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**P.A.C. DI INIZIATIVA PRIVATA**

**DENOMINATO "ZONA H"**

**RELAZIONE IDRAULICA**

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**COMMITTENTI:**

**PETROL SERVICE SRL**

**PROMOCENTER 2000 SRL**

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**IL TECNICO**

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## Premessa

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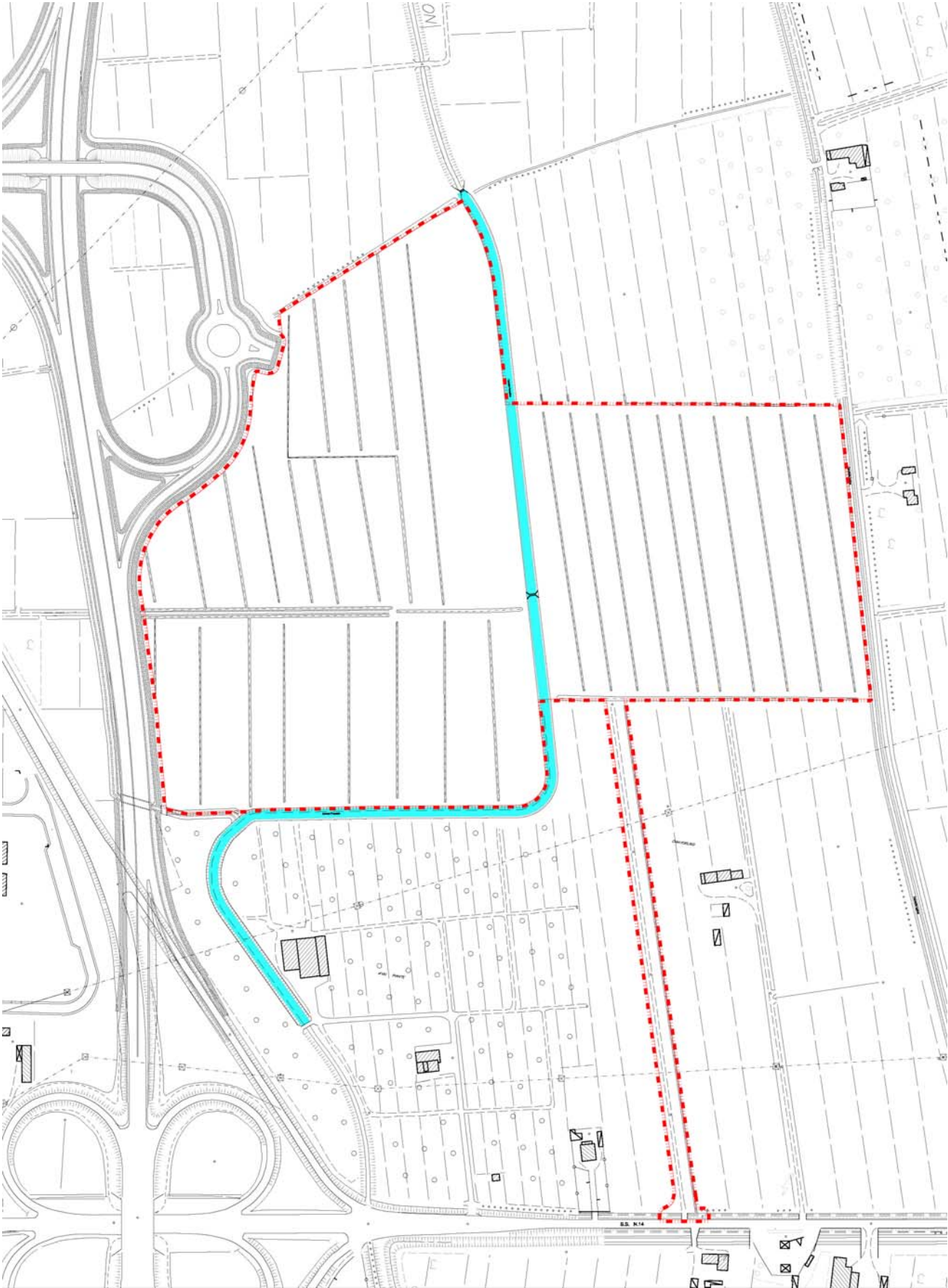
La presente relazione idraulica intende giustificare le scelte adottate per la realizzazione delle opere di raccolta delle acque meteoriche e delle acque di rifiuto previste dal P.A.C. di iniziativa privata denominato “Zona H”.

La zona oggetto di intervento urbanistico appartiene al territorio soggetto al controllo idraulico da parte del “Consorzio di Bonifica Bassa Friulana” di Udine. La zona recentemente e' stato oggetto di studio di riassetto idraulico per l' inserimento del nuovo casello autostradale con soluzioni tecniche concordate tra Ente gestore dell' autostrada A4 e Consorzio di Bonifica con progetto redatto dallo Studio Foramitti di Udine.

Pertanto, le scelte sulla rete di scarico delle acque meteoriche e delle acque reflue devono recepire le indicazioni dello studio idraulico menzionato ed essere conformi alle previsioni del piano generale di fognatura comunale.

Nella presente relazione, per non aggravare le condizioni di rischio idraulico della zona si e' proceduto al dimensionamento del sistema di raccolta e laminazione delle acque meteoriche in occasione di eventi con tempo di ritorno 10 anni in modo tale da garantire l' invarianza idraulica rispetto allo stato attuale del canale Fossalon che attraversando l' area d' intervento costituisce sia allo stato attuale che a quello di progetto il recettore finale delle acque.

Figura 1



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## Indicazioni Progettuali

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L' inserimento del nuovo casello autostradale ha comportato uno sconvolgimento alla vocazione naturale dei luoghi ed al loro assetto funzionale e al fine di rendere compatibile in termini di sostenibilita' ambientale lo sviluppo urbano sul territorio comunale sono allo studio e in corso di applicazione nuove strategie e provvedimenti tesi ad attenuare il carico idraulico nei comparti edificatori esistenti o in ampliamento in considerazione delle portate future che verranno generate dal drenaggio delle superfici e dei suoli a seguito delle loro modifiche d' uso. Attualmente non sono disponibili strumenti operativi aggiornati che recepiscono queste indicazioni, pertanto nella stesura del presente progetto si applica il principio dell' **Invarianza Idraulica** con la quale si impone che la portata al colmo di piena risultante dal drenaggio di un' area non venga modificata con il cambio di destinazione d' uso del suolo o con la variazione dei parametri idrologici originari come l' assorbimento dei suoli e la conseguente riduzione dei tempi di corrivazione delle acque e soprattutto nell' isolare le acque meteoriche dalle acque di rifiuto urbano mantenendo invariati o aumentando i tempi di corrivazione nei singoli bacini con l' inserimento di adeguate possibilità di invaso alle acque di piena prima di raggiungere i collettori di bonifica.

Non essendo ancora previsto l' adeguamento delle reti di fognatura separata ai nuovi insediamenti urbanistici, per la realizzazione delle nuove reti, sia per tipologia che per uso dei materiali, si seguiranno le indicazioni del Piano Generale di Fognatura Comunale adottando un recapito ad impianti di depurazione autonomi.

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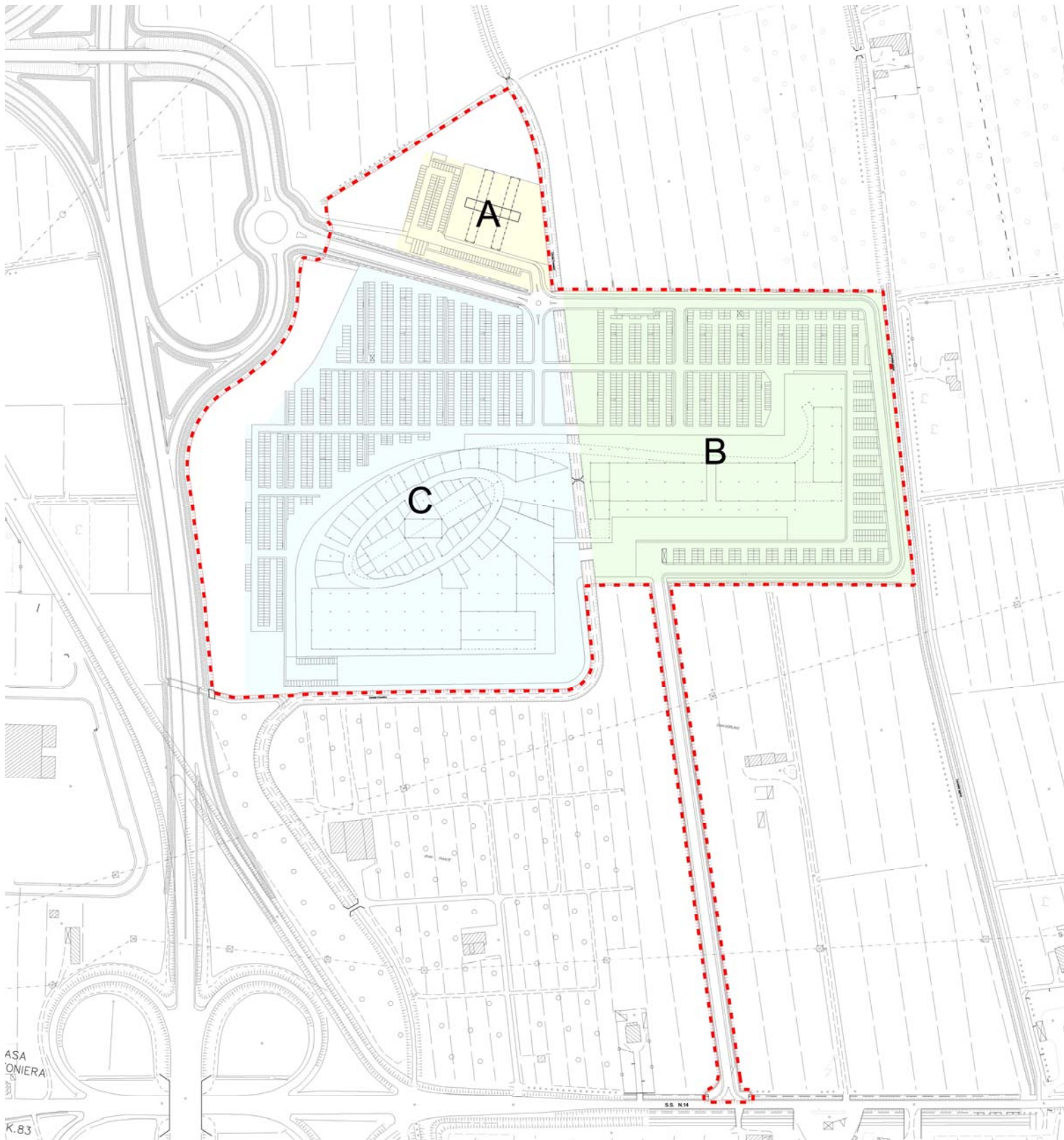
## Acque meteoriche

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Il territorio è attraversato dal canale Fossalon che provenendo da nord lambisce inizialmente la zona d' intervento per poi attraversarla con una curva finale a destra costeggiandola per il confine sud e abbandonandola con una curva a sinistra.(fig. 1) La quota attuale del terreno risulta posizionata variabilmente da nord a sud tra i m. 5.00 e m. 4.30, il progetto prevede di portare la quota di superficie a una media costante di 5.50m. In queste condizioni l' attuale sezione del canale Fossalon con una pendenza di 0,001 e una portata massima di 20,67 mc/sec risultanti dal progetto Foramitti, di cui in premessa, comporta un tirante idraulico in regime di moto uniforme pari a m. 2.85, sufficiente a garantire un franco arginale sulle nuove quote d' imposta dell' intervento urbanistico. (**appendice 1**)

L' intervento suddivide naturalmente la zona in tre bacini (fig. 2) con scarico autonomo nel canale Fossalon e denominati Zona A, Zona B e Zona C.

**Figura 2**



## **Considerazioni generali**

Il calcolo della massima portata defluente allo stato attuale della zona oggetto di intervento, delle portate attese allo stato di progetto e il dimensionamento del sistema di raccolta e laminazione delle acque meteoriche e' stato eseguito mediante il software di libero dominio SWMM 5.0 (Storm Water Management Model), prodotto dalla Environmental Protection Agency (EPA) americana.

L' evento pluviometrico preso a riferimento per la modellazione e' caratterizzato da un tempo di ritorno pari a 10 anni e durata 1 ora, Le perdite di bacino sono state calcolate secondo il metodo CN del Soil Conservation Service (SCS) americano, mentre la trasformazione afflussi netti-deflussi e' stata eseguita con riferimento al metodo dell' onda cinematica e il moto nelle condotte risulta di tipo vario per tener conto degli invasamenti nelle condotte stesse e nei bacini di accumulo predisposti per la laminazione della piena.

Per individuare l' evento di precipitazione da assumere a base di calcolo sono state assunte le registrazioni massime annuali delle altezze di precipitazione per le diverse durate (scrosci e precipitazioni orarie) rilevate dagli annali del servizio idrografico della stazione pluviografica di Latisana. Dalle elaborazioni statistico-probabilistiche sono state desunte le equazioni della curva di possibilita' pluviometrica compatibili con la tipologia dell' evento significativo per la rete idraulica in studio e per un tempo di ritorno caratteristico delle opere di fognatura e bonifica pari a 10 anni.

Curve di possibilita' pluviometrica con tempo di ritorno  $T = 10$  anni

Indicando con  $t =$  tempo di precipitazione in ore  
 $h =$  altezza di precipitazione in mm

per precipitazioni inferiori ad ore 1  $h = 44,1 t^{0,30}$

per precipitazioni superiori ad ore 1  $h = 40,5 t^{0,38}$

La curva individua lo ietogramma sintetico di progetto in funzione alla durata dell' evento che regola il funzionamento idraulico del condotto in esame appartenente alla rete in studio.

Considerando la tipologia dei sottobacini di raccolta si adotta un tempo di evento pari a 60 minuti, verificando la variazione delle grandezze idrauliche per un tempo di evento di 45 minuti e di tre ore.

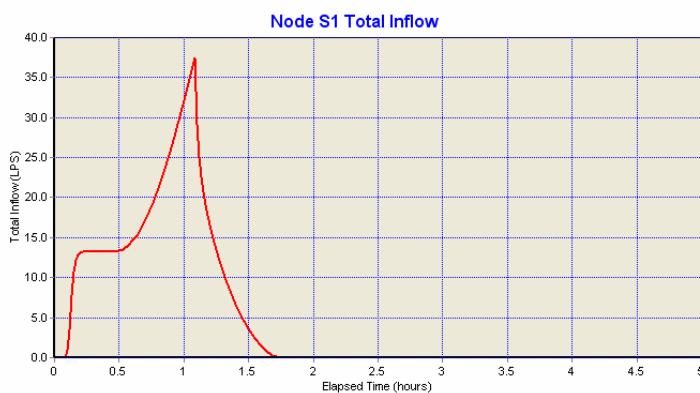
## Calcolo della massima portata uscente allo stato attuale

Il modello idrologico per il calcolo della massima portata uscente allo stato attuale in occasione di eventi pluviometrici con tempo di ritorno 10 anni e durata di pioggia di 1 ora e' stato implementato per ogni zona precedentemente definita nel codice di calcolo SWMM mediante l'impiego di un elemento subcatchement (sottobacino), un elemento raingage (pluviometro) e un elemento outfall (chiusura bacino). L'elemento sottobacino simula l'area scolante allo stato attuale quasi interamente a verde con parametro CN pari a 80 con una percentuale di impermeabilita' pari al 10% e il 25% della zona impermeabile senza depressioni. La scabrezza superficiale dell'area scolante per il calcolo della trasformazione afflussi netti-deflussi con il metodo dell'onda cinematica e' stata simulata mediante l'assegnazione dei coefficienti di scabrezza di Manning pari a 0,01 per le zone impermeabili e 0,20 per le zone permeabili, la pendenza superficiale del piano di scorrimento e' stata assunta pari al 0,5% con altezza di accumulo delle depressioni pari a 1mm per le zone impermeabili e 4mm per le zone permeabili, le grandezze geometriche per i bacini sono state assunte:

Zona	A	B	C
Area Ha	1.085	6.640	9.140
L Drenaggio m	106	515	850

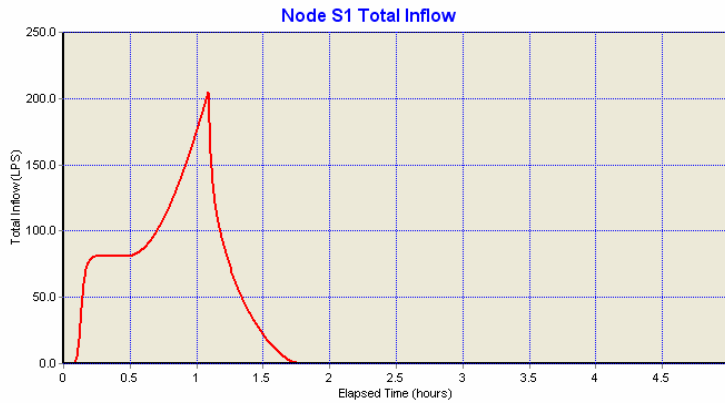
L'evento pluviometrico di riferimento, simulato mediante l'elemento reingage, è costituito da una pioggia di durata oraria con un tempo di ritorno 10 anni e altezza pari a 44,10 mm.

Il Report con gli schemi di calcolo del programma SWMM viene riportato in **appendice 2**, gli idrogrammi di piena attesi allo scarico risultano:

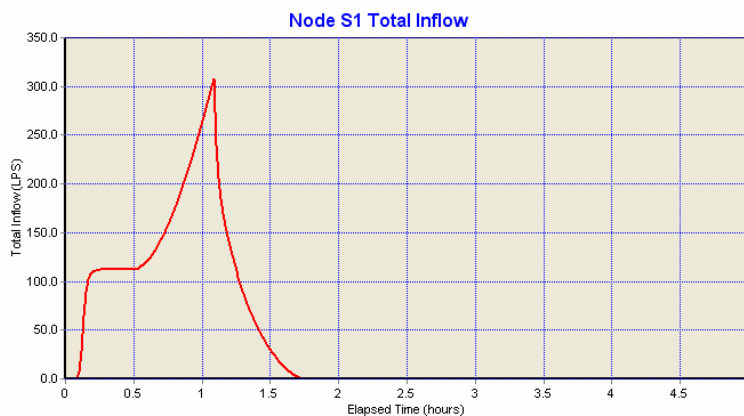


Idrogramma di piena per la Zona A -  $Q_{max} = 37,50$  l/sec





Idrogramma di piena per la Zona B -  $Q_{max} = 205$  l/sec



Idrogramma di piena per la Zona C -  $Q_{max} = 310$  l/sec

Pertanto la portata massima complessiva attesa risulta pari a:

$$Q_{max} = 40 + 205 + 310 = 555 \text{ l/sec}$$

### ***Calcolo della massima portata uscente allo stato di progetto***

Il calcolo della massima portata uscente allo stato di progetto e' stato eseguito costruendo il modello idrologico per ogni singola zona suddividendola in tanti sottobacini in relazione alla possibilita' di scarico delle condotte inserite: si sono simulati i sottobacini corrispondenti ciascuno ad un area scolante con gli elementi condotto che simulano i vari tratti della fognatura in progetto, gli elementi giunzione che modellano i pozzetti del condotto fognario principale e gli elementi outfall che modellano lo scarico nel canale ricevente.

Ogni singolo sottobacino e' stato suddiviso in aree omogenee per il calcolo delle perdite assumendo le seguenti tre tipologie:

Superficie impermeabile (strade, marciapiedi, tetti) CN=98

Superficie semipermeabile (autobloccanti parcheggio) CN=90

Superficie permeabile (verde, aiuole) CN=80

La media ponderale dei valori e' il CN medio da applicare al sottobacino

La percentuale di area impermeabile deriva da:

$(\text{zona impermeabile} + \text{zona semipermeabile}) / \text{superficie complessiva}$

La percentuale di area impermeabile senza accumulo deriva da:

$(\text{zona impermeabile}) / (\text{zona impermeabile} + \text{zona semipermeabile})$

La scabrezza superficiale dell' area scolante per il calcolo della trasformazione afflussi netti-deflussi con il metodo dell' onda cinematica e' stata simulata mediante l' assegnazione dei coefficienti di scabrezza di Manning pari a 0,012 per le zone impermeabili e 0,20 per le zone permeabili, la pendenza superficiale del piano di scorrimento e' stata assunta pari al 0,5% con altezza di accumulo delle depressioni pari a 2mm per le zone semipermeabili e 4mm per le zone permeabili, le zone impermeabili hanno altezza di accumulo nulla.

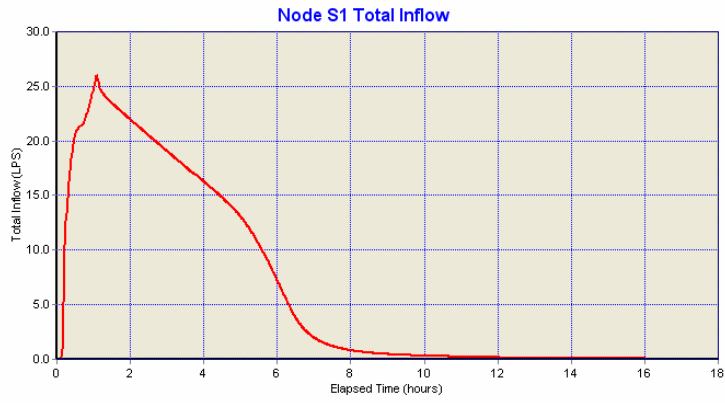
L' evento pluviometrico di riferimento, simulato mediante l' elemento reingage, e' costituito da una pioggia di durata oraria con un tempo di ritorno 10 anni e altezza pari a 44,10 mm.

La rete di scarico viene modellata con condotti circolari con diametro in relazione alla minima possibilita' di ricoprimento e pendenza di fondo uniforme pari a 0,0005.

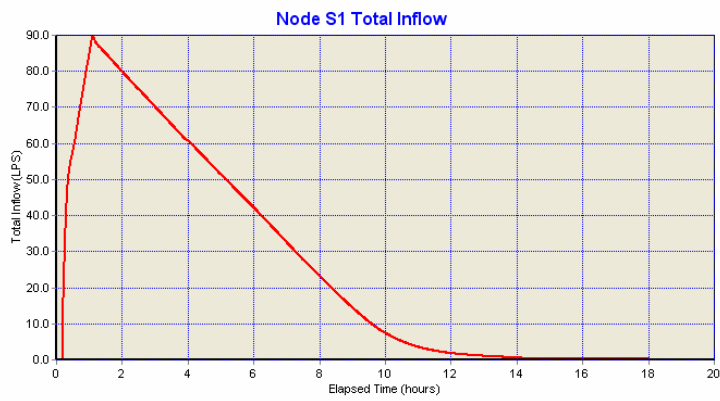
Per il dimensionamento del sistema di laminazione delle portate meteoriche si e' assunto un nodo di scarico particolare con una bocca tarata di fondo che garantisca una portata inferiore a quella imposta dalla condizione di invarianza idraulica e una condotta superiore sfiorante che permetta lo scarico delle acque in esubero per fenomeni meteorici piu' intensi rispetto a quelli attesi.

La condizione di sufficienza si impone inserendo alcuni serbatoi lungo la rete della capacita' tale che per i fenomeni attesi, la portata sugli sfioratori risulti nulla.

