on site and available for inspection at all times during normal business hours.

Item to Document	Documentation Requirements
(a) Each E&SC measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC plan.	Initial and date each E&SC measure on a copy of the approved E&SC plan or complete, date and sign an inspection report that lists each E&SC measure shown on the approved E&SC plan. This documentation is required upon the initial installation of the E&SC measures or if the E&SC measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC plan.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC measures.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation to be Kept on Site
In addition to the E&SC plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This General Permit as well as the Certificate of Coverage, after it is received.
(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years
All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING
1. Occurrences that Must be Reported
Permittees shall report the following occurrences:
(a) Visible sediment deposition in a stream or wetland.
(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.
(d) Anticipated bypasses and unanticipated bypasses.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements
After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0368.

Occurence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• Within 24 hours, an oral or electronic notification. • Within 7 calendar days, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible***. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours,*** an oral or electronic notification. • ***Within 7 calendar days***, a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment [40 CFR 122.41(l)(7)]	• ***Within 24 hours,*** an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a desription of the noncompliance, and its causes; the period on noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurence of the noncompliance. [40 CFR 122.41(l)(6)] • Division staff may waive the requirement for a written report on a case-by-case basis.

PART II, SECTION G, ITEM (4)
DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

(a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,
(b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,
(c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems,
(d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,
(e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
(f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT
Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes		
Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION
Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS
1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

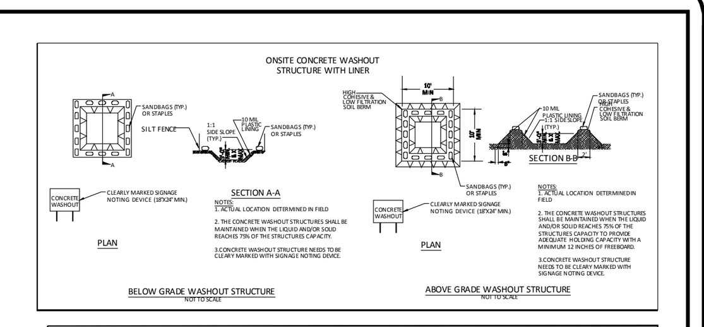
EQUIPMENT AND VEHICLE MAINTENANCE
1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE
1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE
1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

PORTABLE TOILETS
1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

EARTHEN STOCKPILE MANAGEMENT
1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.



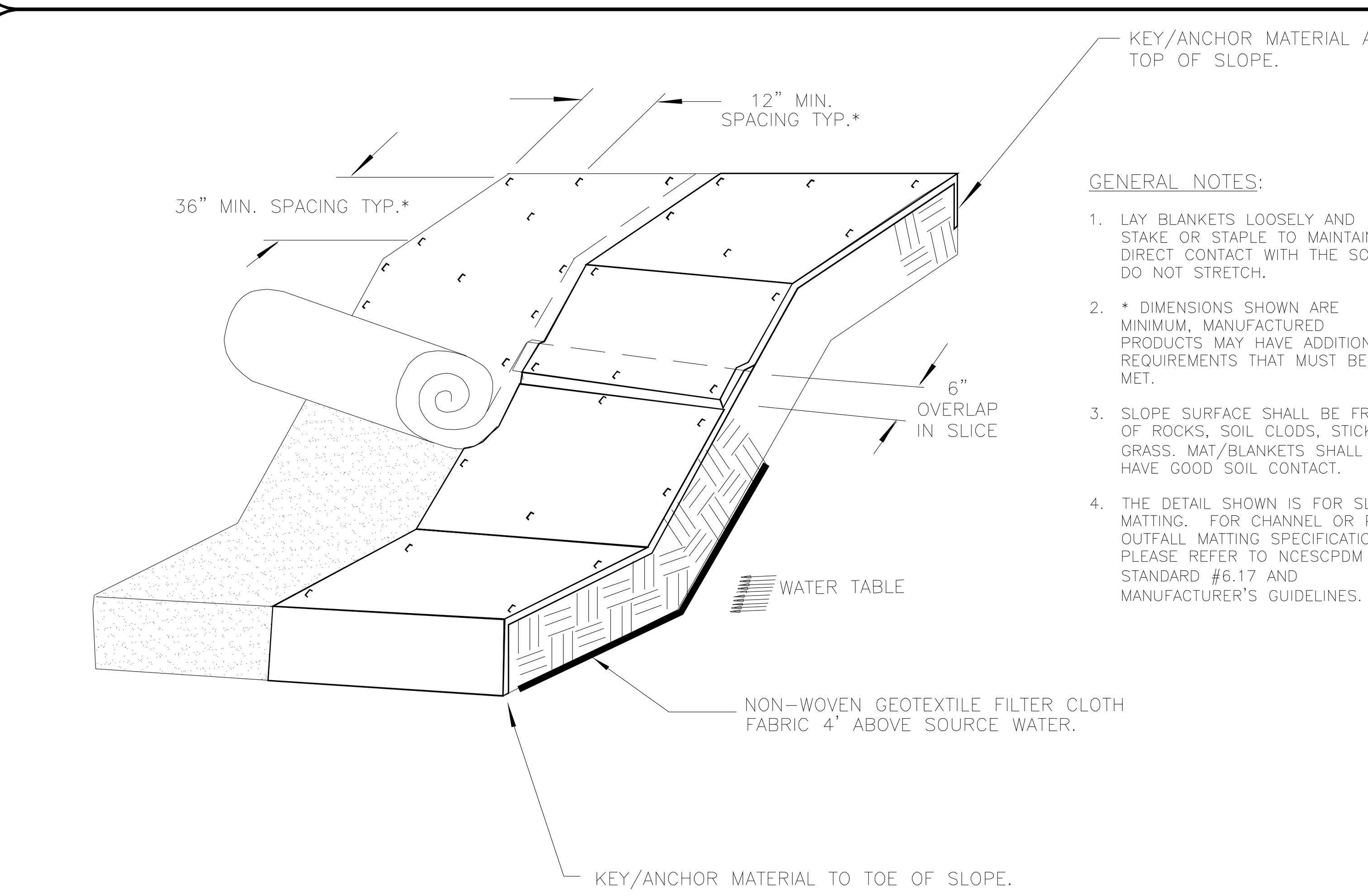
CONCRETE WASHOUTS
1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES
1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE
1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19



GENERAL NOTES:

1. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
2. * DIMENSIONS SHOWN ARE MINIMUM, MANUFACTURED PRODUCTS MAY HAVE ADDITIONAL REQUIREMENTS THAT MUST BE MET.
3. SLOPE SURFACE SHALL BE FREE OF ROCKS, SOIL CLODS, STICKS, GRASS. MAT/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
4. THE DETAIL SHOWN IS FOR SLOPE MATTING. FOR CHANNEL OR PIPE OUTFALL MATTING SPECIFICATIONS, PLEASE REFER TO NCESCPDM STANDARD #6.17 AND MANUFACTURER'S GUIDELINES.

NOT TO SCALE

EMBANKMENT MATTING DETAIL

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CHARLOTTE, NC 28203
T: 704.780.4972
NC License #P-1370

CLIENT: THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28307 ENGINEER JAY D. BANKS 04.26.23

PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: EROSION DETAILS - 2

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C6-3

April 25, 2023 - 5:39pm By: Jay Banks

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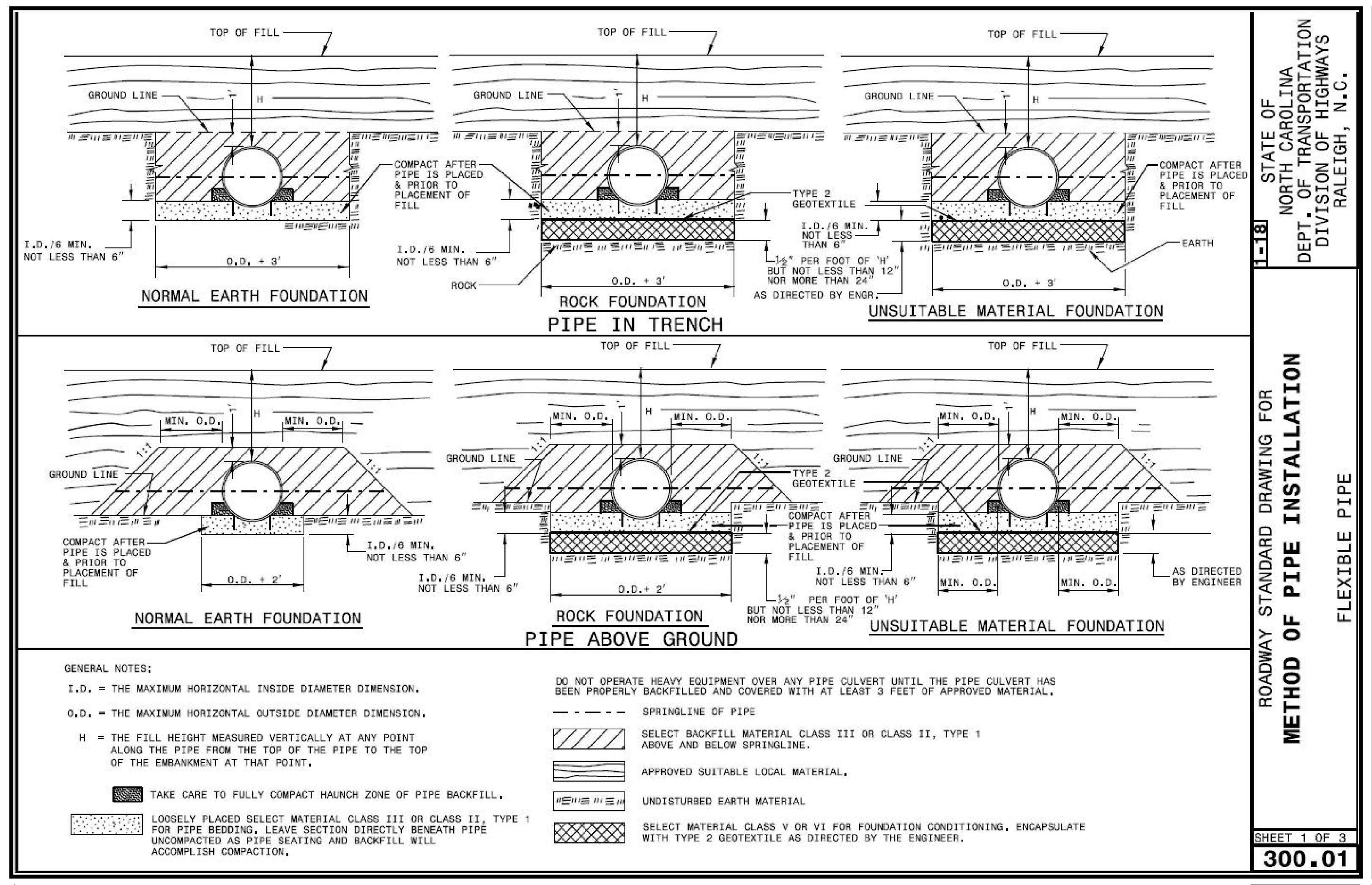
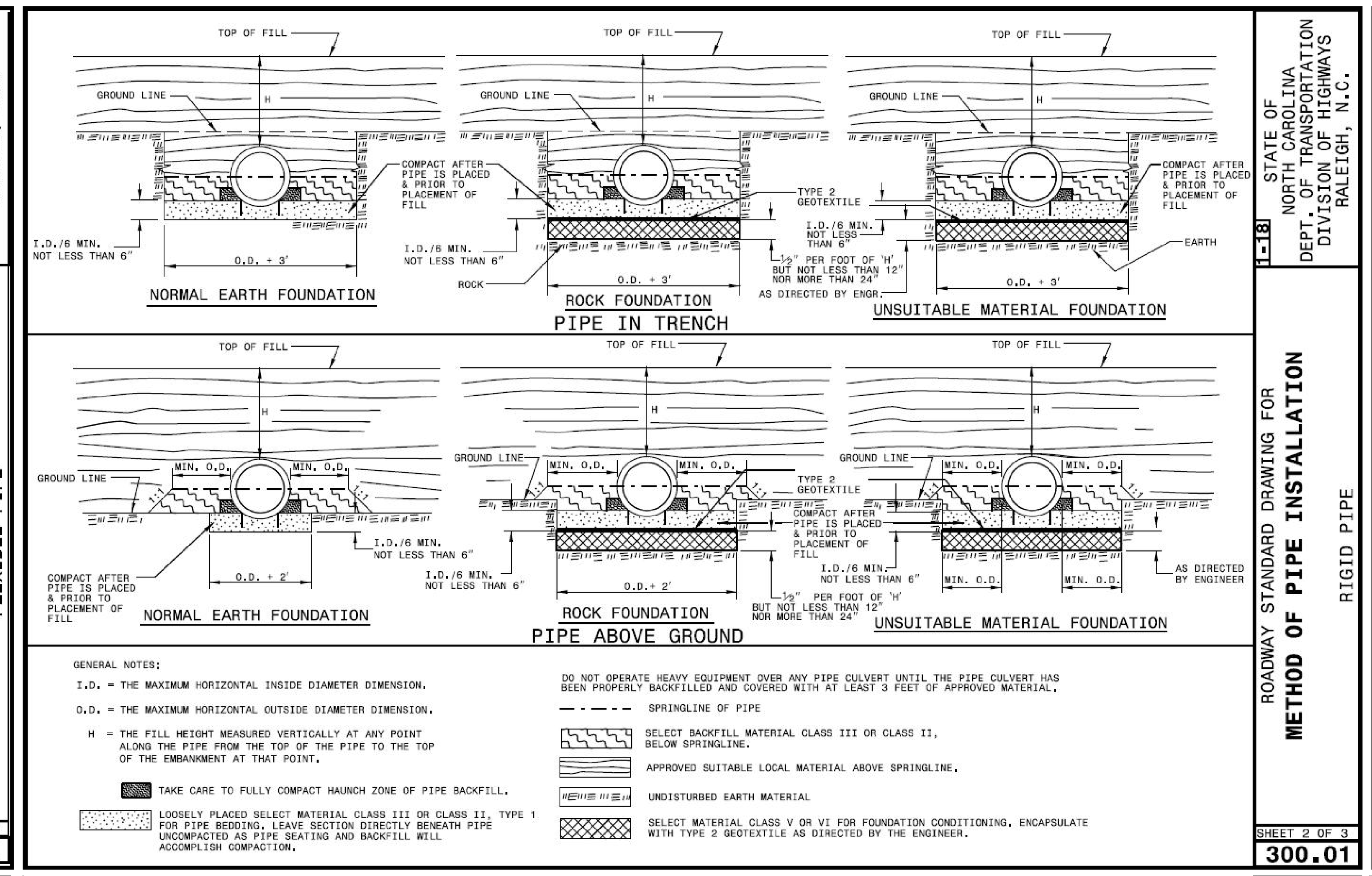




