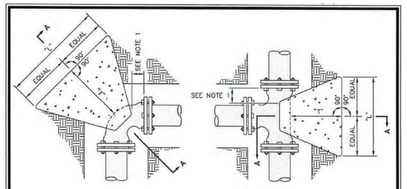
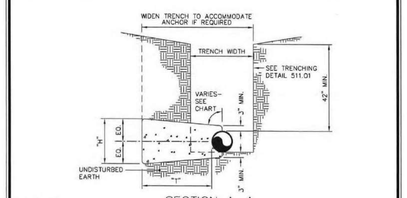




NOTES:
1. Concrete blocking is to be formed to ensure accessibility to fittings and poured against undisturbed earth.
2. Fittings are to be completely wrapped with plastic, prior to pouring concrete.
3. Concrete to be minimum 3,000 psi. @ 28 days.

OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	BLOCKING DETAIL for HORIZONTAL BENDS AND TEE	SCALE: Not To Scale	DETAIL # 512.02
		REVISION DATE: August 15, 2003	SHEET # 1 of 4

▲ TEST PRESSURE = 150 P.S.I.

PIPE SIZE	TYPE FITTING	DIMENSIONS (Ft.) "L"	"H"	"T"	VOLUME CONCRETE CU. YD.
4 INCHES	11 1/4°	---	---	---	---
	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.00	1.00	2.50	0.09
	TEE / PLUG	1.00	1.00	2.00	0.07
4 INCHES	11 1/4°	1.00	1.00	2.50	0.09
	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.00	1.00	2.50	0.09
	90°	1.50	1.50	2.50	0.15
	TEE / PLUG	1.50	1.50	2.00	0.12
6 INCHES	11 1/4°	1.50	1.50	2.50	0.15
	22 1/2°	1.50	1.50	2.50	0.15
	45°	1.50	1.50	2.50	0.15
	90°	2.00	2.00	3.00	0.28
	TEE / PLUG	2.00	2.00	2.50	0.23
8 INCHES	11 1/4°	2.00	2.00	2.50	0.23
	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.00	2.00	2.75	0.25
	90°	4.00	2.00	3.00	0.39
	TEE / PLUG	3.00	2.00	2.50	0.32
12 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	2.00	2.00	3.00	0.28
	45°	3.00	2.50	3.00	0.47
	90°	4.50	3.00	3.50	0.94
	TEE / PLUG	5.50	3.00	3.00	0.81
16 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	3.00	2.00	3.00	0.39
	45°	6.00	2.00	3.00	0.84
	90°	6.50	3.50	3.50	1.54
	TEE / PLUG	6.50	3.50	3.00	1.32

CHART NOTES:
1. If blocking excavation is in lightly compacted fill areas, or in areas where boulders or stumps have been removed, blocking size must be re-sized for the specific location/circumstance by a NC licensed Professional Engineer.
2. Blocking sizes shown in these tables assume the following:
   a. Blocking is constructed in residual soils as shown in detail
   b. Soil bearing pressure = 2000 psf
   c. Velocity of flow = 15 fps
3. This detail not applicable to reducing bends.
4. Neither the weight of the concrete blocking nor friction between concrete blocking and soil was added into blocking sizes computation. Therefore, blocking size is conservative.

OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	BLOCKING DETAIL for HORIZONTAL BENDS AND TEE	SCALE: Not To Scale	DETAIL # 512.02
		REVISION DATE: August 15, 2003	SHEET # 2 of 4

▲ TEST PRESSURE = 200 P.S.I.

PIPE SIZE	TYPE FITTING	DIMENSIONS (Ft.) "L"	"H"	"T"	VOLUME CONCRETE CU. YD.
4 INCHES	11 1/4°	1.00	1.00	1.00	0.04
	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.50	1.50	2.50	0.15
	TEE / PLUG	1.50	1.50	2.00	0.12
4 INCHES	11 1/4°	1.00	1.00	2.50	0.09
	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.50	1.50	2.50	0.15
	90°	2.00	2.00	2.50	0.15
	TEE / PLUG	1.50	1.50	2.00	0.12
6 INCHES	11 1/4°	1.50	1.50	2.50	0.15
	22 1/2°	1.50	1.50	2.50	0.15
	45°	1.50	1.50	2.50	0.15
	90°	2.50	2.00	3.00	0.33
	TEE / PLUG	2.50	2.00	2.50	0.28
8 INCHES	11 1/4°	2.00	2.00	2.50	0.23
	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.00	2.00	2.50	0.23
	90°	4.00	2.00	3.00	0.50
	TEE / PLUG	4.00	2.00	2.50	0.42
12 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	3.00	2.00	3.00	0.39
	45°	4.00	2.50	3.00	0.61
	90°	5.50	3.00	3.50	1.13
	TEE / PLUG	5.50	3.00	3.00	0.97
16 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	4.00	2.00	3.00	0.50
	45°	5.50	3.00	3.50	1.13
	90°	7.50	4.00	3.50	2.01
	TEE / PLUG	7.50	4.00	3.00	1.72

CHART NOTES:
1. If blocking excavation is in lightly compacted fill areas, or in areas where boulders or stumps have been removed, blocking size must be re-sized for the specific location/circumstance by a NC licensed Professional Engineer.
2. Blocking sizes shown in these tables assume the following:
   a. Blocking is constructed in residual soils as shown in detail
   b. Soil bearing pressure = 2000 psf
   c. Velocity of flow = 15 fps
3. This detail not applicable to reducing bends.
4. Neither the weight of the concrete blocking nor friction between concrete blocking and soil was added into blocking sizes computation. Therefore, blocking size is conservative.

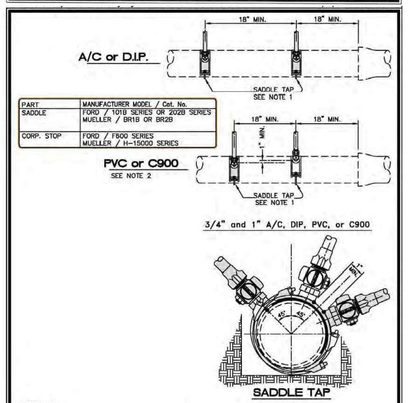
OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	BLOCKING DETAIL for HORIZONTAL BENDS AND TEE	SCALE: Not To Scale	DETAIL # 512.02
		REVISION DATE: August 15, 2003	SHEET # 3 of 4

▲ TEST PRESSURE = 250 P.S.I.

PIPE SIZE	TYPE FITTING	DIMENSIONS (Ft.) "L"	"H"	"T"	VOLUME CONCRETE CU. YD.
4 INCHES	11 1/4°	1.00	1.00	1.00	0.04
	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.50	1.50	2.50	0.15
	TEE / PLUG	1.50	1.50	2.00	0.12
4 INCHES	11 1/4°	1.00	1.00	2.50	0.09
	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.50	1.50	2.50	0.15
	90°	2.00	2.00	2.50	0.23
	TEE / PLUG	2.00	2.00	2.00	0.19
6 INCHES	11 1/4°	1.50	1.50	2.50	0.15
	22 1/2°	1.50	1.50	2.50	0.15
	45°	2.00	1.50	2.50	0.19
	90°	3.00	2.00	3.00	0.39
	TEE / PLUG	3.00	2.00	2.50	0.32
8 INCHES	11 1/4°	2.00	2.00	2.50	0.23
	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.50	2.00	2.50	0.28
	90°	4.00	2.50	3.00	0.61
	TEE / PLUG	4.00	2.50	2.50	0.51
12 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	3.00	2.00	3.00	0.44
	45°	4.50	2.75	3.00	0.74
	90°	6.00	3.50	3.50	1.43
	TEE / PLUG	6.00	3.50	3.00	1.22
16 INCHES	11 1/4°	2.50	2.00	3.00	0.33
	22 1/2°	4.00	2.50	3.00	0.61
	45°	6.00	3.50	3.50	1.43
	90°	8.00	4.50	4.00	2.74
	TEE / PLUG	8.00	4.50	3.50	2.40

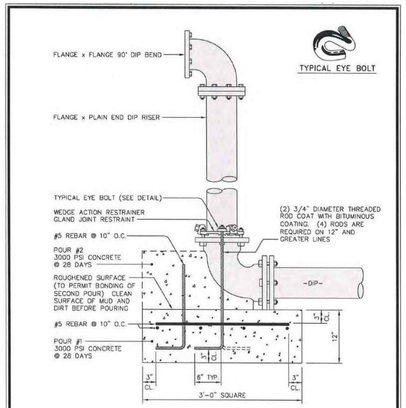
CHART NOTES:
1. If blocking excavation is in lightly compacted fill areas, or in areas where boulders or stumps have been removed, blocking size must be re-sized for the specific location/circumstance by a NC licensed Professional Engineer.
2. Blocking sizes shown in these tables assume the following:
   a. Blocking is constructed in residual soils as shown in detail
   b. Soil bearing pressure = 2000 psf
   c. Velocity of flow = 15 fps
3. This detail not applicable to reducing bends.
4. Neither the weight of the concrete blocking nor friction between concrete blocking and soil was added into blocking sizes computation. Therefore, blocking size is conservative.

OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	BLOCKING DETAIL for HORIZONTAL BENDS AND TEE	SCALE: Not To Scale	DETAIL # 512.02
		REVISION DATE: August 15, 2003	SHEET # 4 of 4



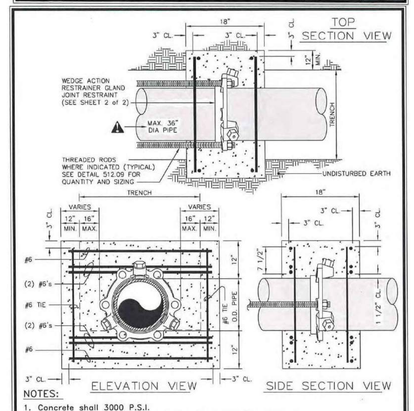
NOTES:
1. All bronze saddle (Single or double strap for 3/4" and 1")
2. If 2 taps are made on each side of the main there shall be a minimum of 18" horizontal separation. Multiple taps on the same side shall have a minimum 18" horizontal separation and staggered a minimum of 1" vertically to prevent damage to the main.

OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	STANDARD 3/4" and 1" WATER TAPPING DETAIL	SCALE: Not To Scale	DETAIL # 512.06
		REVISION DATE: October, 2011	SHEET # 1 of 1



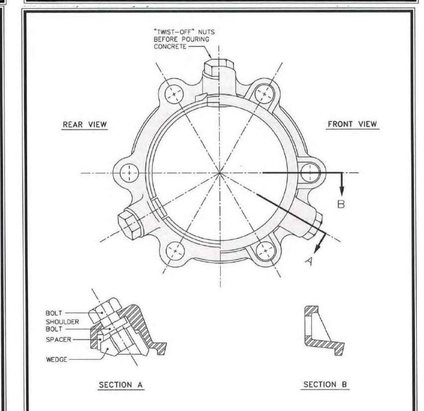
NOTES:
1. Excavate under elbow for footing, place steel & rods in footing & pour (pour #1)
2. Once concrete has set in footing pour horizontal blocking (pour #2)
3. Footing adequate for water mains up to 8". North Carolina licensed Professional Engineer to design footings for lines greater than 8" diameter.

OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	THRUST FOOTING DETAIL	SCALE: Not To Scale	DETAIL # 512.07
		REVISION DATE: August 15, 2003	SHEET # 1 of 1



NOTES:
1. Concrete shall 3000 P.S.I.
2. Reinforcing bars shall be deformed bars, and tied together.
3. Trench bottom width in vicinity of thrust block(s) installation shall be the minimum width for placement of pipe (Max trench width = pipe O.D.+2 Ft.)
4. Backfill and compact in 6" layers.
5. Place thrust collar on one full joint of pipe.
6. Last joint of pipe will not to be mechanical joint pipe.
7. Place wedge action restrainer gland joint restraint 4 feet from plug end of pipe.

OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	THRUST COLLAR & BLOCKING with WEDGE ACTION RESTRAINER GLAND	SCALE: Not To Scale	DETAIL # 512.08
		REVISION DATE: August 15, 2003	SHEET # 1 of 2



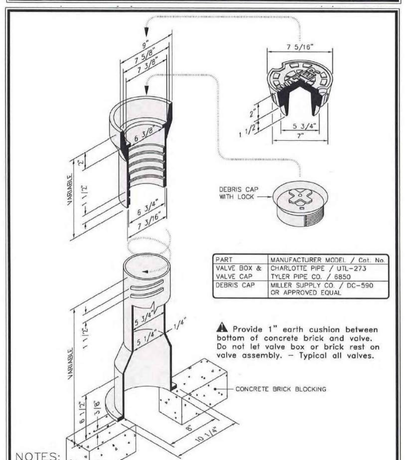
▲ A MEG-A-LUG SERIES 1100 or FORD WEDGE ACTION RESTRAINER GLAND UFR SERIES 1400 MECHANICAL JOINT RESTRAINT SHALL BE PLACED ON DIP. CONCRETE & REINFORCEMENT STEEL SHALL ALSO BE AS SHOWN ON SHEET 1 of 2.

OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	THRUST COLLAR & BLOCKING with WEDGE ACTION RESTRAINER GLAND	SCALE: Not To Scale	DETAIL # 512.08
		REVISION DATE: August 15, 2003	SHEET # 2 of 2

TIE ROD ANCHORS DATUM		
PIPE SIZE (INCHES)	ROD DIAMETER	NUMBER OF A307 RODS REQUIRED
TEST PRESSURE = 150 PSI		
6	3/4"	2
8	3/4"	2
10	3/4"	2
12	3/4"	4
16	3/4"	6
20	3/4"	8
24	3/4"	8
30	1"	10
TEST PRESSURE = 200 PSI		
6	3/4"	2
8	3/4"	2
10	3/4"	4
12	3/4"	6
16	3/4"	8
20	3/4"	12
24	3/4"	10
30	1"	14
TEST PRESSURE = 250 PSI		
6	3/4"	4
8	3/4"	4
10	3/4"	4
12	3/4"	6
16	3/4"	12
20	3/4"	14
24	3/4"	16
30	1"	20

ASTM A307 CADIUM COATED TIE RODS

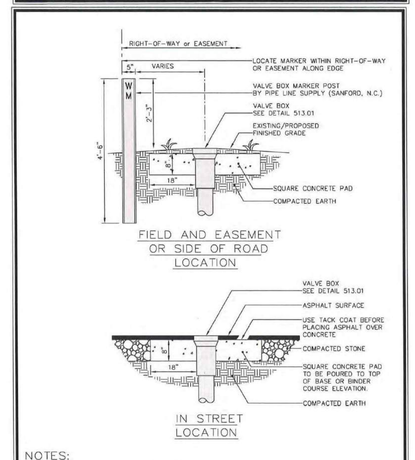
OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	TIE ROD ANCHORS DATUM CHART	SCALE: Not To Scale	DETAIL # 512.09
		REVISION DATE: August 15, 2003	SHEET # 1 of 1



▲ Provide 1" earth cushion between bottom of concrete brick and valve. Do not let valve box or brick rest on valve assembly. - Typical all valves.

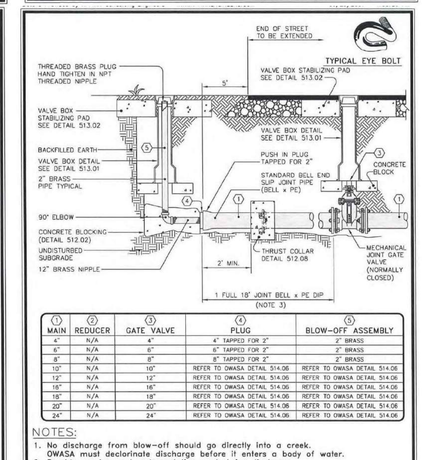
NOTES:
1. Use heavy duty traffic lid marked "WATER".

OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	STANDARD SCREW VALVE BOX DETAIL	SCALE: Not To Scale	DETAIL # 513.01
		REVISION DATE: August 15, 2003	SHEET # 1 of 1



NOTES:
1, Concrete to be minimum 3,000 PSI @ 28 days.

OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	VALVE BOX STABILIZING PAD DETAILS	SCALE: Not To Scale	DETAIL # 513.02
		REVISION DATE: August 15, 2003	SHEET # 1 of 1



① MAIN	② REDUCER	③ GATE VALVE	④ PLUG	⑤ BLOW-OFF ASSEMBLY
4"	N/A	4"	4" TAPPED FOR 2"	2" BRASS
6"	N/A	6"	6" TAPPED FOR 2"	2" BRASS
8"	N/A	8"	8" TAPPED FOR 2"	2" BRASS
10"	N/A	10"	REFER TO OWASA DETAIL 514.06	REFER TO OWASA DETAIL 514.06
12"	N/A	12"	REFER TO OWASA DETAIL 514.06	REFER TO OWASA DETAIL 514.06
18"	N/A	18"	REFER TO OWASA DETAIL 514.06	REFER TO OWASA DETAIL 514.06
18"	N/A	18"	REFER TO OWASA DETAIL 514.06	REFER TO OWASA DETAIL 514.06
20"	N/A	20"	REFER TO OWASA DETAIL 514.06	REFER TO OWASA DETAIL 514.06
24"	N/A	24"	REFER TO OWASA DETAIL 514.06	REFER TO OWASA DETAIL 514.06

NOTES:
1. No discharge from blow-off should go directly into a creek. OWASA must declorinate discharge before it enters a body of water.
2. Provide erosion and sedementation control for discharge.
3. If pipe is PE, use MJ cap and rod to thrust collar (detail 512.08).

OWASA	400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366	ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY	Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org
Quality Service Since 1977	TEMPORARY 2" BLOW-OFF ASSEMBLY FOR MAINS UP TO 24"	SCALE: Not To Scale	DETAIL # 514.05
		REVISION DATE: August 15, 2003	SHEET # 1 of 1

McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293

www.mcadamsco.com

CLIENT

WOODFIELD INVESTMENTS
11425 HORSEMAN'S TRAIL
RALEIGH, NC 27613
PHONE: 919. 535. 8947

PARK APARTMENTS
FORM DISTRICT PERMIT
1250 EPHESUS CHURCH ROAD
CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044862 NATHAN BALES
NOT RELEASED FOR CONSTRUCTION

REVISIONS

NO.	DATE	
1	05. 03. 2019	PER CHAPEL HILL AND OWASA COMMENTS

PLAN INFORMATION

PROJECT NO.	WDF-17000
FILENAME	WDF17000-D1
CHECKED BY	ZNB
DRAWN BY	HMA
SCALE	NTS
DATE	02. 28. 2019

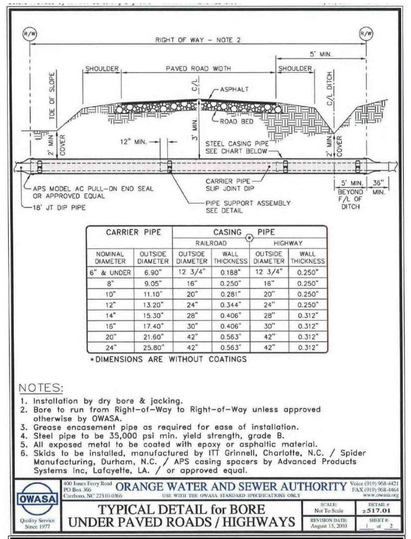
SHEET

OWASA DETAILS

D-4

X:\Projects\WDF\WDF-17000\Land\Form District Permit\Current Drawings\WDF17000-D1.dwg, 5/3/2019 9:48:51 AM, Bales, Nathan

FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION



CARRIER PIPE		CASING PIPE			
		RAILROAD		HIGHWAY	
NOMINAL DIAMETER	OUTSIDE DIAMETER	OUTSIDE DIAMETER	WALL THICKNESS	OUTSIDE DIAMETER	WALL THICKNESS
6" & UNDER	6.90"	12 3/4"	0.188"	12 3/4"	0.250"
8"	9.05"	16"	0.250"	16"	0.250"
10"	11.10"	20"	0.281"	20"	0.250"
12"	13.20"	24"	0.344"	24"	0.250"
14"	15.30"	28"	0.406"	28"	0.312"
16"	17.40"	30"	0.406"	30"	0.312"
20"	21.60"	42"	0.563"	42"	0.312"
24"	25.80"	42"	0.563"	42"	0.312"

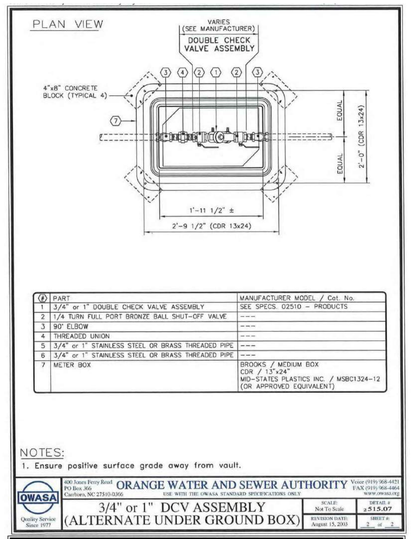
*DIMENSIONS ARE WITHOUT COATINGS

NOTES:
1. Installation by dry bore & jacking.
2. Bore to run from Right-of-Way to Right-of-Way unless approved otherwise by OWASA.
3. Grease encasement pipe as required for ease of installation.
4. Steel pipe to be 35,000 psi min. yield strength, grade B.
5. All exposed metal to be coated with epoxy or asphaltic material.
6. Skids to be installed, manufactured by ITT Grinnell, Charlotte, N.C. / Spider Manufacturing, Durham, N.C. / APS casing spacers by Advanced Products Systems Inc, Lafayette, LA. / or approved equal.

OWASA Quality Service Since 1977 | 400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366 | ORANGE WATER AND SEWER AUTHORITY USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY | Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org

TYPICAL DETAIL for BORE UNDER PAVED ROADS / HIGHWAYS

SCALE: Not To Scale | DETAIL #: s517.01 | REVISION DATE(S): August 13, 2003 | SHEET #: 1 of 2



#	PART	MANUFACTURER MODEL / Cat. No.
1	3/4" or 1" DOUBLE CHECK VALVE ASSEMBLY	SEE SPECS. 02510 – PRODUCTS
2	1/4 TURN FULL PORT BRONZE BALL SHUT-OFF VALVE	----
3	90° ELBOW	----
4	THREADED UNION	----
5	3/4" or 1" STAINLESS STEEL OR BRASS THREADED PIPE	----
6	3/4" or 1" STAINLESS STEEL OR BRASS THREADED PIPE	----
7	METER BOX	BROOKS / MEDIUM BOX CDR / 13"x24" MID-STATES PLASTICS INC. / MSBC1324-12 (OR APPROVED EQUIVALENT)

NOTES:
1. Ensure positive surface grade away from vault.

