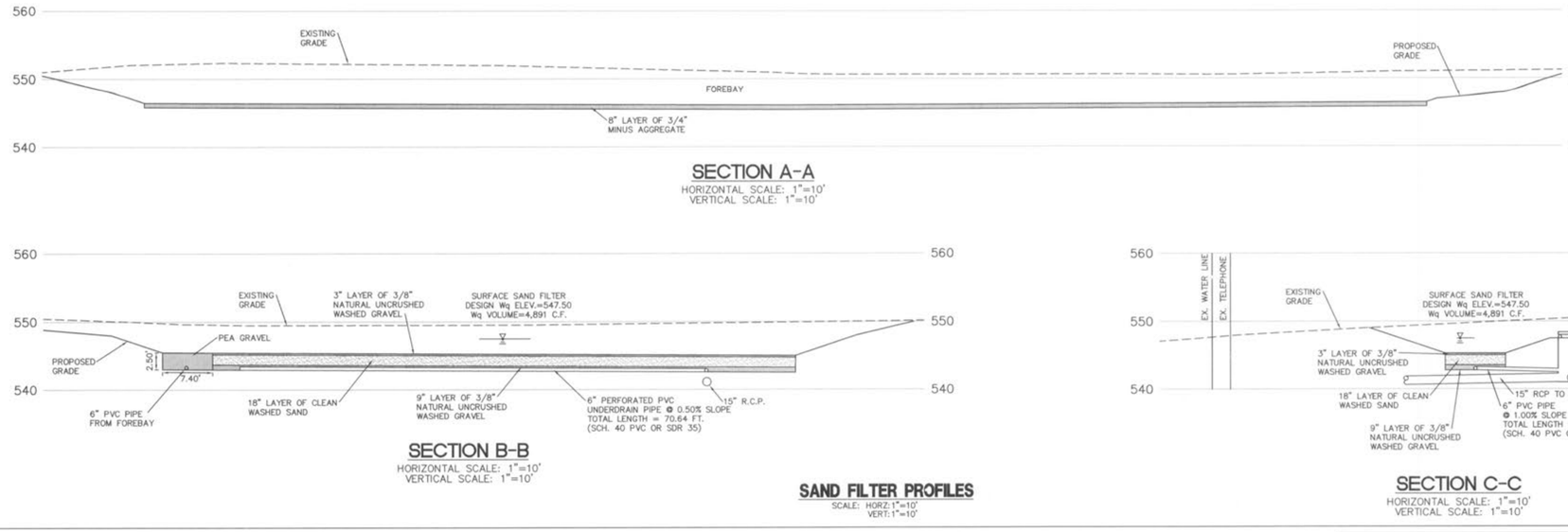
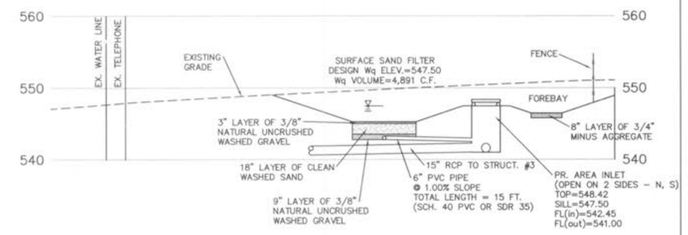


SECTION A-A

HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=10'

SECTION B-B

HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=10'



SECTION C-C

HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=10'

SAND FILTER PROFILES

SCALE: HORZ:1"=10'
VERT:1"=10'

PROJECT: Centene Data Center (Progress Point Lot A) — PROJ. NO: 209-4511

Table 1: Roof Runoff (North), Car Parking Lot & Greenspace Surface Sand Filter

Step 1: Water Quality Volume:

Drainage/Disturbed Area1	2.56	Acres	
Percent Impervious Cover(I)	42.5	%	
Required WQv Area1:	4,582	*Cu. FT. [WQv=(1.14*(.05+.009I)*A)/12*43560]*	

Step 2: Sediment Basin Surface Area(Asf)

Required WQv	4582	
Asf	302	*Ft.^2 (.066 x WQv)**

*Note: This equation is for % Impervious < 75%

Step 3: WQv Pretreatment Forebay

			Provided: Elevation	Area	Volume
Required WQv	3,436	*Cu. FT. [Vp=0.75xWQv]*	546.50	758	0
Pretreatment Volume(Vp)	1,146	*Cu. FT. [Vp=0.25xWQv]*	547.00	1343	525
			547.50	1943	1347
			548.00	2556	2472