FLEXIBLE PIPE

Round Corrugated Steel Pipe
2 2/3 x ½ corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (Ga) 16	14	12	10	8
12	12	204	256			
15	12	162	204			
18	12	135	169	239		
21	12	115	145	204		
24	12	100	126	178		
30	12	79	100	142		
36	12	65	83	117	152	
42	12	55	70	100	130	160
48	12	48	61	87	113	139
54	12		54	77	100	123
60	12			69	90	111
66	12				81	100
72	12				74	91
78	12					81
84	12					69

Round Corrugated Aluminum Pipe
2 2/3 x ½ corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (Ga) 16	14	12	10	8
12	12	123	155	218	281	344
15	12	98	123	174	224	275
18	12	81	102	144	187	228
21	12	69	87	123	160	195
24	12	60	76	108	139	171
27	12		67	95	123	151
30	12		60	85	111	136
36	12		50	71	92	113
42	12			60	78	96
48	12			52	68	84
54	12			46	50	74
60	12				50	62
66	12					51
72	12					41

** FOR DIFFERENT CORRUGATIONS AND ARCH PIPES REFER TO ROADWAY DESIGN MANUAL OR MANUFACTURERS SPECIFICATION.

HDPE - * (Minimum fill) 2′ for pipe diameters ≥ 12″ and ≤ 60″
* (Maximum fill) 20′ for pipe diameters ≤ 24″
17′ for pipe diameters ≥ 30″ and ≤ 60″

PVC - * (Minimum fill) 2′ for pipe diameters ≥ 12″ and ≤ 36″
* (Maximum fill) 30′ for pipe diameters ≥ 12″ and ≤ 36″

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

CSP - AASHTO M36
CAAP - AASHTO M196
HDPE - AASHTO M294
PVC - ASTM F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1′ MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

RIGID PIPE

RCP - * (Minimum fill) 1′ for Class IV & CLASS V
2′ for Class III & Class II

* (Maximum fill) 10′ - Class II pipe
20′ - Class III pipe
30′ - Class IV pipe
40′ - Class V pipe

(For fills > 40′ & < 80′ use LRFD Direct Design Method)

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

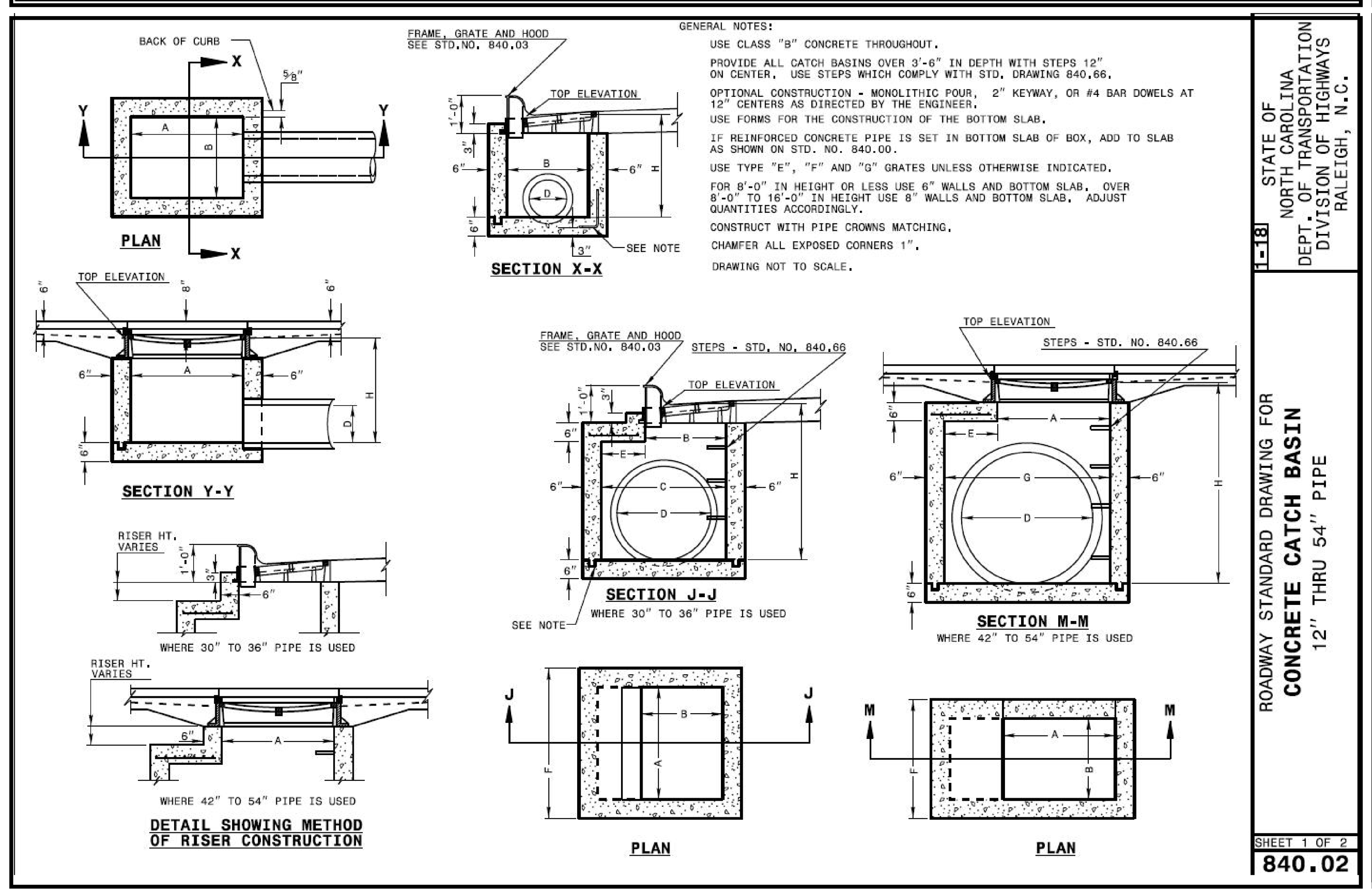
REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

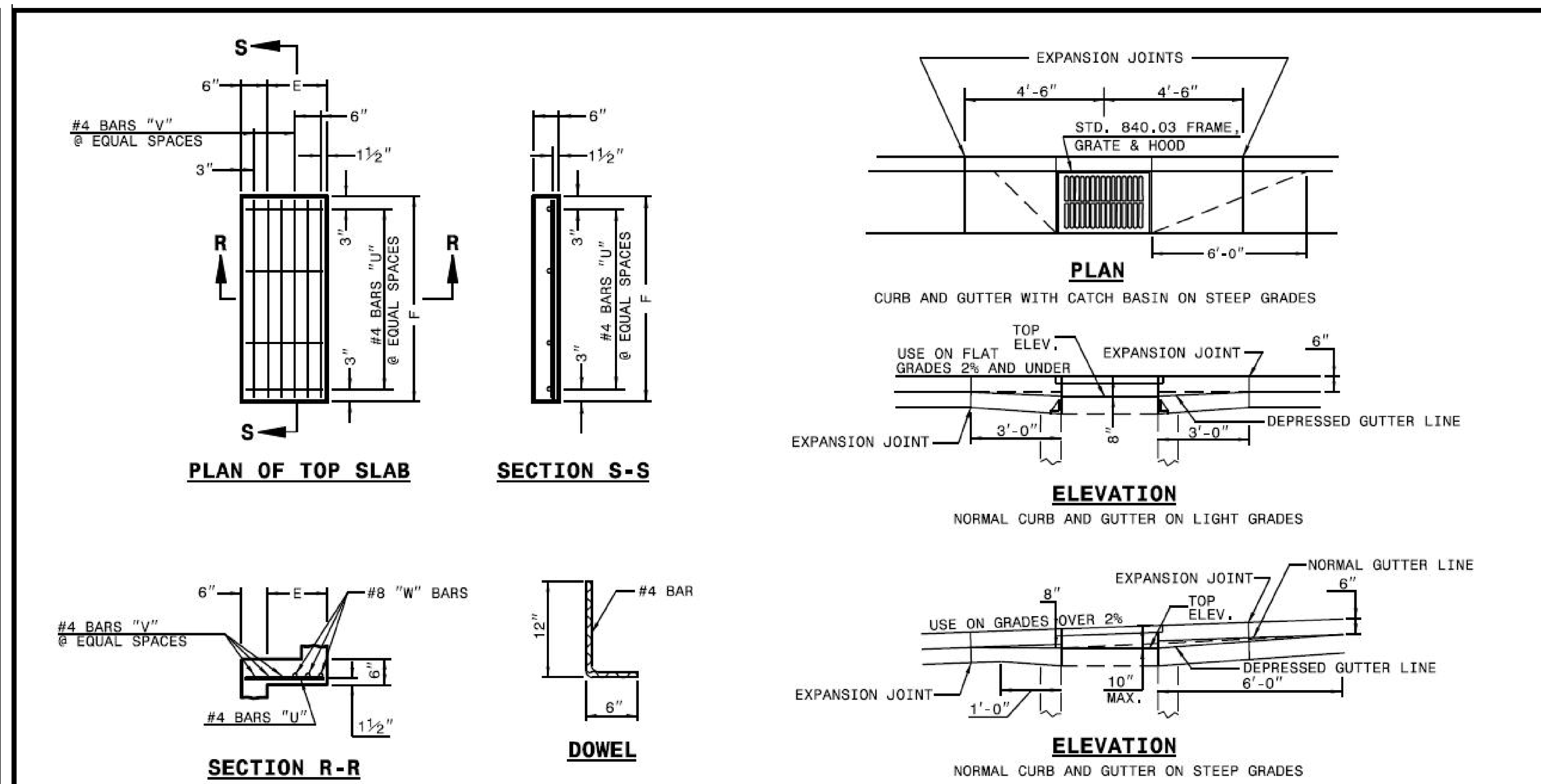
RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1′ MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ROADWAY STANDARD DRAWING FOR **METHOD OF PIPE INSTALLATION**
FILL HEIGHT TABLES
SHEET 3 OF 3
300.01

