

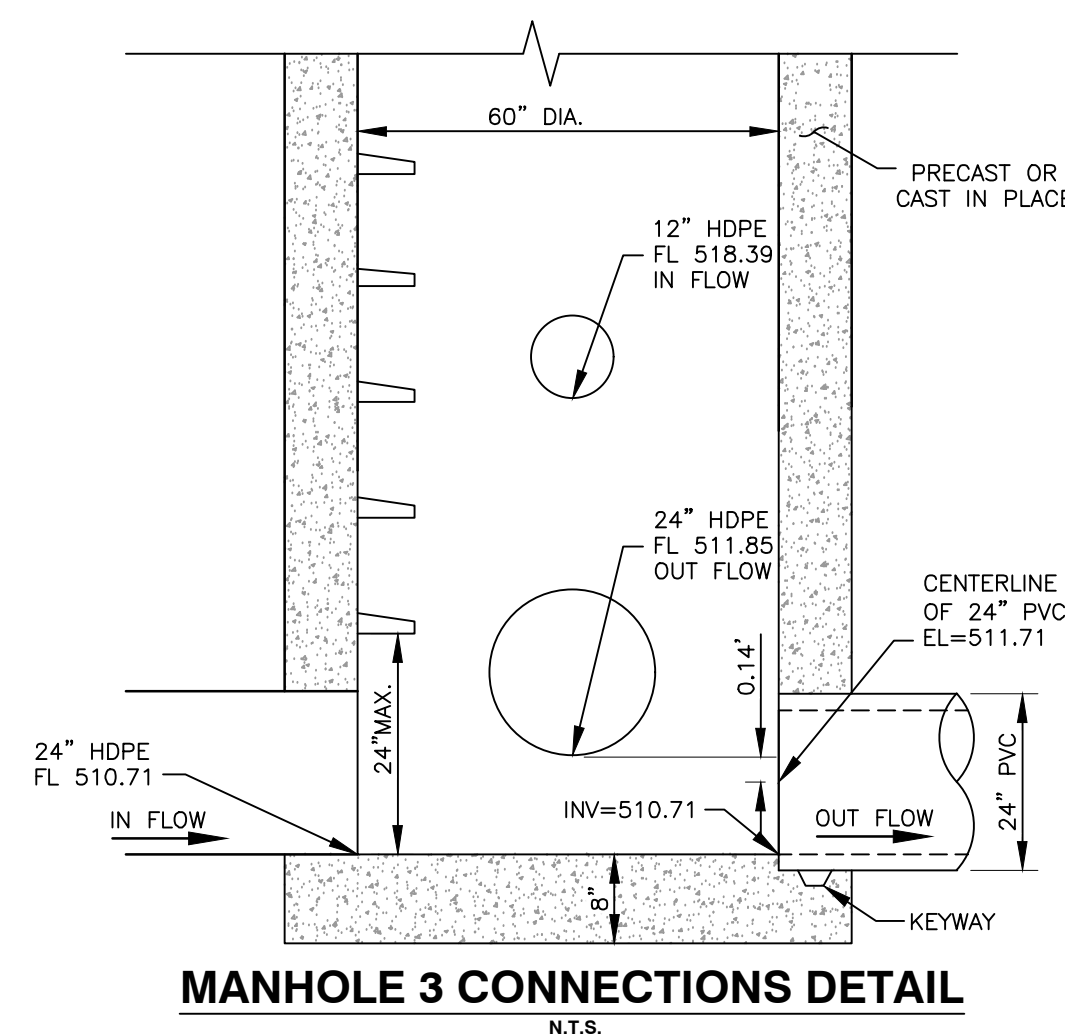
WATER QUALITY PEAK DISCHARGE RATE (PER APPENDIX D-10) & STORAGE VOLUME (PER MSD 4.080.02)	
Drainage Area to HDS	
Curve Number, CN =	96 (Based on WQ rainfall depth)
Note: $CN=100/[10+5P+10Qa-10V(Qa^2+1.25QaP)]$	
Time of Concentration, Tc =	5 minutes
	0.083 hours
Site Area, A =	4.23 acres
	0.00661149 sq. miles
MSD WQ Rainfall Depth, P =	1.14 inches
Impervious Area Percentage, I =	87.5%
	Note: $Rv=0.05+0.009(I)$
Volumetric Runoff Coefficient, Rv =	0.8375
Initial Abstraction, Ia =	0.0833 inches
	Note: $Ia=(200/CN)-2$
Ratio Ia/P =	0.0731
WQ Post-Development Runoff Depth, Qa =	0.9548 inches
	Note: $Qa=PxRv$
Unit Peak Factor, qu =	980 (from Exhibit 4-II)
Peak Discharge, Qp =	6.18 cfs
Note: $Qp=qu \cdot A \cdot Qa$ (where A is in sq. miles)	