Step 4: WQv Basin Area

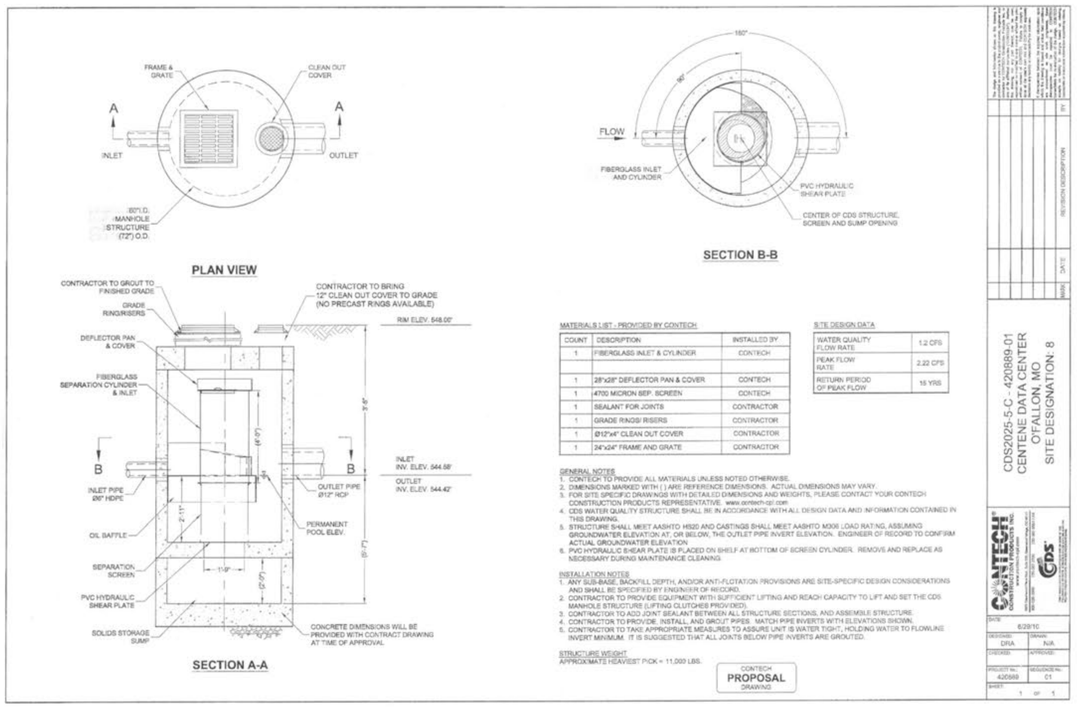
Provided: Area(Af) = 858 Ft.^2

			Provided Volume(Vt) (Above Sand Filter) Elevation	Area	Volume
Required WQv	4,582	*Cu. FT.*	545.50	858	0
Filter Bed Depth(ft)	1.50	*Ft.***	546.00	1,174	508
Coefficient of Permeability(k)	3.5	*Ft./day****	546.50	1,504	1,176
Avg. height of water above Bed(hf)	1.00	*Ft.*	547.00	1,848	2,916
Design Filter Bed Drain Time(tf)	1.67	*days*****	547.50	2,207	3,029
Surface Area of Filter Bed(Af)	470	*Ft.^2 (WQv x df)/[(k) x (hf + df) x (tf)]*	548.00	2,579	4,226

**Filter Bed Depth Typically is 1.5' (18") for sand filter, and has to be 1.0' minimum.
***k=3.5 ft/day for sand
****Note: 1.67 days for Sand Filters

Step 5: Storage Provided(100% WQv)

Required WQv	4,582		
			v (Voids) = 0.40
Pretreatment Volume(Vp)	1,347	*Cu. Ft.*	
Treatment Volume(Vt)	3,544	*Cu. Ft. [Vt = vf x Af]*	
Provided WQv:	4,891	*Cu. Ft. [Vp + Vt]*	



MATERIALS LIST - PROVIDED BY CONTECH:

COUNT	DESCRIPTION	INSTALLED BY
1	FIBERGLASS INLET & CYLINDER	CONTECH
1	28"x28" DEFLECTOR PAN & COVER	CONTECH
1	4700 MICRON SEP. SCREEN	CONTECH
1	SEALANT FOR JOINTS	CONTRACTOR
1	GRADE RINGS/ RISERS	CONTRACTOR
1	Ø12"x4" CLEAN OUT COVER	CONTRACTOR
1	24"x24" FRAME AND GRATE	CONTRACTOR

SITE DESIGN DATA

WATER QUALITY FLOW RATE	1.2 CFS
PEAK FLOW RATE	2.22 CFS
RETURN PERIOD OF PEAK FLOW	10 YRS

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 DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH CONSTRUCTION PRODUCTS REPRESENTATIVE. www.contech-cpi.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO H520 AND CASTINGS SHALL MEET AASHTO M306 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = 11,000 LBS.