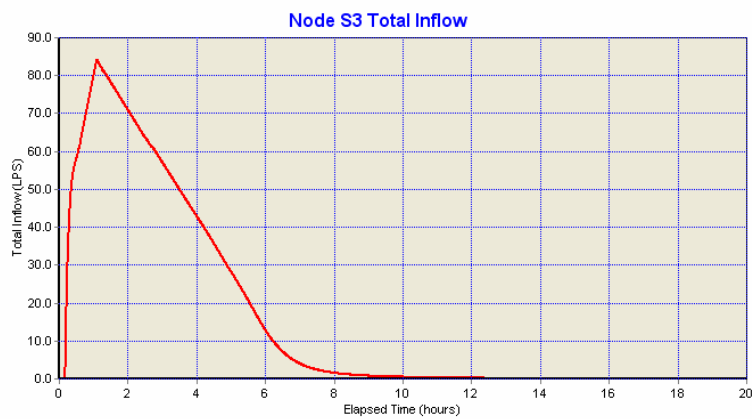
Il Report con gli schemi di calcolo del programma SWMM viene riportato in **appendice 3**, gli idrogrammi di piena attesi allo scarico risultano:



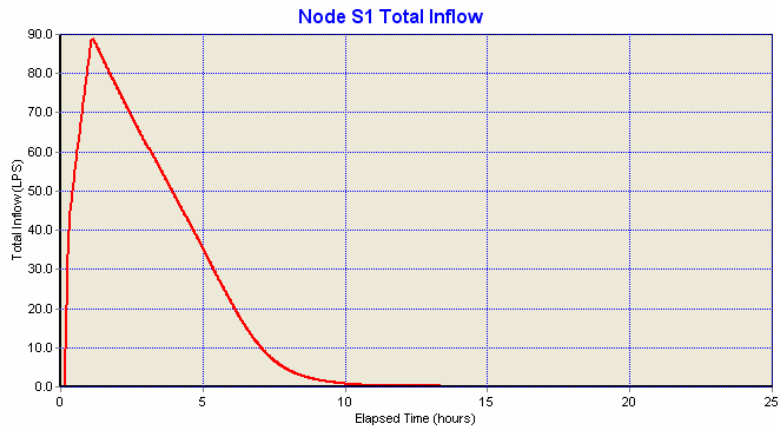
Idrogramma di piena per la Zona A -  $Q_{max} = 26$  l/sec



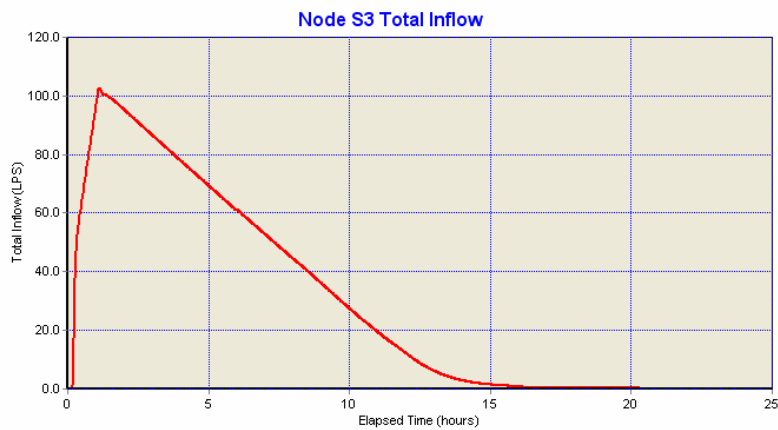
Idrogramma di piena per la Zona B scarico 1 -  $Q_{max} = 90$  l/sec



Idrogramma di piena per la Zona B scarico 3 -  $Q_{max} = 85$  l/sec



Idrogramma di piena per la Zona C scarico 1 -  $Q_{max} = 89$  l/sec



Idrogramma di piena per la Zona C scarico 3 -  $Q_{max} = 103$  l/sec

Pertanto la portata massima complessiva attesa risulta pari a:

$$Q_{max} = 26 + 90 + 85 + 89 + 103 = 393 \text{ l/sec}$$

Si ritiene che la condizione di invarianza idraulica sia soddisfatta in quanto la portata scaricata dopo l'intervento risulta di 393 l/sec inferiore alla attuale di 555 l/sec e il tempo di svuotamento passa da circa 2 ore a circa 15 ore.

Dai risultati delle elaborazioni idrauliche per la rete della fognatura meteorica riportate in **appendice 3** correlate alle quote di massima piena del canale ricevente riportate in **appendice 1** si desume la necessita' di mantenere le quote di scorrimento il piu' possibile elevate compatibilmente alla necessita' di un ricoprimento sufficiente a garantire la stabilita' delle opere stradali, di inserire serbatoi interrati per la laminazione dell' onda di piena e di

provvedere gli scarichi sul canale ricevente con manufatti adeguati alla reale possibilità di scarico.

Come indicato dagli elaborati grafici, la rete interrata delle acque meteoriche viene realizzata con tubazioni circolari in calcestruzzo armato con unione a bicchiere e anello di tenuta, le condotte vengono intercettate da pozzetti di ispezione in corrispondenza di intersezioni, deviazioni, variazioni di sezione e lungo la linea almeno uno ogni 50 mt.

Planimetricamente lo scarico avviene lungo le sedi stradali per permettere una efficiente manutenzione.

Altimetricamente le condotte vengono posizionate in modo da essere ricoperte adeguatamente. La pendenza delle condotte viene mantenuta sull'ordine dello 0,05%.

La captazione delle acque stradali viene effettuata con pozzetti pesanti a gola di lupo in calcestruzzo sui marciapiedi e con caditoie in sede stradale in ghisa sferoidale di adeguata classe, la mutua distanza non supera i 15 metri.

La captazione dell'acqua dei fabbricati viene effettuata con idonei pozzetti di presa in calcestruzzo posizionati in corrispondenza agli scarichi privati ed alla profondità più bassa possibile al fine di permettere un efficiente scolo delle attuali acque di superficie.

Tutti gli innesti per la captazione delle acque vengono fatti in corrispondenza ai pozzetti di ispezione ed i manufatti vengono realizzati in conformità alle prescrizioni del Regolamento di fognatura comunale.

I serbatoi di accumulo per la provvisoria ritenzione delle acque invase vengono realizzati assemblando celle modulari in polipropilene confinate da membrane impermeabilizzanti di contorno collegate da tubazioni multiple ai pozzetti della rete pluviale. I collegamenti possono essere dotati di valvole apposite per gestire il flusso di evacuazione dell'acqua invasa anche in caso d'uso per annaffiamento o altra attività di lavaggio e consumo.

I manufatti di scarico vengono realizzati con un pozzettone alla cui base viene posizionato lo scarico di fondo con una bocca tarata (tubo a diametro fisso) protetta da una griglia, la bocca tarata scarica sul ricevente con una valvola a clapet per impedire il rigurgito dell'acqua del canale. La valvola a clapet comanda l'apertura di una deviazione all'impianto di sollevamento adeguato a garantire lo scarico della portata della bocca tarata in caso di ostruzione della condotta di scarico. Subito a valle della bocca tarata viene inserito l'allacciamento alla vasca di prima pioggia. Sul pozzettone di arrivo viene realizzata una bocca di sfioro all'altezza del cielo della condotta di arrivo in modo da garantire comunque lo scarico dell'acqua in pressione per eventuali malfunzionamenti o per eventi superiori a quelli previsti.

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## Acque nere

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Per la realizzazione della rete di scarico delle acque nere, vista l' impossibilita' di allacciamento alla rete esistente si seguono le indicazioni del piano generale di fognatura comunale prevedendo l' inserimento di adeguati impianti di depurazione prima dello scarico delle acque reflue sui canali ricettori.

Precisamente come evidenziato negli elaborati grafici di progetto per la zona A di insediamento di una struttura ricettiva viene realizzato un impianto di depurazione a fanghi attivi della capacita' di 150 abitanti equivalenti in grado di soddisfare le necessita' previste dal massimo impegno della struttura alberghiera e per la zona B C di insediamento di un Centro Commerciale viene realizzato un impianto di depurazione a fanghi attivi della capacita' di 300 abitanti equivalenti in grado di soddisfare le necessita' previste dal massimo impegno della struttura commerciale considerando i 400 addetti al servizio della struttura e le previste attivita' di inserimento all' interno del Centro stesso. Gli impianti di ossidazione a fanghi attivi prevedono le seguenti parti:

- decantazione primaria su fosse Imhoff
- ossidazione biologica su vasche chiuse aerate
- decantazione finale in vasche tramoggiate per separare i fanghi biologici dall' acqua depurata che puo' essere scaricata nel ricevente.
- apparecchiature di sussidio meccanico, di controllo e di trattamento.

Le tratte di adduzione vengono realizzata con tubazioni circolari in Ghisa Sferoidale con giunto rapido con unione a bicchiere e guarnizione di tenuta; le condotte di diametro nominale DN250mm vengono intercettate da pozzetti di ispezione in calcestruzzo armato, in corrispondenza di intersezioni, deviazioni, variazioni di sezione e lungo la linea almeno uno ogni 50 mt.

Le condotte vengono posizionate con una pendenza di fondo del 0,2%.

Gli allacciamenti vengono realizzati con pozzetti ispezionabili in pvc, le vasche condensagrassi e qualsiasi altro pretrattamento previsto da normativa verrà realizzato prima dell' allacciamento alla fognatura nera.

Lo scarico delle acque reflue dalla zona B alla zona C viene garantito da un impianto di sollevamento meccanico a due pompe, di cui una di riserva, alloggiata in un pozzetto dimensionato in modo da garantire un efficiente uso delle pompe stesse per numero di avvii

ora. Il dimensionamento sarà fatto nel rispetto delle previsioni per uno scarico efficiente di tutte le acque provenienti a monte dell' impianto stesso.

Le condotte adottate risultano esuberanti rispetto alle necessità idrauliche in quanto la scelta dei diametri viene effettuata in relazione alla necessità di una efficiente manutenzione nel tempo e pertanto non viene effettuata nessuna verifica idraulica di funzionamento delle condotte stesse.

Latisana, 30.08.2008

ing. Paolo Bravin

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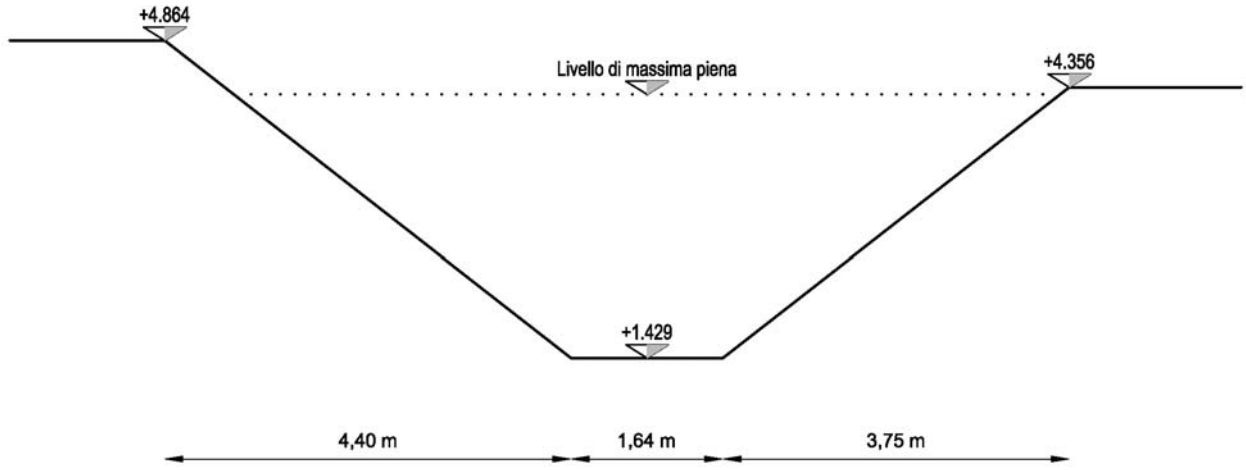
## **Appendice 1**

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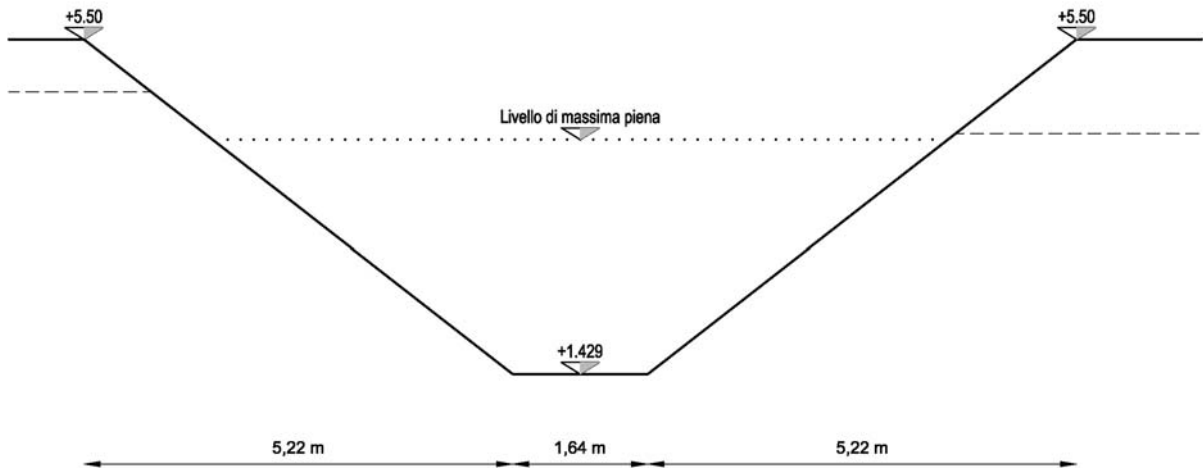
***VERIFICA IDRAULICA CANALE "FOSSALON"***



### Situazione esistente



### Situazione di Progetto



## Tratto: canale Fossalon

Pendenza [m/m]: 0.0010

Verifica sezione: Fossalon1

### SEZIONE GENERICA

N.	Nome	Larghezza max	Altezza max	Formula
		[m]	[m]	
i	Fossalon1	30.00	4.07	GS

#### Legenda sezioni generiche

Larghezza max: massima dimensione orizzontale della sezione;

Altezza max: tirante massimo della sezione;

Dettaglio dei vertici della sezione

N.	X	Y	Scabrezza
	[m]	[m]	
1	0	5.50	35.00
2	10	5.50	35.00
3	15	1.43	35.00
4	16.7	1.43	35.00
5	21.9	5.50	35.00
6	30	5.50	35.00

#### Legenda vertici

N.: numero del vertice;

X: ascissa del vertice;

Y: ordinata del vertice;

k: scabrezza;

### VERIFICA IDRAULICA

h	Corda	Chi	Sigma	R	V	Q	GR
[m]	[m]	[m]	[m <sup>2</sup> ]	[m]	[m/s]	[m <sup>3</sup> /s]	[%]
2.8481	8.8378	10.8325	15.0063	1.3853	1.3754	20.6700	69.98

H	Zita	S.tot	Qmax	hc	Vc	Qc	Froude
[m]	[m]	[mc]	[m <sup>3</sup> /s]	[m]	[m/s]	[m <sup>3</sup> /s]	
2.9448	1.1057	19.4954	46.4899	1.6729	3.2516	61.2457	0.337

<u>Simbologia</u>	
h = tirante	H = carico piezometrico
Corda = corda della sezione idrica	Zita = affondamento del baricentro
Chi = perimetro bagnato	S.tot = spinta totale
Sigma = area della sezione idrica	Qmax = portata massima della sezione
R = raggio idraulico	hc = tirante di stato critico della portata Q
V = velocità	Vc = velocità di stato critico della portata Q
GR = grado di riempimento	Qc = portata di stato critico per il tirante h
	Froude = numero di Froude per la portata Q

### SCALA DI DEFLUSSO

h	Corda	Chi	Sigma	R	V	Q	GR	Froude
[m]	[m]	[m]	[m <sup>2</sup> ]	[m]	[m/s]	[m <sup>3</sup> /s]	[%]	
0.1000	1.9506	2.0207	0.1825	0.0903	0.2228	0.0407	2.46	0.233
0.2000	2.2012	2.3413	0.3901	0.1666	0.3351	0.1307	4.91	0.254
0.3000	2.4518	2.6620	0.6228	0.2340	0.4202	0.2617	7.37	0.266
0.4000	2.7025	2.9826	0.8805	0.2952	0.4907	0.4321	9.83	0.274
0.5000	2.9531	3.3033	1.1633	0.3522	0.5519	0.6421	12.29	0.281
0.6000	3.2037	3.6239	1.4711	0.4059	0.6068	0.8927	14.74	0.286
0.7000	3.4543	3.9446	1.8040	0.4573	0.6570	1.1852	17.20	0.290
0.8000	3.7049	4.2652	2.1620	0.5069	0.7036	1.5212	19.66	0.294
0.9000	3.9555	4.5859	2.5450	0.5550	0.7474	1.9022	22.11	0.298
1.0000	4.2061	4.9065	2.9531	0.6019	0.7890	2.3299	24.57	0.301
1.1000	4.4568	5.2272	3.3862	0.6478	0.8286	2.8060	27.03	0.304
1.2000	4.7074	5.5478	3.8444	0.6930	0.8667	3.3320	29.48	0.306
1.3000	4.9580	5.8685	4.3277	0.7374	0.9034	3.9097	31.94	0.309
1.4000	5.2086	6.1891	4.8360	0.7814	0.9389	4.5408	34.40	0.311
1.5000	5.4592	6.5098	5.3694	0.8248	0.9734	5.2268	36.86	0.313
1.6000	5.7098	6.8304	5.9279	0.8679	1.0070	5.9694	39.31	0.316
1.7000	5.9604	7.1511	6.5114	0.9105	1.0398	6.7703	41.77	0.318
1.8000	6.2111	7.4717	7.1200	0.9529	1.0718	7.6310	44.23	0.320
1.9000	6.4617	7.7924	7.7536	0.9950	1.1031	8.5532	46.68	0.322
2.0000	6.7123	8.1130	8.4123	1.0369	1.1339	9.5383	49.14	0.323
2.1000	6.9629	8.4337	9.0960	1.0785	1.1640	10.5879	51.60	0.325
2.2000	7.2135	8.7543	9.8049	1.1200	1.1937	11.7037	54.05	0.327
2.3000	7.4641	9.0750	10.5387	1.1613	1.2228	12.8870	56.51	0.329
2.4000	7.7147	9.3956	11.2977	1.2024	1.2515	14.1395	58.97	0.330
2.5000	7.9654	9.7163	12.0817	1.2435	1.2798	15.4626	61.43	0.332
2.6000	8.2160	10.0369	12.8908	1.2843	1.3077	16.8577	63.88	0.333
2.7000	8.4666	10.3576	13.7249	1.3251	1.3353	18.3264	66.34	0.335
2.8000	8.7172	10.6782	14.5841	1.3658	1.3625	19.8701	68.80	0.336
2.9000	8.9678	10.9989	15.4683	1.4064	1.3893	21.4903	71.25	0.338
3.0000	9.2184	11.3195	16.3776	1.4468	1.4158	23.1883	73.71	0.339
3.1000	9.4690	11.6402	17.3120	1.4873	1.4421	24.9655	76.17	0.341
3.2000	9.7197	11.9608	18.2714	1.5276	1.4681	26.8235	78.62	0.342
3.3000	9.9703	12.2815	19.2559	1.5679	1.4937	28.7635	81.08	0.343
3.4000	10.2209	12.6021	20.2655	1.6081	1.5192	30.7870	83.54	0.344
3.5000	10.4715	12.9228	21.3001	1.6483	1.5444	32.8953	86.00	0.346
3.6000	10.7221	13.2434	22.3598	1.6884	1.5693	35.0898	88.45	0.347
3.7000	10.9727	13.5641	23.4445	1.7284	1.5941	37.3718	90.91	0.348
3.8000	11.2233	13.8847	24.5543	1.7684	1.6186	39.7427	93.37	0.349
3.9000	11.4740	14.2054	25.6892	1.8084	1.6429	42.2037	95.82	0.351
4.0000	11.7246	14.5260	26.8491	1.8483	1.6670	44.7563	98.28	0.352

<u>Simbologia</u> h = tirante Corda = corda della sezione idrica Chi = perimetro bagnato Sigma = area della sezione idrica	R = raggio idraulico V = velocità Q = portata della sezione GR = grado di riempimento Froude = numero di Froude
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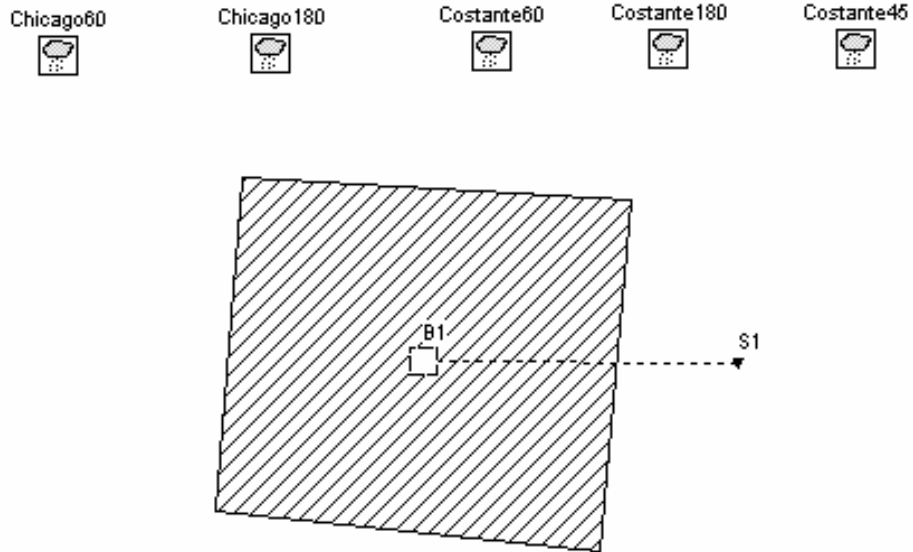
## **Appendice 2**

---

***MODELLO SWMM SCARICO ACQUE METEORICHE  
SITUAZIONE ESISTENTE***

# MODELLO SWMM STATO ATTUALE ZONA A

## SCHEMA PLANIMETRICO DELLA ZONA



## REPORT

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.013)

---

Situazione Esistente  
ZONA A  
Costante 60 min

\*\*\*\*\*  
Analysis Options  
\*\*\*\*\*

Flow Units ..... LPS  
Infiltration Method ..... CURVE\_NUMBER  
Starting Date ..... AUG-18-2008 00:00:00  
Ending Date ..... AUG-18-2008 05:00:00  
Antecedent Dry Days ..... 0.0  
Report Time Step ..... 00:01:00  
Wet Time Step ..... 00:01:00  
Dry Time Step ..... 00:01:00

\*\*\*\*\*  
Element Count  
\*\*\*\*\*

Number of rain gages ..... 5  
Number of subcatchments ... 1  
Number of nodes ..... 1  
Number of links ..... 0  
Number of pollutants ..... 0  
Number of land uses ..... 0

\*\*\*\*\*  
 Raingage Summary  
 \*\*\*\*\*

Name	Data Source	Data Type	Interval hours
Chicago60	ChiTr10T60minDt5min	VOLUME	0.08
Chicago180	ChiTr10T180minDt5min	VOLUME	0.08
Costante60	KostTr10T60minDt5min	VOLUME	0.08
Costantel80	KostTr10T180minDt5min	VOLUME	0.08
Costante45	KostTr10T45minDt5min	VOLUME	0.08

\*\*\*\*\*  
 Subcatchment Summary  
 \*\*\*\*\*

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
B1	1.09	106.00	10.00	0.5000	Costante60	S1

\*\*\*\*\*  
 Node Summary  
 \*\*\*\*\*

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
S1	OUTFALL	0.00	0.00	0.0	

	Volume hectare-m	Depth mm
Runoff Quantity Continuity		
Total Precipitation .....	0.048	44.160
Evaporation Loss .....	0.000	0.000
Infiltration Loss .....	0.038	35.275
Surface Runoff .....	0.009	7.864
Final Surface Storage ...	0.001	1.023
Continuity Error (%) .....	0.000	

	Volume hectare-m	Volume Mliters
Flow Routing Continuity		
Dry Weather Inflow .....	0.000	0.000
Wet Weather Inflow .....	0.009	0.085
Groundwater Inflow .....	0.000	0.000
RDII Inflow .....	0.000	0.000
External Inflow .....	0.000	0.000
External Outflow .....	0.009	0.085
Internal Outflow .....	0.000	0.000
Evaporation Loss .....	0.000	0.000
Initial Stored Volume ...	0.000	0.000
Final Stored Volume .....	0.000	0.000
Continuity Error (%) .....	0.000	