CONTECH CASCADE MSD APPROVAL

Model	Manhole Diameter (ft)	MTR (cfs)	50% Max. Sediment Storage Volume (ft ³)
CS-3	3	1.02	5.3
CS-4	4	1.80	9.4
CS-5	5	2.81	14.7
CS-6	6	4.05	21.2
CS-8	8	7.20	37.7
CS-10	10	11.3	58.9
CS-12	12	16.2	84.8

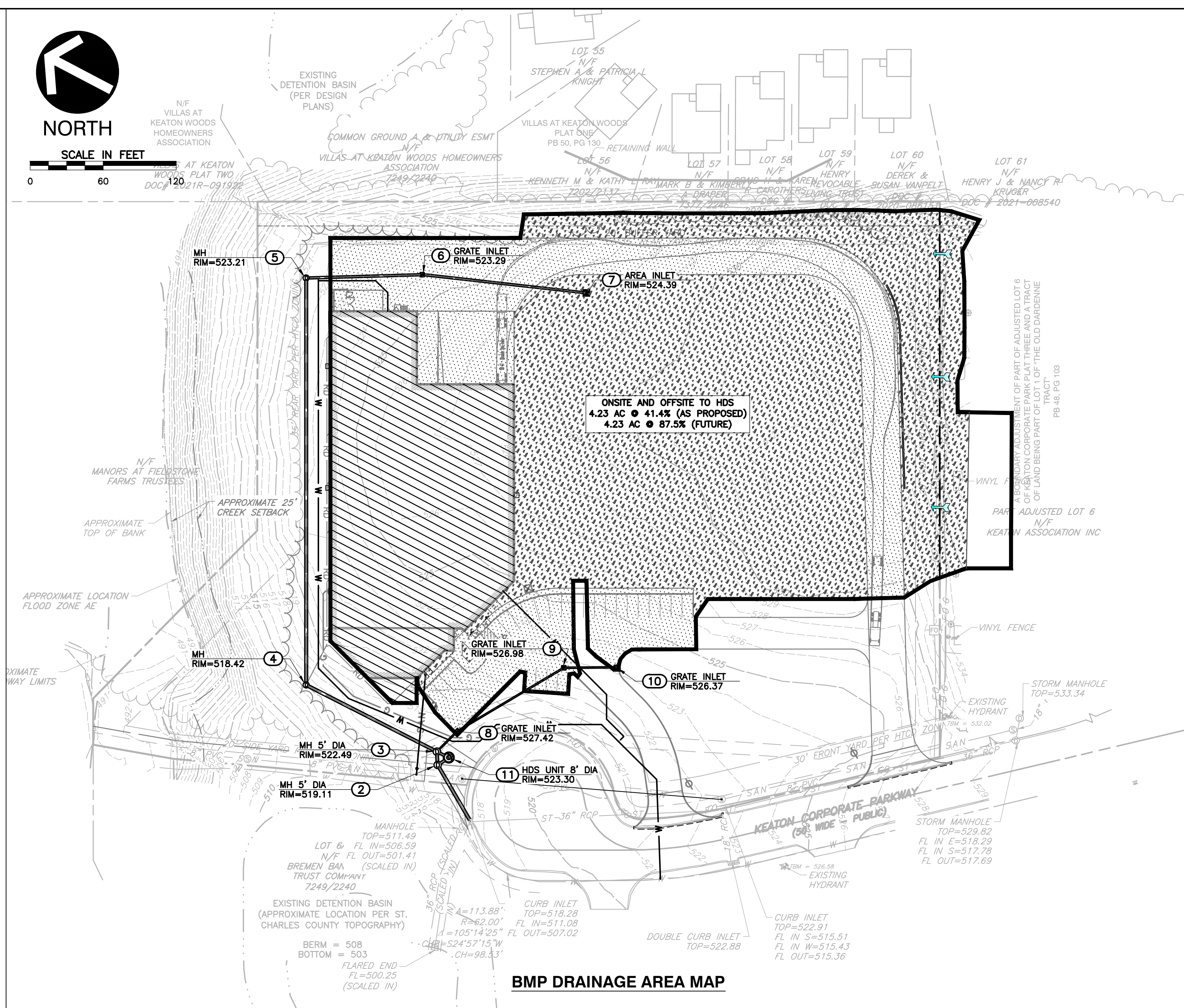
REQUIRED BMP MAX TREATMENT = 6.18 CFS
 PROVIDED BMP MAX TREATMENT = 7.20 CFS
 (CONTECH CS-8 CASCADE SEPARATOR)