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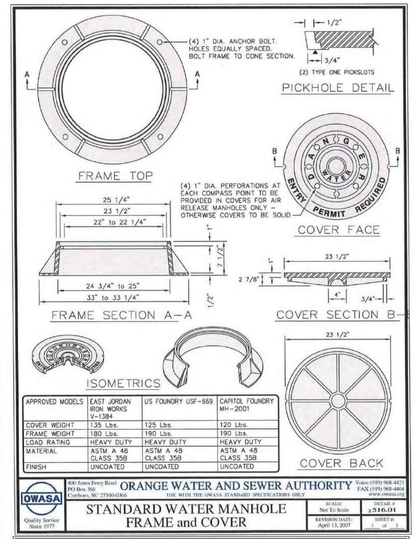
3/4" or 1" DCV ASSEMBLY (ALTERNATE UNDER GROUND BOX)

SCALE: Not To Scale | DETAIL #: s515.07 | REVISION DATE(S): August 13, 2003 | SHEET #: 1 of 2



APPROVED MODELS	EAST JORDAN IRON WORKS V-1384	US FOUNDRY USF-669	CAPITOL FOUNDRY MH-2001
COVER WEIGHT	135 Lbs.	125 Lbs.	120 Lbs.
FRAME WEIGHT	180 Lbs.	190 Lbs.	190 Lbs.
LOAD RATING	HEAVY DUTY	HEAVY DUTY	HEAVY DUTY
MATERIAL	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B
FINISH	UNCOATED	UNCOATED	UNCOATED

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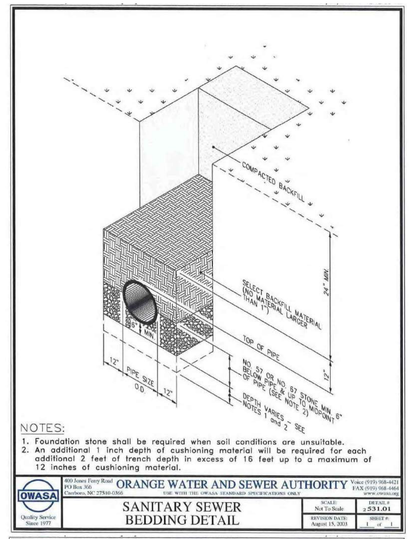
STANDARD WATER MANHOLE FRAME and COVER

SCALE: Not To Scale | DETAIL #: s516.01 | REVISION DATE(S): April 13, 2007 | SHEET #: 1 of 1



NOTES:
1. Foundation stone shall be required when soil conditions are unsuitable.
2. An additional 1 inch depth of cushioning material will be required for each additional 2 feet of trench depth in excess of 16 feet up to a maximum of 12 inches of cushioning material.

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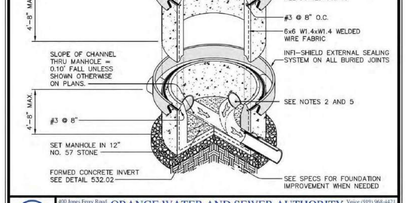
SANITARY SEWER BEDDING DETAIL

SCALE: Not To Scale | DETAIL #: s531.01 | REVISION DATE(S): August 13, 2003 | SHEET #: 1 of 1



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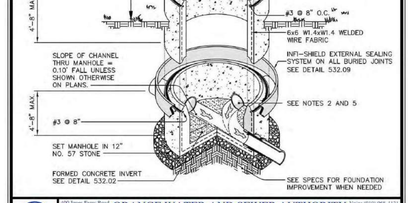
STANDARD ECCENTRIC CONE MANHOLE DETAIL

SCALE: Not To Scale | DETAIL #: s532.01 | REVISION DATE(S): April 13, 2007 | SHEET #: 1 of 3



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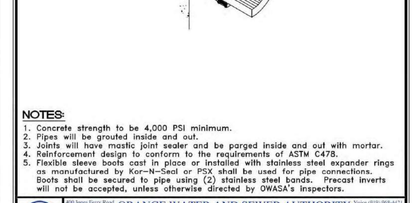
STANDARD ECCENTRIC FLAT TOP MANHOLE DETAIL

SCALE: Not To Scale | DETAIL #: s532.01 | REVISION DATE(S): MAY 21, 2015 | SHEET #: 2 of 3



PART	MANUFACTURER MODEL / Cat. No.
SLEEVE BOOTS	KOR-N-SEAL or PSX

NOTES:
1. Concrete strength to be 4,000 PSI minimum.
2. Pipes will be grouted inside and out.
3. Joints will have mastic joint sealer and be parged inside and out with mortar.
4. Reinforcement design to conform to the requirements of ASTM C478.
5. Flexible sleeve boots cast in place or installed with stainless steel expander rings as manufactured by Kor-N-Seal or PSX shall be used for pipe connections. Boots shall be secured to pipe using (2) stainless steel bands. Precast inverts will not be accepted, unless otherwise directed by OWASA's Inspectors.

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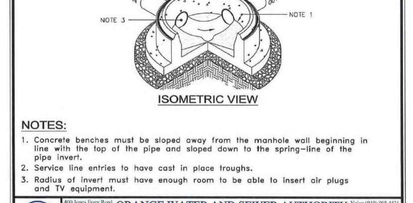
STANDARD ECCENTRIC MANHOLE DETAIL

SCALE: Not To Scale | DETAIL #: s532.01 | REVISION DATE(S): April 13, 2007 | SHEET #: 1 of 3



NOTES:
1. Concrete benches must be sloped away from the manhole wall beginning in line with the top of the pipe and sloped down to the spring-line of the pipe invert.
2. Service line entries to have cast in place troughs.
3. Radius of invert must have enough room to be able to insert air plugs and TV equipment.

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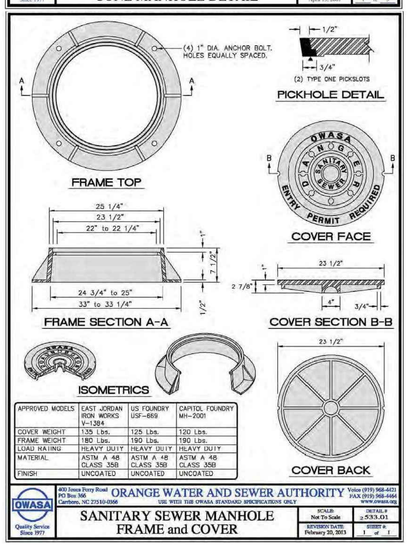
STANDARD SEWER INVERT PLANS FOR MANHOLE

SCALE: Not To Scale | DETAIL #: s532.02 | REVISION DATE(S): March 11, 2005 | SHEET #: 1 of 1



APPROVED MODELS	EAST JORDAN IRON WORKS V-1384	US FOUNDRY USF-669	CAPITOL FOUNDRY MH-2001
COVER WEIGHT	135 Lbs.	125 Lbs.	120 Lbs.
FRAME WEIGHT	180 Lbs.	190 Lbs.	190 Lbs.
LOAD RATING	HEAVY DUTY	HEAVY DUTY	HEAVY DUTY
MATERIAL	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B
FINISH	UNCOATED	UNCOATED	UNCOATED

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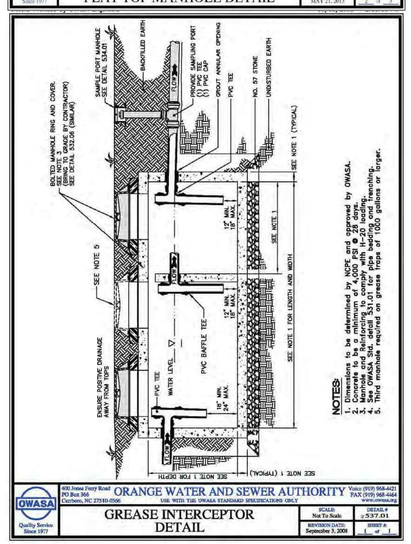
SANITARY SEWER MANHOLE FRAME and COVER

SCALE: Not To Scale | DETAIL #: s533.01 | REVISION DATE(S): February 20, 2013 | SHEET #: 1 of 1



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GREASE INTERCEPTOR DETAIL

SCALE: Not To Scale | DETAIL #: s537.01 | REVISION DATE(S): September 3, 2008 | SHEET #: 1 of 1

McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
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WOODFIELD INVESTMENTS
11425 HORSEMAN'S TRAIL
RALEIGH, NC 27613
PHONE: 919. 535. 8947

PARK APARTMENTS

FORM DISTRICT PERMIT
1250 EPHESUS CHURCH ROAD
CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA PROFESSIONAL SEAL 044862 ENGINEER NATHAN BALES — NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	
1	05. 03. 2019	PER CHAPEL HILL AND OWASA COMMENTS

PLAN INFORMATION

PROJECT NO.	WDF-17000
FILENAME	WDF17000-D1
CHECKED BY	ZNB
DRAWN BY	HMA
SCALE	NTS
DATE	02. 28. 2019

SHEET

OWASA DETAILS

D-5

FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION

X:\Projects\WDF\WDF-17000\Land\Form District Permit\Current Drawing\WDF17000-D1.dwg, 5/3/2019 9:08:56 AM, Bales, Nathan

STORMWATER CONTROL MEASURE 'A' CONSTRUCTION SPECIFICATIONS

GENERAL NOTES

1. PRIOR TO CONSTRUCTION, ANY DISCREPANCIES IN THE PLANS AND NOTES SHALL BE BROUGHT TO THE DESIGN ENGINEER'S ATTENTION IMMEDIATELY.

2. THE FINAL CERTIFICATION FOR THIS FACILITY WILL INCLUDE A CERTIFICATION BY THE ON-SITE GEOTECHNICAL ENGINEER THAT THE PROJECT WAS CONSTRUCTED PER THE APPROVED PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE ON-SITE GEOTECHNICAL ENGINEER FOR OBSERVATION AND TESTING SUCH THAT THE ON-SITE GEOTECHNICAL ENGINEER CAN CERTIFY THE CONSTRUCTION.

3. ALL CONSTRUCTION ACTIVITY RELATED TO THE PROPOSED STORMWATER CONTROL MEASURE SHALL BE PER THE DETAILS AND SPECIFICATIONS SHOWN IN THESE DRAWINGS. SOILS, COMPACTION, AND OTHER MISCELLANEOUS DETAILS AND SPECIFICATIONS MAY BE MODIFIED PER THE RECOMMENDATIONS OF THE ON-SITE GEOTECHNICAL ENGINEER. HOWEVER, PRIOR TO IMPLEMENTATION, THE DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DEVIATION FROM THESE DESIGN DRAWINGS, INCLUDING SHOP DRAWINGS FOR ANY PROPOSED MODIFICATION.

4. DURING THE INITIAL STAGES OF CONSTRUCTION, THE STORMWATER CONTROL MEASURE MAY BE USED AS A SEDIMENT BASIN FOR EROSION CONTROL PURPOSES. IF SO, THE CONTRACTOR SHALL FOLLOW THE GENERAL CONSTRUCTION SEQUENCE BELOW:

   A. THE CONTRACTOR SHALL CONSTRUCT THE ENTIRE FACILITY (PERMANENT OUTLET STRUCTURE, DAM, ETC.) WITH THE EXCEPTION OF THE INTERIOR FINE GRADING FOR THE FACILITY. THE INTERIOR FINE GRADING WILL BE CONSTRUCTED ONCE THE EROSION CONTROL PHASE IS COMPLETE.
   B. THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) SHALL BE CONNECTED TO THE PERMANENT 6"Ø DIP DRAIN PIPE.
   C. ONCE THE UPSTREAM DRAINAGE AREA IS STABILIZED AND THE EROSION CONTROL INSPECTOR APPROVES THE REMOVAL OF THE SEDIMENT BASIN, THE CONTRACTOR SHALL REMOVE THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) AND CLEAN-OUT THE BASIN. ALL SEDIMENT, TRASH, ETC. SHALL BE DISPOSED OF PROPERLY (I.E. - PLACED IN A LANDFILL) AND NOT STOCKPILED IN AN AREA WHERE WATER QUALITY COULD BE ADVERSELY AFFECTED.
   D. ONCE THE BASIN IS CLEANED OUT, AND ALL EROSION CONTROL DEVICES REMOVED, THE CONTRACTOR SHALL CONSTRUCT THE INTERIOR GRADING SHOWN ON THIS SHEET.
   E. ONCE THE GRADING IS COMPLETE, THE CONTRACTOR SHALL REQUEST AN ON-SITE INSPECTION AND AN AS-BUILT SURVEY PRIOR TO INSTALLATION OF THE STORMWATER CONTROL MEASURE PLANTS. IF THE CONTRACTOR PLANTS THE PROPOSED VEGETATION PRIOR TO AN AS-BUILT SURVEY (AND SUBSEQUENT APPROVAL), ANY CHANGES TO THE GRADING / RE-PLANTING OF PLANTS WILL BE AT THE CONTRACTOR'S EXPENSE.
   F. ONCE THE ENGINEER HAS APPROVED THE AS-BUILT GRADING, THE CONTRACTOR SHALL PLANT THE PROPOSED STORMWATER CONTROL MEASURE PLANTS SHOWN ON THE LANDSCAPE PLAN FOR THE FACILITY. AFTER COMPLETION OF THE PLANTING, THE LANDSCAPE CONTRACTOR SHALL PROVIDE A LETTER TO THE ENGINEER CERTIFYING THAT THE PLANTS HAVE BEEN INSTALLED PER THE APPROVED STORMWATER CONTROL MEASURE PLANTING PLAN.

6. ALL OSHA REQUIREMENTS FOR EXCAVATIONS (SHORING, DEPTH, ETC.) ARE THE RESPONSIBILITY OF THE CONTRACTOR. IF REQUIRED, THE CONTRACTOR SHALL PROVIDE AN EXCAVATION PLAN TO BE SEALED BY A NC P.E. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE IF AN EXCAVATION PLAN IS REQUIRED. THE JOHN R. MCADAMS COMPANY ASSUMES NO RESPONSIBILITY FOR ANY EXCAVATION DESIGN RELATED TO SAFETY OR OSHA REQUIREMENTS.

7. THE BEDDING MATERIAL FOR THE STORMWATER CONTROL MEASURE SHALL BE SPECIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER. TYPICALLY A WELL-GRADED GRANULAR MATERIAL WILL BE USED FOR THE BEDDING. PLEASE NOTE THAT IF CONSTRUCTION EQUIPMENT WILL BE OPERATING FOR AN EXTENDED PERIOD OF TIME ON THE BEDDING, THEN THE APPROPRIATE MEASURES (E.G. ENGINEERED FABRIC, STIFF GEOGRID, ETC.) SHALL BE TAKEN TO ENSURE THE INTEGRITY OF THE BEDDING IS NOT COMPROMISED.

8. IT IS ANTICIPATED THAT DEWATERING WILL BE NECESSARY IN THE EXCAVATION AREAS (E.G. - EMBANKMENT SUB GRADE, INTERIOR PORTIONS OF THE STORMWATER FACILITY, KEY TRENCH, ETC.). THEREFORE, THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE STORMWATER FACILITY SITE. DURING PLACEMENT OF FILL WITHIN THESE AREAS, THE CONTRACTOR SHALL KEEP THE WATER LEVEL BELOW THE BOTTOM OF THE EXCAVATION / CONSTRUCTION AREAS. THE MANNER IN WHICH THE WATER IS REMOVED SHALL BE SUCH THAT THE EXCAVATION BOTTOM AND SIDE SLOPES ARE STABLE, WITH NO SEDIMENT DISCHARGED FROM THE SITE (I.E. PUMPED WATER MAY NEED TO BE DIRECTED TO AN APPROVED EROSION CONTROL DEVICE SUCH AS A DIRT BAG (ACF ENVIRONMENTAL), OR ENGINEER APPROVED EQUIVALENT, PRIOR TO DISCHARGE).

9. THE RETAINING WALL ALIGNMENT SHOWN ON THESE PLANS DEPICTS THE LOCATION OF THE FRONT FACE OF THE RETAINING WALL AT THE BOTTOM.

10. THE RETAINING WALL IS TO BE A DESIGN-BUILD PROJECT(S) BY THE CONTRACTOR. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN FINAL CONSTRUCTION DRAWINGS FROM A REGISTERED PROFESSIONAL ENGINEER AND GAIN ALL REQUIRED PERMITS NECESSARY FOR THE CONSTRUCTION OF THE RETAINING WALL.

11. THE RETAINING WALL SHALL BE ASSUMED TO BE BACKFILLED WITH OFF-SITE BORROW MATERIAL OR PROCESSED FILL UNLESS CONTRACTOR CAN PROVIDE OWNER WITH CONFIRMATION FROM THE GEOTECHNICAL ENGINEER AND THE RETAINING WALL DESIGNER THAT READILY AVAILABLE ON-SITE SOILS CAN BE USED.

12. THE TOP AND BOTTOM OF WALL ELEVATIONS SHOWN ON THESE PLANS IDENTIFY FINISHED GRADE ELEVATIONS ONLY. THE EXTENT THAT THE RETAINING WALL WILL BE EXTENDED BELOW GRADE TO THE FOOTING SHALL BE IDENTIFIED ON THE RETAINING WALL CONSTRUCTION DRAWINGS.

13. THE ON-SITE GEOTECHNICAL ENGINEER SHOULD BE GIVEN AN OPPORTUNITY TO REVIEW ALL RETAINING WALL PLANS AND DESIGNS RELEVANT TO GEOTECHNICAL CONSIDERATIONS PRIOR TO FINAL DESIGN OF THE WALLS.

14. THE GRADES SHOWN ON THIS PLAN ARE FINISHED GRADES. IF THE EXISTING SOIL LAYER AFTER CONSTRUCTION / COMPACTION IS NOT DETERMINED SUITABLE BY A LANDSCAPE PROFESSIONAL FOR THE DRY POND PLANTINGS ALONG THE INTERIOR PORTIONS OF THE PROPOSED DRY POND, THEN THE CONTRACTOR SHALL AMEND THE PLANTING AREA OF THE DRY POND AS DIRECTED BY A LANDSCAPE PROFESSIONAL.

15. ANY REMOVED TOPSOIL SHALL BE STOCKPILED FOR USE IN PLANTING (SEEDING) ON THE DAM EMBANKMENT ONCE FINAL GRADES (AS SHOWN ON THE GRADING PLAN) HAVE BEEN ESTABLISHED WITH COMPACTED FILL. PRIOR TO TOPSOIL INSTALLATION, THE CONTRACTOR SHALL SCARIFY THE TOP 2"-3" OF THE BERM SECTION TO PROMOTE BONDING OF THE TOPSOIL WITH THE COMPACTED FILL. THE TOPSOIL DEPTH SHALL RANGE FROM 3"-4" ON THE DAM EMBANKMENT. PLEASE NOTE THE STOCKPILED TOPSOIL SHALL BE AMENDED, AS DIRECTED BY A LANDSCAPE PROFESSIONAL, PRIOR TO INSTALLATION ON THE EMBANKMENT.

16. THE CONTRACTOR SHALL REFER TO THE LANDSCAPE PLAN FOR THE PERMANENT PLANTING PLAN/SCHEDULE FOR THIS FACILITY. CONTRACTOR SHALL COORDINATE WITH A LANDSCAPE PROFESSIONAL REGARDING SCHEDULING FOR PLANT INSTALLATION. THE CONTRACTOR SHALL PROVIDE A ONE-YEAR WARRANTY FOR ALL PLANTS INSTALLED. PLEASE NOTE THAT NO TREES/SHRUBS OF ANY TYPE MAY BE PLANTED ON THE PROPOSED DAM EMBANKMENT (FILL AREAS).

OUTLET STRUCTURE MATERIAL SPECIFICATIONS

1. THE 30"Ø RCP OUTLET BARREL SHALL BE CLASS III RCP, MODIFIED BELL AND SPIGOT, MEETING THE REQUIREMENTS OF ASTM C76-LATEST. THE PIPES SHALL HAVE CONFINED O-RING RUBBER GASKET JOINTS MEETING ASTM C-443-LATEST. THE PIPE JOINTS SHALL BE TYPE R-4.

2. THE STRUCTURAL DESIGN FOR THE 5' X 5' (INTERNAL DIMENSIONS) RISER BOX WITH EXTENDED BASE SHALL BE BY OTHERS. PRIOR TO ORDERING THE STRUCTURES, THE CONTRACTOR SHALL PROVIDE, TO THE DESIGN ENGINEER FOR REVIEW, SHOP DRAWINGS AND SUPPORTING STRUCTURAL CALCULATIONS SEALED BY A P.E. REGISTERED IN NORTH CAROLINA DEMONSTRATING THE PERTINENT VERTICAL LOADS ARE SUPPORTED BY THE CONCRETE RISER STRUCTURE.

3. THE RISER BOX OUTLET STRUCTURE SHALL BE PROVIDED WITH STEPS 16" ON CENTER. STEPS SHALL BE PROVIDED ON THE INNER WALL OF THE RISER BOX. STEPS SHALL BE IN ACCORDANCE WITH NCDOT STD. 840.66. PLEASE REFER TO SHEET SW-A2 FOR LOCATION OF THE RISER STEPS.

4. THE CONCRETE ANTI-FLOTATION BLOCKS SHALL BE PRECAST AS THE EXTENDED BASE OF THE RISER BOX DURING FABRICATION. THE PRECAST BASE SHALL BE INCLUDED AS PART OF THE SHOP DRAWINGS THAT WILL BE SUBMITTED TO THE ENGINEER FOR REVIEW (SEE ITEM 2 ABOVE). IN LIEU OF A PRE-CAST BASE, THE CONTRACTOR MAY OPT TO CAST-IN-PLACE THE ANTI-FLOTATION BLOCK IN THE FIELD. HOWEVER, PRIOR TO CONSTRUCTING THE CAST-IN-PLACE BASE, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR REVIEW DENOTING THE FOLLOWING:

   A. STEEL REINFORCEMENT
   B. THE CONNECTION MECHANISM TO JOIN THE ANTI-FLOTATION BLOCK WITH THE RISER SECTION

5. IF THE ANTI-FLOTATION BLOCK IS PRECAST AS PART OF THE RISER BASE SECTION, THE ENTIRE PRECAST RISER BOX STRUCTURE SHALL HAVE A SHIPPING WEIGHT OF 28,651 LBS. THE STRUCTURE WEIGHT SHALL BE THE SHIPPING WEIGHT AND SHALL BE DETERMINED BY SUBTRACTING THE WEIGHT OF THE FACTORY BLOCK OUTS FROM THE GROSS STRUCTURE WEIGHT. THIS INFORMATION SHALL BE SHOWN ON THE SHOP DRAWINGS SUBMITTED TO THE ENGINEER FOR REVIEW. IF THE CONTRACTOR OPTS TO CAST-IN-PLACE THE ANTI-FLOTATION BLOCK, THE CONTRACTOR SHALL ENSURE THE WEIGHT OF THE ENTIRE RISER STRUCTURE IS EQUAL TO THE MINIMUM LISTED ABOVE.

