

T.R. HUGHES BOULEVARD (WIDTH VARIES)

PROPERTY N/F OF
ST. CHARLES COUNTY, MISSOURI
D.B. 5367 PG. 2175
PARCEL I.D.: 2-0051-5022-00-0002.1263000
PT. OF FUTURE DEVELOPMENT "E"
"CROSSINGS INDUSTRIAL"
P.B. 44 PG. 269-274

Future Area to Detention
 Imperv. Area = 1.40 ac.
 Pervious Area = 0.16 ac.
 Tributary Area = 1.56 ac.

PROPERTY N/F OF
ST. CHARLES COUNTY, MISSOURI
D.B. 5367 PG. 2175
PARCEL I.D.: 2-0140-3070-00-0002.2710000
PT. OF FUTURE DEVELOPMENT "E"
"CROSSINGS INDUSTRIAL"
P.B. 44 PG. 269-274

TOTAL AREA
484,136 SQ. FT.
(11.14 AC.)

52 Parking Stalls

Detention Basin
 Imperv. Area = 1.74 ac.
 Pervious Area = 0.86 ac.
 Tributary Area = 2.60 ac.

Proposed Emergency
Operations Center
F.F.=506.00

Mechanical
Yard

H

N87°46'44"W 1202.74'

N01°37'04"E
31.51'

S02°13'10"W 344.22'

S01°37'04"W 327.13'

134.8'

9.71' 10.81'

96" CHAIN LINK FENCE

72" CHAIN LINK FENCE

(14)
2-G.I.W./S.I.
TOP=502.75
FL=499.00
UTILITY POLE

(15)
2-G.I.W./S.I.
TOP=504.00
FL=499.75

(16)
2-G.I.W./S.I.
TOP=504.00
FL=500.50

(17)
2-G.I.W./S.I.
TOP=495.93
FL=495.93

(18)
2-G.I.W./S.I.
TOP=500.00
FL=500.00

(28)
DBL. A.I.
TOP=498.67
SILL=497.75
FL=491.25

(29)
F.E.S.
FL=494.00
(H.V.Y. STONE REV.
6'Wx12'Lx2'D)

F.E.S.
FL=494.55
(LT. STONE REV.
4'Wx8'Lx1.5'D)
0.60 ac.
x 1.87 c.f.s./ac.
1.12 c.f.s.
direct to basin

(19)
AREA INLET
TOP=500.42
SILL=499.50
FL=495.00
6" PERF. B.V.C.
UNDERDRAIN
FL=493.83

(19)
F.E.S.
FL=498.00
(LT. STONE REV.
4'Wx8'Lx1.5'D)

(20)
STORM M.H.
TOP=503.50
FL in, out=498.16
FL out W=499.16

(21)
PERCHED C.C.
FL=493.83
FL out=495.50

(22)
2-G.I.W./S.I.
TOP=503.25
FL=500.00

(23)
2-G.I.W./S.I.
TOP=503.95
FL=500.50

(24)
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FL=500.00

(25)
2-G.I.W./S.I.
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FL=500.50

(26)
2-G.I.W./S.I.
TOP=503.25
FL=500.00

(27)
2-G.I.W./S.I.
TOP=503.95
FL=500.50

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FL=500.00

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2-G.I.W./S.I.
TOP=503.95
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TOP=503.25
FL=500.00

(31)
2-G.I.W./S.I.
TOP=503.95
FL=500.50

(32)
2-G.I.W./S.I.
TOP=503.25
FL=500.00

(33)
2-G.I.W./S.I.
TOP=503.95
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2-G.I.W./S.I.
TOP=503.25
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2-G.I.W./S.I.
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(36)
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(43)
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(51)
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(52)
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(162)
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TOP=503.25
FL=500.00

(163)

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
To Basin	Watershed - 100	0	0.609	0.083	22.10
To Basin	Watershed - 2	0	0.239	0.083	8.68
To Basin	Watershed - 25	0	0.476	0.083	17.28
To Basin	Watershed - 15	0	0.386	0.083	14.00