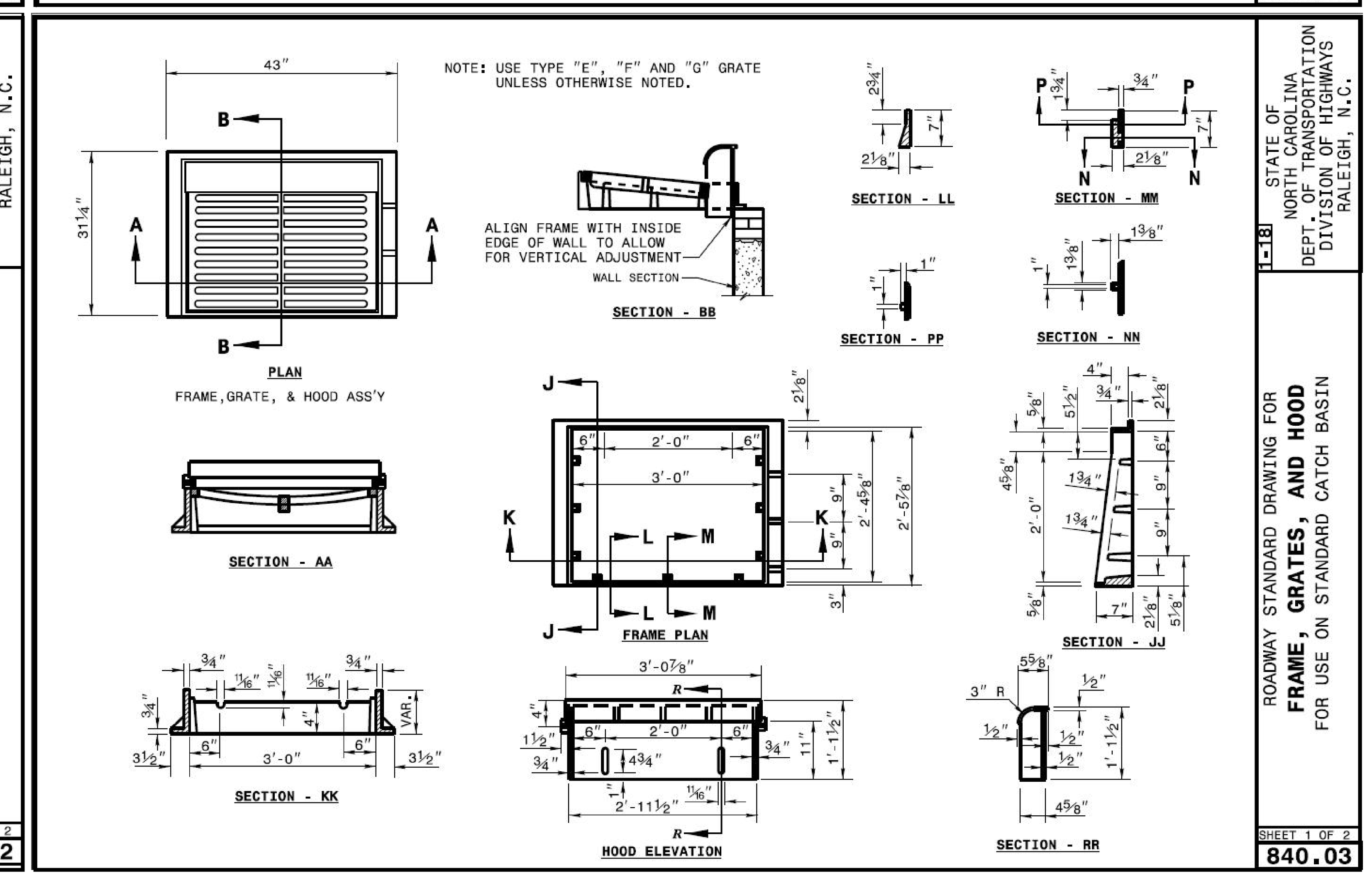


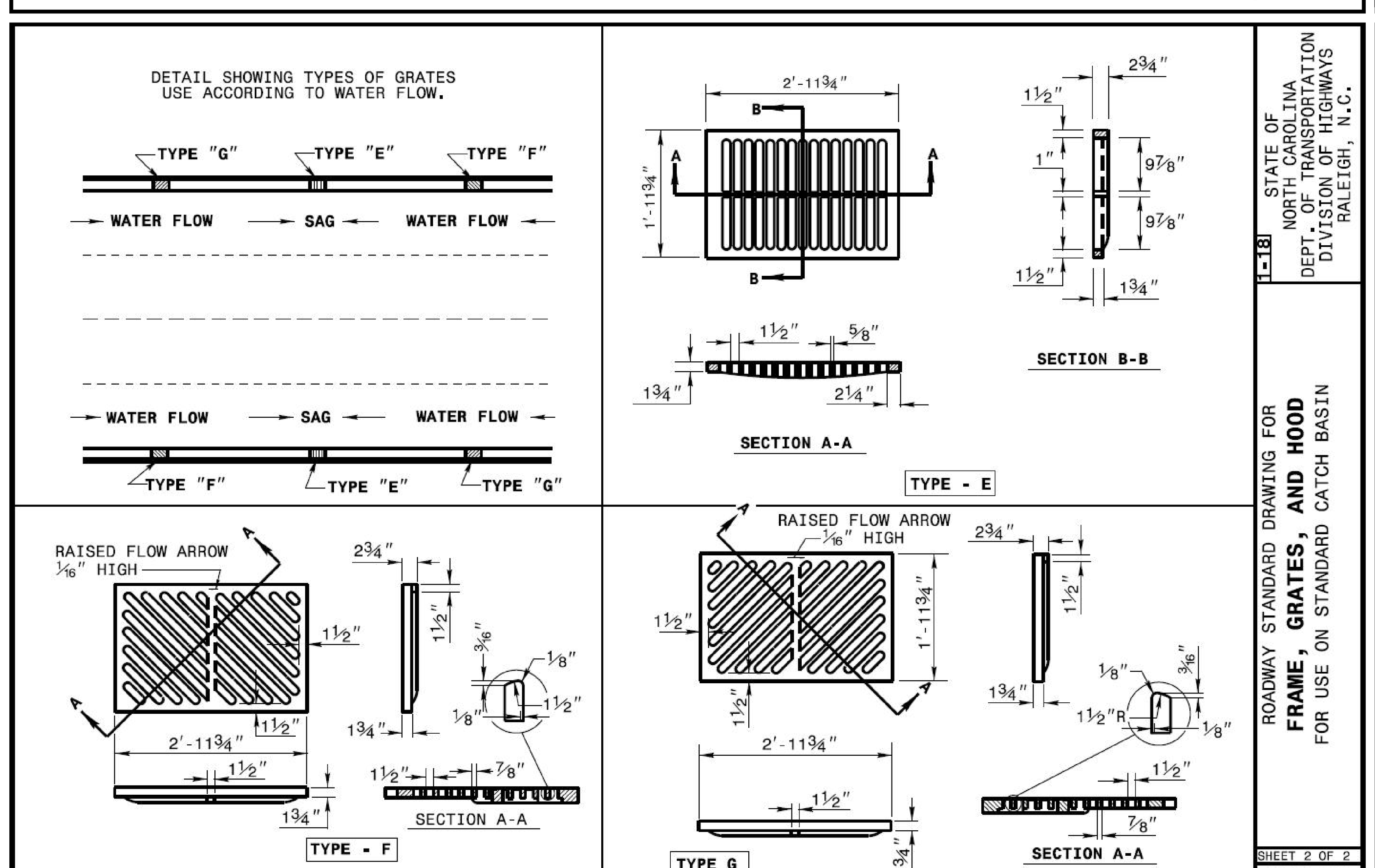


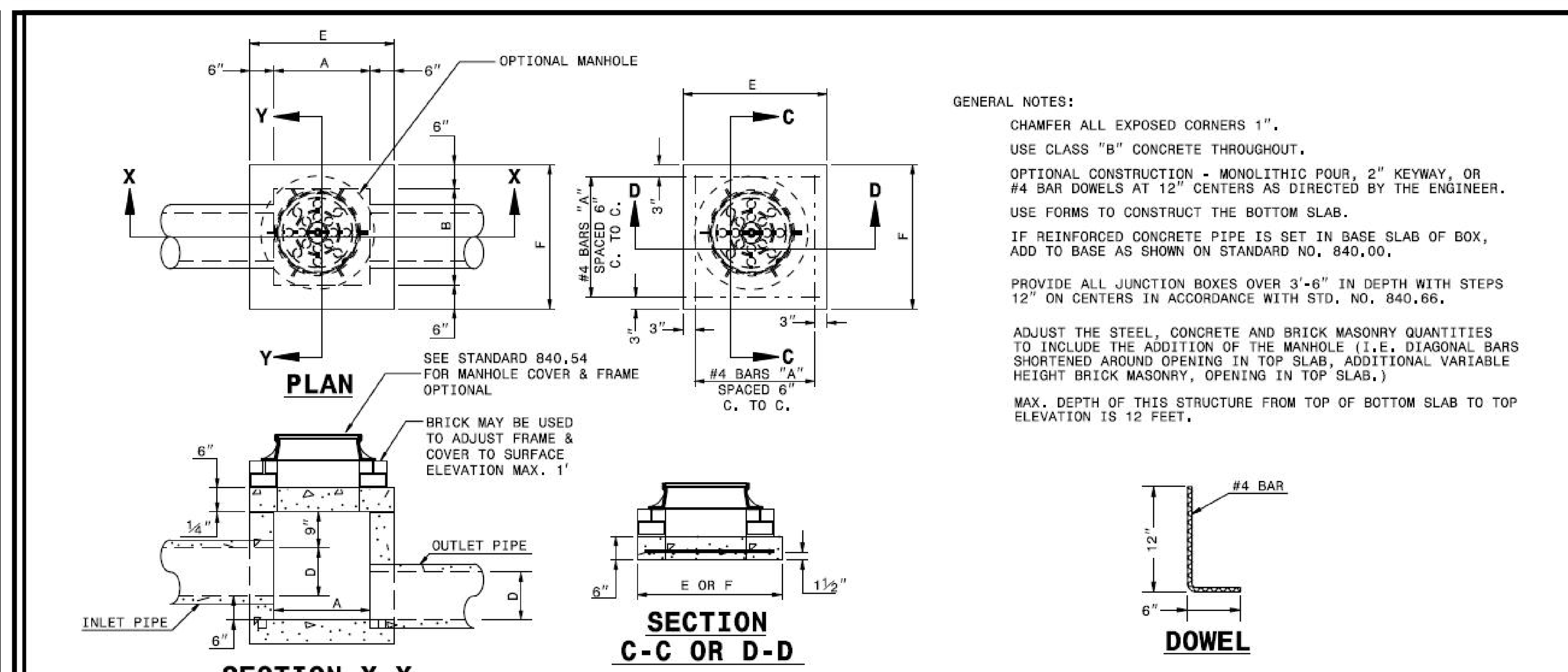
MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *																			
DIMENSIONS OF BOX AND PIPE						COVER DIMENSION									CU.YDS. CONC. IN BOX			DEDUCTIONS ONE PIPE	
PIPE	SPAN	WIDTH	WIDTH	SPAN	MIN. HEIGHT			BARS-U		BARS-V		BARS-W		TOTAL LBS.	TOP SLAB	BOTTOM SLAB	TOT. CONC. FOR MINIMUM HEIGHT, H		
D	A	B	C	G	H	E	F	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH					C.M.	R.C.
12″	3′-0″	2′-2″	--	--	2′-9″	--	--	--	--	--	--	--	--	--	--	0.235	0.772	0.015	0.026
15″	3′-0″	2′-2″			3′-0″											0.235	0.829	0.023	0.036
18″	3′-0″	2′-2″			3′-3″											0.235	0.887	0.033	0.049
24″	3′-0″	2′-2″			3′-9″											0.235	1.001	0.059	0.085
30″	3′-0″	2′-2″	3′-4″		4′-3″	1′-2″	4′-0″	4	1′-5″	2	3′-9″	3	3′-9″	39	0.123	0.321	1.433	0.092	0.127
36″	3′-0″	2′-2″	3′-10″		4′-9″	1′-8″	4′-0″	4	1′-11″	3	3′-9″	3	3′-9″	43	0.161	0.358	1.714	0.132	0.178
42″	3′-0″	2′-2″		4′-5″	5′-3″	1′-5″	3′-2″	4	1′-8″	2	2′-11″	3	2′-11″	32	0.112	0.318	1.738	0.180	0.243
48″	3′-0″	2′-2″		5′-0″	5′-9″	2′-0″	3′-2″	4	2′-3″	3	2′-11″	3	2′-11″	35	0.145	0.352	2.052	0.235	0.317
54″	3′-0″	2′-2″		5′-7″	6′-3″	2′-7″	3′-2″	4	2′-10″	5	2′-11″	3	2′-11″	41	0.180	0.386	2.387	0.297	0.401

* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ROADWAY STANDARD DRAWING FOR **CONCRETE CATCH BASIN** 12″ THRU 54″ PIPE
SHEET 2 OF 2
840.02