6. THE RISER BOX JOINTS SHALL BE SEALED USING BUTYL RUBBER SEALANT CONFORMING TO ASTM-C990-LATEST. IF NECESSARY, THE CONTRACTOR SHALL INCORPORATE A WATERSTOP INTO THE RISER BOX JOINT TO ENSURE A WATERTIGHT CONNECTION. THE CONTRACTOR SHALL PARGE JOINTS ON BOTH THE INSIDE AND OUTSIDE WITH NON-SHRINK GROUT.

7. PRIOR TO ORDERING, THE CONTRACTOR SHALL SUBMIT TRASH RACK SHOP DRAWINGS TO THE ENGINEER FOR REVIEW. CONTRACTOR SHALL ENSURE THAT AN ACCESS HATCH IS PROVIDED WITHIN THE TRASH RACK (SEE DETAIL SW-A2 FOR LOCATION) THAT WILL ALLOW FOR FUTURE MAINTENANCE ACCESS. CONTRACTOR SHALL ALSO PROVIDE A CHAIN AND LOCK FOR SECURING THE ACCESS HATCH. NOTE THE ACCESS HATCH SHALL LINE UP WITH THE ACCESS STEPS AFTER INSTALLATION.

8. ALL POURED CONCRETE SHALL MEET THE FOLLOWING SPECIFICATIONS UNLESS OTHERWISE NOTED:
   -MINIMUM 3000 PSI (28 DAY)
   -SLUMP = 3" - 5"
   -ENTRAINED AIR = 5% - 7%

   PLEASE NOTE NO CONCRETE SHALL BE POURED WHEN THE AMBIENT AIR TEMPERATURES ARE EXPECTED TO BE ABOVE 85°F OR BELOW 40°F. CAST-IN-PLACE CONCRETE SHALL BE "WET CURED" AFTER FINISHING FOR A MINIMUM OF 48 HOURS.

9. GEOTEXTILE FABRIC FOR THE 30"Ø RCP OUTLET BARREL JOINTS SHALL BE MIRAFI 180N OR ENGINEER APPROVED EQUAL (NON-WOVEN FABRIC)

10. STORMWATER FACILITY EMERGENCY DRAW DOWN IS VIA AN 6"Ø PLUG VALVE. THE VALVE SHALL BE A M&H STYLE 1820 ECCENTRIC VALVE OR APPROVED EQUAL. THIS VALVE IS IN ACCORDANCE WITH AWWA C-517, AND SHALL BE OPERABLE FROM TOP OF OUTLET STRUCTURE VIA A HAND WHEEL (SEE DETAIL SHEET SW-A2). THE CONTRACTOR SHALL PROVIDE A REMOVABLE VALVE WRENCH WITH A HAND WHEEL ON TOP FOR OPERATION OF THE 6"Ø PLUG VALVE. A CHAIN AND LOCK SHALL ALSO BE PROVIDED FOR SECURING THE WRENCH TO THE TRASH RACK.

CONSTRUCTION SEQUENCE

1. PRIOR TO CONSTRUCTION, THE OWNER SHALL OBTAIN A LAND DISTURBING (GRADING) PERMIT AND AN "APPROVAL TO CONSTRUCT" FROM THE TOWN OF CHAPEL HILL AND ALL OTHER NECESSARY PERMITS FROM APPLICABLE AGENCIES (E.G. 404 / 401 PERMITS)

2. INSTALL ALL SEDIMENT AND EROSION CONTROL MEASURES PER THE APPROVED SEDIMENT AND EROSION CONTROL PLAN. THE CONTRACTOR SHALL MAINTAIN ALL APPROVED SEDIMENT AND EROSION CONTROL MEASURES THROUGHOUT THE ENTIRE PROJECT, AS REQUIRED. THE CONTRACTOR SHALL RECEIVE APPROVAL FROM THE EROSION CONTROL INSPECTOR, AS REQUIRED BY GOVERNING AGENCIES, PRIOR TO ANY CLEARING.

3. CLEAR AND GRUB AREA WITHIN THE LIMITS OF THE PROPOSED DAM CONSTRUCTION. ALL TREES AND THEIR ENTIRE ROOT SYSTEMS MUST BE REMOVED FROM THE DAM FOOTPRINT AREA AND BACKFILLED WITH SUITABLE SOIL MATERIAL. THE BACKFILLED AREAS SHALL BE COMPACTED TO THE SAME STANDARDS AS THE DAM EMBANKMENT. THE REMAINING AREA OF THE EMBANKMENT SHALL BE STRIPPED TO A SUITABLE DEPTH AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER. ANY RESIDUAL SOILS TO BE LEFT IN PLACE MUST BE WELL SCARIFIED TO PROMOTE BONDING OF THE NEW EMBANKMENT FILL. NO EMBANKMENT MATERIAL SHALL BE PLACED FOR THE DAM OR KEY TRENCH UNTIL APPROVAL OF THE DAM SUBGRADE IS OBTAINED FROM THE ON-SITE GEOTECHNICAL ENGINEER.

4. EXCAVATE FOR THE NEW KEY TRENCH ALONG THE CENTERLINE OF THE PROPOSED DAM EMBANKMENT. THE TRENCH SHALL EXTEND A MINIMUM OF 5 FT BELOW EXISTING GRADE OR 2 FT BELOW THE 30"Ø RCP OUTLET BARREL AND SHALL HAVE A MINIMUM BOTTOM WIDTH OF 5 FEET. THE KEY TRENCH SIDESLOPES SHALL BE A MINIMUM OF 1:1 (H:V). THE KEY TRENCH SHALL BE COMPACTED TO THE SAME SPECIFICATION LISTED IN ITEM 4 OF THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS." DEPENDING UPON ON-SITE SOIL CONDITIONS ENCOUNTERED DURING EXCAVATION, THE ON-SITE GEOTECHNICAL ENGINEER MAY VARY THE DEPTH AND DIMENSIONS OF THE KEY TRENCH AS DEEMED NECESSARY. THE ON-SITE GEOTECHNICAL ENGINEER SHALL RETAIN DOCUMENTATION OF ANY VARIATION FOR FUTURE AS-BUILT SUBMITTALS TO THE TOWN OF CHAPEL HILL.

5. BEGIN PLACEMENT OF BACKFILL WITHIN THE KEY TRENCH. THE KEY TRENCH SHALL BE COMPACTED TO THE SPECIFICATIONS LISTED ITEM 4 OF THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS." THE KEY TRENCH SHALL BE TESTED PER THE SPECIFICATIONS LISTED IN THAT SECTION.

6. PRIOR TO INSTALLATION, SUBGRADE CONDITIONS ALONG THE SPILLWAY PIPES SHOULD BE EVALUATED BY THE ON-SITE GEOTECHNICAL ENGINEER TO ASSESS WHETHER SUITABLE BEARING CONDITIONS EXIST AT THE SUBGRADE LEVEL. SHOULD SOFT OR OTHERWISE UNSUITABLE CONDITIONS BE ENCOUNTERED ALONG THE PIPE ALIGNMENTS, THESE MATERIALS SHOULD BE UNDERCUT AS DIRECTED BY THE GEOTECHNICAL ENGINEER. THE UNDERCUT MATERIALS SHALL BE REPLACED WITH ADEQUATELY COMPACTED STRUCTURAL FILL, LEAN CONCRETE OR FLOWABLE FILL AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER.

7. IN ORDER TO HELP PROTECT THE SOIL SUBGRADE FROM DETERIORATION (DUE TO EXPOSURE, RAINFALL, SEEPAGE, AND RUNOFF) BEFORE THE CRADLE CAN BE POURED, IT IS STRONGLY RECOMMENDED THAT A 3" TO 4" THICK CONCRETE MUD MAT BE POURED OVER THE SUBGRADE ONCE IT IS APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE MUD MAT WILL ALSO PROVIDE BEARING FOR THE BLOCKS THAT TEMPORARILY SUPPORT THE SPILLWAY PIPE UNTIL THE CRADLE CAN BE POURED. THE METHOD OF BLOCK SUPPORT FOR THE PIPE PROPOSED BY THE CONTRACTOR SHOULD BE SUBMITTED TO THE JOHN R. McADAMS COMPANY FOR REVIEW.

8. BEGIN CONSTRUCTION OF THE NEW EMBANKMENT. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8" THICK LIFTS PRIOR TO COMPACTION, UNLESS DIRECTED OTHERWISE BY THE ON-SITE GEOTECHNICAL ENGINEER. FILL LIFTS SHALL BE CONTINUOUS OVER THE ENTIRE LENGTH OF FILL. IF IT IS NECESSARY, THE EMBANKMENT FILL MATERIAL WILL BE OVERBUILT IN HORIZONTAL LIFTS AND CUT BACK TO FINAL GRADE IN ORDER TO ACHIEVE PROPER COMPACTION.

9. AS CONSTRUCTION OF THE EMBANKMENT MOVES FORWARD, IT WILL BE NECESSARY TO INSTALL THE CONCRETE CRADLE. SEE NOTE ON CRADLE DETAIL (SHEET SW-A3). THIS MAY BE CONSTRUCTED USING ONE OF THE FOLLOWING METHODS:

   A. IF THE PROPOSED STRUCTURAL FILL MATERIAL IS UTILIZED AS THE FORMWORK FOR THE CONCRETE CRADLE, THEN THE STRUCTURAL FILL SHOULD BE INSTALLED AND COMPACTED UP TO THE TOP OF CONCRETE CRADLE ELEVATION. ONCE THE STRUCTURAL FILL REACHES THE NEXT DOWNSTREAM JUNCTION BOX OR HEADWALL AND IS COMPACTED TO THE ELEVATION OF THE TOP OF THE CONCRETE CRADLE, EXCAVATE THE CONCRETE CRADLE TRENCH PER THE PROVIDED DETAILS AND CONSTRUCT THE CONCRETE CRADLE AS PER THE PROVIDED CONCRETE CRADLE DETAIL.

   B. IF THE PROPOSED STRUCTURAL FILL IS NOT UTILIZED AS THE FORMWORK FOR THE CONCRETE CRADLE, THEN PRIOR TO CONSTRUCTING THE STRUCTURAL FILL EMBANKMENT, THE FORMWORK FOR THE CONCRETE CRADLE SHOULD BE INSTALLED ON EXISTING GROUND AND/OR THE MUD MAT. THE CONCRETE CRADLE SHALL BE CONSTRUCTED PER THE PROVIDED DETAILS

10. AS AN ALTERNATE TO A CONCRETE CRADLE UNDER THE BARREL PIPE (SEE SHEET SW-A3), THE CONTRACTOR MAY CHOOSE TO ELIMINATE THE CONCRETE CRADLE AND USE COMPACTED BACKFILL IF THE ON-SITE GEOTECHNICAL ENGINEER WILL PROVIDE A NC PE SEALED LETTER CERTIFYING THAT THE COMPACTION UNDER, AROUND, AND ABOVE THE BARREL MEETS THE SPECIFICATIONS OF THE EMBANKMENT COMPACTION REQUIREMENTS AND MOISTURE CONTENT. THIS CERTIFICATION LETTER MUST BE SUBMITTED TO THE DESIGN ENGINEER BEFORE AS-BUILT CERTIFICATION OF THE FACILITY. THIS SEPARATE CERTIFICATION MUST BE SPECIFIC TO THE BARREL PIPE FOR THE FACILITY, AND MUST CLEARLY STATE THAT ALL SOIL MATERIAL UNDER, AROUND, AND ABOVE THE BARREL PIPE MEETS THE BERM AND SOIL COMPACTION SPECIFICATIONS ON THIS SHEET. THIS CERTIFICATION IS TO INCLUDE REFERENCE TO BOTH MATERIAL AND COMPACTION, AND MUST STATE THAT ALL MATERIALS UNDER, AROUND, AND ABOVE THE BARREL HAVE BEEN COMPACTED PER THE BERM MATERIAL SPECIFICATIONS (AT LEAST 95% OF MAXIMUM DRY DENSITY USING ASTM D698 STANDARD PROCTOR) WITH NO VOID SPACES PRESENT. THE CONTRACTORS INTENT TO UTILIZE THIS ALTERNATIVE MUST BE STATED PRIOR TO CONSTRUCTION TAKING PLACE. THIS CONTRACTORS CERTIFICATION MUST BE PRESENTED TO THE DESIGN ENGINEER BEFORE AN AS-BUILT CERTIFICATION CAN BE ISSUED FOR THIS FACILITY.

11. INSTALL RISER / BARREL ASSEMBLY, ALONG WITH THE EMERGENCY DRAIN SYSTEM. THE DRAIN VALVE LOCATED WITHIN THE RISER BOX SHALL BE KEPT OPEN UNTIL AN AS-BUILT CERTIFICATION HAS BEEN COMPLETED BY THE ENGINEER AND AN APPROVAL TO IMPOUND HAS BEEN ISSUED BY ALL APPLICABLE AGENCIES.

12. INSTALL 30" RCP OUTLET BARREL SPILLWAY FILTER FROM THE DETAILS SHOWN ON SHEET SW-A3.

13. CONSTRUCT EMBANKMENT PER SPECIFICATIONS LISTED IN THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS" AND REQUIREMENTS OF THE ON-SITE GEOTECHNICAL ENGINEER. ALL CHARACTERISTICS OF THE EMBANKMENT FILL MATERIAL SHALL MEET THE STANDARDS SET FORTH IN "BERM AND SOIL COMPACTION SPECIFICATIONS", INCLUDING COMPACTION AND MOISTURE REQUIREMENTS. IF NECESSARY TO ACHIEVE PROPER COMPACTION, THE EMBANKMENT FILL MATERIAL WILL BE OVERBUILT IN HORIZONTAL LIFTS AND CUT BACK TO PROPER FINAL GRADE. ANY HAND COMPACTION ACTIVITIES AROUND SPILLWAY OR DRAIN STRUCTURES SHALL BE CONDUCTED IN 4-INCH LOOSE LIFTS AND BE TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT. ALL COMPACTION AND MOISTURE TESTING SHALL BE CARRIED OUT AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER AND AS LISTED IN THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS".

14. UPON COMPLETION OF DAM EMBANKMENT, PROMPTLY STABILIZE AND SEED DAM EMBANKMENT PER SEEDING SCHEDULE.

15. SCHEDULE A FINAL AS-BUILT INSPECTION AND AS-BUILT SURVEY WITH THE ENGINEER. AN AS-BUILT INSPECTION SHOULD BE SCHEDULED A MINIMUM OF 60 DAYS BEFORE A PERMIT TO IMPOUND IS REQUIRED. ANY COMMENTS OR DEFICIENCIES IN THE DAM CONSTRUCTION MUST BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AND OWNER BEFORE CERTIFICATION SHALL BE GRANTED. UPON FINAL APPROVAL FROM THE TOWN OF CHAPEL HILL, CLOSE THE 6"Ø BOTTOM DRAIN VALVE IN THE RISER BOX AND BEGIN IMPOUNDING WATER. NO WATER SHALL BE IMPOUNDED BEFORE AN APPROVAL TO IMPOUND IS ISSUED FROM THE TOWN OF CHAPEL HILL.

BERM AND SOIL COMPACTION SPECIFICATIONS

1. PRIOR TO CONSTRUCTION, THE ON-SITE GEOTECHNICAL ENGINEER SHALL IDENTIFY BORROW / FILL AREAS AND VERIFY THEIR SUITABILITY FOR USE WITHIN THE DAM EMBANKMENT. ALSO, THE ON-SITE GEOTECHNICAL ENGINEER SHALL PERFORM STANDARD PROCTORS ON THE PROPOSED BORROW MATERIAL TO ENSURE THAT OPTIMUM MOISTURE CONTENT AND COMPACTION CAN BE ACHIEVED / CONTROLLED DURING CONSTRUCTION.

2. ALL FILL MATERIALS TO BE USED FOR THE DAM EMBANKMENT SHALL BE TAKEN FROM BORROW AREAS APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE FILL MATERIAL SHALL BE FREE FROM ROOTS, STUMPS, WOOD, STONES GREATER THAN 6", AND FROZEN OR OTHER OBJECTIONABLE MATERIAL. THE FOLLOWING SOIL TYPES ARE SUITABLE FOR USE AS FILL WITHIN THE DAM EMBANKMENT AND KEY TRENCH: ML AND CL. ALL FILL MATERIALS SHALL BE APPROVED BY THE ONSITE GEOTECHNICAL ENGINEER FOR THE INTENDED USE.

3. FILL PLACEMENT FOR THE EMBANKMENT SHALL NOT EXCEED A MAXIMUM 8" LIFT (UNCOMPACTED). EACH LIFT SHALL BE CONTINUOUS FOR THE ENTIRE LENGTH OF EMBANKMENT. BEFORE PLACEMENT OF FILL FOR THE BERM SECTION, ALL UNSUITABLE MATERIAL SHALL BE REMOVED AND THE SURFACE PROPERLY PREPARED FOR FILL PLACEMENT. FILL MATERIAL ADJACENT TO ALL SPILLWAY AND DRAINAGE STRUCTURES SHALL BE PLACED IN 4-INCH (UNCOMPACTED) LIFTS AND HAND-COMPACTED TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT.

4. ALL FILL SOILS USED IN THE EMBANKMENT CONSTRUCTION SHALL BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698). THE FILL SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN -1 TO +3 PERCENT OF ITS OPTIMUM MOISTURE CONTENT. COMPACTION TESTS SHALL BE PERFORMED BY THE ON-SITE GEOTECHNICAL ENGINEER DURING CONSTRUCTION TO VERIFY THAT THE PROPER COMPACTION LEVEL HAS BEEN REACHED. THE FILL SHOULD BE COMPACTED USING A SHEEPSFOOT TYPE COMPACTOR. IN ORDER TO PREVENT DAMAGE TO THE PIPE, NO COMPACTION EQUIPMENT SHALL CROSS ANY PIPE UNTIL MINIMUM COVER IS ESTABLISHED ALONG THE PIPE.

5. THE DESIGN ENGINEER SHALL BE PROVIDED WITH REPORTS AND CERTIFICATION, BY THE ON-SITE GEOTECHNICAL ENGINEER, THAT THE GEOTECHNICAL ASPECTS OF THE FACILITY HAVE BEEN CONSTRUCTED PER PLAN. THESE REPORTS AND CERTIFICATION WILL BE NEEDED DURING THE AS-BUILT CERTIFICATION PROCESS FOR THIS STORMWATER FACILITY. THEREFORE, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE TESTING AND OBSERVATION WITH THE ON-SITE GEOTECHNICAL ENGINEER.

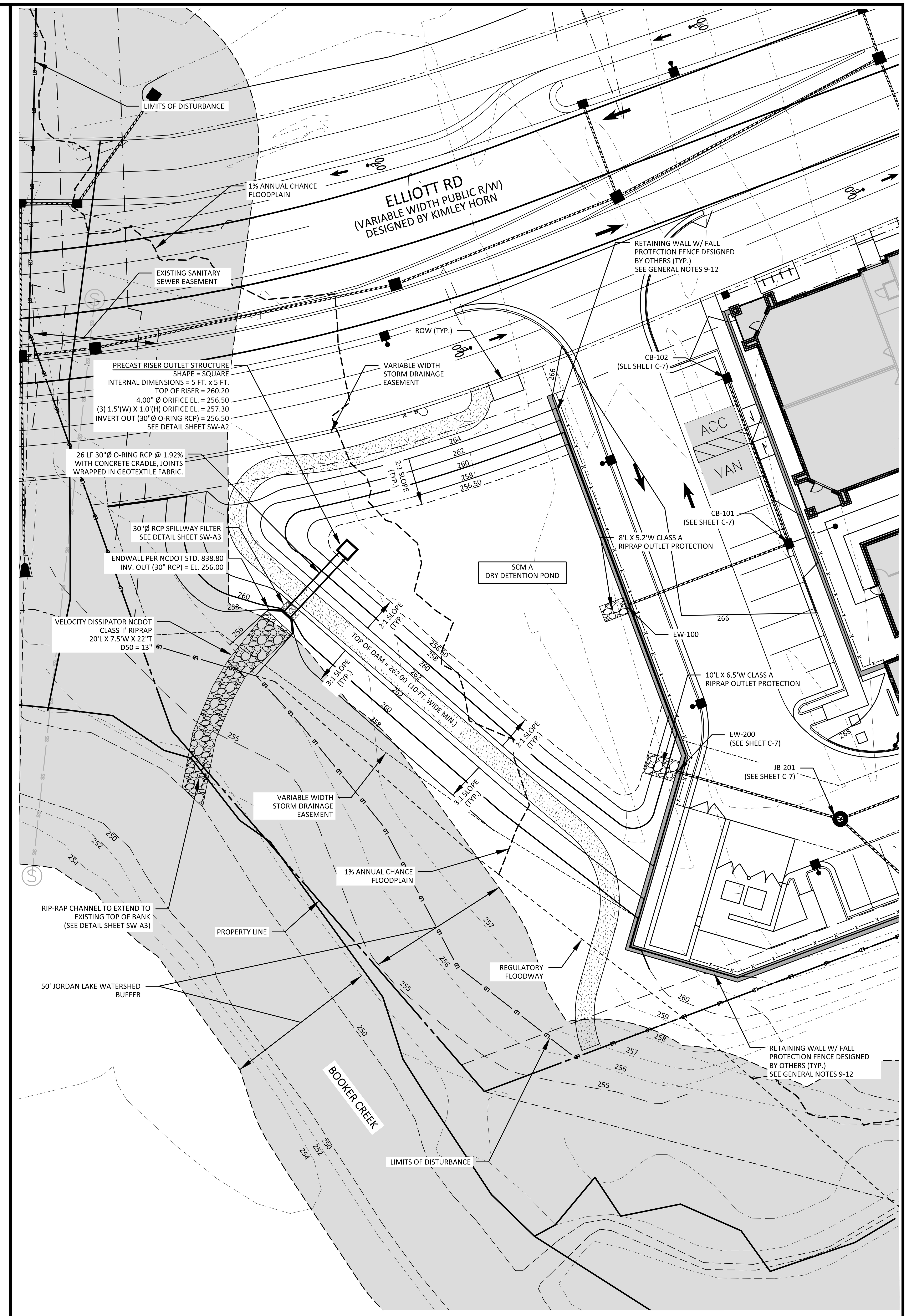
6. TESTING OF THE NEW FILL MATERIALS SHALL BE PERFORMED TO VERIFY THAT THE RECOMMENDED LEVEL OF COMPACTION IS ACHIEVED DURING CONSTRUCTION. THEREFORE, ONE DENSITY TEST SHALL BE PERFORMED FOR EVERY 2,500 SQUARE FEET OF AREA FOR EVERY LIFT OF FILL OR AS RECOMMENDED BY THE ON-SITE GEOTECHNICAL ENGINEER.