\*\*\*\*\*  
 Subcatchment Runoff Summary  
 \*\*\*\*\*

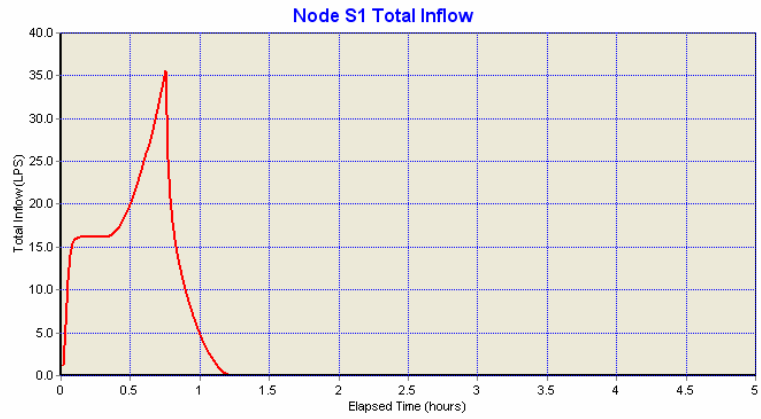
Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff Mlitrs	Peak Runoff LPS	Runoff Coeff
B1	44.160	0.000	0.000	35.275	7.864	0.085	37.501	0.178
System	44.160	0.000	0.000	35.275	7.864	0.085	37.501	0.178

Analysis begun on: Wed Aug 20 20:03:50 2008  
 Analysis ended on: Wed Aug 20 20:03:51 2008  
 Total elapsed time: 00:00:01

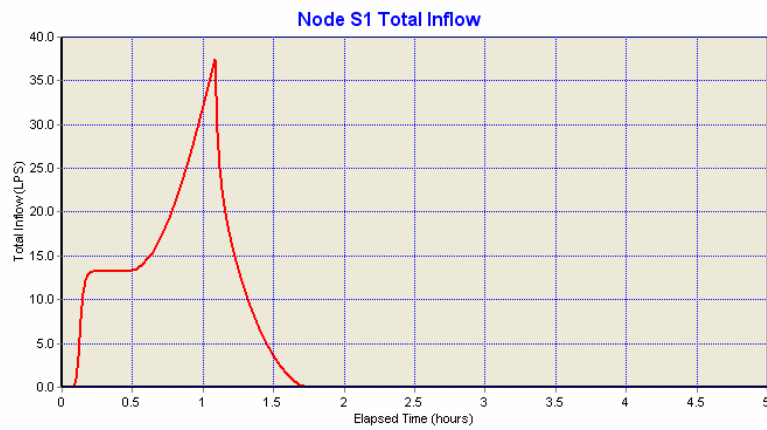
IDROGRAMMI DELLE PORTATE MASSIME DI SCARICO ALLA CHIUSURA DEL BACINO

SCARICO IN S1

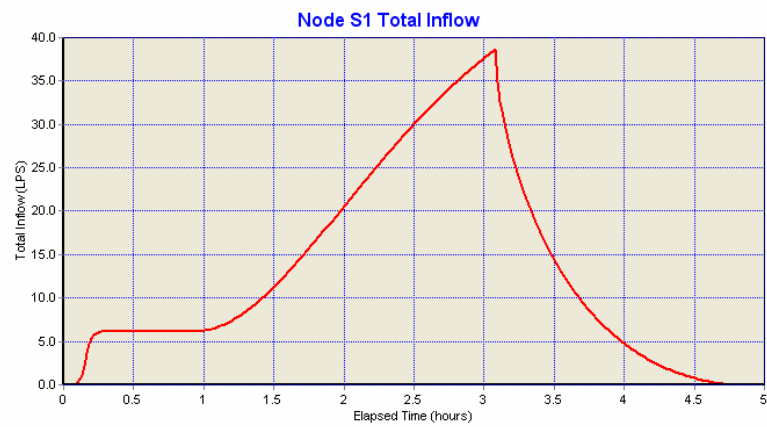
Evento meteorico con ietogramma costante di 45 minuti



Evento meteorico con ietogramma costante di 60 minuti



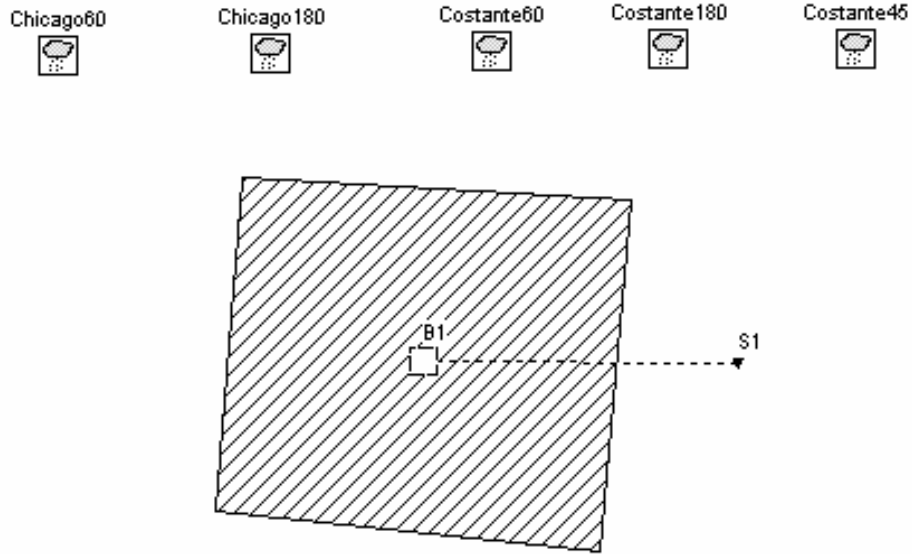
Evento meteorico con ietogramma costante di 180 minuti





# MODELLO SWMM STATO ATTUALE ZONA B

## SCHEMA PLANIMETRICO DELLA ZONA



## REPORT

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.013)

---

Situazione Esistente  
ZONA B  
Costante 60 min

\*\*\*\*\*  
Analysis Options  
\*\*\*\*\*

Flow Units ..... LPS  
Infiltration Method ..... CURVE\_NUMBER  
Starting Date ..... AUG-18-2008 00:00:00  
Ending Date ..... AUG-18-2008 05:00:00  
Antecedent Dry Days ..... 0.0  
Report Time Step ..... 00:01:00  
Wet Time Step ..... 00:01:00  
Dry Time Step ..... 00:01:00

\*\*\*\*\*  
Element Count  
\*\*\*\*\*

Number of rain gages ..... 5  
Number of subcatchments ... 1  
Number of nodes ..... 1  
Number of links ..... 0  
Number of pollutants ..... 0  
Number of land uses ..... 0

\*\*\*\*\*  
 Raingage Summary  
 \*\*\*\*\*

Name	Data Source	Data Type	Interval hours
Chicago60	ChiTr10T60minDt5min	VOLUME	0.08
Chicago180	ChiTr10T180minDt5min	VOLUME	0.08
Costante60	KostTr10T60minDt5min	VOLUME	0.08
Costante180	KostTr10T180minDt5min	VOLUME	0.08
Costante45	KostTr10T45minDt5min	VOLUME	0.08

\*\*\*\*\*  
 Subcatchment Summary  
 \*\*\*\*\*

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
B1	6.64	515.00	10.00	0.5000	Costante60	S1

\*\*\*\*\*  
 Node Summary  
 \*\*\*\*\*

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
S1	OUTFALL	0.00	0.00	0.0	

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation .....	0.293	44.160
Evaporation Loss .....	0.000	0.000
Infiltration Loss .....	0.237	35.739
Surface Runoff .....	0.049	7.356
Final Surface Storage ....	0.007	1.066
Continuity Error (%) .....	-0.004	

Flow Routing Continuity	Volume hectare-m	Volume Mliters
Dry Weather Inflow .....	0.000	0.000
Wet Weather Inflow .....	0.049	0.489
Groundwater Inflow .....	0.000	0.000
RDII Inflow .....	0.000	0.000
External Inflow .....	0.000	0.000
External Outflow .....	0.049	0.489
Internal Outflow .....	0.000	0.000
Evaporation Loss .....	0.000	0.000
Initial Stored Volume ....	0.000	0.000
Final Stored Volume .....	0.000	0.000
Continuity Error (%) .....	0.000	

\*\*\*\*\*  
 Subcatchment Runoff Summary  
 \*\*\*\*\*

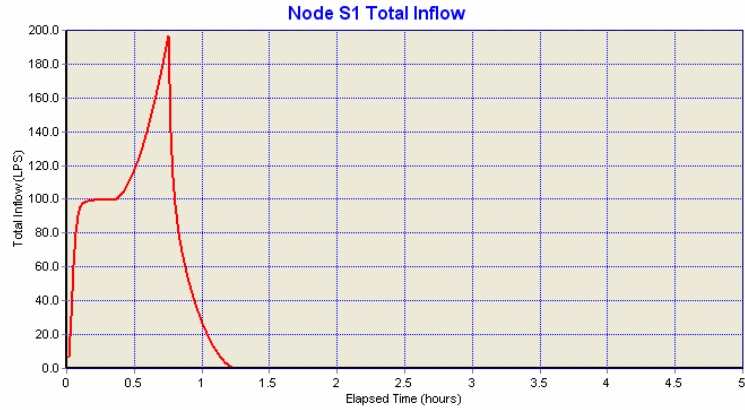
Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff Mltrs	Peak Runoff LPS	Runoff Coeff
B1	44.160	0.000	0.000	35.739	7.356	0.488	204.724	0.167
System	44.160	0.000	0.000	35.739	7.356	0.488	204.724	0.167

Analysis begun on: Wed Aug 20 20:21:25 2008  
 Analysis ended on: Wed Aug 20 20:21:25 2008  
 Total elapsed time: < 1 sec

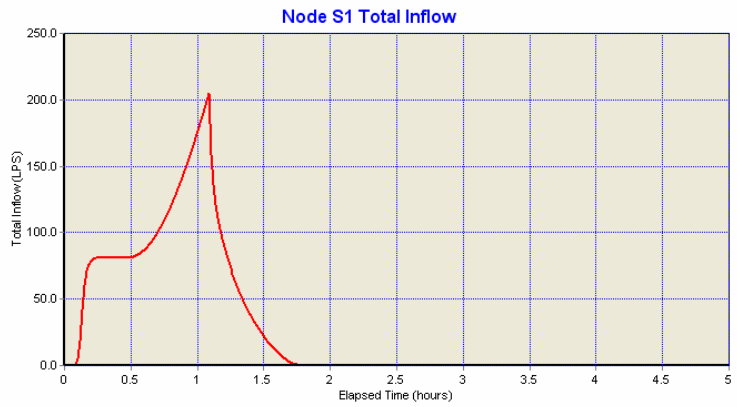
IDROGRAMMI DELLE PORTATE MASSIME DI SCARICO ALLA CHIUSURA DEL BACINO

SCARICO IN S1

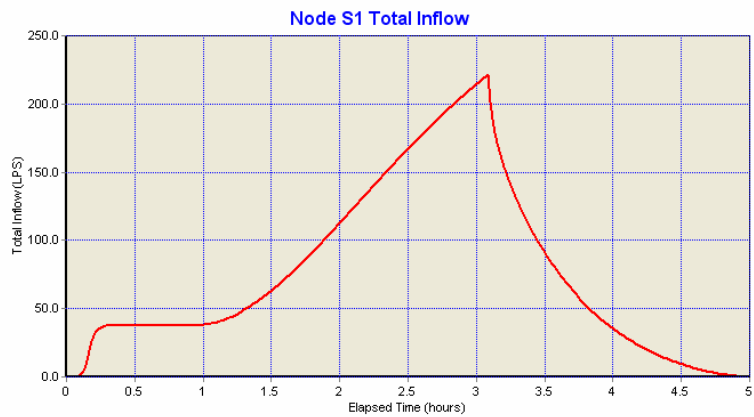
Evento meteorico con ietogramma costante di 45 minuti



Evento meteorico con ietogramma costante di 60 minuti

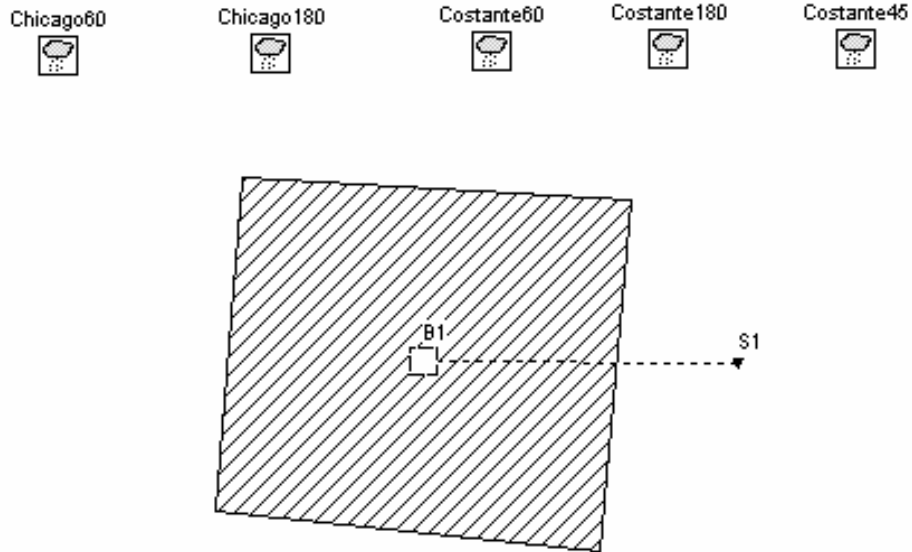


Evento meteorico con ietogramma costante di 180 minuti



# MODELLO SWMM STATO ATTUALE ZONA C

## SCHEMA PLANIMETRICO DELLA ZONA



## REPORT

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.013)

---

Situazione Esistente  
ZONA C  
Costante 60 min

\*\*\*\*\*  
Analysis Options  
\*\*\*\*\*

Flow Units ..... LPS  
Infiltration Method ..... CURVE\_NUMBER  
Starting Date ..... AUG-18-2008 00:00:00  
Ending Date ..... AUG-18-2008 05:00:00  
Antecedent Dry Days ..... 0.0  
Report Time Step ..... 00:01:00  
Wet Time Step ..... 00:01:00  
Dry Time Step ..... 00:01:00

\*\*\*\*\*  
Element Count  
\*\*\*\*\*

Number of rain gages ..... 5  
Number of subcatchments ... 1  
Number of nodes ..... 1  
Number of links ..... 0  
Number of pollutants ..... 0  
Number of land uses ..... 0

\*\*\*\*\*  
 Raingage Summary  
 \*\*\*\*\*

Name	Data Source	Data Type	Interval hours
Chicago60	ChiTr10T60minDt5min	VOLUME	0.08
Chicago180	ChiTr10T180minDt5min	VOLUME	0.08
Costante60	KostTr10T60minDt5min	VOLUME	0.08
Costante180	KostTr10T180minDt5min	VOLUME	0.08
Costante45	KostTr10T45minDt5min	VOLUME	0.08

\*\*\*\*\*  
 Subcatchment Summary  
 \*\*\*\*\*

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
B1	9.14	850.00	10.00	0.5000	Costante60	S1

\*\*\*\*\*  
 Node Summary  
 \*\*\*\*\*

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
S1	OUTFALL	0.00	0.00	0.0	

	Volume hectare-m	Depth mm
Runoff Quantity Continuity		
Total Precipitation .....	0.404	44.160
Evaporation Loss .....	0.000	0.000
Infiltration Loss .....	0.322	35.275
Surface Runoff .....	0.071	7.752
Final Surface Storage ....	0.010	1.135
Continuity Error (%) .....	-0.004	

	Volume hectare-m	Volume Mliters
Flow Routing Continuity		
Dry Weather Inflow .....	0.000	0.000
Wet Weather Inflow .....	0.071	0.709
Groundwater Inflow .....	0.000	0.000
RDII Inflow .....	0.000	0.000
External Inflow .....	0.000	0.000
External Outflow .....	0.071	0.709
Internal Outflow .....	0.000	0.000
Evaporation Loss .....	0.000	0.000
Initial Stored Volume ....	0.000	0.000
Final Stored Volume .....	0.000	0.000
Continuity Error (%) .....	0.000	

\*\*\*\*\*  
 Subcatchment Runoff Summary  
 \*\*\*\*\*

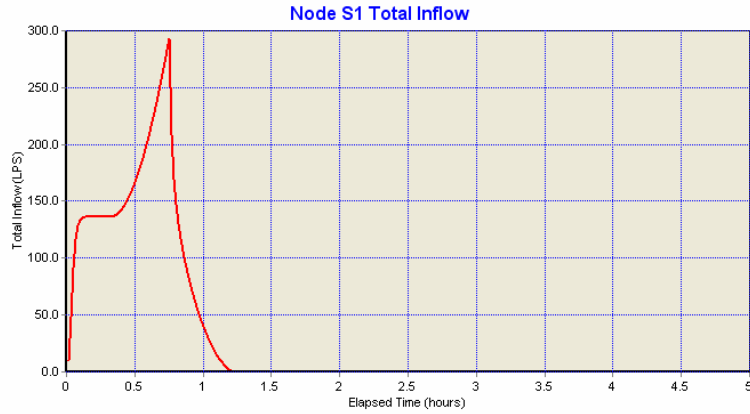
Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff Mltrs	Peak Runoff LPS	Runoff Coeff
B1	44.160	0.000	0.000	35.275	7.752	0.709	308.247	0.176
System	44.160	0.000	0.000	35.275	7.752	0.709	308.247	0.176

Analysis begun on: Thu Aug 21 05:53:45 2008  
 Analysis ended on: Thu Aug 21 05:53:45 2008  
 Total elapsed time: < 1 sec

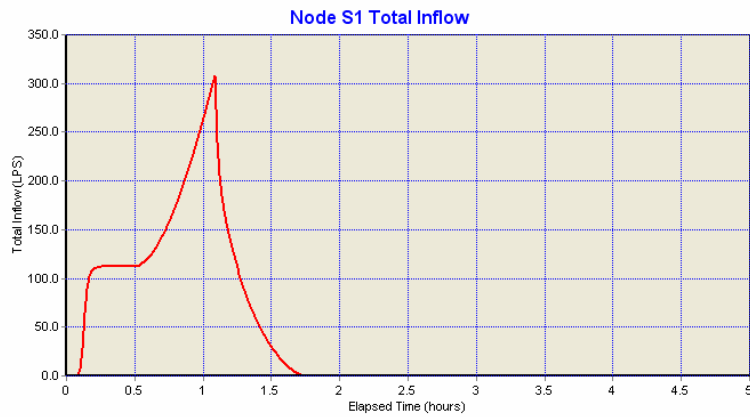
IDROGRAMMI DELLE PORTATE MASSIME DI SCARICO ALLA CHIUSURA DEL BACINO

SCARICO IN S1

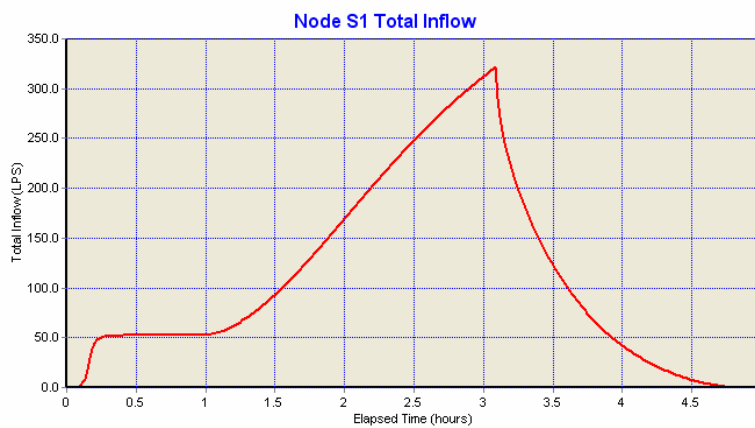
Evento meteorico con ietogramma costante di 45 minuti



Evento meteorico con ietogramma costante di 60 minuti



Evento meteorico con ietogramma costante di 180 minuti



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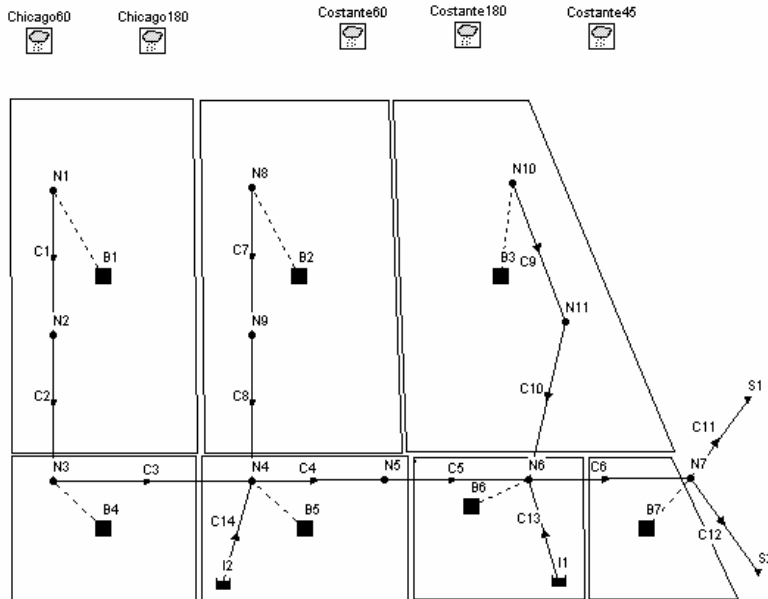
## **Appendice 3**

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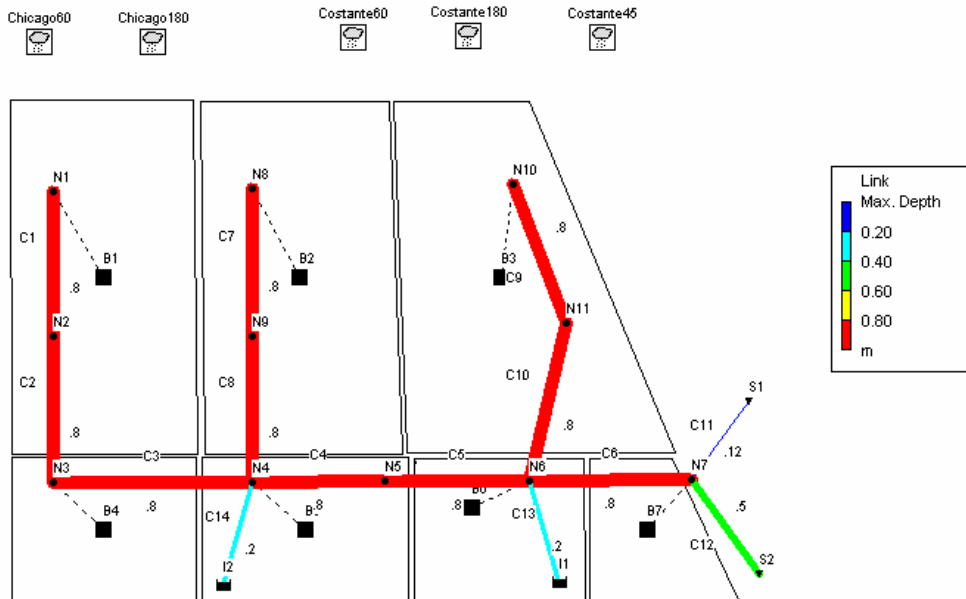
***MODELLO SWMM SCARICO ACQUE METEORICHE  
SITUAZIONE PROGETTUALE***

# MODELLO SWMM STATO DI PROGETTO ZONA A

## SCHEMA PLANIMETRICO DELLA RETE



## SCHEMA RETE DIMENSIONI CONDOTTE





**REPORT**

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.013)