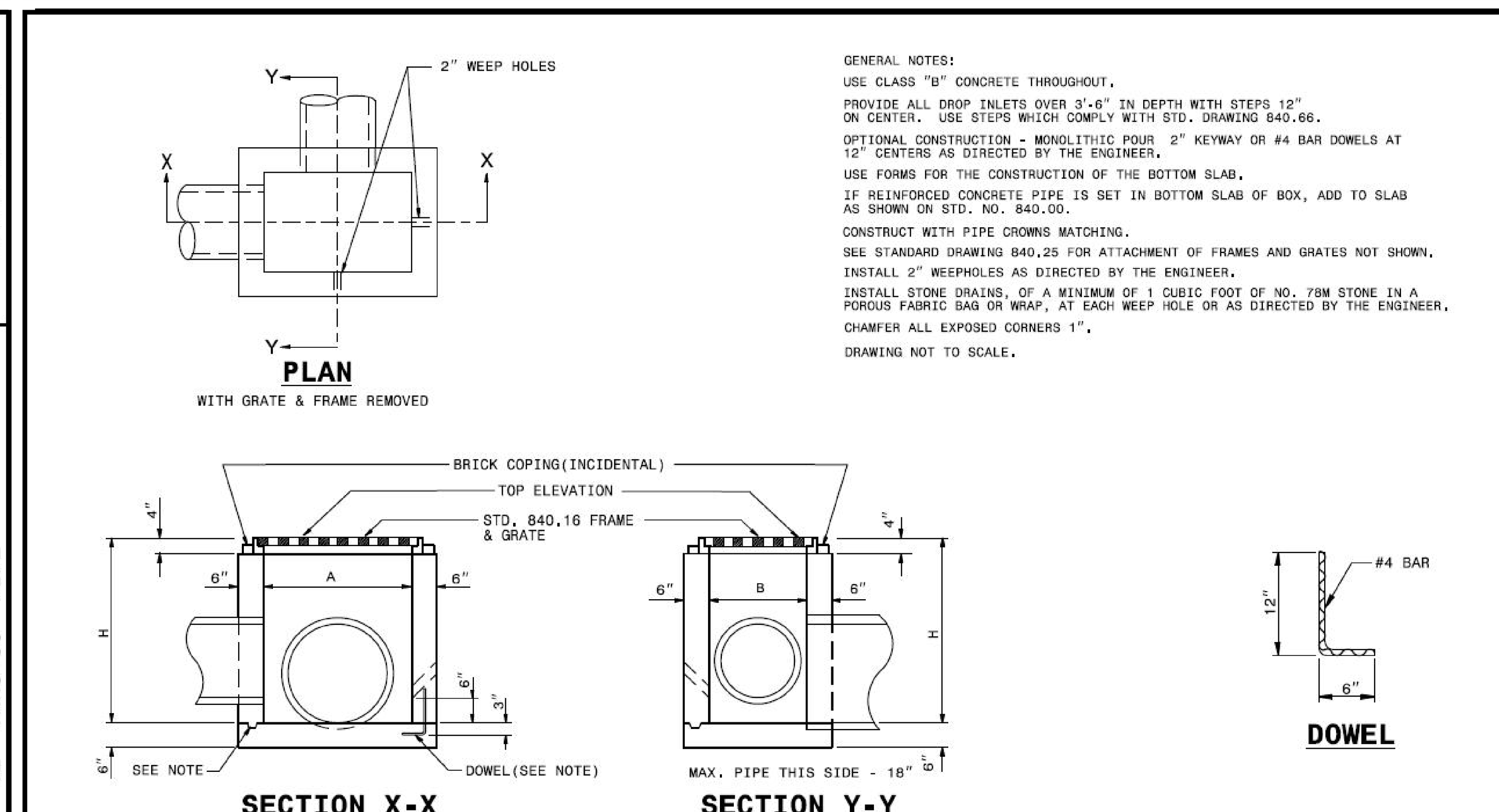






DIMENSIONS AND QUANTITIES FOR CONCRETE JUNCTION BOXES														
DIMENSIONS OF BOX AND PIPE				REINFORCEMENT BARS "A"		TOP SLAB DIMENSIONS		CUBIC YARDS IN BOX			TOTAL QUANTITIES BOX AND SLABS		DEDUCTIONS FOR ONE PIPE CU.YDS.	
PIPE	SPAN	WIDTH	HEIGHT											
D	A	B	H	NO.	LENGTH	E	F	TOP SLAB	BOTTOM SLAB	WALL/ FT. OF HT.	LBS. REINF	CU. YDS. MIN. "H"	C.S.	R.C.
12″	2′-0″	2′-0″	2′-3″	12	2′-9″	3′-0″	3′-0″	0.167	0.167	0.185	22	0.750	0.015	0.024
15″	2′-3″	2′-3″	2′-6″	12	3′-0″	3′-3″	3′-3″	0.196	0.196	0.204	24	0.902	0.023	0.036
18″	2′-6″	2′-6″	2′-9″	14	3′-3″	3′-6″	3′-6″	0.227	0.227	0.222	30	1.065	0.033	0.049
24″	3′-0″	3′-0″	3′-3″	16	3′-9″	4′-0″	4′-0″	0.296	0.296	0.259	40	1.434	0.059	0.085
30″	3′-6″	3′-6″	3′-9″	18	4′-3″	4′-6″	4′-6″	0.375	0.375	0.296	51	1.860	0.092	0.127
36″	4′-0″	4′-0″	4′-3″	20	4′-9″	5′-0″	5′-0″	0.463	0.463	0.333	64	2.341	0.132	0.178
42″	4′-6″	4′-6″	4′-9″	22	5′-3″	5′-6″	5′-6″	0.560	0.560	0.370	77	2.878	0.180	0.243
48″	5′-4″	5′-4″	5′-3″	26	6′-3″	6′-4″	6′-4″	0.743	0.743	0.407	111	3.623	0.235	0.317
54″	5′-10″	5′-10″	5′-9″	28	6′-7″	6′-10″	6′-10″	0.865	0.865	0.444	126	4.283	0.297	0.401
60″	6′-6″	6′-6″	6′-3″	30	7′-3″	7′-6″	7′-6″	1.042	1.042	0.481	145	5.090	0.367	0.495
66″	7′-1″	7′-1″	6′-9″	32	7′-10″	8′-1″	8′-1″	1.210	1.210	0.518	169	5.917	0.444	0.589

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ROADWAY STANDARD DRAWING FOR **CONCRETE JUNCTION BOX** (WITH OPTIONAL MANHOLE) 12″ THRU 66″ PIPE
SHEET 1 OF 1
840.31



DIMENSIONS AND QUANTITIES FOR DROP INLET(BASED ON MIN. HEIGHT, H)								
DIMENSIONS OF BOX & PIPE				CUBIC YARDS CONC. IN BOX			DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	MIN. HEIGHT					
D	A	B	H	BOTTOM SLAB	WALL PER FT. HT.	TOTAL CONCRETE FOR MINIMUM HEIGHT, H	C.M.	R.C.
12″	3′-0″	2′-0″	2′-0″	0.222	0.222	0.592	0.015	0.026
15″			2′-3″			0.648	0.023	0.036
18″			2′-6″			0.703	0.033	0.049
24″			3′-0″			0.814	0.059	0.085
30″	3′-0″	2′-0″	3′-6″	0.222	0.222	0.925	0.092	0.127

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ROADWAY STANDARD DRAWING FOR **CONCRETE DROP INLET** 12″ THRU 30″ PIPE
SHEET 1 OF 1
840.14

BANKS ENGINEERING
1927 SOUTH TRYON ST.
SUITE 106
CHARLOTTE, NC 28203
T: 704.780.4972
NC License #P-1370

CLIENT: THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28307 JAY D. BANKS 04.26.23

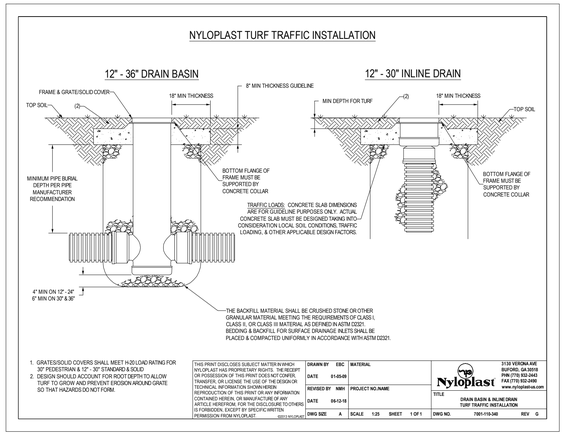
PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: STORM DETAILS-1

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

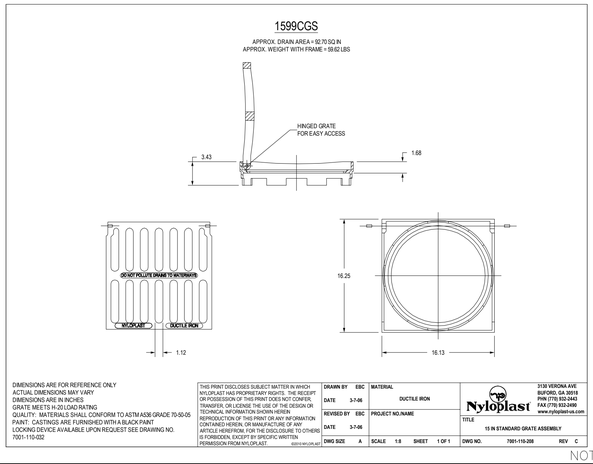
DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C6-4



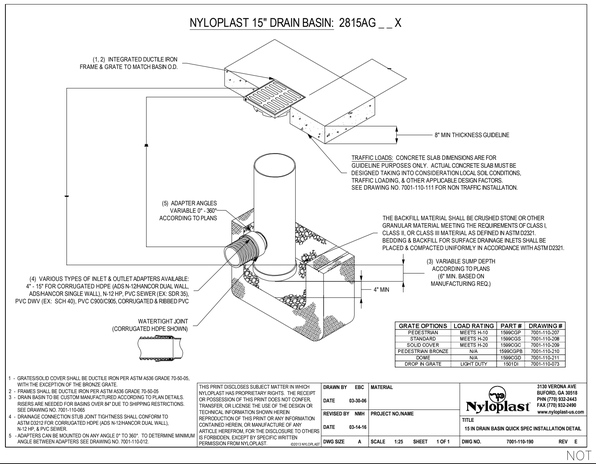
NOT TO SCALE

ADS DRAIN BASIN – TURF TRAFFIC



NOT TO SCALE

ADS GRATE ASSEMBLY – STANDARD



NOT TO SCALE

15" ADS DRAIN BASIN

BANKS ENGINEERING
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CHARLOTTE, NC 28203
T: 704.780.4972
NC License #P-1370

CLIENT:
THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

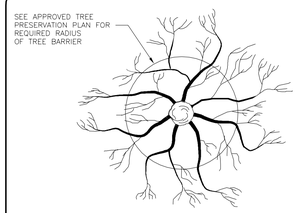
PROJECT:
CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET:
STORM DETAILS-2

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C6-5

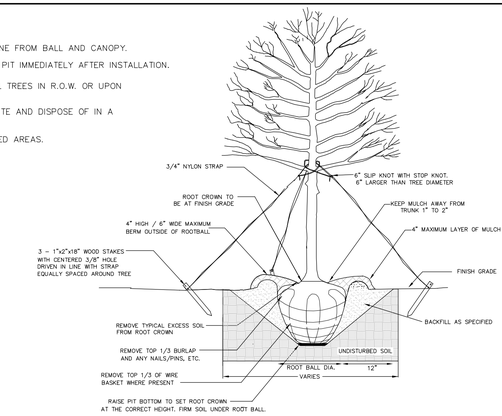


PLAN VIEW OF ROOT ZONE

NOTES:
1. REMOVE ALL BARRIERS UPON COMPLETION OF PROJECT.
2. LANDSCAPING PLANS SHALL SHOW THE LOCATIONS OF ALL TREE PROTECTION FENCES.

TREE PROTECTION DETAIL

NOTES:
1. REMOVE WIRE AND NYLON TWINE FROM BALL AND CANOPY.
2. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
3. STAKING IS REQUIRED FOR ALL TREES IN R.O.W. OR UPON REQUEST OF ARBORIST.
4. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
5. RESEED UNMULCHED, DISTURBED AREAS.



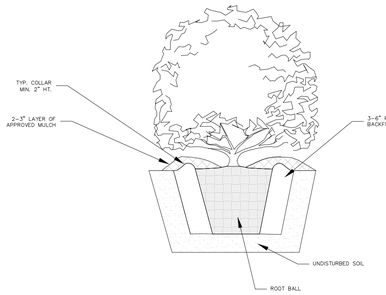
ALL TREES SHALL MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004)

FOR EXAMPLE:	CALIPER	HEIGHT (RANGE)	MAX. HEIGHT	MIN. ROOT BALL DIA.	MIN. ROOT BALL DEPTH
	2"	12-14'	16'	24"	16"
	3"	14-16'	18'	32"	21"

NOT TO SCALE

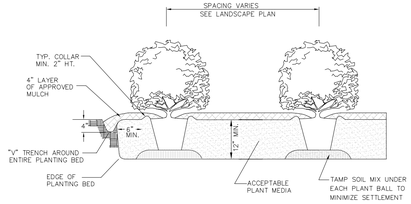
TREE PLANTING
(FOR SINGLE AND MULTI-STEM TREES)

NOTES:
1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINSHED GRADE
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.

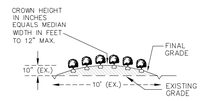


INDIVIDUAL
SMALL SHRUB/TREE PLANTING

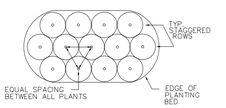
NOTES:
1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINSHED GRADE
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.



TYPICAL PLANTING BED DETAIL

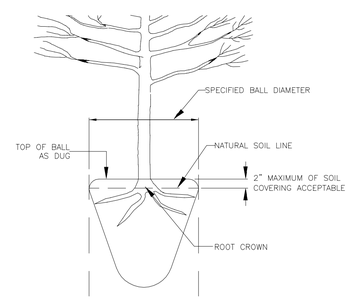


TYPICAL BED CROWNING



TYPICAL PLANTING BED PLAN

SHRUB PLANTING BED



ACCEPTABLE CONDITION
(AS DELIVERED)

UNACCEPTABLE CONDITION
(AS DELIVERED)

NOTE:
A ROOT FLARE EXCAVATION FOR ALL TREES SPECIFIED MAY BE PERFORMED BY THE ENGINEER TO ENSURE THAT TREES WERE NOT PLANTED/GROWN TOO DEEPLY AT SOURCE (NURSERY). LANDSCAPE CONTRACTOR SHALL HAVE SUPPLIER MARK GROUND LEVEL LINE ABOVE ROOT BALL. IF ENGINEER DETERMINES THAT THERE IS EXCESSIVE SOIL OVER THE ROOT CROWN, THESE TREES WILL BE REJECTED.