7. TESTING WILL BE REQUIRED ALONG THE 30"Ø RCP OUTLET BARREL AT A FREQUENCY OF ONE TEST PER 25 LF OF PIPE PER VERTICAL FOOT OF FILL OR AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER.

8. ON-SITE GEOTECHNICAL ENGINEER TO PERFORM SLOPE STABILITY ANALYSIS ON THE UPSTREAM FACE OF THE DAM TO CONFIRM 2:1 SLOPE IS A VIABLE SOLUTION. GEOTECHNICAL ENGINEER TO MAKE RECOMMENDATIONS FOR ANY NECESSARY VARIATION TO THE COMPACTION AND MATERIAL SPECIFICATIONS.

STATEMENT OF RESPONSIBILITY

1. ALL REQUIRED MAINTENANCE AND INSPECTIONS OF THE STORMWATER MANAGEMENT FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER, PER THE EXECUTED OPERATION AND MAINTENANCE AGREEMENT FOR THIS FACILITY.



STORMWATER CONTROL MEASURE 'A' PLAN VIEW

1" = 20'

GRAPHIC SCALE 0 10 20 40
1 inch = 20 ft.

FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION

McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293

www.mcadamsco.com

CLIENT

WOODFIELD INVESTMENTS
11425 HORSEMAN'S TRAIL
RALEIGH, NC 27613
PHONE: 919. 535. 8947

PARK APARTMENTS
FORM DISTRICT PERMIT
1250 EPHESUS CHURCH ROAD
CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA PROFESSIONAL SEAL 042537 ENGINEER JOSHUA E. SHINN
PRELIMINARY - NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	
1	05. 03. 2019	PER CHAPEL HILL AND OWASA COMMENTS

PLAN INFORMATION

PROJECT NO.	WDF-17000
FILENAME	WDF17000-SWA
CHECKED BY	KEG
DRAWN BY	SCB
SCALE	1" = 20'
DATE	02. 28. 2019

SHEET

STORMWATER CONTROL MEASURE 'A' PLAN VIEW

SW-A1

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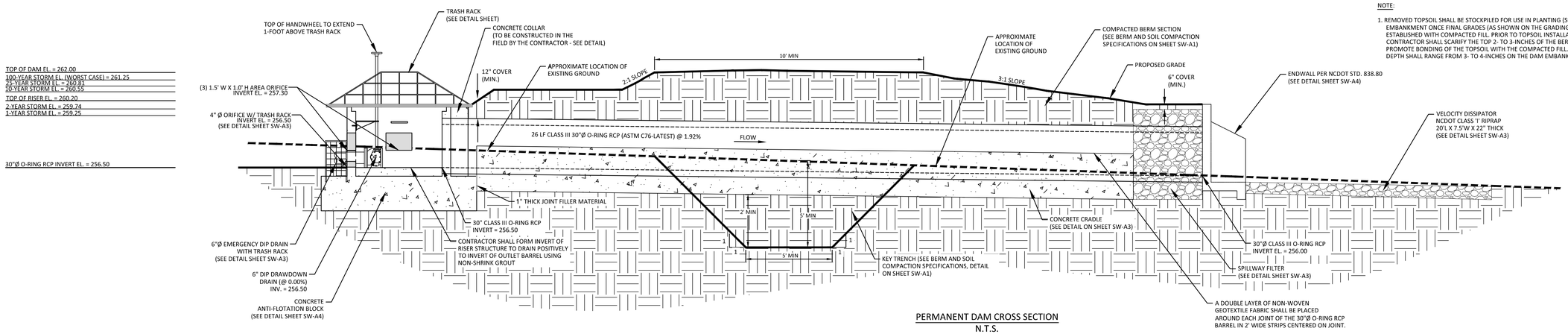
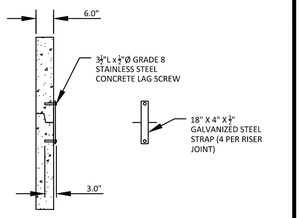


NOTE:

1. REMOVED TOPSOIL SHALL BE STOCKPILED FOR USE IN PLANTING (SEEDING) THE DAM EMBANKMENT ONCE FINAL GRADES (AS SHOWN ON THE GRADING PLAN) HAVE BEEN ESTABLISHED WITH COMPACTED FILL. PRIOR TO TOPSOIL INSTALLATION, THE CONTRACTOR SHALL SCARIFY THE TOP 2- TO 3-INCHES OF THE BERM SECTION TO PROMOTE BONDING OF THE TOPSOIL WITH THE COMPACTED FILL. THE TOPSOIL DEPTH SHALL RANGE FROM 3- TO 4-INCHES ON THE DAM EMBANKMENT.

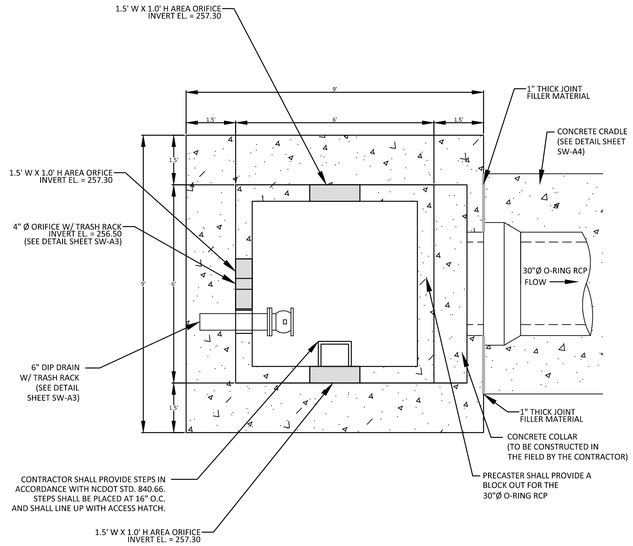
PERMANENT DAM CROSS SECTION
N.T.S.

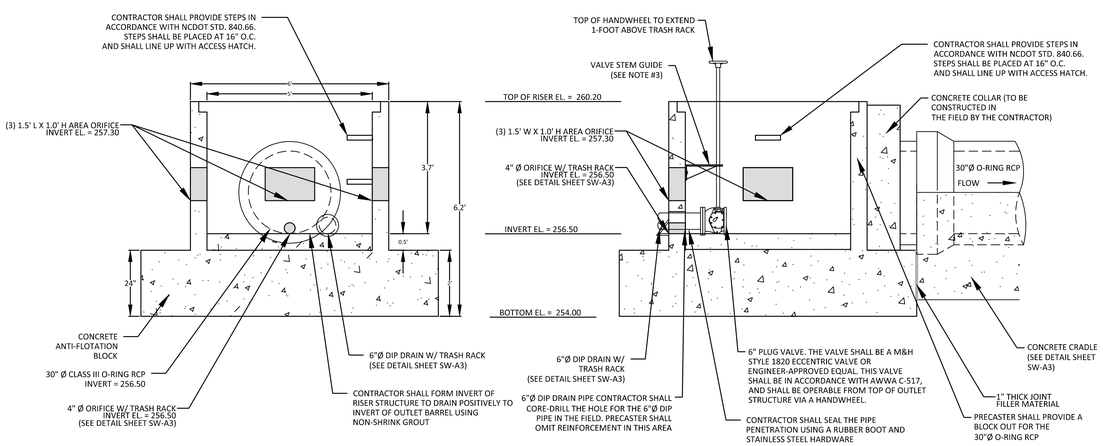


RISER JOINT CONNECTION DETAIL
N.T.S.

NOTES:

1. CONCRETE ANTI-FLOTATION BLOCK TO BE PROVIDED WITH MINIMUM TEMPERATURE AND SHRINKAGE STEEL REINFORCEMENT.
2. TRASH RACKS NOT SHOWN FOR CLARITY.
3. THE NUMBER OF GUIDES FOR THE VALVE STEM SHALL BE DETERMINED IN THE FIELD BY THE CONTRACTOR. THE VALVE STEM MUST BE OPERABLE FROM THE TOP OF THE RISER VIA THE HANDWHEEL WITH AN INSIGNIFICANT AMOUNT OF PLAY IN THE VALVE STEM.
4. CONTRACTOR SHALL PROVIDE A JOINT IN THE OUTLET BARREL NO MORE THAN 5-FT FROM THE RISER.

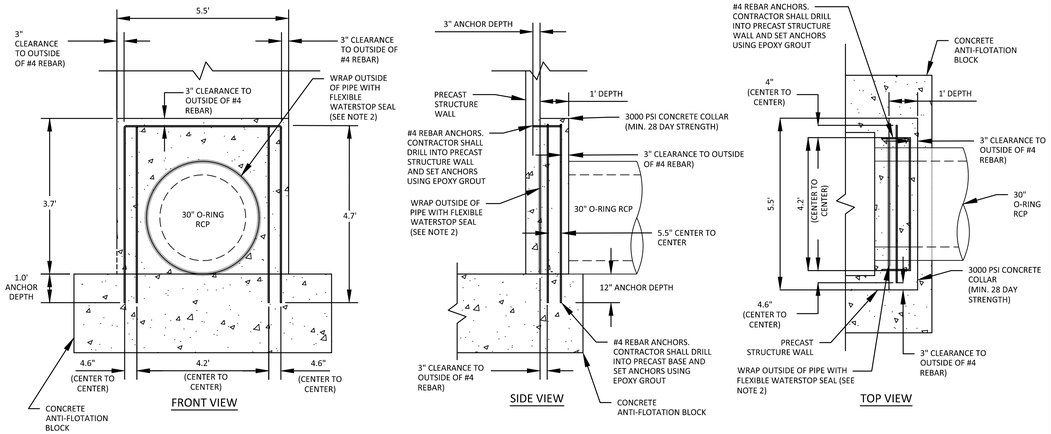




PERMANENT OUTLET STRUCTURE DETAILS
N.T.S.

NOTES:

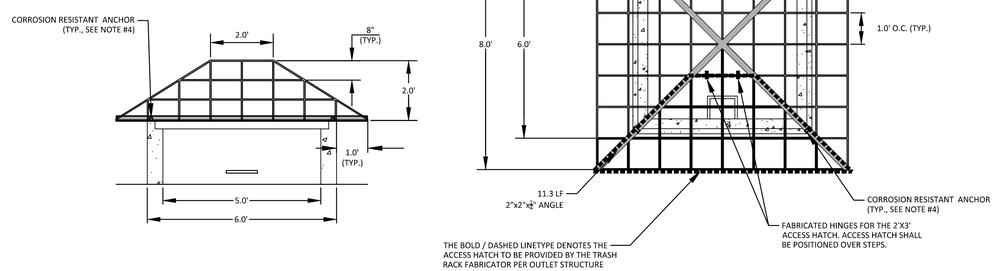
1. ALL REBAR TO BE #4 REBAR.
2. WRAP OUTSIDE OF PIPE WITH VOLCLAY WATERSTOP-RX® 101 (OR PRE-APPROVED EQUIVALENT) AT THE FACE OF THE PRECAST STRUCTURE WALL. PROVIDE 6" OVER LAP ON THE BOTTOM OF THE PIPE.



30"Ø CONCRETE COLLAR DETAIL
N.T.S.

NOTES:

1. ALL REBAR TO BE #4 REBAR.
2. ALL REBAR AND ANGLES TO BE HOT-DIPPED GALVANIZED AND BE PROVIDED WITH AN EPOXY COATING.
3. THE HOT-DIPPED, GALVANIZED 2"x2"x1/4" ANGLES SHALL BE WELDED TO THE REBAR TRASH RACK. ONCE WELDED, THE ENTIRE ASSEMBLY SHALL BE PLACED ONTO THE RISER WITH ANGLES SITTING DIRECTLY ON TOP OF RISER.
4. TRASH RACK IS TO BE SECURELY FASTENED TO THE SPILLWAY RISER WITH A MINIMUM OF FOUR CORROSION-RESISTANT ANCHORS.
5. ACCESS HATCH SHALL ALIGN WITH STEPS IN RISER.



5'X5' RISER TRASH RACK DETAIL
N.T.S.

FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION

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phone 919. 361. 5000
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WOODFIELD INVESTMENTS
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1250 EPHESUS CHURCH ROAD
CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042637 ENGINEER JOSHUA E. SHINN NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	
1	05. 03. 2019	PER CHAPEL HILL AND OWASA COMMENTS

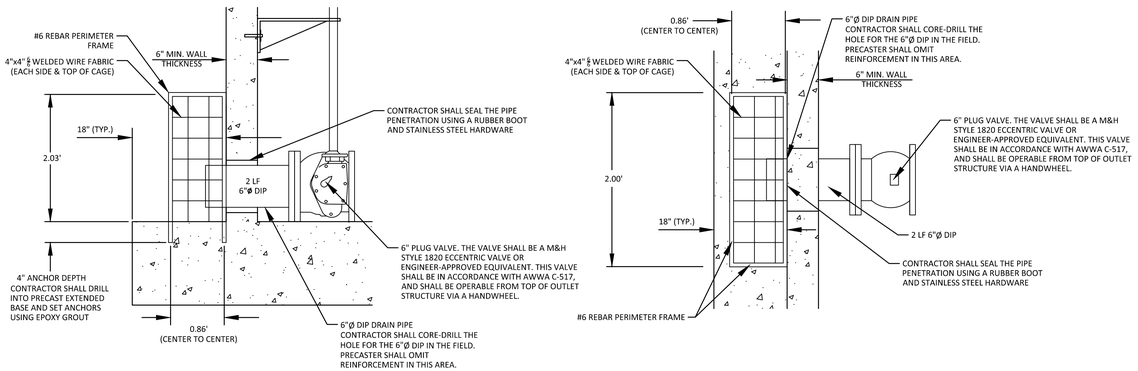
PLAN INFORMATION

PROJECT NO.	WDF-17000
FILENAME	WDF17000-SWA
CHECKED BY	KEG
DRAWN BY	SCB
SCALE	N.T.S.
DATE	02. 28. 2019

SHEET

STORMWATER CONTROL MEASURE 'A' DETAILS

SW-A2

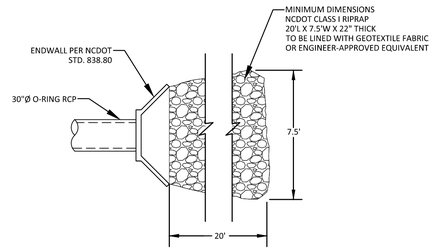


6"Ø EMERGENCY DIP DRAIN TRASH RACK DETAILS

N.T.S.

NOTES:

1. A FILTER BLANKET IS TO BE INSTALLED BETWEEN THE RIPRAP AND SOIL FOUNDATION. THE FILTER BLANKET WILL CONSIST OF A MINIMUM 4" THICK LAYER OF STONE (NCDOT #57) UNDERLAIN WITH MIRAFI FILTER WEAVE 700 OR ENGINEER-APPROVED EQUIVALENT.
2. RIPRAP TO EXTEND TO TOP OF CHANNEL WITH 2:1 SIDE SLOPES THROUGHOUT THE EXTENT OF CHANNEL.



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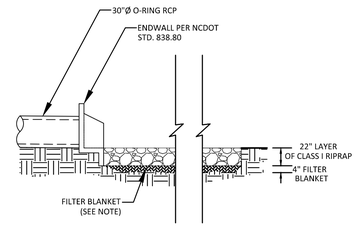


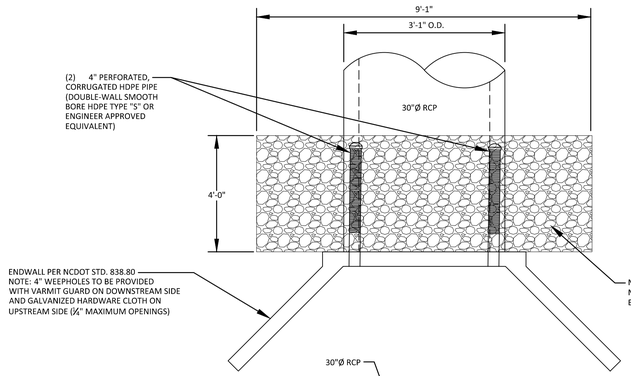
PROFILE VIEW

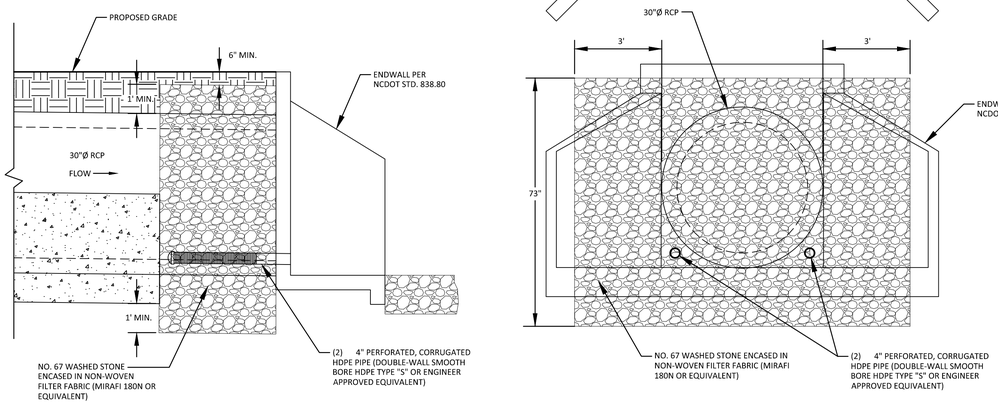
OUTLET BARREL VELOCITY DISSIPATER

N.T.S.

NOTE:

1. HAVILAND DRAINAGE PRODUCTS 4" ALUMINUM ANIMAL GUARD ITEM NUMBER 40160420 (OR ENGINEER APPROVED EQUIVALENT) TO BE INSTALLED AT OUTLET OF 4" HDPE PIPES

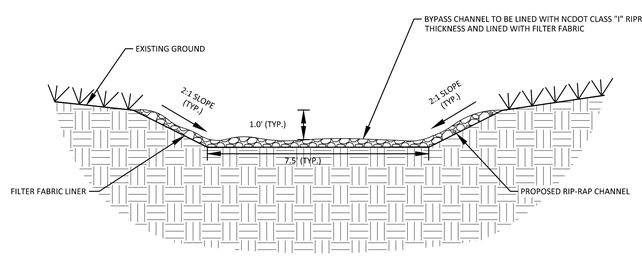




SPILLWAY FILTER DETAIL

N.T.S.

NOTE:
CHANNEL DIMENSION (1.0' DEEP, 7'.5 BOTTOM WIDTH) ARE TO TOP OF RIP-RAP IN CHANNEL. ACTUAL CHANNEL EXCAVATION MUST CONSIDER THICKNESS OF THE RIPRAP AND FILTER FABRIC LINER. BYPASS CHANNEL TO STOP AT TOP OF BANK.



RIP-RAP CHANNEL DETAIL

N.T.S.

NOTE:

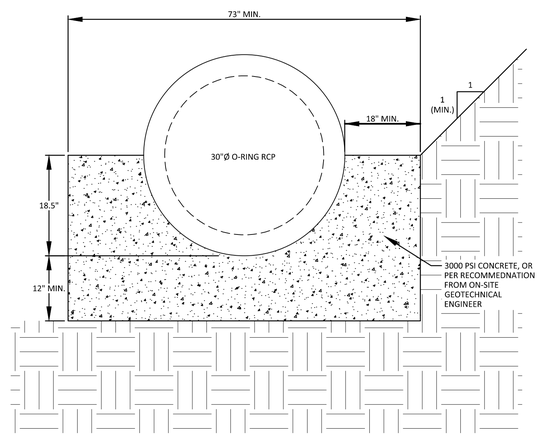
AS AN ALTERNATE TO A CONCRETE CRADLE UNDER THE BARREL PIPE (THIS DETAIL), THE CONTRACTOR MAY CHOOSE TO ELIMINATE THE CONCRETE CRADLE AND USE COMPACTED BACKFILL IF THE ON-SITE GEOTECHNICAL ENGINEER WILL PROVIDE A NC PE SEALED LETTER CERTIFYING THAT THE COMPACTION UNDER, AROUND, AND ABOVE THE BARREL MEETS THE SPECIFICATIONS OF THE EMBANKMENT COMPACTION REQUIREMENTS AND MOISTURE CONTENT. THIS CERTIFICATION LETTER MUST BE SUBMITTED TO THE DESIGN ENGINEER BEFORE AS-BUILT CERTIFICATION OF THE FACILITY. THIS SEPARATE CERTIFICATION MUST BE SPECIFIC TO THE BARREL PIPE FOR THE FACILITY, AND MUST CLEARLY STATE THAT ALL SOIL MATERIAL UNDER, AROUND, AND ABOVE THE BARREL PIPE MEETS THE BERM MATERIAL SPECIFICATIONS STATED ON SHEET SW-A1. THIS CERTIFICATION IS TO INCLUDE REFERENCE TO BOTH MATERIAL AND COMPACTION, AND MUST STATE THAT ALL MATERIALS UNDER, AROUND, AND ABOVE THE BARREL HAVE BEEN COMPACTED PER THE BERM MATERIAL SPECIFICATIONS (AT LEAST 95% OF MAXIMUM DRY DENSITY USING ASTM D698 STANDARD PROCTOR) WITH NO VOID SPACES PRESENT. THE CONTRACTORS INTENT TO UTILIZE THIS ALTERNATIVE MUST BE STATED PRIOR TO CONSTRUCTION TAKING PLACE. THIS CONTRACTORS CERTIFICATION MUST BE PRESENTED TO THE DESIGN ENGINEER BEFORE AN AS-BUILT CERTIFICATION CAN BE ISSUED FOR THIS FACILITY.