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
Basin Out	Watershed - 100	0	0.603	0.400	8.81
Basin Out	Watershed - 2	0	0.237	0.400	1.55
Basin Out	Watershed - 25	0	0.471	0.400	2.06
Basin Out	Watershed - 15	0	0.382	0.400	1.91

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Basin (IN)	Watershed - 100	0	0.603	0.100	22.10	(N/A)	(N/A)
Basin (OUT)	Watershed - 100	0	0.603	0.400	8.81	498.00	0.512
Basin (IN)	Watershed - 2	0	0.237	0.100	8.68	(N/A)	(N/A)
Basin (OUT)	Watershed - 2	0	0.237	0.400	1.55	495.66	0.198
Basin (IN)	Watershed - 25	0	0.471	0.100	17.28	(N/A)	(N/A)
Basin (OUT)	Watershed - 25	0	0.471	0.400	2.06	497.37	0.417
Basin (IN)	Watershed - 15	0	0.382	0.100	14.00	(N/A)	(N/A)
Basin (OUT)	Watershed - 15	0	0.382	0.400	1.91	496.76	0.333

The developed peak runoff for the site was determined using the Rational Method. The area tributary to the detention basin consists of the following components:

2-Year 20-Minute:

	<u>Area</u>		<u>PI Factor</u>	=	<u>Peak Runoff</u>
Impervious:	3.14 acres	x	2.39 c.f.s./acre	=	7.51 c.f.s.
Pervious:	<u>1.02 acres</u>	x	1.15 c.f.s./acre	=	<u>1.17 c.f.s.</u>
Total:	4.16 acres				Total: 8.68 c.f.s.

15-Year 20-Minute:

	<u>Area</u>		<u>PI Factor</u>	=	<u>Peak Runoff</u>
Impervious:	3.14 acres	x	3.85 c.f.s./acre	=	12.09 c.f.s.
Pervious:	<u>1.02 acres</u>	x	1.87 c.f.s./acre	=	<u>1.91 c.f.s.</u>
Total:	4.16 acres				Total: 14.00 c.f.s.

25-Year 20-Minute:

	<u>Area</u>		<u>PI Factor</u>	=	<u>Peak Runoff</u>
Impervious:	3.14 acres	x	4.75 c.f.s./acre	=	14.92 c.f.s.
Pervious:	<u>1.02 acres</u>	x	2.31 c.f.s./acre	=	<u>2.36 c.f.s.</u>
Total:	4.16 acres				Total: 17.28 c.f.s.

100-Year 20-Minute:

	<u>Area</u>		<u>PI Factor</u>	=	<u>Peak Runoff</u>
Impervious:	3.14 acres	x	6.08 c.f.s./acre	=	19.09 c.f.s.
Pervious:	<u>1.02 acres</u>	x	2.95 c.f.s./acre	=	<u>3.01 c.f.s.</u>
Total:	4.16 acres				Total: 22.10 c.f.s.

The allowable release rate for the development is the peak runoff for an equivalent size area in an undeveloped state less the on-site area that bypasses the basin:

Area draining to Basin: 4.16 Acres
 Area bypassing Basin: 0.21 Acres

Equivalent undeveloped area: 4.37 acres

2-Year 20-Minute: 4.37 acres x 1.15 c.f.s./acre = 5.03 c.f.s.
 15-Year 20-Minute: 4.37 acres x 1.87 c.f.s./acre = 8.17 c.f.s.
 25-Year 20-Minute: 4.37 acres x 2.31 c.f.s./acre = 10.10 c.f.s.
 100-Year 20-Minute: 4.37 acres x 2.95 c.f.s./acre = 12.89 c.f.s.