ROOT FLARE DEPTHS
(TREE ROOT BALL CONDITION ON TREES FROM SUPPLIERS)

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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

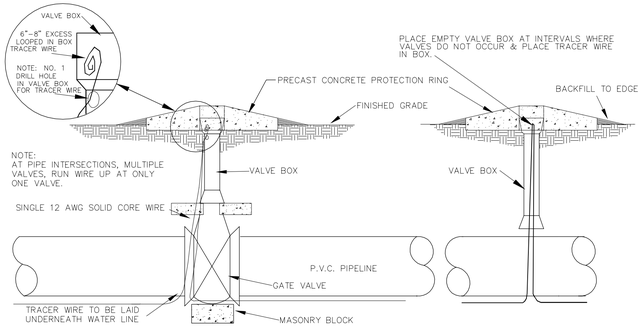
PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: PLANTING DETAILS

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

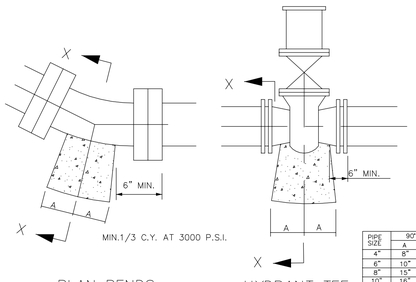
C6-6



NOTES:
1. DRILL HOLE IN VALVE BOX TO INSERT TRACER WIRE,BRING UP TO INSIDE AND ROLL UP AT LEAST 6"-8" EXCESS
2. PLACE TRACER WIRE IN VALVE BOX AT 1,000' INTERVALS OR AS NOTED ON THE PLANS, TYPICAL.
3. DO NOT SPLICE WIRE WHEN BEGINNING A NEW SPOOL. INSTEAD INSTALL A VALVE BOX AND ATTACH EACH WIRE WITH A BRASS SCREW TO THE VALVE BOX.

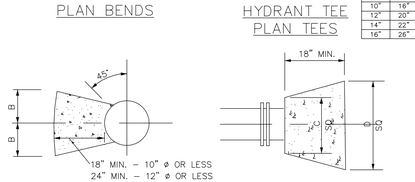
NOT TO SCALE

TYPICAL TRACER WIRE INSTALLATION DETAIL



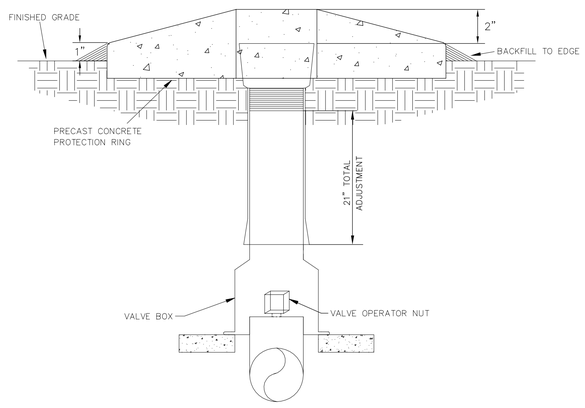
NOTES:
1. CONCRETE SHALL BE 3,000 PSI MIN.
2. CONCRETE FOR THRUST BLOCKING SHALL BE KEPT FAIRLY DRY, THUS MAKING THE CONCRETE WEDGE SHAPE MORE EASILY FORMED WITH THE WIDEST PART (BLOCKING AREA) AGAINST UNDISTURBED SOIL.
3. NO CONCRETE SHALL COVER ANY BOLTS OR GLANDS.
4. ALL PIPING AND ACCESSORIES TO BE WRAPPED WITH 10 MIL. POLYETHYLENE PRIOR TO POURING BLOCKING.
5. VOLUME OF THRUST BLOCKING SHALL BE AS SHOWN ON THE THRUST BLOCKING SCHEDULE.

PIPE SIZE	90° BEND		45° BEND		221/2° BEND		11/4° BEND		TEE		PLUG	
	A	B	A	B	A	B	A	B	A	B	C	D
4"	8"	12"	8"	8"	6"	6"	6"	8"	9"	9"	10"	18"
6"	10"	12"	8"	10"	8"	8"	8"	8"	10"	10"	12"	18"
8"	15"	13"	10"	10"	8"	8"	8"	8"	10"	12"	12"	24"
10"	16"	14"	10"	12"	6"	10"	6"	10"	11"	14"	14"	25"
12"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"
14"	22"	18"	14"	16"	10"	14"	10"	14"	16"	18"	18"	34"
16"	26"	20"	16"	18"	12"	16"	12"	16"	18"	20"	20"	36"



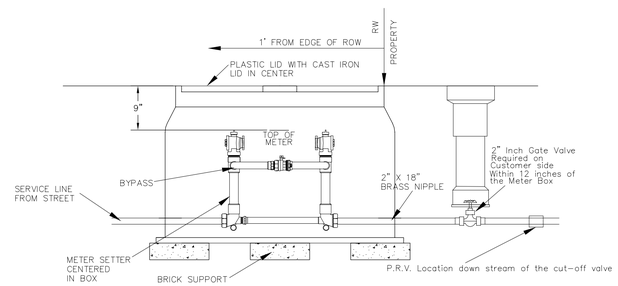
NOT TO SCALE

TYPICAL THRUST BLOCK DETAIL



NOT TO SCALE

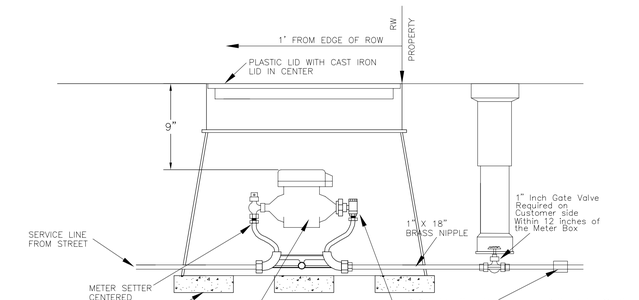
TYPICAL VALVE BOX DETAIL



1. METER AND PRIVATE SERVICE LINE NOT IN CONTRACT UNLESS SPECIFIED
2. METER SETTER SIZE AS NOTED ON PLANS.
3. ALL BRASS FITTINGS SHALL BE COMPRESSION TYPE.
4. 17 1/4" SPREAD (FLANGE TO FLANGE).

NOT TO SCALE

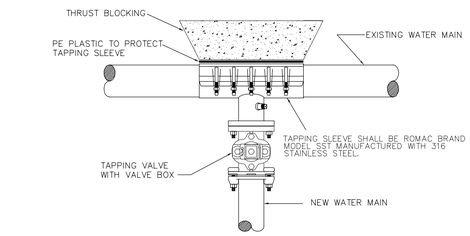
TYPICAL 2" METER SETTER INSTALLATION DETAIL



1. METER AND PRIVATE SERVICE LINE NOT IN CONTRACT UNLESS SPECIFIED
2. METER SETTER SIZE AS NOTED ON PLANS.
3. ALL BRASS FITTINGS SHALL BE COMPRESSION TYPE.

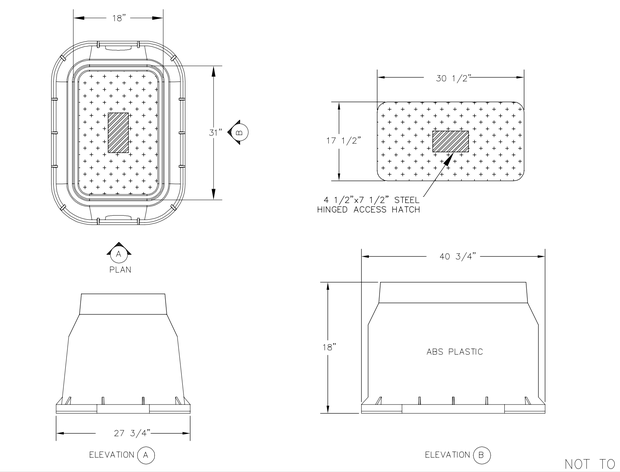
NOT TO SCALE

TYPICAL 1" METER SETTER INSTALLATION DETAIL



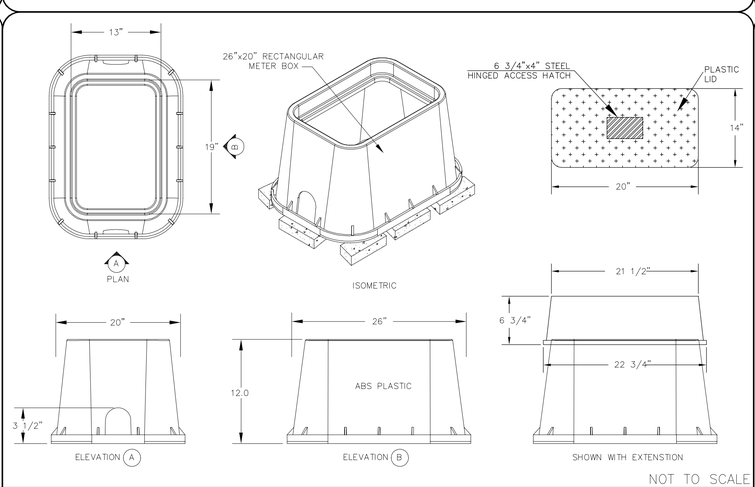
NOT TO SCALE

TYPICAL TAPPING SLEEVE AND VALVE ASSEMBLY DETAIL



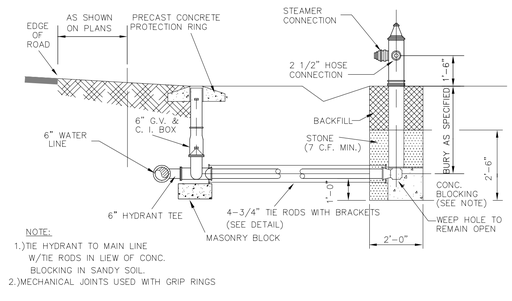
NOT TO SCALE

TYPICAL METER BOX DETAIL FOR 2" SERVICE



NOT TO SCALE

TYPICAL METER BOX DETAIL FOR 1" SERVICE



NOTE:
1.)TIE HYDRANT TO MAIN LINE W/TIE RODS IN LIEW OF CONC. BLOCKING IN SANDY SOIL.
2.)MECHANICAL JOINTS USED WITH GRIP RINGS

NOT TO SCALE

TYPICAL FIRE HYDRANT INSTALLATION DETAIL

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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS 04.26.23

PROJECT: CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET: HRW WATER DETAILS

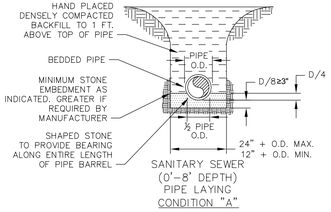
REV	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

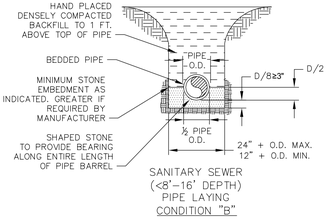
C6-7

April 25, 2023 - 5:39pm By: Jay Banks

C:\Users\Jay Banks\Banks Engineering Dropbox\BE PROJECTS\01054 Keith\Corp\013 Harnett MOB\Dwg\C6-0 TO C6-8 DETAILS.dwg



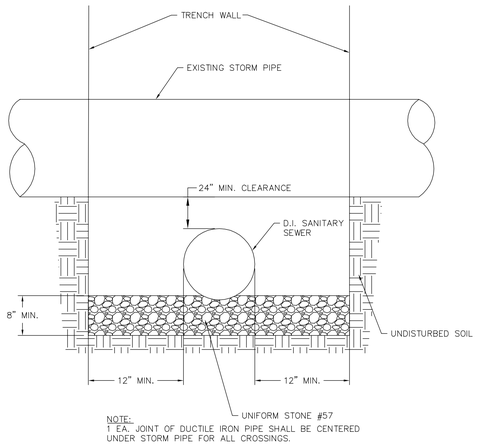
SANITARY SEWER
(0'–8' DEPTH)
PIPE LAYING
CONDITION "A"



SANITARY SEWER
(<8'–16' DEPTH)
PIPE LAYING
CONDITION "B"

NOT TO SCALE

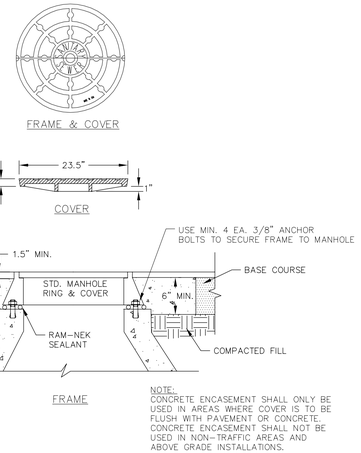
TYPICAL PIPE LAYING CONDITION A & B DETAIL



NOTE:
1 EA. JOINT OF DUCTILE IRON PIPE SHALL BE CENTERED UNDER STORM PIPE FOR ALL CROSSINGS.

NOT TO SCALE

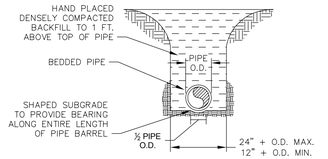
TYPICAL STORM SEWER CROSSING FOR SANITARY SEWER DETAIL



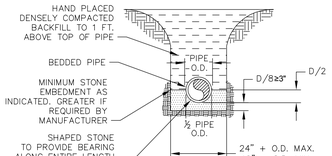
NOTE:
CONCRETE ENCASEMENT SHALL ONLY BE USED IN AREAS WHERE COVER IS TO BE FLUSH WITH PAVEMENT OR CONCRETE. CONCRETE ENCASEMENT SHALL NOT BE USED IN NON-TRAFFIC AREAS AND ABOVE GRADE INSTALLATIONS.