BARREL PIPE CONCRETE CRADLE CONSTRUCTION SEQUENCE

1. IF OPTION A IS CHOSEN FROM NOTE 9 OF THE CONSTRUCTION SEQUENCE (SHEET SW-A1), THEN BRING GRADE OF DAM EMBANKMENT TO SPRINGLINE OF PIPE ELEVATION. IF OPTION B IS CHOSEN FROM NOTE 9 OF THE CONSTRUCTION SEQUENCE, THEN CONSTRUCT FORMWORK FOR CONCRETE CRADLE ON EXISTING GRADE.
2. IF OPTION A IS CHOSEN FROM NOTE 9 OF THE CONSTRUCTION SEQUENCE, THEN EXCAVATE TRENCH FOR CRADLE AND BARREL PER DIMENSIONS ON DRAWINGS. IF OPTION B IS CHOSEN FROM NOTE 9 OF THE OUTLET STRUCTURE MATERIAL SPECIFICATIONS, PROCEED TO STEP 3 BELOW.
3. PLACE BARREL PIPE ON CONCRETE BLOCKS TO GRADE. AT THIS STEP, CONTRACTOR SHALL WRAP A DOUBLE LAYER OF NON-WOVEN GEOTEXTILE FABRIC AROUND EACH JOINT OF THE 30"Ø O-RING RCP BARREL IN 2' WIDE STRIPS CENTERED ON JOINT.
4. PLACE CONCRETE FOR CRADLE FOR EACH SECTION FROM ONE SIDE OF THE TRENCH. ALLOW CONCRETE TO FILL ENTIRE AREA UNDER PIPE AND PIPE HAUNCHES AS TO LEAVE NO VOIDS UNDER THE PIPE BEFORE PLACING CONCRETE ON THE OPPOSITE SIDE OF THE TRENCH. PLACE ENTIRE CRADLE AS ONE LIFT (VERTICALLY) PER DRAWINGS.
5. CONCRETE CRADLE MAY BE ELIMINATED PER RECOMMENDATION FROM THE ON-SITE GEOTECHNICAL ENGINEER. ANY DEVIATION FROM THIS DETAIL SHALL BE SUBMITTED TO AND REVIEWED BY THE DESIGN ENGINEER PRIOR TO IMPLEMENTATION. IF THE CRADLE IS ELIMINATED, THEN A LETTER FROM AN NC PE CERTIFYING THAT ALL SOIL MATERIAL UNDER, AROUND, AND ABOVE THE BARREL PIPE MEETS THE BERM MATERIAL SPECIFICATIONS STATED ON SHEET SW-A1 IS REQUIRED.
6. ALLOW CRADLE TO CURE FOR A MINIMUM OF 7 DAYS BEFORE ANY VIBRATING COMPACTION EQUIPMENT IS USED IN THE VICINITY OF THE BARREL PIPE.
7. TRENCH TO BE BACKFILLED IN 5" LIFTS WHEN COMPACTION IS BY HAND. BACKFILL IS IN 8" LIFTS WHEN CONDUCTED BY MACHINE. MINIMUM OF 2 FEET COVER MUST BE PRESENT ON 30"Ø RCP BEFORE DRIVING OVER WITH HEAVY EQUIPMENT.

NOTE:

1. CONTRACTOR SHALL PROVIDE A JOINT IN THE OUTLET BARREL NO MORE THAN 5-FT FROM THE RISER.

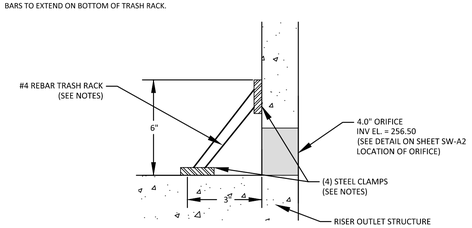


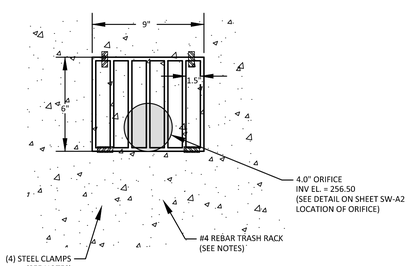
30" CONCRETE CRADLE DETAIL

N.T.S.

NOTES:

1. ATTACH TRASH RACK WITH (4) HOT DIPPED GALVANIZED STEEL CLAMPS. EACH CLAMP ATTACHED TO WEIR BOX BY (2) 4"x1/4" CONCRETE ANCHOR BOLTS. EACH CLAMP SHALL BE COATED WITH AN EPOXY COATING.
2. ALL REBAR TO BE GALVANIZED #4 REBAR WITH AN EPOXY COATING.
3. BARS TO EXTEND ON BOTTOM OF TRASH RACK.





4" ORIFICE TRASH RACK DETAIL

N.T.S.

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McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293

www.mcadamsco.com

CLIENT

WOODFIELD INVESTMENTS
11425 HORSEMAN'S TRAIL
RALEIGH, NC 27613
PHONE: 919. 535. 8947

PARK APARTMENTS

FORM DISTRICT PERMIT
1250 EPHESUS CHURCH ROAD
CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA PROFESSIONAL SEAL 042637 ENGINEER KEGAN E SHINN — NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	
1	05. 03. 2019	PER CHAPEL HILL AND OWASA COMMENTS

PLAN INFORMATION

PROJECT NO.	WDF-17000
FILENAME	WDF17000-SWA
CHECKED BY	KEG
DRAWN BY	SCB
SCALE	N.T.S.
DATE	02. 28. 2019

SHEET

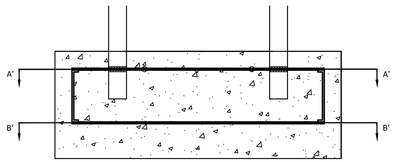
STORMWATER CONTROL MEASURE 'A' DETAILS

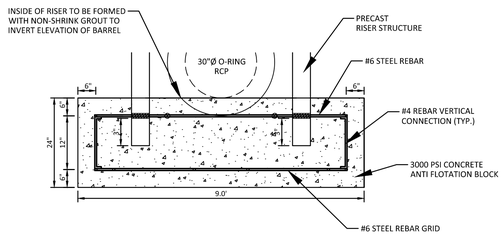
SW-A3

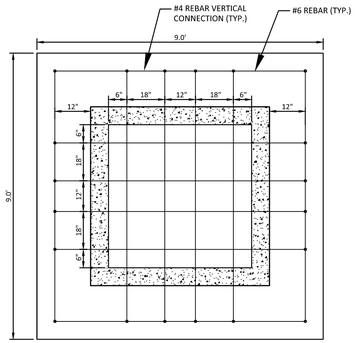
X:\Projects\WDF\WDF-17000\Storm\Form District Permit\Current Drawing\WDF17000-SWA.dwg, 5/2/2019 7:30:02 PM, Dow, Heather

NOTES:

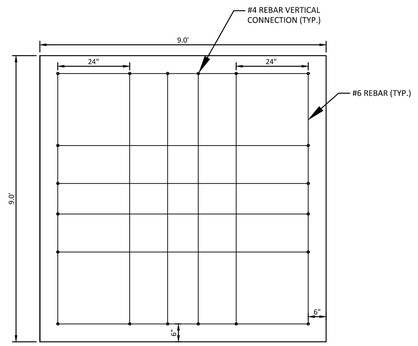
1. ALL REINFORCING STEEL IN RISER ANTI-FLOTATION BLOCK TO BE GRADE 60 #6 BARS FOR HORIZONTAL CROSSING AND GRADE 60 #4 BARS FOR VERTICAL CONNECTIONS.
2. INSIDE OF RISER BOTTOM TO BE FORMED WITH NON-SHRINK GROUT TO INVERT ELEVATION OF BARREL.
3. ALL PIPE PENETRATIONS THROUGH THE CONCRETE RISER STRUCTURE SHALL BE MADE WATERTIGHT.







CROSS SECTION A'-A'
N.T.S.



CROSS SECTION B'-B'
N.T.S.

RISER/ANTI-FLOTATION BLOCK CONNECTION
N.T.S.

SEEDBED PREPARATION

1. CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 4 INCHES DEEP OVER ADVERSE SOIL CONDITIONS, IF AVAILABLE.
2. RIP THE ENTIRE AREA TO 6 INCHES DEPTH.
3. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
4. PER ONE TIME ONLY, APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL.
5. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.
6. SEED ON A FRESHLY PREPARED SEEDBED AND COVER.
7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. AFTER PERMANENT COVER IS ESTABLISHED.
9. CONSULT CONSERVATION INSPECTOR ON MAINTENANCE TREATMENT

TEMPORARY SEEDING SCHEDULE

SEEDING DATE	SEEDING MIXTURE	APPLICATION RATE
JAN 1 - MAY 1	RYE (GRAIN)	120 LBS/AC
	KOBE LESPEDEZA	50 LBS/AC
MAY 1 - AUG 15	GERMAN MILLET	40 LBS/AC
AUG 15 - DEC 30	RYE (GRAIN)	120 LBS/AC

SOIL AMENDMENTS
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/AC GROUND AGRICULTURE LIMESTONE AND 750 LB/AC 10-10-10 FERTILIZER (FROM AUG 15 - DEC 30, INCREASE 10-10-10 FERTILIZER TO 1000 LB/AC).

MULCH
APPLY 4000 LB/AC 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
JAN 1 - AUG 15: REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE, AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

AUG 15 - DEC 30: REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOP DRESS WITH 50 LB/AC OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/AC KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

NOTE: USE THE TEMPORARY SEEDING SCHEDULE ONLY WHEN DATE IS NOT CORRECT TO USE THE PERMANENT SEEDING SCHEDULE.

PERMANENT SEEDING SCHEDULE (DAM EMBANKMENTS)

SEEDING DATE	SEEDING MIXTURE	APPLICATION RATE
AUG 25 - OCT (BEST) FEB - APR 15 (POSSIBLE)	TALL FESCUE	200 LBS/AC

SOIL AMENDMENTS
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 4,000 LB/AC GROUND AGRICULTURE LIMESTONE AND 1000 LB/AC 10-10-10 FERTILIZER.

MULCH
APPLY 4000 LB/AC 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
INSPECT AND REPAIR MULCH FREQUENTLY. REFERTILIZE IN LATE WINTER OF THE FOLLOWING YEAR; USE SOIL TESTS OR APPLY 150 LB/AC 10-10-10 FERTILIZER. MOW REGULARLY TO A HEIGHT OF 2-4 INCHES.

NOTE: PERMANENT SEEDING SCHEDULE IS FOR SLOPES OF THE BASIN AND TOP OF BERM.

SEEDING SPECIFICATIONS

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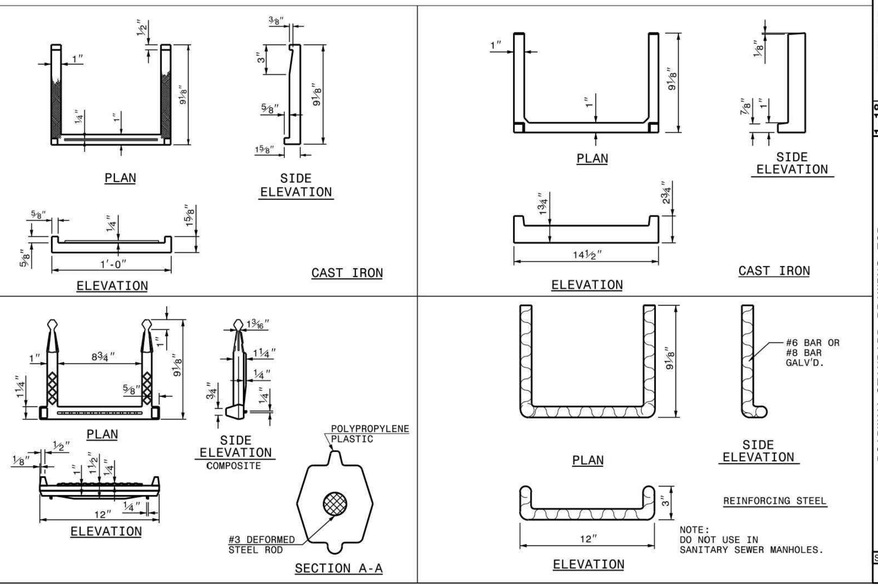
1250 EPHESUS CHURCH ROAD
CHAPEL HILL, NORTH CAROLINA, 27517

NOTES:
INSTALL ALL STEPS PROTRUDING 4" FROM INSIDE FACE OF STRUCTURE WALL.
STEPS DIFFERING IN DIMENSIONS, CONFIGURATION, OR MATERIALS FROM THOSE SHOWN MAY ALSO BE USED PROVIDED THE CONTRACTOR HAS FURNISHED THE ENGINEER WITH DETAILS OF THE PROPOSED STEPS AND HAS RECEIVED WRITTEN APPROVAL FROM THE ENGINEER FOR THE USE OF SUCH STEPS.

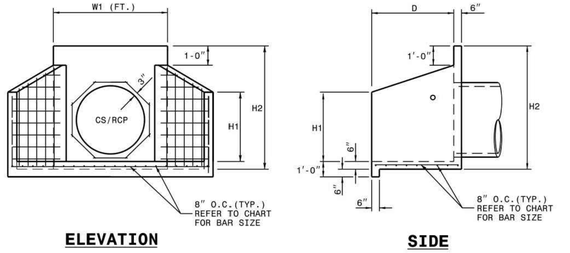


STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.
1-18

ROADWAY STANDARD DRAWING FOR
DRAINAGE STRUCTURE STEPS

SHEET 1 OF 1
840.66

MAINTENANCE ACCESS STEPS
N.T.S.

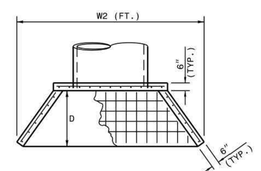


ELEVATION **SIDE**

NOTES:

* THIS PRECAST ENDWALL MAY BE USED FOR THE FOLLOWING STANDARDS: 838.01, 838.11, 838.21, 838.27, 838.33, 838.39, 838.51, 838.57, 838.63 AND 838.69.
* INSTALL PRECAST ENDWALLS WITH WINGS AND PAY FOR IN ACCORDANCE WITH SPECIFICATION SECTION 838.
* USE 4000 PSI CONCRETE.
* PROVIDE ALL REINFORCING STEEL WHICH MEETS ASTM A615 FOR GRADE 60 AND WELDED WIRE FABRIC CONFORMING TO ASTM A185 WITH 2" MIN. CLEARANCE.
* PLACE LIFT HOLES OR PINS IN ACCORDANCE WITH OSHA STANDARD 1926.704.
* PIPE TO BE GROUTED INTO HEADWALL AT JOB SITE BY CONTRACTOR
* ALL ELEMENTS PRECAST TO MEET ASTM C913.
* WELDED WIRE FABRIC MAY BE SUBSTITUTED FOR REBAR AS LONG AS THE SAME AREA OF STEEL IS PROVIDED.
* CHAMFER ALL CORNERS 1" OR HAVE A RADIUS OF 1".

NOTE: THE MINIMUM BAR SIZE SHALL BE #5 BARS AT 8" CTS.THE CONTRACTOR WILL HAVE THE OPTION TO INCREASE THIS BAR SIZE AS NEEDED.



PLAN

ENDWALL DIMENSIONS

FT.	MINIMUM	MIN./MAX.	MIN./MAX.	MIN./MAX.	MIN./MAX.	MIN./MAX.
PIPE DIA.	BAR SIZE	H1(FT.)	H2(FT.)	D (FT.)	W1	W2
1.0	#5 @ 8"	1.25/2.00	2.00/3.75	1.25/1.75	3.00/3.75	5.50/6.00
1.25	#5 @ 8"	1.25/2.00	3.00/3.75	1.25/2.00	3.50/3.75	6.50/6.75
1.50	#5 @ 8"	1.25/2.00	3.00/4.25	1.50/2.50	3.50/3.75	6.50/6.75
2.0	#5 @ 8"	1.50/2.50	4.00/4.75	1.75/2.50	4.00/4.25	7.50/8.25
2.5	#5 @ 8"	2.50/3.50	4.00/6.00	2.00/3.00	4.50/5.50	10.00/11.50
3.0	#5 @ 8"	3.00/3.50	5.00/6.00	2.75/3.50	5.25/5.75	11.50/11.75
3.5	#5 @ 8"	3.25/4.50	6.00/6.75	3.25/3.50	6.00/6.75	12.00/13.25
4.0	#5 @ 8"	3.50/4.50	6.50/7.00	3.25/3.50	6.50/6.75	13.00/13.25
4.5	#5 @ 8"	4.00/5.00	6.50/8.50	3.25/4.00	7.00/9.25	13.50/15.75
5.0	#5 @ 8"	4.50/5.00	7.00/8.50	3.25/4.00	7.25/9.25	13.75/15.75
5.5	#5 @ 8"	4.50/5.00	7.50/8.50	3.25/4.00	7.25/9.25	14.00/15.75
6.0	#5 @ 8"	4.50/5.00	7.50/8.50	3.25/4.00	7.75/9.25	14.75/16.75

OUTLET ENDWALL DETAILS
N.T.S.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.
1-18

ROADWAY STANDARD DRAWING FOR
PRECAST CONCRETE ENDWALL
FOR SINGLE 12" THRU 72" PIPE - 90° SKEW

SHEET 1 OF 1
838.80

NORTH CAROLINA PROFESSIONAL SEAL 042037 ENGINEER JOSHUA E. SHINN
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	
1	05. 03. 2019	PER CHAPEL HILL AND OWASA COMMENTS

PLAN INFORMATION

PROJECT NO.	WDF-17000
FILENAME	WDF17000-SWA
CHECKED BY	KEG
DRAWN BY	SCB
SCALE	N.T.S.
DATE	02. 28. 2019

SHEET

STORMWATER CONTROL MEASURE 'A' DETAILS

SW-A4

FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION

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STORMWATER CONTROL MEASURE 'B' CONSTRUCTION SPECIFICATIONS

GENERAL NOTES

1. THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM SHALL NOT BE USED AS A TEMPORARY EROSION CONTROL DEVICE (I.E. SEDIMENT TRAP OR SEDIMENT BASIN) DURING CONSTRUCTION.
2. ONCE CONSTRUCTED, THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM SHALL NOT RECEIVE STORMWATER RUNOFF UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA TO THE SYSTEM HAS BEEN COMPLETELY STABILIZED AND SITE CONSTRUCTION IS COMPLETE.
3. ALL COMPONENTS OF THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM (CMP SECTIONS, JOINT/RISER CONNECTIONS, ACCESS MANHOLES, ETC.) SHALL BE DESIGNED BY OTHERS. PRIOR TO ORDERING OR INSTALLATION, THE SITE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA, TO THE DESIGN ENGINEER FOR REVIEW. THE STRUCTURAL DESIGN OF THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM, ALONG WITH ITS ASSUMPTIONS, IS ALSO BY OTHERS. THE JOHN R. McADAMS COMPANY, INC. AND ITS EMPLOYEES ASSUME NO LIABILITY WITH RESPECT TO ANY ASPECT OF THE STRUCTURAL DESIGN FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM.
4. IF NECESSARY, THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE UNDERGROUND DETENTION SYSTEM SITE. IT IS ANTICIPATED THAT PUMPING WILL BE NECESSARY IN THE EXCAVATION AREAS. DURING PLACEMENT OF FILL WITHIN THE EXCAVATION AREAS, THE CONTRACTOR SHALL KEEP THE WATER LEVEL BELOW THE BOTTOM OF THE EXCAVATION. THE MANNER IN WHICH THE WATER IS REMOVED SHALL BE SUCH THAT THE EXCAVATION BOTTOM AND SIDESLOPES ARE STABLE. FOR THIS REASON, IT IS BEST TO BEGIN THE CONSTRUCTION OF THE UNDERGROUND DETENTION SYSTEM AT THE DOWNSTREAM END, WITH THE OUTLET ALREADY CONSTRUCTED, TO ALLOW A ROUTE FOR WATER TO ESCAPE.
5. EXISTING UTILITIES AND STRUCTURES SHOWN, BOTH UNDERGROUND AND ABOVE GROUND, ARE BASED ON A FIELD SURVEY AND THE BEST AVAILABLE RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS PRIOR TO BEGINNING RELATED CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

STORMWATER MANAGEMENT SYSTEM MATERIAL SPECIFICATIONS

1. THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM IS TO BE DESIGNED BY OTHERS. PRIOR TO INSTALLATION, SHOP DRAWINGS OF THE STORMWATER MANAGEMENT SYSTEM SHALL BE PROVIDED TO THE DESIGN ENGINEER AND TO THE TOWN OF CHAPEL HILL FOR REVIEW.
2. FILTER CARTRIDGES SHALL BE CONTECH STORMFILTERS WITH PHOSPHOSORB MEDIA. STORAGE PIPE SHALL BE CONTECH ALUMINIZED TYPE II (ALT2) CORRUGATED METAL PIPE. INSTALLATION OF THE STORMWATER DEVICE SHALL BE PER THE MANUFACTURER'S INSTALLATION GUIDELINES AND SPECIFICATIONS.
3. ACCESS RISERS SHALL BE INSTALLED PER STRUCTURAL SPECIFICATIONS. ACCESS STEPS / LADDERS SHALL BE ATTACHED TO THE RISERS TO ALLOW FOR ACCESS INTO THE STORMWATER MANAGEMENT SYSTEM.
4. DRAWDOWN OF THE STORMWATER MANAGEMENT SYSTEM IS VIA A 6"Ø PLUG VALVE. THE VALVE SHALL BE A M&H STYLE 1820 ECCENTRIC VALVE OR ENGINEER-APPROVED EQUAL. THIS VALVE IS IN ACCORDANCE WITH AWWA C-517, AND SHALL BE OPERABLE FROM INSIDE THE DETENTION SYSTEM VIA A HANDWHEEL (SEE DETAIL). THE CONTRACTOR SHALL PROVIDE A REMOVABLE VALVE WRENCH WITH A HANDWHEEL ON TOP FOR OPERATION OF THE 6"Ø PLUG VALVE.
5. THE 30"Ø RCP OUTLET BARREL OF THE DETENTION SYSTEM SHALL BE CLASS III RCP, MODIFIED BELL AND SPIGOT, MEETING THE REQUIREMENTS OF ASTM C76-LATEST. GEOTEXTILE FABRIC FOR THE 30"Ø OUTLET BARREL JOINTS SHALL BE MIRAFI 180N OR ENGINEER APPROVED EQUAL (NON-WOVEN FABRIC). THE ONSITE GEOTECHNICAL ENGINEER SHALL APPROVE FABRIC FOR USE.
6. COVER AND REVIEW OF SITE CONDITIONS TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE SYSTEM TO BE THE RESPONSIBILITY OF THE MANUFACTURER.
7. THE CONTRACTOR SHALL INSTALL THE DETENTION UNIT PER MANUFACTURERS' SPECIFICATIONS.