CONTECH PROPOSAL DRAWING

CDS2025-5-C - 420889-01
CENTENE DATA CENTER
O'FALLON, MO
SITE DESIGNATION: 8

DATE: 6/28/10
DESIGNED: DRA
DRAWN: N/A
CHECKED:
APPROVED:
ATTACHMENT No: 420889
SEDIMENT No: 01
SHEET: 1 OF 1

Table 2: Roof Runoff (South) and Deck Drainage to CDS Hydrodynamic Separator
Peak Discharge and Pretreatment Pipe Size for Water Quality(WQ) Storm

STEP 1 Compute Rational Runoff Coefficient
- Drainage Area(A): 0.77 (Acres - to BMP)
- %Impervious: 90.0 (%)
- Rational Runoff Coefficient(c): 0.86 (Rv= .05+ .009*I)

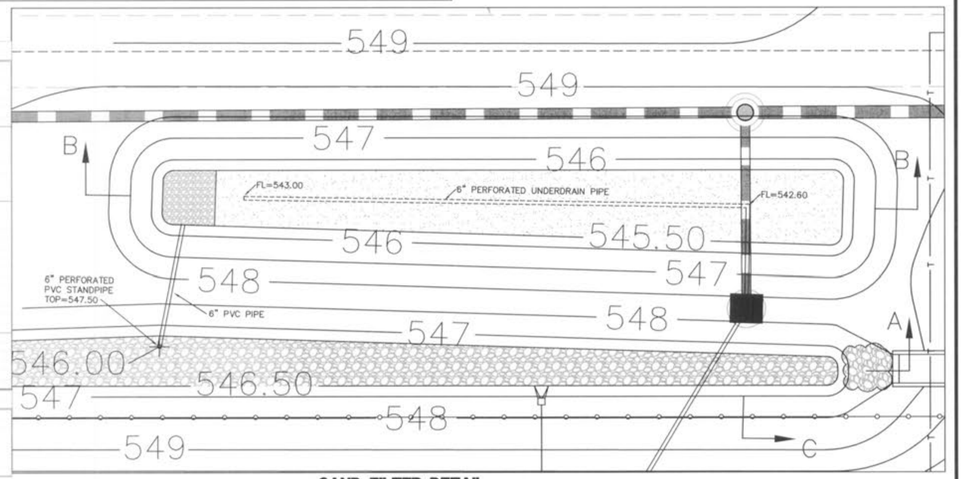
STEP 2 Compute Curve Number(CN)
- Rainfall Depth(P): 1.14 (Inches)* *Rainfall Depth = 1.14" for WQ Storm
- Compute Runoff Volume(Qw): 0.96 (Qw=PxRv)
- Compute CN: 98.5 (CN= 1000/(10+5P+10Qa-10(Qa^2 + 1.25QaP)^.5)

STEP 3 Compute Peak Runoff Rate for Water Quality(WQ) Storm
- Time of Concentration(Tc): 5 (Minutes (Assumed))
- Tc): 0.08 (Hours)
- Compute Initial Abstraction(Ia): 0.029 (Ia=200/CN)-2
- Compute Ia/P Ratio: 0.02586 (Ia/P)
- Unit Peak Factor(qu): 1000 (From Figure D-11.1)
- Drainage Area(Am): 0.0012 (sq.mi.(Am=A/640))
- Peak Developed Peak Discharge for Water Quality(WQ) Storm (Qp): 1.18 (Qp=quxAmxQw)

STEP 4 Water Quality Volume (WQv)
- Drainage Area(A): 0.77 (Acres - to BMP)
- %Impervious: 90.0 (%)
- (WQv): 2,745 (Cu. FT. [WQv=(1.14*(.05+.009*I)*A)/12*43560])

- Wq Flow Rate Capacity Required: 1.18 c.f.s.
- Wq Flow Rate Capacity Provided: 1.2 c.f.s.
- BMP Selected: CDS