NOT TO SCALE

TYPICAL STANDARD MANHOLE FRAME & COVER DETAIL



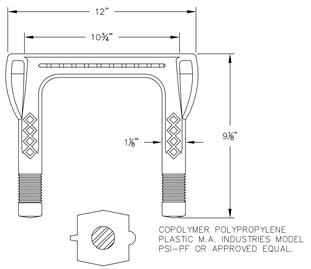
SANITARY SEWER
(DUCTILE IRON ONLY)
(0'–16' DEPTH)
PIPE LAYING
CONDITION "C"



SANITARY SEWER
(DUCTILE IRON ONLY)
(>16' DEPTH)
PIPE LAYING
CONDITION "D"

NOT TO SCALE

TYPICAL PIPE LAYING CONDITION C & D DETAIL

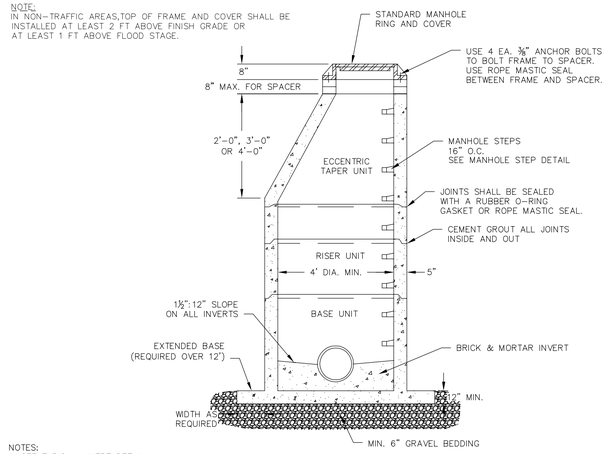


COPOLYMER POLYPROPYLENE PLASTIC M.A. INDUSTRIES MODEL PSI-PF OR APPROVED EQUAL.

NOT TO SCALE

TYPICAL POLYPROPYLENE PLASTIC STEP DETAIL

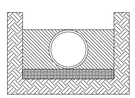
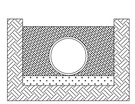
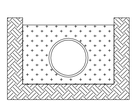
NOTE:
IN NON-TRAFFIC AREAS,TOP OF FRAME AND COVER SHALL BE INSTALLED AT LEAST 2 FT ABOVE FINISH GRADE OR AT LEAST 1 FT ABOVE FLOOD STAGE.



NOTES:
1. SEE TYPICAL INVERT DETAIL.

NOT TO SCALE

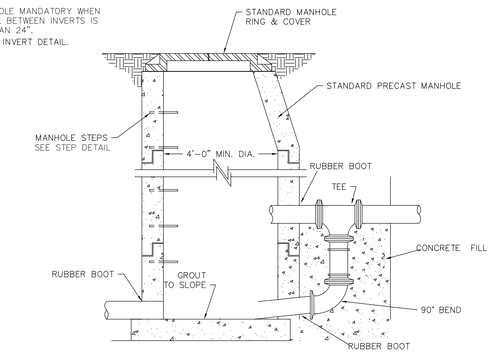
TYPICAL STANDARD PRECAST CONCRETE MANHOLE DETAIL

LAYING CONDITIONS	DESCRIPTION	PROJECT USE
 TYPE 3	PIPE BEDDED IN 4" MININUM JOB EXCAVATED MATERIAL. BACKFILL LIGHTLY CONSOLIDATED TO TOP OF PIPE.	ALL DUCTILE IRON GRAVITY SEWER LINE.
 TYPE 4	PIPE BEDDED IN SAND, GRANULAR MATERIAL OR GRADED GRAVEL TO THE DEPTH OF 1/8 PIPE DIAMETER, 4" MIN. JOB EXCAVATED MATERIAL COMPACTED TO 4" ABOVE TOP OF PIPE. (APPROX. 95% STANDARD PROCTOR, AASHTO T-99)	ALL PVC WATER LINE AND PVC FORCE MAIN.
 TYPE 5	PIPE BEDDED TO ITS CENTERLINE IN COMPACTED GRANULAR MATERIAL 4" MIN. UNDER PIPE. COMPACTED GRANULAR OR SAND MATERIAL TO 4"ABOVE TOP OF PIPE. (APPROX. 95% STANDARD PROCTOR, AASHTO T-99)	ALL PVC GRAVITY SEWER LINE.
	GRAVITY SEWER SDR-35 PIPE FULLY ENCOMPASSED IN 57 STONE 4" UNDER TO 4" ABOVE TOP OF PIPE SDR-26 PIPE GRAVEL 4" BELOW TO TOP OF PIPE	

NOT TO SCALE

TYPICAL LAYING CONDITIONS DETAIL

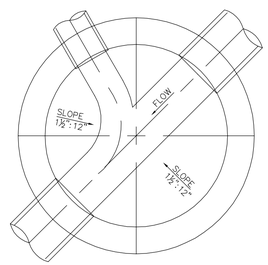
NOTE:
1. PIPE SIZE FOR DROP TO EQUAL INFLOW SEWER PIPE SIZE.
2. FITTINGS FOR DROPS SHALL BE C-900 OR SCHEDULE 40 PVC.
3. SAW-CUT OR DRILL ALL HOLES FOR PIPE AND BOLTS.
4. DROP-MANHOLE MANDATORY WHEN DIFFERENTIAL BETWEEN INVERTS IS GREATER THAN 24".
5. SEE TYPICAL INVERT DETAIL.



NOT TO SCALE

TYPICAL OUTSIDE DROP MANHOLE DETAIL

NOTE:
1. THE FLOW CHANNEL THROUGH MANHOLES SHOULD BE MADE TO CONFORM IN SHAPE AND SLOPE TO THE SEWER MAIN.
2. CHANGE IN DIRECTION OF THE CHANNEL SHALL NOT BE EXCEED 90 DEGREES.
3. SEE TYPICAL MANHOLE STRUCTURE.



NOT TO SCALE

TYPICAL MANHOLE INVERT DETAIL

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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT:
CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET:
HRW SANITARY SEWER DETAILS

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C6-8

SPECIFICATIONS AND SPECIAL PROVISION NOTES

The following specifications and special provisions are intended to be used in conjunction with Approved Plan Set, Local municipality standard details - if applicable, NCDOT Roadway Standard Drawings and NCDOT Standard Specifications for all development.

I. STREETS, DRIVE AISLES & PARKING AREAS

A. GENERAL NOTES

1. All work and materials shall conform to the latest edition of the North Carolina Department of Transportation Standard Specifications for Roads and Structures unless otherwise specified in this plan set.
2. All asphalt cuts shall be made with a saw when preparing street surfaces for patching or widening strips.
3. Paper joints shall be used to seal the ends of an asphalt pour so that future extensions can be made without causing rough joints.
4. When placing asphalt against existing surfaces, a straight edge shall be used to prevent “humping” at that location.
5. Stone shall be primed if paving is not complete within seven days following stone base approval.
6. Surfaces shall be tacked when asphalt is being placed over existing asphalt streets or adjoining concrete, storm drain and sanitary sewer structures.
7. In rolling and hilly terrains, sweeping of the stone base and/or application of a tack coat may be required near intersections. These requirements will be established by the applicable municipality inspector based on field conditions.
8. ALL concrete used for streets, curb and gutter, sidewalks and drainage structures, etc. shall have a minimum compressive strength of 3600 PSI at 28 days. This requirement shall be provided regardless of any lesser compressive strength specified in the North Carolina Department of Transportation Standard Specifications for Roads and Structures. For improvements to non-private facilities and at the direction of municipality inspector, the contractor shall prepare concrete test cylinders in accordance with Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures at the direction of the project inspector. All equipment and cylinder molds shall be furnished by the contractor. It shall be the responsibility of the contractor to protect the cylinders until such time as they are transported for testing. Testing for projects shall be performed by an independent testing lab, at no cost to the municipality. The contractor shall provide equipment and perform tests on concrete for a maximum slump and air content as defined in Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures. These tests shall be performed at a frequency established by the inspector. Materials failing to meet specifications shall be removed by the contractor.
9. All concrete shall be cured with 100% Resin Base, white pigmented curing compound which meets ASTM Specifications C- 309, Type 1, applied at a uniform rate at one (1) gallon to 400 square feet within 24 hours of placement of the concrete.
10. All curb and gutter shall be backfilled with soil approved by the Owner/Developer contracted Geotechnical testing firm and/or municipality inspector within 48 hours after construction to prevent erosion.
11. All backfill shall be non-plastic in nature, free from roots, vegetative matter, waste, construction material or other objectionable material. Said material shall be capable of being compacted by mechanical means and the material shall have no tendency to flow or behave in a plastic manner under the tamping blows or proof rolling.
12. Materials deemed by the Geotechnical testing firm and/or municipality inspector as unsuitable for backfill purposes shall be removed and replaced with select backfill material.
13. All trenches in the street right-of-way or under proposed pavement shall be backfilled with suitable material immediately after the pipe is laid. The fill around all pipe shall be placed in layers not to exceed six (6) inches and each layer shall be compacted thoroughly. For Storm Drainage see Backfill under Storm Drainage section.
14. Under no circumstances shall water be permitted to rise in un-backfilled trenches after the pipe has been placed.
15. Compaction requirements shall be attained by the use of mechanical compaction methods. Each six (6) inch layer of backfill shall be placed loose and thoroughly compacted into place.
16. Straight forms shall not be used for forming curb and gutter in curves.
17. All excess concrete on the front edge (lip) of gutter shall be removed when curb and gutter is poured with a machine.
18. All subgrade shall be compacted to 100% of the maximum density obtainable with the Standard Proctor Test to a depth of eight (8) inches, and a density of 95% Standard Proctor for depths greater than eight (8) inches. All tests shall be performed by Owner/Developer's contracted Geotechnical testing firm at no cost to the municipality.
19. A canvas cover or other suitable cover shall be required for transporting plant mix asphalt during cool weather when the following conditions are present:
    a) Air temperature is below 60 degrees F.
    b) Length of haul from plant to job is greater than five (5) miles.
    c) Other occasions at the municipality and/or Geotechnical testing firm's discretion when a combination of factors indicates that material should be covered in order to assure proper placement temperature.
20. Concrete or asphalt shall not be placed until the air temperature measured at the location of the paving operation is at 35 degrees F and rising by 10:00 a.m. Concrete or paving operations should be suspended when the air temperature is 40 degrees F and descending. The contractor shall protect freshly placed concrete or asphalt in accordance with Sections 420 (Concrete Structures), 600 (Asphalt Bases And Pavements), and 700 (Concrete Pavements And Shoulders) of the North Carolina Department of Transportation Standard Specifications when the air temperature is at or below 35 degrees F and the concrete has not obtained an age of 72 hours.
21. The contractor shall maintain two-way traffic at all times when working within existing streets unless otherwise noted. This also applies to existing parking areas and drive aisles unless Owner/Developer has indicated otherwise. The contractor shall place and maintain signs, danger lights, and barricades and furnish watchmen or flagmen to direct traffic in accordance with applicable local municipality requirements. For example: City of Charlotte W.A.T.C.H. manual or NCDOT / SCDOT work zone traffic control and specifications.
22. The contractor shall do that which is necessary to control erosion and to prevent sedimentation damage to all adjacent properties and streams in accordance with the appropriate local municipality or NCDENR / SCDHEC guidelines.

B. GRADING

1. Proposed street rights-of-way shall be graded to their full width for ditch type streets and a minimum of eight (8) feet behind the curb for curb and gutter sections.
2. Unless otherwise directed by Geotechnical testing firm or local municipality inspector, fill embankments shall be formed of suitable material placed in successive layers not to exceed more than six (6) inches in depth for the full width of the cross-section or proposed grading area, including the width of the slope area. No stumps, trees, brush, rubbish or other unsuitable materials or substances shall be placed in the embankment. Each successive six (6) inch layer shall be thoroughly compacted by the sheepsfoot tamping roller, 10-ton power roller, pneumatic-tired roller, or other methods approved by the Geotechnical testing firm or local municipality inspector. Embankments over and around all pipe culverts shall be of select material, placed and thoroughly tamped and compacted as directed by the Geotechnical testing firm or local municipality inspector.

C. ROADWAY, DRIVE AISLE, PARKING AREA BASE

1. All public roadways, drive aisles, parking areas or other pavement surfaces intended for vehicular use shall be constructed with a base course per the applicable municipality requirements or Geotechnical Report. In the event of conflict, the more stringent standard shall apply.
2. The material for stone base course shall conform to the requirements of Section 1010, Aggregate for Non-Asphalt Flexible Type Base, and Section 520, Aggregate Base course of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
3. The stone base shall be compacted to 100% of the maximum density obtainable with the Modified Proctor Test (AASHTO- T180) by rolling with ring or tamping roller or with a pneumatic tired roller with a minimum weight of ten tons. When completed, the base course shall be smooth, hard, dense, unyielding and well bonded.
4. A bituminous concrete base course meeting Municipality/Owner requirements may be substituted in lieu of a stone base course.
5. Asphalt base course will only be allowed within widening strips less than five (5) feet in width.

D. ROADWAY INTERMEDIATE AND SURFACE COURSE

1. All public roadways shall be constructed with an intermediate and surface course per local municipality and/or NCDOT requirements. Private drive aisles and parking areas designated as “Heavy Duty” shall include intermediate and surface course per Geotechnical Report or approved site plans. In the event of conflict between site plans and Geotechnical Report, the more stringent standard shall apply.
2. Plant mixed asphalt shall conform in all respects to Section 610 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
3. For public roadways, the local municipality / NCDOT / SCDOT inspector shall be given a (24) twenty-four hour notification to inspect the intermediate course deficiencies. All deficiency repairs are to be monitored by a local municipality / NCDOT inspector and accepted prior to application of final layer.
4. Local municipality / NCDOT / SCDOT inspectors shall be notified prior to using recycled plant mixes.
5. Failure to meet the above requirements may result in the delay or prevention of street acceptance by the Local municipality / NCDOT / SCDOT.