FOUNDATION/BEDDING NOTES

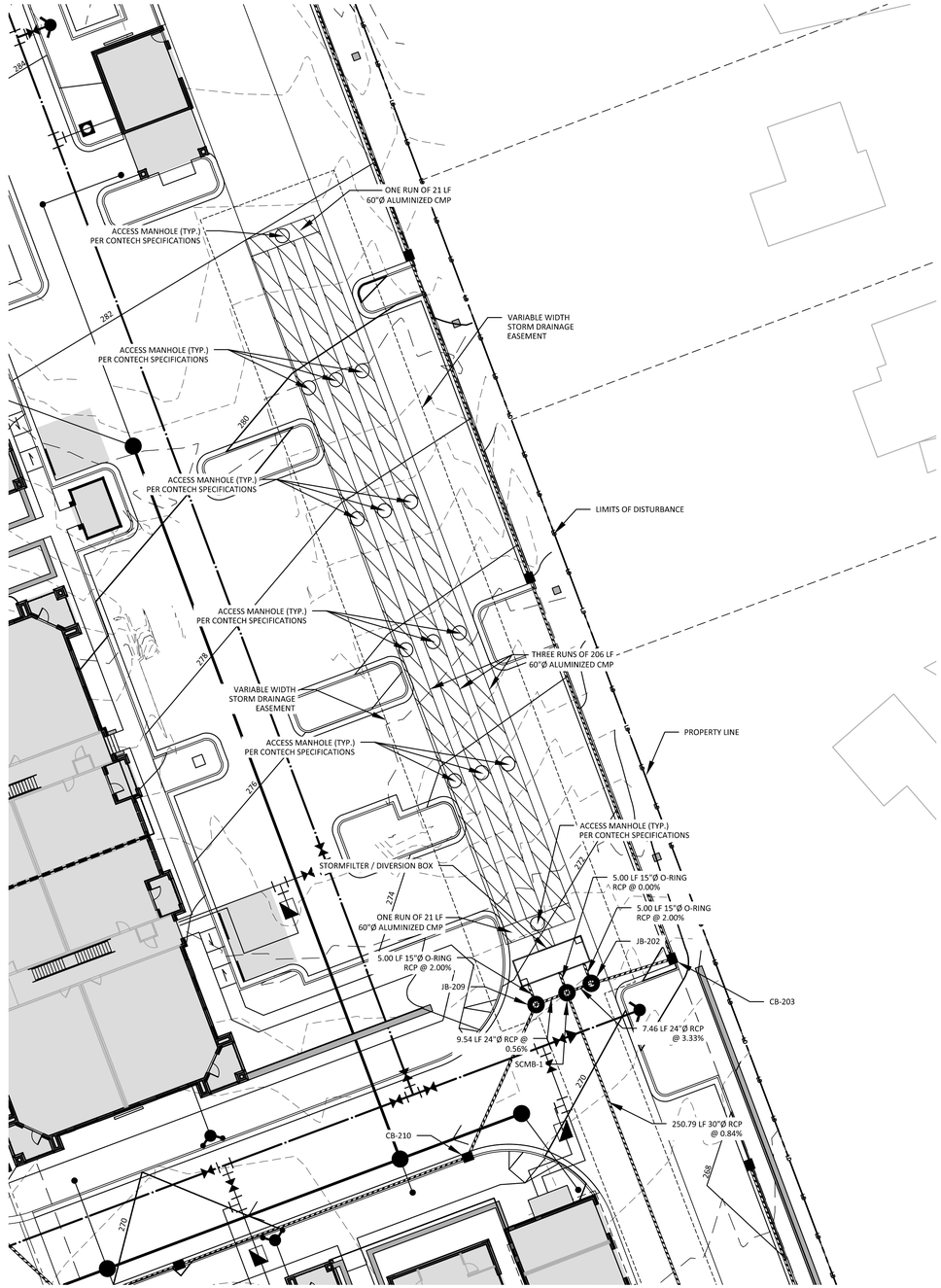
1. ONCE THE EXCAVATION IS COMPLETE AND PRIOR TO INSTALLATION OF THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM, THE ONSITE GEOTECHNICAL ENGINEER SHALL VERIFY THE BEARING CAPACITY OF THE UNDERLYING SOILS TO SERVE AS A FOUNDATION FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM. IF THE ONSITE GEOTECHNICAL ENGINEER DEEMS THE FOUNDATION SOILS AS UNSUITABLE, THEN THE UNSUITABLE MATERIAL SHOULD BE REMOVED DOWN TO A SUITABLE DEPTH AND THEN BUILT BACK UP TO THE CORRECT ELEVATION WITH A COMPACTED BACKFILL MATERIAL THAT IS APPROVED BY THE ONSITE GEOTECHNICAL ENGINEER. THE APPROVED BACKFILL MATERIAL SHOULD HAVE A GRADATION THAT WILL NOT ALLOW THE MIGRATION OF FINES, WHICH COULD CAUSE SETTLEMENT OF THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM. IF NECESSARY, A GEOTEXTILE FABRIC CAN BE USED TO SEPARATE THE UNDERLYING SOILS AND THE BACKFILL MATERIAL. THIS GEOTEXTILE FABRIC (IF USED) IS TO BE SPECIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER.
2. PLEASE NOTE THAT IF THE CONTRACTOR CONSTRUCTS AND COVERS UP THE EXCAVATION FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM PRIOR TO INSPECTION, THEN THIS AREA SHALL BE UNCOVERED AND TESTED (TO THE ENGINEER'S AND OWNER'S APPROVAL) AT THE CONTRACTOR'S EXPENSE.
3. THE FOUNDATION SUBGRADE SHALL BE GRADED TO A UNIFORM OR SLIGHTLY SLOPING GRADE PRIOR TO PLACEMENT OF THE BEDDING MATERIAL. IF THE FOUNDATION SUBGRADE WILL BE EXPOSED FOR AN EXTENDED PERIOD OF TIME DURING CONSTRUCTION, THEN IT SHOULD BE GRADED TO A SLIGHT SLOPE SUCH THAT SATURATION OF THE SUBGRADE DOES NOT OCCUR.
4. THE EXCAVATION PIT SHALL BE LINED (ON THE BOTTOM AND ALL FOUR SIDES) WITH A NON-WOVEN GEOTEXTILE FABRIC (MIRAFI 180N OR APPROVED EQUIVALENT). THE ONSITE GEOTECHNICAL ENGINEER SHALL APPROVE FABRIC FOR USE.
5. THE BEDDING MATERIAL FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM SHALL BE SPECIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER. TYPICALLY, A WELL-GRADED GRANULAR MATERIAL WILL BE USED FOR THE BEDDING. PLEASE NOTE THAT IF CONSTRUCTION EQUIPMENT WILL BE OPERATING FOR AN EXTENDED PERIOD OF TIME ON THE BEDDING, THEN THE APPROPRIATE MEASURES (E.G. ENGINEERED FABRIC, STIFF GEOGRID, ETC.) SHALL BE TAKEN TO ENSURE THE INTEGRITY OF THE BEDDING IS NOT COMPROMISED.
6. THE CONTRACTOR SHALL PROVIDE A FOUNDATION DRAIN FOR THE UNDERGROUND DETENTION SYSTEM DESIGNED BY OTHERS. THE UNDERDRAIN SYSTEM SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATION AND SHALL POSITIVELY DRAIN TO DOWNSTREAM STRUCTURE.

BACKFILL MATERIAL NOTES

1. THE ON-SITE GEOTECHNICAL ENGINEER SHALL SPECIFY THE BACKFILL MATERIAL FOR THE STORMWATER MANAGEMENT SYSTEM.
2. THE BACKFILL MATERIAL SHOULD BE FREE OF ROCKS, FROZEN LUMPS, AND OTHER FOREIGN MATTER THAT COULD CAUSE HARD SPOTS WITHIN THE BACKFILL MATERIAL, OR THAT COULD DECOMPOSE AND CREATE VOIDS.
3. HIGHLY PLASTIC SILTS, HIGHLY PLASTIC CLAYS, ORGANIC SILTS, ORGANIC CLAYS, AND PEATS SHOULD NOT BE USED AS A BACKFILL MATERIAL.
4. THE BACKFILL MATERIAL SHOULD BE PLACED IN 6" LOOSE LIFTS AND COMPACTED TO 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM-D698). THE FILL SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN +/- TWO PERCENT OF ITS OPTIMUM MOISTURE CONTENT.
5. ANY MATERIAL STOCKPILING ON TOP OF THE STORMWATER MANAGEMENT SYSTEM SHALL BE APPROVED BY THE STRUCTURAL DESIGN ENGINEER OR DETENTION SYSTEM MANUFACTURER.

STATEMENT OF RESPONSIBILITY

1. ALL REQUIRED MAINTENANCE AND INSPECTIONS OF THIS FACILITY SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER, PER THE EXECUTED OPERATION AND MAINTENANCE AGREEMENT FOR THIS FACILITY.



GRAPHIC SCALE
0 10 20 40
1 inch = 20 ft.

STORMWATER CONTROL MEASURE 'B' PLAN VIEW

1" = 20'

FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION

McADAMS
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2905 Meridian Parkway
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phone 919. 361. 5000
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NORTH CAROLINA PROFESSIONAL SEAL 042037 ENGINEER JOSHUA E SHINN — NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	
1	05. 03. 2019	PER CHAPEL HILL AND OWASA COMMENTS

PLAN INFORMATION

PROJECT NO.	WDF-17000
FILENAME	WDF17000-SWB
CHECKED BY	KEG
DRAWN BY	SCB
SCALE	1" = 20'
DATE	02. 28. 2019

SHEET

STORMWATER CONTROL MEASURE 'B' PLAN VIEW

SW-B1

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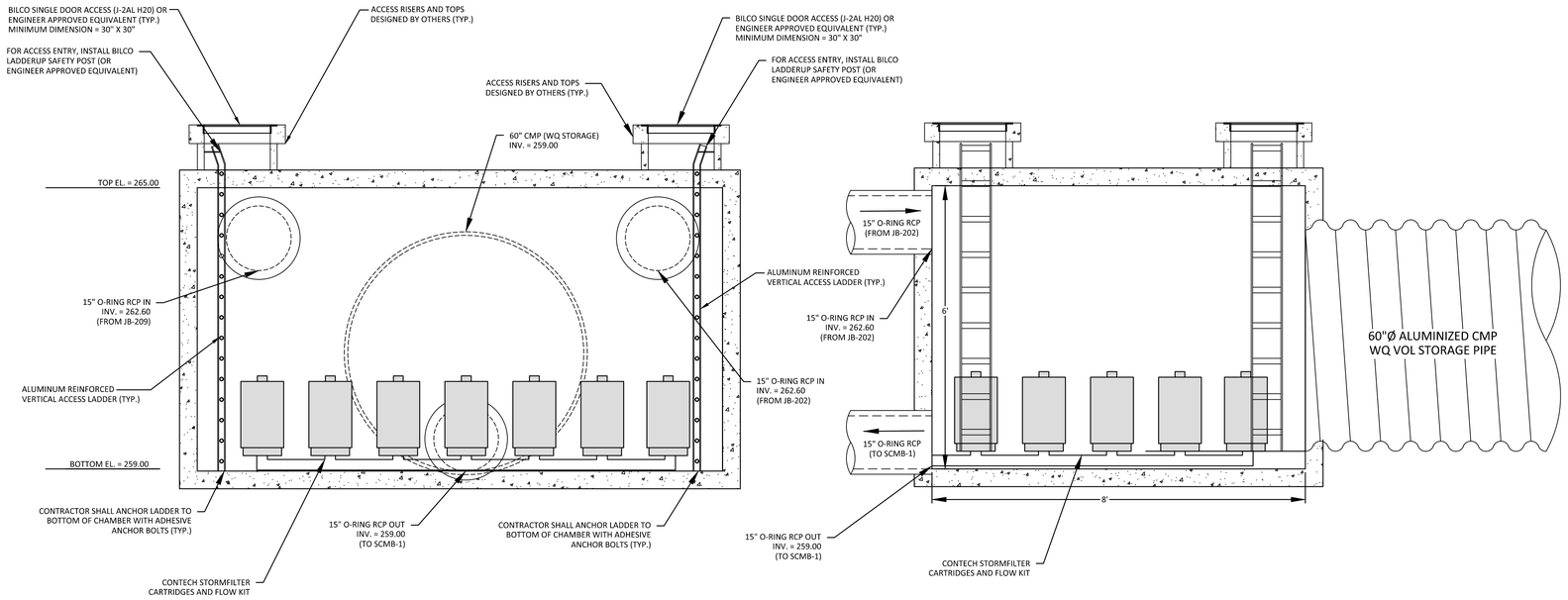
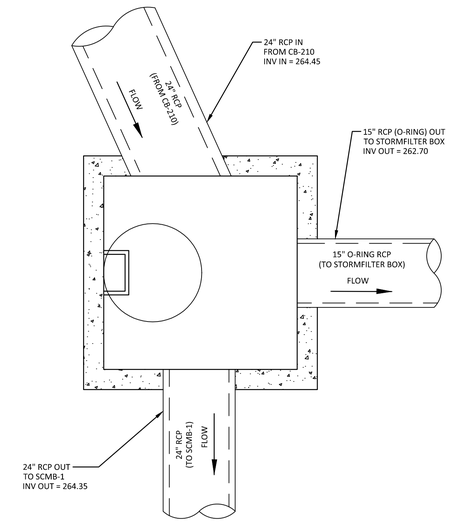
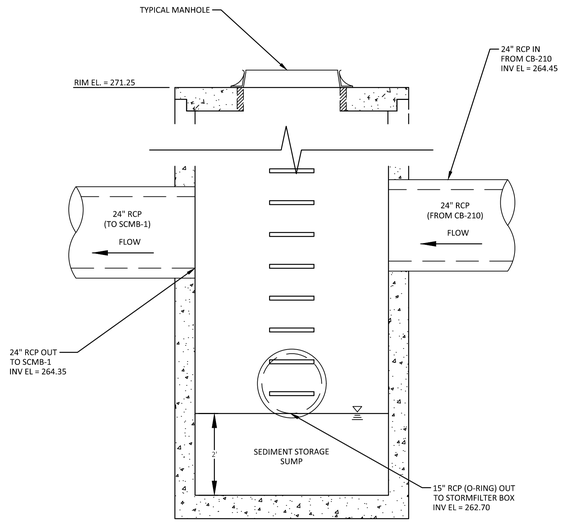


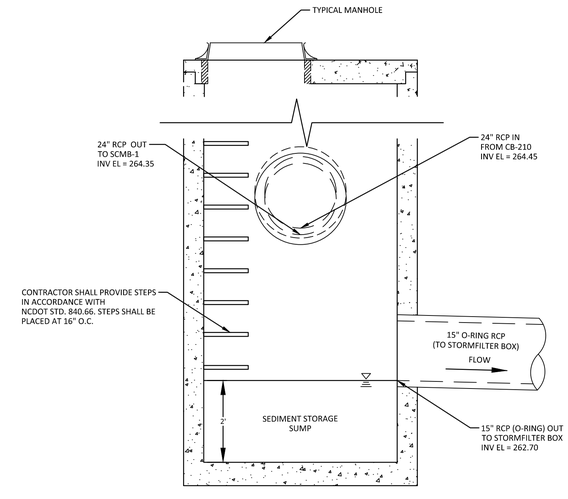
STORMFILTER BOX DETAILS
N.T.S.



PLAN VIEW



SIDE VIEW



SECTION VIEW

SPLITTER BOX #1 (JB-209)
N.T.S.

FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION

McADAMS
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293

www.mcadamsco.com

CLIENT

WOODFIELD INVESTMENTS
11425 HORSEMAN'S TRAIL
RALEIGH, NC 27613
PHONE: 919. 535. 8947

PARK APARTMENTS
FORM DISTRICT PERMIT
1250 EPHESUS CHURCH ROAD
CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA PROFESSIONAL SEAL 042637 ENGINEER JOSHUA E. SWINK — NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	
1	05. 03. 2019	PER CHAPEL HILL AND OWASA COMMENTS

PLAN INFORMATION

PROJECT NO.	WDF-17000
FILENAME	WDF17000-SWB
CHECKED BY	KEG
DRAWN BY	SCB
SCALE	AS NOTED
DATE	02. 28. 2019

SHEET

STORMWATER CONTROL MEASURE 'B' DETAILS

SW-B2

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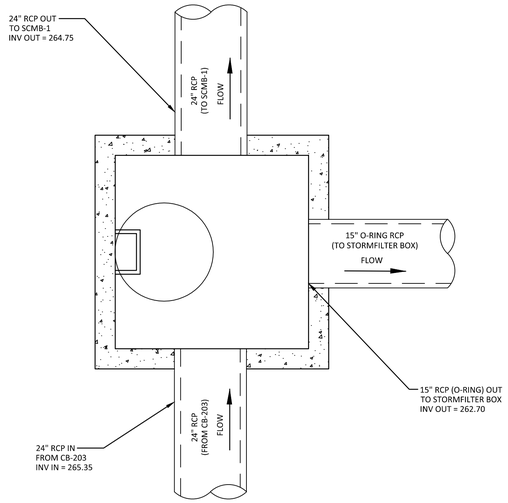
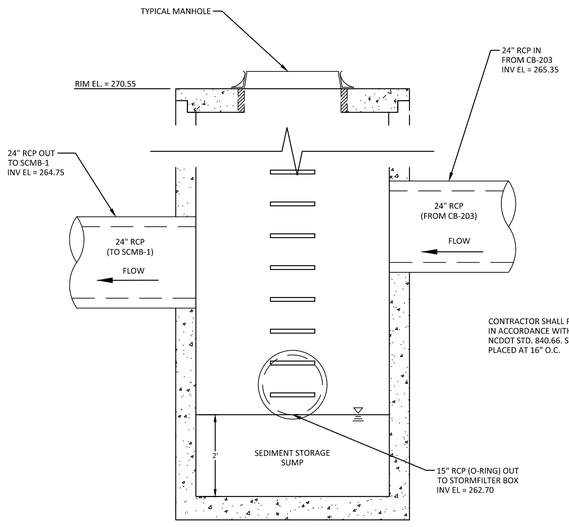
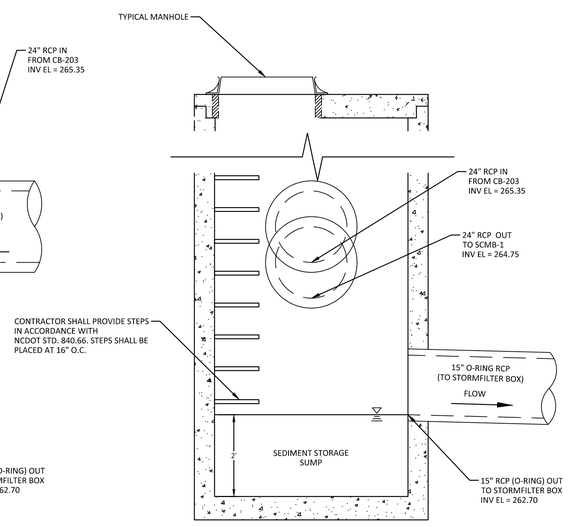


PLAN VIEW



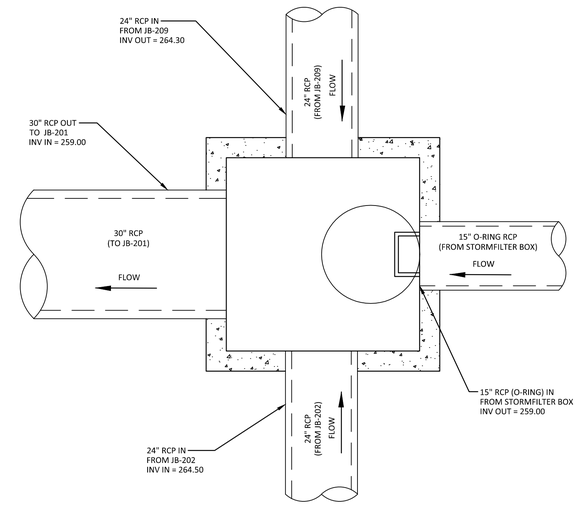
SIDE VIEW



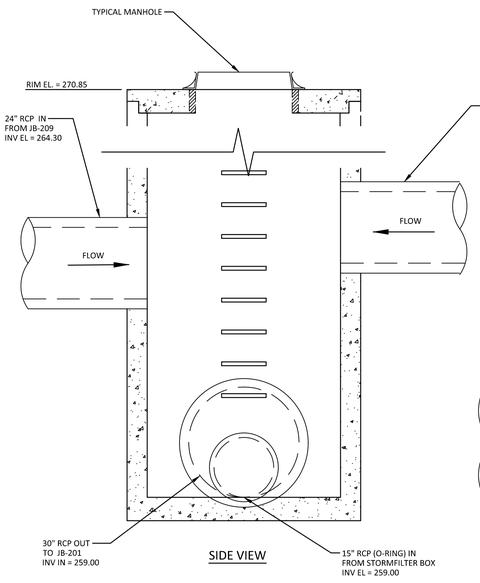
SECTION VIEW

SPLITTER BOX #2 (JB-202)

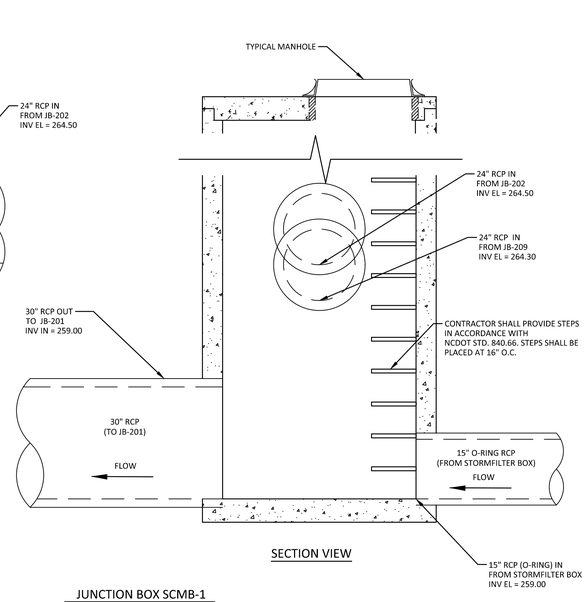
N.T.S.