Situazione Progetto

ZONA A

Costante 60 min

\*\*\*\*\*  
Analysis Options  
\*\*\*\*\*

Flow Units ..... LPS  
 Infiltration Method ..... CURVE\_NUMBER  
 Flow Routing Method ..... DYNWAVE  
 Starting Date ..... AUG-18-2008 00:00:00  
 Ending Date ..... AUG-18-2008 08:00:00  
 Antecedent Dry Days ..... 0.0  
 Report Time Step ..... 00:01:00  
 Wet Time Step ..... 00:01:00  
 Dry Time Step ..... 00:01:00  
 Routing Time Step ..... 30.00 sec

\*\*\*\*\*

Element Count

\*\*\*\*\*

Number of rain gages ..... 5  
 Number of subcatchments ... 7  
 Number of nodes ..... 15  
 Number of links ..... 14  
 Number of pollutants ..... 0  
 Number of land uses ..... 0

\*\*\*\*\*

Raingage Summary

\*\*\*\*\*

Name	Data Source	Data Type	Interval hours
Chicago60	ChiTr10T60minDt5min	VOLUME	0.08
Chicago180	ChiTr10T180minDt5min	VOLUME	0.08
Costante60	KostTr10T60minDt5min	VOLUME	0.08
Costante180	KostTr10T180minDt5min	VOLUME	0.08
Costante45	KostTr10T45minDt5min	VOLUME	0.08

\*\*\*\*\*

Subcatchment Summary

\*\*\*\*\*

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
B1	0.23	100.00	87.00	0.5000	Costante60	N1
B2	0.22	120.00	86.00	0.5000	Costante60	N8
B3	0.30	120.00	67.00	0.5000	Costante60	N10
B4	0.08	30.00	51.00	0.5000	Costante60	N3
B5	0.09	40.00	68.00	0.5000	Costante60	N4
B6	0.11	45.00	56.00	0.5000	Costante60	N6
B7	0.04	15.00	56.00	0.5000	Costante60	N7

\*\*\*\*\*

Node Summary

\*\*\*\*\*

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
N1	JUNCTION	3.78	1.80	0.0	
N2	JUNCTION	3.77	1.80	0.0	
N3	JUNCTION	3.76	1.80	0.0	
N4	JUNCTION	3.74	1.80	0.0	
N5	JUNCTION	3.73	1.80	0.0	
N6	JUNCTION	3.72	1.80	0.0	
N7	JUNCTION	3.70	1.80	0.0	
N8	JUNCTION	3.77	1.80	0.0	
N9	JUNCTION	3.75	1.80	0.0	
N10	JUNCTION	3.74	1.80	0.0	
N11	JUNCTION	3.73	1.80	0.0	

S1	OUTFALL	3.70	0.12	0.0
S2	OUTFALL	4.50	0.50	0.0
I1	STORAGE	3.92	0.50	0.0
I2	STORAGE	3.94	0.50	0.0

\*\*\*\*\*  
Link Summary  
\*\*\*\*\*

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	N1	N2	CONDUIT	25.0	0.0480	0.0120
C2	N2	N3	CONDUIT	25.0	0.0520	0.0120
C3	N3	N4	CONDUIT	30.0	0.0500	0.0120
C4	N4	N5	CONDUIT	25.0	0.0480	0.0120
C5	N5	N6	CONDUIT	25.0	0.0520	0.0120
C6	N6	N7	CONDUIT	32.0	0.0500	0.0120
C7	N8	N9	CONDUIT	25.0	0.0480	0.0120
C8	N9	N4	CONDUIT	25.0	0.0520	0.0120
C9	N10	N11	CONDUIT	25.0	0.0480	0.0120
C10	N11	N6	CONDUIT	25.0	0.0520	0.0120
C11	N7	S1	CONDUIT	5.0	0.0061	0.0120
C12	N7	S2	CONDUIT	7.0	0.0044	0.0120
C13	I1	N6	CONDUIT	5.0	0.0061	0.0120
C14	I2	N4	CONDUIT	5.0	0.0061	0.0120

\*\*\*\*\*  
Cross Section Summary  
\*\*\*\*\*

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	CIRCULAR	0.80	0.50	0.20	0.80	1	313.87
C2	CIRCULAR	0.80	0.50	0.20	0.80	1	326.69
C3	CIRCULAR	0.80	0.50	0.20	0.80	1	320.35
C4	CIRCULAR	0.80	0.50	0.20	0.80	1	313.87
C5	CIRCULAR	0.80	0.50	0.20	0.80	1	326.69
C6	CIRCULAR	0.80	0.50	0.20	0.80	1	320.35
C7	CIRCULAR	0.80	0.50	0.20	0.80	1	313.87
C8	CIRCULAR	0.80	0.50	0.20	0.80	1	326.69
C9	CIRCULAR	0.80	0.50	0.20	0.80	1	313.87
C10	CIRCULAR	0.80	0.50	0.20	0.80	1	326.69
C11	CIRCULAR	0.12	0.01	0.03	0.12	1	0.71
C12	CIRCULAR	0.50	0.20	0.12	0.50	1	26.99
C13	CIRCULAR	0.20	0.03	0.05	0.20	1	2.77
C14	CIRCULAR	0.20	0.03	0.05	0.20	1	2.77

	Volume hectare-m	Depth mm
Runoff Quantity Continuity		
*****	-----	-----
Total Precipitation .....	0.048	44.160
Evaporation Loss .....	0.000	0.000
Infiltration Loss .....	0.006	5.632
Surface Runoff .....	0.041	37.843
Final Surface Storage ....	0.001	0.688
Continuity Error (%) .....	-0.008	

	Volume hectare-m	Volume Mliters
Flow Routing Continuity		
*****	-----	-----
Dry Weather Inflow .....	0.000	0.000
Wet Weather Inflow .....	0.041	0.410
Groundwater Inflow .....	0.000	0.000
RDII Inflow .....	0.000	0.000
External Inflow .....	0.000	0.000
External Outflow .....	0.039	0.391
Internal Outflow .....	0.001	0.007
Evaporation Loss .....	0.000	0.000
Initial Stored Volume ....	0.000	0.000
Final Stored Volume .....	0.001	0.011
Continuity Error (%) .....	0.214	

\*\*\*\*\*  
 Time-Step Critical Elements  
 \*\*\*\*\*  
 Link C11 (97.37%)  
 Link C13 (2.54%)

\*\*\*\*\*  
 Highest Flow Instability Indexes  
 \*\*\*\*\*  
 All links are stable.

\*\*\*\*\*  
 Routing Time Step Summary  
 \*\*\*\*\*  
 Minimum Time Step : 1.11 sec  
 Average Time Step : 1.67 sec  
 Maximum Time Step : 30.00 sec  
 Percent in Steady State : 0.00  
 Average Iterations per Step : 2.00

\*\*\*\*\*  
 Subcatchment Runoff Summary  
 \*\*\*\*\*

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff Mltrs	Peak Runoff LPS	Runoff Coeff
B1	44.160	0.000	0.000	2.333	41.202	0.095	27.769	0.933
B2	44.160	0.000	0.000	1.820	41.737	0.093	27.250	0.945
B3	44.160	0.000	0.000	6.333	37.089	0.111	35.049	0.840
B4	44.160	0.000	0.000	12.536	30.781	0.026	8.894	0.697
B5	44.160	0.000	0.000	6.532	36.889	0.033	10.494	0.835
B6	44.160	0.000	0.000	10.501	32.958	0.037	12.474	0.746
B7	44.160	0.000	0.000	10.113	33.451	0.015	5.021	0.757
System	44.160	0.000	0.000	5.632	37.843	0.410	126.952	0.857

\*\*\*\*\*  
 Node Depth Summary  
 \*\*\*\*\*

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
N1	JUNCTION	0.35	0.72	4.50	0 01:05
N2	JUNCTION	0.36	0.73	4.50	0 01:05
N3	JUNCTION	0.37	0.75	4.50	0 01:05
N4	JUNCTION	0.38	0.76	4.50	0 01:05
N5	JUNCTION	0.40	0.77	4.50	0 01:05
N6	JUNCTION	0.41	0.78	4.50	0 01:05
N7	JUNCTION	0.42	0.80	4.50	0 01:05
N8	JUNCTION	0.36	0.73	4.50	0 01:05
N9	JUNCTION	0.37	0.75	4.50	0 01:05
N10	JUNCTION	0.38	0.76	4.50	0 01:05
N11	JUNCTION	0.40	0.77	4.50	0 01:05
S1	OUTFALL	0.11	0.12	3.82	0 00:21
S2	OUTFALL	0.00	0.00	4.50	0 01:05
I1	STORAGE	0.21	0.50	4.42	0 01:07
I2	STORAGE	0.20	0.50	4.44	0 01:10

\*\*\*\*\*  
Node InFlow Summary  
\*\*\*\*\*

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume Mltrs	Total Inflow Volume Mltrs
N1	JUNCTION	27.77	27.77	0 01:05	0.095	0.095
N2	JUNCTION	0.00	27.10	0 00:37	0.000	0.095
N3	JUNCTION	8.89	33.68	0 00:39	0.026	0.120
N4	JUNCTION	10.49	68.95	0 00:39	0.033	0.337
N5	JUNCTION	0.00	26.35	0 00:12	0.000	0.242
N6	JUNCTION	12.47	65.32	0 00:39	0.037	0.479
N7	JUNCTION	5.02	27.45	0 01:05	0.015	0.391
N8	JUNCTION	27.25	27.25	0 01:05	0.094	0.093
N9	JUNCTION	0.00	26.75	0 00:38	0.000	0.094
N10	JUNCTION	35.05	35.05	0 01:05	0.111	0.111
N11	JUNCTION	0.00	33.73	0 01:05	0.000	0.111
S1	OUTFALL	0.00	26.06	0 01:05	0.000	0.391
S2	OUTFALL	0.00	0.00	0 01:05	0.000	0.000
I1	STORAGE	0.00	46.81	0 00:38	0.000	0.102
I2	STORAGE	0.00	44.32	0 00:40	0.000	0.095

\*\*\*\*\*  
Node Surcharge Summary  
\*\*\*\*\*

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
I1	STORAGE	2.98	0.300	0.000
I2	STORAGE	2.71	0.300	0.000

\*\*\*\*\*  
Node Flooding Summary  
\*\*\*\*\*

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume Mltrs	Maximum Poned Volume ha-mm
I1	0.14	28.67	0 01:07	0.007	0.00
I2	0.01	5.56	0 01:10	0.000	0.00

\*\*\*\*\*  
Storage Volume Summary  
\*\*\*\*\*

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
I1	0.043	45	0.095	100	0 01:07	7.55
I2	0.039	41	0.095	100	0 01:10	8.52

\*\*\*\*\*  
 Outfall Loading Summary  
 \*\*\*\*\*

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume Mltrs
S1	99.91	16.33	26.06	0.391
S2	0.00	0.00	0.00	0.000
System	49.96	16.33	26.06	0.391

\*\*\*\*\*  
 Link Flow Summary  
 \*\*\*\*\*

Link	Type	Maximum Flow LPS	Time of Max Occurrence days hr:min	Maximum Velocity m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	27.10	0 00:37	0.45	0.09	0.91
C2	CONDUIT	26.61	0 00:37	0.36	0.08	0.92
C3	CONDUIT	33.16	0 00:39	0.22	0.10	0.94
C4	CONDUIT	26.35	0 00:12	0.42	0.08	0.96
C5	CONDUIT	24.69	0 01:11	0.28	0.08	0.97
C6	CONDUIT	23.87	0 01:14	0.26	0.07	0.99
C7	CONDUIT	26.75	0 00:38	0.45	0.09	0.93
C8	CONDUIT	26.30	0 00:38	0.36	0.08	0.94
C9	CONDUIT	33.73	0 01:05	0.45	0.11	0.96
C10	CONDUIT	31.61	0 00:41	0.40	0.10	0.97
C11	CONDUIT	26.06	0 01:05	2.30	36.68	1.00
C12	CONDUIT	0.00	0 01:05	0.00	0.00	0.00
C13	CONDUIT	46.81	0 00:38	1.72	16.87	1.00
C14	CONDUIT	44.32	0 00:40	1.65	15.97	1.00

\*\*\*\*\*  
 Flow Classification Summary  
 \*\*\*\*\*

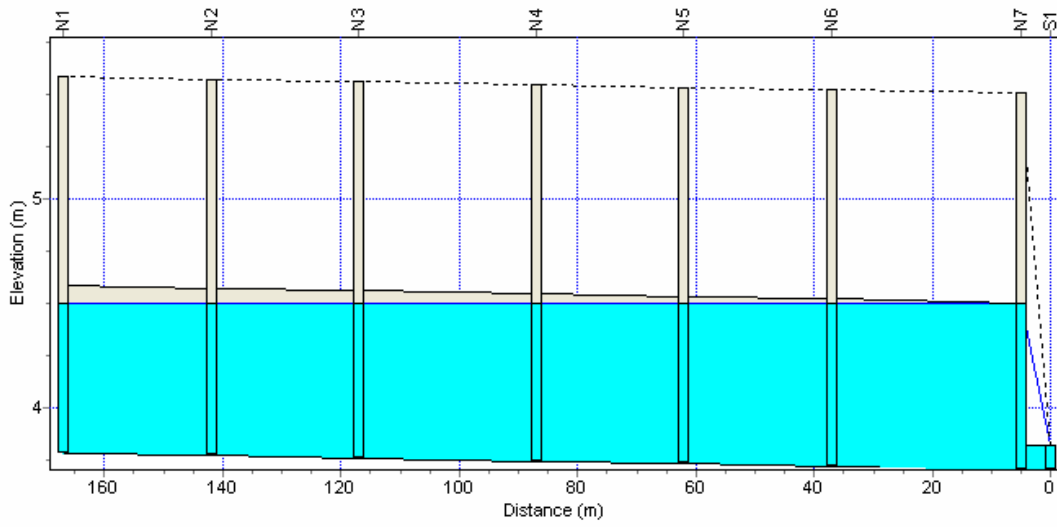
Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---							Avg. Froude Number	Avg. Flow Change
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit		
C1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0000
C2	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0000
C3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
C4	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0000
C5	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
C6	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.0000
C7	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0000
C8	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0000
C9	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0000
C10	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.0000
C11	1.00	0.00	0.00	0.00	0.21	0.79	0.00	0.00	1.38	0.0042
C12	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C13	1.00	0.01	0.00	0.00	0.73	0.04	0.00	0.22	0.35	0.0024
C14	1.00	0.01	0.00	0.00	0.70	0.04	0.00	0.24	0.35	0.0025

\*\*\*\*\*  
 Conduit Surge Summary  
 \*\*\*\*\*

Conduit	----- Hours Full -----			Hours	Hours
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
C11	0.01	0.01	0.01	7.85	0.01
C13	2.95	2.95	2.95	4.83	2.39
C14	2.68	2.68	2.68	4.62	2.24

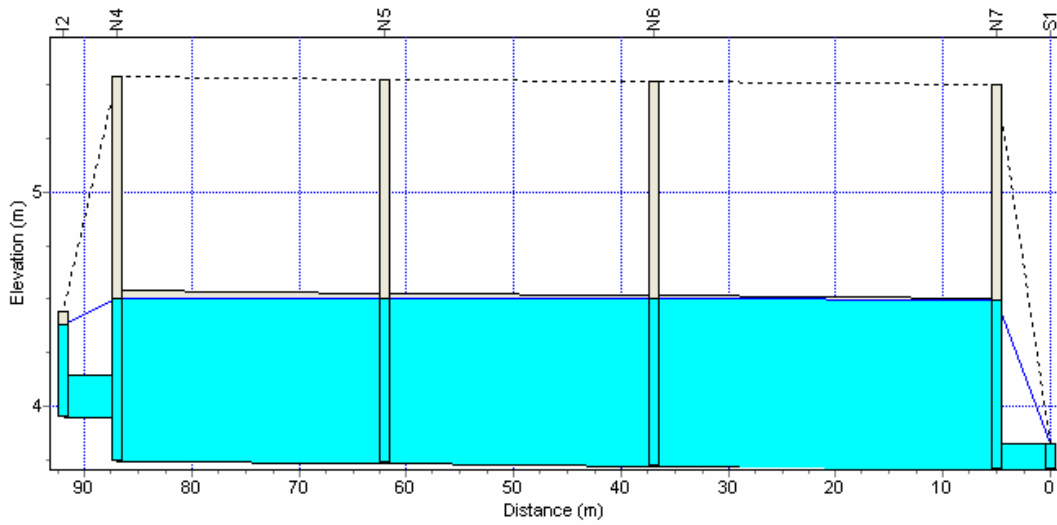
PROFILI LONGITUDINALI PRINCIPALI DI MASSIMO RIEMPIMENTO

Water Elevation Profile: Node S1 - N1



08/18/2008 01:06:00

Water Elevation Profile: Node S1 - I2

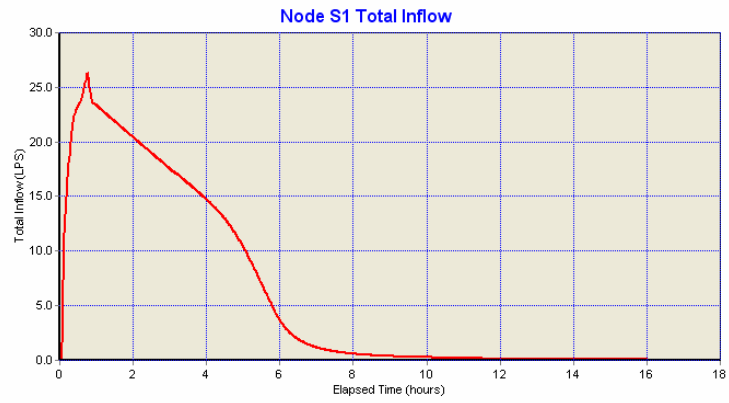


08/18/2008 01:06:00

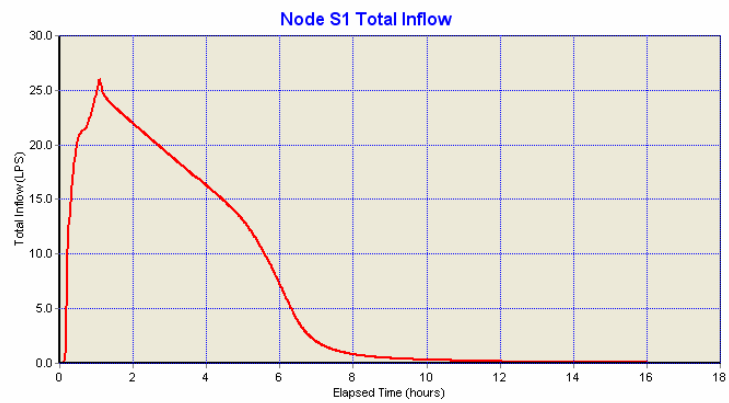
# IDROGRAMMI DELLE PORTATE MASSIME DI SCARICO ALLA CHIUSURA DEL BACINO

## SCARICO IN S1

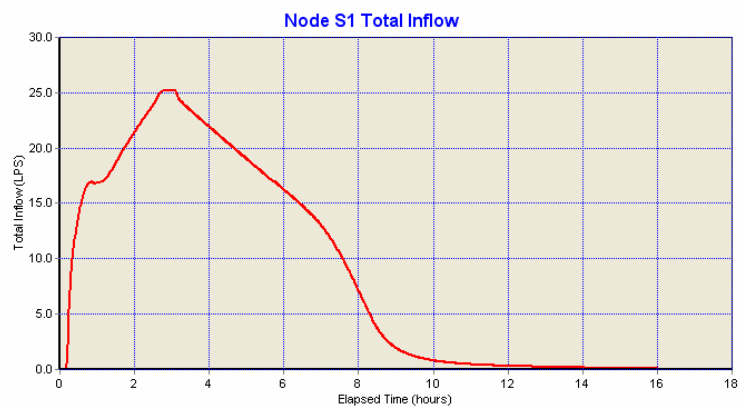
Evento meteorico con ietogramma costante di 45 minuti



Evento meteorico con ietogramma costante di 60 minuti

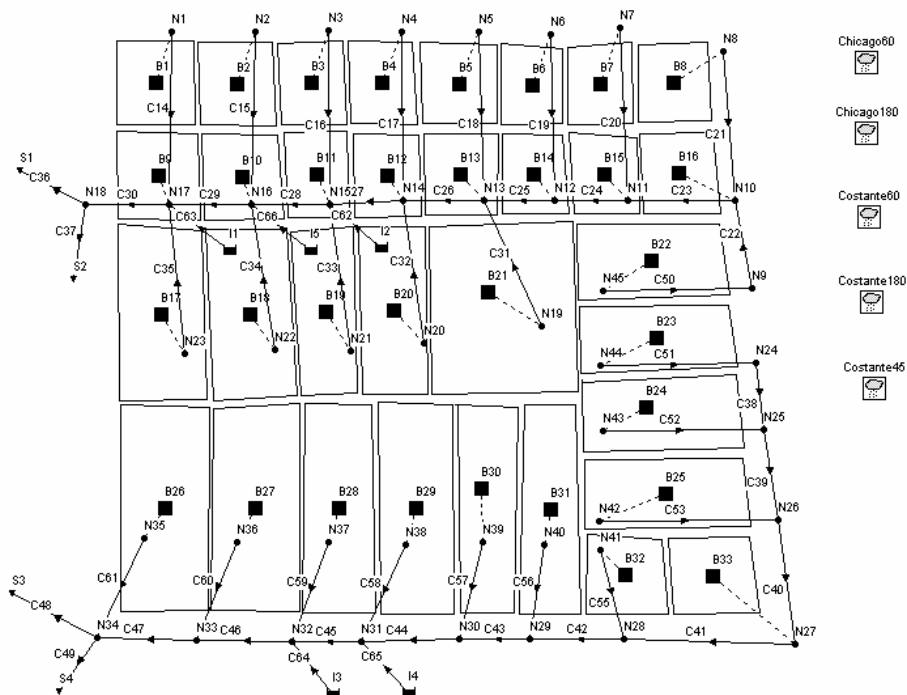


Evento meteorico con ietogramma costante di 180 minuti



# MODELLO SWMM STATO DI PROGETTO ZONA B

## SCHEMA PLANIMETRICO DELLA RETE



## SCHEMA RETE DIMENSIONI CONDOTTE





Situazione Progetto  
 ZONA B  
 Costante 60 min

\*\*\*\*\*  
 Analysis Options  
 \*\*\*\*\*

Flow Units ..... LPS  
 Infiltration Method ..... CURVE\_NUMBER  
 Flow Routing Method ..... DYNWAVE  
 Starting Date ..... AUG-18-2008 00:00:00  
 Ending Date ..... AUG-18-2008 18:00:00  
 Antecedent Dry Days ..... 0.0  
 Report Time Step ..... 00:01:00  
 Wet Time Step ..... 00:01:00  
 Dry Time Step ..... 00:01:00  
 Routing Time Step ..... 30.00 sec

\*\*\*\*\*  
 Element Count  
 \*\*\*\*\*

Number of rain gages ..... 4  
 Number of subcatchments ... 33  
 Number of nodes ..... 54  
 Number of links ..... 52  
 Number of pollutants ..... 0  
 Number of land uses ..... 0

\*\*\*\*\*  
 Raingage Summary  
 \*\*\*\*\*

Name	Data Source	Data Type	Interval hours
Chicago60	ChiTr10T60minDt5min	VOLUME	0.08
Chicago180	ChiTr10T180minDt5min	VOLUME	0.08
Costante60	KostTr10T60minDt5min	VOLUME	0.08
Costante180	KostTr10T180minDt5min	VOLUME	0.08