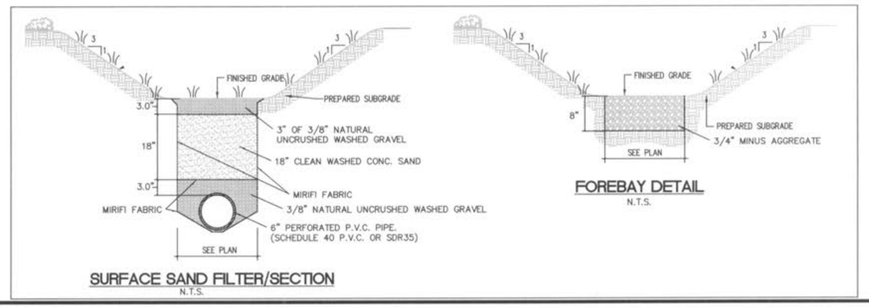
Water Quality - Total Site
- Total Required WQv: 7,071 Cu. FT.
- Total Provided WQv: 7,631 Cu. FT.



SAND FILTER DETAIL

SCALE: HORZ:1"=10'
VERT:1"=10'

PRECAST INLET #8 DETAIL



MATERIAL SPECIFICATIONS FOR SAND FILTERS

MATERIAL	SPECIFICATION / TEST METHOD	SIZE	NOTES
SAND	CLEAN AASHTO-M6 OR ASTM-C-33 CONCRETE SAND	0.02" TO 0.04"	SAND SUBSTITUTES SUCH AS DIABASE AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.
PEAT	ASH CONTENT: <15% pH RANGE: 5.2 TO 4.9 LOOSE BULK DENSITY 0.12 TO 0.15 g/cc	N/A	THE MATERIAL MUST BE REED-SEDGE HEMIC PEAT, SHREDDED, UNCOMPACTED, UNIFORM AND CLEAN
LEAF COMPOST		N/A	
UNDERDRAIN GRAVEL	AASHTO-M-43	No. 67 TO 0.75"	NATURAL, UNCRUSHED, WASHED
GEOTEXTILE FABRIC (IF REQUIRED)	ASTM-D-4833 (PUNCTURE STRENGTH-125 lb.) ASTM-D-4632 (TENSILE STRENGTH-300 lb.)	0.08" THICK EQUIVALENT OPENING SIZE OF #80 SIEVE	MUST MAINTAIN 125 gpm PER sq. ft. FLOW RATE. NOTE: A 4" PEA GRAVEL LAYER MAY BE SUBSTITUTED FOR GEOTEXTILES MEANT TO "SEPARATE" SAND FILTER LAYERS.
IMPERMEABLE LINER (IF REQUIRED)	ASTM-D-4833 (THICKNESS) ASTM-D-412 (TENSILE STRENGTH-1,100 lb., ELONGATION 200%) ASTM-D-624 (TEAR RESISTANCE-150 lb./in) ASTM-D-471 (WATER ABSORPTION: +8 TO -2% MASS)	30 mil. THICKNESS	LINER TO BE ULTRAVIOLET RESISTANT. A GEOTEXTILE FABRIC SHOULD BE USED TO PROTECT THE LINER FROM PUNCTURE.
UNDERDRAIN PIPING	F 758, TYPE PS 28 OR AASHTO-M-278	4"-6" RIGID SCHEDULE 40 PVC OR SDR35 PEA GRAVEL: 0.75"	3/8" PERF. @ 6" ON CENTER, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES; NOT NECESSARY UNDERNEATH PIPES.
STONE WINDOW	ASTM-D-448		USE CLEAN BANK-RUN GRAVEL

5	2010-11-03 FOR PERMIT
4	2010-07-21 REVISED PER CITY & PWSD COMMENTS
3	2010-06-30 REVISED PER CITY COMMENTS
2	2010-16-09 PROGRESS PRINTING #2
1	2010-05-24 REVISED PER SEWER DISTRICT COMMENTS

NOV. 3, 2010

STATE OF MISSOURI GEORGE MICHAEL STOCK NUMBER E-25116 REGISTERED PROFESSIONAL ENGINEER

GEORGE M. STOCK E-25116
CIVIL ENGINEER
CERTIFICATE OF AUTHORITY NUMBER: 000996

WATER QUALITY DETAILS

CENTENE DATA CENTER

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PH. (636) 530-9100
FAX (636) 530-9130
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Web: www.stockassoc.com

DRAWN BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER:	SHEET:
J.M.B.	05/07/10	G.M.S.	05/07/10	209-4511	C15 of 21

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