PLAN VIEW



SIDE VIEW



SECTION VIEW

JUNCTION BOX SCMB-1

N.T.S.

FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION

X:\Projects\WDF\WDF-17000\Storm\Form District Permit\Current Drawings\WDF17000-SWB.dwg, 5/3/2019 10:40:26 AM, Dow, Heather

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CHAPEL HILL, NORTH CAROLINA, 27517

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042637 JOSHUA E. SWINK — NOT FOR CONSTRUCTION

REVISIONS

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PLAN INFORMATION

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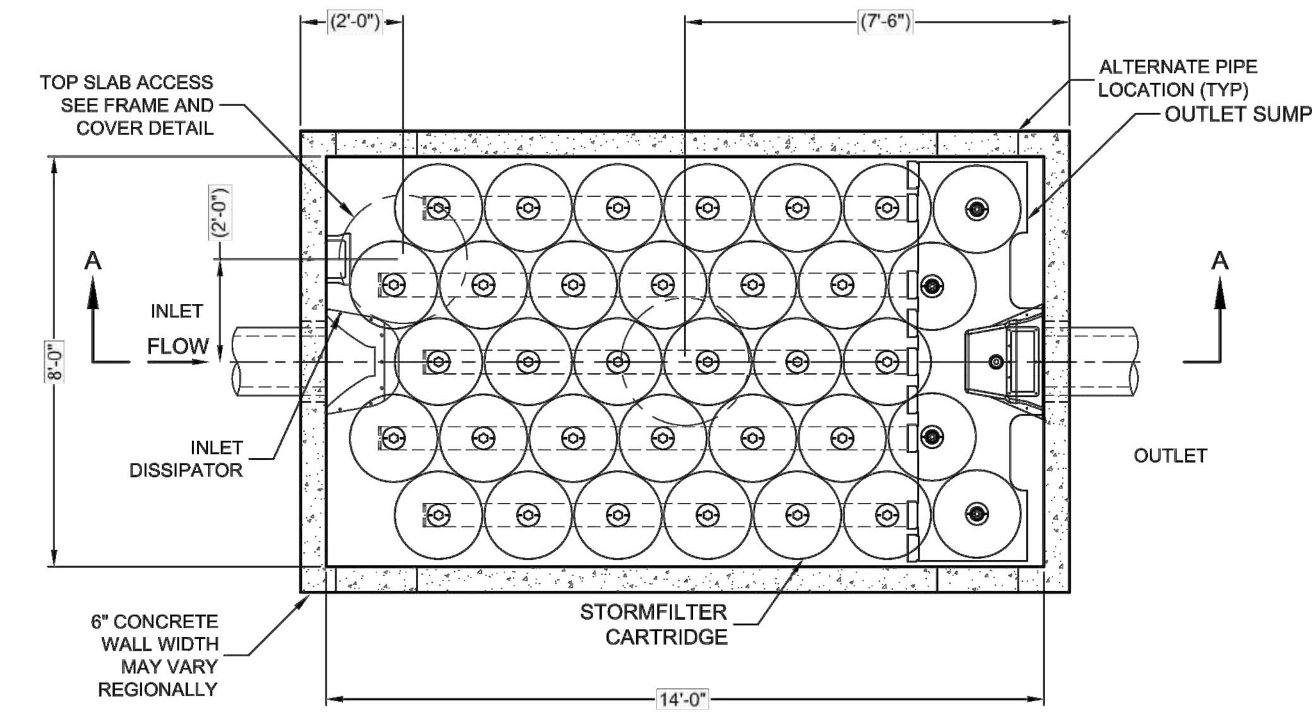
FILENAME	WDF17000-SWB
CHECKED BY	KEG
DRAWN BY	SCB
SCALE	AS NOTED
DATE	02. 28. 2019

SHEET

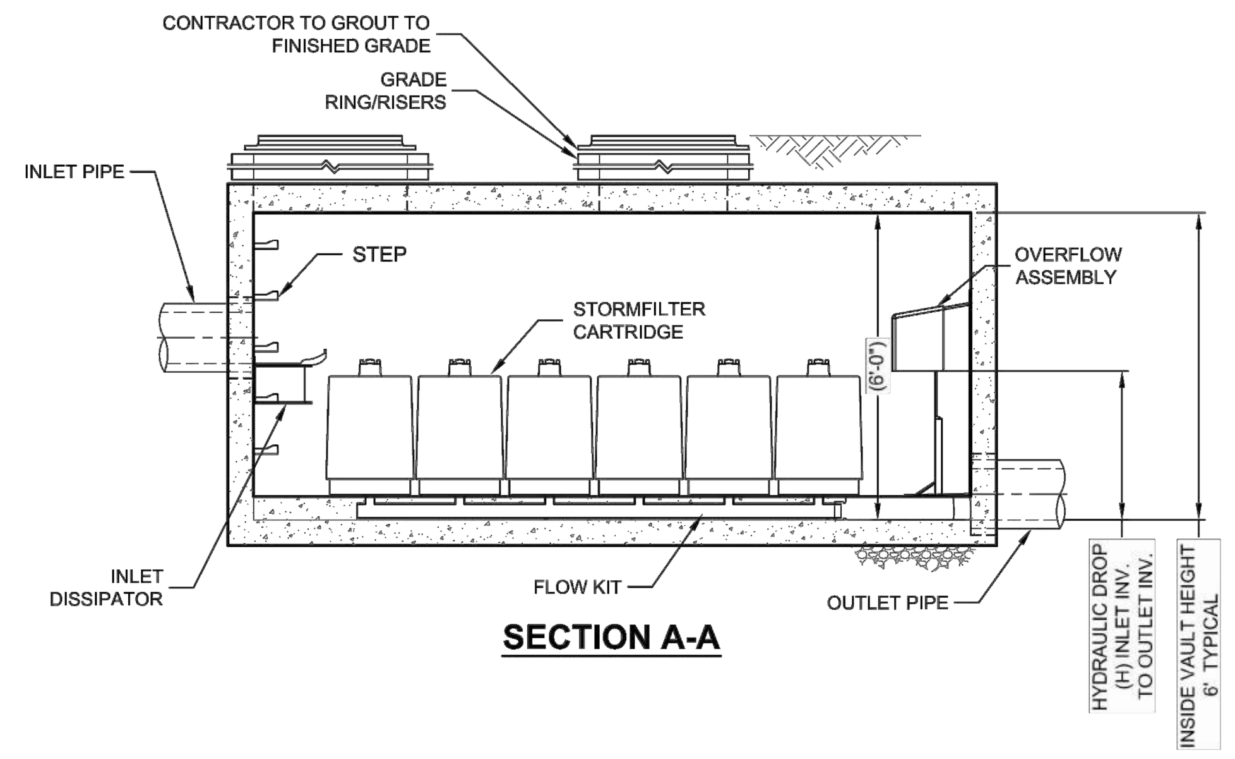
STORMWATER CONTROL MEASURE 'B' DETAILS

SW-B3



PLAN VIEW

VAULT STYLE: OUTLET SUMP (NIB)



SECTION A-A

The Stormwater Management StormFilter®

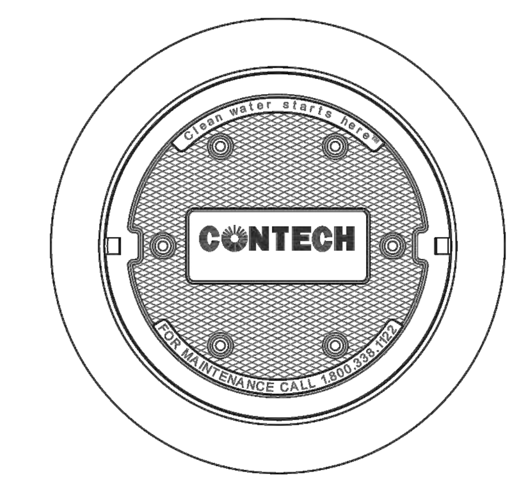
STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD VAULT STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (34). VAULT STYLE OPTIONS INCLUDE INLET BAY (27), INLET BAY/OUTLET BAY (22), OUTLET BAY (29), INLET BAY/FULL HEIGHT BAFFLE (28), FULL HEIGHT BAFFLE WALL (25).
STORMFILTER 8X14 PEAK HYDRAULIC CAPACITY IS 1.8 CFS. IF THE SITE CONDITIONS EXCEED 1.8 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27"			18"			LOW DROP		
RECOMMENDED HYDRAULIC DROP (H)	3.05'			2.3'			1.8'		
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf
CARTRIDGE FLOW RATE (gpm)	22.5	18.79	11.25	15	12.53	7.5	10	8.35	5

* 1.67 gpm/sf SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY



FRAME AND COVER

(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			*
WATER QUALITY FLOW RATE (cfs)			*
PEAK FLOW RATE (cfs)			*
RETURN PERIOD OF PEAK FLOW (yrs)			*
CARTRIDGE HEIGHT (27", 18", LOW DROP(LD))			*
NUMBER OF CARTRIDGES REQUIRED			*
CARTRIDGE FLOW RATE			*
MEDIA TYPE (PERLITE, ZPG, PSORB)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	*	*	*
INLET PIPE #2	*	*	*
OUTLET PIPE	*	*	*
UPSTREAM RIM ELEVATION			*
DOWNSTREAM RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			
* PER ENGINEER OF RECORD			

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONFORMING TO ASTM C-857 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER VAULT (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL VAULT SECTIONS AND ASSEMBLE VAULT.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

CONTECH® ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

SF0814
STORMFILTER
STANDARD DETAIL

McADAMS
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CHAPEL HILL, NORTH CAROLINA, 27517

REVISIONS

NO.	DATE	
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PLAN INFORMATION

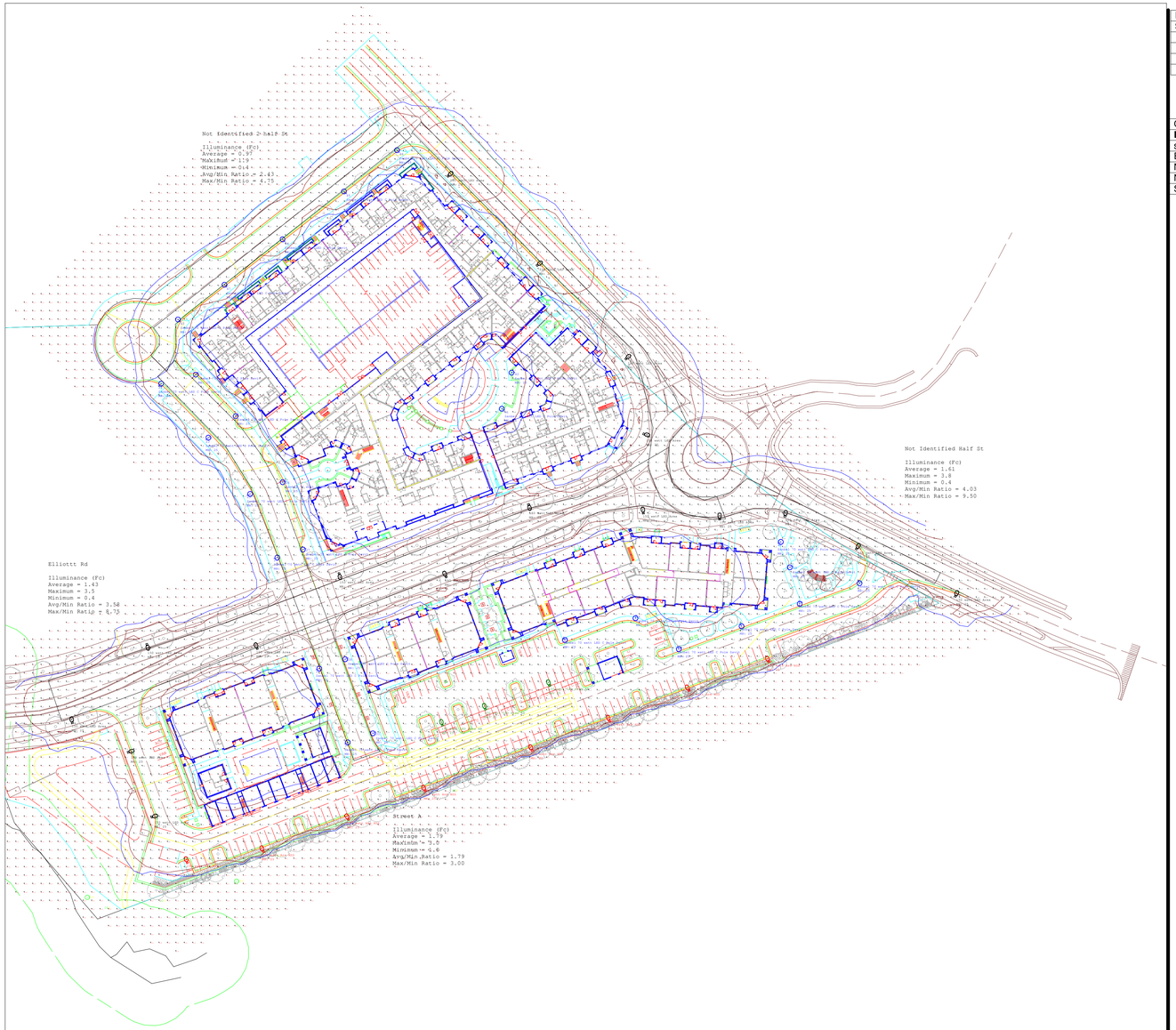
PROJECT NO.	WDF-17000
FILENAME	WDF17000-SWB
CHECKED BY	KEG
DRAWN BY	SCB
SCALE	AS NOTED
DATE	02. 28. 2019

SHEET

STORMWATER CONTROL MEASURE 'B' DETAILS

SW-B4

FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION



Luminaire Schedule

Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	17	150 watt LED Area	SINGLE	N.A.	0.850	ATB2 40B LED E10 XXXXX R3
	27	Sanbel 70 watt LED C Pole Davit	SINGLE	N.A.	0.850	GBLF 070 4K XXXX L3
	3	150 watt LED Area AB	SINGLE	N.A.	0.850	ATB2 40B LED E10 XXXXX R3
	8	150 watt Are HSS	SINGLE	N.A.	0.850	ATB2 40BLEDE10 XXXXX R3 HS

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
site	Illuminance	Fc	0.53	3.8	0.0	N.A.	N.A.
Elliottt Rd	Illuminance	Fc	1.43	3.5	0.4	3.58	8.75
Not Identified 2 half St	Illuminance	Fc	0.97	1.9	0.4	2.43	4.75
Not Identified Half St	Illuminance	Fc	1.61	3.8	0.4	4.03	9.50
Street A	Illuminance	Fc	1.79	3.0	1.0	1.79	3.00

Sanibel

20'
25'

70W
150W

Roadway

15'
20'
25'
30'
35'

50W
70W
110W
150W
220W
280W

DUKE ENERGY®

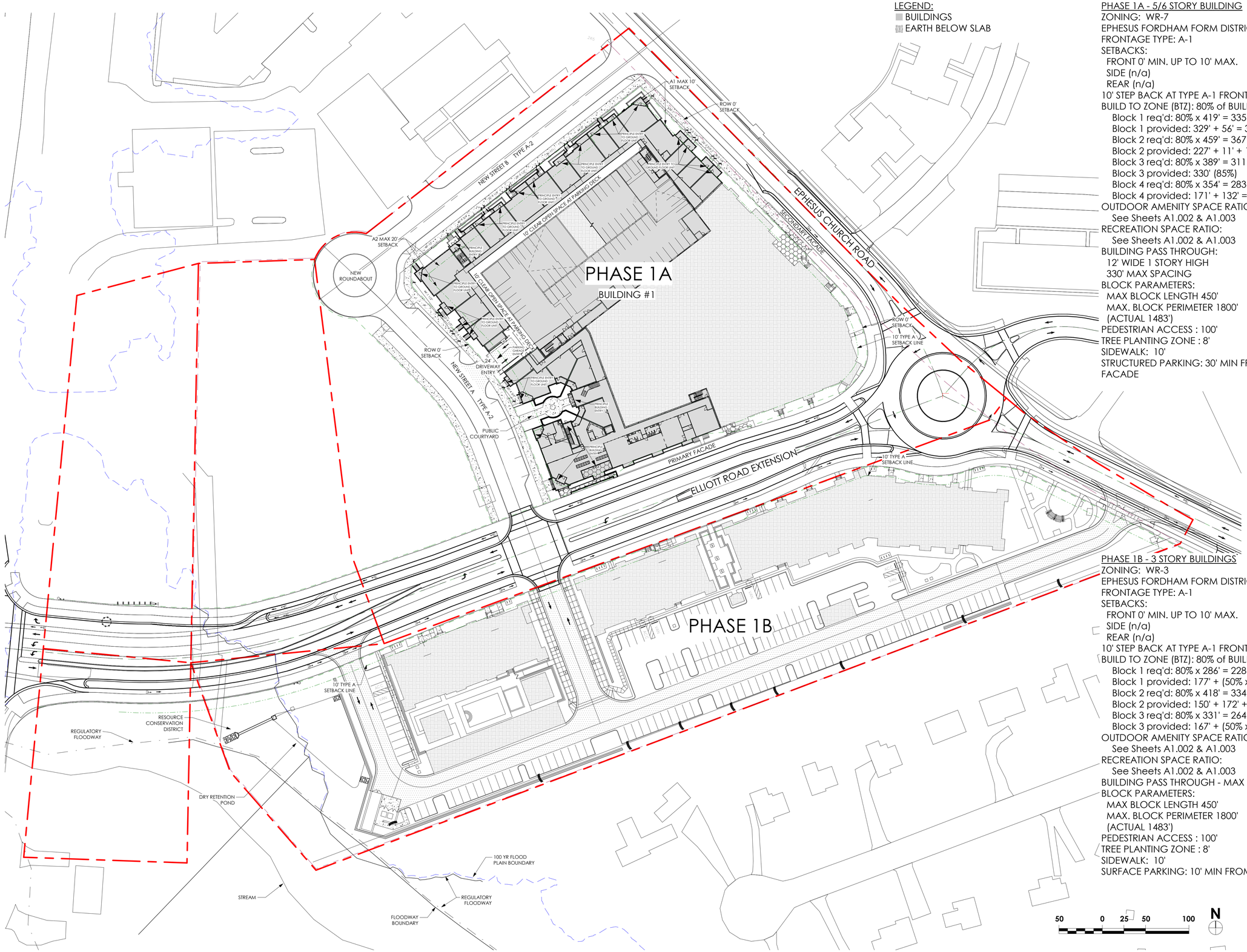
#	Date	Comments

Revisions

Drawn By: Tom Grantham, LC, CEM
Checked By:
Date:5/2/2019
Scale: 1" = 80'

Park Apartments

Chapel Hill



LEGEND:
- BUILDINGS
- EARTH BELOW SLAB

PHASE 1A - 5/6 STORY BUILDING
ZONING: WR-7
EPHESUS FORDHAM FORM DISTRICT
FRONTAGE TYPE: A-1
SETBACKS:
FRONT 0' MIN. UP TO 10' MAX.
SIDE (n/a)
REAR (n/a)
10' STEP BACK AT TYPE A-1 FRONTAGE (N/A)
BUILD TO ZONE (BTZ): 80% of BUILDING FACADE
Block 1 req'd: 80% x 419' = 335.2'
Block 1 provided: 329' + 56' = 385' (92%)
Block 2 req'd: 80% x 459' = 367.2'
Block 2 provided: 227' + 11' + 163' = 401' (87%)
Block 3 req'd: 80% x 389' = 311.2'
Block 3 provided: 330' (85%)
Block 4 req'd: 80% x 354' = 283.2'
Block 4 provided: 171' + 132' = 303' (86%)
OUTDOOR AMENITY SPACE RATIO:
See Sheets A1.002 & A1.003
RECREATION SPACE RATIO:
See Sheets A1.002 & A1.003
BUILDING PASS THROUGH:
12' WIDE 1 STORY HIGH
330' MAX SPACING
BLOCK PARAMETERS:
MAX BLOCK LENGTH 450'
MAX. BLOCK PERIMETER 1800'
(ACTUAL 1483')
PEDESTRIAN ACCESS : 100'
TREE PLANTING ZONE : 8'
SIDEWALK: 10'
STRUCTURED PARKING: 30' MIN FROM BUILDING FACADE

PHASE 1B - 3 STORY BUILDINGS
ZONING: WR-3
EPHESUS FORDHAM FORM DISTRICT
FRONTAGE TYPE: A-1
SETBACKS:
FRONT 0' MIN. UP TO 10' MAX.
SIDE (n/a)
REAR (n/a)
10' STEP BACK AT TYPE A-1 FRONTAGE (N/A)
BUILD TO ZONE (BTZ): 80% of BUILDING FACADE
Block 1 req'd: 80% x 286' = 228.8'
Block 1 provided: 177' + (50% x 108') = 231' (81%)
Block 2 req'd: 80% x 418' = 334.4'
Block 2 provided: 150' + 172' + (50% x 35') = 339.5' (81%)
Block 3 req'd: 80% x 331' = 264.8'
Block 3 provided: 167' + (50% x 201') = 267.5' (81%)
OUTDOOR AMENITY SPACE RATIO:
See Sheets A1.002 & A1.003
RECREATION SPACE RATIO:
See Sheets A1.002 & A1.003
BUILDING PASS THROUGH - MAX 330' SPACING
BLOCK PARAMETERS:
MAX BLOCK LENGTH 450'
MAX. BLOCK PERIMETER 1800'
(ACTUAL 1483')
PEDESTRIAN ACCESS : 100'
TREE PLANTING ZONE : 8'
SIDEWALK: 10'
SURFACE PARKING: 10' MIN FROM RES. ZONE

HOUSING STUDIO
333 West Trade Street, Suite 300
Charlotte, NC 28202
T: 704.333.7862 F: 980.237.3862

THE PARK AT CHAPEL HILL APARTMENTS
PHASE 1A & 1B
CHAPEL HILL, NC
FORM DISTRICT PERMIT - 2/28/2019
FORM DISTRICT PERMIT RE-SUBMITTAL 5/3/2019