\*\*\*\*\*  
 Subcatchment Summary  
 \*\*\*\*\*

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
B1	0.20	60.00	65.00	0.5000	Costante60	N1
B2	0.19	60.00	100.00	0.5000	Costante60	N2
B3	0.11	60.00	87.00	0.5000	Costante60	N3
B4	0.12	60.00	100.00	0.5000	Costante60	N4
B5	0.13	60.00	96.00	0.5000	Costante60	N5
B6	0.16	60.00	97.00	0.5000	Costante60	N6
B7	0.12	60.00	100.00	0.5000	Costante60	N7
B8	0.12	60.00	96.00	0.5000	Costante60	N8
B9	0.23	160.00	51.00	0.5000	Costante60	N17
B10	0.16	160.00	97.00	0.5000	Costante60	N16
B11	0.14	160.00	88.00	0.5000	Costante60	N15
B12	0.16	160.00	97.00	0.5000	Costante60	N14
B13	0.13	140.00	92.00	0.5000	Costante60	N13
B14	0.20	130.00	94.00	0.5000	Costante60	N12
B15	0.16	110.00	97.00	0.5000	Costante60	N11
B16	0.17	140.00	94.00	0.5000	Costante60	N10
B17	0.28	120.00	84.00	0.5000	Costante60	N23
B18	0.23	120.00	100.00	0.5000	Costante60	N22
B19	0.20	120.00	95.00	0.5000	Costante60	N21
B20	0.23	120.00	98.00	0.5000	Costante60	N20
B21	0.50	130.00	96.00	0.5000	Costante60	N19
B22	0.23	50.00	98.00	0.5000	Costante60	N45
B23	0.23	65.00	98.00	0.5000	Costante60	N44
B24	0.24	65.00	98.00	0.5000	Costante60	N43
B25	0.23	60.00	98.00	0.5000	Costante60	N42
B26	0.32	80.00	100.00	0.5000	Costante60	N35
B27	0.24	140.00	97.00	0.5000	Costante60	N36

B28	0.26	140.00	100.00	0.5000	Costante60	N37
B29	0.26	140.00	100.00	0.5000	Costante60	N38
B30	0.26	140.00	100.00	0.5000	Costante60	N39
B31	0.26	140.00	100.00	0.5000	Costante60	N40
B32	0.10	60.00	100.00	0.5000	Costante60	N41
B33	0.15	60.00	95.00	0.5000	Costante60	N27

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Node Summary

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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
N1	JUNCTION	4.04	2.50	0.0	
N2	JUNCTION	4.06	2.50	0.0	
N3	JUNCTION	4.07	2.50	0.0	
N4	JUNCTION	4.09	2.50	0.0	
N5	JUNCTION	4.11	2.50	0.0	
N6	JUNCTION	4.12	2.50	0.0	
N7	JUNCTION	4.14	2.50	0.0	
N8	JUNCTION	4.15	2.50	0.0	
N17	JUNCTION	4.01	2.50	0.0	
N16	JUNCTION	4.03	2.50	0.0	
N15	JUNCTION	4.05	2.50	0.0	
N14	JUNCTION	4.06	2.50	0.0	
N13	JUNCTION	4.08	2.50	0.0	
N12	JUNCTION	4.09	2.50	0.0	
N11	JUNCTION	4.11	2.50	0.0	
N10	JUNCTION	4.13	2.50	0.0	
N23	JUNCTION	4.04	2.50	0.0	
N22	JUNCTION	4.06	2.50	0.0	
N21	JUNCTION	4.07	2.50	0.0	
N20	JUNCTION	4.09	2.50	0.0	
N19	JUNCTION	4.11	2.50	0.0	
N9	JUNCTION	4.15	2.50	0.0	
N18	JUNCTION	4.00	2.50	0.0	
N24	JUNCTION	4.17	2.50	0.0	
N25	JUNCTION	4.16	2.50	0.0	
N26	JUNCTION	4.14	2.50	0.0	
N27	JUNCTION	4.13	2.50	0.0	
N28	JUNCTION	4.10	2.50	0.0	
N29	JUNCTION	4.09	2.50	0.0	
N30	JUNCTION	4.07	2.50	0.0	
N31	JUNCTION	4.05	2.50	0.0	
N32	JUNCTION	4.04	2.50	0.0	
N33	JUNCTION	4.03	2.50	0.0	
N34	JUNCTION	4.00	2.50	0.0	
N35	JUNCTION	4.02	2.50	0.0	
N36	JUNCTION	4.05	2.50	0.0	
N37	JUNCTION	4.06	2.50	0.0	
N38	JUNCTION	4.08	2.50	0.0	
N39	JUNCTION	4.09	2.50	0.0	
N40	JUNCTION	4.10	2.50	0.0	
N41	JUNCTION	4.11	2.50	0.0	
N42	JUNCTION	4.16	2.50	0.0	
N43	JUNCTION	4.17	2.50	0.0	
N44	JUNCTION	4.19	2.50	0.0	
N45	JUNCTION	4.17	2.50	0.0	
S1	OUTFALL	4.00	0.20	0.0	
S2	OUTFALL	5.20	1.00	0.0	
S3	OUTFALL	4.00	0.20	0.0	
S4	OUTFALL	5.00	1.00	0.0	
I1	STORAGE	4.12	0.80	0.0	
I2	STORAGE	4.15	0.80	0.0	
I3	STORAGE	4.14	0.80	0.0	
I4	STORAGE	4.17	0.80	0.0	
I5	STORAGE	4.13	0.80	0.0	

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Link Summary

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Name	From Node	To Node	Type	Length	%Slope	Roughness
C14	N1	N17	CONDUIT	55.0	0.0509	0.0120
C15	N2	N16	CONDUIT	55.0	0.0509	0.0120
C16	N3	N15	CONDUIT	55.0	0.0509	0.0120

C17	N4	N14	CONDUIT	55.0	0.0509	0.0120
C18	N5	N13	CONDUIT	55.0	0.0509	0.0120
C19	N6	N12	CONDUIT	55.0	0.0509	0.0120
C20	N7	N11	CONDUIT	55.0	0.0509	0.0120
C21	N8	N10	CONDUIT	45.0	0.0489	0.0120
C22	N9	N10	CONDUIT	45.0	0.0489	0.0120
C23	N10	N11	CONDUIT	39.0	0.0513	0.0120
C24	N11	N12	CONDUIT	32.0	0.0500	0.0120
C25	N12	N13	CONDUIT	35.0	0.0486	0.0120
C26	N13	N14	CONDUIT	32.0	0.0500	0.0120
C27	N14	N15	CONDUIT	31.0	0.0516	0.0120
C28	N15	N16	CONDUIT	30.0	0.0500	0.0120
C29	N16	N17	CONDUIT	32.0	0.0500	0.0120
C30	N17	N18	CONDUIT	30.0	0.0500	0.0120
C31	N19	N13	CONDUIT	55.0	0.0509	0.0120
C32	N20	N14	CONDUIT	55.0	0.0509	0.0120
C33	N21	N15	CONDUIT	55.0	0.0509	0.0120
C34	N22	N16	CONDUIT	55.0	0.0509	0.0120
C35	N23	N17	CONDUIT	55.0	0.0509	0.0120
C36	N18	S1	CONDUIT	5.0	0.0061	0.0120
C37	N18	S2	CONDUIT	5.0	0.0061	0.0120
C38	N24	N25	CONDUIT	32.0	0.0500	0.0120
C39	N25	N26	CONDUIT	32.0	0.0500	0.0120
C40	N26	N27	CONDUIT	37.0	0.0351	0.0120
C41	N27	N28	CONDUIT	50.0	0.0500	0.0120
C42	N28	N29	CONDUIT	32.0	0.0500	0.0120
C43	N29	N30	CONDUIT	32.0	0.0500	0.0120
C44	N30	N31	CONDUIT	31.0	0.0516	0.0120
C45	N31	N32	CONDUIT	30.0	0.0500	0.0120
C46	N32	N33	CONDUIT	30.0	0.0500	0.0120
C47	N33	N34	CONDUIT	50.0	0.0500	0.0120
C48	N34	S3	CONDUIT	5.0	0.0061	0.0120
C49	N34	S4	CONDUIT	5.0	0.0061	0.0120
C50	N45	N9	CONDUIT	25.0	0.0520	0.0120
C51	N44	N24	CONDUIT	35.0	0.0514	0.0120
C52	N43	N25	CONDUIT	35.0	0.0514	0.0120
C53	N42	N26	CONDUIT	35.0	0.0514	0.0120
C55	N41	N28	CONDUIT	20.0	0.0500	0.0120
C56	N40	N29	CONDUIT	20.0	0.0500	0.0120
C57	N39	N30	CONDUIT	45.0	0.0511	0.0120
C58	N38	N31	CONDUIT	45.0	0.0511	0.0120
C59	N37	N32	CONDUIT	45.0	0.0511	0.0120
C60	N36	N33	CONDUIT	45.0	0.0511	0.0120
C61	N35	N34	CONDUIT	45.0	0.0511	0.0120
C62	I2	N15	CONDUIT	5.0	0.0061	0.0120
C63	I1	N17	CONDUIT	5.0	0.0061	0.0120
C64	I3	N32	CONDUIT	5.0	0.0061	0.0120
C65	I4	N31	CONDUIT	5.0	0.4000	0.0120
C66	I5	N16	CONDUIT	5.0	0.0061	0.0120

\*\*\*\*\*  
Cross Section Summary  
\*\*\*\*\*

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C14	CIRCULAR	1.20	1.13	0.30	1.20	1	953.04
C15	CIRCULAR	1.20	1.13	0.30	1.20	1	953.04
C16	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C17	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C18	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C19	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C20	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C21	CIRCULAR	1.00	0.79	0.25	1.00	1	574.34
C22	CIRCULAR	1.00	0.79	0.25	1.00	1	574.34
C23	CIRCULAR	1.00	0.79	0.25	1.00	1	588.23
C24	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C25	CIRCULAR	1.00	0.79	0.25	1.00	1	572.47
C26	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C27	CIRCULAR	1.00	0.79	0.25	1.00	1	590.12
C28	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C29	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C30	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C31	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C32	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C33	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C34	CIRCULAR	1.20	1.13	0.30	1.20	1	953.04