E. SIDEWALKS, RAMPS, AND DRIVEWAYS

1. Where sidewalks and pedestrian routes within street crossings and/or ADA routes from ADA parking areas within private developments (including marked and unmarked crosswalks) are provided, they must be constructed so they are accessible to all potential users, including those with disabilities.
2. Sidewalks shall be constructed of not less than 3600 P.S.I. concrete and shall be four (4) inches thick, constructed on an adequately graded base, except where a sidewalk crosses a driveway it shall be six (6) inches thick. Subgrade shall be compacted to 95% of the maximum density obtainable with the Standard Proctor Test. The surface of the sidewalk shall be steel trowel and light broom finished and cured with an acceptable curing compound. Tooled joints shall be provided at intervals of not less than five (5) feet and expansion joints at intervals of not more than forty-five (45) feet. The sidewalk shall have a desired lateral slope of 1.5% (2.00% maximum).
3. Planting strip adjacent to sidewalk shall be graded to ¼ inch per foot (min.) up to 1 ¼ inch per foot (max.), except where excessive natural grades make this requirement impractical. In such cases, the engineer / local municipality inspector may authorize a suitable grade.
4. Sidewalk widths shall be a minimum of five (5) feet unless otherwise specified. For sidewalks less than five (5) feet, a 5'x5' sidewalk area is required at least every 200' for a passing zone unless otherwise provided by residential driveways, intersecting sidewalk, etc.
5. Running slope of all ramps shall be up to 7.5% (8.33% maximum) unless otherwise noted. Curb ramps are required where sidewalks intersect curbing at any street intersection, driveways or as shown on approved Site Plans.
6. Where pedestrian routes are contained within a street or right-of-way, the grade of pedestrian access routes shall not exceed the general grade established for the adjacent street or highway.

II. STORM DRAINAGE

A. GENERAL NOTES

1. All work and materials shall conform to the latest edition of the NCDOT / SCDOT Standard Specifications unless otherwise specified. ALL concrete used for drainage structures shall have a minimum compressive strength of 3600 PSI at 28 days. This requirement shall be provided regardless of any lesser compressive strength specified in the NCDOT / SCDOT Standard Specifications.
2. It will be the Contractors responsibility to check with AHJ (Authority Having Jurisdiction) to determine if prior approval by AHJ is required to use pre-cast drainage structures within their street right-of-way.
3. Pipe within municipality right-of-way shall have minimum diameter of fifteen (15) inches (eighteen (18) inches minimum on cross drain culverts).
4. Reinforced concrete pipe may be used in all storm drain applications. Unless local municipality prevents use of alternative pipe materials, High Density Polyethylene Pipe (HDPE) may be substituted for pipe diameters of 48 inches or less. Culverts 60 inches in diameter or greater may be Corrugated Aluminized Metal Pipe (CAMP) or aluminum with a minimum 14 gauge metal.
5. All pipe shall be laid with the bell or groove upgrade and the joint entirely interlocking.
6. For all pipes within municipality right-of-way, wrap geotextile (NCDOT Section 156 - Type 2 or equal) around all pipe joints. Extend geotextile at least 12 inches beyond each side of the joint or band. Secure geotextile against the outside of the pipe by methods approved by the manufacturer.
7. The minimum cover for all pipes is two (2) feet measured from the final surface. Special applications for less than two (2) feet of cover will be reviewed and approved by local municipality inspector or site engineer on a case-by-case basis. The maximum cover for storm drainage pipes shall at a minimum comply with the requirements of the North Carolina Department of Transportation Highway Design Branch Roadway Design Manual, Part I, Section 5, and “Drainage Design” or appropriate SCDOT standards. Storm pipe design that exceeds these criteria may be approved at the discretion of the local municipality inspector or site engineer.
8. All pipes in storm drain structures shall be flush with the inside wall.
9. The bottom of all storm drain structures shall be constructed flush with pipe inverts - sump conditions with standing water will not be acceptable. Precast structures that have not been manufactured to account for pipe wall thickness will require a poured concrete bottom to create required flush condition with incoming / outgoing pipe inverts.
10. All storm drain structures over three (3) feet and six (6) inches in height must have steps in accordance with local municipality or NCDOT / SCDOT requirements.
11. The interior surfaces of all storm drainage structures shall be pointed up and smoothed to an acceptable standard using mortar mixed to manufacturer's specifications.
12. Storm drainage piping shall be placed in a straight alignment at uniform grade. No changes in alignment shall be allowed except at catch basins, manholes, or other junctions that provide appropriate clean out access. The maximum length between access points is 300 linear feet. A pipe collar meeting NCDOT / SCDOT standards or standard junction structure is required where pipes from two manufactures or materials are tied together. Pipes should be on the same grade and alignment and have the same internal diameter at pipe collar location.
13. All frames, grates, rings, covers, etc., shall have a minimum of two (2) and maximum of six (6) 1" diameter vent holes and must conform to NCDOT / SCDOT standards.
14. All graded creek banks and slopes shall be at a maximum of two (2) feet horizontal to one (1) foot vertical (2:1) and not to exceed 10' without terracing or the slopes shall be designed by a Professional Geotechnical Engineer and approved by the local municipality inspector on a case by case basis.
15. All piping conveying stormwater in and out of public right-of-way shall require a post-construction as-built pipe video to confirm system has been installed correctly and is free of defects and debris. This requirement applies to all piping within right-of-way and to pipe that is only partially within right-of-way to the 1st structure beyond right-of-way limits. Video to be provided by NASSCO-PACP certified contractor.

B. BACKFILL

1. Provide and install backfill per NCDOT / SCDOT, Geotechnical Engineer or manufacture standards - whichever is more stringent. Layers shall not exceed six (6) inches loose and each layer shall be compacted thoroughly.
2. All backfill shall be non-plastic in nature, free from roots, vegetative matter, waste, construction material or other objectionable material. Said material shall be capable of being compacted by mechanical means and the material shall have no tendency to flow or behave in a plastic manner under tamping blows or proof rolling.
3. Materials deemed by the Geotechnical Engineer or local municipality inspector as unsuitable for backfill purposes shall be removed and replaced with select backfill material.
4. Backfilling of trenches shall be accomplished immediately after the pipe is laid. Do not operate heavy equipment over any pipe culvert until pipe culvert has been properly backfilled, covered and compacted with protective cover of at least three (3) feet of an approved material.
5. Compaction requirements shall be attained using mechanical compaction methods. Each layer of backfill shall be placed loose and thoroughly compacted in place.
6. Under no circumstances shall water be permitted to rise in un-backfilled trenches after pipe has been placed.
7. Unless a more stringent standard is required per note 1) above - RCP / CMP - Backfilling of trenches shall be accomplished immediately after the pipe is laid. The fill around the pipe shall be placed in layers not to exceed six (6) inches, each layer shall be thoroughly compacted to 95% of the maximum density obtainable with the Standard Proctor Test (a density of 100% Standard Proctor is required for the top eight (8) inches).
8. Unless a more stringent standard is required per note 1) above - HDPE - Backfill material used to install HDPE pipe shall be Select Material, Class II-IV, as defined by Section 1016-3 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures or SCDOT equivalent. Upon submittal of written certification of material suitability by a licensed Geotechnical engineer, NCDOT / SCDOT Class I Select Material may be used. If required by AHJ, all backfill material shall be approved by the local municipality inspector prior to placement of the material within the street right-of-way.

C. REINFORCED CONCRETE PIPE (RCP) and Culverts

1. Concrete pipe used within the street right-of-way shall be a minimum of Class III Reinforced Concrete Pipe, with a minimum diameter of fifteen (15) inches. Installation of Class IV or higher concrete pipe shall be identified on the As-Built Plan and the City inspector shall be given documentation and notification of this information prior to construction. All concrete shall be at least 3600 psi.
2. Preformed joint sealer, which conforms to ASTM C990 Section 6.2 "Butyl Rubber Sealant" and NCDOT 1032-6.F or equivalent SCDOT standard. Joints utilizing preformed joint sealant shall be used in combination with Type 2 filtration geotextile wrap around all RCP pipe joints.
3. Rubber (elastomeric) gasket seals in accordance with ASTM C 443 which are in compliance with ASTM C 1619, Class C (unless otherwise required to exceed this specification, as specified by the engineer). Joints shall be produced with single offset spigot or with a confined O-ring groove. Rubber Gaskets may be pre-lubricated profile, profile rubber gaskets, or O-ring. Rubber gasket installation shall be per manufacturer's recommendations. Where rubber gaskets meeting this section are specified, no filtration geotextile wrap is required around the joints for RCP.
4. Fill lift holes with a manufactured soil tight lift hole plug or as approved by the manufacturer. Provide the manufacturers approved method for filling lift holes if requested.
5. The maximum pipe slope for reinforced concrete pipe is 10 percent. Pipe slopes exceeding this value will require an anchoring mechanism. If not provided with construction documents, contact storm drainage design engineer prior to placement for guidance.

D. HIGH DENSITY POLYETHYLENE PIPE (HDPE)

1. The Product used shall be corrugated exterior/smooth interior pipe (Type S), conforming to the requirements of AASHTO Specification M294 (latest edition) for Corrugated Polyethylene Pipe.
2. Bell and spigot joints shall be required. Bells shall cover at least two full corrugations on each section of pipe. The bell and spigot joint shall have an “O” ring rubber gasket meeting ASTM F477 with the gasket factory installed, placed on the spigot end of the pipe. Pipe joints shall meet all requirements of AASHTO M294.
3. All HDPE pipe installed within public right-of-way must be inspected and approved by the local municipality inspector prior to any backfill being placed. The local municipality inspector must be present during the backfilling operation as well.
4. The minimum length of HDPE pipe permitted for use shall be four (4) feet. HDPE flared end sections are not allowed.

E. STANDARDS FOR DESIGN

1. All storm drainage design shall conform to the standards and specifications as provided in the North Carolina Department of Transportation Standards Specifications for Roads and Structures, SCDOT standards or local municipality requirements - whichever AHJ applies to the specific project area.
2. Adequate storm drainage shall be provided throughout the development by means of storm drainage pipes or properly graded channels.
3. If ground water is identified to be near the surface, sub-surface drainage shall be provided. In capillary soils, the water level should be four (4) to six (6) feet below the surface to prevent the rise of moisture into the subgrade. Sub-drains shall be used to lower ground water in low areas in the street.

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CHARLOTTE, NC 28203
T: 704.780.4972
NC License #P-1370

CLIENT:
THE KEITH CORPORATION
4500 Cameron Valley Pkwy.
Suite 400
Charlotte, NC 28211

NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

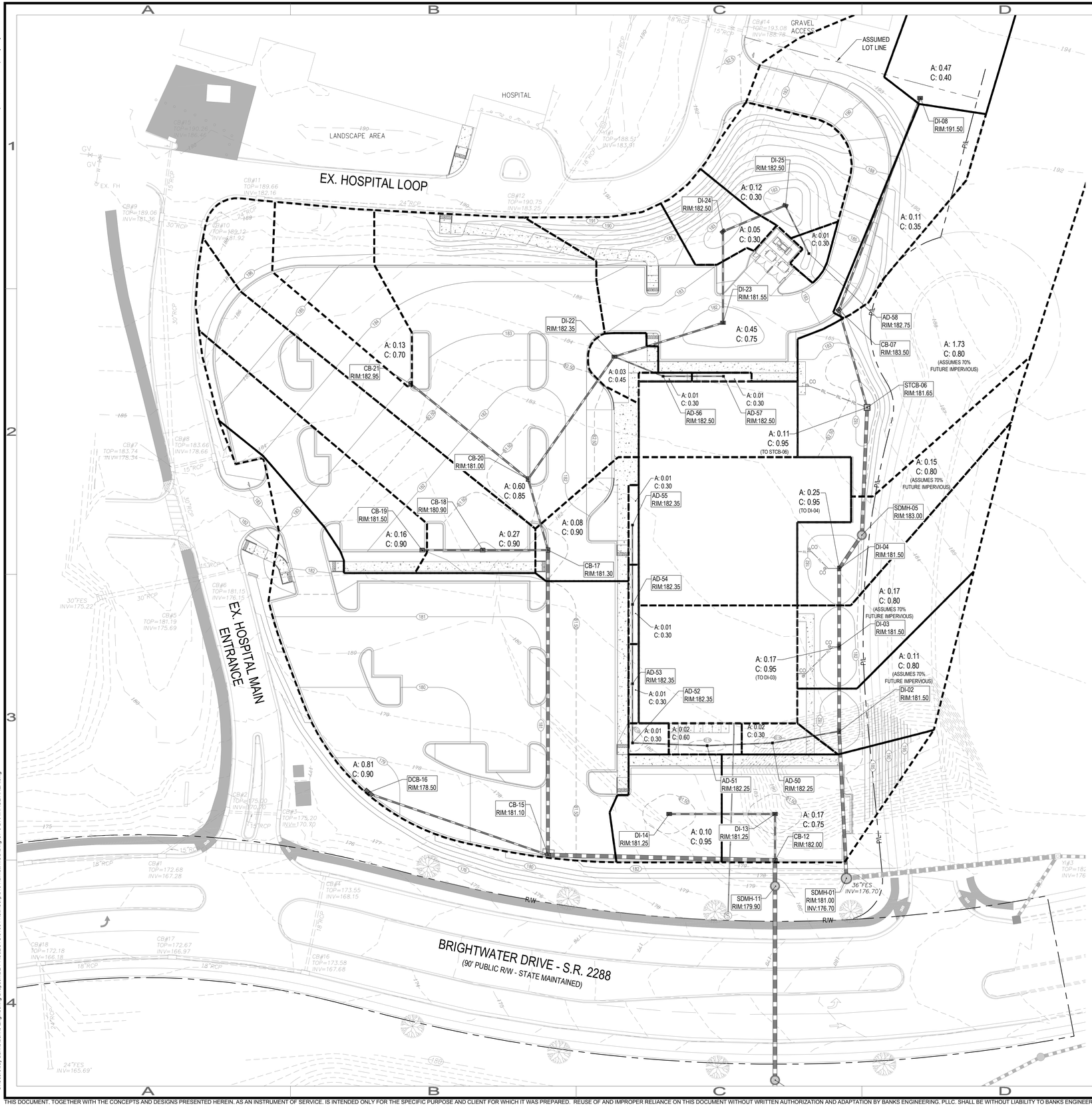
PROJECT:
CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET:
SPECIFICATIONS

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C6-9



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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT:
CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET:
DRAINAGE AREA

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C7-0

Know what's below. Call before you dig.