On-site area bypassing the basin: 0.21 acres

2-Year 20-Minute: 0.21 acres x 2.39 c.f.s./acre = 0.50 c.f.s.
 15-Year 20-Minute: 0.21 acres x 3.85 c.f.s./acre = 0.81 c.f.s.
 25-Year 20-Minute: 0.21 acres x 4.75 c.f.s./acre = 1.00 c.f.s.
 100-Year 20-Minute: 0.21 acres x 6.08 c.f.s./acre = 1.28 c.f.s.

Allowable Release Rate: (Equivalent undeveloped area – bypass area)

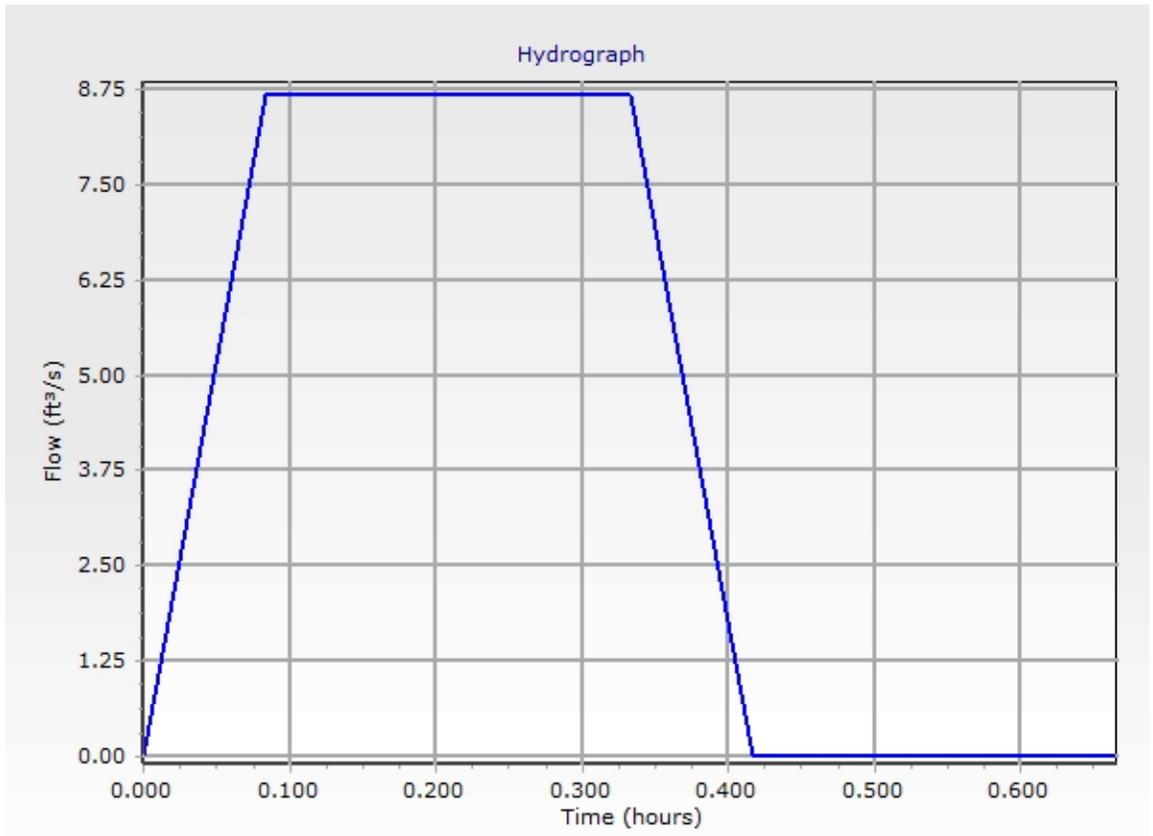
2-Year 20-Minute: 5.03 c.f.s. - 0.50 c.f.s. = 4.53 c.f.s.
 15-Year 20-Minute: 8.17 c.f.s. - 0.81 c.f.s. = 7.36 c.f.s.
 25-Year 20-Minute: 10.10 c.f.s. - 1.00 c.f.s. = 9.10 c.f.s.
 100-Year 20-Minute: 12.89 c.f.s. - 1.28 c.f.s. = 11.61 c.f.s.