C35	CIRCULAR	1.20	1.13	0.30	1.20	1	953.04
C36	CIRCULAR	0.20	0.03	0.05	0.20	1	2.77
C37	CIRCULAR	1.00	0.79	0.25	1.00	1	202.81
C38	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C39	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C40	CIRCULAR	1.00	0.79	0.25	1.00	1	486.89
C41	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C42	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C43	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C44	CIRCULAR	1.00	0.79	0.25	1.00	1	590.12
C45	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C46	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C47	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C48	CIRCULAR	0.20	0.03	0.05	0.20	1	2.77
C49	CIRCULAR	1.00	0.79	0.25	1.00	1	202.81
C50	CIRCULAR	1.00	0.79	0.25	1.00	1	592.33
C51	CIRCULAR	1.00	0.79	0.25	1.00	1	589.07
C52	CIRCULAR	1.00	0.79	0.25	1.00	1	589.07
C53	CIRCULAR	1.00	0.79	0.25	1.00	1	589.07
C55	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C56	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C57	CIRCULAR	1.00	0.79	0.25	1.00	1	587.24
C58	CIRCULAR	1.00	0.79	0.25	1.00	1	587.24
C59	CIRCULAR	1.00	0.79	0.25	1.00	1	587.24
C60	CIRCULAR	1.00	0.79	0.25	1.00	1	587.24
C61	CIRCULAR	1.00	0.79	0.25	1.00	1	587.24
C62	CIRCULAR	0.20	0.03	0.05	0.20	2	2.77
C63	CIRCULAR	0.20	0.03	0.05	0.20	2	2.77
C64	CIRCULAR	0.20	0.03	0.05	0.20	2	2.77
C65	CIRCULAR	0.20	0.03	0.05	0.20	2	22.47
C66	CIRCULAR	0.20	0.03	0.05	0.20	2	2.77

```

*****
Runoff Quantity Continuity          Volume      Depth
                                     hectare-m   mm
*****
Total Precipitation .....          0.298      44.160
Evaporation Loss .....              0.000         0.000
Infiltration Loss .....             0.008         1.112
Surface Runoff .....                0.288      42.613
Final Surface Storage ....           0.003         0.435
Continuity Error (%) .....          -0.001

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*****
Flow Routing Continuity             Volume      Volume
                                     hectare-m   Mliters
*****
Dry Weather Inflow .....            0.000         0.000
Wet Weather Inflow .....            0.288         2.878
Groundwater Inflow .....            0.000         0.000
RDII Inflow .....                   0.000         0.000
External Inflow .....                0.000         0.000
External Outflow .....               0.286         2.857
Internal Outflow .....                0.000         0.000
Evaporation Loss .....                0.000         0.000
Initial Stored Volume ....            0.000         0.000
Final Stored Volume .....            0.002         0.017
Continuity Error (%) .....            0.106

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*****
Time-Step Critical Elements
*****
Link C36 (97.18%)
Link C48 (2.76%)

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*****
Highest Flow Instability Indexes
*****
All links are stable.

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\*\*\*\*\*  
Routing Time Step Summary  
\*\*\*\*\*

Minimum Time Step : 0.88 sec  
Average Time Step : 1.91 sec  
Maximum Time Step : 30.00 sec  
Percent in Steady State : 0.00  
Average Iterations per Step : 2.00

\*\*\*\*\*  
Subcatchment Runoff Summary  
\*\*\*\*\*

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff Mltrs	Peak Runoff LPS	Runoff Coeff
B1	44.160	0.000	0.000	8.282	35.110	0.069	22.337	0.795
B2	44.160	0.000	0.000	0.000	43.492	0.083	23.503	0.985
B3	44.160	0.000	0.000	2.038	41.528	0.046	13.381	0.940
B4	44.160	0.000	0.000	0.000	43.338	0.053	14.916	0.981
B5	44.160	0.000	0.000	0.541	42.991	0.057	16.278	0.974
B6	44.160	0.000	0.000	0.454	42.848	0.067	19.069	0.970
B7	44.160	0.000	0.000	0.000	43.338	0.053	14.916	0.981
B8	44.160	0.000	0.000	0.389	43.588	0.051	14.204	0.987
B9	44.160	0.000	0.000	12.878	30.163	0.071	25.328	0.683
B10	44.160	0.000	0.000	0.494	42.592	0.068	19.572	0.964
B11	44.160	0.000	0.000	2.025	41.425	0.060	17.583	0.938
B12	44.160	0.000	0.000	0.494	42.592	0.068	19.572	0.964
B13	44.160	0.000	0.000	1.449	41.613	0.052	15.192	0.942
B14	44.160	0.000	0.000	0.814	42.920	0.088	25.061	0.972
B15	44.160	0.000	0.000	0.401	43.223	0.069	19.594	0.979
B16	44.160	0.000	0.000	0.700	43.112	0.075	21.417	0.976
B17	44.160	0.000	0.000	2.568	41.145	0.117	34.474	0.932
B18	44.160	0.000	0.000	0.000	43.739	0.102	28.655	0.990
B19	44.160	0.000	0.000	0.586	43.288	0.088	25.024	0.980
B20	44.160	0.000	0.000	0.231	43.493	0.102	28.633	0.985
B21	44.160	0.000	0.000	0.395	43.553	0.216	60.833	0.986
B22	44.160	0.000	0.000	0.234	43.595	0.100	28.069	0.987
B23	44.160	0.000	0.000	0.233	43.541	0.099	27.738	0.986
B24	44.160	0.000	0.000	0.233	43.520	0.107	30.006	0.986
B25	44.160	0.000	0.000	0.270	43.346	0.100	28.182	0.982
B26	44.160	0.000	0.000	0.000	44.150	0.143	39.732	1.000
B27	44.160	0.000	0.000	0.226	43.900	0.104	29.160	0.994
B28	44.160	0.000	0.000	0.000	44.060	0.116	32.188	0.998
B29	44.160	0.000	0.000	0.000	44.060	0.116	32.188	0.998
B30	44.160	0.000	0.000	0.000	44.060	0.116	32.188	0.998
B31	44.160	0.000	0.000	0.000	44.060	0.116	32.188	0.998
B32	44.160	0.000	0.000	0.000	43.922	0.045	12.573	0.995
B33	44.160	0.000	0.000	0.590	43.220	0.064	18.021	0.979
System	44.160	0.000	0.000	1.112	42.613	2.878	821.772	0.965

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Node Depth Summary  
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
N1	JUNCTION	0.38	0.90	4.94	0 01:06
N2	JUNCTION	0.37	0.88	4.94	0 01:06
N3	JUNCTION	0.36	0.87	4.94	0 01:06
N4	JUNCTION	0.34	0.85	4.94	0 01:05
N5	JUNCTION	0.33	0.84	4.95	0 01:05
N6	JUNCTION	0.32	0.82	4.95	0 01:06
N7	JUNCTION	0.30	0.81	4.95	0 01:06
N8	JUNCTION	0.29	0.80	4.95	0 01:06
N17	JUNCTION	0.41	0.92	4.94	0 01:06
N16	JUNCTION	0.39	0.91	4.94	0 01:06
N15	JUNCTION	0.38	0.89	4.94	0 01:06
N14	JUNCTION	0.37	0.88	4.94	0 01:05

N13	JUNCTION	0.36	0.87	4.95	0	01:05
N12	JUNCTION	0.34	0.85	4.95	0	01:05
N11	JUNCTION	0.33	0.84	4.95	0	01:05
N10	JUNCTION	0.31	0.82	4.95	0	01:06
N23	JUNCTION	0.38	0.90	4.94	0	01:06
N22	JUNCTION	0.37	0.88	4.94	0	01:06
N21	JUNCTION	0.36	0.87	4.94	0	01:06
N20	JUNCTION	0.34	0.85	4.94	0	01:06
N19	JUNCTION	0.33	0.84	4.95	0	01:06
N9	JUNCTION	0.29	0.80	4.95	0	01:06
N18	JUNCTION	0.42	0.94	4.94	0	01:06
N24	JUNCTION	0.19	0.68	4.85	0	01:06
N25	JUNCTION	0.19	0.70	4.85	0	01:06
N26	JUNCTION	0.20	0.71	4.85	0	01:06
N27	JUNCTION	0.21	0.73	4.85	0	01:06
N28	JUNCTION	0.23	0.75	4.85	0	01:06
N29	JUNCTION	0.24	0.76	4.85	0	01:06
N30	JUNCTION	0.25	0.78	4.85	0	01:06
N31	JUNCTION	0.26	0.79	4.85	0	01:06
N32	JUNCTION	0.27	0.81	4.85	0	01:06
N33	JUNCTION	0.28	0.82	4.85	0	01:05
N34	JUNCTION	0.30	0.85	4.85	0	01:06
N35	JUNCTION	0.28	0.82	4.85	0	01:05
N36	JUNCTION	0.26	0.80	4.85	0	01:05
N37	JUNCTION	0.25	0.78	4.85	0	01:06
N38	JUNCTION	0.24	0.77	4.85	0	01:06
N39	JUNCTION	0.23	0.76	4.85	0	01:06
N40	JUNCTION	0.23	0.75	4.85	0	01:06
N41	JUNCTION	0.22	0.74	4.85	0	01:06
N42	JUNCTION	0.19	0.70	4.85	0	01:06
N43	JUNCTION	0.18	0.68	4.85	0	01:06
N44	JUNCTION	0.17	0.66	4.85	0	01:06
N45	JUNCTION	0.28	0.78	4.95	0	01:06
S1	OUTFALL	0.15	0.20	4.20	0	00:33
S2	OUTFALL	0.00	0.00	5.20	0	00:00
S3	OUTFALL	0.11	0.20	4.20	0	00:34
S4	OUTFALL	0.00	0.00	5.00	0	00:00
I1	STORAGE	0.31	0.80	4.91	0	01:12
I2	STORAGE	0.29	0.76	4.90	0	01:14
I3	STORAGE	0.20	0.68	4.82	0	01:12
I4	STORAGE	0.18	0.65	4.82	0	01:12
I5	STORAGE	0.30	0.77	4.90	0	01:13

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Node InFlow Summary  
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Node	Type	Maximum	Maximum	Time of Max Occurrence days hr:min	Lateral Inflow Volume Mltrs	Total Inflow Volume Mltrs
		Lateral Inflow LPS	Total Inflow LPS			
N1	JUNCTION	22.34	23.99	0 00:15	0.069	0.070
N2	JUNCTION	23.50	23.50	0 01:04	0.083	0.083
N3	JUNCTION	13.38	18.60	0 00:12	0.046	0.047
N4	JUNCTION	14.92	21.52	0 00:12	0.053	0.053
N5	JUNCTION	16.28	20.67	0 00:11	0.057	0.058
N6	JUNCTION	19.07	19.07	0 01:04	0.067	0.067
N7	JUNCTION	14.92	14.92	0 01:04	0.053	0.053
N8	JUNCTION	14.20	14.20	0 01:04	0.051	0.051
N17	JUNCTION	25.33	184.68	0 01:04	0.071	1.976
N16	JUNCTION	19.57	230.33	0 00:32	0.068	1.720
N15	JUNCTION	17.58	276.56	0 00:32	0.060	1.469
N14	JUNCTION	19.57	240.91	0 00:32	0.068	1.051
N13	JUNCTION	15.19	195.78	0 00:33	0.052	0.828
N12	JUNCTION	25.06	116.93	0 00:33	0.088	0.502
N11	JUNCTION	19.59	83.03	0 00:33	0.069	0.348
N10	JUNCTION	21.42	57.00	0 00:33	0.076	0.226
N23	JUNCTION	34.47	34.47	0 01:04	0.117	0.117
N22	JUNCTION	28.66	28.66	0 01:04	0.102	0.102
N21	JUNCTION	25.02	25.02	0 01:04	0.089	0.089
N20	JUNCTION	28.63	28.63	0 01:04	0.102	0.102
N19	JUNCTION	60.83	60.83	0 01:04	0.217	0.216
N9	JUNCTION	0.00	26.77	0 00:33	0.000	0.100
N18	JUNCTION	0.00	93.24	0 01:05	0.000	1.741
N24	JUNCTION	0.00	26.27	0 00:33	0.000	0.099

N25	JUNCTION	0.00	52.10	0	00:33	0.000	0.205
N26	JUNCTION	0.00	74.76	0	00:33	0.000	0.305
N27	JUNCTION	18.02	88.40	0	00:33	0.064	0.368
N28	JUNCTION	0.00	96.22	0	00:33	0.000	0.414
N29	JUNCTION	0.00	122.39	0	00:33	0.000	0.530
N30	JUNCTION	0.00	147.85	0	00:32	0.000	0.645
N31	JUNCTION	0.00	171.55	0	00:32	0.000	0.953
N32	JUNCTION	0.00	107.15	0	00:34	0.000	1.075
N33	JUNCTION	0.00	75.43	0	01:18	0.000	0.974
N34	JUNCTION	0.00	90.63	0	01:05	0.000	1.117
N35	JUNCTION	39.73	39.73	0	01:04	0.143	0.143
N36	JUNCTION	29.16	29.16	0	01:04	0.105	0.104
N37	JUNCTION	32.19	32.19	0	01:04	0.116	0.116
N38	JUNCTION	32.19	32.19	0	01:04	0.116	0.116
N39	JUNCTION	32.19	32.19	0	01:04	0.116	0.116
N40	JUNCTION	32.19	32.19	0	01:04	0.116	0.116
N41	JUNCTION	12.57	12.57	0	01:04	0.045	0.045
N42	JUNCTION	28.18	28.18	0	01:04	0.100	0.100
N43	JUNCTION	30.01	30.01	0	01:04	0.107	0.106
N44	JUNCTION	27.74	27.74	0	01:04	0.099	0.098
N45	JUNCTION	28.07	28.07	0	01:04	0.100	0.100
S1	OUTFALL	0.00	90.01	0	01:06	0.000	1.741
S2	OUTFALL	0.00	0.00	0	00:00	0.000	0.000
S3	OUTFALL	0.00	84.16	0	01:06	0.000	1.117
S4	OUTFALL	0.00	0.00	0	00:00	0.000	0.000
I1	STORAGE	0.00	98.75	0	00:30	0.000	0.233
I2	STORAGE	0.00	96.34	0	00:30	0.000	0.227
I3	STORAGE	0.00	93.87	0	00:30	0.000	0.205
I4	STORAGE	0.00	88.25	0	00:31	0.000	0.195
I5	STORAGE	0.00	96.86	0	00:30	0.000	0.231

\*\*\*\*\*  
Node Surcharge Summary  
\*\*\*\*\*

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
I1	STORAGE	5.86	0.598	0.002
I2	STORAGE	5.48	0.556	0.044
I3	STORAGE	3.61	0.482	0.118
I4	STORAGE	3.31	0.448	0.152
I5	STORAGE	5.67	0.573	0.027

\*\*\*\*\*  
Node Flooding Summary  
\*\*\*\*\*

No nodes were flooded.

\*\*\*\*\*  
Storage Volume Summary  
\*\*\*\*\*

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
I1	0.093	40	0.232	100	0 01:12	12.98
I2	0.086	37	0.227	98	0 01:14	13.76
I3	0.060	26	0.205	88	0 01:12	17.59
I4	0.053	23	0.194	84	0 01:12	17.30
I5	0.089	38	0.230	99	0 01:13	13.50

\*\*\*\*\*  
 Outfall Loading Summary  
 \*\*\*\*\*

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume Mltrs
S1	99.92	44.87	90.01	1.741
S2	0.00	0.00	0.00	0.000
S3	99.95	31.55	84.16	1.117
S4	0.00	0.00	0.00	0.000
System	49.97	76.42	174.13	2.857

\*\*\*\*\*  
 Link Flow Summary  
 \*\*\*\*\*

Link	Type	Maximum Flow LPS	Time of Max Occurrence days hr:min	Maximum Velocity m/sec	Max/ Full Flow	Max/ Full Depth
C14	CONDUIT	20.14	0 00:24	0.23	0.02	0.76
C15	CONDUIT	22.33	0 00:26	0.23	0.02	0.75
C16	CONDUIT	13.87	0 00:27	0.19	0.02	0.88
C17	CONDUIT	14.99	0 00:28	0.18	0.03	0.87
C18	CONDUIT	14.01	0 00:35	0.20	0.02	0.85
C19	CONDUIT	17.87	0 00:32	0.13	0.03	0.84
C20	CONDUIT	13.52	0 00:30	0.15	0.02	0.82
C21	CONDUIT	12.99	0 00:30	0.24	0.02	0.81
C22	CONDUIT	23.36	0 00:33	0.18	0.04	0.81
C23	CONDUIT	50.08	0 00:33	0.25	0.09	0.83
C24	CONDUIT	74.64	0 00:33	0.22	0.13	0.85
C25	CONDUIT	108.90	0 00:32	0.28	0.19	0.86
C26	CONDUIT	183.87	0 00:32	0.46	0.32	0.87
C27	CONDUIT	227.99	0 00:32	0.59	0.39	0.89
C28	CONDUIT	168.28	0 00:33	0.39	0.18	0.75
C29	CONDUIT	119.08	0 00:33	0.37	0.13	0.76
C30	CONDUIT	93.24	0 01:05	0.44	0.10	0.78
C31	CONDUIT	58.84	0 00:32	0.50	0.10	0.85
C32	CONDUIT	28.41	0 00:32	0.39	0.05	0.87
C33	CONDUIT	25.73	0 00:30	0.38	0.04	0.88
C34	CONDUIT	27.58	0 00:28	0.38	0.03	0.75
C35	CONDUIT	34.97	0 00:28	0.40	0.04	0.76
C36	CONDUIT	90.01	0 01:06	2.87	32.44	1.00
C37	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C38	CONDUIT	23.59	0 00:33	0.26	0.04	0.69
C39	CONDUIT	48.12	0 00:33	0.27	0.08	0.71
C40	CONDUIT	70.46	0 00:33	0.28	0.14	0.72
C41	CONDUIT	84.59	0 00:33	0.27	0.15	0.74
C42	CONDUIT	91.30	0 00:33	0.27	0.16	0.76
C43	CONDUIT	118.17	0 00:32	0.34	0.20	0.77
C44	CONDUIT	142.02	0 00:32	0.40	0.24	0.79
C45	CONDUIT	78.66	0 00:34	0.34	0.14	0.80
C46	CONDUIT	73.91	0 01:18	0.37	0.13	0.81
C47	CONDUIT	76.88	0 01:18	0.26	0.13	0.83
C48	CONDUIT	84.16	0 01:06	2.68	30.34	1.00
C49	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C50	CONDUIT	26.77	0 00:33	0.44	0.05	0.79
C51	CONDUIT	26.27	0 00:33	0.43	0.04	0.67
C52	CONDUIT	28.51	0 00:33	0.46	0.05	0.69
C53	CONDUIT	26.65	0 00:33	0.44	0.05	0.70
C55	CONDUIT	11.65	0 00:30	0.44	0.02	0.74
C56	CONDUIT	31.19	0 00:31	0.59	0.05	0.76
C57	CONDUIT	29.91	0 00:31	0.53	0.05	0.77
C58	CONDUIT	29.97	0 00:29	0.53	0.05	0.78
C59	CONDUIT	29.97	0 00:26	0.53	0.05	0.80
C60	CONDUIT	28.34	0 00:10	0.52	0.05	0.81
C61	CONDUIT	37.60	0 00:30	0.49	0.06	0.83
C62	CONDUIT	96.34	0 00:30	1.70	17.36	1.00
C63	CONDUIT	98.75	0 00:30	1.75	17.80	1.00
C64	CONDUIT	93.87	0 00:30	1.68	16.92	1.00
C65	CONDUIT	88.25	0 00:31	1.59	1.96	1.00
C66	CONDUIT	96.86	0 00:30	1.72	17.46	1.00



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Flow Classification Summary  
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Conduit	Adjusted /Actual Length	--- Fraction of				Time in Flow		Class		Avg. Froude Number	Avg. Flow Change
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit			
C14	1.00	0.00	0.02	0.00	0.98	0.00	0.00	0.00	0.00	0.0000	
C15	1.00	0.00	0.03	0.00	0.97	0.00	0.00	0.00	0.00	0.0000	
C16	1.00	0.00	0.04	0.00	0.96	0.00	0.00	0.00	0.00	0.0000	
C17	1.00	0.00	0.05	0.00	0.95	0.00	0.00	0.00	0.00	0.0000	
C18	1.00	0.00	0.05	0.00	0.95	0.00	0.00	0.00	0.00	0.0000	
C19	1.00	0.00	0.06	0.00	0.94	0.00	0.00	0.00	0.01	0.0000	
C20	1.00	0.00	0.07	0.00	0.93	0.00	0.00	0.00	0.01	0.0000	
C21	1.00	0.00	0.09	0.00	0.91	0.00	0.00	0.00	0.01	0.0000	
C22	1.00	0.00	0.05	0.00	0.95	0.00	0.00	0.00	0.01	0.0000	
C23	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000	
C24	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000	
C25	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0000	
C26	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.0000	
C27	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.0000	
C28	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.06	0.0000	
C29	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.08	0.0000	
C30	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.08	0.0000	
C31	1.00	0.00	0.05	0.00	0.95	0.00	0.00	0.00	0.01	0.0000	
C32	1.00	0.00	0.05	0.00	0.95	0.00	0.00	0.00	0.01	0.0000	
C33	1.00	0.00	0.04	0.00	0.96	0.00	0.00	0.00	0.01	0.0000	
C34	1.00	0.00	0.03	0.00	0.97	0.00	0.00	0.00	0.01	0.0000	
C35	1.00	0.00	0.02	0.00	0.98	0.00	0.00	0.00	0.01	0.0000	
C36	1.00	0.00	0.00	0.00	0.42	0.57	0.00	0.00	1.14	0.0020	