NORTH

SCALE: 1"= 30'
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April 25, 2023 - 5:42pm By - Jay Banks

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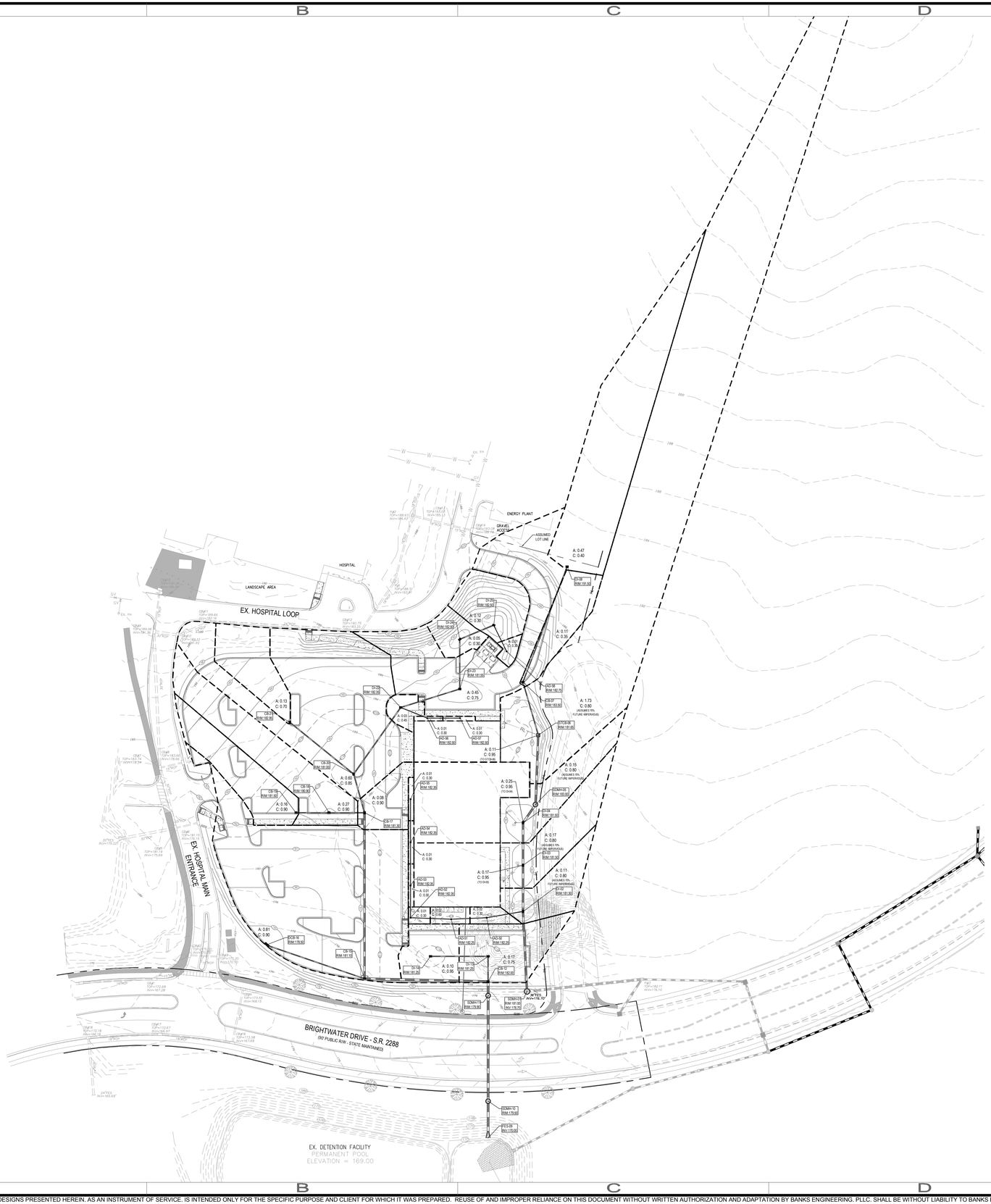

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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT:
CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET:
DRAINAGE AREA-OVERALL

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C7-1

811 Know what's below. Call before you dig.

NORTH

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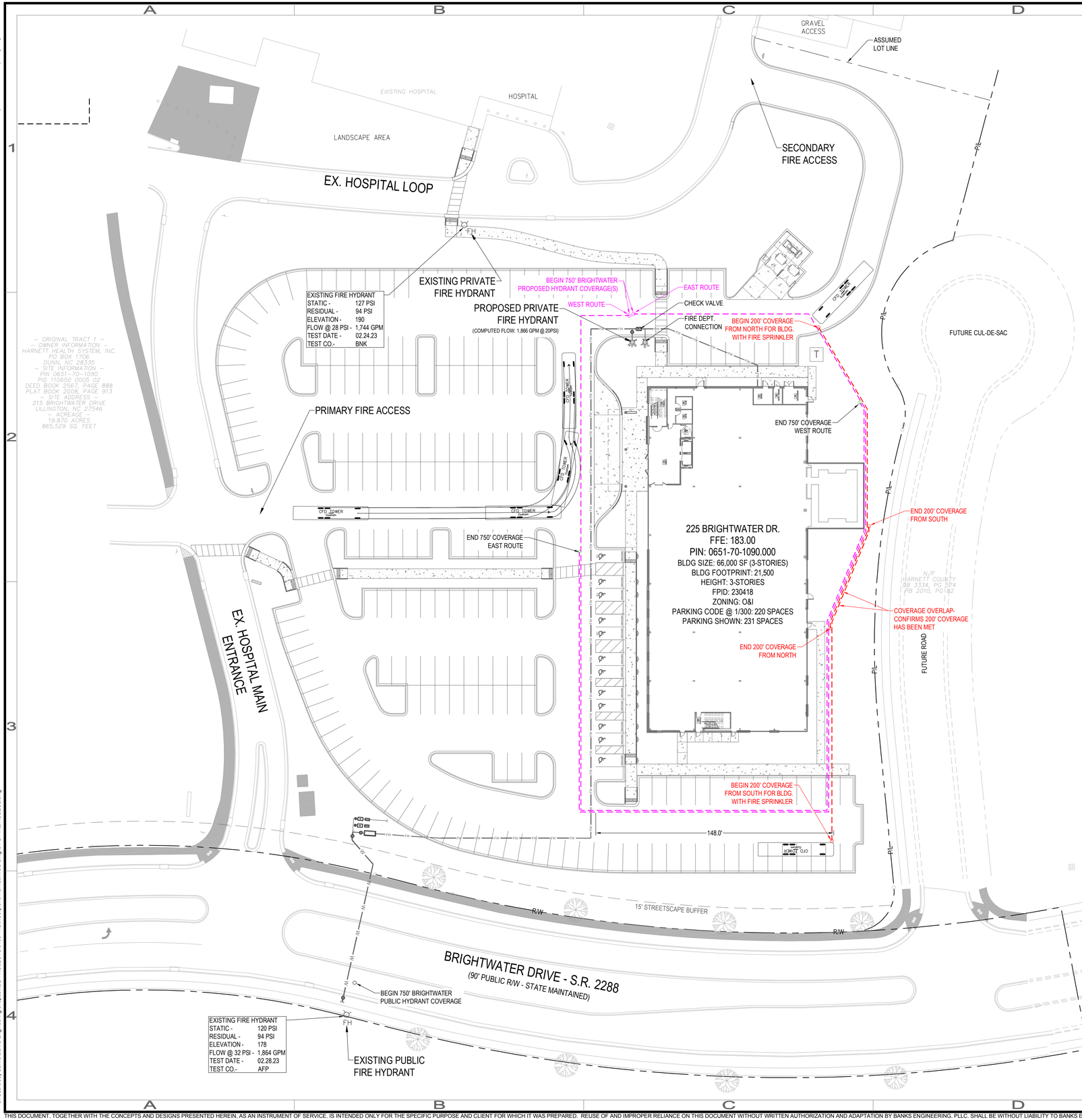

Know what's below. Call before you dig.

SCALE: 1"= 30'
0 15 30 60

NORTH

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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT:
CFVH HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET:
FIRE ACCESS

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C7-2

April 25, 2023 - 5:43pm By: Jay Banks

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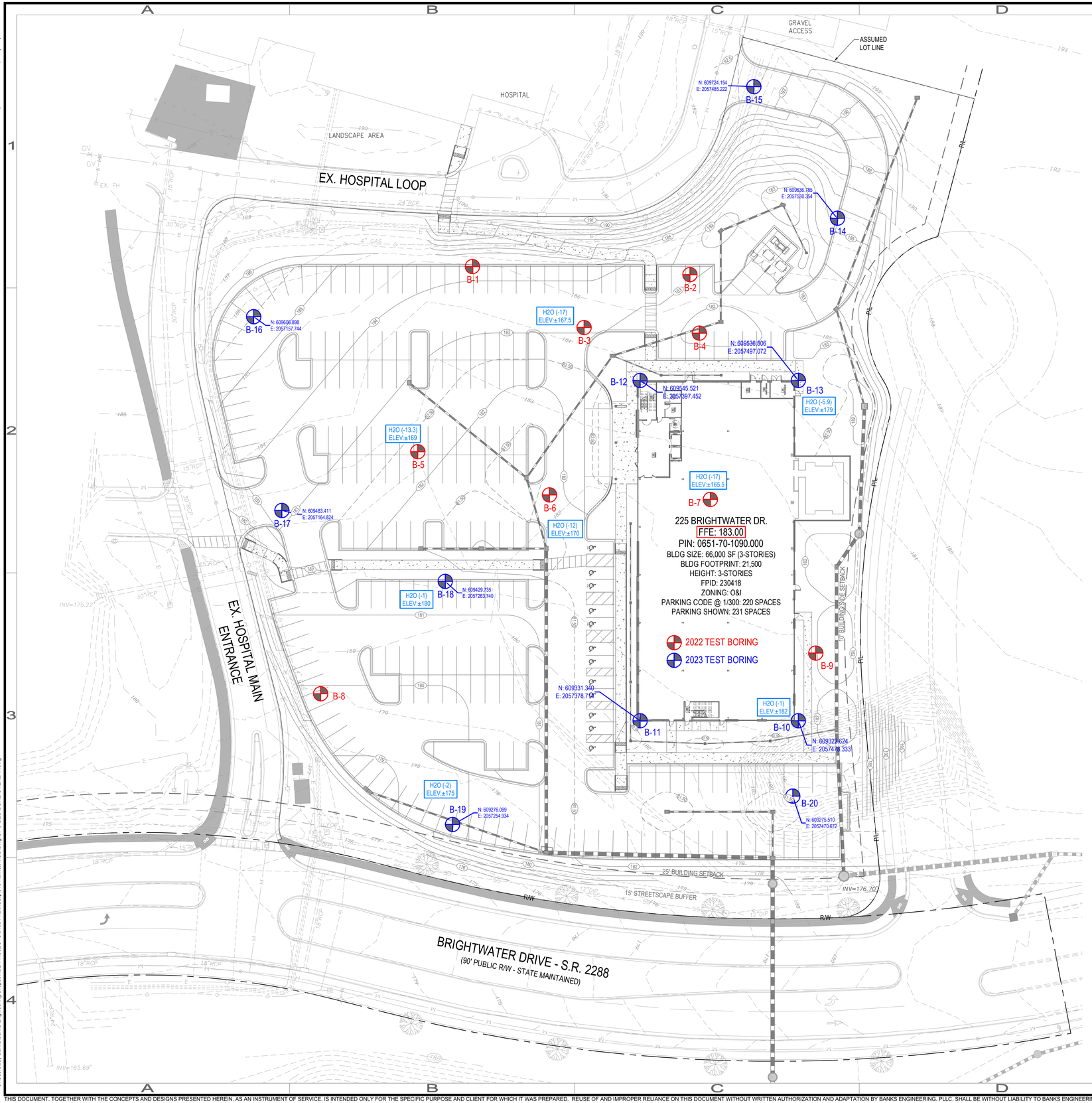

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NORTH CAROLINA PROFESSIONAL SEAL 28302 ENGINEER JAY D. BANKS
04.26.23

PROJECT:
CFV/H HARNETT MOB
225 Brightwater Dr.
Lillington, NC 27546

SHEET:
GEO-BORE
GRADE OVERLAY

REV.	DATE	DESCRIPTION
-	04.26.23	1st municipality review

DESIGNED:	JDB
DRAWN:	
CHECKED:	
PROJECT:	1024007
DATE:	04.26.23

C7-3

811 Know what's below. Call before you dig.

SCALE: 1"= 30'
0 15 30 60

April 25, 2023 - 5:44pm By: Jay Banks
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