Hydrographs Detailed Report: HYG 1 (2year)

Element Details			
ID	28	Start Time	0.000 hours
Label	HYG 1	Increment	0.083 hours
Tag	2year	End Time	0.667 hours
Notes			
Notes			

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.083 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	8.68	8.68	8.68	8.68
0.417	0.00	0.00	0.00	0.00	(N/A)



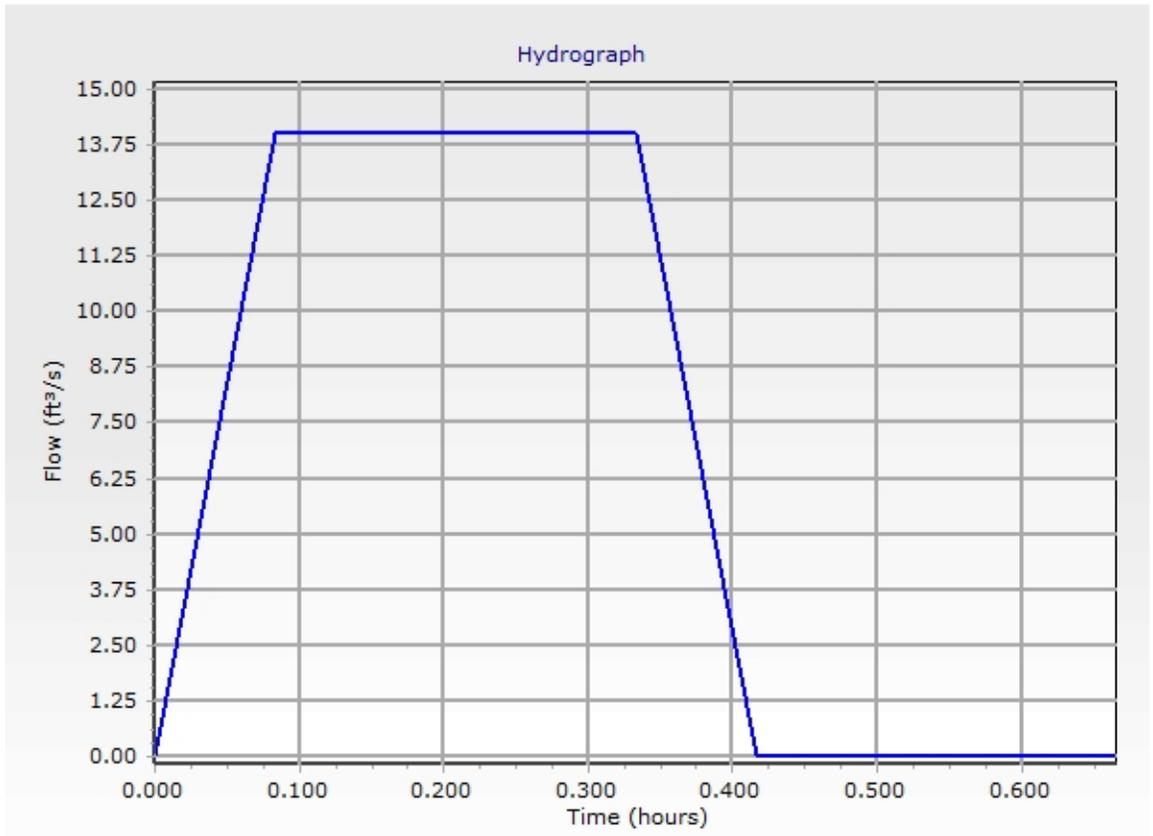
Hydrographs Detailed Report: HYG 4

(15year)

Element Details			
ID	52	Start Time	0.000 hours
Label	HYG 4	Increment	0.083 hours
Tag	15year	End Time	0.667 hours
Notes			
Notes			

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.083 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	14.00	14.00	14.00	14.00
0.417	0.00	0.00	0.00	0.00	(N/A)