C37	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	
C38	1.00	0.05	0.08	0.00	0.87	0.00	0.00	0.00	0.02	0.0000	
C39	1.00	0.00	0.05	0.00	0.95	0.00	0.00	0.00	0.03	0.0000	
C40	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.0000	
C41	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.0000	
C42	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.06	0.0000	
C43	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.06	0.0000	
C44	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.06	0.0000	
C45	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.08	0.0000	
C46	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.11	0.0000	
C47	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.10	0.0000	
C48	1.00	0.00	0.00	0.00	0.59	0.41	0.00	0.00	0.91	0.0019	
C49	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	
C50	1.00	0.05	0.09	0.00	0.86	0.00	0.00	0.00	0.01	0.0000	
C51	1.00	0.13	0.12	0.00	0.75	0.00	0.00	0.00	0.01	0.0000	
C52	1.00	0.05	0.19	0.00	0.76	0.00	0.00	0.00	0.01	0.0000	
C53	1.00	0.00	0.22	0.00	0.78	0.00	0.00	0.00	0.01	0.0000	
C55	1.00	0.00	0.23	0.00	0.77	0.00	0.00	0.00	0.00	0.0000	
C56	1.00	0.00	0.21	0.00	0.79	0.00	0.00	0.00	0.01	0.0000	
C57	1.00	0.00	0.16	0.00	0.84	0.00	0.00	0.00	0.01	0.0000	
C58	1.00	0.00	0.14	0.00	0.86	0.00	0.00	0.00	0.01	0.0000	
C59	1.00	0.00	0.11	0.00	0.89	0.00	0.00	0.00	0.01	0.0000	
C60	1.00	0.00	0.11	0.00	0.89	0.00	0.00	0.00	0.01	0.0000	
C61	1.00	0.00	0.06	0.00	0.94	0.00	0.00	0.00	0.01	0.0000	
C62	1.00	0.00	0.00	0.00	0.75	0.02	0.00	0.23	0.25	0.0025	
C63	1.00	0.00	0.00	0.00	0.77	0.02	0.00	0.20	0.24	0.0028	
C64	1.00	0.00	0.00	0.00	0.54	0.02	0.00	0.44	0.31	0.0026	
C65	1.00	0.00	0.00	0.00	0.54	0.02	0.00	0.44	0.40	0.0003	
C66	1.00	0.00	0.00	0.00	0.76	0.02	0.00	0.22	0.25	0.0026	

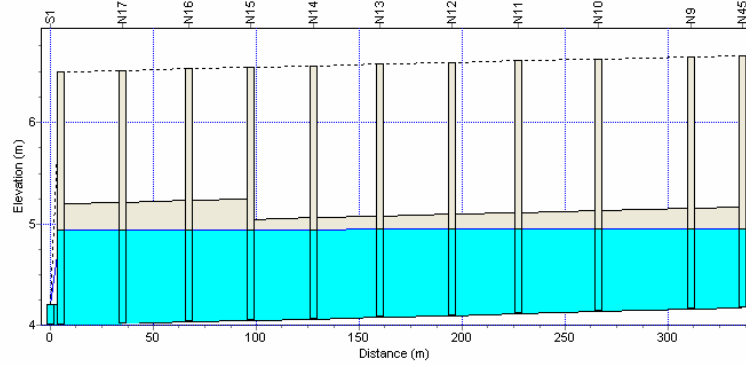
\*\*\*\*\*  
 Conduit Surcharge Summary  
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Conduit	Hours Full			Hours	Hours
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
C36	3.39	3.39	3.40	11.15	3.39
C48	2.12	2.12	2.13	7.17	2.12
C62	5.47	5.47	5.47	8.26	4.78
C63	5.84	5.84	5.85	8.77	5.13
C64	3.59	3.59	3.59	5.73	2.93
C65	3.31	3.31	3.31	0.84	0.01
C66	5.65	5.65	5.65	8.51	4.96

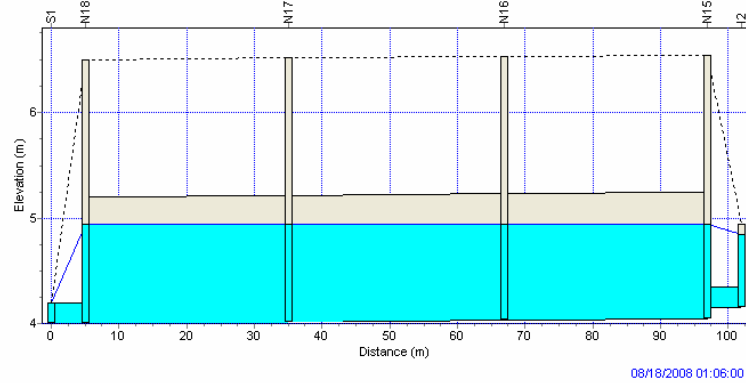
Analysis begun on: Wed Aug 20 18:30:47 2008  
 Analysis ended on: Wed Aug 20 18:30:53 2008  
 Total elapsed time: 00:00:06

**PROFILI LONGITUDINALI PRINCIPALI DI MASSIMO RIEMPIMENTO**

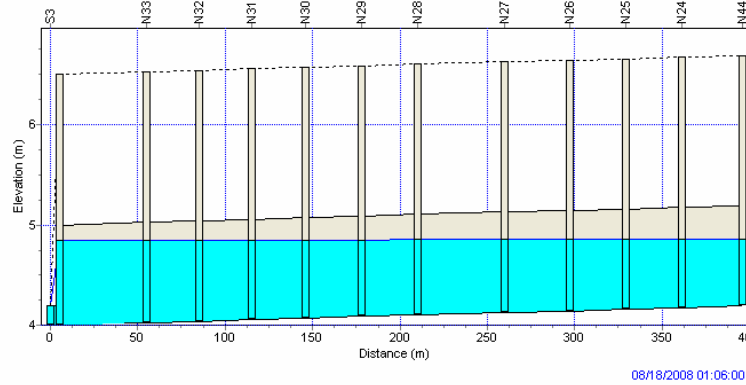
**Water Elevation Profile: Node S1 - N45**



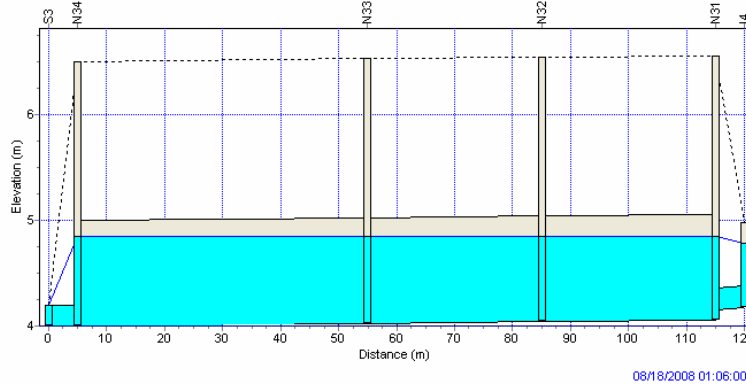
**Water Elevation Profile: Node S1 - I2**



**Water Elevation Profile: Node S3 - N44**



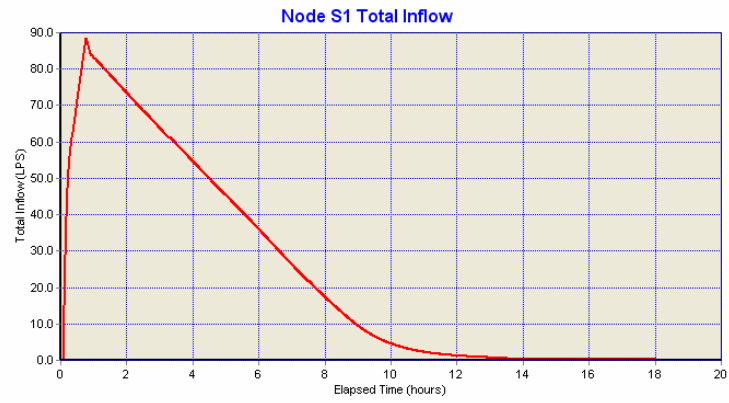
**Water Elevation Profile: Node S3 - I4**



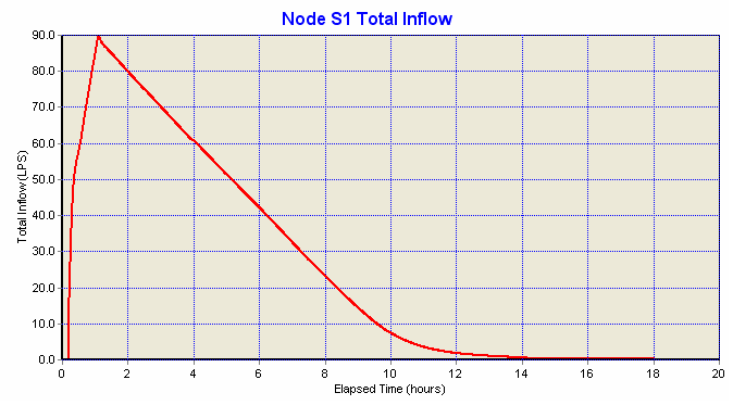
IDROGRAMMI DELLE PORTATE MASSIME DI SCARICO ALLA CHIUSURA DEL BACINO

SCARICO IN S1

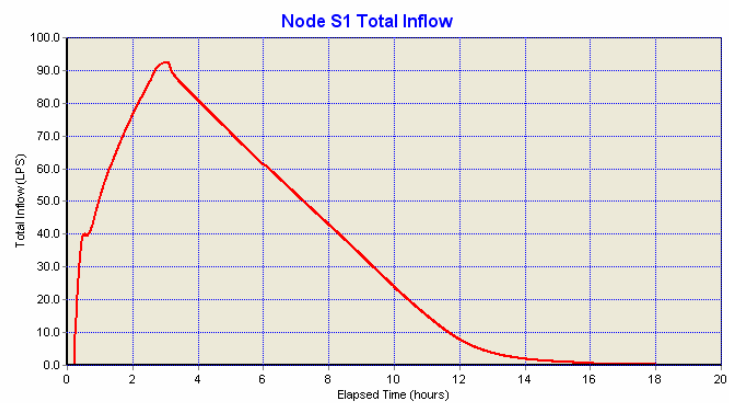
Evento meteorico con ietogramma costante di 45 minuti



Evento meteorico con ietogramma costante di 60 minuti



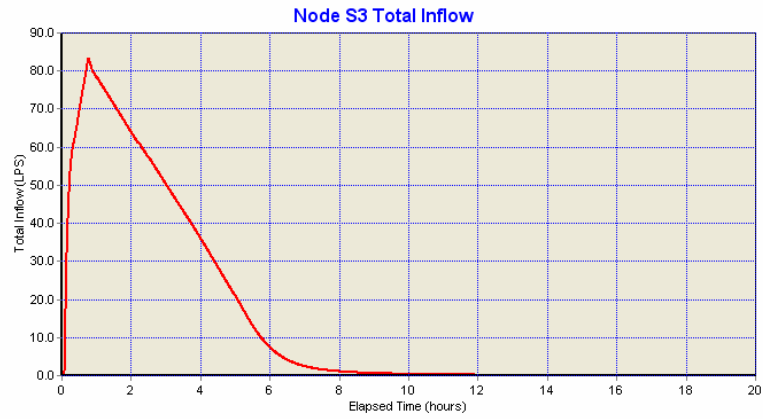
Evento meteorico con ietogramma costante di 180 minuti



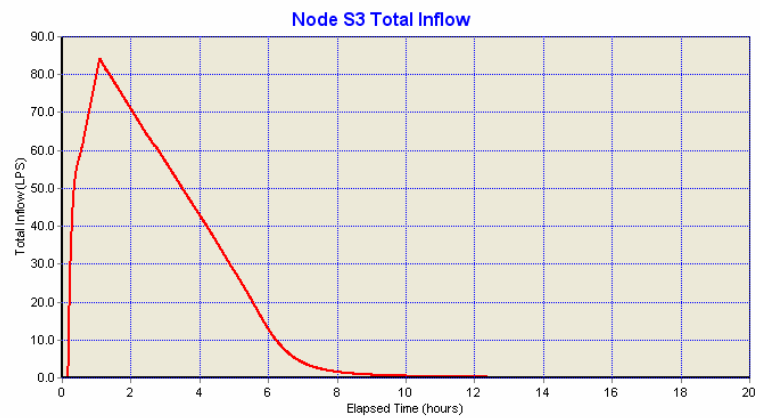
IDROGRAMMI DELLE PORTATE MASSIME DI SCARICO ALLA CHIUSURA DEL BACINO

SCARICO IN S3

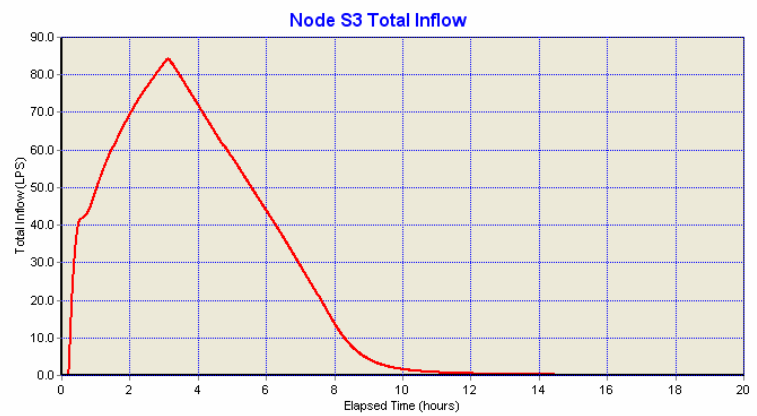
Evento meteorico con ietogramma costante di 45 minuti



Evento meteorico con ietogramma costante di 60 minuti

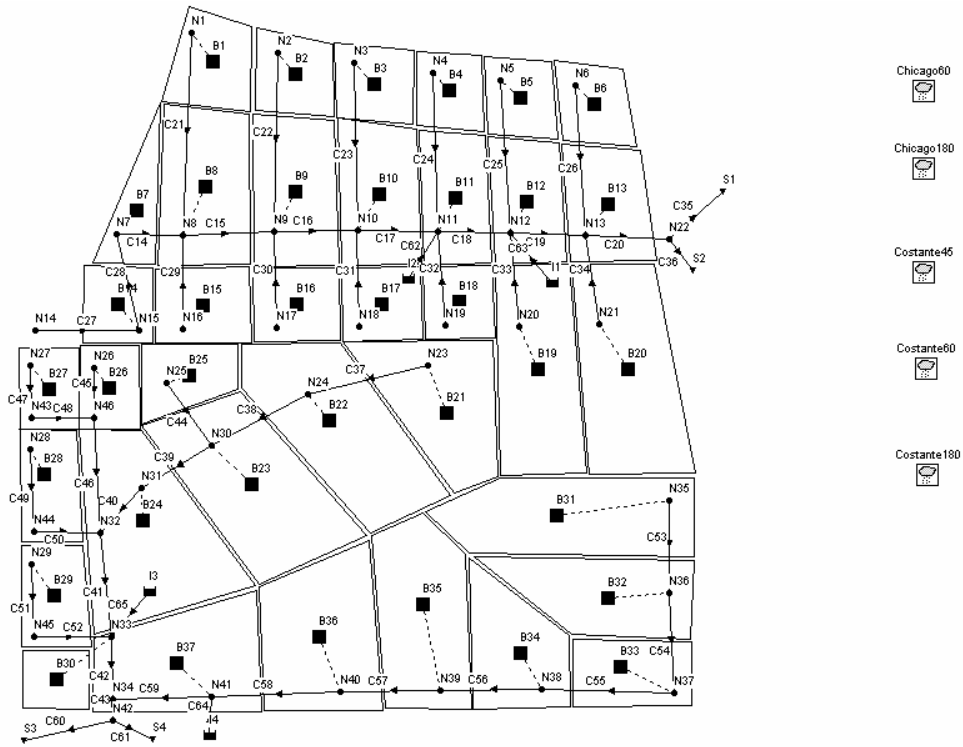


Evento meteorico con ietogramma costante di 180 minuti

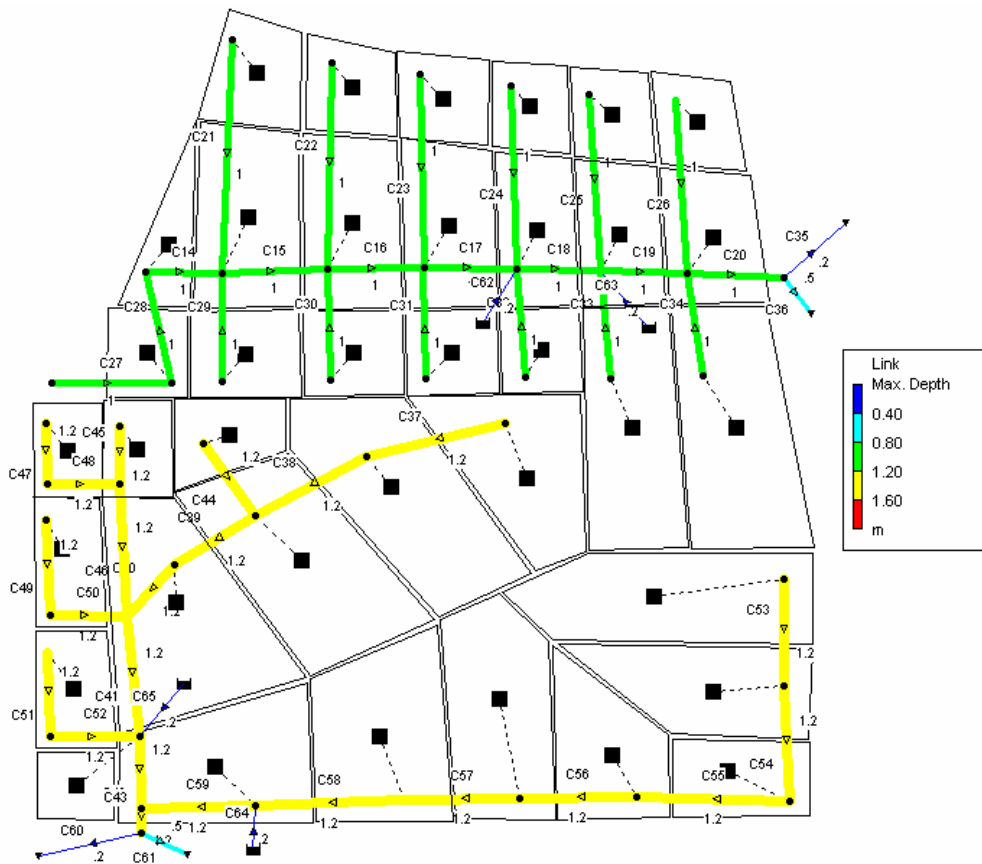


# MODELLO SWMM STATO DI PROGETTO ZONA C

## SCHEMA PLANIMETRICO DELLA RETE



## SCHEMA RETE DIMENSIONI CONDOTTE



**REPORT**

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.013)

Situazione Progetto  
 ZONA C  
 Costante 60 min

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 Analysis Options  
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Flow Units ..... LPS  
 Infiltration Method ..... CURVE\_NUMBER  
 Flow Routing Method ..... DYNWAVE  
 Starting Date ..... AUG-18-2008 00:00:00  
 Ending Date ..... AUG-18-2008 23:59:00  
 Antecedent Dry Days ..... 0.0  
 Report Time Step ..... 00:01:00  
 Wet Time Step ..... 00:01:00  
 Dry Time Step ..... 00:01:00  
 Routing Time Step ..... 30.00 sec

\*\*\*\*\*  
 Element Count  
 \*\*\*\*\*

Number of rain gages ..... 5  
 Number of subcatchments ... 37  
 Number of nodes ..... 54  
 Number of links ..... 52  
 Number of pollutants ..... 0  
 Number of land uses ..... 0

\*\*\*\*\*  
 Raingage Summary  
 \*\*\*\*\*

Name	Data Source	Data Type	Interval hours
Chicago60	ChiTr10T60minDt5min	VOLUME	0.08
Chicago180	ChiTr10T180minDt5min	VOLUME	0.08
Costante60	KostTr10T60minDt5min	VOLUME	0.08
Costante180	KostTr10T180minDt5min	VOLUME	0.08
Costante45	KostTr10T45minDt5min	VOLUME	0.08

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 Subcatchment Summary  
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Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
B1	0.12	70.00	89.00	0.5000	Costante60	N1
B2	0.13	80.00	100.00	0.5000	Costante60	N2
B3	0.10	70.00	94.00	0.5000	Costante60	N3
B4	0.08	60.00	94.00	0.5000	Costante60	N4
B5	0.12	50.00	100.00	0.5000	Costante60	N5
B6	0.08	50.00	32.00	0.5000	Costante60	N6
B7	0.15	90.00	100.00	0.5000	Costante60	N7
B8	0.26	210.00	90.00	0.5000	Costante60	N8
B9	0.21	190.00	98.00	0.5000	Costante60	N9
B10	0.16	170.00	91.00	0.5000	Costante60	N10
B11	0.16	170.00	91.00	0.5000	Costante60	N11
B12	0.22	190.00	98.00	0.5000	Costante60	N12
B13	0.16	160.00	48.00	0.5000	Costante60	N13
B14	0.12	100.00	94.00	0.5000	Costante60	N15
B15	0.10	80.00	87.00	0.5000	Costante60	N16
B16	0.09	80.00	96.00	0.5000	Costante60	N17
B17	0.07	75.00	90.00	0.5000	Costante60	N18
B18	0.07	75.00	90.00	0.5000	Costante60	N19
B19	0.34	90.00	99.00	0.5000	Costante60	N20
B20	0.34	80.00	85.00	0.5000	Costante60	N21
B21	0.26	60.00	100.00	0.5000	Costante60	N23
B22	0.41	100.00	98.00	0.5000	Costante60	N24
B25	0.18	60.00	96.00	0.5000	Costante60	N25
B26	0.14	80.00	91.00	0.5000	Costante60	N26

B27	0.20	80.00	88.00	0.5000	Costante60	N27
B23	0.36	100.00	100.00	0.5000	Costante60	N30
B24	0.41	100.00	100.00	0.5000	Costante60	N31
B37	0.56	100.00	100.00	0.5000	Costante60	N41
B28	0.18	80.00	86.00	0.5000	Costante60	N28
B29	0.22	90.00	86.00	0.5000	Costante60	N29
B30	0.19	50.00	5.00	0.5000	Costante60	N33
B36	0.60	50.00	100.00	0.5000	Costante60	N40
B35	0.62	50.00	100.00	0.5000	Costante60	N39
B34	0.37	50.00	100.00	0.5000	Costante60	N38
B33	0.23	100.00	100.00	0.5000	Costante60	N37
B32	0.34	50.00	100.00	0.5000	Costante60	N36
B31	0.67	30.00	100.00	0.5000	Costante60	N35

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Node Summary  
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Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
N1	JUNCTION	4.12	2.50	0.0	
N2	JUNCTION	4.11	2.50	0.0	
N3	JUNCTION	4.09	2.50	0.0	
N4	JUNCTION	4.07	2.50	0.0	
N5	JUNCTION	4.05	2.50	0.0	
N6	JUNCTION	4.03	2.50	0.0	
N7	JUNCTION	4.10	2.50	0.0	
N8	JUNCTION	4.09	2.50	0.0	
N9	JUNCTION	4.07	2.50	0.0	
N10	JUNCTION	4.05	2.50	0.0	
N11	JUNCTION	4.04	2.50	0.0	
N12	JUNCTION	4.03	2.50	0.0	
N13	JUNCTION	4.01	2.50	0.0	
N14	JUNCTION	4.15	2.50	0.0	
N15	JUNCTION	4.13	2.50	0.0	
N16	JUNCTION	4.12	2.50	0.0	
N17	JUNCTION	4.10	2.50	0.0	
N18	JUNCTION	4.08	2.50	0.0	
N19	JUNCTION	4.07	2.50	0.0	
N20	JUNCTION	4.05	2.50	0.0	
N21	JUNCTION	4.04	2.50	0.0	
N22	JUNCTION	4.00	2.50	0.0	
N23	JUNCTION	4.14	2.50	0.0	
N24	JUNCTION	4.12	2.50	0.0	
N25	JUNCTION	4.12	2.50	0.0	
N26	JUNCTION	4.11	2.50	0.0	
N27	JUNCTION	4.12	2.50	0.0	
N28	JUNCTION	4.10	2.50	0.0	
N29	JUNCTION	4.07	2.50	0.0	
N30	JUNCTION	4.10	2.50	0.0	
N31	JUNCTION	4.08	2.50	0.0	
N32	JUNCTION	4.06	2.50	0.0	
N33	JUNCTION	4.03	2.50	0.0	
N34	JUNCTION	4.01	2.50	0.0	
N35	JUNCTION	4.18	2.50	0.0	
N36	JUNCTION	4.15	2.50	0.0	
N37	JUNCTION	4.13	2.50	0.0	
N38	JUNCTION	4.10	2.50	0.0	
N39	JUNCTION	4.08	2.50	0.0	
N40	JUNCTION	4.05	2.50	0.0	
N41	JUNCTION	4.03	2.50	0.0	
N42	JUNCTION	4.00	2.50	0.0	
N43	JUNCTION	4.10	2.50	0.0	
N46	JUNCTION	4.09	2.50	0.0	
N44	JUNCTION	4.08	2.50	0.0	
N45	JUNCTION	4.04	2.50	0.0	
S1	OUTFALL	4.00	0.20	0.0	
S2	OUTFALL	5.00	1.00	0.0	
S3	OUTFALL	4.00	0.20	0.0	
S4	OUTFALL	5.20	0.60	0.0	
I1	STORAGE	4.13	0.80	0.0	
I2	STORAGE	4.14	0.80	0.0	
I3	STORAGE	4.13	1.20	0.0	
I4	STORAGE	4.13	1.20	0.0	



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 Link Summary  
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Name	From Node	To Node	Type	Length	%Slope	Roughness
C14	N7	N8	CONDUIT	32.0	0.0500	0.0120
C15	N8	N9	CONDUIT	27.0	0.0519	0.0120
C16	N9	N10	CONDUIT	43.0	0.0488	0.0120
C17	N10	N11	CONDUIT	20.0	0.0500	0.0120
C18	N11	N12	CONDUIT	32.0	0.0500	0.0120
C19	N12	N13	CONDUIT	38.0	0.0500	0.0120
C20	N13	N22	CONDUIT	15.0	0.0533	0.0120
C21	N1	N8	CONDUIT	70.0	0.0500	0.0120
C22	N2	N9	CONDUIT	75.0	0.0507	0.0120
C23	N3	N10	CONDUIT	65.0	0.0508	0.0120
C24	N4	N11	CONDUIT	60.0	0.0500	0.0120
C25	N5	N12	CONDUIT	50.0	0.0500	0.0120
C26	N6	N13	CONDUIT	45.0	0.0511	0.0120
C27	N14	N15	CONDUIT	30.0	0.0500	0.0120
C28	N15	N7	CONDUIT	55.0	0.0509	0.0120
C29	N16	N8	CONDUIT	55.0	0.0509	0.0120
C30	N17	N9	CONDUIT	55.0	0.0509	0.0120
C31	N18	N10	CONDUIT	55.0	0.0509	0.0120
C32	N19	N11	CONDUIT	55.0	0.0509	0.0120
C33	N20	N12	CONDUIT	55.0	0.0509	0.0120
C34	N21	N13	CONDUIT	55.0	0.0509	0.0120
C35	N22	S1	CONDUIT	5.0	0.0061	0.0120
C36	N22	S2	CONDUIT	5.0	0.0061	0.0120
C37	N23	N24	CONDUIT	50.0	0.0500	0.0120
C38	N24	N30	CONDUIT	40.0	0.0500	0.0120
C39	N30	N31	CONDUIT	40.0	0.0500	0.0120
C40	N31	N32	CONDUIT	40.0	0.0500	0.0120
C41	N32	N33	CONDUIT	66.0	0.0500	0.0120
C42	N33	N34	CONDUIT	30.0	0.0500	0.0120
C43	N34	N42	CONDUIT	20.0	0.0500	0.0120
C44	N25	N30	CONDUIT	40.0	0.0500	0.0120
C45	N26	N46	CONDUIT	40.0	0.0500	0.0120
C46	N46	N32	CONDUIT	54.0	0.0500	0.0120
C47	N27	N43	CONDUIT	40.0	0.0500	0.0120
C48	N43	N46	CONDUIT	35.0	0.0514	0.0120
C49	N28	N44	CONDUIT	40.0	0.0500	0.0120
C50	N44	N32	CONDUIT	35.0	0.0514	0.0120
C51	N29	N45	CONDUIT	50.0	0.0500	0.0120
C52	N45	N33	CONDUIT	35.0	0.0514	0.0120
C53	N35	N36	CONDUIT	50.0	0.0500	0.0120
C54	N36	N37	CONDUIT	50.0	0.0500	0.0120
C55	N37	N38	CONDUIT	50.0	0.0500	0.0120
C56	N38	N39	CONDUIT	50.0	0.0500	0.0120
C57	N39	N40	CONDUIT	50.0	0.0500	0.0120
C58	N40	N41	CONDUIT	50.0	0.0500	0.0120
C59	N41	N34	CONDUIT	32.0	0.0500	0.0120
C60	N42	S3	CONDUIT	5.0	0.0061	0.0120
C61	N42	S4	CONDUIT	5.0	0.0061	0.0120
C62	I2	N11	CONDUIT	5.0	0.0061	0.0120
C63	I1	N12	CONDUIT	5.0	0.0061	0.0120
C64	I4	N41	CONDUIT	5.0	0.0061	0.0120
C65	I3	N33	CONDUIT	5.0	0.0061	0.0120

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 Cross Section Summary  
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C14	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C15	CIRCULAR	1.00	0.79	0.25	1.00	1	591.48
C16	CIRCULAR	1.00	0.79	0.25	1.00	1	574.03
C17	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C18	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C19	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C20	CIRCULAR	1.00	0.79	0.25	1.00	1	599.88
C21	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C22	CIRCULAR	1.00	0.79	0.25	1.00	1	584.69
C23	CIRCULAR	1.00	0.79	0.25	1.00	1	585.28

C24	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C25	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C26	CIRCULAR	1.00	0.79	0.25	1.00	1	587.24
C27	CIRCULAR	1.00	0.79	0.25	1.00	1	580.83
C28	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C29	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C30	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C31	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C32	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C33	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C34	CIRCULAR	1.00	0.79	0.25	1.00	1	586.08
C35	CIRCULAR	0.20	0.03	0.05	0.20	1	2.77
C36	CIRCULAR	1.00	0.79	0.25	1.00	1	202.81
C37	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C38	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C39	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C40	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C41	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C42	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C43	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C44	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C45	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C46	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C47	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C48	CIRCULAR	1.20	1.13	0.30	1.20	1	957.89
C49	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C50	CIRCULAR	1.20	1.13	0.30	1.20	1	957.89
C51	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C52	CIRCULAR	1.20	1.13	0.30	1.20	1	957.89
C53	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C54	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C55	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C56	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C57	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C58	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C59	CIRCULAR	1.20	1.13	0.30	1.20	1	944.49
C60	CIRCULAR	0.20	0.03	0.05	0.20	1	2.77
C61	CIRCULAR	0.60	0.28	0.15	0.60	1	51.94
C62	CIRCULAR	0.20	0.03	0.05	0.20	2	2.77
C63	CIRCULAR	0.20	0.03	0.05	0.20	2	2.77
C64	CIRCULAR	0.20	0.03	0.05	0.20	4	2.77
C65	CIRCULAR	0.20	0.03	0.05	0.20	4	2.77

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*****
Runoff Quantity Continuity
*****
Total Precipitation ..... 0.400 44.160
Evaporation Loss ..... 0.000 0.000
Infiltration Loss ..... 0.015 1.607
Surface Runoff ..... 0.382 42.153
Final Surface Storage .... 0.004 0.396
Continuity Error (%) ..... 0.008

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*****
Flow Routing Continuity
*****
Dry Weather Inflow ..... 0.000 0.000
Wet Weather Inflow ..... 0.382 3.816
Groundwater Inflow ..... 0.000 0.000
RDII Inflow ..... 0.000 0.000
External Inflow ..... 0.000 0.000
External Outflow ..... 0.380 3.799
Internal Outflow ..... 0.000 0.000
Evaporation Loss ..... 0.000 0.000
Initial Stored Volume .... 0.000 0.000
Final Stored Volume ..... 0.001 0.015
Continuity Error (%) ..... 0.060

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*****
Time-Step Critical Elements
*****
Link C60 (99.59%)

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\*\*\*\*\*  
Highest Flow Instability Indexes  
\*\*\*\*\*  
All links are stable.

\*\*\*\*\*  
Routing Time Step Summary  
\*\*\*\*\*  
Minimum Time Step : 0.80 sec  
Average Time Step : 1.89 sec  
Maximum Time Step : 30.00 sec  
Percent in Steady State : 0.00  
Average Iterations per Step : 2.00

\*\*\*\*\*  
Subcatchment Runoff Summary  
\*\*\*\*\*

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff Mltrs	Peak Runoff LPS	Runoff Coeff
B1	44.160	0.000	0.000	1.706	41.804	0.049	14.182	0.947
B2	44.160	0.000	0.000	0.000	43.160	0.058	16.486	0.977
B3	44.160	0.000	0.000	0.911	42.333	0.042	12.065	0.959
B4	44.160	0.000	0.000	0.911	42.315	0.036	10.306	0.958