ORIFICE EQUATION = $C \times A \times \sqrt{2 \times 32.2 \times \Delta H}$
 C = 0.66
 A = 3.14 SQ FT (24"Ø)
 G = 32.2 FT/SEC/SEC
 6.18 CFS = 0.66 x 3.14 x $\sqrt{2 \times 32.2 \times \Delta H}$
 ΔH = 0.14 FT (ABOVE CENTERLINE OF ORIFICE)



WATER QUALITY DESIGN SHEET AS PROPOSED		
WATER QUALITY CALCULATIONS - ONSITE DISTURBED REQUIRED		
Drainage Area	5.40 ac	*WQ STORAGE VOLUME PER MSD 4.080.02
Impervious Area	4.23 ac	
WQv*	9,604 cf	
WQv Requirement (75%)	7,203 cf	*Forebay req'd if D.A. is greater than 2.5ac
Forebay Volume Requirement (25%)	0 cf	
Note: $WQv=[P \cdot Rv \cdot A]/12$ where P=1.14 inches of rainfall, Rv=0.05+0.009I where I is % impervious cover and A is drainage		
WATER QUALITY CALCULATIONS - TRIBUTARY AS PROPOSED		
Drainage Area	4.23 ac	*WQ STORAGE VOLUME PER MSD 4.080.02
Impervious Area	41%	
WQv*	7,397 cf	
Note: $WQv=[P \cdot Rv \cdot A]/12$ where P=1.14 inches of rainfall, Rv=0.05+0.009I where I is % impervious cover and A is drainage		
BMP TRIBUTARY AREA EQUIVALENT VOLUME AS PROPOSED		
WQv Tributary Equivalent Volume	7,397 cf	
Tributary Volume > Required Volume	PASS	

WATER QUALITY DESIGN SHEET FUTURE		
WATER QUALITY CALCULATIONS - ONSITE DISTURBED REQUIRED		
Drainage Area	5.40 ac	*WQ STORAGE VOLUME PER MSD 4.080.02
Impervious Area	76%	
WQv*	16,342 cf	
WQv Requirement (75%)	12,256 cf	*Forebay req'd if D.A. is greater than 2.5ac
Forebay Volume Requirement (25%)	0 cf	
Note: $WQv=[P \cdot Rv \cdot A]/12$ where P=1.14 inches of rainfall, Rv=0.05+0.009I where I is % impervious cover and A is drainage		
WATER QUALITY CALCULATIONS - TRIBUTARY FUTURE		
Drainage Area	4.23 ac	*WQ STORAGE VOLUME PER MSD 4.080.02
Impervious Area	88%	
WQv*	14,660 cf	
Note: $WQv=[P \cdot Rv \cdot A]/12$ where P=1.14 inches of rainfall, Rv=0.05+0.009I where I is % impervious cover and A is drainage		
BMP TRIBUTARY AREA EQUIVALENT VOLUME FUTURE		
WQv Tributary Equivalent Volume	14,660 cf	
Tributary Volume > Required Volume	PASS	



SOURCE ONE SOLUTIONS CONSTRUCTION PLAN
 PART OF ADJUSTED LOT 6 OF A BOUNDARY ADJUSTMENT PLAT OF KEATON CORPORATE PARK PLAT THREE AND THE JAMES KNAUTH TRACT, ACCORDING TO THE PLAT THEREOF, RECORDED IN PLAT BOOK 45, PAGE 352, WITHIN U.S. SURVEY 1669, TOWNSHIP 46 NORTH, RANGE 3 EAST, CITY OF O'FALLON, ST. CHARLES COUNTY, MISSOURI

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JAMES R. PIPER, JR.
 PE-2012006197
 10/31/2023
 PROFESSIONAL ENGINEER

JAMES R. PIPER, JR. PE
 #PE-2012000797
 PROFESSIONAL CIVIL ENGINEER
 *HAND SIGNATURE ON FILE

JRP	DKK	DKK	381-945
DRAWN BY:	CHECKED BY:	APPROVED BY:	PROJECT NO:

Developer / Owner Information
SOURCE ONE SOLUTIONS
 c/o KEYSTONE CONSTRUCTION CO.
 633 Spirit Valley Central Drive
 Chesterfield, MO 63005

STORMWATER MANAGEMENT

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 Approval Date 08/03/2023
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Page No. **C402**