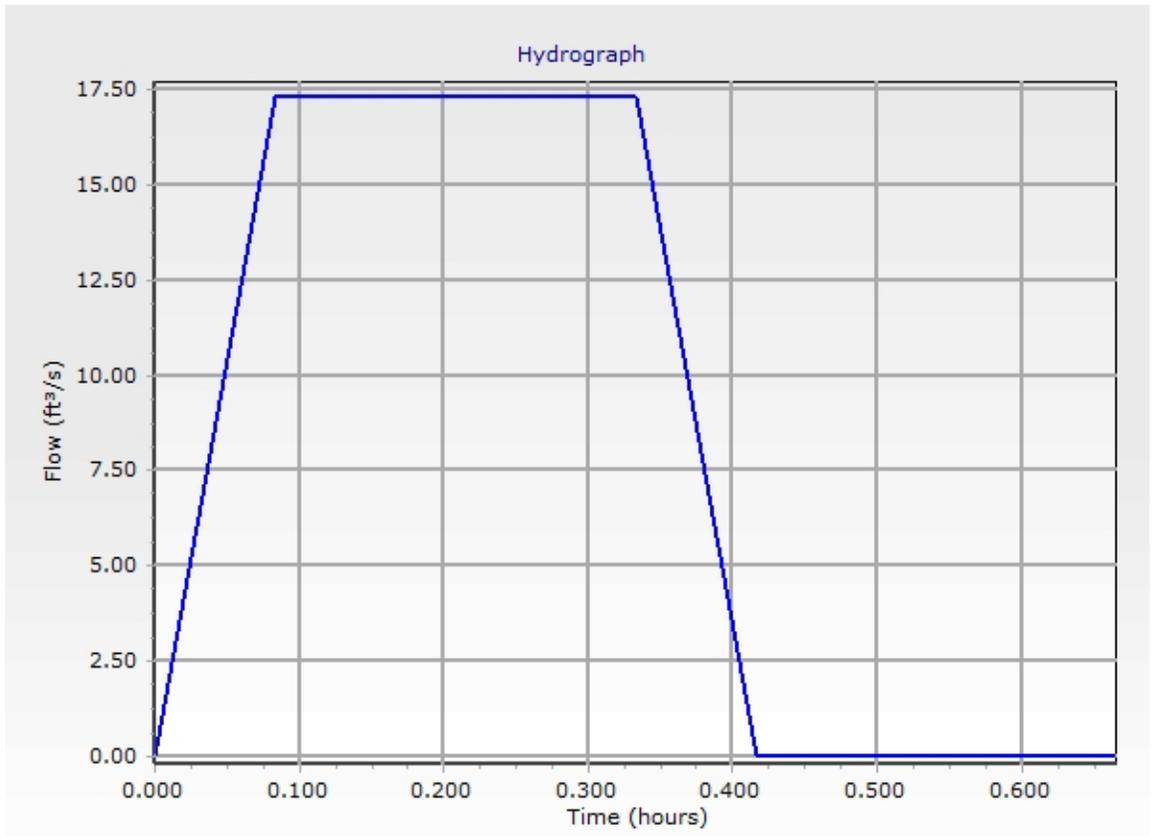


Hydrographs Detailed Report: HYG 2 (25year)

Element Details			
ID	30	Start Time	0.000 hours
Label	HYG 2	Increment	0.083 hours
Tag	25year	End Time	0.667 hours
Notes			
Notes			

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.083 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	17.28	17.28	17.28	17.28
0.417	0.00	0.00	0.00	0.00	(N/A)



Hydrographs Detailed Report: HYG 3

(100yr)

Element Details			
ID	29	Start Time	0.000 hours
Label	HYG 3	Increment	0.083 hours
Tag	100yr	End Time	0.667 hours
Notes			
Notes			

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.083 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	22.10	22.10	22.10	22.10
0.417	0.00	0.00	0.00	0.00	(N/A)