B5	44.160	0.000	0.000	0.000	43.255	0.050	14.229	0.980
B6	44.160	0.000	0.000	19.125	24.219	0.019	7.669	0.548
B7	44.160	0.000	0.000	0.000	43.701	0.067	18.805	0.990
B8	44.160	0.000	0.000	1.688	41.456	0.106	31.053	0.939
B9	44.160	0.000	0.000	0.328	42.737	0.090	25.859	0.968
B10	44.160	0.000	0.000	1.367	42.021	0.069	19.957	0.952
B11	44.160	0.000	0.000	1.367	41.987	0.066	19.007	0.951
B12	44.160	0.000	0.000	0.328	42.756	0.095	27.181	0.968
B13	44.160	0.000	0.000	12.211	31.315	0.049	17.430	0.709
B14	44.160	0.000	0.000	0.908	42.376	0.052	15.045	0.960
B15	44.160	0.000	0.000	2.220	40.991	0.041	12.209	0.928
B16	44.160	0.000	0.000	0.601	42.617	0.038	10.958	0.965
B17	44.160	0.000	0.000	1.681	41.541	0.030	8.845	0.941
B18	44.160	0.000	0.000	1.681	41.541	0.030	8.845	0.941
B19	44.160	0.000	0.000	0.096	43.745	0.150	42.188	0.991
B20	44.160	0.000	0.000	2.210	41.759	0.144	41.791	0.946
B21	44.160	0.000	0.000	0.000	44.149	0.113	31.280	1.000
B22	44.160	0.000	0.000	0.195	43.793	0.179	50.171	0.992
B25	44.160	0.000	0.000	0.675	42.372	0.078	22.362	0.960
B26	44.160	0.000	0.000	1.668	41.422	0.058	17.040	0.938
B27	44.160	0.000	0.000	2.283	40.887	0.083	24.660	0.926
B23	44.160	0.000	0.000	0.000	44.151	0.161	44.774	1.000
B24	44.160	0.000	0.000	0.000	44.150	0.180	50.011	1.000
B37	44.160	0.000	0.000	0.000	44.146	0.249	69.062	1.000
B28	44.160	0.000	0.000	2.664	40.394	0.074	22.138	0.915
B29	44.160	0.000	0.000	2.675	40.417	0.091	27.007	0.915
B30	44.160	0.000	0.000	34.082	9.092	0.017	9.845	0.206
B36	44.160	0.000	0.000	0.000	44.140	0.267	74.209	1.000
B35	44.160	0.000	0.000	0.000	44.140	0.276	76.661	1.000
B34	44.160	0.000	0.000	0.000	44.144	0.163	45.387	1.000
B33	44.160	0.000	0.000	0.000	44.157	0.104	28.827	1.000
B32	44.160	0.000	0.000	0.000	44.144	0.148	41.216	1.000
B31	44.160	0.000	0.000	0.000	44.137	0.296	82.051	0.999
System	44.160	0.000	0.000	1.607	42.153	3.818	1090.811	0.955

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Node Depth Summary  
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
N1	JUNCTION	0.20	0.80	4.93	0 01:06
N2	JUNCTION	0.21	0.81	4.93	0 01:06
N3	JUNCTION	0.23	0.84	4.93	0 01:06
N4	JUNCTION	0.23	0.85	4.93	0 01:06
N5	JUNCTION	0.25	0.87	4.92	0 01:06
N6	JUNCTION	0.26	0.89	4.92	0 01:06
N7	JUNCTION	0.22	0.82	4.93	0 01:06
N8	JUNCTION	0.23	0.84	4.93	0 01:06
N9	JUNCTION	0.24	0.85	4.93	0 01:06
N10	JUNCTION	0.25	0.87	4.93	0 01:06
N11	JUNCTION	0.26	0.88	4.92	0 01:06
N12	JUNCTION	0.27	0.90	4.92	0 01:06
N13	JUNCTION	0.28	0.91	4.92	0 01:06
N14	JUNCTION	0.19	0.78	4.93	0 01:06
N15	JUNCTION	0.20	0.80	4.93	0 01:06
N16	JUNCTION	0.21	0.81	4.93	0 01:07
N17	JUNCTION	0.22	0.83	4.93	0 01:07
N18	JUNCTION	0.23	0.85	4.93	0 01:06
N19	JUNCTION	0.24	0.85	4.92	0 01:07
N20	JUNCTION	0.25	0.87	4.92	0 01:06
N21	JUNCTION	0.26	0.89	4.92	0 01:06
N22	JUNCTION	0.29	0.92	4.92	0 01:06
N23	JUNCTION	0.39	1.02	5.17	0 01:07
N24	JUNCTION	0.41	1.05	5.17	0 01:07
N25	JUNCTION	0.41	1.05	5.17	0 01:07
N26	JUNCTION	0.42	1.06	5.17	0 01:07
N27	JUNCTION	0.41	1.04	5.17	0 01:06
N28	JUNCTION	0.43	1.07	5.17	0 01:07
N29	JUNCTION	0.46	1.10	5.16	0 01:07
N30	JUNCTION	0.43	1.07	5.17	0 01:07
N31	JUNCTION	0.45	1.09	5.17	0 01:07
N32	JUNCTION	0.46	1.11	5.17	0 01:07
N33	JUNCTION	0.49	1.14	5.16	0 01:07
N34	JUNCTION	0.51	1.15	5.16	0 01:07
N35	JUNCTION	0.37	0.99	5.17	0 01:06
N36	JUNCTION	0.39	1.02	5.17	0 01:06
N37	JUNCTION	0.41	1.04	5.17	0 01:06
N38	JUNCTION	0.43	1.07	5.17	0 01:06
N39	JUNCTION	0.45	1.09	5.17	0 01:07
N40	JUNCTION	0.47	1.12	5.17	0 01:07
N41	JUNCTION	0.49	1.14	5.16	0 01:07
N42	JUNCTION	0.52	1.16	5.16	0 01:07
N43	JUNCTION	0.43	1.06	5.17	0 01:07
N46	JUNCTION	0.44	1.08	5.17	0 01:06
N44	JUNCTION	0.45	1.09	5.17	0 01:07
N45	JUNCTION	0.48	1.12	5.16	0 01:07
S1	OUTFALL	0.11	0.20	4.20	0 00:36
S2	OUTFALL	0.00	0.00	5.00	0 00:00
S3	OUTFALL	0.15	0.20	4.20	0 00:27
S4	OUTFALL	0.00	0.00	5.20	0 00:00
I1	STORAGE	0.20	0.80	4.93	0 01:08
I2	STORAGE	0.19	0.78	4.92	0 01:10
I3	STORAGE	0.40	0.99	5.12	0 01:17
I4	STORAGE	0.40	0.99	5.12	0 01:17

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Node InFlow Summary  
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Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	TimeofMax Occurrence days:hr:min	Lateral Inflow Volume Mltrs	Total Inflow Volume Mltrs
N1	JUNCTION	14.18	14.18	001:05	0.049	0.049
N2	JUNCTION	16.49	16.49	001:04	0.058	0.058
N3	JUNCTION	12.06	14.81	000:18	0.042	0.042
N4	JUNCTION	10.31	14.40	000:12	0.036	0.036
N5	JUNCTION	14.23	14.23	001:05	0.050	0.050
N6	JUNCTION	7.67	13.96	000:11	0.019	0.023
N7	JUNCTION	18.80	29.64	000:27	0.067	0.120
N8	JUNCTION	31.05	73.09	000:29	0.106	0.316
N9	JUNCTION	25.86	106.89	000:29	0.090	0.502
N10	JUNCTION	19.96	120.59	000:27	0.069	0.644
N11	JUNCTION	19.01	130.56	000:27	0.066	0.929
N12	JUNCTION	27.18	116.15	000:26	0.095	1.222
N13	JUNCTION	17.43	102.24	001:05	0.050	1.282
N14	JUNCTION	0.00	6.74	000:23	0.000	0.012
N15	JUNCTION	15.04	17.76	000:21	0.052	0.064
N16	JUNCTION	12.21	12.21	001:05	0.041	0.042
N17	JUNCTION	10.96	13.93	000:12	0.038	0.039
N18	JUNCTION	8.85	16.57	000:15	0.030	0.031
N19	JUNCTION	8.85	14.37	000:12	0.030	0.031
N20	JUNCTION	42.19	42.19	001:05	0.151	0.150
N21	JUNCTION	41.79	41.79	001:05	0.144	0.144
N22	JUNCTION	0.00	89.94	001:05	0.000	1.277
N23	JUNCTION	31.28	31.28	001:05	0.113	0.113
N24	JUNCTION	50.17	78.43	000:26	0.180	0.292
N25	JUNCTION	22.36	22.36	001:05	0.078	0.078
N26	JUNCTION	17.04	19.57	000:18	0.058	0.060
N27	JUNCTION	24.66	24.66	001:05	0.084	0.085
N28	JUNCTION	22.14	22.14	001:05	0.074	0.075
N29	JUNCTION	27.01	45.27	000:15	0.091	0.092
N30	JUNCTION	44.77	135.19	000:26	0.161	0.531
N31	JUNCTION	50.01	173.50	000:26	0.180	0.710
N32	JUNCTION	0.00	194.64	000:28	0.000	0.960
N33	JUNCTION	9.84	234.43	000:29	0.017	1.769
N34	JUNCTION	0.00	165.93	000:52	0.000	2.717
N35	JUNCTION	82.05	82.05	001:05	0.296	0.295
N36	JUNCTION	41.22	114.84	000:55	0.148	0.444
N37	JUNCTION	28.83	131.52	000:35	0.104	0.547
N38	JUNCTION	45.39	166.36	000:29	0.163	0.711
N39	JUNCTION	76.66	231.06	000:29	0.276	0.986
N40	JUNCTION	74.21	292.42	000:34	0.267	1.254
N41	JUNCTION	69.06	349.22	000:34	0.249	2.034
N42	JUNCTION	0.00	104.05	001:05	0.000	2.522
N43	JUNCTION	0.00	37.84	000:19	0.000	0.090
N46	JUNCTION	0.00	67.09	000:19	0.000	0.176
N44	JUNCTION	0.00	34.88	000:18	0.000	0.081
N45	JUNCTION	0.00	63.89	000:16	0.000	0.100
S1	OUTFALL	0.00	88.91	001:06	0.000	1.277
S2	OUTFALL	0.00	0.00	000:00	0.000	0.000
S3	OUTFALL	0.00	102.76	001:07	0.000	2.522
S4	OUTFALL	0.00	0.00	000:00	0.000	0.000
I1	STORAGE	0.00	77.66	000:26	0.000	0.155
I2	STORAGE	0.00	75.73	000:27	0.000	0.154
I3	STORAGE	0.00	214.30	000:29	0.000	0.538
I4	STORAGE	0.00	208.00	000:27	0.000	0.538

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Node Surcharge Summary  
\*\*\*\*\*

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
I1	STORAGE	4.22	0.600	0.000
I2	STORAGE	4.08	0.577	0.023
I3	STORAGE	8.06	0.795	0.205
I4	STORAGE	8.07	0.794	0.206

\*\*\*\*\*  
Node Flooding Summary  
\*\*\*\*\*

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate LPS	Time of Max Occurrence days hr:min	Total Flood Volume Mltrs	Maximum Poned Volume ha-mm
I1	0.01	9.64	0 01:08	0.000	0.00

\*\*\*\*\*  
Storage Volume Summary  
\*\*\*\*\*

Maximum	Average	Avg	Maximum	Max	Time of Max
Outflow	Volume	Pcnt	Volume	Pcnt	Occurrence
Storage Unit	1000 m3	Full	1000 m3	Full	days hr:min
LPS					
I1	0.040	26	0.155	100	0 01:08
13.81					
I2	0.039	25	0.154	99	0 01:10
13.67					
I3	0.214	34	0.537	85	0 01:17
22.97					
I4	0.215	34	0.537	85	0 01:17
23.08					

\*\*\*\*\*  
Outfall Loading Summary  
\*\*\*\*\*

Outfall Node	Flow Freq. Pcnt.	Avg. Flow LPS	Max. Flow LPS	Total Volume Mltrs
S1	99.96	29.88	88.91	1.277
S2	0.00	0.00	0.00	0.000
S3	99.91	52.60	102.76	2.522
S4	0.00	0.00	0.00	0.000
System	49.97	82.48	191.65	3.799

\*\*\*\*\*  
Link Flow Summary  
\*\*\*\*\*

Link	Type	Maximum Flow LPS	Time of Max Occurrence days hr:min	Maximum Velocity m/sec	Max/Full Flow	Max/Full Depth
C14	CONDUIT	24.14	0 00:25	0.25	0.04	0.83
C15	CONDUIT	58.53	0 00:27	0.34	0.10	0.85
C16	CONDUIT	87.23	0 00:28	0.37	0.15	0.86
C17	CONDUIT	103.80	0 00:28	0.37	0.18	0.88
C18	CONDUIT	64.18	0 01:13	0.15	0.11	0.89
C19	CONDUIT	78.46	0 01:18	0.31	0.14	0.91
C20	CONDUIT	89.94	0 01:05	0.33	0.15	0.92
C21	CONDUIT	11.41	0 00:29	0.18	0.02	0.82
C22	CONDUIT	14.50	0 00:29	0.20	0.02	0.83
C23	CONDUIT	9.48	0 00:25	0.18	0.02	0.86
C24	CONDUIT	9.30	0 00:21	0.15	0.02	0.87
C25	CONDUIT	13.13	0 00:23	0.13	0.02	0.88
C26	CONDUIT	10.90	0 00:11	0.19	0.02	0.90
C27	CONDUIT	6.74	0 00:23	0.23	0.01	0.79
C28	CONDUIT	10.83	0 00:27	0.11	0.02	0.81
C29	CONDUIT	11.69	0 00:27	0.16	0.02	0.82
C30	CONDUIT	11.60	0 00:27	0.20	0.02	0.84
C31	CONDUIT	8.55	0 00:15	0.16	0.01	0.86
C32	CONDUIT	7.76	0 00:25	0.16	0.01	0.87
C33	CONDUIT	40.85	0 00:23	0.39	0.07	0.88
C34	CONDUIT	37.01	0 01:05	0.39	0.06	0.90
C35	CONDUIT	88.91	0 01:06	2.83	32.05	1.00
C36	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C37	CONDUIT	28.46	0 00:26	0.21	0.03	0.86
C38	CONDUIT	71.27	0 00:26	0.29	0.08	0.88
C39	CONDUIT	123.58	0 00:26	0.46	0.13	0.90
C40	CONDUIT	165.60	0 00:30	0.74	0.18	0.91
C41	CONDUIT	172.73	0 00:28	0.40	0.18	0.94
C42	CONDUIT	79.31	0 00:18	0.44	0.08	0.96
C43	CONDUIT	104.05	0 01:05	0.41	0.11	0.97
C44	CONDUIT	19.32	0 00:26	0.13	0.02	0.88
C45	CONDUIT	18.11	0 00:22	0.42	0.02	0.89
C46	CONDUIT	65.46	0 00:18	0.28	0.07	0.91
C47	CONDUIT	26.18	0 00:22	0.42	0.03	0.88
C48	CONDUIT	23.13	0 00:19	0.34	0.02	0.89
C49	CONDUIT	24.74	0 00:28	0.41	0.03	0.90
C50	CONDUIT	25.68	0 00:18	0.16	0.03	0.92
C51	CONDUIT	22.46	0 00:15	0.43	0.02	0.92
C52	CONDUIT	51.81	0 00:16	0.31	0.05	0.94
C53	CONDUIT	73.63	0 00:55	0.21	0.08	0.84
C54	CONDUIT	102.70	0 00:35	0.26	0.11	0.86
C55	CONDUIT	121.34	0 00:29	0.30	0.13	0.88
C56	CONDUIT	157.27	0 00:29	0.33	0.17	0.90
C57	CONDUIT	219.60	0 00:29	0.46	0.23	0.92
C58	CONDUIT	280.21	0 00:34	0.59	0.30	0.94
C59	CONDUIT	165.93	0 00:52	0.66	0.18	0.95
C60	CONDUIT	102.76	0 01:07	3.27	37.04	1.00
C61	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C62	CONDUIT	75.73	0 00:27	1.40	13.65	1.00
C63	CONDUIT	77.66	0 00:26	1.43	14.00	1.00
C64	CONDUIT	208.00	0 00:27	1.81	18.74	1.00
C65	CONDUIT	214.30	0 00:29	1.84	19.31	1.00

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Flow Classification Summary  
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Conduit	Adjusted --- /Actual Length		Fraction of Time in Flow Class ----						Avg. Froude Number	Avg. Flow Change
	Dry		Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit		
C14	1.00	0.00	0.09	0.00	0.91	0.00	0.00	0.00	0.02	0.0000
C15	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0000
C16	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.06	0.0000
C17	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.06	0.0000
C18	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.08	0.0000
C19	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.10	0.0000
C20	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.09	0.0000
C21	1.00	0.00	0.16	0.00	0.84	0.00	0.00	0.00	0.01	0.0000
C22	1.00	0.00	0.15	0.00	0.85	0.00	0.00	0.00	0.01	0.0000
C23	1.00	0.00	0.15	0.00	0.85	0.00	0.00	0.00	0.01	0.0000
C24	1.00	0.00	0.15	0.00	0.85	0.00	0.00	0.00	0.00	0.0000
C25	1.00	0.00	0.15	0.00	0.85	0.00	0.00	0.00	0.00	0.0000
C26	1.00	0.00	0.14	0.00	0.86	0.00	0.00	0.00	0.00	0.0000
C27	1.00	0.13	0.17	0.00	0.70	0.00	0.00	0.00	0.01	0.0000
C28	1.00	0.09	0.04	0.00	0.87	0.00	0.00	0.00	0.02	0.0000
C29	1.00	0.00	0.19	0.00	0.80	0.00	0.00	0.00	0.01	0.0000
C30	1.00	0.00	0.18	0.00	0.82	0.00	0.00	0.00	0.01	0.0000
C31	1.00	0.00	0.17	0.00	0.83	0.00	0.00	0.00	0.00	0.0000
C32	1.00	0.00	0.16	0.00	0.84	0.00	0.00	0.00	0.00	0.0000
C33	1.00	0.00	0.15	0.00	0.85	0.00	0.00	0.00	0.01	0.0000
C34	1.00	0.00	0.13	0.00	0.87	0.00	0.00	0.00	0.01	0.0000
C35	1.00	0.00	0.00	0.00	0.63	0.37	0.00	0.00	0.89	0.0015
C36	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C37	1.00	0.05	0.05	0.00	0.90	0.00	0.00	0.00	0.01	0.0000
C38	1.00	0.00	0.05	0.00	0.95	0.00	0.00	0.00	0.01	0.0000
C39	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
C40	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
C41	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
C42	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.0000
C43	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.07	0.0000
C44	1.00	0.00	0.10	0.00	0.90	0.00	0.00	0.00	0.00	0.0000
C45	1.00	0.01	0.09	0.00	0.90	0.00	0.00	0.00	0.00	0.0001
C46	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.01	0.0000
C47	1.00	0.06	0.04	0.00	0.90	0.00	0.00	0.00	0.01	0.0001
C48	1.00	0.01	0.05	0.00	0.94	0.00	0.00	0.00	0.01	0.0000
C49	1.00	0.05	0.04	0.00	0.91	0.00	0.00	0.00	0.00	0.0001
C50	1.00	0.00	0.05	0.00	0.95	0.00	0.00	0.00	0.01	0.0000
C51	1.00	0.03	0.04	0.00	0.93	0.00	0.00	0.00	0.00	0.0000
C52	1.00	0.00	0.03	0.00	0.97	0.00	0.00	0.00	0.01	0.0000
C53	1.00	0.05	0.06	0.00	0.88	0.00	0.00	0.00	0.01	0.0000
C54	1.00	0.03	0.03	0.00	0.95	0.00	0.00	0.00	0.02	0.0000
C55	1.00	0.01	0.02	0.00	0.97	0.00	0.00	0.00	0.02	0.0000
C56	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.02	0.0000
C57	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
C58	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
C59	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0000
C60	1.00	0.00	0.00	0.00	0.37	0.63	0.00	0.00	1.30	0.0017
C61	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
C62	1.00	0.00	0.00	0.00	0.52	0.01	0.00	0.47	0.23	0.0018
C63	1.00	0.00	0.00	0.00	0.54	0.01	0.00	0.46	0.23	0.0018
C64	1.00	0.00	0.00	0.00	0.79	0.02	0.00	0.19	0.21	0.0045
C65	1.00	0.00	0.00	0.00	0.79	0.02	0.00	0.19	0.21	0.0047

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Conduit Surcharge Summary  
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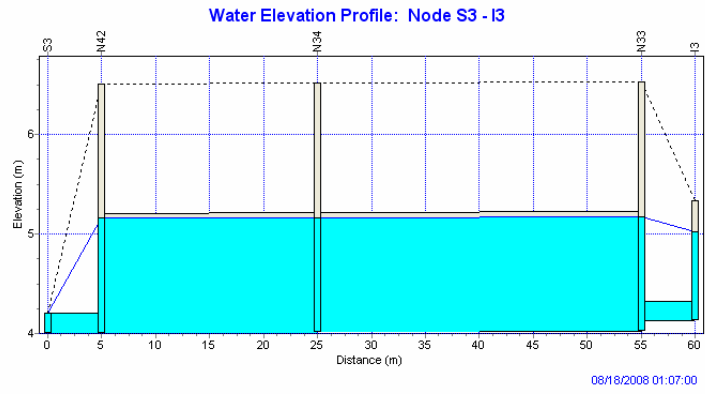
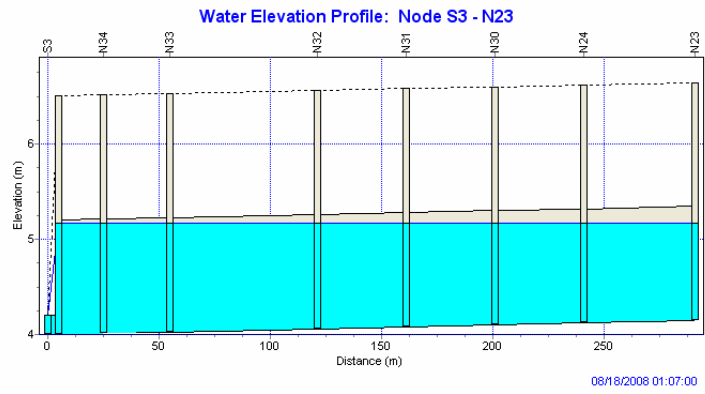
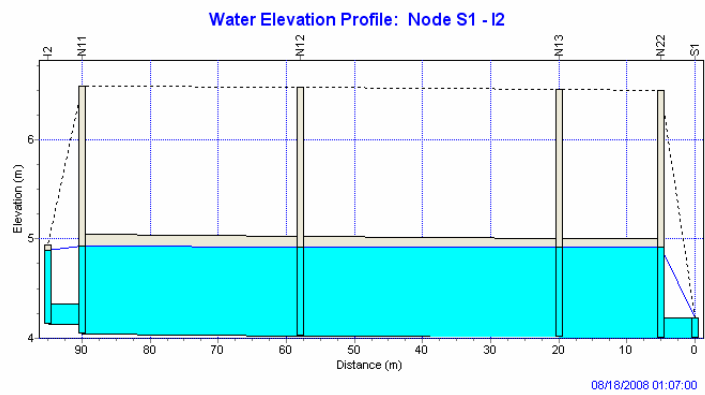
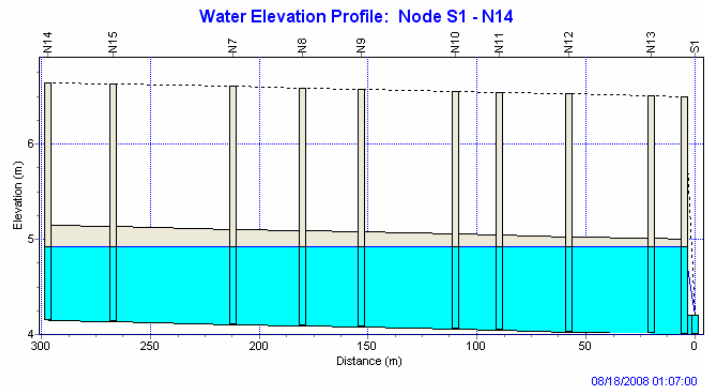
Conduit	Hours Full			Hours Above Normal Flow	Hours Capacity Limited
	Both Ends	Upstream	Dnstream		
C35	2.48	2.48	2.49	8.33	2.48
C60	5.53	5.53	5.54	13.85	5.53
C62	4.07	4.07	4.07	6.02	3.40
C63	4.21	4.21	4.21	6.17	3.51



C64	8.06	8.06	8.06	11.79	7.23
C65	8.05	8.05	8.05	11.78	7.25

Analysis begun on: Thu Aug 21 14:29:47 2008  
Analysis ended on: Thu Aug 21 14:29:56 2008  
Total elapsed time: 00:00:09

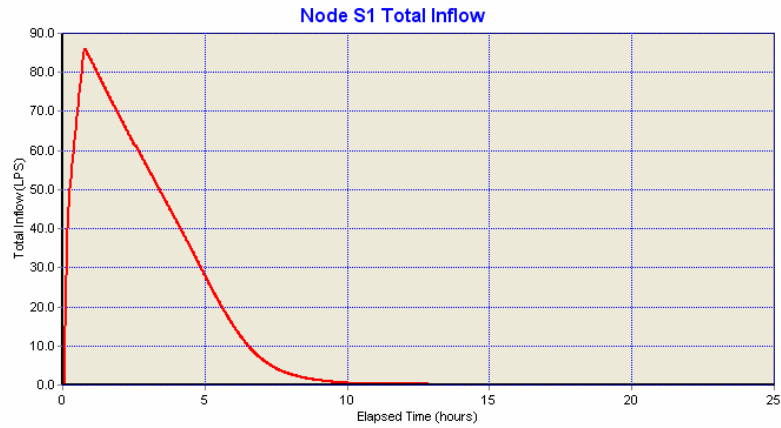
PROFILI LONGITUDINALI PRINCIPALI DI MASSIMO RIEMPIMENTO



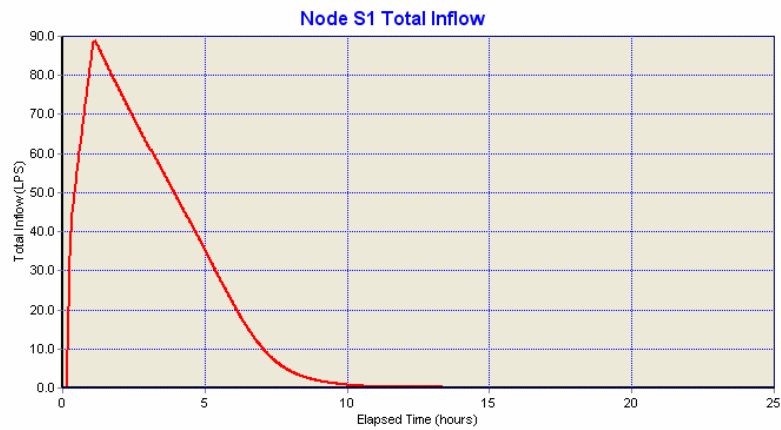
IDROGRAMMI DELLE PORTATE MASSIME DI SCARICO ALLA CHIUSURA DEL BACINO

SCARICO IN S1

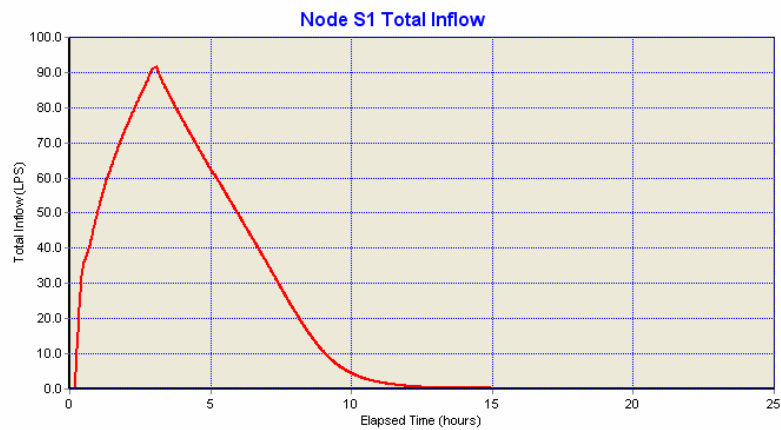
Evento meteorico con ietogramma costante di 45 minuti



Evento meteorico con ietogramma costante di 60 minuti



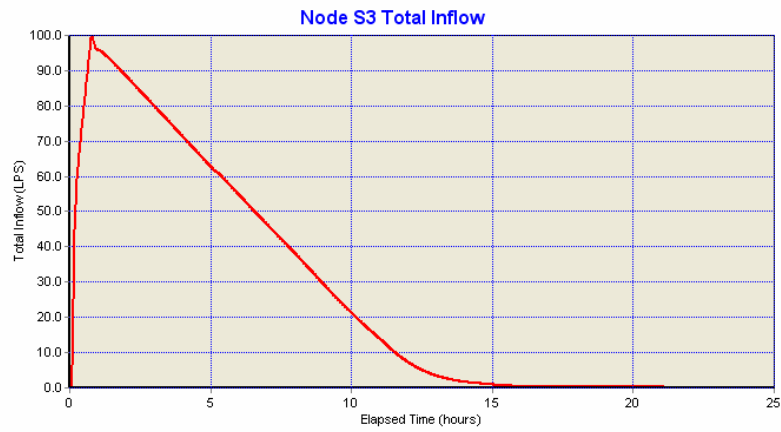
Evento meteorico con ietogramma costante di 180 minuti



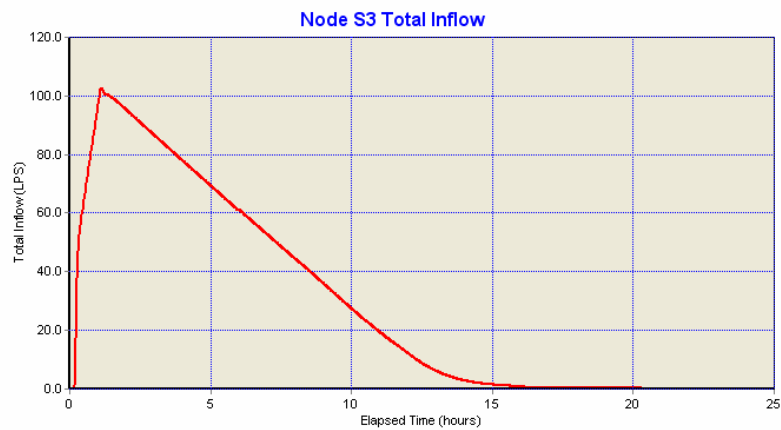
IDROGRAMMI DELLE PORTATE MASSIME DI SCARICO ALLA CHIUSURA DEL BACINO

SCARICO IN S3

Evento meteorico con ietogramma costante di 45 minuti



Evento meteorico con ietogramma costante di 60 minuti



Evento meteorico con ietogramma costante di 180 minuti