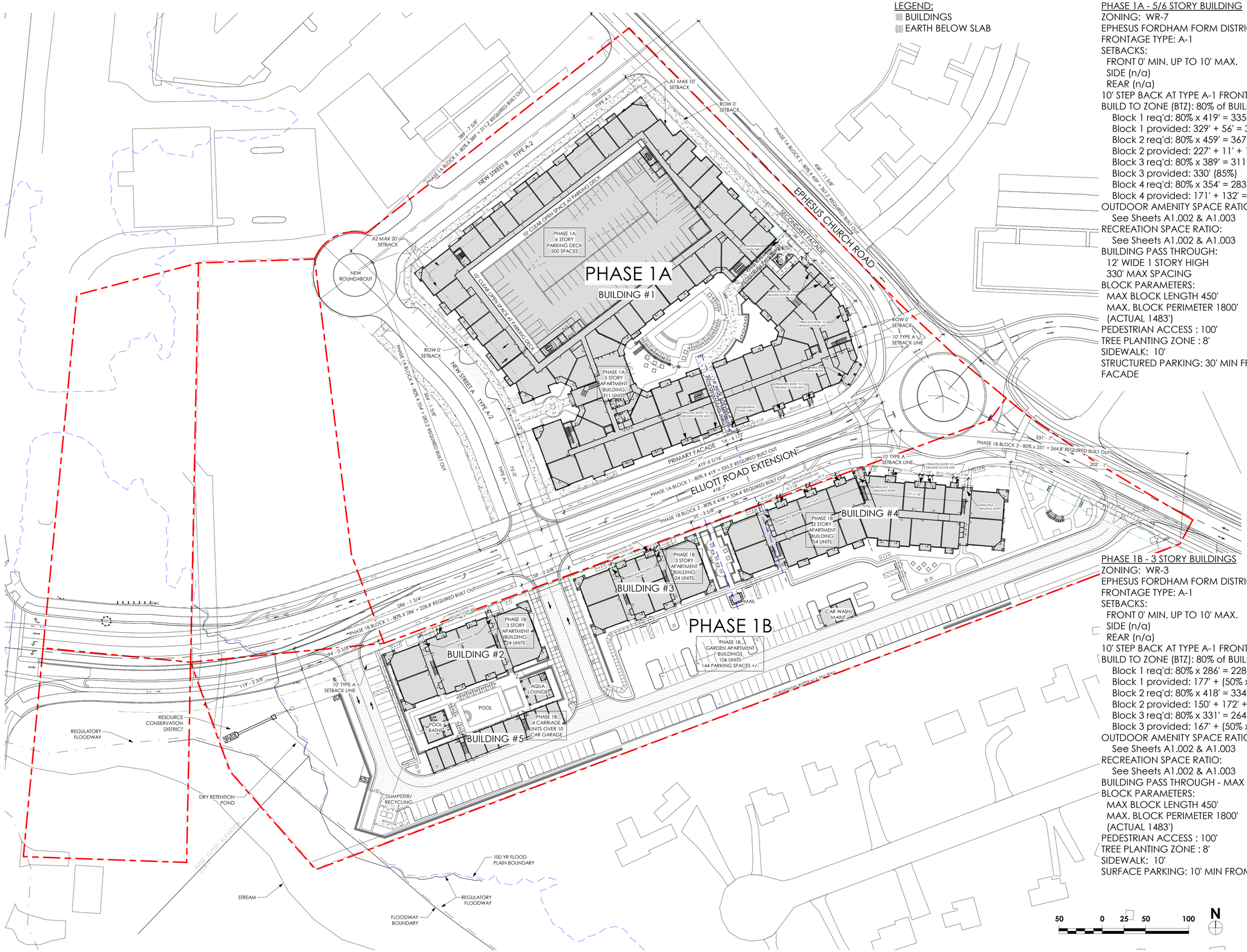
HOUSING STUDIO, P.A. REGISTERED ARCHITECTURAL CORPORATION CERT. NO. 50863 NORTH CAROLINA CHARLOTTE, NC

PROJECT SITE PLAN - LOWER LEVEL

A1.000

1 ARCHITECTURAL SITE PLAN - LOWER LEVEL
1" = 50'-0"

1703 THE PARK AT CHAPEL HILL GARDEN
4/19/2019 7:30:56 AM



1 ARCHITECTURAL SITE PLAN - MAIN LEVEL
1" = 50'-0"

LEGEND:
- BUILDINGS
- EARTH BELOW SLAB

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330' MAX SPACING
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MAX BLOCK LENGTH 450'
MAX. BLOCK PERIMETER 1800'
(ACTUAL 1483')
PEDESTRIAN ACCESS : 100'
TREE PLANTING ZONE : 8'
SIDEWALK: 10'
STRUCTURED PARKING: 30' MIN FROM BUILDING FACADE

PHASE 1B - 3 STORY BUILDINGS
ZONING: WR-3
EPHESUS FORDHAM FORM DISTRICT
FRONTAGE TYPE: A-1
SETBACKS:
FRONT 0' MIN. UP TO 10' MAX.
SIDE (n/a)
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SIDEWALK: 10'
SURFACE PARKING: 10' MIN FROM RES. ZONE

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HOUSING STUDIO, P.A.
REGISTERED ARCHITECTURAL CORPORATION
CERT. NO. 50863
NORTH CAROLINA
CHARLOTTE, NC

PROJECT SITE
PLAN - MAIN
LEVEL

A1.001

I:\703.THE PARK AT CHAPEL HILL GARDEN
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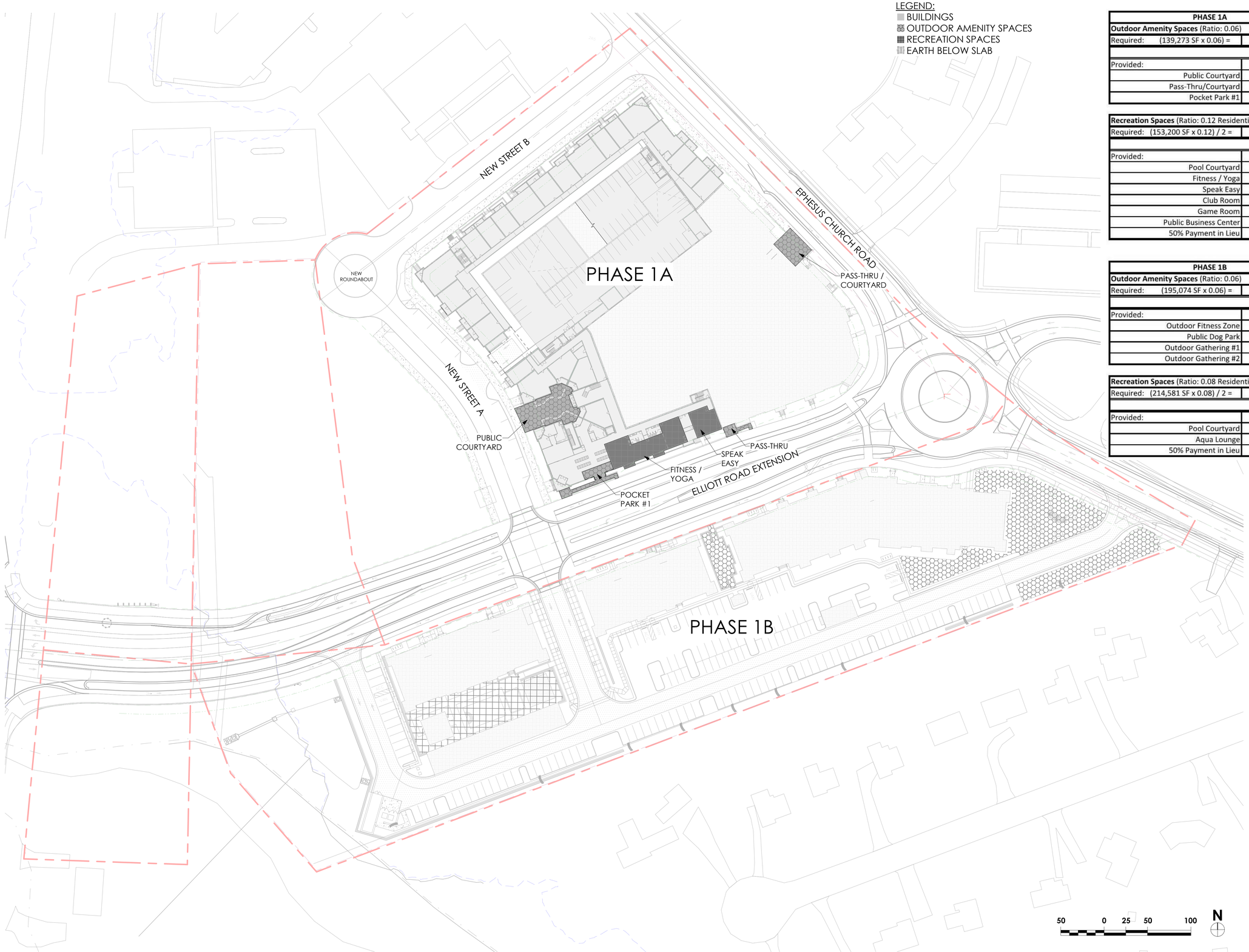

PHASE 1A	
Outdoor Amenity Spaces (Ratio: 0.06)	
Required: (139,273 SF x 0.06) =	**8,356**
Provided:	**9,109**
Public Courtyard	2,309
Pass-Thru/Courtyard	6,043
Pocket Park #1	757

Recreation Spaces (Ratio: 0.12 Residential Portion)	
Required: (153,200 SF x 0.12) / 2 =	**9,192**
Provided:	**15,969**
Pool Courtyard	9,058
Fitness / Yoga	2,480
Speak Easy	911
Club Room	1,819
Game Room	871
Public Business Center	831
50% Payment in Lieu	4,596

PHASE 1B	
Outdoor Amenity Spaces (Ratio: 0.06)	
Required: (195,074 SF x 0.06) =	**11,704**
Provided:	**15,406**
Outdoor Fitness Zone	7,484
Public Dog Park	3,862
Outdoor Gathering #1	1,379
Outdoor Gathering #2	2,681

Recreation Spaces (Ratio: 0.08 Residential Portion)	
Required: (214,581 SF x 0.08) / 2 =	**8,583**
Provided:	**7,458**
Pool Courtyard	6,558
Aqua Lounge	900
50% Payment in Lieu	4,292

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Charlotte, NC 28202
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THE PARK AT CHAPEL HILL APARTMENTS
PHASE 1A & 1B
CHAPEL HILL, NC
FORM DISTRICT PERMIT - 2/28/2019
FORM DISTRICT PERMIT RE-SUBMITTAL 5/3/2019

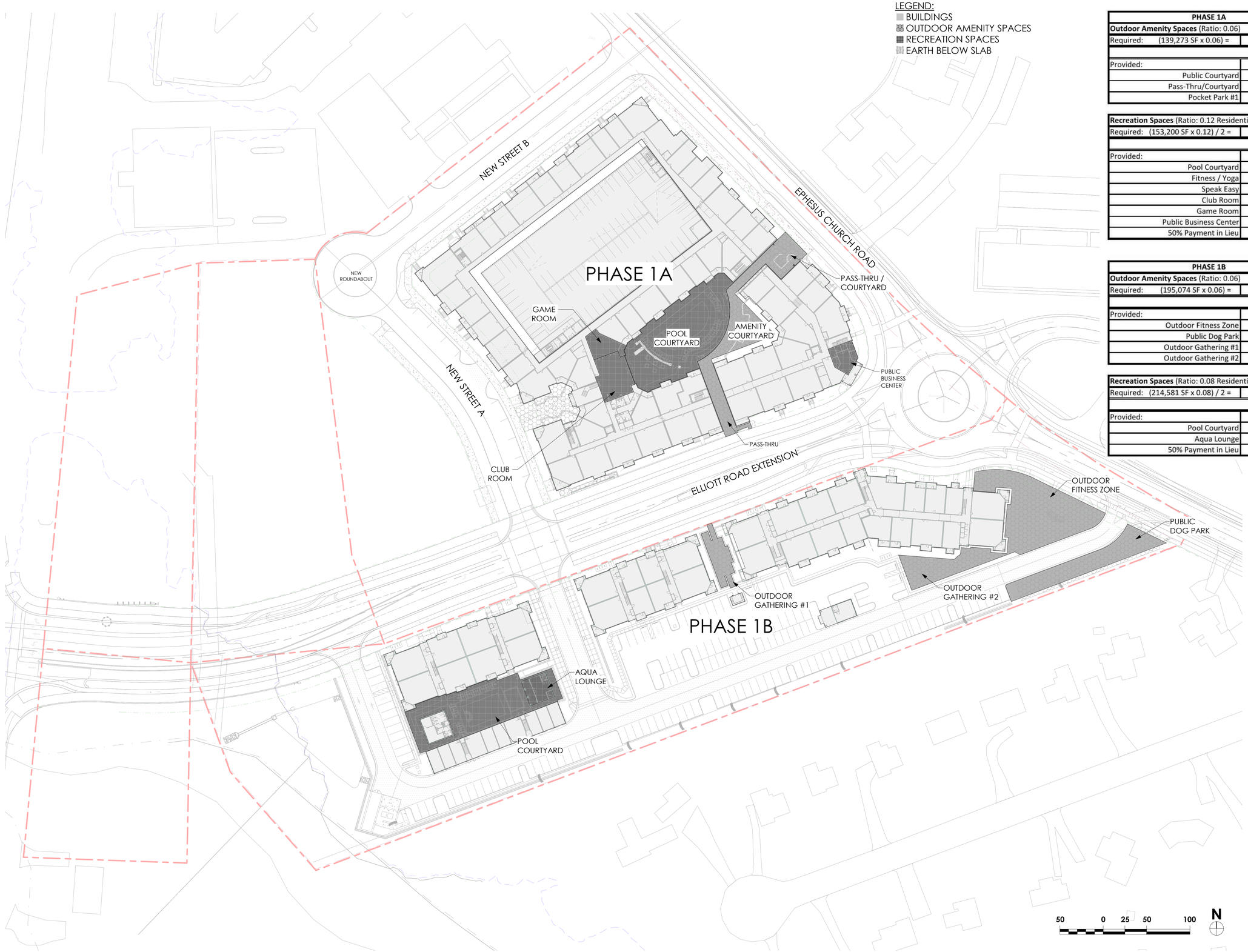
HOUSING STUDIO, P.A.
REGISTERED ARCHITECTURAL CORPORATION
CERT. NO. 50863
NORTH CAROLINA
CHARLOTTE, NC

PROJECT
AMENITY SPACE
SITE PLAN -
LOWER LEVEL

A1.002

1 OUTDOOR AMENITY & RECREATION SPACE SITE PLAN - LOWER LEVEL
1" = 50'-0"

1703 THE PARK AT CHAPEL HILL GARDEN
4/19/2019 7:56:11 AM



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Provided:	**15,969**
Pool Courtyard	9,058
Fitness / Yoga	2,480
Speak Easy	911
Club Room	1,819
Game Room	871
Public Business Center	831
50% Payment in Lieu	4,596

PHASE 1B	
Outdoor Amenity Spaces (Ratio: 0.06)	
Required: (195,074 SF x 0.06) =	**11,704**
Provided:	**15,406**
Outdoor Fitness Zone	7,484
Public Dog Park	3,862
Outdoor Gathering #1	1,379
Outdoor Gathering #2	2,681

Recreation Spaces (Ratio: 0.08 Residential Portion)	
Required: (214,581 SF x 0.08) / 2 =	**8,583**
Provided:	**7,458**
Pool Courtyard	6,558
Aqua Lounge	900
50% Payment in Lieu	4,292

HOUSING STUDIO
333 West Trade Street, Suite 300
Charlotte, NC 28202
T: 704.333.7862 F: 980.237.3862

THE PARK AT CHAPEL HILL APARTMENTS
PHASE 1A & 1B
CHAPEL HILL, NC
FORM DISTRICT PERMIT - 2/28/2019
FORM DISTRICT PERMIT RE-SUBMITTAL 5/3/2019

PROJECT
AMENITY SPACE
SITE PLAN - MAIN LEVEL

A1.003

1 OUTDOOR AMENITY & RECREATION SPACE SITE PLAN - MAIN LEVEL
1" = 50'-0"

1703 THE PARK AT CHAPEL HILL GARDEN
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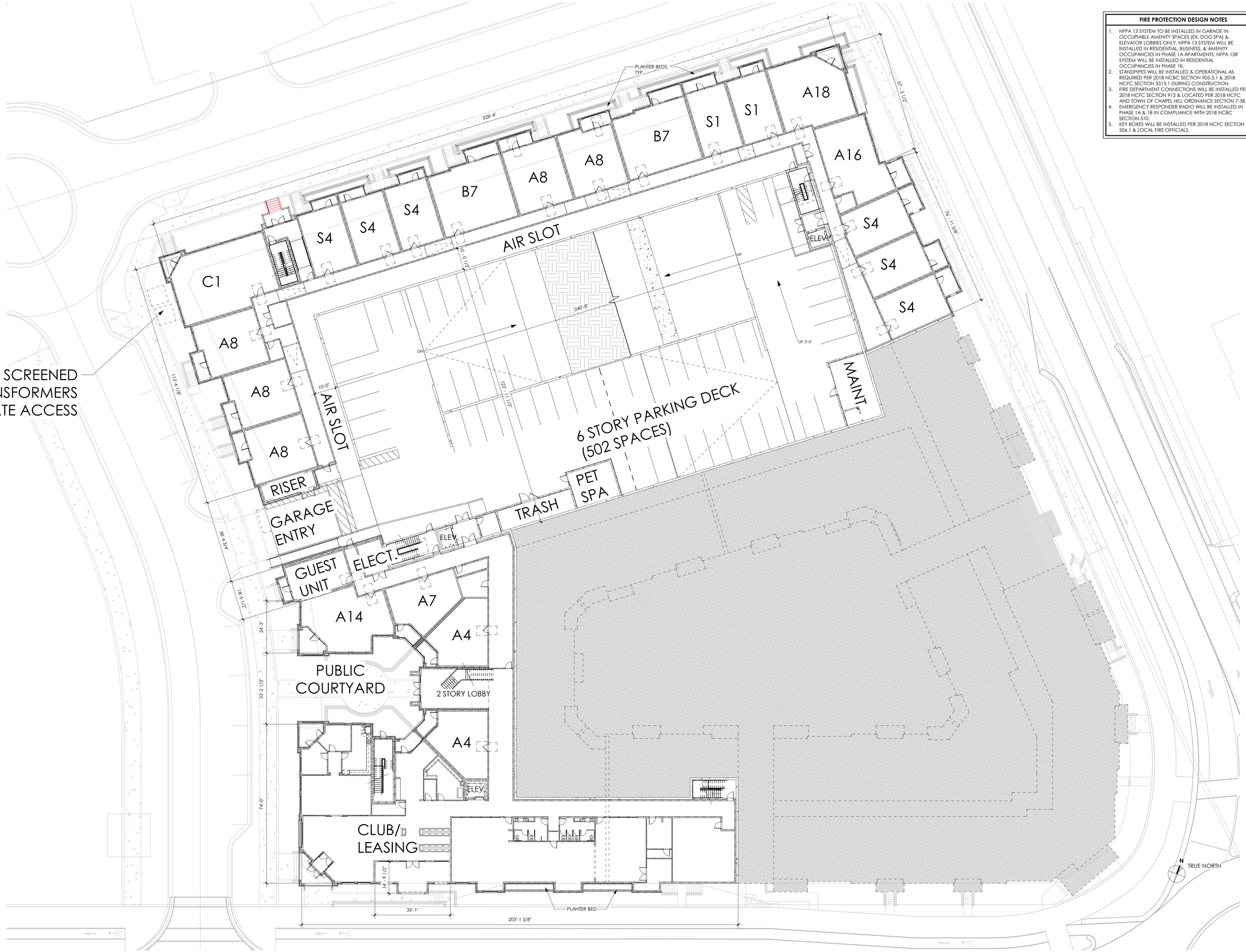

1 LOWER LEVEL - KEY PLAN CDC
1" = 20'-0"

FIRE PROTECTION DESIGN NOTES

1. NFPA 13 SYSTEM TO BE INSTALLED IN GARAGE IN OCCUPIABLE AMENITY SPACES (EX. DOG SPA) & ELEVATOR LOBBIES ONLY. NFPA 13 SYSTEM WILL BE INSTALLED IN RESIDENTIAL, BUSINESS, & AMENITY OCCUPANCIES IN PHASE 1A APARTMENTS. NFPA 13R SYSTEM WILL BE INSTALLED IN RESIDENTIAL OCCUPANCIES IN PHASE 1B.
2. STANDPIPES WILL BE INSTALLED & OPERATIONAL AS REQUIRED PER 2018 NCBC SECTION 905.3.1 & 2018 NCFC SECTION 3313.1 DURING CONSTRUCTION.
3. FIRE DEPARTMENT CONNECTIONS WILL BE INSTALLED PER 2018 NCFC SECTION 912 & LOCATED PER 2018 NCFC AND TOWN OF CHAPEL HILL ORDINANCE SECTION 7-38.
4. EMERGENCY RESPONDER RADIO WILL BE INSTALLED IN PHASE 1A & 1B IN COMPLIANCE WITH 2018 NCBC SECTION 510.
5. KEY BOXES WILL BE INSTALLED PER 2018 NCFC SECTION 506.1 & LOCAL FIRE OFFICIALS.

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THE PARK AT CHAPEL HILL APARTMENTS
PHASE 1A
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HOUSING STUDIO, P.A.
REGISTERED ARCHITECTURAL COMPANY
CERT. NO. 50863
NORTH CAROLINA
CHARLOTTE, NC

LOWER LEVEL FLOOR PLAN

A2A.00

1703 THE PARK AT CHAPEL HILL APARTMENTS
4/19/2019 7:39:08 AM

FIRE PROTECTION DESIGN NOTES

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THE PARK AT CHAPEL HILL APARTMENTS
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HOUSING STUDIO, P.A.
REGISTERED ARCHITECTURAL CORPORATION
CERT. NO. 50863
NORTH CAROLINA
CHARLOTTE, NC

1ST FLOOR PLAN

A2A.01

1 1ST FLOOR - KEY PLAN CDC
1" = 20'-0"

1703 THE PARK AT CHAPEL HILL APARTMENTS
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